Volume 14 Issue 3

October 2021

Friends of Wilson Lake

From Your President, Rob Lively

The message that I feel runs through our Fall Newsletter is that of **interconnectivity** and **interdependence**; the need for our working together as a community, as a lake association, and as individuals.

At the community level we are blessed with the assistance of University of Maine Farmington faculty and students, and in this issue editor Wynn Muller, in the context of discussing lake turnover, features the important work of Professor Julia Daily at the FOWL/UMF Buoy. Community interconnectivity is also reflected in the May 2021 "Environmental Achievement Award" presented to the Town of Wilton and FOWL by the Androscoggin Valley Council of Governments. It is a testament to the cooperation and good work that can come from lake associations working with their local government.

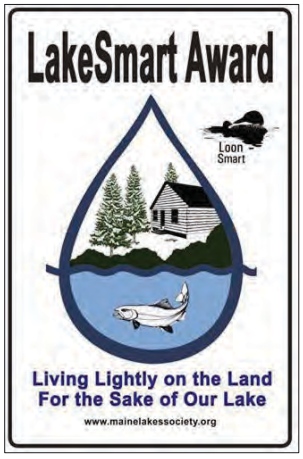
Our report in the 2020 Town of Wilton Annual Report, and the minutes of our virtual Annual Meeting held in July, both reflect the impact of COVID-19, but we as an association were able to continue many aspects of our work. We were very pleased that Wilson Lake and FOWL were featured in the August 2021 issue of Lake Stewards of Maine's "Lakes of Maine." Scott Williams, then Executive Director of the Lake Stewards of Maine, commented on "the remarkably comprehensive vision and process by which FOWL has helped to ensure the future health of this resource."

The importance of our contributions as individuals was highlighted by Roberta Hill of Lake Stewards of Maine, our guest speaker at the July Annual Meeting. She spoke of Climate Change and its impact on Maine Lakes; one example being that we are seeing later ice-in, and earlier ice-out, which means algae has a longer time to grow in the warmer water, growth that can be exacerbated by elevated levels of Phosphorous. She encouraged us to do our part as individuals in combating the effects of climate change. Rob Rogers provides a helpful discussion of Phosphorous levels in Maine lakes in this issue and how it can be addressed by us as individuals; he highlights the work of those volunteers across the state, and those individuals right here in Wilton, who do their part by continually testing and assessing the water quality of our lakes.

Thanks for your continued support of FOWL.

Rob Lively

Inside this Issue:



Visit our Website:
www.friendsofwilsonlake.org

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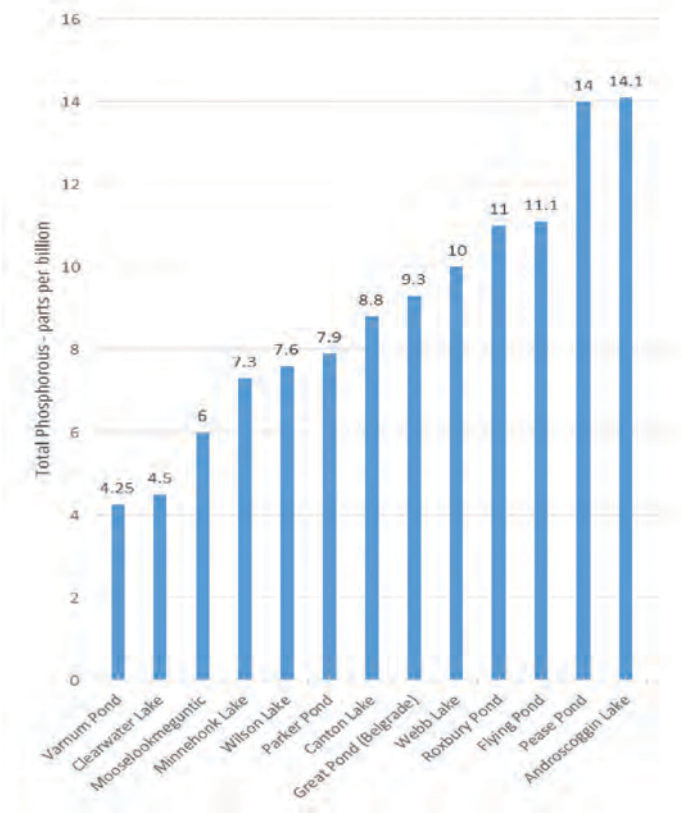
Total Phosphorous — A Sampling of Western Maine Lakes and Ponds

by Rob Rogers, FOWL Board

Lake supporters have heard about phosphorus as a nutrient which impacts water quality for decades now. A look at the data made available on the Lake Stewards of Maine website (lakesofmaine.org) provides some perspective on phosphorus levels in area lakes. Maine is incredibly fortunate to have dedicated individuals and organizations throughout the state who participate in the Volunteer Lake Monitoring Program (VLMP). Maine DEP also performs periodic water quality sampling and analysis on Maine lakes. The DEP data and VLMP measurements have been ongoing since the 1970s and are carefully recorded and catalogued to provide a valuable legacy of water quality data. The Lake Stewards of Maine website makes it easy to access VLMP data for any lake in Maine that participates in the program.



Total phosphorus (TP) is one of several indicators collected in the water quality monitoring program. TP refers to the total organic and inorganic phosphorus found in a water sample. Water samples can be "surface grabs", "bottom grabs" or multiple samples taken at different depths in the top 12 to 20 feet of the water column called an "epilimnetic core" (EC) sample. Total phosphorus test results are reported as micrograms per liter (µg/L) or parts per billion (ppb). One part per billion, is one millionth of a gram in a liter of water.

To the right is a graph of total phosphorus (TP) data for several lakes in our region of Western Maine. The value shown is an average of the epilimnetic core results obtained over the lifespan of the water quality monitoring program up to and including 2018.

There are many variables affecting the productivity of algae in freshwater bodies, but in general, lakes and ponds with phosphorus levels between 10 and 30 ppb are considered "meso-eutrophic"* and the risk of harmful summer algal blooms increases substantially in those conditions. A notable example is East Pond in Somerset County which had phosphorus levels averaging 19 ppb and required an expensive mitigation effort implemented in 2018.

So on balance, Wilson Lake's phosphorus level indicates healthy water quality, but it will always remain important to implement good land-use practices in the watershed to keep it that way. And if you happen to run into one of Maine's veteran water quality volunteers, like Wilton's own Mary Ryan, thank them for their work over the years. We owe our understanding of the "big picture" to dedicated individuals like her.

* Robert G. Wetzel, Limnology, Harcourt Brace College Publishers, 1983.

FOWL Annual Meeting July 18, 2021

by Holly Windle, FOWL Secretary, Zoom meeting

Facilitated by Susan Gallo, Executive Director, Maine Lakes. (There were 49 registrations, and 32 actual links for attendance.)

WELCOME — After Sue Gallo, providing technical facilitation, opened the proceedings, FOWL president Rob Lively welcomed those attending, noting the changes brought by COVID-19: last year's canceled meeting and this year's on-line version. He expressed hope for a gathering in person for the 2022 meeting.

APPROVAL OF MINUTES FROM 2019 ANNUAL MEETING (COVID precluded an Annual Meeting in 2020) Approval moved by Wynn Muller, seconded by Richard Rames, and passed.

TREASURER'S REPORT — Wynn Muller, referring to the 6/30/2021 spreadsheet emailed to attendees, pointed out an anticipated loss of about $1,500 for the year. We generally spend what comes in, he explained, and that loss amount is fairly close to what is expected as a gain for the balance of the year. FOWL has about $24,000 in Certificates of Deposit, and about a year's surplus kept in the checking account.

ELECTION OF OFFICERS AND BOARD MEMBERS — Sandy Muller, representing the nominating committee, which included Barry Hathaway and Justy Nazar, said that FOWL will continue looking for additional people for committees and Board positions. She referred to the emailed document of Board members where those up for election this year are indicated in red ink. She drew attention to new Board nominees Rob Rogers and Olivia Schanck.

Approval of the slate was moved by Holly Windle and seconded by Wynn Muller, and passed.

Rob Lively noted three outgoing Board members—Sharon Rainey, Ken Sawyer, and Lori Lewis—and expressed appreciation for their service.

REPORTS — (The online verbal reports were supplemented by photos and other illustrations.)

Wayne Smith "Lakes and Loons" Program — Rob Lively explained that this educational program for 3rd-graders has been going on since 2006, thanks to a generous yearly donation from the Wayne Smith family. As always, BioDiversity Research Institute of Portland makes the key presentation. This year it was Lucas Savoy, and, because of COVID restrictions, it was an online experience for both 3rd graders and 4th graders, as the program did not take place in 2020. The teacher reported that the students were "glued to their screens."

David Prince Memorial Scholarship — Rob Lively announced that this year's award to a Mt. Blue High School senior went to Tricia Souther Bowering. She will apply the scholarship funds, awarded for her history of community service and winning essay, as she studies nursing at USM. She has a goal of becoming a hospice nurse.

2021 Loon Count — Judy Landry, who has been participating in this tally for 15 years, explained that their boat went out yesterday at the designated time of 7:00 to 7:30 AM to locate loons. This event takes place on the third Saturday in July as part of an official Maine Audubon annual loon count. Wilson Lake's tally was 8 adults and 3 chicks. Rob Lively went along as a spotter.

Courtesy Boat Inspections (CBI) Program — Justy Nazar said that this program, which began in 2003 to check for invasive plants on boats coming in and out of the lake, now also looks for aquatic animals. Each spring, FOWL looks for students, ages 16 or more, to serve as monitors, as well as adult support. This year, there were 5 monitors; they have so far checked 553 boats and found one non-invasive plant. We are trying to keep our lake as clean as we can.

Water Testing — Rob Lively reported that the red buoy out in the lake marks the "deep hole" where an 80-foot line measures temperature and dissolved oxygen at various levels. UMF professors Julia Daley and Rachel Hovel monitor these sensors. In addition, during the summer FOWL does periodic testing by hand of temperature, dissolved oxygen, and phosphorus, as well as taking Secchi disk readings. The testing shows no indication of declining water quality, and *the Fall 2021 FOWL newsletter will have information on the UMF readings*.

Status of the Rock Wall Enhancement — The wall at the foot of the lake is in need of repair or restoration, Rob reported. In addition to that work, the town of Wilton is moving ahead with plans for a walking path along the wall. The landscaping changes will include creating 17 angled parking spaces.

Status of Proposed Wilson Lake Marina — In response to a proposal to the Wilton Planning Board for a 12-slip marina on Stinchcomb Lane adjacent to the public boat launch, FOWL worked with environmental consultant Jen Jespersen to develop a list of water quality concerns. These were submitted to the developer and to the Planning Board. An article in FOWL's May 2021 newsletter gives more information. The Planning Board tabled their review while awaiting approval from the State and Maine's Department of Environmental Protection.

continued next page

Strategic Planning: Shaping the Future of FOWL — Rob Lively explained that, as part of a periodic evaluation of where our organization wants to be in the future, Board members held a series of strategic planning Zoom meetings in late 2020 and early 2021, facilitated by Jen Jespersen. The document produced from these sessions is available on the FOWL website and indicates three categories of focus: Board & Membership Development, Public Relations/Outreach, and Lake Science. Rob encouraged people to use the Q&A section at this meeting to indicate their interest in helping with any of these areas.

PRESIDENT'S REPORT — Rob Lively identified as a highlight of the past year the Environmental Achievement Award given to FOWL and the Town of Wilton for the Wilson Lake Watershed Protection Project. This was through the Androscoggin Valley Council of Governments.

Brief Q&A — In response to a question as to whether there had been a loon count at Hill's Pond, Wynn Muller said that, if so, the information should be available on the Audubon website. Rob Lively said that the Lake Stewards of Maine website also has loon count info, noting that our lake is identified as Wilson Pond in the search function.

Guest Speaker: Robert Hill of Lake Stewards of Maine: "Climate Change and Its Impact on Maine Lakes"

Rob Lively introduced the speaker, an aquatic ecologist and environmental educator with Lake Stewards of Maine, an organization now in its 50th year, where she serves as Invasive Species Program Director.

Presentation: Since 1971, Lake Stewards of Maine has engaged citizens to gather and disseminate credible scientific information, Ms. Hill said. Over 1,200 citizen lake scientists have provided information for 50 lakes. Using charts and photographs to illustrate and explain her points, Ms. Hill explained that climate science shows a globally-destructive warming pattern due to human activity. Gas, oil, and coal contribute to CO_2 along with other greenhouse gases.

Here are some of the points she made:

Maine has experienced an approximate increase of 3°F since 1985. Having more days above 95° is projected, along with wetter winters and springs, and drier summers. In general: more frequent extreme weather. Unfortunately, an extended warm season gives more opportunity for algal growth. A wetter spring increases run-off, erosion, and nutrients brought into our lakes. Summer drought compacts the soil and increases those problems.

Warmer water holds less dissolved oxygen and increases the bioavailability of toxins like lead and mercury. This makes consumption of fish more hazardous, particularly to children and pregnant women. Loons also are sensitive to mercury and lead. Unfortunately, the invasive aquatic species will thrive in warmer water. A less harsh winter will encourage ticks, emerald ash borer, and the southern pine beetle. As temperature and nutrients change, Maine's iconic cold-water species (moose, loons, lobster, chickadees, brook trout) will be more at risk.

Ms. Hill urged immediate action to lower our carbon footprint. Lake Stewards of Maine is continuing to study the problem, and Ms. Hill encouraged all of us to "lift the cone of silence on climate change" and talk to our neighbors about the need for action. This could range from the personal (biking, use of LED lights, solar power, more aggressive recycling) to broader community focus on protecting lake buffers or lobbying for legislative changes.

Comments, Q & A — When asked whether the CBI program is helping the issue, Ms. Hill said yes, that it is one level of help, like the LakeSmart program.

Rob Lively noted that this year's April 11 ice-out date was 9 days earlier than our 25-year average.

Rob Lively thanked Roberta for her excellent presentation and Sue Gallo for technical facilitation of the meeting. He also thanked FOWL members for their support and expressed the hope that FOWL would be able to gather next summer in person for the Annual Meeting on July 17, scheduled to be held at the Lions Club meeting hall.

Meeting adjourned at 2:10 pm

Respectfully submitted,
Holly Windle

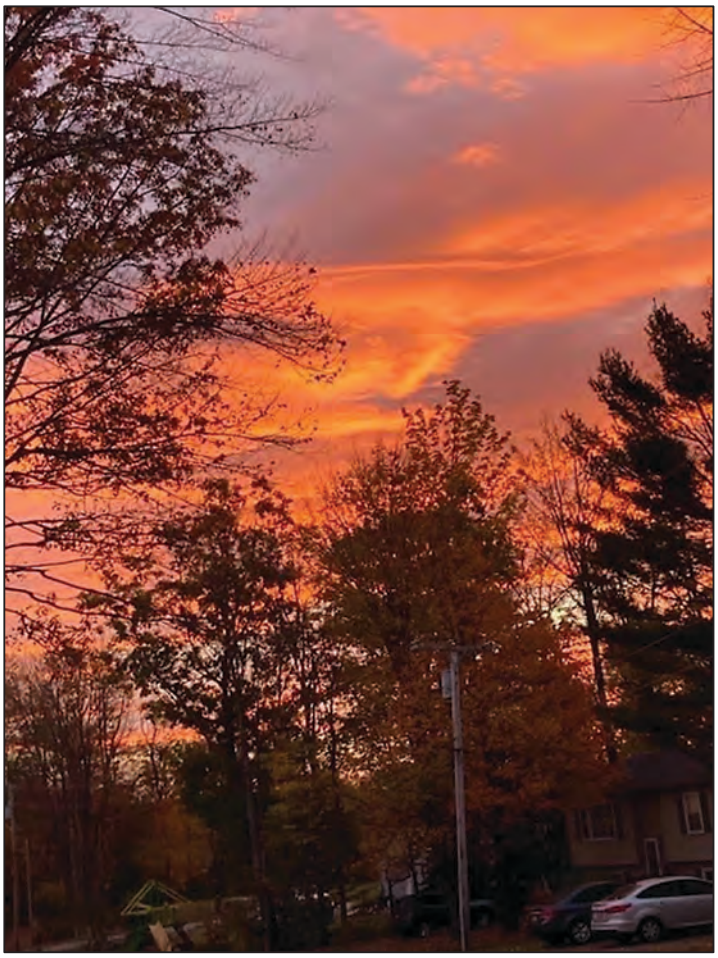


Photo byJusty Nazar

Buoy Data Shows Lake Turnover

by Wynn Muller, charts by Julia Daly

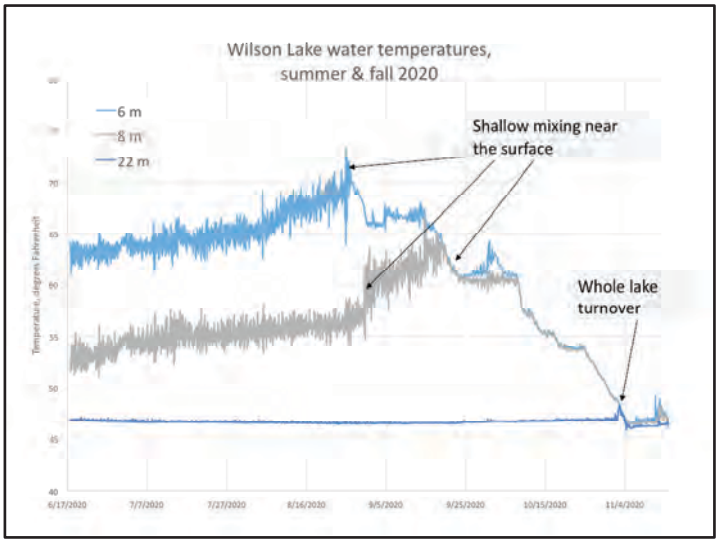
When I was first introduced to lake science, someone mentioned that the lake "turned-over" twice a year. I did not believe it. Cars turn over, so do trains. Governments turn over and so does one's investment portfolio. But lakes, never. How would you lift up the lake to turn it? Would the water not seep between your fingers? This had to be one of those idioms like the "left-handed monkey wrench" I was tasked to obtain from the next tent over at a Boy Scout camp out.

Lake Stratification

I soon learned that I was totally wrong and that lakes do turn over "internally". Here's how it works. The temperature in the lake varies by depth—it is layered or **stratified**. During the summer, the colder temperature water sinks to the bottom while the warmer water stays at the top—and during the warm summer months increases to warm while the bottom temperature remains quite constant. The upper layer (called the **epilimnion**) is that part of the lake where sunlight can penetrate and plants and algae grow. In the lower level (known as the **hypolimnion**) the temperature remains quite constant throughout. The area where these levels meet is known as the thermocline where the temperature changes rapidly. Water testing in Wilson Lake has been done irregularly since 1974 and shows a summer **epilimnion** of about 6-10 meters (increasing over the summer), a **thermocline** from about 10 to 12 meters, leaving a **hypolimnion** of about 10–12 meters in the deepest area of the lake. The sorting out of the lake into these temperature zones is known as stratification and it is common in all deep-water lakes.

Lake Temperature

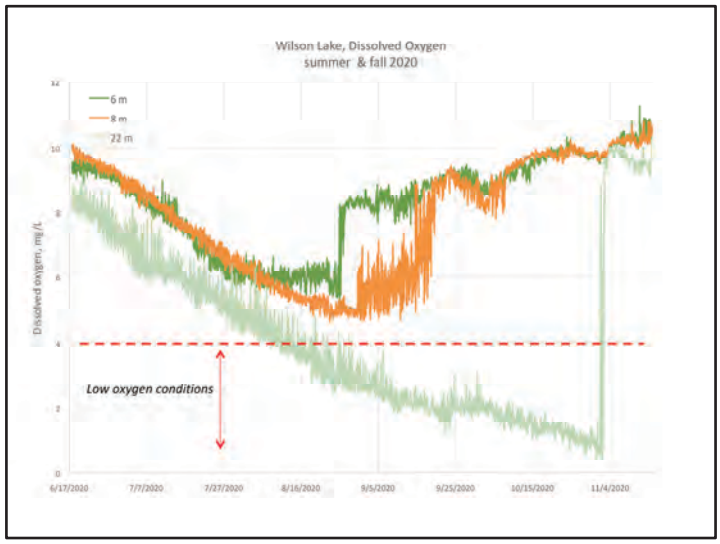
Of all the temperature readings we had historically, only one was in the winter months—March 17, 1975. It shows the surface temperature at 0.8 C, dropping to 2.0 at 3 meters, 2.7 at 18 meters and 3.0 at 21 meters. Notice that here the colder but least dense water is at the top of the lake. As water cools, it becomes denser until about 4 C; below that, it becomes less dense, then freezes. At the end of the winter, when the ice goes out, the lake is primed for another seasonal turnover as the surface warms up and temperatures in the **hypolimnion** and **epilimnion** are close to each other. The work being done by UMF–FOWL at the orange buoy shows us temperature (and dissolved oxygen) every 30 minutes over the course of the entire year, so we can readily see when the lake turns over. One feature we have learned from this is that sometimes mixing occurs within layers versus a true turnover event, when the lake mixes from surface to bottom. During the late summer, mixing within the **epilimnion** leads to abrupt changes in temperature but the **hypolimnion** remains unchanged. As you can see from the attached **Figure #1** the lake turned over in early November (temperature at the **epilimnion** (top) has become colder than that at the **hypolimnion** (bottom)). This means heavier water at the top will sink to the bottom. Note that this did not occur instantaneously since the difference in temperatures is minimal and it takes a while for the heavier and lighter waters to settle.



Lake Dissolved Oxygen (DO)

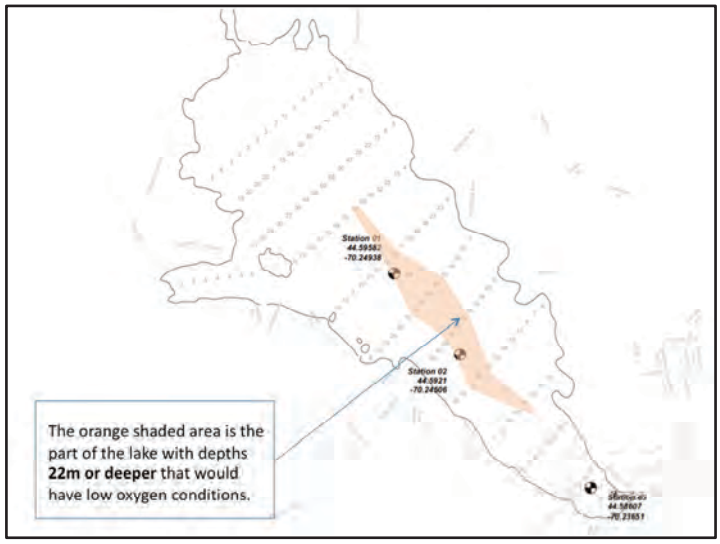
Let's now take a look at the impact on Dissolved Oxygen. Water molecules do contain an oxygen atom (H_2O) but this oxygen is not sufficient for the needs of aquatic organisms living in the water. However, oxygen enters the water from the atmosphere and also from streams that feed the lake where it is actually dissolved in to the water. This dissolved oxygen is breathed by fish and zooplankton and is necessary for them to survive. During the spring and summer photosynthetic activity is driven by high solar radiation and the biological activity creating dissolved oxygen peaks. However, when the lake is stratified, the solar radiation is unable to reach the **hypolimnion** and the DO and the temperature diverge. This is further exacerbated by the need of organisms to respire and consume oxygen. The bottom of the lake, even the entire **hypolimnion** may eventually become **hypoxic** (low in oxygen) or even **anoxic** (devoid of oxygen) driving cold water fish into the more moderate temperatures toward the **thermocline**. Look at **Figure #2** where the readings from the buoy show DO levels at 6 meters (darkest green) toward the lower area of the **epilimnion**, 8 meters (orange) near the **thermocline** and 22 meters (light green) near the bottom of the lake

(**hypolimnion**). You can see the DO throughout the summer is similar throughout the summer months at 6 meters and 8 meters. In the early fall, the water in the top layer (**epilimnion**) begins to mix with the higher levels of the **thermocline** causing the DO to raise rapidly. However, the DO of the water in the **hypolimnion** continues to drop until the whole lake turns in early November.



Cold Water is DO deprived

The **dashed line** in Figure #2 indicates low oxygen (hypoxic) readings, below a DO level of 4 mg/l, since that may be a concern for aquatic life. The cold-water fish, trout and salmon, would need to move up out of the cold temperature they prefer and toward the **thermocline** to obtain sufficient oxygen to survive. **Figure #3** shows the area of the lake where the depth is 22 meters (72 feet) or greater. Note the buoy is located near Station #1 although it does get moved each year by the ice going out in the spring. This is that cold water area where trout and salmon generally live.



Charts by Julia Daly, UMF

Photo byJusty Nazar

Current Status of the Wilson Lake Marina

by Wynn Muller

On March 11, 2021 James Butler and Ashley Rand as principals of Wilson Lake Marina, LLP, submitted an application to the Wilton Planning Board to operate a private marina with 12 boat slips at 10 Rowell Street. Since the property at 10 Rowell Street is zoned residential and this was a proposed use as commercial the application was deliberated over the summer. The zoning regulations had no provision for a commercial "marina" within this residential zoned property.

The Planning Board created two new ordinances to their zoning regulations which addressed this issue and these were approved by the Town Meeting on June 14th. The first or these stipulated conditions under which a commercial marina could be approved within a residential zone. The second merely corrected the Wilton Zoning laws to agree with those of the State of Maine which take precedence in areas of conflict. Many citizens felt that by their vote at the town meeting the marina was being denied. Such was not the case. The Town Meeting did not have the authority to approve or deny this application. That was up to the Planning Board.

The Planning Board did a site walk and held a public hearing on June 17th before meeting on August 26 to vote to deny the application subject to drafting of a formal vote to be reviewed and approved on September 16th. The minutes of the September meeting reflect under item #6 that the Planning Board voted to accept the denial of the WLM by a vote of 5 to 0, with 2 abstentions who had recused themselves for the 8/26/21 meeting. This vote was based upon a 7 page "finding of facts" and "conclusions" sent to the applicant on September 16, 2021.

As this is being written, the applicant on 9/24/21 has filed to have an Administrative Appeal by the Board of Appeals. This is scheduled for 11/10/21 at 6:00 pm.

Photo by Pam Harnden of SunMediaGroup

Wilton Annual Report

by Rob Lively

If you read the Annual Town Reports, you know that Rob Lively enters a report for FOWL each year with a summary or our activities and accomplishments. In the event that not all have read the annual report, we are enclosing a copy of that report for FOWL below. It was written by Rob in February 2021 for inclusion in the Town Annual Report.

Friends of Wilson Lake (FOWL)

To the Citizens of Wilton,

As for all of us, 2020 was a challenging year for FOWL. While we were able to continue some of our work, COVID-19 did impact many of our activities: we were unable to offer the Wayne Smith Lakes and Loons Awareness Program to all third graders at Academy Hill School; we postponed our 2020 Annual Meeting until July 18, 2021; we were unable to provide free boat rides at the cancelled Blueberry Festival and the cancelled Chamber of Commerce BBQ; and our LakeSmart and LoonSmart programs were put on hold.

However, there were also many positives. Membership was at 301. We had an additional 26 business partners, of which 9 were sponsors of a week or two of Courtesy Boat Inspections.

During the year, we…

- celebrated our 31st Anniversary;
- regularly monitored the water quality of Wilson Lake;
- monitored for dissolved oxygen and water temperature year-round at the buoy at the "deep hole" of the lake;
- worked with two UMF professors who conducted research at the buoy;
- sponsored the Courtesy Boat Inspection (CBI) program where we inspected a record 1065 boats. No invasive plants were found. This topped last year's record of 983, and all 15 weeks were sponsored by local businesses;
- Olivia Schanck was named the winner of the David Prince Memorial Scholarship for post-secondary education;
- Under the capable facilitation of Jen Jespersen of Ecological Instincts, FOWL began a Strategic Planning Process that began in the Fall and extended into the Winter. We considered: 1) where do we want FOWL to be in the next 3-5 years?; and 2) how do we get there from here?
  Top priorities include:
  1) Board & Membership Development;
  2) Public Relations/Outreach; and
  3) Lake Science.

Thank you for your continued support of FOWL.

Respectfully submitted,
Rob Lively, President — FOWL

Visit our Website:
www.friendsofwilsonlake.org

Wilson Lake is a treasured resource in the community of Wilton, Maine.

We aim to protect the lake, its watershed, plants, and wildlife, but we cannot achieve our goals alone. Find out how you can help.

Photographs by Susan Atwood and Tony Nazar.

Come and dig into our website. Here you can learn facts about Wilson Lake, review the Maine Boaters Safety guide, review the 2016 Watershed Survey report, view and link to our corporate members, and so much more!

Environmental Achievement Award

by Rob Lively

The Town of Wilton and the Friends of Wilson Lake (FOWL) recently were honored with an "Environmental Achievement Award" from the Androscoggin Valley Council of Governments. With the Town, FOWL did a Watershed Survey in 2016, completed a Watershed Based Protection Plan in 2017, and received a 2018–2019 federal grant ($69,696) under the Clean Water Act 319 Nonpoint Source Management Program to target runoff, support public and schoolchildren education programs, and provide LakeSmart evaluations and certifications. We very much appreciate the award and feel it is a testament to the cooperation and good work that can come from local associations working with their local government.

FOWL
PO Box 560
Wilton, Maine 04294