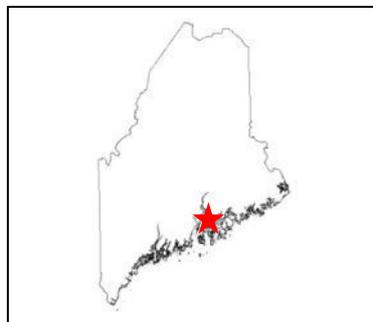


Geologic Site of the Month
October, 2014

Geology Guides a Turtle Home, Blue Hill, Maine



44° 26' 45.31" N, 68° 34' 45.65" W

Text by
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Introduction

We humans often utilize global positioning systems (GPS) to assist us with surveying, driving, flying, locating favorite fishing or hunting spots, or simply to take us back to our starting position whether that be our home, camp, or automobile. The go to (“goto”) feature of these devices has become relied on so frequently, some of us likely take it for granted and would become lost without it. While we often read of biologists and their study of the migration of various animals and how they seem to navigate to places of birth, a story of a painted turtle in Blue Hill, Maine and its journey home reminds us that biology is very much connected to geology.



Figure 1a and b. (a) Photograph of a pair of Eastern Painted Turtles *Chrysemys picta picta* enjoying some sun on a birch log. (b) Photograph of *Chrysemys picta picta* traveling through the woods possibly to lay eggs.

A Turtle and Its Journey Back Home

In the Spring of 1973, an [Eastern Painted Turtle *Chrysemys picta picta*](#) (Figure 1) was caught with a dip net as a child's pet along the northeast shore of [Noyes Pond](#) (locally called Norris Pond and historically referred to as "Chalk Pond") in Blue Hill, Maine (Figure 2a). The turtle was kept for about a year and during this time, the child's initials "JB" were carefully etched into the lower edge of the shell. After a year in captivity, it was decided that the turtle should be returned to the wild. Instead of returning it back to Noyes Pond, it was released during the early Summer of 1974 along the eastern shore of nearby [Toddy Pond](#) (approximately 3.2 miles to the north of Noyes Pond) near the Surry-Blue Hill town line (Figure 2b).



Photo by Gerald R. Butler

Figure 2a. Photograph of Noyes Pond looking southwesterly near where turtle was caught. Blue Hill Mountain is in the background.



Photo by D. B. Locke

Figure 2b. Photograph at Toddy Pond looking southwesterly from eastern shore where turtle was released.



Journey Back Home

The story of this turtle and its great adventure might have ended here from a purely human perspective, except for the fact that in the Summer of 1975, this very same turtle complete with the carved “**JB**” initials in its shell was observed back at Noyes Pond at nearly the same spot as it was originally caught in 1973!! While the path the turtle took in its journey back to Noyes Pond is not known, it is known that turtles utilize the [Earth’s magnetic field](#), [chemical imprinting or chemoreception](#), and [sense of smell](#) to aid them in navigation (Derek Yorks, Wildlife Biologist, Maine Department of Inland Fisheries and Wildlife, personal communication). Given this, it is theorized that the turtle swam toward the upper end of the Toddy Pond perhaps by magnetic field guidance and then encountered the mouth of Western Brook (Figure 3). From this point, the turtle may have also relied on chemoreception and smell following Western Brook to its headwaters near Cushion Swamp. Southeastward of Cushion Swamp there is a drainage divide and distance of 600-800 feet which the turtle would have traversed through the woods en route to Noyes Pond. If the turtle chose this path, it would have traveled a total distance of approximately 3.9 miles (Figure 4)



Figure 3



Photo by D. B. Locke

Figure 3a. Photograph of the mouth of Western Brook.



Photo by D. B. Locke

Figure 3b. Photograph of enlarged view of brook mouth.

Figure 4

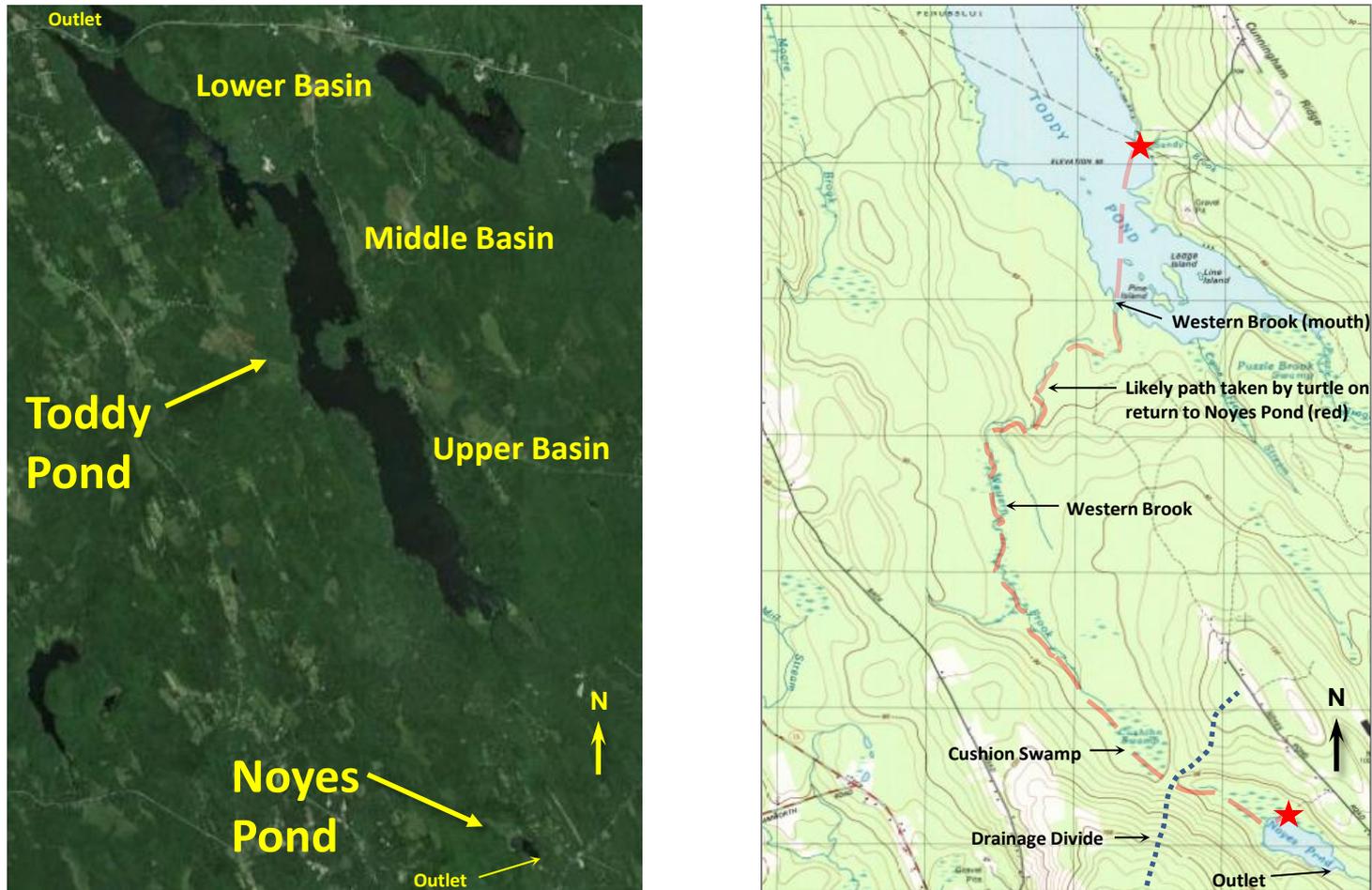


Figure 4a and b (a) Aerial photograph (left) showing the three basins of Toddy Pond and Noyes Pond to the south. (b) Section of USGS 7.5 minute Blue Hill, Maine quadrangle (right) showing upper basin of Toddy Pond and Noyes Pond to the south. Also shown by the red stars is the capture location at Noyes Pond and release location at Toddy Pond and a possible return path back to Noyes Pond taken by the turtle.



Surficial Geology

Toddy Pond is comprised of three basins which cover 2,408 acres, has a maximum depth of 122 feet (in the northern basin) and drains northward eventually into tributaries to the Penobscot River. In contrast, Noyes Pond has an area of 27 acres, a maximum depth of 18 feet and the outlet (Peter's Brook) discharges to Blue Hill Bay. These two ponds are NOT connected and are situated in different drainage basins. While the Eastern Painted Turtle is found in Toddy Pond, this particular turtle was clearly determined to return to its birthplace and must have endured numerous challenges during its travel homeward.

While Noyes Pond does not drain to Western Brook, it is thought that the Cushion Swamp area may be underlain by similar sediments as Noyes Pond resulting in similar water chemistry to Noyes Pond and this could further explain the turtle's successful return to the pond. The surficial geology of the Noyes Pond and Toddy Pond areas is predominantly mapped as glacial till which is composed of a heterogeneous mixture of sand, silt, clay, and stones. At depth however, Noyes Pond is underlain by [diatomaceous earth](#) which was actually mined to a limited extent in the late 19th to early 20th centuries. This sediment is NOT known to occur in Toddy Pond. Diatomaceous earth is composed almost entirely of silica or SiO₂ and is derived from the skeletal remains of diatoms. It is often used in the mechanical filtration of water and other fluids. At this time, it is not known to what extent the presence of diatomaceous earth at Noyes Pond acts as a chemical imprint or influences the geochemistry to create a unique chemical signature.



References and Additional Information

Acts and Resolves of the Sixty-Eighth Legislature of the State of Maine, Private and Special Laws of the State of Maine 1897, Augusta: The Secretary of State, p.660. ([PDF, 74.22 Kb](#)).

Hinckley, William P., 1989, Bits of Local History: A compendium of re-published articles originally written for The Weekly Packet; Blue Hill Historical Society and Penobscot Bay Press, pp. 20-21.

Thompson, Woodrow B., and Borns, Harold W., 1977, Surficial Geology of the Blue Hill Quadrangle, Maine; Maine Geological Survey (Department of Conservation), [Open File Map 77-36](#) (PDF, 2.7 Mb), scale 1:62,500.

