

# **A RESIDENT'S GUIDE TO THE INDIAN PONDS**



**INDIAN PONDS ASSOCIATION  
3<sup>RD</sup> EDITION  
2015**

# INTRODUCTION

The purpose of this book is to collect, in one place, useful and interesting information about the Indian Ponds and the area around them for the benefit of those living near them or visiting them. “The Indian Ponds” is the name given to the group of three great ponds, Mystic Lake, Middle Pond, and Hamblin Pond, situated in the village of Marstons Mills in the western part of the town of Barnstable, Massachusetts. These ponds are, respectively, the second, third, and fourth largest ponds in the town, collectively covering over 300 acres.

The more we learn about the Indian Ponds, the more we come to appreciate their uniqueness and value. All three ponds provide the residents of the area with many kinds of recreation: swimming, boating, kayaking, fishing, and sunbathing, and scenic beauty to enjoy in all seasons. Pond beaches are especially good for small children as the water is warm and clear, and there are no waves.

They also provide birds and many other forms of wildlife with sustenance and a place to live and raise their young. Mystic Lake and Middle Pond are listed by the state Natural Heritage and Endangered Species Program as Core Habitat because they support populations of rare species, and the watershed around them

has been designated Critical Supporting Watershed. Healthy ponds support diverse ecosystems with intact food webs.



**Boating on Middle Pond**

Ponds attenuate nitrogen from groundwater, using bacterial action to turn dissolved nitrates into nitrogen gas, allowing it to escape into the air, which reduces the cost of removing excess nitrogen from wastewater.

Healthy ponds increase property values; people want to live near them. Waterfront properties pay higher residential taxes. If the value of these properties were to decrease because of pond degradation, the rest of the town would have to be taxed more to make up the deficit.

The Indian Ponds Association has worked actively to protect the Indian Ponds and their environment since 1958. In addition to pond stewardship, the organization is also committed to educating the public. To that end, it publishes the quarterly IPA Newsletter with articles that focus on the pond and the IPA's activities in dealing with issues that affect the ponds. The Newsletter is distributed to everybody who lives in the immediate area of the three ponds, whether they are IPA members or not.

To the many people who contributed their time and effort to this project, and to all who love the Indian Ponds and are committed to protecting them for their children and grandchildren, this third edition of the Resident's Guide is appreciatively dedicated.

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Maggie Fearn,  
Emory Anderson,  
Editors

**Cover photo: A view of the southeast shore of Mystic Lake** *(Photo by Mike Walker)*

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# HISTORY OF THE INDIAN PONDS

## How the ponds began

**The Indian Ponds are three examples of the nearly 1,000 “kettle ponds” that dot Cape Cod.** These ponds were created when the Laurentide glacier began to retreat, approximately 12,000 years ago. As the glacier slowly melted, it would occasionally leave behind a large, dense chunk of ice that remained in place while meltwater flowed by it, depositing sediments. The sediments accumulated around the chunk, gradually burying it. Eventually the chunk melted and its “roof” of sediment collapsed, leaving a deep depression in the land. Geologists call these depressions “kettle holes”. When they are deep enough to dip below the water table, they fill with water and become ponds.

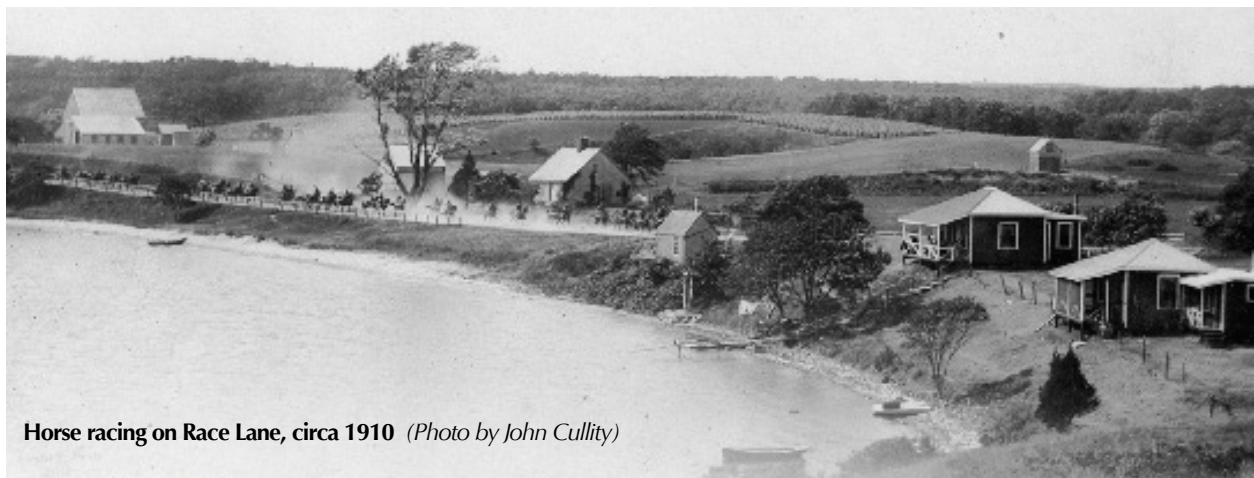
## Social and cultural history: old names

**The Walling Map of 1856 shows the three Indian Ponds as three separate bodies of water, unconnected to each other, with two streams flowing from them.** One of these streams flowed out of Middle Pond at approximately the same place as today’s herring run, then joined the Marstons Mills River, along with another stream flowing out of Muddy Pond at a swampy place in the center of what is now (and was then) a large area of cranberry bogs. A second stream, or “Herring Ditch” flowed from Hamblin Pond just

north of what is now Chesley Lane, off Route 149. Dry today, the Herring Ditch was once such an abundant source of herring that the Marstons Mills Fishing Company was formed to buy up fishing rights along its banks. This stream flowed into Nantucket Sound at Warren’s Cove. At its southern end, it was known as Tracy’s Brook.

**The ponds have had various names.** “Mystic” derives from an ancient Algonquian name, spelled by the early colonial settlers as “Misteake”, which could be translated to mean “big water”. Middle Pond was called Run Pond in the first half of the twentieth century, because of its herring run. Hamblin Pond was known as Crocker’s Pond in the early 1800s, later Grigson’s Pond, and then Clear Lake, before it was finally named for the Hamblin family who have lived near its shores for the past 300 years.

**North of Mystic Lake, along Race Lane, lay the hamlet of Ponds ville, peopled with families bearing the last names of Hamblin, Crocker, Jones, and Fuller.** Many of the old houses are still there. East of Ponds ville, where the airfield is today, was “The Plains”, the large, flat area of outwash plain below the moraine that contained some of the best farmland on the Cape. Race Lane was exactly that in the old days, a dirt lane where locals would race their horses along a marked mile.



Horse racing on Race Lane, circa 1910 (Photo by John Cullity)

## Agricultural history: cows, ducks, ice, cranberries

**Mystic Lake Farm, also known as Hord's Dairy, existed for more than 40 years, from the early 1920s through the early 1960s.** It sprawled over 140 acres along Race Lane and was home to a large herd of dairy cattle, as many as 150 head by some accounts, plus facilities for processing, bottling, and distributing milk all over the Cape. Swedish immigrant Hilding Hord's cows were pastured west of the airfield and would go to drink from Mystic Lake via a fieldstone cow tunnel built by the Town of Barnstable in 1928, when it first paved the ancient dirt path known as Race Lane. The Hords grew up to 45 tons of corn on their acreage every year to feed the herd. Cow manure plus runoff from the fields, which were fertilized with phosphates, added significant amounts of phosphorus to Mystic Lake during those years.

**From the early 1800s, the ponds were a source of ice, a valuable commodity in the days before refrigeration.** Men cut blocks of ice from the pond with saws during winter. These were dragged off the pond by teams of horses or oxen and stored in ice houses through the warm months, insulated by hay. Ice from Cape ponds was carried as far away as the Caribbean by local trading schooners. Hilding's son Norman Hord recalled that, as recently as the Depression, "We had an ice house on the lake. Men who couldn't pay the bill would come and cut ice and I'd pull the blocks with a tractor and a bull rope. That's how they'd pay their bills; they worked it off. The blocks were 300 pounds."

**In the 1920s, the Hadley family established the Clear Lake Duck Farm at the south end of Hamblin Pond.** For 35 years, they raised white and Muscovy ducks for meat and feathers. By the time the farm shut down in 1935, the pond water could no longer be described as clear. In spring, the pond would suddenly turn bright green with algal blooms, which spread over the entire surface during the warm months. When the algae died off during the fall, its decomposition would consume dissolved oxygen and kill many fish. In the early

1990s, the Town decided to remedy the situation. After a study of the pond, they hired a company that treated the water with alum (aluminum sulfate) in 1995. Unfortunately, the application was not well controlled and temporary pH fluctuations killed a number of fish. The phosphorus in the sediments that was fertilizing the algae, however, was inactivated by the treatment and the water cleared up immediately. Fish have thrived in Hamblin Pond



**Clear Lake Duck Farm, from the air, 1947. The beach is covered with thousands of ducks, nearly invisible in this old photo.**

ever since, and the water quality remained excellent until 2014, when a massive bloom of cyanobacterial algae turned it a muddy green which lasted from midsummer until mid-fall. Alum treatments are not permanent, and The Town of Barnstable plans to re-treat the pond in 2015.

**Cranberries have been grown on Cape Cod since the mid-1800s.** Cranberry bogs are a common sight in the area around the Indian Ponds and throughout southeastern Massachusetts. Cranberry bogs function as part of the wetland system and provide open space as well as habitat for birds wildlife, and native plants. Some bog owners generously allow their bogs to be used for walking, a recreational opportunity much enjoyed by their neighbors. The wet harvesting of the ripe berries in October provides spectacular scenery.

**The cranberry is a native wetland plant, and cranberry production is compatible with wetlands preservation.** A cranberry wetland system consists of producing bogs, reservoirs, ponds, and uplands, which help to preserve hundreds of acres of open space. Larger “flow through” bog systems also incorporate large swampy areas full of native plants that filter pesticide residues and silt from the water before it is sent downstream. Just like natural wetlands, the cranberry wetland system recharges the aquifer, provides flood control and storm water drainage, protects and preserves habitat for plants and animals, and filters groundwater.



**Loading the harvested cranberries in a flooded bog.**

**Cranberry growers use water from ponds for irrigation, frost protection, and wet harvesting.** In the Indian Ponds area, there are strict regulations gov-



**Old wooden bridge over the Marstons Mills River in the Hamblin bogs**

erning when water can be withdrawn from the ponds, based on the level of the aquifer as reflected

by the water level in the ponds. Some bogs also return water to the ponds, which is a source of added nutrients. Cranberry growers also use pesticides and herbicides when necessary. All pesticides used are tested and registered with the U.S. Environmental Protection Agency and the Commonwealth of Massachusetts. Anyone who uses these substances must be licensed by the Commonwealth, and they must also complete annual training requirements in order to maintain their license.

### What Is a Great Pond?

In 1647, great ponds were defined in colonial statutes such that “no town shall appropriate to any particular person [...] any great pond containing more than ten acres of land, and that no man shall come upon another’s propriety [sic] without their leave”. The water in a great pond is held in trust by the state for public use, but the land around it may be held privately.

## Airplanes and nightlife

**The history of the ponds, especially Mystic Lake, is entwined with that of the airfield, which was founded by Zenas V. Crocker in 1929.** Amelia Earhart landed there in 1933. During summers beginning in the 1930s and running through World War II, the Massachusetts National Guard would bivouac at the airfield and the guardsmen swam in what became known as “Soldiers’ Cove.” Nearby was the Aviation Country Club, which advertised “Dining, Dancing, Open Bar, Bert Lowe’s Orchestra”, and was sometimes raided by the sheriff. The military goings-on came to an end after the war, although the airfield has remained active. In 2003, the Town of Barnstable bought the airfield, the land around it, and the 23 acres across Race Lane that about Mystic Lake for \$11.2 million to maintain as open space for conservation and recreation. Although various uses have been proposed for this acreage, so far it has been left undisturbed.



# HOW PONDS WORK

## About water

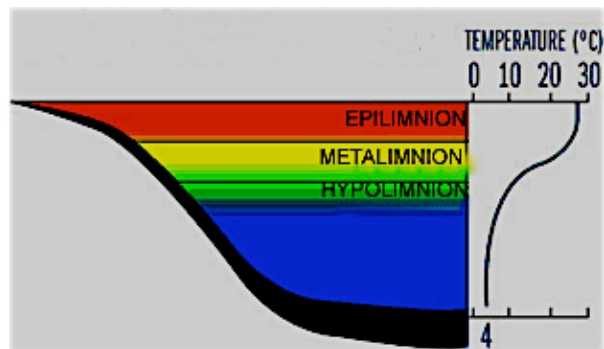
**Fresh water is a substance with unique properties.** One of the most remarkable of these, from a pond's point of view, is that water achieves its greatest density at 39.2°F, just above its freezing point of 32°F. This means that, as the temperature drops on a cold day, when the surface water reaches 39.2°F, it sinks, displacing all the warmer water in the water column. It is only when all the water is at 39.2°F, that the top layer will continue cooling until it reaches 32°F and freezes. As this upper water cools towards its freezing point, it expands, so that it is lighter than the slightly warmer water beneath it, so ice floats.

## Ponds through the seasons

As the sun begins to warm the pond in early spring, the ice on the surface turns to slush and becomes denser, sinking as it melts. As the pond continues to warm, the water above 39.2°F rises, creating vertical currents that, along with the wind, churn the pond's waters. During this spring overturn, nutrients from the sediments are distributed throughout the water column where they fertilize the growth of microscopic algae, which form the basis of the pond's food chain. In deeper ponds, such as Hamblin (65 feet) and Mystic (45 feet), the annual spring overturn does not extend the full depth of the pond, but is confined to an upper layer about 30 feet deep.

This creates a three-layer *stratification* in the water column. The upper layer, the *epilimnion*, is actively mixed by the wind; as a result it is full of dissolved gases such as oxygen and also receives a lot of sunlight. Below the epilimnion is a narrow transitional zone, the *metalimnion*, where the temperature drops rapidly. Below that is the deep *hypolimnion*, full of cold, dense, poorly-aerated water. Little light penetrates this far into the water, so no green plants can grow here. This explains why the hypolimnion is low in dissolved oxygen. The depths of the pond and the bottom sediments are home to many types of

anaerobic bacteria, which busily decompose organic matter and recycle nutrients. Shallower ponds, such as Middle (35 feet), do not stratify; all of the water column is mixed, both thermally and by the wind.

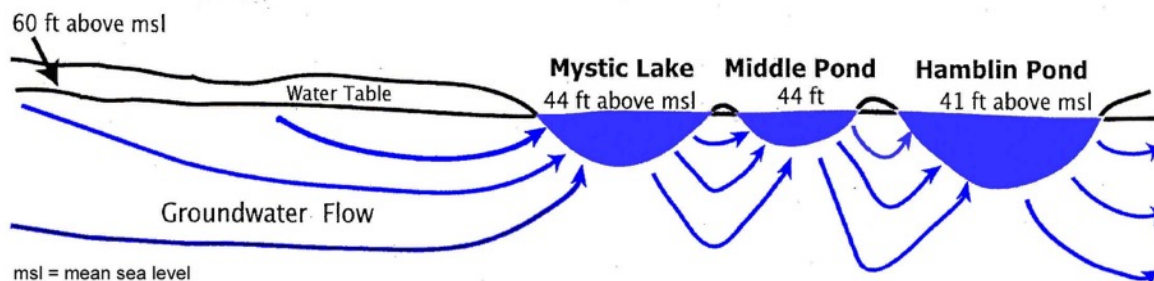


Profile of a stratified pond, showing gradient of temperature from top to bottom.

## The watershed

**Some of the water that falls as rain or melts from snow moves along the ground, running downhill.** As it flows, it forms rivulets and streams. These flow into holes or depressions which fill up to form puddles or ponds, which may then overflow into creeks or rivers, which eventually all flow to the sea. A watershed is an area in which all of the water that falls on the land ends up at one common point. On Cape Cod, that point is usually a marine estuary.

**In addition to moving along the surface of the ground, water that falls as rain or snow is also pulled by gravity down through the soil,** always seeking the lowest point until it is blocked by an impermeable layer such as rock or dense soil such as clay. This groundwater builds up in the soil. All the groundwater on Cape Cod is connected to comprise the aquifer, which extends to a depth of around 400 feet. The upper edge of the ground-



The Indian Ponds in profile, showing the flow of groundwater through the three ponds.

water is the water table. The surface of a pond is this upper edge of the groundwater, giving us a “window” on the aquifer. The sandy and gravelly bottoms of ponds allow the groundwater to flow freely in and out as it moves through the watershed. Water flows through the Indian Ponds, coming in from the northwest and out towards the south, running down the river’s course and meeting the sea at Prince Cove and Warren’s Cove.

**The aquifer also supplies all of the domestic water needs of Cape Cod residents.** Between 23 million and 42 million gallons of water are pumped out of the Cape Cod aquifer every day to supply these needs. Locally, the 19 public wells in the Centerville-Osterville-Marstons Mills Water District are pumped at a combined rate of about 3 million gallons a day. Private wells add to that total.

## The ponds as ecological communities

An ecological community is a group of plants and animals that live in a particular type of environment and support each others’ lives through myriad connections and dependencies that have become established over long periods of time. An Atlantic Coastal Plain Pond is an example of such a community. Each of the three Indian Ponds is an Atlantic Coastal Plain Pond. They support a small but diverse community of plants and animals that includes insects, mollusks, crustaceans, amphibians, reptiles, birds, mammals, fungi, mosses, herbaceous plants, shrubs, and trees. Many of these organisms live only in the Atlantic Coastal Plain Pond community, which is itself an uncommon environment. Some of them are now rare or threatened by

environmental changes such as increased nutrients produced by surrounding development, changes in groundwater levels caused by pumping, and competition from foreign invaders.

**The major habitats of our ponds begin at the shore with the *littoral zone*,** which extends as far into the water as rooted plants, such as rushes, can grow. The *limnetic zone* is the open water itself. These two zones support many kinds of living things, including fish, insect larvae, reptiles, amphibians, and plants. The deepest waters are the *profundal zone*, in which little easily-recognizable life is found, but which is still exceedingly important to the functioning of the pond as an ecosystem. Here reside anaerobic bacteria which consume waste products and the remains of dead plants and animals, releasing minerals for reuse in other parts of the ecosystem. These minerals, notably nitrogen and phosphorus, are mixed into the water column at the spring and fall overturns, as well as by the wind.

**During summer in the littoral and limnetic zones, algae and other small plants, which create food through photosynthesis, feed tiny zooplankton and filter-feeders such as mussels, which in turn are food for fish, frogs, turtles, and their young.** Many species of birds also benefit from this algae-based food web. As the days grow shorter, the supply of nutrients in the water is consumed, although some algae are able to fix nitrogen from the air and continue growing. As the air cools in the fall, another thermal overturn of the water column occurs, fueling another brief bloom of algae, but eventually all the plants die as well as many of the animals, and their remains settle in the deep sediments along with the leaves from the surrounding trees, and another pond year has come full circle.

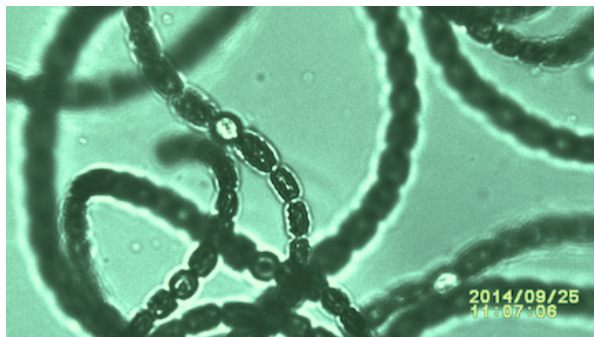


# LIFE IN THE INDIAN PONDS

## Plants

**The foundation of all life in the ponds is algae.** These ancient microscopic plants combine sunlight and carbon dioxide to create nourishment in the form of carbohydrates, releasing oxygen as a byproduct. They exist in a number of forms in every part of the pond. We seldom notice algae except for the times when an overabundance of nutrients causes a population explosion, a “bloom” of algae, making the water turn green and occasionally toxic.

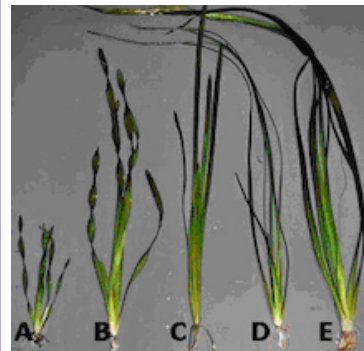
**The principal summertime “bloomers” in the Indian Ponds are the cyanobacteria, a diverse group of primitive plants with surprisingly sophisticated chemical abilities.** Different kinds can produce nitrates from nitrogen gas in the air, convert nitrates back into gas, or produce toxins that are dangerous to other pond organisms and sometimes to animals and people. Cyanobacterial blooms caused a massive die-off of mussels in Mystic Lake and Middle



Strands of *Anabaena*, a genus of cyanobacteria that caused a large bloom in Hamblin Pond in 2014. The clear cells are specialized for fixing nitrogen from air.

Pond in 2009 and 2010, before Mystic was treated with alum to reduce the sedimentary phosphorus that was fueling the blooms. Numerous other types of algae are typically found in Cape Cod ponds, most of them best observed under a microscope, but each playing its vital role in the ecological pageant.

**More obvious are the plants that have roots and leaves,** the ones growing underwater (*submerged*, examples of which are shown below), those that float or have leaves or flowers that float (*floating*, such as water lilies), or those that protrude above the water (*emergent*, such as rushes and cattails). These plants also produce their food by photosynthesis, so they must live in the shallower parts of the pond where sunlight can reach them. A few plants, such as the diminutive duckweed, find living space by floating, roots and all, out in the open water.



*Valisneria*, or “water celery”, has tapelike leaves with fine white striping.



*Potamogeton*, shown with a pencil for scale, is difficult to pronounce, but enjoyed by waterfowl.

## Special pond animals: invertebrates

The smallest of the consumers in the pond are the **microinvertebrates**, an astonishing variety of many kinds of tiny animals that eat algae and become, in turn, food for mussels and fish. One of the most interesting of these is *Daphnia*, which hatches in astonishing numbers during spring, but is decimated by the baby herring and other fish during summer. Called “water flea” because of its bouncy style of swimming, its transparent body is just big enough to see with the naked eye. It is an important member of the pond’s food chain and is completely harmless to anything larger than itself.



*Daphnia*, 1-5 mm in size, are an important food source for baby herring in the spring.

The larger invertebrates comprise many types of animals that are readily observable in the ponds: mussels, snails, insect larvae, insects, spiders, worms, and crayfish. One of these, the freshwater mussel, is of special interest because of its endangered status, its unique methods of reproduction, and its vital role in maintaining water quality.

## Dragonflies and damselflies

Among the threatened or endangered species that inhabit Barnstable’s coastal plain ponds are one species of dragonfly and two species of damselfly. These two kinds of insects are closely related, each being a suborder of *Odonata*, an order of insect so ancient that it predates the dinosaurs by 100 mil-

lion years. These fascinating creatures first appeared in the Carboniferous Age when the great primitive forests that eventually became our coal deposits were alive. They are among the oldest of insects.



Comet darter dragonfly

Dragonflies are strong fliers, while damselflies appear fluttery and indecisive. Dragonflies are generally larger than damselflies. Both flaunt spectacular colors and patterns.

The *Odonata* are informally referred to as “odes” by their many admirers. There is an American Dragonfly Society complete with dragonfly-themed meetings, institutes, conferences, and seminars. A



New England bluet damselfly

Although dragonflies and damselflies resemble each other, dragonflies always hold their two pairs of long, lacelike wings at right angles to their bodies, while damselflies fold their wings against their backs when at rest.

newsletter, “Ode News”, published on Cape Cod, boasts 300 subscribers in 32 states and provinces and lists sightings by species so fellow enthusiasts can exclaim and compare notes. In just the past few years, four new field guides to the “odes” of the eastern United States have been published.

Some of the odes have fanciful and evocative common names such as stream cruiser, powdered dancer, sphagnum sprite, and seaside dragonlet. Others sound downright spooky, as stygian shadowdragon, ebony boghaunter, but none of them harm people in any way.

**There are no fewer than 23 species of dragonfly** that are listed as endangered, threatened, or of special concern by the Massachusetts Natural Heritage and Endangered Species Program, plus four species of damselfly. Two species we frequently see in summer around the Indian Ponds are on this list: the comet darter, a dragonfly, and the pine barrens bluet, a damselfly. The New England bluet damselfly, another local “ode,” has recently been removed from the list.

**Dragonflies hatch in fresh water** and spend from three months to four or more years living underwater as *nymphs*, where they are ferocious predators of mosquito and other insect larvae. On a spring or summer day when the time is right, the nymph climbs out of the water onto a rush or other emergent plant. As it clings there, its rigid casing splits down the back and the mature insect emerges. As blood pumps into its wing buds, the beautiful wings unfold and stiffen and the insect flies away into the countryside. During the next few weeks, it becomes sexually mature and its colors develop and deepen. After mating, the female lays her eggs on a pond or stream bank or on vegetation, but always near fresh water.

**Many species of odonates are particular about the kind of water they will live in.** Some prefer brooks and rivers, others insist on ponds, bogs, or marshes. The two species that have been identified as threatened in Barnstable County are creatures that need clear ponds with plenty of open water.

## Mussels

**Everyone who has spent time in or around Mystic Lake or Middle Pond has noticed the presence of creatures that resemble clams, but are actually freshwater mussels.** Soft-bodied animals enclosed within two shells, freshwater mussels inhabit streams, rivers, ponds, and lakes throughout North America. They are, as a group, considered to be the most endangered order of animals on the continent. Of the eleven known species in Massachusetts, seven are protected by law. Of these, three have been found in Mystic Lake and/or Middle Pond: the triangle floater, tidewater mucket, and eastern pondmussel,

although so many millions of mussels were killed in the algal blooms of 2009 and 2010, that the continued presence of these three species is in question. In the days when Hamblin Pond supported a herring run, it may have had mussels, too, but it has none today.

**All freshwater mussels spend their adult lives partially buried in sand or gravel,** where they suck water into their bodies, filter out minute particles of food, then discharge the filtered water. In this way,



The eastern pondmussel (*Ligumia nasuta*), listed as a species of “special concern”, was found in small numbers in Mystic Lake and Middle Pond in 2007, but the mussel survey in 2010 found none.

they play an important role in keeping the water clear. They also serve as food for fish and mammals. Raccoons especially appreciate a feast of mussels. Fortunately for the mussels, people find their taste unpleasant.

**Every freshwater mussel is either a male or a female.** In the fall, the male mussels release sperm into the water and the females filter it into their gills, where their eggs are fertilized and the larval mussels, called *glochidia*, develop over winter. In spring, the female releases the microscopic larvae into the water, where they must immediately find a fish. Attaching themselves to the fins or the gills of the fish, they develop for several weeks before dropping to the bottom, where they spend the rest of their lives. The fish is not harmed. Some species of mussel attach only to one particular species of fish, and if that species is not present, the mussel dies. Other species of mussel are not so particular, and for them, any fish will do. Mussels start reproducing at about six years of age and live from fifteen to as many as one hundred years, depending on species.



**Female mussels have evolved amazing adaptations to help their glochidia find fish hosts in which to develop.** Some mussels have special tissues that imitate small bait fish that they extrude in order to lure larger fish near. When the large fish approaches,



**Female mussel deploying a minnow-like lure to attract a fish.**

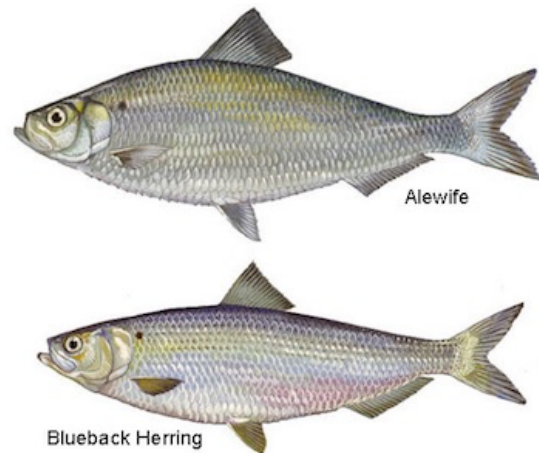
es, the mussel sprays the larval glochidia at it and they are sucked into the fish's gills, where they attach and remain safe until it is time for them to drop to the bottom and develop into adults.

**Mussels are threatened by dams, pollution, silt, and changes in water temperature or chemistry.** Whatever kills fish will kill the mussels that are dependent on that kind of fish for successful reproduction. As water quality declines, mussels die out, and as it improves, their populations increase. The way to preserve this endangered, but useful and interesting, group of creatures is to maintain healthy ponds and streams.

## Herring and the herring run

**“River herring” or “herring” or “alewives” are names that describe two similar species of fish,** the alewife (*Alosa pseudoharengus*) and the blueback herring (*Alosa aestivalis*), which are related to shad, sardines, and menhaden. They are not to be confused with sea herring (*Clupea harengus*), the kind that are made into pickled herring. River herring run about 13-14 inches in length and live for 7-10 years. They are anadromous, meaning that they spawn inland and spend the rest of the year at sea. Herring begin to appear in the Marstons Mills River when the water temperature reaches about 50°F in April or early May. They migrate in “classes”, each class returning to its home waters to spawn every three years. After swimming under Route 28 and up the lower part of the herring run into the Mill Pond, they continue up the river and through the long herring ladder behind Flume Avenue. They lay their eggs in Middle Pond or Mystic Lake and return to sea. The young of the year swim down to the sea in

late summer or early fall when they are 1½ to 2½ inches long.



**Herring were fished inshore until the late 1960s, when offshore fleets began targeting them.** Since then, their numbers have declined profoundly. They have recently been listed by the Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife and the National Marine Fisheries Service as a Species of Concern. Due to drastic declines in river herring populations, Massachusetts enacted a moratorium on the taking of herring in 2003, which has been renewed continuously and is still in effect in 2015. The Town of Barnstable also prohibits any taking of herring without a permit. This includes the baby herring, which should not be taken or disturbed.

**The herring run in Marstons Mills consists of several sections.** Water flows from Middle Pond down to a concrete structure which has adjustable boards to control the flow of water from the pond into the river and a two-step fish ladder. Immediately following is a wooden flume nearly 1,000 feet long. This flume encloses a fish ladder of many steps over which the fish ascend in the spring and descend in the fall. A concrete structure just below Mill Pond in the village combines a dam and another herring ladder. The water runs through this, then under Route 28 and into Prince Cove; thence to Nantucket Sound.

## Frogs



A pickerel frog, showing its golden underside.

Frogs, toads, and salamanders are **amphibians**. They must mate and lay their eggs in fresh water, and many species spend their whole lives in or near freshwater ponds, streams, or swamps. The eggs hatch into tadpoles, which eventually grow legs and become quadrupeds. Frogs and toads lose the tadpole tail; salamanders keep theirs. Typical amphibians of the Indian Ponds are frogs.



Leopard frog

The **pickerel frog** (*Lithobates palustris*) is a handsome fellow, with dark-brown rectangular spots separated by light yellow lines and stripes. Its underside is yellow, which distinguishes it from its commonly-mistaken relative, the **leopard frog** (*Rana pipiens*), which has round or oval spots and a white belly. The pickerel frog can secrete an irritating toxin from glands in its skin, which helps to deter predators.



American bullfrog

Both frogs survive on a varied diet of invertebrates, particularly insects and insect larvae, and spend their winters hibernating in the sediments at the bottom of a pond. The **American bullfrog** (*Lithobates catesbeianus*) has a deep voice to match its large size and prefers to live near permanent bodies of fresh water, and is often heard calling in late spring and early summer, its deep voice sounding almost like a cow.

## Turtles

**Turtles are an extremely ancient order of reptile** that live inside a shell made of bone or cartilage, the top of which is called the *carapace* and the bottom the *plastron*. The carapace is divided into plates called *scutes*. All turtles breathe air and lay their eggs on land. Some species of turtle are aquatic and live in fresh or salt water, while others live only on land. Small species of turtle are prey for fish, birds, and mammals, as are the hatchlings and young of the larger turtle species.



Spotted turtle

Large turtles have no natural enemies and prey on whatever they can catch. They also eat plants to round out their diets. Some turtles grow to be very old, 100 years or more. The four species of freshwater aquatic turtle you might see in and around the Indian Ponds are the spotted turtle, eastern musk turtle, snapping turtle, and painted turtle.

The **spotted turtle** (*Clemmys guttata*) has a black, smooth carapace and yellow spots on its shell, legs, and head. It grows no larger than 5 inches long. It spends much of its time on land, although preferring to live near a pond that provides mud, water lilies, and duckweed. It feeds on insects, small fish, invertebrates, and plants. This turtle's numbers are declining due to habitat loss and poaching. Because of this, it is illegal to possess a spotted turtle.

The **eastern musk turtle** (*Sternotherus odoratus*) is another small turtle, 2 to 4 inches long, and a bottom-dweller. It is



Eastern musk turtle

often called a “stinkpot” because it can emit a musky fluid when disturbed. It can also snap, so it’s best left alone. It can live up to 50 years.

The **common snapping turtle** (*Chelydra serpentina*) also prefers to spend its life in the water, where it lurks motionless in ambush. When a prey animal happens along, the turtle quickly extends its long neck and snaps it up with its sharp, hooked jaws. It



**Common snapping turtle**

comes to land in May and June and is frequently seen crossing roads to get to a preferred nesting site. It is best not to try to move a large snapping turtle (they grow to as much as 35 pounds and can live for 40 or more years), because the only safe place to touch it out of range of its fierce jaws is its tail, and lifting or dragging it by the tail may dislocate its spine.

The pretty **painted turtle** (*Chrysemys picta*) is a common sight basking on logs, often in groups. It is distinguished by red patches at the edges of the carapace, a



**Painted turtle**

yellow plastron, and bright green and yellow stripes on the head, neck, and legs. It grows to 9 inches long.

## Mammals

You might spot nearly twenty species of terrestrial mammal in the vicinity of the Indian Ponds, ranging from shrews, mice, and bats to foxes, coyote, deer, rabbits, and opossums. There was recently a sighting of a fisher near Middle Pond. Some of these mammals visit the ponds for food, eating mussels, fish, and insects from the ponds, but they live on land. There are a few mammals, however,

that are more truly aquatic, two of which live in the Indian Ponds: muskrat and otter.

The **muskrat** (*Ondatra zibethicus*) may be seen at dawn and dusk, its favorite times of day for foraging, but you need to be stealthy, because it will disappear underwater or into its burrow the moment it sees you. It is primarily an herbivore, consuming pond weeds, cattails, and water lilies, but



**Muskrat**

U.S. Fish and Wildlife

sometimes eats mussels, crayfish, and frogs as well. It lives in a burrow in a steep bank. Muskrats are rodents, 1 to 2 feet long, with tails flattened laterally that they use for steering when swimming. With webbed hind feet and the ability to stay underwater for as long as 15 minutes, they are excellent swimmers and completely at home in the water. Their fine, dense fur was greatly sought by the fur trade in the past, but less so today. They live all over North America wherever there are freshwater swamps, streams, and ponds.

**River otters** (*Lontra canadensis*) have been sighted several times in the Indian Ponds, but they are shy and uncommon on Cape Cod. Energetic, playful, and active year-round, particularly at night, they swim using their webbed, clawed feet and long tail for propulsion and steering. Otters live on a diet of fish, amphibians, turtles, and crayfish. The female raises 6 to 8 young in an extensive burrow in a bank. Otters live 8 to 9 years and grow to around 30 pounds.



**River otter** (Photo by Nicole Duplex for National Geographic)



## Birds

The **mute swan** (*Cygnus olor*) is a European bird that was introduced to the United States to orna-



Parent swans with cygnets.

ment the ponds of parks and estates. While graceful to watch, they are also large and aggressive, which makes it hard for native birds to compete with them for food or space. In some areas, they are considered invasive, but in the Indian Ponds area, their populations are kept in check by foxes and coyotes, which prey upon the cygnets.

Considered the world's most abundant duck, the **mallard** (*Anas platyrhynchos*) is native to Europe, Asia, and North America, although it has been widely introduced nearly everywhere else. It is the



Male mallard duck with distinctive green head.

ancestor of most breeds of domesticated duck. It “dabbles” for its food, upending its body in shallow water to gather plants as well as small fish, amphibians, and invertebrates to eat. It nests on the ground or in a hole if it can find one. It lives 5 to 10 years and grows to 3 pounds.

The **bald eagle** (*Haliaeetus leucocephalus*) is being seen with greater frequency around the Indian Ponds as its populations in the northeast increase. Bald eagles live where fish are abundant. This bird is the only eagle exclusively native to North America. Its populations are most abundant in Alaska and



A bald eagle, soaring.

British Columbia. Bald eagles were nearly decimated in the lower United States by pesticides, particularly DDT, and are still considered threatened here. Females, with a wingspan of 6-7 feet, and weighing up to 14 pounds, are larger than males. Eagle talons are long and curved for snatching fish of up to 4 pounds from the water. Their beaks have sharp edges for slicing and a hook for tearing the skin and flesh of their prey. They are superb fliers, flying as fast as 30 to 35 miles an hour, and they soar with ease, thanks to their great wings and long, flexible primary wing feathers. An eagle's eyesight is 4 times better than that of a person with 20:20 vision. The distinctive white feathers on its head do not appear until an eagle is 5 years old.

## FISHING IN THE INDIAN PONDS

All three ponds are open for fishing year-round. Hamblin Pond is stocked every spring and fall with brown, rainbow, tiger, and brook trout. Mystic and Middle are not stocked, but are reputed to harbor good populations of both smallmouth and large-



**Brown trout**



**Tiger trout**



**Rainbow trout**



**Brook trout**

mouth bass, with fish in the 12 to 18 inch range. There are also said to be plenty of yellow and white perch over 10 inches, as well as healthy populations of pumpkinseed sunfish, white sucker, chain pickerel, banded killifish, brown bullhead, and golden shiner.



**Smallmouth bass**



**Largemouth bass**



**Pumpkinseed sunfish**

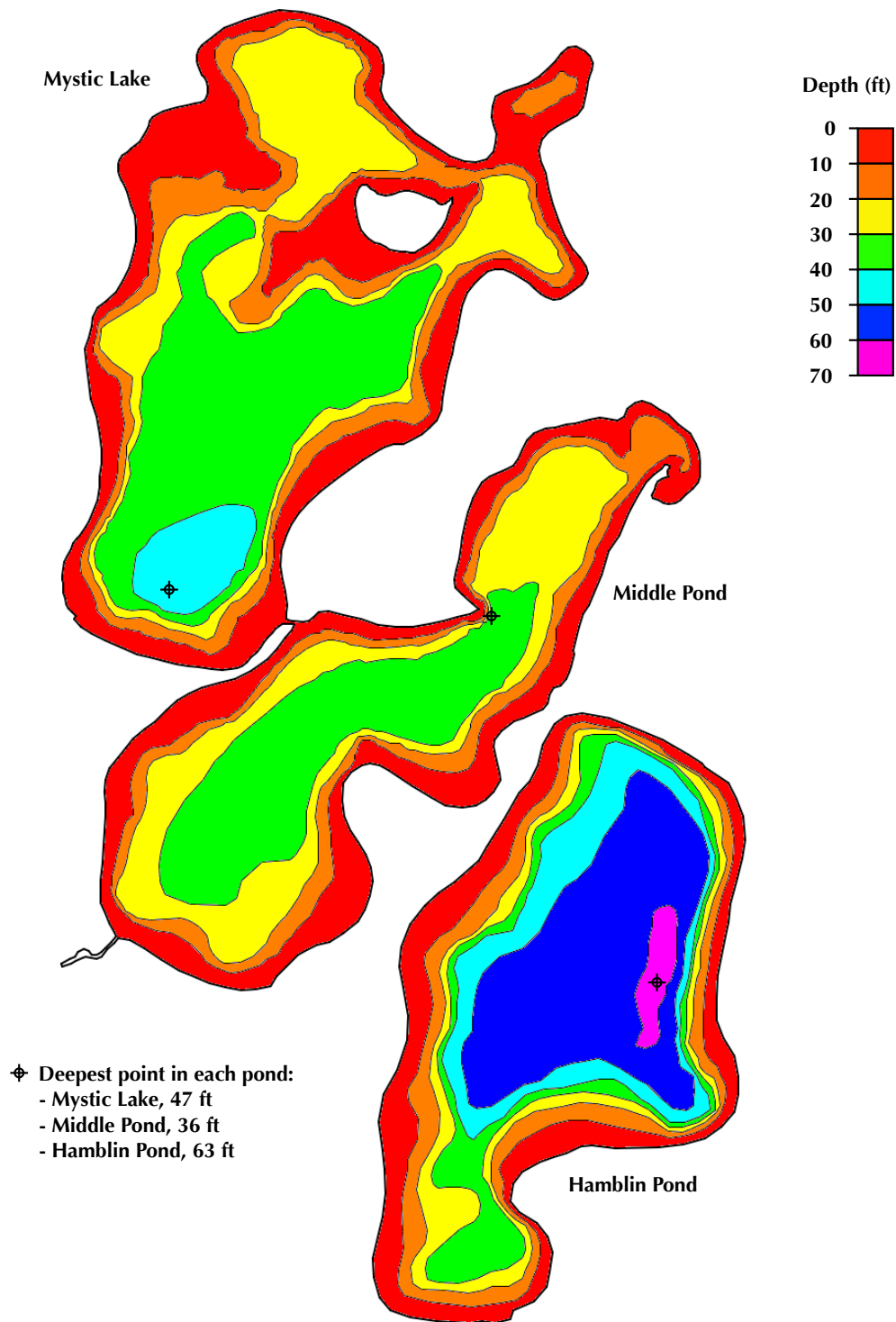


**Yellow perch**

A valid Massachusetts fishing license is required to fish in the Indian Ponds. To obtain one online, go to <http://www.sport.state.ma.us>. Fees vary according to the age of the applicant and whether a resident or not.

Because of its elevated mercury content, there is a state advisory about eating bass caught in Cape Cod ponds. See <http://www.state.ma.us.dph.beha/fishlist.htm>

## BATHYMETRIC MAP OF THE INDIAN PONDS





# BEACHES AND BOATING

## Beaches

There are public beaches on all three Indian Ponds. A beach parking sticker is required, and is available from the Town of Barnstable Recreation Division, Hyannis Youth and Community Center, 14 Bassett Lane, Hyannis.

The **Hamblin Pond town beach** is the largest of the three beaches, has the biggest parking lot, and is the only pond beach with rest rooms. To get there, take Route 149 south from the roundabout and look for the turnoff, a lane running off to the right immediately after the cemetery. From the village, it is the first left after the Indian Lakes subdivision, just before the cemetery.

The narrow **Middle Pond town beach** is squeezed between a boat launching ramp and a private association beach. Enter the Indian Lakes subdivision from Route 149. Follow Mystic Drive to the right and continue until you see the "Town Way to Water" sign on your right.

**Mystic Lake's town beach** is on Race Lane, about two-thirds of a mile west of the roundabout, just at the place where you can begin to see across the pond. The parking lot is very small, but the beach is 600 feet long. Unfortunately, most of it is overgrown. There is also a walking trail to Mystic Lake from a parking lot on Race Lane opposite the airfield, but there is no beach.

**Do enjoy the beach. Please don't bring your dog!** Dogs are illegal on public beaches between May 15 and September 15. Dog feces are often to blame when a beach must be closed due to coliform bacterial pollution. Kindly resist the temptation to feed the ducks and geese! It is prohibited by law, "people food" isn't good for them, and food encourages them to hang around and pollute the beach.

**Trash on beaches is a serious problem for the Indian Ponds. Please don't litter!** At the end of the season, IPA members and other local volunteers collect and haul away many bags of food and beverage containers, cigarette butts, diapers, and household garbage, much of it found hidden away among the shrubbery.

## Boating

There are three boat launching ramps. The **Hamblin Pond boat ramp** has the most capacious parking lot. Take Route 149 south from the roundabout and look for a turnout on the right just after Lauren Drive. The driveway is U-shaped, so you have two chances to locate it.

For the safety of swimmers and protection of wildlife, boats with engines of greater than 10 horsepower are not allowed to operate on any of the Indian Ponds.

The **Middle Pond boat ramp** is at the Middle Pond beach as described above. The beach slopes very gradually here, so it is suitable only for kayaks and very small boats. This launch covers both Mystic and Middle, as there is a small channel that connects the two ponds. Depths in the channel vary, but it is always shallow and requires careful navigation.

**The public beach on Race Lane has a particularly steep ramp**, that is accessible only to kayaks and canoes. Also, parking is very limited here. A better choice would be the Middle Pond boat ramp, described above, which is shallower, but safer.

# A RESIDENT'S GUIDE TO WHAT'S LEGAL (AND WHAT'S NOT) AROUND THE PONDS

Any type of alteration you could possibly make to the land or its vegetation within 100 feet of a pond will fall within the jurisdiction of the Town of Barnstable Conservation Commission.

**The 100-foot demarcation line does not start at the water itself, but from where wetland vegetation begins to grow.** It is highly recommended that you consult the Conservation Division at 200 Main Street, Hyannis, (508) 862-4093, in advance of any work within this buffer zone to avoid the expense of having to pay a fine, tear down, replant, or remediate afterwards.

Included in the kinds of alterations not to be undertaken without the consent of the Conservation Commission are: removal or severe pruning of trees, any kind of construction activity, making a lawn, making a path to the water through existing vegetation, creating a beach, building a dock of any kind, and filling or grading of land within the 100-foot buffer zone.

Such activities will not necessarily be forbidden, but the interest of the Commission is to assure that they are done in such a way as not to damage the resource being protected, in this case, the pond and its surrounding wetland areas.

**To learn more about the Wetland Protection laws** and regulations and how they are applied, the following references will be useful: *A Guide to the Wetland Protection Act* (pamphlet), available from the Town of Barnstable, Conservation Division, 200 Main Street, Hyannis, MA 02601.

Also, the website of the Barnstable Conservation Commission has many helpful publications available to download at the following website:

<http://www.town.barnstable.ma.us/conservation/>

## Docks and piers

**Docks and piers, including floating ones secured to the shore, require permits and must be constructed according to Town regulations.** Permitting is under the jurisdiction of the Conservation Commission. Additional permit(s) from the state may also be required. For more information, consult the following reference:

<http://www.town.barnstable.ma.us/Conservation/Regulations/FinalChapter703.pdf>

## Moorings and swim floats

**Moorings are under the jurisdiction of the Town Waterways Committee and the Harbormaster.** Permits are required for freshwater moorings. The Town has regulations that specify legal types and sizes for all components of a mooring system: anchor, pennant, pick-up buoy, etc. Mushroom or Helix anchors are the only types of anchor allowed in freshwater. Cinder blocks and other heavy objects that are not anchors may not be used. Following are references that you should consult before placing any kind of mooring or float:

<http://www.townofbarnstable.us/harbormaster/Mooring%20Regulations.pdf>

## THREATS TO THE PONDS

Assaults on the life of a pond can be massive and obvious, like the duck farm that raised 10,000 ducks on Hamblin Pond for 30 years. But more often they are gradual and seemingly innocuous, perhaps affecting only a small part of the pond's ecosystem. Trees cut down, a shoreline turned into lawn, a septic system leaching nutrients, dogs on beaches—in time, these seemingly small actions can add up to an assault that is as deadly to a pond as a duck farm. People who live on or near the ponds can do much to keep the ponds healthy and their biodiversity intact. **The three greatest threats to the Indian Ponds come from septic systems, runoff, and invasive plants.**

**All septic systems leach phosphorus and nitrogen into the groundwater, even new Title V systems.** Phosphorus from septic systems travels very slowly—about three feet a year on Cape Cod—because it is attracted to iron particles in the soil. Nitrogen, on the other hand, travels rapidly in groundwater. Phosphorus fuels the growth of algae in freshwater ponds, while nitrogen does the same in saltwater bays and estuaries. Septic systems also leach poisons from household products and residues from drugs into the groundwater. Chlorine from laundry bleach is an example of a poison that persists in the environment long after it runs down the drain. Flushing away unused drugs can introduce long-lasting hormones and other endocrine-disrupting substances into ponds and the ocean.

**Runoff occurs during heavy rainstorms and snowmelt when water rushes down slopes and into the ponds.** In addition to carrying muddy sediment, runoff picks up whatever is on the land and transports it directly into the water. It carries animal droppings, petroleum products, and tire residues from vehicles, fertilizers, and pesticides into the ponds where they remain for a long time and are ingested and incorporated into the bodies of living things such as fish. Fertilizer in runoff contains phosphorus that travels rapidly to the ponds on the surface as opposed to septic system phosphorus, which travels more slowly in groundwater.

**There are simple things we can do to prevent runoff from our property,** such as making our path to the water crooked rather than straight and planting buffer strips of vegetation to slow the water, filter out debris and chemicals, and deter waterfowl. Two more tips: pick up dog poop and resist feeding the geese/swans/ducks.

**Invasive plants are non-native plants that have been introduced or imported, “gone wild,” and proliferated rapidly in an environment without natural competitors.** They can be either terrestrial or aquatic. Three land plants that are recognized as



European gray willow, *Salix atrocineria*

invaders in the Indian Ponds are purple loosestrife, a perennial garden plant, *Phragmites*, a reed, and European gray willow, a tree. Underwater, Mystic Lake and Middle Pond harbor the nearly-uncontrollable invader *Hydrilla*, a rapidly-spreading aquatic nightmare. These four threats to the ponds are discussed further on pages 21 to 24.



Purple loosestrife (*Lythrum salicaria*), beautiful but dangerous.



# HOW CAN WE HELP?

## Septic systems

**More than 85% of Cape Cod households and businesses use septic systems to dispose of their wastewater.** Septic systems, even the latest Title V systems, are designed to control the spread of pathogens such as disease-carrying bacteria and viruses, but do not prevent chemical nutrients from leaching into the groundwater. Title V of the Massachusetts State Environmental Code was implemented in 1978, before the effects of nutrients in groundwater were fully understood.

No matter how new your septic system, it leaches phosphorus and nitrogen into groundwater.

**Nitrogen is a threat to saltwater estuaries** where it fertilizes and promotes the growth of algae which reduce water clarity. These algae blooms inhibit the growth of eelgrass, which is the nursery habitat of many valuable commercial species such as crabs, clams, mussels, flounders, and scallops. Nitrogen does not harm healthy freshwater ponds, which have the ability to rid themselves of excess nitrogen by releasing nitrogen gas into the air through biological processes. But excess concentrations of nitrogen in groundwater are deadly for salt ponds, bays, and estuaries.

**The threat to freshwater ponds is phosphorus.** Excess phosphorus is like jet fuel for algae, and particularly for cyanobacteria. The process by which a pond becomes over-fertilized and produces large quantities of algae, explained on the previous page, is called *eutrophication*. If this process is allowed to continue, the pond may become unusable for recreation, unpleasant to be near, and uninhabitable by many desirable species such as fish or filter-feeding mussels.

**Excess phosphorus has degraded water quality in all three Indian Ponds,** resulting in dangerous

cyanobacteria blooms and the deaths of millions of mussels. This phosphorus appears to have been deposited into the ponds by long-ago agricultural activities. It lurks in the sediments and is regenerated into the water column during summer, when conditions of low oxygen prevail in the depths. Alum treatments were done in 1995 in Hamblin Pond and in 2010 in Mystic Lake to inactivate this sedimentary phosphorus. In recent years, cyanobacteria blooms have been re-occurring in Hamblin Pond, including an extremely severe bloom in 2014 that lasted from mid-July until Oc-

We urge you to support wastewater planning efforts that will reduce and control the excess nitrogen and phosphorus that are harming both our freshwater ponds and our saltwater bays and estuaries.

tober and closed the pond for swimming during most of that time. This is an indication that the previous alum treatment may be wearing off, and another treatment has been proposed.

## Preventing runoff

**All of us and our activities affect the groundwater beneath our feet, which is also the water in our ponds, as well as the water we drink.** Septic systems and intensive agriculture are not the only culprits guilty of degrading groundwater. The way we landscape and maintain our outdoor areas can help or harm. The fertilizers, pesticides, and other things we put on the land are dissolved by rainwater and seep down into the sandy soil, where they end up in the groundwater. If we live near a pond,

How we landscape and maintain our yards can make a big difference to the health of our ponds.

these substances can run along the surface and directly into the water when it rains.

**Automobiles contribute their share of groundwater pollution.** Tire dust, exhaust soot, and petroleum products wash off our roadways and driveways into the nearest storm sewer when it rains, and from there leach into the groundwater. During winter, salt from road de-icing becomes part of the mixture.

**Waterfowl droppings also contribute nitrogen and phosphorus to the ponds.** Beach closures during summer months are often attributable to waterfowl pollution. For this reason, it is important not to encourage them by feeding. It's not good for the birds, it's not good for the pond, and it's illegal to feed waterfowl.

**Lawns, from the standpoint of the environment, are extensive monocrops of introduced plants that require much attention, water, fertilizer, and weed-killers to stay green and attractive.** They don't hold moisture in the soil as well as more deeply-rooted plants, nor do they offer habitat to wildlife. It may be a radical thought to many of us, but a vast lawn may not be a particularly desirable possession after all. Many Cape Codders choose a "Cape Cod lawn", one which incorporates native grasses and other plants for a carefree look, low maintenance, and fewer chemicals in the environment. Some of us have managed to reduce the size of our lawns by introducing attractive plantings of native greenery around the edges, or by simply mulching certain areas. One thing we can all do is use organic, slow-release fertilizers that help our lawn—of whatever size—stay beautiful without adding extra nitrogen, phosphorus, and pesticides to our groundwater.

**The blacktop driveway, like the expanse of green lawn, is a hallowed landscaping feature** and is also questionable from the environment's point of view. Porous paving materials such as brick, pavers, gravel, or shell do a better job of absorbing rainwater and preventing runoff. Walkways and play areas can also be porously paved or mulched for a more environmentally-friendly surface. Whatever kind of driveway you prefer, use sand instead of salt in winter to render ice less slippery.

**Gardens can be used to control runoff.** Wherever the land slopes, water runs off. Some day when it's raining hard, put on your sou'wester and go outside to see where water is running off of your property. Planting ground covers, shrubs, ferns, or other greenery across a slope will slow the flow and absorb nutrients and chemicals before they reach the pond.

**Planting native plants pays big dividends.** They flourish in sandy soils, high winds, and low nutrients. Not only do they require less care, but they are magnets for birds and wildlife. Cape Cod Cooperative Extension, <http://www.capecodextension.org>, has much useful information as well as an extensive list of native plants that will thrive in the Indian Ponds area.

**The best way to keep runoff out of a pond is to plant a "buffer strip"** of low-growing plants such as irises, ferns, shrubs, and vines between your yard and the water's edge. The way to begin is to stop mowing a 20-foot strip between your lawn and the pond, and see what comes up, then add or subtract. These plants will act as living filters, capturing sediment, pollutants, and nutrients, and preventing them from getting into the pond. A well-designed buffer strip of attractive plants can enhance your view and add value to your property. It will help to deter geese and ducks from using your yard as their own. The *Massachusetts Buffer Manual* is all the how-to-do-it help you will need. This attractive and useful publication is available online at <http://berkshireplanning.org/reports-and-documents>.

## Discourage and control invasive plants

**Purple loosestrife** (see photo, page 20) is on the loose around the Indian Ponds. It was found several years ago growing on private property along the shores of Middle and Hamblin Ponds. The IPA obtained a permit to hand-pull it, and, with the efforts of many volunteers, managed to eliminate nearly all of it. Despite the threat it poses to wetlands, however, it continues to be sold in garden centers as an ornamental, so it can reappear on our pond shores at any time. One prominent stand of purple loosestrife is still claiming the shore of Hamblin Pond on the east end of the public beach. You can help by not planting it in your yard.

***Phragmites*, or common reed, is a tall, grass-like plant** that sports prominent plumes of seeds in summer. These seeds are spread by the wind, but the plant also conquers new territory by sending out long runners on the surface of the ground, some up to 50 feet or more, that sprout new plants



*Phragmites*, or common reed.

every few feet. Once it gains a foothold, it spreads rapidly and is extremely difficult to eradicate. *Phragmites* is well-entrenched all over Cape Cod, colonizing much of what once was freshwater

marshland and cattail country on the upland borders of salt marshes. So far it has established itself on only one location in the Indian Ponds, a large and spreading patch west of the town beach on Hamblin Pond.

**European gray willow is a tree similar in appearance to our native pussy willows** (see photo on page 20). Its foliage is blue-green, and, when mature, it looks like a large, round, bluish shrub. It

grows exclusively in wetlands and can be seen around the shores of all three Indian Ponds. It spreads by growing multiple stems that have a tendency to break apart and fall into the water. Whenever a living stem touches the water, it can grow roots. Insidiously, over time, the clump moves farther out into the water. Cut stumps also quickly resprout. The oldest gray willows on the Indian Ponds are on Mystic Lake and are 70 to 80 years old, as determined by counting rings.

**In 2007, the IPA developed a plan to remove gray willows**, in collaboration with Bartlett Tree Experts, waterfront property owners, and the Town of Barnstable. The actual removal and treatment of stumps with herbicide was done by Bartlett, which removed all cuttings by boat and disposed of them properly ashore. Approximately half of the infestation was removed in this way, including many of the largest and oldest trees. Property owners are encouraged to have any gray willow growing on their beaches removed professionally.

## *Hydrilla*: aquatic invader

***Hydrilla* is the worst invasive plant in the Indian Ponds today.** First discovered as a few patches on the western shore of Mystic Lake in 2010, it was immediately attacked by hand-pulling and the placing of benthic barriers of dark material that prevent sunlight from reaching the plants. It was subsequently treated by diver-assisted suction harvesting in 2011 and 2012, and professional applications of the herbicide Endothall in 2013 and 2014, along with manual harvesting in all years. Despite these concerted efforts at control, *Hydrilla* has continued to spread to shallow water areas on nearly all shores of Mystic, and several patches have become established in Middle Pond near the “cut” that connects the two ponds. Efforts to control and, someday, we hope, to eradicate this formidable invader are ongoing, thanks to the Town of Barnstable, which has underwritten the professional control efforts.



**Long Pond, in Centerville, is the only other pond on the Cape so far that has become infested with *Hydrilla*.** Thanks to persistent efforts, underwritten by the Town of Barnstable, it has been eradicated after nine years. The herbicide Sonar (fluridone) was what finally did it in.



**Identifying *Hydrilla***—note that leaves are attached to the stem in whorls of four or more leaflets, and that the leaflets have toothed edges. Stems are brittle and fragment easily; they feel slightly crispy.

**One of the principal reasons *Hydrilla* is so difficult to eradicate is that it produces tubers,** small reproductive structures, about the size of a grain of rice, that allow the plant to overwinter successfully. In Long Pond, tubers have remained viable for up to nine



***Elodea*, a native plant, not to be mistaken for *Hydrilla*.** Note leaves in whorls of three and leaflets with smooth edges.

years. It is this adaptation that allows the plant to so successfully resist eradication efforts.

**Invasive plants and animals get into ponds when people empty aquariums, or transport them on boats or fishing equipment, or when birds carry seeds or plant parts from one pond to another.** There isn't too much we can do about birds (except not encouraging them by feeding). But we can be careful to wash off all plant material when taking a boat or fishing equipment from pond to pond. If you see a plant or animal that looks suspicious, do take a sample and report it, but don't attempt to remove it, as this requires a permit and often results in spreading the invader. And never empty aquariums outdoors.

To report an organism you suspect might be an invasive, please take a sample, keep it wet, and e-mail the IPA at [info@indianponds.org](mailto:info@indianponds.org)



***Hydrilla*, showing tubers, bottom center.**

## INDIAN PONDS ASSOCIATION (IPA): 57 years of pond stewardship and community service

Established in 1958 by the residents of Marstons Mills living in the vicinity of the Indian Ponds, the IPA's motivating issue was the dense development in the immediate area of the ponds and the threat that posed to the ponds' fragile ecology and that of the surrounding watershed. Throughout the ensuing 57 years, the IPA has advocated effectively in a number of landmark decisions benefiting the ponds and adjacent lands. In 1961, the IPA convinced the Town of Barnstable that larger lot sizes were essential to prevent contamination of the ponds from septic discharge, resulting in the establishment of the first one-acre zoning on Cape Cod. In 1975, the IPA persuaded the Town to limit the maximum motor size to 10 hp on the ponds to prevent accidents to swimmers and ecological damage. In 2009, the IPA advocated with the Town and with the Massachusetts Natural Heritage and Endangered Species Program to allow an alum treatment in Mystic Lake. The organization has continued to be vigilant in matters of local zoning, conservation, and preservation of water quality.

The IPA strongly supported the Town's purchase of the former Danforth property in 2003, with the Cape Cod Airfield as the principal user of the land. The overriding concern was that commercial or residential development of that large tract of land would have a detrimental impact on the Indian Ponds. The IPA has advocated consistently to retain the 23-acre parcel adjacent to Mystic Lake in its natural state.

In 2004, the IPA launched a major study of the three Indian Ponds in collaboration with the Cape Cod Commission and the Town of Barnstable. This study, published as "First Order Assessment of the Indian Ponds Final Report" (March, 2006), was largely funded by the IPA and has been widely applauded and used as a model to be followed by other lake associations. This pond study report can be found on the IPA website, [www.indianponds.org](http://www.indianponds.org).

In 2005, IPA members discovered the presence of a major invasive plant species, purple loosestrife, on the shores of two of the Indian Ponds and obtained a three-year permit to remove these plants. In 2006, the IPA became aware of two additional invasive plant species affecting the Indian Ponds, the common reed, *Phragmites*, and the European gray willow tree. Working with Bartlett Tree Experts, it developed a two-year program for removing the gray willow that resulted in eliminating more than half of the established plants.

Organizationally, the IPA has evolved from an initial small group of members to a potent organization currently numbering around 160 household memberships, including many who live outside of the IPA area. About 60% of the current members are not waterfront property owners, but are members because they support the mission of the IPA. In 1984, the IPA was granted 501(c)(4) status by the IRS in 1984 and 501(c)(3) status in 2003, making it possible for membership dues and other donations to be deductible as charitable contributions for federal income tax purposes.

The IPA first published a newsletter in 2001, initially issued three times a year. Since 2003, quarterly issues have been mailed to a distribution list now numbering nearly 700. The IPA website was built in 2002 which contains all previous issues of the Newsletter as well as the Pond Study Report, this Resident's Guide, and other useful information.



Mystic Lake's Ram Island in autumn.

## IPA organization

- Two categories of membership: Resident, for those who live within the IPA area (see back cover), and Friends of the IPA (FIPA) for those who reside elsewhere.
- An eleven-member Board of Directors, elected by the membership for a maximum of three consecutive two-year terms.
- A President, Vice-President, Treasurer, and Clerk, elected by the Board from among the Directors.
- Annual Meetings held on a Sunday in July, preferably outdoors.
- Annual membership dues are currently \$20 per year per household.



Plymouth gentian (*Sabatia kennedyana*), a rare and endangered wildflower that blooms on Cape Cod pond shores during low water years.

## Current activities

- Initiatives to control or eradicate invasive plants: purple loosestrife, European gray willow, *Phragmites*, *Hydrilla*.
- Annual cleanup of derelict boats and debris from the ponds.
- Establishment of the Edward Schwarm Scholarship, in memory of a former IPA officer and director who died in 2005, awarding one or two scholarships each year to high school seniors who have demonstrated scholastic achievement and extracurricular work or community service related to the mission of the IPA.
- Participation in Marstons Mills community activities such as Village Day by sponsoring a display table of IPA projects and activities.
- Quarterly publication of the IPA Newsletter, mailed to nearly 700 local residents as well as town, state, and national government officials as an educational tool and to inform our constituents about current activities and concerns of the IPA.
- Bimonthly water quality testing in all three ponds including clarity, temperature, and dissolved oxygen.
- Mapping and monitoring of *Hydrilla* in Mystic Lake and Middle Pond; hand-pulling and management of benthic barriers to discourage regrowth.
- Working with Town of Barnstable and private contractors to coordinate *Hydrilla* control program.
- Working with consultants and Town to establish requirements and obtain permitting for alum treatment of Hamblin Pond.
- Maintaining and operating boats to facilitate its activities on all three ponds.
- Monthly sampling and monitoring of algae and zooplankton to provide an additional dimension of information on how our ponds work.
- Detailed depth charting of all three ponds.



# Indian Ponds Association

**"To preserve and protect the natural environment and ecological systems of the Indian Ponds and surrounding parcels of land and watershed and to participate in studies and work with other agencies, individuals, and groups to educate the public, serve the community, and promote and preserve the Indian Ponds and surrounding areas."**



**To receive a free IPA Newsletter or to join, contact:  
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