THE IPA NEWSLETTER

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

Fall 2020 **A quarterly publication of the Indian Ponds Association, Inc.** **Vol. 20 No.4**

IN THIS ISSUE

MYSTIC LAKE STUDY CONCLUSION: PHOSPHORUS CONTROL NEEDED

A study of Mystic Lake funded by the IPA and conducted by Dr. Ken Wagner of Water Resources Services this past year has been completed. A detailed report describing the project's approach, the results obtained from four field samplings of water, phytoplankton (algae), zooplankton, and sediments from the lake bottom, the study's conclusions, and management implications and options was recently submitted to the IPA and was discussed at the November 5 Board of Directors meeting. The report concluded that **internal loading** (release to the overlying water from the sediments) **of phosphorus (P) is still the dominant source of P in Mystic Lake**. Management of internal loading requires control of the interchange between the sediment and the overlying water, especially where dissolved oxygen is low or nearly absent, which is the case in Mystic Lake. Three main options for achieving such control include: dredging, inactivation of P by chemical means, and oxygenation. Based on cost considerations, **inactivation of P in the sediments with alum (aluminum sulfate) is the least expensive option and is the most likely way to achieve water clarity and algae management goals for the lake.**

This study, authorized by the Board in mid-March at a cost not to exceed $6,600, involved field work on four sampling dates (May 22, July 15, September 8, and October 15) and at three sampling sites in Mystic Lake (one at the deepest location at the south end of the lake (about 14 meters depth), another in the north end off the Race Lane beach (about 7.5 meters depth), and the third south of Ram Island (about 10 meters depth). Measurements were taken on each date and at each station at various depths from the surface to the bottom for: dissolved oxygen, temperature, pH, conductivity, turbidity, and chlorophyll *a*. Water samples were collected for determining concentrations of phosphorus and iron. Phytoplankton and zooplankton samples were taken with towed fine-meshed nets. Bottom samples were collected only from the upper 2 cm of sediment and analyzed for total P, iron–P, aluminum–P, calcium–P, biogenic P (the more available fraction of organic P), and organic P. The stated goal of this study was to evaluate the accumulation of P in deeper water, assess its availability in the upper 2 cm of sediment interacting to the greatest degree with overlying water, and assess the plankton community in relation to reports of blooms and related problems. Full details of the sampling, results, conclusions, and management options can be found in the report (Mystic Lake Status Update 2020) available on the IPA website (https://www.indianponds.org/). Much of the following text in this article is taken directly from the report.

The treatment of Mystic Lake with alum in September 2010 was intended to inactivate the P bound to iron in the layer of sediment close to the overlying water and thus minimize its release when oxygen is depleted by organic decomposition in deeper water, which always happens during the late spring–early fall period. Although a decline in P concentration was observed after this treatment, it was not as pronounced as desired. A combination of a lower-than-recommended dose of alum, due to regulatory constraints by the MA Natural Heritage and Endangered Species Program, and lower efficiency of treatment in late summer after so much P had already been released from the sediment and from dead mussels, is suspected as the cause. Conditions have not improved as much as hoped, and periodic issues with lower clarity and visible cyanobacteria accumulations remain.

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INDIAN PONDS CYANOBACTERIA MONITORING RESULTS FOR 2020

The last sampling effort for the Indian Ponds Cyanobacteria Monitoring Program was completed on October 8, 2020. Begun in early June, this program entailed bi-weekly field sampling and laboratory analysis of water samples collected from the northeast corners of each of the three Indian Ponds. Funded by the IPA and conducted by staff from the Association to Preserve Cape Cod (APCC), this effort complemented similar monitoring done by the Town of Barnstable's Department of Health and Environment at each of the Town's public beaches. Throughout summer, levels of cyanobacteria rose and fell in each of the Indian Ponds; however, levels in the ponds consistently remained below those warranting a health warning or beach closure. Unfortunately, on the last day of September and through the first two weeks of October, cyanobacteria levels prompted the posting of health warnings and closures at public beaches on Mystic Lake. Hamblin Pond and Middle Pond had no such postings this year.

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MYSTERY OF THE MIDDLE POND–MYSTIC LAKE CUT

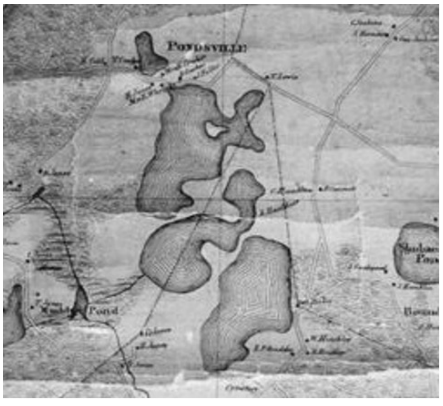
The Marstons Mills Historical Society requests the help of residents to solve the mystery of when the cut between Mystic Lake and Middle Pond was created and by whom. Early historical maps and US Geological Survey maps through the year 1942 show the ponds as separate. The 1943 Geological Survey map shows a tiny cut which increases in later years.

Former Wheeler Road resident Bob Frazee has advised that a connection, and later culvert, was rumored to have existed at one time under Wheeler Road at its low point, but was closed long ago. Perhaps when the current pass-through was created?

According to Frazee, divers have remarked about a strong current running from the Mystic–Middle cut directly to a narrow point on the isthmus on Hollidge Hill Road where another culvert between Middle Pond and Hamblin Pond was rumored to have once existed.

These culverts are interesting because both locations have marsh-like borders. If you have any information to help solve this mystery, please contact info@indianponds.org or message us on our new Facebook page. If you have other interesting facts to share about the history of the Indian Ponds, we'd love to hear from you. Thanks!

1856 historic map



1943 US Geological Survey map

Wendy Bierwirth

MYSTIC LAKE STUDY CONCLUSIONS

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If ongoing septic system and lawn runoff were primary drivers contributing directly to elevated P, then one would expect elevated P levels in the near surface and mid-depth water samples collected in the study throughout the spring and summer. However, total P was less than the detection limit at the surface in late May and even in early September. Significant leaching of P into Mystic Lake would probably have been accompanied by algae blooms during spring and summer rather than only during the period of late summer turnover in some years.

Septic systems tend to supply P at a high N:P ratio, as nitrogen (N) is much more mobile in soil than P, and this would foster green algae growth. Filamentous green algae growths are observed at times in the lake and may indeed be linked to wastewater inputs, but any accompanying P does not immediately lead to cyanobacteria production. Rather, P from groundwater not utilized by green algae growing at the point of entry will tend to be bound to iron that will also be high if significant P is present (both move together in groundwater), will precipitate to the bottom, but may become part of the internal load later and thereby figure into cyanobacteria growth. In that regard, it is still important to minimize wastewater inputs to the lake, but there are limited options for doing so without creating a sewer system to remove effluent for treatment elsewhere. Advanced on-site treatment systems can reduce P output, but are considerably more expensive than traditional, legal systems.

Surface runoff is not typically a large source of nutrients to Cape Cod ponds, as the soils are sandy and there are not nearly as many direct entry pipes as in other parts of Massachusetts. However, where such pipes exist, it is advisable to turn them into leaching basins to provide some soil filtration prior to the water reaching a pond. There are regulations that pertain to such leaching systems, however, so it is not always as simple as we might like. Minimizing sources of nutrients that can contaminate runoff, whether it goes directly or indirectly into the pond, is advisable, and includes limiting use of fertilizers, properly disposing of yard wastes, and not using P-containing detergents for vehicle or other outside cleaning activities. However, runoff is likely to contain mostly particulate P, not immediately available for use by algae, and those particles usually settle to the bottom where they can contribute to the internal load. As with groundwater sources, runoff is mainly a long-term source of P, but mainly through its fueling of internal loading.

While not runoff per se, discharges from cranberry bogs, mainly associated with flooding and return of that water to the pond, usually have high concentrations of P. Much of this P will be particulate, as with residential area runoff, and will consist of berries, leaves, stems, and some sediment. It will settle to the bottom fairly rapidly, where the organic matter creates oxygen demand that leads to low oxygen and reactions that promote internal P loading. Over time, the associated P may also represent a substantial contribution to the P reserves in the surficial sediment that provide the internal P load. Management of cranberry bogs varies widely and is informed by considerable research and outreach effort by the Massachusetts Cranberry Experiment Station. Bogs are not likely to be a negligible long-term source, but their impact can be greatly reduced by best management practices.

Atmospheric deposition and direct inputs by bird and other wildlife are also P sources to Cape Cod ponds, but there is limited control over these sources, and they also tend to be dominated by particulate forms that settle and feed the internal load.

While watershed management is always appropriate to protect a pond, it is unlikely to be sufficient to remediate a pond that has become overloaded with P. **Control of internal P loading is, therefore, essential in the vast majority of cases where cyanobacteria blooms have occurred, and Mystic Lake is no exception.** Management of internal loading requires control of the interchange between sediment and overlying water, especially where oxygen is low. There are three main options for achieving such control: dredging, oxygenation, and P inactivation, the last of which was conducted in Mystic Lake in 2010. Each can be effective, but cost and regulatory/community acceptability are also important in choosing an approach.

While this study has concluded that the P already in the sediments of Mystic Lake is the main source of P that fuels the production of unwanted algae such as cyanobacteria, it is nevertheless imperative that we stress the importance of minimizing fertilizer applications, reducing the amount of run-off water being directly deposited in the ponds, and reducing the nutrients being released into the groundwater via our current septic systems. Since the Town's Comprehensive Wastewater Management Plan is not intended to encompass any of the properties that are on the upstream side of the Indian Ponds where the groundwater flow is into the ponds, it is necessary that residents do their part, in the long-term, to help maintain the future health of these precious ponds. **In the short-term, however, expanding the inactivation of phosphorus in the sediments with alum is the most practical and least expensive method to suppress the present P in Mystic Lake and achieve improved water clarity and reduced algae production.**

Emory D. Anderson, PhD

STATE OF THE WATERS: CAPE COD 2020

As it did last year, the Association to Preserve Cape Cod (APCC) has released a report on the water quality of Cape Cod's coastal embayments, freshwater ponds and lakes, and public water supplies. This year's report is based on water quality data available through 2019, whereas last year's report was based on data through 2018. Ponds were graded using water quality data from no earlier than 2015 and included, for the first time, the results of APCC's cyanobacteria monitoring. Of the three Indian Ponds, Mystic Lake and Hamblin Pond were graded as Acceptable, whereas Middle Pond was graded as Unacceptable. This is in contrast to last year's APCC report in which Hamblin and Middle were graded as Acceptable and Mystic as Unacceptable. Further comments on this are provided later in this article. The full report can be accessed online at https://capecodwaters.org/. Some of the text that follows is taken verbatim from the APCC report.

Grading for freshwater ponds and lakes

To grade freshwater ponds and lakes, APCC used two methods: the Carlson Trophic Index and cyanobacteria monitoring data. The Carlson Trophic Index is a scoring method that evaluates the trophic state of the water body in terms of three important water quality parameters: total phosphorus, chlorophyll, and water transparency. Using the Carlson Trophic Index, a pond with high nutrient concentrations (**eutrophic to hypereutrophic**) would be characterized by high concentrations of algae, algal scums, poor water clarity due to dense algae and low to no dissolved oxygen, and would have scores from 50 to 100. At the opposite end of the spectrum, a pond with low nutrient concentrations (**oligotrophic**) would be characterized by clear well-oxygenated water, healthy aquatic plants, and little to no algal growth, and would have scores from 0 to 40. A pond with intermediate nutrient concentrations (**mesotrophic**) would be characterized by moderately clear water, intermediate amounts of aquatic plants and algae, and low dissolved oxygen during the summer, and pond would have scores from 40 to 50. APCC adopted a grading system that assigns the following grades to Carlson Trophic Index scores: those less than 50 are graded as: "Acceptable: requires ongoing protection" and those of 50 and above are graded as: "Unacceptable: requires immediate restoration."

The second grading method using cyanobacteria monitoring data was utilized this year to help fill the gap in freshwater pond data and provide an additional measure of pond health. APCC's Cyanobacteria Monitoring Program uses an EPA-approved protocol developed by the Cyanobacteria Monitoring Collaborative. The protocol utilizes a combination of field observations, microscopy, and fluorometry to analyze samples from freshwater lakes and ponds for cyanobacteria. To interpret cyanobacteria monitoring data, APCC developed a new cyanobacteria grading system utilizing "Low," "Moderate", and "High" tiers (where High represents levels where pets and humans are advised to avoid contact with pond water). The new cyanobacteria grading system was applied to grade ponds monitored in 2019 by APCC and by town officials. If a town posted a cyanobacteria advisory in 2019, that pond was placed in the same category as those ponds in APCC's "High" tier. Similarly, ponds monitored by town officials that never required the posting of an advisory for cyanobacteria in 2019 were placed in the same category as those that only reached the "Low" or "Moderate" tier in APCC's Cyanobacteria Monitoring Program.

Beginning in 2020, APCC's pond grading system was revised to include both the Carlson Trophic Index grades and cyanobacteria data:

1. Carlson Trophic Index scores and grades for ponds were calculated only for ponds where more recent water quality data from 2015 on were available, and where at least three years of data were available.
2. Cyanobacteria monitoring data from 2019 were used to grade ponds using APCC's tiered cyanobacteria system described above:
   a. Ponds with "High" cyanobacteria levels were graded as "Unacceptable: requires immediate restoration";
   b. Ponds with "Low" or "Moderate" cyanobacteria levels were graded as "Acceptable: requires ongoing protection."
3. If a pond had both Carlson Trophic Index grades and cyanobacteria grades:
   a. The pond was graded as "Acceptable: requires ongoing protection" only if both grades were Acceptable;
   b. Conversely, a pond was graded as "Unacceptable: requires immediate restoration" if at least one of the grades was Unacceptable.
4. If a pond had only one grade (i.e., Carlson Trophic Index grade or cyanobacteria grade), that grade was used as the overall pond grade.

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DIGITAL MEDIA COMMUNICATIONS: CHANGES FOR THE IPA

Earlier this year, the IPA Board of Directors established a sub-committee to review our website, social media options, and how we should communicate with our members and the local community in the future. Based on the recommendations of that sub-committee, the Board has agreed to implement several new initiatives including offering receipt of quarterly newsletters via e-mail, online membership registration, collection of annual dues, and the launching of an official Facebook page.

NEWSLETTER OPTIONS

The IPA quarterly newsletter is currently available both as a black and white paper copy sent in the mail and as a color version that can be accessed online on our website (https://www.indianponds.org/). The paper copy will continue to be mailed to everyone on our mailing list (currently in excess of 650 recipients). However, anyone wishing to go "paperless" will be able to sign up by providing their name, mailing address, and e-mail address to the IPA, with specific details to follow on Facebook and in the winter newsletter.

"LIKE US" OR "FOLLOW US" ON FACEBOOK

We believe setting up and maintaining a social media page in the current age of real-time digital communication has become a necessity that will facilitate increased and beneficial interactions with our members, friends, associates, and other interested parties. We view a Facebook page as a logical step in extending our reach within the community as we pursue our mission to preserve and protect the natural environment and ecological systems of the Indian Ponds and watershed not only for the benefit of the residents who live in proximity to the ponds, but also for our many visitors from on and off the Cape. We continue to appreciate the support of our members and friends, and we look forward to your participation in providing feedback, articles, photographs, and conversations to make our Facebook page a truly active and interesting community page, so please check it out and "LIKE" us on Facebook @**Indian Ponds Association** and "FOLLOW" us if you want updates in your Newsfeed.

WEBSITE

During the summer and with the generous help of Associate Director and webmaster Wendy Bierwirth, our IPA website was updated to a new platform which, if you have not already done so, you should view at https://www.indianponds.org/). The website includes our mission statement, contacts, current water quality reports, newsletters, links to other sites of interest, and an archive of pond studies and educational materials. You can download and print copies of current and past newsletters, membership registration forms, register to receive the newsletter by e-mail, and, starting in January, you will be able to make annual dues and donation payments online as well.

As an alternative to Facebook, you can also receive IPA updates by completing the subscribe form on the website or becoming a member of the blog.

ONLINE REGISTRATION AND PAYMENT OF ANNUAL DUES

Beginning in January, members will be able to register and renew their annual membership, pay their annual dues, and donate to the scholarship and ponds funds online by competing the online registration form available on the website https://www.indianponds.org/). All payments will be made through secure online payment processors such as PayPal or Zelle. The IPA will not receive nor store members' credit card or financial information. Members wishing to pay their annual dues by mail will be able to download and print the registration form from the website and mail it to the address on the form. For the foreseeable future, we will continue including remittance envelopes with the winter newsletter for those wishing to continue paying their dues and contributions in that way.

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A WORLD OF NUTHATCHES

There are about twenty-eight different nuthatches in the world. There are four different types here in the United States, but only two on Cape Cod. We have the red-breasted and white-breasted nuthatch. I have both at my feeders every day, and I am sure that those of you who have feeders out have them too. I also have one other on my life list, the pygmy that I got in Colorado when we were out there for Claire's work.

The nuthatches belong to a genus of small passerine birds that are characterized by large heads, short tails, and powerful bills and feet. Their most endearing feature is the way they walk down tree trunks, head-first. Often they will be in the feeder "upside-down". Most of the species have grey or bluish upper parts, the tops of their heads, back and wings, and a black eye stripe. The sexes look similar, but may differ in the under part coloration. They vary in size from the giant nuthatch, at about 7.5 inches, to the small brown-headed nuthatch and the pygmy nuthatch, around 3.9 inches.

White-Breasted Nuthatch

Most nuthatches breed in the temperate woodlands of the Northern Hemisphere, although two species have adapted to rocky habitats in the warmer regions of Eurasia. The greatest diversity is in southern Asia. All members of this family nest in holes or crevices. Most are non-migratory and live in their habitat year-round; however, the North American red-breasted nuthatch prefers warmer climes during the winter and shows up on the Cape usually in late September.

Red-Breasted Nuthatch

Nuthatches are omnivorous and eat mostly insects, nuts, and seeds. They are also frequent visitors to the suet I put out for the birds. They have been known to wedge large food items in a crevice and then work on the food until it is all devoured.

Nuthatches are very vocal, using an assortment of calls and whistles. Their breeding songs tend to be simple and often identical to their contact calls, but longer in duration. The red-breasted nuthatch, which coexists with the black-capped chickadee throughout much of its range, is able to understand the chickadee's calls. The chickadee has subtle call variations that communicate information about the size and risk of potential predators. Many birds recognize the simple alarm calls, but the red-breasted nuthatch is able to interpret the chickadee's detailed variations and respond appropriately.

All in all, the nuthatch is fun to watch as well as being relatively intelligent.

Dave Reid

POND TESTING OVERVIEW: 2020

The annual testing of the three Indian Ponds on a roughly bi-weekly basis from May to October has been completed for another year. This year's testing began on May 12, concluded on October 15, and witnessed again the usual transitioning of the ponds through three phases.

The first phase, evident In mid-May, was characterized by nearly constant water temperatures from surface to bottom, at least in Mystic Lake (maximum depth of 48 feet) and Middle Pond (maximum depth of 35 feet), which are shallower than Hamblin Pond (maximum depth of 63 feet), and by dissolved oxygen fairly constant from the surface to the bottom.

The second phase, beginning in late May and continuing through September, showed water temperatures in upper-level waters steadily warming and lower-level waters remaining cool and relatively unchanged, resulting in the formation of a thermocline (only in the deeper Mystic and Hamblin) at a depth of about 6–7 meters (20–22 feet), with dissolved oxygen abundant above the thermocline and steadily declining below and generally absent in the bottom 4–5 meters (13–16 feet). The exception to this pattern is Middle Pond where, because of its shallower depth, wind action continually mixes the entire water column to produce nearly uniform temperature and dissolved oxygen from surface to bottom.

The third phase, apparent by mid-October, is when gradually cooling air temperatures also cool the pond waters. This phase, similar to the first phase, resulted again in nearly constant water temperatures from surface to bottom for Mystic Lake and Middle Pond, while for the deeper Hamblin Pond only down to about 11–12 meters (36–39 feet), below which they remain unchanged throughout the year at about 9°C (48°F). In Mystic and Middle, dissolved oxygen returned to fairly constant levels from surface to bottom, while in Hamblin, dissolved oxygen dropped to minimal levels below 11 meters (36 feet).

Surface water temperatures, always of interest to those who use the ponds for swimming or other activities, were 12.3 and 12.4°C (54°F) in Mystic and Middle, respectively, on the first day of testing (May 12). The peak temperature measured in all three ponds was 27.8°C (82.2°F) in Hamblin Pond on August 4. This is the highest temperature recorded on any testing date for the three ponds in recent years.

Pond testing, as in previous years, consisted of measurements of dissolved oxygen and temperature at 1-meter intervals from the surface to the bottom, and water clarity as determined using a Secchi disk. In addition to this routine testing, the IPA also participated in the annual Pond and Lake Stewardship (PALS) program. This year, the IPA's PALS testing took place on September 2 in all three ponds. In addition to the above-mentioned measurements, water samples were collected at various depths for analysis of nitrogen, phosphorus, alkalinity, chlorophyll *a*, and pH at UMass Dartmouth's SMAST laboratory.

Pond condition is most easily and quickly measured using a Secchi disk. Water clarity is influenced by suspended or dissolved material in the water column generally due to phytoplankton (algae). Of the three ponds, Hamblin Pond consistently had the best clarity, with an average reading of 5.8 meters (19.0 feet), Middle Pond averaged 4.5 meters (14.8 feet), and Mystic Lake had the worst clarity, averaging only 3.4 meters (11.2 feet).

Because of the COVID-19 pandemic and resulting social distancing requirements, volunteer involvement in our pond testing this year was restricted compared to previous years. Bob Derderian again, as he has done in previous years, single-handedly did all of the Hamblin Pond testing. Emory Anderson, assisted by his wife Geri and their granddaughters Elisabet and Kristina Norgard, handled all of the testing on Mystic Lake and Middle Pond.

Emory D. Anderson, PhD

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GO TO THE IPA WEBSITE: www.indian-ponds.org

CYANOBACTERIA MONITORING RESULTS

(Continued from page 2)

The reason for the early fall bloom in Mystic Lake may be due to the sudden rise of phosphorus levels associated with Mystic Lake's "fall turnover", a natural process involving the seasonal warming and cooling of the lake's waters. During summer, Mystic Lake thermally stratifies, with warm water on the surface and the coldest water at the bottom. During summer, phosphorus is released from the sediments and circulates in the coldest water near the bottom. However, this phosphorus does not initially contribute to significant algae production because it is locked in the cold water near the bottom. But, during fall turnover, water temperatures cool, the lake's steep temperature gradient disintegrates, and the wind is able to help circulate and mix the lake's water. At that time, the phosphorus-laden deep water mixes with the surface waters and some of its phosphorus probably becomes available for cyanobacteria production. Continued monitoring will help determine whether this early fall spike in cyanobacteria in Mystic Lake is a regular phenomenon. It will also help us to better understand and potentially predict the occurrence of cyanobacteria blooms in our ponds.

Bill Hearn, PhD

DIGITAL MEDIA COMMUNICATIONS

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UNACCEPTABLE CONTENT AND DATA SECURITY

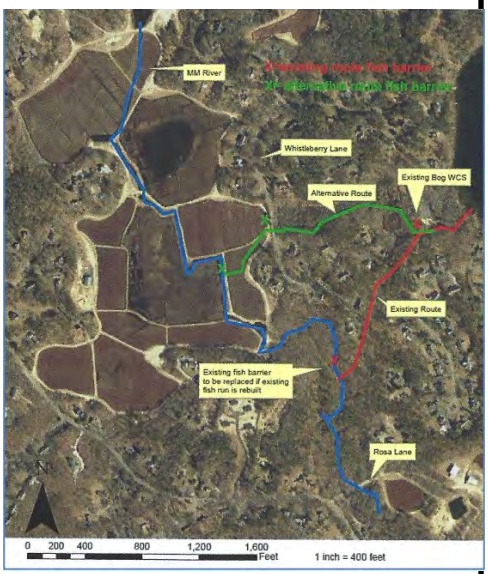
Concurrent with the launch of our new website and the Board's decision to move forward with a Facebook page and online registration and payment options, the Board also adopted guidelines for acceptable and unacceptable content on the website and social media page and guidelines for the handling and storage of members' personally identifiable data. The Board welcomes and encourages the posting of interesting and relevant articles and photographs of the ponds and the local community and believes it should keep its members and other interested parties informed on what it considers unacceptable content on its website and Facebook page. The guidelines, which will be available on the website and in future newsletters, are primarily focused on avoiding subjects considered inappropriate for the IPA and include, but are not limited to, topics such as political statements or beliefs, hateful or discriminatory comments, offensive or violent language, commercial solicitations, and explicit sexual content. The data security guidelines affirm the Board's position regarding the confidentiality of members' personally identifiable information, that it will only use that information to promote Association activities, and that it does not and will not sell or share that information with any other party.

Peter Atkinson

LATEST ON MIDDLE POND HERRING RUN RECONSTRUCTION

The Natural Resources Conservation Service (NRCS) has committed to funding a portion of the construction of the replacement of the Middle Pond fishway. Final approval and review by NRCS is required as part of this funding agreement. NRCS approached the Town about performing a route alternatives analysis to determine if the existing route should be maintained/rebuilt, or if a route through the cranberry bogs should be considered, which would more closely replicate what is understood to be the historic migratory route prior to the construction of the current fishway. The Town agreed to perform this study, and the analysis is currently on-going, with results expected later this year. The map depicts the existing route from Middle Pond to the Marstons Mills River and the alternative route being investigated.

Once the evaluation is further along and the impacts of the alternative route and the visualization of a potential design of the route have been properly vetted, the Whistleberry neighborhood, especially homeowners whose properties abut the alternate route, and well as other interested individuals and groups, such as the Indian Ponds Association, would be engaged to solicit their views. This is probably months away at this point.



Griffin Beaudoin, P.E.
Town Engineer

STATE OF THE WATERS 2020

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Summary for freshwater ponds and lakes

For ponds, the percentage (42%) of Unacceptable ponds increased from 39% in 2019. The number (54) and percentage (58%) of ponds that are Acceptable decreased from 2019, when 91, or 61%, of the ponds were Acceptable. Ponds this year were graded using a combination of Carlson Trophic Index grades based on water quality data in addition to cyanobacteria grades based on cyanobacteria monitoring data from 2019. Carlson Trophic Index grades were based on new, more stringent criteria for utilizing pond water quality data; i.e., datasets utilized must include at least three years of data collected no earlier than 2015. Only 29 ponds met these criteria. The Cape has 996 freshwater ponds. The fact that only 29 ponds have sufficient newer data represents a huge data gap that needs to be addressed if ponds are to be restored and protected, based on data reflecting current and recent conditions. Cyanobacteria grades were added to provide another measure of nutrient enrichment and to address a huge gap in pond water quality data. Ponds continue to show the impacts of nutrient loading, whether they are graded using the Carlson Trophic Index or cyanobacteria.

Status of the Indian Ponds

The three Indian Ponds were graded as follows: Hamblin Pond (Acceptable: requires ongoing protection), Middle Pond (Unacceptable: requires immediate restoration), and Mystic Lake (Acceptable: requires ongoing protection). Last year's report had graded both Hamblin and Middle as Acceptable, but Mystic as Unacceptable. The reason Middle Pond was graded as Unacceptable in this year's report is because of the cyanobacteria monitoring data for 2019 which showed two high levels observed on June 25 and August 25, the latter which resulted in a two-week Pet Advisory being posting by the Town of Barnstable. Based on the new grading system employed, this Pet Advisory placed Middle Pond in the High cyanobacteria category and also triggered an overall grade of Unacceptable.

In examining the Excel spreadsheet available on the above-mentioned APCC website, which lists the datasets used in grading the Cape's freshwater ponds and lakes, it appears that only the 2019 cyanobacteria data were used to grade the three Indian Ponds. The Carlson Trophic Index was only used, in conjunction with cyanobacteria data, for 29 of the Cape's freshwater ponds and lakes, those being the ones for which the datasets included at least three years of water quality data collected no earlier than 2015. However, it is puzzling why the APCC chose not to use the PALS data collected by the Indian Ponds Association. In last year's APCC report, which was based only on the Carlson Tropic Index analysis of water quality data, PALS data for 2012–2016 were used to evaluate the three Indian Ponds. Such data for 2017 and 2018 were collected by the IPA and should have been available to the APCC for this year's evaluation. APCC has informed the IPA that they did not have the more recent PALS data available at the time of their analysis, but would endeavor to have it in hand so as to be able to use the latest three years of data with the Carlson Trophic Index analysis.

Emory D. Anderson, PhD

"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