

A Natural History
of the
Hop Brook

by

Marilyn Novak

Hop Brook Ponds Study Committee
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NOTES

In 1992 the Sudbury Board of Selectmen created the Hop Brook Ponds Study Committee to examine the cause of, and to investigate possible remedies to, the extensive algae growth blanketing the ponds of the Hop Brook system. As part of that work the Committee produced a series of short reports summarizing its findings.

This report, written and illustrated by Committee member Marilyn Novak, describes the diverse array of plants and wildlife found along the Hop Brook. It reminds us that small streams like the Hop Brook are the ecological foundation – the life blood – of a healthy local environment.

Go out and take a look. Coax your friends and family to join you in a walk along the many access areas along Hop Brook.

Stephen M. Meyer
Chair, Hop Brook Ponds System Study Committee
Conservation Commissioner

November 9, 1994

Natural History of the Hop Brook

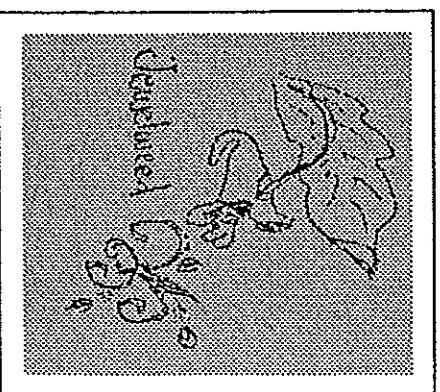
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Hop Brook winds its way through approximately 9 miles of Sudbury. It's the Hop Brook you pass when you cross over the small bridge on Dutton Road near French Road; it's the Hop Brook you pass when you cross the small bridge on Peakham Road near Blueberry Hill Road; and it's the Hop Brook you pass on Landham Road on your way to Frammingham. Hop Brook, or one of its feeder streams is probably that small brook that runs through your neighborhood or behind your house. On its long and twisting journey from Marlboro to its convergence with the Sudbury River in Wayland, Hop Brook is an integral part of the Sudbury landscape. The plants and animals that live in it, on it, under it or next to it, all add to the quality of life here in Sudbury. Anything that threatens this habitat eventually threatens our quality of life.

Hop Brook takes on many forms as it moves through town. It is a quickly moving stream in some places, a wetland or a shallow millpond in others. It begins its journey in Sudbury as a wetland, quickly opening up to become Grist Mill Pond by the Wayside Inn. The brook that leaves the Grist Mill Pond soon becomes a wetland at the inlet to Carding Mill Pond. From Carding Mill Pond the stream moves and twists following drainage paths around low rounded hills and glacial deposits until it flows into an extensive wetland area before entering Stearns Mill Pond. After leaving Stearns Mill Pond, Hop Brook continues, sometimes as a stream and at other times widening out into wetlands until it reaches the Sudbury river.

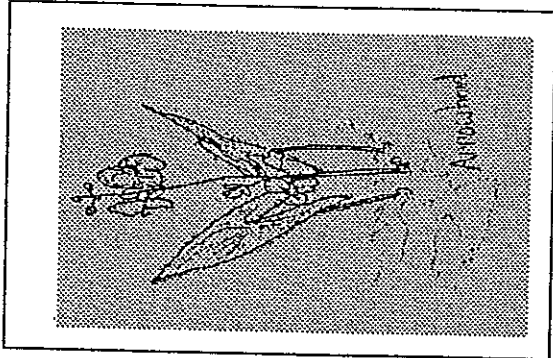
When Hop Brook takes the form of a stream, water flow is quick enough to keep the bottom scoured of sediment. The rocks in the middle of the stream have little plant life growing on them. Along the banks, plants that appreciate the extra moisture grow in abundance. The exotic purple loosestrife, a European import, grows thickly. Its beautiful magenta spires, seen from July to September, hide the real fact that it is an invasive enemy with little wildlife value that is systematically crowding out native plants.

The cardinal flower, with its bright scarlet blossoms, is not as prolific as the loosestrife, but it is preferred by hummingbirds. Jewelweed, growing in large clumps, cover the stream banks and present their orange flowers from July to September. After a rain shower, drops that collect on the jewelweed's leaves look



slightly translucent and gemlike and that appears to be how it got its name. When the fruits of the jewelweed are ripe, a slight touch will set off a seed dispersal mechanism that acts like a gun, shooting the seeds a good distance away.

Near the stream banks, in the water, but away from the quickly flowing center of the stream, live plants that can stand to have their root systems submerged. Some can only stand seasonal immersion while others survive through the entire growing season partially under water. Most of these specialized plants can also be found in the Hop Brook wetlands. Arrowhead is well named, since its aerial leaves resemble arrowheads. It is quite common along the Hop Brook. Arrowhead produces two kinds of leaves depending on the water level. In spring, when the water level is higher, leaves are produced that float on the water surface and are longer and thinner than the leaves produced when the water level subsides. As the water level drops, aerial leaves develop. The arrowhead develops trios of white flowers in late summer. The roots are tubers which are often eaten by ducks and muskrats.



Other common streamside plants include the pickerelweed, with its spikes of pretty lavender flowers, the smartweed with its late summer small pink flowers, the arrow arum which produces a green spathe in early summer, and the Joe-Pye weed with its purplish stem and late summer pinkish-purple flower clusters. The arrowhead, pickerelweed and arrow arum have leaves that look enough alike to confuse identification. The flowers of these plants, arrowhead with white flowers, pickerelweed with lavender flowers and arrow arum with its green spathe, should help alleviate that possibility.

The belted kingfisher, a bird which mainly eats small fish can sometimes be found along the stream banks. This flicker-sized bird can be seen perched on reeds or branches that hang over the water. It has the ability to hover in the air while it looks for fish. After sighting a small fish, it will dive into the water catching the fish with its thick pointed beak. Returning the branch the kingfisher flicks its head back, tosses the fish into the air, opens wide, and gulp!

Other birds that can be seen along the stream bank include such common birds as the common flicker, a type of woodpecker, the white-breasted nuthatch, the tufted titmouse, and the black-capped chickadee. The Baltimore oriole, a bright orange and black spring visitor, is strikingly beautiful as it flies

rich (phosphorus rich) waters of the shallow millponds completely closing off the surface in some places. In some areas of the Grist millpond waternet is thick and dense enough to support the weight of a medium sized dog. This algal growth limits the amount of oxygen and light available to the organisms that live in the pond. Blocking out sunlight it kills off underwater plants, destroying the habitat value of the ponds.

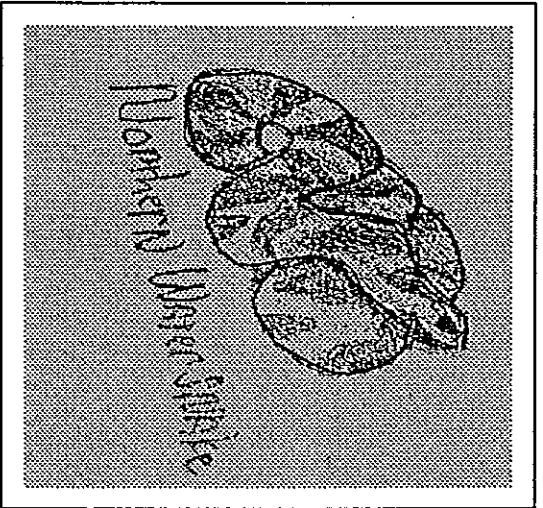
It also adversely affects the temperature and pH of the ponds. Fish, which used to be common to the ponds, like bass and pickerel, if they are found at all, are of a much smaller size than would be expected. Some fish which can live in more polluted environments, such as catfish and sunfish seem to have become the predominant fish type.

The Hop Brook system is worth preserving as a natural habitat that can be enjoyed in our increasingly urbanized town. The many plants and animals that depend on the Hop Brook can teach us and our children a local lesson in how to get along with nature, and the importance of natural systems in our daily lives. We don't have to go far to see an ancient reptile, like the snapping turtle, crawl out of the waters to lay its soft white eggs, to see beavers show their contempt for running water or the hunting strategies of a four foot tall great blue heron. They are here; literally in our own backyards. But they will remain here only as long as we protect their habitat, the Hop Brook.

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Large Northern Water Snakes -- most a dull black in color -- can be seen throughout the summer sunning themselves on along the banks, draped over fallen trees at water's edge, or swimming sinuously in the wetlands and ponds. They grow to be quite long - 42" and can be aggressive if cornered. They eat small fish and frogs. We had one that insisted on spending the summer curled around one of the metal legs of our children's swing set. We let him stay there and made sure the children didn't frighten him while they continued to use the rest of the swing set and gain an appreciation for their 3 1/2 foot long guest. We've also found them in our woodpile and doing a good impression of a branch next to a half submerged log by the edge of the pond.

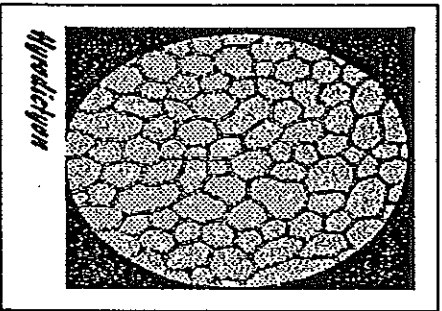


Garter snakes are very common residents of many different habitats including wetlands and wooded areas that border streams. They are striped, usually yellow or tan alternating with black. They eat insects, frogs, toads, salamanders and help keep those populations under control. Unlike other snakes which lay typical rubbery reptile eggs, garter snakes bear 6 or more live young sometime during the summer.

The Hop Brook system is home to a wide variety of fish. Bass, perch, pumpkinseed, chain pickerel, and carp are just a few of the species caught by anglers. Some of Hop Brook's better protected tributaries -- the small gurgling streams that run through protected woodlands -- even host Brook Trout.

By the end of May, beginning of June a noxious alga, called waternet (*Hydrodictyon*) begins to cover the ponds. Grist millpond seems to be covered with a thicker layer of waternet than the other ponds, although they are all affected.

Waternet, which looks like lace under the microscope, reproduces rapidly in the nutrient

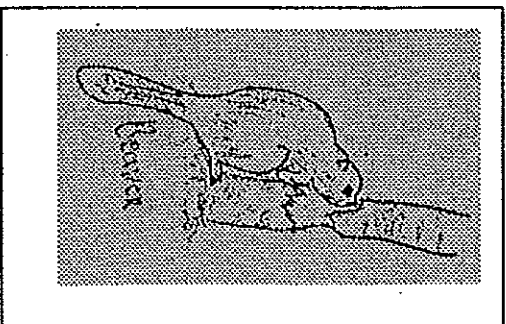


from tree to tree. Canary-yellow American goldfishes dart through trees along the banks.

As the topography changes along the course of the Hop Brook and the elevation levels off, the stream expands to form a wetland. Hop Brook does this throughout its length forming many beautiful and useful wetland areas. Hop Brook conservation area off Dutton Road and Haynes Meadows conservation land in back of Curtis Middle School are fine places to observe wetland ecosystems. One of these wetlands recently hosted a family of beavers. The remnants of their construction work -- a long dam and an impressive lodge -- stand in disrepair in the Hop Brook.

Tracks left behind by white-tailed deer, mink, red fox, and muskrats can be found along the entire length of the Hop Brook. Where natural vegetation remains intact food, water, and shelter are abundant.

Wetland vegetation provides shade that helps moderate water temperatures, which is important to fish life. Flooded wetland areas provide food, breeding habitat, and cover for fish. It is the wetlands plant community and the unique wetland soils that act as sinks, transformers, and cleansers of the entire Hop Brook system by detaining sediments, absorbing excess nutrients, such as nitrogen and phosphorus, and breaking down toxic substances that would otherwise flow unchecked through Sudbury and into the Sudbury River. Effective and efficient water pollution control absolutely free.



The tussock sedge is a common wetlands plant. Its "tussocks," are formed from the dead remains of many years growing seasons. Once established, this perennial can form "tussocks" two to three feet high. The seeds are eaten by ducks, while the roots and sprouts provide food for muskrats.

Probably the plants most easily identified with a marshy or wetlands area are the reeds, cattails and rushes. All of these plants, with their spiky foliage and distinctive seed heads, not only shade the water but provide safe nesting, nesting material, and hiding places for birds. They also provide large amounts of food for birds, mammals, reptiles, fish and amphibians.

Cattails, which grow to be 7 feet tall, provide food for aphids, caterpillars and beetles which feed on the leaves and burrow into the stems. The insects provide a rich food source for many varieties of insect eating birds like marsh wrens.

Male marsh wrens build their nests among the cattails. Their nests are made of an outer shell of woven cattails, grasses and/or sedges. The males make many of these dummy or "courting" nests, up to twenty-six but usually only five or six. It takes about one to three days for the male to complete a nest and he may work on several at once. When the females arrive and pair off with the males, they select one of the male's nests and add the lining, or sometimes the female will build a totally new nest for the pair. The female lines whichever nest they choose with grasses and sedge leaves, then adds a layer of cattail fluff, which provides a tight insulating layer and ends with a layer of fine grass or sedge strips. Feathers may also be added. The dummy nests may be used by roosting adults at night, by fledglings for shelter after they leave the breeding nest, and in winter by adults that remain in residence.

A common early summer resident of the wetlands is the red-winged blackbird. The male is easily identified by its bright red epaulets which provide a gaudy display against his jet black body. The female is a rather dull streaked brown in color.

The most amazing visitor to the Hop Brook wetlands and ponds is the great blue heron. It's size alone, standing 42-52 inches tall, makes it the center of attention. They wade in the shallows catching and eating fish, frogs, crayfish, insects and mice. They have been seen nesting in the Massachusetts Federation of Women's Clubs Memorial Forest off Dutton Road.

Three shallow millponds, Grist Millpond, Carding Millpond and Stearns Millpond complete the profile of the Hop Brook system. Each was associated at one time with a working mill. The Grist Mill at the Wayside Inn is the only one in operation today.

In spring, as soon as the ice clears, the ponds are visited by different species of ducks. The common merganser pauses during its northern migration to nesting areas and returns in the fall for its trip south. The Canada goose, which now can be seen all year as long as the ponds aren't completely iced over, flies low over the ponds sounding its incessant honk, looking for a good place to land. Black ducks, common mallards, and teals are often seen in spring and continue to be seen all summer long.

This is the time for canoeists to enjoy the ponds. Paddling slowly by the new spring growth damselflies and dragonflies emerge from their immature forms and begin staking out territory. Dragonflies will fly over their tightly delineated territory checking their perimeters, chasing away intruders and then returning to a designated home base, usually the top of one of the tallest plants in its territory. A fantastic assortment of bizarre aquatic invertebrates dance along the water's surface, or scurry along the stream floor.

Mosquitoes begin to breed by the thousands in the stagnant shallows that surround the ponds. The little brown bats that come out at dusk, flit around the ponds and the trees that border the ponds appear to make only a small dent in the mosquito population, even though each bat consumes a several thousand of them every night.

The frog chorus begins in spring and can be heard until fall. Bullfrogs, green frogs, pickerel and leopard frogs all make their signature sounds. Blended with the sound of spring peepers in the reeds, the resulting symphony is loud enough to disturb a good night's sleep.

Sometime in June, the female snapping turtles come out of the ponds to lay their eggs. They haul themselves up embankments, around fences, and across streets to find a sandy bit of soil they can dig up to form the nest for their eggs. They spend an hour or more digging a hole about 6-10 inches deep with their back legs and then deposit a dozen or more eggs before covering the hole again and slowly returning to the pond. Most of the eggs are dug up and eaten within 24 hours by raccoons and cats. Very few survive to hatch in September and make their way to the pond.

Painted turtles bask all summer along on sunlit logs and rock surfaces in and around Hop Brook. Always alert, the slightest sound sends them splashing into the water.

