

Seasonal Changes of a Vernal Pool

Newton Conservators member Paul Spagnoli took a series of photos to document seasonal changes at Bare Pond, a vernal pool in Webster Woods, the part of Webster Conservation Area recently acquired by the City of Newton.

Unlike other ponds and lakes, vernal pools are **temporary** freshwater bodies of water. These small pools are filled by autumnal rains, snow melt, and spring rains. By the end of summer, most vernal pools have dried up, leaving leaf litter, cracked mud, and rocks to show where they were. To be a certified vernal pool in Massachusetts, there must be water in the pool for more than two months in the spring and summer of most years (to enable obligate vernal pool species to reproduce), and there can be no fish. Without predatory fish, other creatures can thrive.

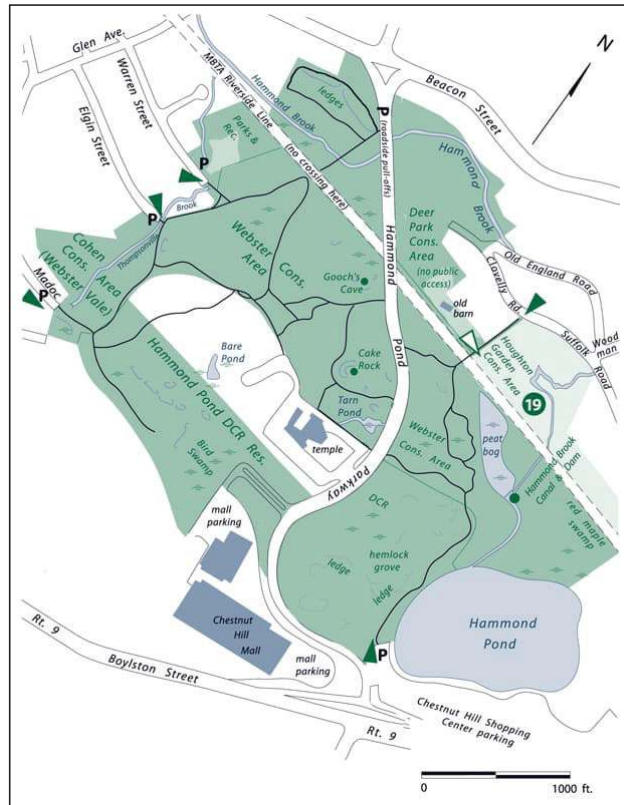
Vernal pools (and the forested land around them) provide essential habitat for many species. In the spring, vernal pools are home to reproducing invertebrates (such as fairy shrimp, dragonflies, and damselflies) and vertebrates (such as spotted salamanders and noisy wood frogs).



Dragonfly Larva



Wood frogs with eggs



In the photo taken on March 18 (below), the water was at its highest level. At this point, its resident wood frogs were beginning to chorus loudly and were laying their eggs. In the middle of March, the discussion board for the Friends of Webster Woods contained the first messages from visitors to the pond who were hearing and seeing wood frogs in the pond on warm days.

Unseen to most observers at that time, fairy shrimp also were active in the pond. Fairy shrimp are a life form perfectly suited to spending their entire brief lives in a vernal pool. They hatch from eggs left in the soil on the bottom of the pond the previous year. The slow-moving crustaceans molt several times and reach their adult size of 1” within a couple weeks, before

most of their would-be predators are active. They have eleven pairs of legs, stalked eyes and swim upside down, using their many legs to find and filter decaying plants and even smaller animals in the pool.



Photo taken March 18

In April, the wood frog eggs hatched. I saw masses of wriggling black tadpoles in the water on visits to Bare

Paul’s first photo (right) shows the seasonal changes that take place at Bare Pond — and many other vernal pools in our region.

Continued on page 6



External gills on a juvenile salamander

Pond in April. They were foraging for algae and decayed leaf matter. At the same time, spotted salamanders were busy laying their eggs, which probably were attached to vegetation in sunny areas of the pond.

In Paul's photo from June 16 (below), the water level had receded enough that some of the trees were on dry land. And more of the big rock was above water. Those wood frog tadpoles that survived attacks from birds, beetles, turtles and snakes were undergoing their metamorphosis into tiny frogs. The salamander eggs would have hatched into .5" larvae with external gills. For the first couple days, juvenile



Photo taken June 16

salamanders also have "balancers" behind their gills (and in front of their front legs) to help keep them upright. By the time this photo was taken, the fairy shrimp would have died, leaving their cyst eggs filled with perfectly formed embryos buried in the muck at the bottom of the dried-up pond and ready to hatch in the spring of 2021.

When Paul took his photo on June 28 (right, top), there were only a few puddles left in Bare Pond. By this point, the salamanders and wood frogs had all dispersed into the woods around the pond, where they will overwinter in the abandoned burrows of small mammals and under rocks and fallen trees. As ecologist Eric Olson wrote in an article in 2018, "The various amphibians that arrive at vernal pools in March or April will reside in and near a pool only long enough to mate and lay eggs; all the rest of the year they are forest dwellers."



Photo taken June 28

By the time Paul took a photograph on July 21 (below), four months after the first photo, the land was bone dry.

Bare Pond is Newton's largest vernal pool but not its only one. The city has a total of thirteen vernal pools certified by the state's Natural Heritage & Endangered Species Program. Most of those vernal pools are located in Cold Spring Park, near the state's Charles River Reservation, and in Webster Woods. In addition, there are almost twenty more bodies



Photo taken July 21

of water that potentially are vernal pools but have not yet been certified. The State Wetlands Protection Act protects certified vernal pools in Newton only when they fall within jurisdictional areas such as Riverfront Area or floodplains.

If you would like to learn more about vernal pools, visit the website of the Vernal Pool Association: <https://www.vernalpool.org/> ♦

✿ Beth Wilkinson