

THE IPA NEWSLETTER

Mystic Lake, Middle Pond, and Hamblin Pond in Marstons Mills, MA

Fall 2023

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MYSTIC LAKE ALUM TREATMENT

Dr. Kenneth Wagner of Water Resource Service, Inc. has recently been contracted by the Town of Barnstable to manage the alum treatment for Mystic Lake. There are many steps to be accomplished to effectuate this project. First, the project needs to be defined based on the area of the bottom sediment and the measured amount of phosphorous on the surface of the sediment layer. This plan will then need to be vetted by the Mass. Division of Fisheries and Wildlife and the Mass Natural Heritage and Endangered Species Program. Once these two agencies have signed off on the plan, it then goes to the Barnstable Conservation Commission for approval and any stipulations. At some point in this process, a contractor will be contracted to implement the treatment and agree to the defined time-table.

Because the water temperature needs to be above 40°F for the alum to properly disperse, this generally rules out a winter application. The water column tends to be more unstable in summer, thus ruling out a summer application. The project time-table is further constrained by the seasonal herring runs. Historically, the Mass. Division of Fisheries and Wildlife has favored a fall application. Because of all of these reasons and since Water Resource Services, Inc. was not contracted until November, we will most likely not see this treatment until fall 2024.

Many readers will remember that two massive cyanobacteria blooms in late summer, one in 2009 and the other in 2010, occurred prior to the 2010 alum treatment of Mystic Lake. Weather conditions this summer were not particularly conducive to cyanobacteria blooms, so we hope that next summer will be equally not conducive.

Butch Roberts

RESOLUTION OF PROPOSED DOCK AT 24 FLUME AVENUE

In the winter 2022 issue of this newsletter, it was reported that the IPA and several homeowner associations had collaborated in opposing a proposed 72-foot permanent dock at 24 Flume Avenue, a waterfront property at the south end of Middle Pond. As a result of this opposition, the Conservation Commission finally approved a shortened 56-foot dock with seasonal deployment annually between April 1 and November 1.

Although the Commission authorized a seasonal dock, approval included the use of helical piles onto which it would be anchored. The piles, with 18-in metal rods protruding above the pond bottom, were viewed by residents who use Middle Pond as being dangerous to navigation by boaters, kayakers, and paddleboarders or to anyone wading in the vicinity of the piles during the offseason. An appeal, supported by a petition drive, objecting to the helical piles was made to the Mass. Department of Environmental Protection Water Protection Program.

Although a final ruling was not made by the DEP Water Protection Program, the property owner, responding to the public opposition to the piles, presented an alternative which was considered by the Conservation Commission at its October 31 meeting. The alternative proposal was to use 12-in diameter concrete blocks embedded 6 inches into the pond bottom where they would remain year-round. During the season, the dock legs would be placed into holes in the blocks to support the dock, which is a practice similar to that used in other seasonal docks around the pond. This proposal was considered acceptable by the IPA and was approved by the Commission. The homeowner's efforts to satisfy the safety concerns of those who use Middle Pond for recreational purposes are appreciated.

*Butch Roberts
Emory Anderson*

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MESSAGE FROM YOUR PRESIDENT



When I joined the IPA board five years ago, the political environment regarding clean water and the health of freshwater ponds was significantly different from now, but change was brewing in the background. There was very little discussion around the health of the freshwater ponds on the Cape. The EPA mandated that coastal communities with impaired estuaries reduce the amount of nitrogen going into the affected bays and estuaries. This focused the collective public interest on reducing nitrogen flowing into the groundwater. With this intense focus on nitrogen, the question of phosphorous loading in our freshwater ponds was barely discussed. Monitoring water quality, *Hydrilla* treatments, and alum treatments that the Indian Ponds Association was championing were rare exceptions relative to the other 960 ponds on the Cape.

Due to the collective action of a number of scientists and environmentalists on the Cape responding to several Cape-wide pond surveys emphasizing the deteriorating quality of our freshwater ponds, a movement has been energized. The following is just a partial list of activities and dedicated organizations:

- Over the last 10 years, several pond organizations have been created and mobilized to take action on their respective ponds.
- The Cape Cod Commission received funding to initiate a Cape Cod Regional Water Quality Monitoring Program to collect and synthesize water quality data from Cape Cod ponds.
- In June 2022, the Cape Cod Ponds Network held its first meeting providing a platform for pond associations Cape-wide.
- The Waquoit Bay National Estuarine Research Reserve is expanding its resources to include freshwater pond pollution and pond association education.
- The Massachusetts Septic System Testing Center is now testing several Innovative/Alternative Onsite Septic System technologies to remove phosphorus from the onsite septic system waste stream.

The Indian Ponds Association is no longer a rare exception on Cape Cod. We now have local resources available for support that did not exist a decade ago. The opportunities to advance our mission have never been better. However, we need active and energetic membership involvement if the Indian Ponds Association is to take advantage of these opportunities. Please consider ways in which you can help in this effort. Visit our website at www.indianponds.org and become a member. There is always room for volunteers to become energetic and committed stewards of our three ponds.

Thank you for your support.

Butch Roberts

BARNSTABLE LAND TRUST'S WHEELER HOLLY PRESERVE CAMPAIGN

Barnstable Land Trust (BLT) has an agreement to purchase the nearly 10-acre Wheeler family property at 150 and 178 Wheeler Road in Marstons Mills and has kicked off a fundraising campaign to close on the property in June 2024. This presents a remarkable opportunity to expand the conservation land and trail access from Fuller Farm and protect endangered species in Middle Pond.

The Wheeler homestead is the last undeveloped property on Wheeler Road and holds a rich history. Wilfrid Wheeler Jr. (known as Boysie), an arborist long associated with Bartlett Tree Experts, purchased the undeveloped land after the 1938 Hurricane, calling the property Windrift. Prominent among the trees brought to Windrift were varieties of the American holly (*Ilex opaca*) cultivated by Boysie's father, Wilfrid Wheeler Sr. A farmer and esteemed horticulturalist, Wilfrid Sr. sought to preserve this native tree which he collected and propagated at his Ashumet Farm in Falmouth. BLT intends to steward the land to protect its thriving and historic holly trees.

The Wheeler parcel is thickly wooded with pitch pine, white pine, white and black oak, American holly and American beech, plus an understory of black huckleberry, blueberry, wintergreen, field grasses, and wild sarsaparilla. Deer, fox, raccoon, turkey, songbirds, and coyote all shelter and feed in the woods. The property has almost 600 feet of frontage on Middle Pond, the spawning ground for Barnstable's most prolific anadromous fish run (alewives and blueback herring) coming up through the Marstons Mills River from Nantucket Sound.

Preserving this property from becoming a 4-lot housing development will ensure the protection of the endangered species (freshwater mussels and aquatic plants) that make their home on the shoreline of Middle Pond. Further, it

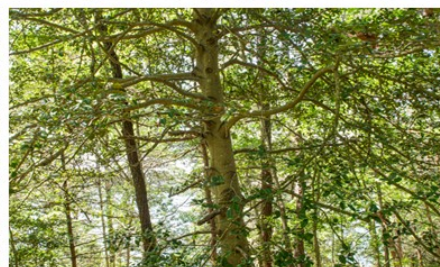
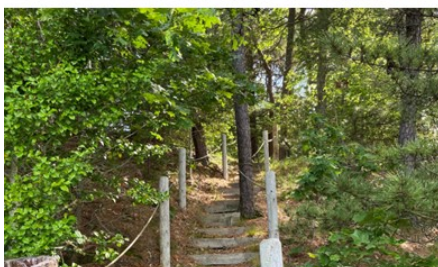
prevents the addition of nutrients to Middle Pond from new septic systems if developed into housing.

As the Wheeler property shares a 600-foot boundary with Fuller Farm, purchase of the property will expand the natural area extending from Fuller Farm to the Danforth Recreation Area on Race Lane, which itself connects to the Cape Cod Airfield and the West Barnstable Conservation Area.

BLT's vision for the property includes a loop trail accessible to the public from parking at Fuller Farm. The trail would navigate woodland, bog, and field on Fuller Farm and provide a view of Middle Pond from a bench in the Wheeler woods. BLT intends to maintain the existing house on the property and rent it to staff who can serve as property caretakers.

The success of this conservation effort is contingent upon the generous support of the community. You are invited to help protect the beautiful Wheeler Holly Preserve and its unique hollies for generations to come. Please visit www.blt.org/wheeler or contact Kelsey Ellis at kelsey@blt.org of 508-771-2585 x103 to learn more.

*Kelsey Ellis
BLT Director of Development*



EXPLORING THE FUTURE: RESTORING THE MARSTONS MILLS RIVER AND PROTECTING OUR WATERSHED

In the heart of our community lies the Marstons Mills River, a waterway intimately woven into our lives, flowing from the Indian Ponds watershed through the cranberry bogs and out into the ocean via the Three Bays estuary. However, beneath its tranquil surface, the river has been facing challenges. The water quality has been declining, and the culprit is no secret: our septic systems.

These systems, while essential, have been leaching nitrogen and phosphorous into the river, contributing to toxic algae blooms that harm aquatic life and pose risks to humans. In fact, over 80% of the nitrogen in the river originates from these septic systems, while the remaining 15–20% comes from lawn fertilizers and storm/road runoff. The Marstons Mills River, like a hurried messenger, transports these nutrients from the watershed to the ocean in just a few hours.

Recognizing this urgent issue, the Barnstable Clean Water Coalition (BCWC) has taken a significant step forward. The BCWC has acquired over 60 acres of cranberry bogs and initiated a groundbreaking plan: restoring these bogs to wetlands, a natural filtration system as old as time.

This innovative method involves exposing ancient seeds buried beneath the bogs, encouraging the growth of natural wetland plants. By doing so, the wetlands will absorb and capture the nitrogen before it reaches the ocean. This approach, although relatively new, has proven successful in other restoration projects like Tidmarsh Farm in Plymouth and Coonamessett Farm in Falmouth, where a significant reduction in nitrogen flow was achieved.

Currently in the planning phase, the project involves intricate studies and innovative filtering systems. The BCWC plans to break ground within a year, heralding a transformative era for the Marstons Mills River. Alterations in the river's flow will slow down the nitrogen's journey, enabling absorption by the restored wetlands.

Crucially, the area surrounding the Marstons Mills River is not slated to have a sewer system for 20–30 years. Having a sewer system would significantly reduce nitrogen and other excess nutrients, emphasizing the urgency of the BCWC's restoration project.

But the BCWC's vision goes beyond mere restoration. They plan to collaborate with the Barnstable Land Trust (BLT) to transform the area into a special place for our community. A sanctuary where families can walk, hike, bird watch, and immerse themselves in the wonders of nature. They anticipate wildlife flourishing, as previous successful restoration projects have exhibited.

To the abutters, the BCWC issues a reassurance amidst the inevitable construction appearances; with time, these wetlands will sprout lush seedlings, transforming the landscape into a thriving habitat. It's a transformation worth witnessing, a testament to nature's resilience and our community's dedication.

With the recent sale of the cranberry bogs, changes are evident that concern abutters. Increased foot traffic and illegal parking have become unwelcome companions, while some dog owners have neglected their responsibility, leaving behind more mess on footpaths. The invasive poison ivy has also found a new home further complicating the landscape. Even the remaining bog owners express their concerns. The proposed interruption in the river's flow prompts worries about their livelihoods, adding another layer of complexity to the situation.

Amidst these concerns, the conversation continues. The abutters, the BCWC, and the community as a whole find themselves at a crossroads, navigating the delicate balance between progress and preservation. As discussions unfold and decisions are made, the hope is for a resolution that respects the concerns of all parties involved, ensuring the harmony of the community and the vitality of the Marstons Mills River for generations to come.

The BCWC welcomes all questions and comments, valuing the insights of neighboring abutters and community members. To stay updated on this exciting restoration project and its transformation into a community haven, visit the BCWC website at www.bcleanwater.org. Together, we are steering our waters towards a healthier, more vibrant future.

Sandy Leo-Clark

CHECK OUT THE TOWN OF BARNSTABLE'S NEW CITIZEN NOTIFICATIONS MOBILE APP

This App was launched in July and is called **My Barnstable, powered by GOGov**. It is extremely powerful, very easy to use, and puts the power of Town Hall in the palm of your hand. It is a great source of information for Town news, events, service interruptions, and updates, and provides important links to the Town's website. Town staff can streamline important community communications and information to citizens in more efficient ways.

To download the free app, go to the Apple App Store or Google Play Store and search "My Barnstable" to find the app. By default, all notification categories are available to unregistered users. If you would like to customize what notifications you receive, you can create an account within the My Barnstable App and choose which notifications categories you would like information sent to you. If you want to stay on top of what is happening from the Town Council to the Conservation Commission as well as interact with the Town government, this is a great tool.

MEASURING POND HEALTH

Introduction

To continue our monitoring of pond health in 2023, three key measurements (water clarity, temperature, and dissolved oxygen) were collected roughly every two weeks between April and October. Measurements were taken on 13 days in Mystic Lake and Middle Pond and 11 days in Hamblin Pond. We're indebted to our volunteers who assisted with the pond testing: Emory Anderson, Peter Atkinson, Scott Borden, Sandy Leo-Clark, Greg Cronin, Bob Derderian, Tom Odjakjian, Robert Reynolds, Butch Roberts, Carol Sim, and Amber Unrah.

Water clarity

Water clarity is affected by suspended material such as algae in the water and is one of the most obvious indicators of pond health. Water clarity is measured visually by lowering a black-and-white disk known as a "Secchi disk" into the water and recording the depth at which the disk can still be seen.

2023 overall water clarity: As shown in Figure 1, Hamblin Pond had the highest average clarity (6.4 m), while Mystic Lake was lowest (3.5 m). Although Mystic had an alum treatment in 2010, the alum dose was too low to be effective. As a result, Mystic has more phosphorous available to fuel planktonic algae growth, reducing water clarity on that pond. In contrast, the alum treatment in Hamblin

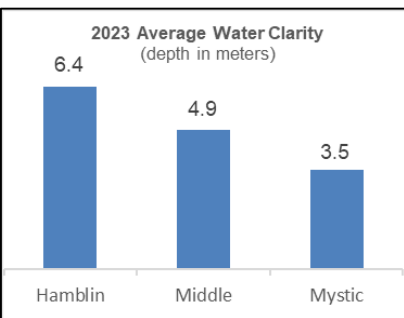


Figure 1. Average clarity ranged from 6.4 m on Hamblin to 3.5 m on Mystic.

in 2015 was very effective, resulting in high water clarity that has persisted since the treatment.

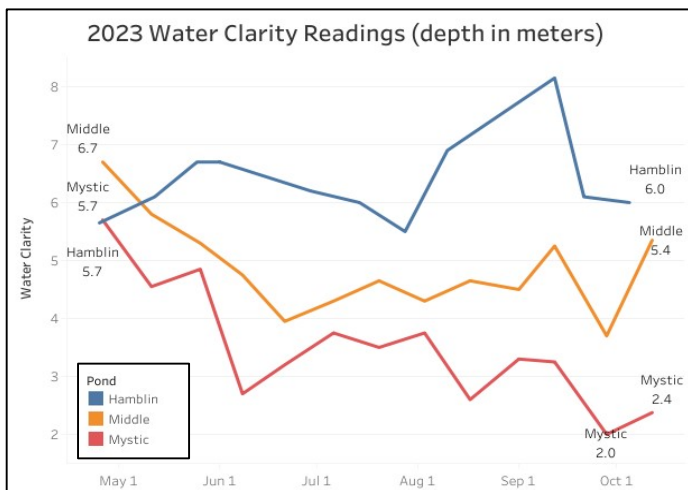


Figure 2. Pond clarity declined significantly on Mystic Lake during 2023, from 5.7 m in April to 2.4 m in October.

2023 water clarity changes: Figure 2 shows the changes in water clarity readings in 2023. As seen, clarity initially was good in all three ponds (5.7 m for Hamblin and Mystic, 6.7 m for Middle). However, a significant decline was evident in Mystic where clarity gradually dropped to a low of 2.0 m on September 28 as the availability of phosphorus allowed more algae to be produced during the season. Hamblin, benefiting from its effective alum treatment in 2015 and

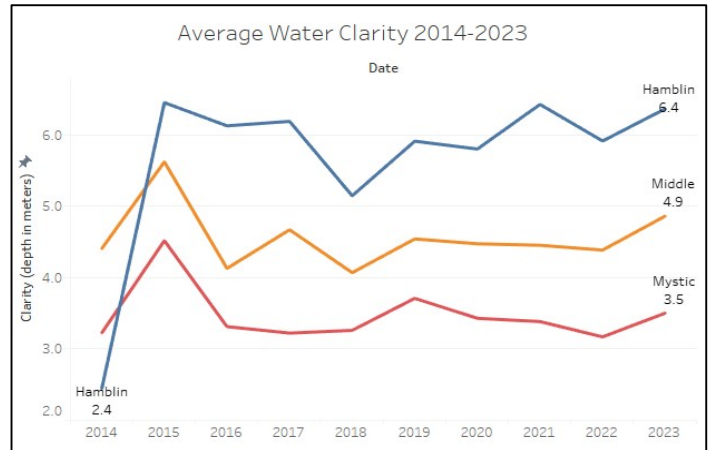


Figure 3. Long-term trends show the impact of Hamblin's successful alum treatment in 2015 and its lasting effects.

greater depth, did not exhibit a decline in clarity and ended the season with a slightly higher clarity than at the start. Clarity for Middle Pond was between that for Hamblin and Mystic, except for the initial reading in April (6.7 m).

Historical view of water clarity: Figure 3 shows average pond clarity over the past 10 years. As shown on the right side of the graph, readings in 2023 were generally in line with the past eight years. Clarity readings on all three ponds were up slightly from 2022. This uptick was likely due to weather conditions in 2023 that were less conducive to algae growth, producing clearer water as well as a drop in cyanobacteria measured by the Association to Preserve Cape Cod (APCC).

On the left side of the graph, Figure 3 illustrates the effectiveness of the alum treatment in Hamblin Pond. In 2014, prior to the treatment, average clarity in Hamblin was only 2.4 m and reached a low of just 0.9 m on August 22, 2014. Since the treatment, Hamblin has had the highest clarity of the three ponds, averaging 6.0 m during 2015–2023. It's hoped that the upcoming alum treatment in 2024 on Mystic Lake will have a similar positive impact.

Dissolved oxygen

Dissolved oxygen (DO), measured in milligrams per liter (mg/l), is required to support life in the ponds. For example, freshwater fish such as trout thrive in water above 5 mg/l and are stressed below that level. Readings below 2

mg/l represent a “dead zone” where water can’t support life. Low levels of DO are common at the bottoms of deeper ponds such as Hamblin (max. depth = 19.2 m) and Mystic (14.3 m). However, unhealthy levels of DO can also occur at shallower depths. For example, a pond with excess nutrients such as phosphorus and nitrogen can allow algae to grow out of control as the water warms. When the algae die off, bacteria consume the DO in the process of decomposing the algae.

DO levels above 2 mg/l in Middle Pond were found all the way to the bottom (9 m) each month except July and August, where it extended to 8 m. In Mystic, average monthly DO levels extended to 7 m each month. However, DO levels below 2 were seen in July and August starting at a depth of 8 m.

Water temperature

Seasonal temperature changes at the surface: Temperatures in the three ponds showed the usual seasonal cycle of warming and cooling. As seen in Table 1, surface temperatures averaged 13.7°C (56.6°F) in the initial reading in late

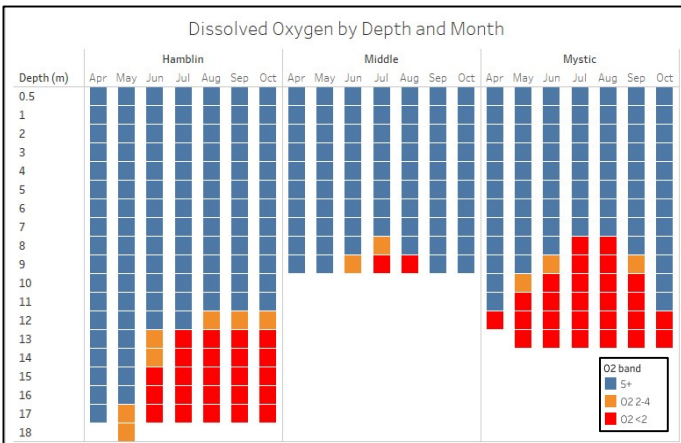


Figure 4. Dissolved oxygen levels varied by depth across the season.

Pond Surface Temperatures °C (°F)			
	Late April	Late July	October
Hamblin	13.5 (56.3)	28.7 (83.7)	20.2 (68.4)
Mystic	13.8 (56.8)	27.0 (80.6)	17.9 (64.2)
Middle	13.7 (56.7)	27.8 (82.0)	18.6 (65.5)
Avg.	13.7 (56.6)	27.8 (82.1)	18.9 (66.0)

Table 1. Surface temperatures started off cool in April, peaked in late July, and then cooled again into October.

April, rose to 27.8°C (82.1°F) in late July, and then dropped again to 18.9°C (66.0°F) in the final reading in October.

Temperature profiles by depth: Figure 55 shows the temperature profiles of the ponds from June to October. As seen, water temperatures varied significantly from top to bottom.

Figure 4 shows the average dissolved oxygen levels by month and by depth in the three ponds. As seen, high average levels of DO (> 5 mg/l) were found throughout the year in all ponds from the surface down to 7 in depth. In Hamblin Pond, average monthly DO levels above 2 mg/l were present throughout the year to a depth of 12 m and extended to the bottom in April and May. Average monthly

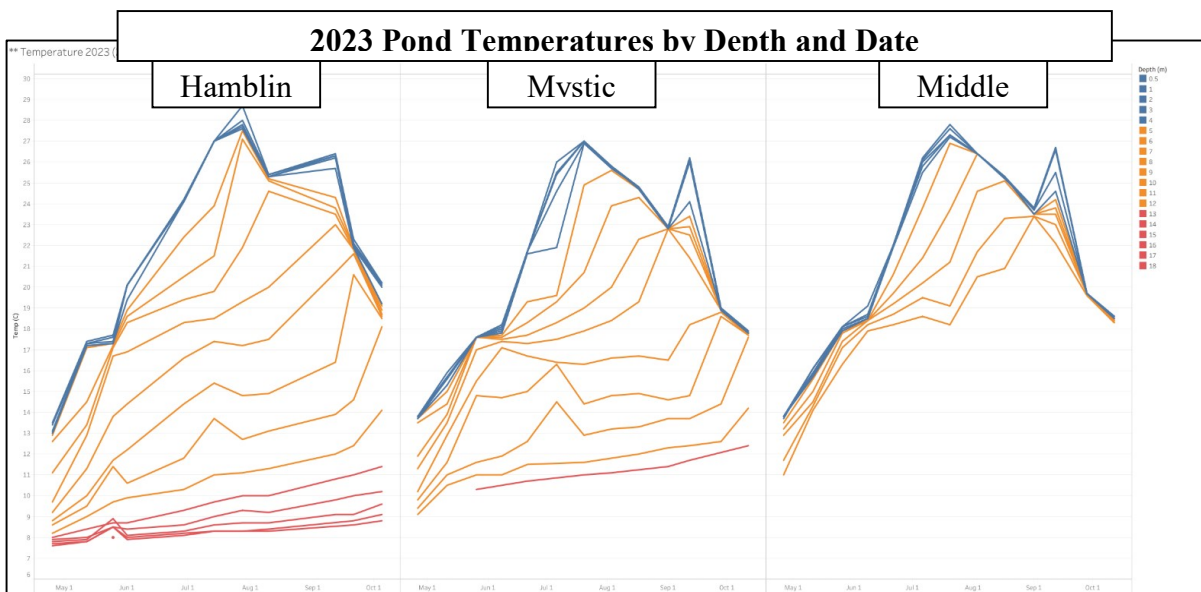


Figure 5. Pond temperatures change over time during the year and vary significantly by depth. All three ponds have a warm and uniform upper layer (blue lines) that heats and cools with the change of seasons. Hamblin and Mystic also have a cold bottom layer (red lines) that remains a fairly constant temperature. Middle Pond, which is shallower, lacks the cold bottom layer that’s seen on Hamblin and Middle.

- **Top layer:** All three ponds had a warm upper layer that extended to a depth of at least 4 m throughout the season. In this upper layer, temperatures rose rapidly through late July and then cooled again going into the fall season. Wind action mixed the water in this top layer to create the fairly uniform top temperature band that we see.

- **Middle Layer:** Below the top layer, temperatures drop rapidly with depth while continuing to show significant warming and cooling during the season. If the pond is deep enough, this region can form what's called a thermocline, a region that isolates the warm upper layer from a cold bottom layer that prevents mixing between the two.

- **Bottom layer:** For deeper lakes like Hamblin and Mystic, a colder and denser water layer exists at the bottom. In 2023, this layer started at a depth of around 13 m and showed little temperature variation over the course of the season. Middle Pond, with a maximum depth of just 10.4 m, was too shallow to have a cold bottom layer.

Cyanobacteria testing was done by the Town of Barnstable in collaboration with the APCC. On June 12, a significant amount of cyanobacteria scum was observed in Mystic Lake, leading to a public health advisory for people and pets. This advisory remained in effect for about two weeks until two negative test results were received.

Tom Hamilton

SQUIRRELS ON MY DECK

As occasionally happens, I have procrastinated until the last minute. Fortunately, a subject has been suggested and it is one that I think I'll enjoy writing about. I enjoy sitting and watching the squirrels playing on my deck. I realize that they are more concerned with searching for food than with entertaining me, but the result is the same. There are three who usually spend time with me, and I have come to recognize them from their actions more than from their appearance. For instance, there is one who feeds



Eastern gray squirrel

from the drain holes on the bottom of the feeder rather than from the feeder openings on the top of the container, one who crouches inside the ring on the top of the feeder and hangs over the side to get his seeds, and one who has a large white spot on his side from some injury sometime in the past. One of them is a large female and the other two are males.

Squirrels are rodents and are members of a family that includes both small and medium-sized members. The family includes tree squirrels, ground squirrels, and flying squirrels, as well as chipmunks, groundhogs, marmots, and prairie dogs. Squirrels are indigenous to the Americas, Eurasia, and Africa. They were introduced by humans to Australia. They can be found in various colors: grey, red, black, and white, to name a few. There is a really beautiful solid black one in the woods when you first come onto the road where we live who has been there for the last 6 months or so.

Here on the Cape, there are two main squirrel species: the eastern gray squirrel and the American red squirrel. The

gray squirrel is most commonly seen, whereas the much smaller red squirrel is more feisty, aggressive, and noisy. A third, less common squirrel, which is rarely seen, is the flying squirrel. There are two species: the northern flying squirrel, which prefers coniferous forests, and the southern flying squirrel, which prefers deciduous forest.

In the wild, squirrels enjoy a lifespan anywhere from 5 to 10 years, chipmunks from 6 to 10 years, and marmots from 15 to 18 years.

Squirrel predators include coyotes, hawks, bobcats, black bears, owls, snakes, foxes, and man. They are quite good to eat. When I lived in Florida and Texas, my father and I used to go squirrel hunting. As you can imagine, you'd need to bag quite a few for a decent meal.

Squirrels inhabit both hardwood and coniferous woodlands. Hardwood and mixed hardwood and pine forests offer ideal habitats. Squirrels build nests, called dreys, from leaves, twigs, and moss about 25 feet from the ground. They also burrow into hollow trees and tree cavities. They will also willingly accept a bird's nest that they find abandoned. They communicate with other squirrels both vocally and by signaling with their tails. Tail whipping is usually used as a sign that predators have been spotted nearby. They also scent mark to mark their territory and to find mates. They are friendly to humans and can be coaxed into accepting food from your hand.



American red squirrel

Dave Reid

“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.” IPA Mission Statement

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FORWARDING SERVICE REQUESTED

