THE NEWSLETTER
The Colebrook Land Conservancy

"In Land We Trust" *Spring 2018*

Spring Magic: Vernal Pools

Vernal pools are the breeding grounds for a number of species, including the Spotted Salamander, at right.

Spring is officially here, and change is in the air. Mounds of snow are disappearing, crocuses and daffodils are emerging from the soil; we hear the sounds of birds and the bears have begun to reappear, announcing the arrival of a new season. In 2018, the Vernal Equinox in the Northern Hemisphere is on March 20th, that moment when the sun is directly above the equator, and day and night are exactly the same length. For many of us, this Vernal Equinox also signals that time of the year when vernal pools and their inhabitants re-emerge.

Vernal pools are shallow depressions which fill up with water during the winter snow melt and the ensuing spring rains, and are usually completely dry during summer and fall. They range in size from small puddles to shallow lake-size bodies of water and are generally isolated from stream systems. Vernal pools are typically associated with grasslands and rocky plains or basins, though they may form in forests. Generally, beneath vernal pools there is either bedrock or hard clay, which helps them retain water. Vernal pools are considered to be a distinctive type of wetland; as they are devoid of fish, certain crustaceans, amphibians and insects unable to otherwise withstand competition or predation can thrive there.

Despite being dry for most of the year, vernal pools begin to teem with life once they fill with water. The organisms found there fall into two types. The first and most notable are members of the Obligate species, such as Fairy shrimp, spotted salamanders and wood frogs, which are completely dependent on the vernal pool habitat for their reproduction and survival. The second type, members of the Facultative species, are not solely dependent on vernal pools, since they also use other wetland habitats during their life cycles. The most common of these are various species of breeding frogs and toads. The types of species found in vernal pools vary from coast to coast and internationally. In the box is a list of those found in vernal pools in our area. Additionally, birds such as egrets, ducks and hawks use vernal pools as a seasonal

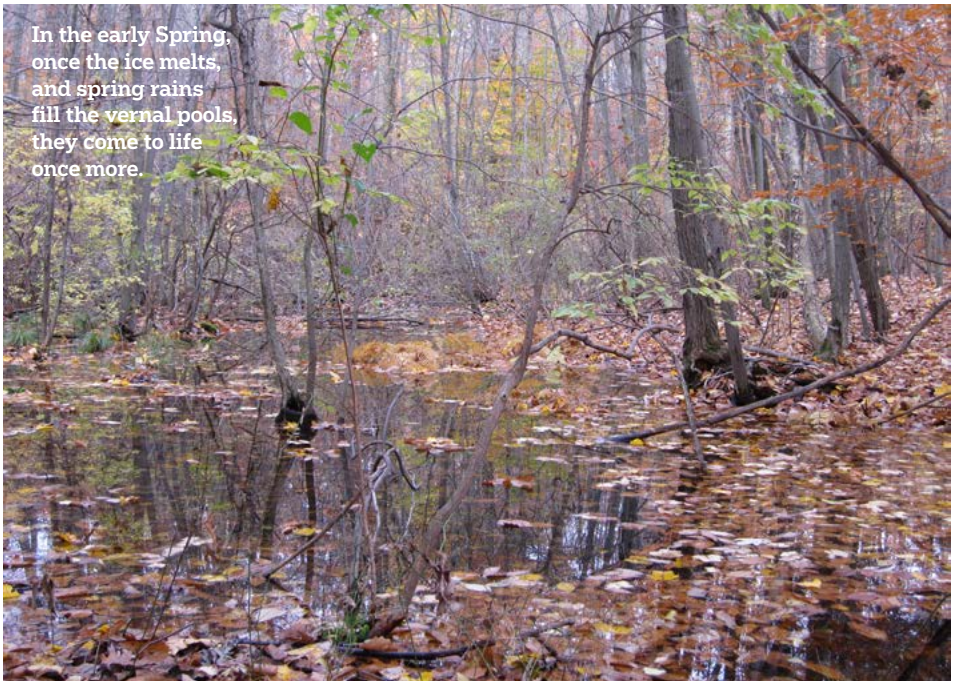
source of food and water.

In 2011, the Farmington River Watershed Association (FRWA) was engaged by the Farmington River Coordinating Committee (FRCC) to organize a vernal pool verification project in the town of Colebrook, one of the towns along the section of the Farmington River West Branch which has been designated as a Wild & Scenic River. Using data developed by wetland scientist Ed Pawlak and GIS specialist Jeff Bolton, they provided more precise visual information to previously used aerial photos. Using coordinates for PVP's (Potential Vernal Pools), FRWA biologist Elizabeth Corrigan was able to identify properties where they occur, and in many cases, access the sites for verification. A report has been generated containing a list of coordinates for 61 PVP's. Of these, a total of 55 were verified as pools, including eight verified as vernal pools. In addition, Ms. Corrigan located and verified 21 more previously unknown vernal pools.

Vernal Pool Inhabitants

OBLIGATE SPECIES
Spotted Salamander
Jefferson Salamander
Blue Spotted Salamander
Wood Frog
Fairy Shrimp

FACULTATIVE SPECIES
Red spotted Newt
Spring Peeper
Green Tree Frog
Leopard Frog
Pickerel Frog



In the early Spring, once the ice melts, and spring rains fill the vernal pools, they come to life once more.

In addition to the mapping and study data, another way to locate vernal pools is to listen. If you drive around town, you will hear the spring peepers. Interspersed between their calls one might hear a deep croaking, somewhat akin to a duck's quack. The calls are somewhat sporadic but distinctive. If you hear the croaking, very quietly approach the area and you may be rewarded by seeing a wood frog, named the "Lone Ranger" of vernal pools, due to the distinctive black mask around its eyes.

A sure sign of a vernal pool is the sight of a gelatinous cluster of eggs under the water's surface. These clusters most likely belong to the spotted salamander, though other species produce them as well. Eggs are laid in the vernal pool, then the juveniles leave it two or three months later, not returning until the following spring to breed. In the case of the salamanders, the adults may visit the pool only briefly. The woods and fields surrounding the pools are therefore critical for the survival of the species found in the pools.

A well-known phenomenon associated with vernal pools is the spring migration of spotted salamanders—sometimes across busy town roads—to mate, breed and lay their eggs in the pool's shallow, watery edges. As salamanders cross the road, naturalists volunteer their time to stand watch to prevent cars from running over them.

Several crustaceans, such as fairy shrimp, lay eggs that sink to the bottom of the pool, dry out in summer, freeze in winter and hatch when the water returns in spring. This freezing in winter and hatching in the spring raises the question—how can any organism survive this? Enter the world of Cryobiology.

Cryobiology is the study of the behavior of proteins, cells, tissues, organs and organisms at extremely low temperatures. Another example of cryobiological behavior can be seen in the wood frog in winter: it survives months of hibernation without a heartbeat and with much of its body frozen. Despite the almost complete shutdown of its body, the frog isn't harmed by freezing; when the temperatures rise in the spring, it returns to normal activity.

Researchers have found that a wood frog can survive when 65 to 70 percent of its body is frozen and safely undergo multiple freeze-thaw cycles in winter. The wood frog's liver produces a large amount of glucose as winter approaches. This glucose is transported by the blood and enters the animal cells where it acts as antifreeze. Additionally, an increased concentration of a waste substance called urea helps to prevent freezing in the cells. Understanding the adaptations that enable frogs to survive freezing could aid human medical research in critical areas. For instance, improving the safety of cryopreservation of tissues and organs for transplants, or glucose management in diabetes, or the restoration of blood flow to organs after a heart attack or stroke would represent a major medical breakthrough.

Vernal pools are a natural laboratory well worth preserving, studying and enjoying, as they provide a unique habitat for many rare plants and animals, safeguarding their survival in an increasingly challenging natural environment.

—Jerry Rathbun

A Bluebird approaching the nest box, bringing food to the baby birds. At right, top, a Bluebird landing; At right, bottom, in repose.

Bluebirds Need Homes!

If you have ever had the pleasure of seeing a flash of intense blue with perhaps a little orange or white in the trees outside your window, or heard a melodic, turalee call, you may have encountered a Bluebird. However, the thrill of seeing these charming creatures may be as endangered as the bird itself. Bluebirds are struggling to compete with the very aggressive, non-native European Starlings and House Sparrows for a decreasing amount of breeding habitat in the Northeast. With development and increased human encroachment, many old trees that had provided homes for these cavity nesting birds have been cut down, and old wooden fence posts have been replaced by metal poles. Over time, climate change will further endanger the birds' accustomed breeding habitats as well.

Now is the time to do something to help the beleaguered bluebird, by setting up a nesting site —a Bluebird nest box, or even better, two of them 15 to 20 feet apart for these social creatures—or by creating a Bluebird trail of nest boxes. The North American Bluebird Society notes that there seems to be a direct correlation between areas where Bluebird nest boxes have been erected and an increase in the bluebird population. There are a variety of nest boxes for sale online, or at various local stores such as Walmart. The Colebrook Land Conservancy also has a limited number of bluebird houses for sale at $25 apiece. They were built and donated by Conservancy member Les Bluestone. If you are interested in purchasing one of them please contact info@colebrooklandconservancy.org

You can also make your own nest box. The Audubon Society www.audubon.org and the North American Bluebird Society www.nabluebirdsociety.org both have blueprints for them.

The North American Bluebird Society (NABS) offers some guidelines on building a nest box that will attract Eastern Bluebirds and keep out Starlings and House Sparrows.

Nest Boxes should be:
—well ventilated, watertight, and have drainage holes. They should be easy to open, monitor, and easy to clean
—made of solid, untreated light-colored wood, or exterior grade plywood and if painted on the outside, it should be a light color
—have a round entrance hole measuring no more than 1 ½ to 1 and 9/16 inches in diameter, or a 1 and 3/8 x 2 ¼ inch vertical oval hole
—of small to moderate size
—preferably not have a perch as House Sparrows and House Wrens are attracted to them
—positioned at the edge of a field or pasture, or any open area, 15 to 20 feet apart, preferably in pairs or in a series
—periodically inspected and cleaned, and all non-bluebirds should be evicted

—Amy Bernstein

What Do Bluebirds Eat?

SUMMER
Caterpillars, beetles, crickets, grasshoppers, and spiders

FALL AND WINTER
Fruits like mistletoe, sumac, blueberries, black cherry, tupelo, currants, wild holly, dogwood berries, hackberries, honeysuckle, bay, pokeweed, and juniper berries

Colebrook Land Conservancy's 16th Annual Pot Luck Supper

Please join us at the Colebrook Senior and Community Center on Saturday, April 14th at 5 pm for a pot luck supper (bring your favorite homemade dish or dessert) and a discussion about the amazing lives of turtles. John Foley, one of Connecticut's leading experts, will offer an illustrated talk on where turtles live, how they survive, why they have domed shells, and how to tell one species from another. John will bring some special guests with him, too—Reese's and Meatball. Former K-3 teacher Sara Videtto will end the evening with a reading of her acclaimed children's book, *Turtle's First Winter*.

We lack email addresses for many of you, and if there is an alert we wish to send out, information about upcoming events or other announcements, we have no way of contacting you but snail mail. Please send us your email address:

info@colebrooklandconservancy.org

The Colebrook Land Conservancy
P.O. Box 90 Colebrook, CT 06021

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