

A Close Look at Bare Pond in Webster Woods

By Richard Primack, long-time Newton resident and Professor of Plant Ecology at Boston University

Bare Pond, a large vernal pool in Webster Woods, has many unique features, including one of Newton's few spring breeding sites for yellow-spotted salamanders.



PHOTO: DAN BRODY

A spotted salamander collected by a scientist at Bare Pond

The Newton Conservators often leads walks to Bare Pond to see the adult salamanders and their egg masses. Inspiring a "Save the Salamanders" rallying cry, this species helped generate public support for Newton to acquire the land from Boston College four years ago.



PHOTO: RICHARD PRIMACK

Bare Pond and its Pyramid Rock during the autumn



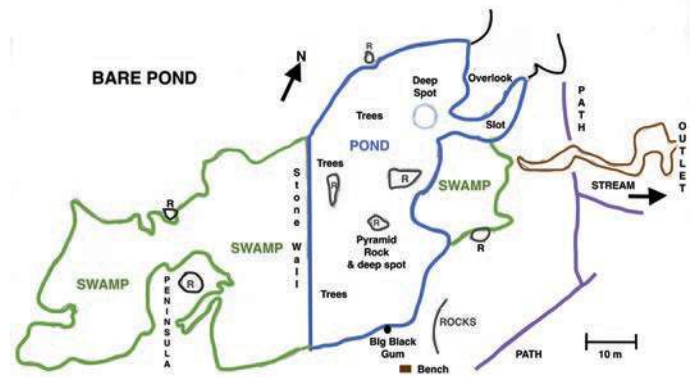
PHOTO: RICHARD PRIMACK

Bare Pond in winter

Many local residents know that Bare Pond fills up in fall, freezes over in winter, dries out in late spring, and is bone-dry and "bare" in summer. It is a place to have secluded ice-skating parties in cold winters and look for aquatic insects and other tiny swimming creatures in spring. In mid-summer, concentrations of aquatic beetles and juvenile salamanders can be found in the

last remaining pools, making easy pickings for Great Blue Herons and other hungry birds.

Over the last eight months of 2024, I decided to investigate the pond more carefully and systematically. I had been visiting Bare Pond for over 60 years, but had I missed any hidden secrets? Henry David Thoreau studied Walden Pond for years and gained tremendous insights into the natural world; would a study of Bare Pond reveal the same to me?



In this new map of Bare Pond made by Richard Primack, open water is indicated in blue. The water-filled swamp is indicated in green. Rocks (R) are indicated in black. The stream is brown. Paths are purple.

Mapping Bare Pond



PHOTO: RICHARD PRIMACK

Bare Pond slot



PHOTO: RICHARD PRIMACK

Bare Pond after water has receded

I began by mapping the area. Using a measuring tape, a compass, and flagging, I mapped the outline of the water around Bare Pond. The open water is part of a larger 0.8-acre swampy wetland. The whole wetland is irregularly shaped like a dragon flying southwest (if you use your imagination), and the pond's open water covers about 44% of the wetland. It is about 61 yards long and 30 yards wide.

Among the notable features of the pond and surrounding wetland are a water-filled, rock-edged slot adjacent to a rock overlook, a peninsula that constricts the swamp in the south, and a 19th-century stone wall that

forms the southwest border of the pond. Presumably, the wall was built to mark property boundaries and keep in livestock.

When the pond is dry in the summertime, you can measure the high water line left on swamp trees and rocks. Using this approach, I found that the average pond depth is around 30 inches. The greatest depth is 43 inches around Pyramid Rock in the middle of the pond and at the shallow basin close to the overlook. The basin might have been dug out more than 150 years ago to provide drinking water for domestic animals. If we assume an average depth of 30 inches, the Bare Pond wetland contains around 675,000 gallons (or 3,334 cubic yards) of water.



Drone photo of Bare Pond in winter

warmer summer weather, levels dropped twice as fast on dry days—roughly an inch each day. Starting in the fall of 2024, I will measure the process of the pond filling up again.

Bare Pond Stream

Bare Pond has an outlet on its eastern side along the walking

Tracking changes

Starting in early January, 2023, I measured the water temperature and depth at two points near the rock overlook every few days. I learned that the pond’s water changes even more frequently and rapidly than I had realized.



Bare Pond watermark

— between February 24 and 28 — the water temperature warmed 12 degrees, from 35 to 47 degrees.

After several inches of rain in early March, water levels in the pond rose by 4 inches. When the weather was dry and cold, levels dropped by perhaps a half-inch per day. In

On February 13, 2024, there was no ice on the pond. On February 15, ice covered 95% of the pond. By February 25, there was no ice again.

When the pond was full, its water temperature ranged from 32 degrees Fahrenheit on February 5 to 70 degrees on May 23, a 38-degree shift. Even within just a few days

path, which I call “Bare Pond Stream.” This intermittent stream flows only when the pond is full and there has been rain. The pond can be thought of as a saucer tilted slightly to the side. As long as it is not full, no water spills out into the stream, but when it is full, any rain that falls causes water to spill over the edge and flow into the stream. Heavy rain when the pond is full results in a strong flow in the stream. But after a few days with no rain, the stream stops flowing again.

Bare Pond Stream disappears into the ground before reaching the valley below. In bigger rains, the flow is stronger, and the length of the stream is longer, varying from just a few yards to several hundred yards.

On April 3 and 4, 2024, there was a very heavy rain. I measured the flow rate by measuring the stream width and depth with a ruler and the speed of the water with a small floating plastic bottle. I found that the stream carried 269 gallons of water per minute, or 16,140 gallons per hour, the same rate as about six standard one-third-horsepower sump pumps. After a day without rain, the flow declined to only 23% of the previous day.

Hooked

I have only started to learn the secrets of Bare Pond. It is much more dynamic than I had thought — shifting from ice to water and back again, warming and cooling, and flooding and drying. As I’ve been looking, I’ve found more of the pond’s mysteries to explore, including unusual rock features, peculiar trees, and aquatic creatures.

I’m looking forward to another year of investigation. ♦