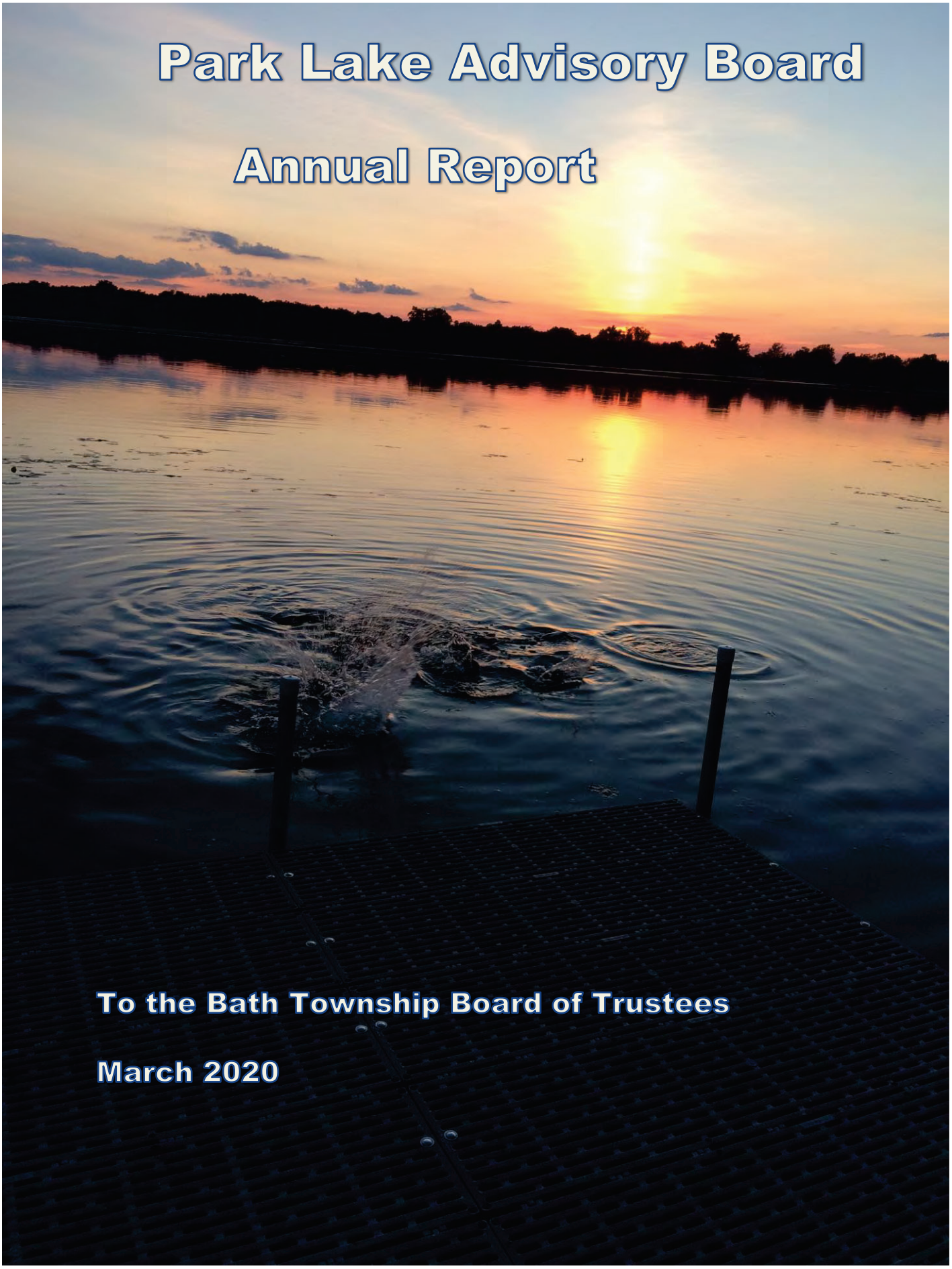
Park Lake Advisory Board

Annual Report



To the Bath Township Board of Trustees

March 2020

Table of Contents

Introduction

The Park Lake Improvement League actively pursued the care of Park Lake during the 1940's, 1950's and 1960's, operating under the guidance of the Bath Township Board of Trustees. Many projects were successfully undertaken, the most important of which was the excavation of the canals around Oak Island, the construction of dikes and a water control device, occurring in 1947. The Clinton County Court first set the lake level at 846.25 feet above sea level on December 4, 1947; the level was later recommended to 845 feet above sea level by the Michigan Conservation Department. During 2012, the Clinton County Drain Commissioner petitioned the Clinton County Circuit court to reinstate the legal lake level at 845.2 feet above sea level (NAVD88 datum; note that previous lake levels were based on earlier surveying standards, so don't exactly match the reference points currently used), and the Court rendered a judgment in agreement. Subsequent to that judgment, a new lake level control structure was installed and became operational in July of 2014.

The Park Lake Advisory Board (PLAB) was formally established in December of 2003 with membership by appointment of the Township Supervisor. The Park Lake Advisory Board operates using a set procedure that includes regularly scheduled meetings, a standard agenda and published minutes. Regular meetings are scheduled for the third Wednesday of each month and are held in the Township Hall. The PLAB has established a mission statement with supporting goals, and a vision statement outlining the philosophy under which the PLAB operates. The board maintains an Action Item list to clearly identify upcoming tasks as well as the advisory board member(s) responsible for updates. This list is reviewed monthly to ensure that progress on important activities is completed in a timely fashion. The board has also developed a Future Item list to provide guidance on issues that are important, but that the Board cannot or feels should not be acted upon in the near term. An Annual Report is submitted to the Township Board of Trustees.

Executive Summary

The mission of the Park Lake Advisory Board is to advise the township on how best to preserve the natural integrity of Park Lake and the surrounding area to benefit the people and wildlife using the lake. Our vision is that we will apply modern conservation techniques to the entire watershed/ecosystem in order to improve environmental conditions, wildlife habitat and recreational resources. Some of the major accomplishments during the past several years include:

- Continued to monitor the lake level with respect to the optimal operation of the water control structure. The lake level has been maintained 1 to 2 feet higher than it had been prior to installation of the water control structure, resulting in increased lake area as well as lake depth. Both of these changes have increased the utility of the lake for boating, fishing, lake aesthetics, and has increased habitat for fish and wildlife.

- The board continued to monitor the weed problem on Park Lake. The lake has been treated to varying degrees and with different herbicides for the past several years, leading to substantial variation in the amount of weed cover each year. A study was conducted by Jennifer Jermalowicz-Jones of Restorative Lake Sciences to evaluate the lake and recommend actions to combat weeds and excessive organic sediments in the lake. Based on her recommendations and discussion by the board with Steve Hanson of Professional Lake and Land Management, the lake was treated with ProcellaCOR ®, a new herbicide treatment approach in 2019. Preliminary results of this treatment are promising, with the plant survey of the lake showing near elimination of Eurasian water milfoil by August.

- Collaborated with the Parks and Recreation Committee to develop a draft plan for the Park Lake Preserve to enhance recreational opportunities around the lake. This proposal was submitted to the Board of Trustees in 2019, but was not recommended for funding.

- The Park Lake Advisory Board engaged in a number of educational and outreach activities, helping citizens of Bath Township better understand the lake and its management

The minutes of our meetings are available on the township website. The board reviews action and future items monthly, and within this report, we provide a copy of the initial action/future item lists for January 2019 and the final lists for January 2020 to provide insight into activities that took place over the course of 2019.

Proposed Goals and Objectives for Park Lake Management

Primary goals

To maximize the recreational and quality of life benefits that Park Lake provides to lakeshore and township residents, as well as the general public, while maintaining the lake's ability to support a diversity of wildlife and plants. To work with Friends of Park Lake and other groups to inform, educate, and involve the public toward the betterment of the lake, and to instill a sense of community with Park Lake at its core.

Brief background relevant to goals

There are approximately 120 lakeshore properties in addition to township and county lands that make up about 50% of the lakeshore. The lake provides opportunities for swimming, boating, fishing, and hunting in addition to the aesthetic qualities of the lake. Use of the lake by various user groups contributes to the economy of the township in addition to the increased property values for lakeshore owners. The primary impairments to these benefits include (1) excessive weed growth; (2) accumulation of organic sediments; and (3) lack of a water control structure to maintain water depth. The lake hosts a wide variety of plants and wildlife, and the natural habitats provided on township property helps greatly to maintain this biodiversity.

Vision statement

The vision for Park Lake is to maximize the recreational and quality of life benefits that the lake provides to lakeshore and township residents, as well as the general public, while maintaining the lake's ability to support a diversity of wildlife and plants. To work with Friends of Park Lake and other groups to inform, educate, and involve the public toward the betterment of the lake, and to instill a sense of community with Park Lake at its core. The management of the lake will take an ecologically sound approach to rehabilitate the lake from the deleterious effects of human-caused eutrophication in order to enhance the use of the lake.

Impediments

Although all lakes naturally fill in over time, Park Lake has suffered from human impacts that have greatly accelerated these natural processes. Because of this, many of the beneficial uses of the lake (e.g., boating, swimming, fishing, hunting, scenic beauty) have been impaired by excessive plant growth and sedimentation of the lake. In addition to this, invasive plants such as Eurasian watermilfoil, starry stonewort, purple loosestrife, and Phragmites threaten both human uses as well as the ecological health of the lake and the surrounding riparian zone. The following objectives are intended to address these impediments and rehabilitate the lake.

Background and Objectives

Boating

Park Lake has a public boat launch maintained by the township, providing free access to the lake for lakeshore residents, township residents, as well as the general public. The boat launch does not have a boat wash station, and it has been observed that boats arriving and departing Park Lake sometimes carry invasive weeds. Many private residences have boat docks, but variation in water level sometimes limits the size of boats that can be launched or docked on the lake. Excessive weed growth also limits areas of the lake accessible to motor boats, and in some areas, even limits accessibility to canoes and kayaks. The shallow nature and modest size of Park Lake make it generally unsuitable as an "all sports lake", and our qualitative observations suggest that canoe and kayak use of the lake have increased substantially without apparent conflicts with fishing boats.

a. Maintain boat launch for "small" watercraft by keeping suitable water depth via lake level control structure, dredging in the area (if necessary), and reducing weed abundance near the boat launch so as to not be an impediment.

b. Reduce weed abundance along the inhabited shoreline to provide lakeshore owners the ability to access the lake by boat.

c. Maintain overall weed levels to a point where boating is feasible (during normal water levels) for the majority (i.e., >50%) of the lake.

d. Advertise Park Lake as a desirable destination for canoeing and kayaking (e.g., at the Quiet Water Symposium).

e. Monitor boat usage, and if problems appear, draft an ordinance (as allowed by DNR) to limit boat speed or horsepower in order to promote safe use of the lake by all users. Work with the Township, Sheriff and DNR to encourage enforcement of existing regulations.

f. Collaborate with Friends of Park Lake to explore the feasibility of installing a boat wash station to minimize transfer of invasive species into and out of Park Lake

Fishing

Park Lake supports a diverse warm-water fishery, with anglers targeting bluegill, pumpkinseed, black crappie, largemouth bass, northern pike, yellow perch, and channel catfish. Discussions with anglers suggest that catch rates are modest, as is the size structure of the catch. Anecdotal information indicates that some competitive anglers use Park Lake for "practice fishing" for largemouth bass, and in recent years the township has hosted an ice-fishing derby. Fish populations in the lake are all self-sustaining, with the exception of channel catfish which are stocked every other year by the Michigan DNR. The most recent stocking was on June 28, 2017 when 3,700 juvenile channel catfish averaging 5.35 inches in length were stocked. Common carp occur in the lake, but do not appear to be causing any

problems with water quality or with the fishery for other species, and in fact have recently supported a bow fishery. In 2010 the township installed a fishing dock near the public beach to provide access for anglers without boats. This dock is used extensively, providing a substantial benefit to anglers without boat access.

a. Direct fishery management actions are outside of the purview of the township, but we support the continued stocking of channel catfish to provide a fishery, as well as the benefits they provide in maintaining the size-structure of panfish.

b. Maintain spawning habitat quality; avoid potential impediments to fish reproduction such as applying weed treatments directly on spawning grounds or manipulating water levels during spawning periods.

c. Work with the Park and Recreation department to maximize the benefits accruing from the fishing dock maintained by the township.

Swimming

Park Lake has a public swimming beach maintained by the township. Access to the beach is free, but no lifeguards are present, and the public is allowed to swim at their own risk. The water by the beach is not regularly tested for coliform bacteria or other indicators of water quality impairment with regards to swimming. The beach is sand, but the shoreline sometimes has problems with excessive goose excrement. The swimming area is relatively narrow, and is being encroached by weed growth and organic sediment deposition. The remainder of the lake is generally too weedy and soft-bottomed to provide a high-quality swimming experience.

a. Minimize weed growth in the vicinity of the beach to maintain the quality of the swimming area. Continue to import sand as needed to maintain the beach.

b. Determine if it is possible and cost-effective to extend the depth of the sand bottomed beach area to reach a depth of at least 4.5 feet (under normal lake levels).

c. Deter waterfowl use of the beach area to the point where the beach quality is acceptable to most beach users.

d. Test water on an annual basis for coliform bacteria or other indicators of the suitability of lake water for swimming.

Lake aesthetic quality

The natural habitats present along the south and much of the western shoreline provides a highly desirable lake experience for many lakeshore owners. However, excessive plant growth in some areas limits the visual appeal and accessibility of the lake for some owners. Water clarity in the lake currently averages approximately 10 feet as measured by a Secchi disk. This level of water clarity is generally viewed as being of high quality for lakes in this

region. The soft-textured organic sediments that are prevalent along much of the shoreline diminish the aesthetic quality of the lake. In 2018, Jennifer Jermalowicz-Jones of Restorative Lake Sciences will conduct a study to determine the feasibility of using aeration to combat this problem.

The lake level control structure that was installed in 2014 has increased the average lake level by 1 to 2 feet for much of the year, and has expanded the area of the lake. Some lakefront property owners are temporarily experiencing problems with erosion due to the water level returning to a height that it has not been at for many years, but was historically. We anticipate that this erosion will diminish as the lakeshore plants adjust to the higher water level and develop new root systems. We also anticipate that some of the excessive growth of cattail and swamp loosestrife (*Decodon verticillatus*, also known as whorled loosestrife or waterwillow) along the shoreline will be inundated, leading to an improvement in the view from the lakeshore.

a. Continue to monitor water levels in the lake to determine if the lake water control structure is holding water levels as desired.

b. Maintain natural shoreline along township and county-owned property.

c. Cooperate with the Parks and Recreation Committee to develop plans for Park Lake Preserve.

d. Management of weed abundance to allow for boating will likely maintain aesthetic quality; explore alternative weed control methods.

e. Maintain water clarity to average between 6 and 12 feet Secchi disk measurement. Monitoring of water clarity via Secchi disk, and monitoring water phosphorus (which is the major nutrient driving algae growth) is encouraged.

f. Sample lake sediments to determine if contaminants in the sediment are at levels that would impair the biological functioning of Park Lake, or if the sediments are contaminated at a level that would forestall dredging options.

g. Explore methods for conversion or removal of excessive organic near-shore organic sediments to a more sand or gravel texture.

h. Reduce cattail density along township land to improve “viewscape” provided by the lake.

Plant diversity

The shoreline of Park Lake is currently dominated by native plant species, such as cattails, swamp loosestrife, and arrow arum among others. There are also riparian wetlands that contain species such as sundew, pitcher plant, ferns and mosses. Mixed in with these native species are a number of non-native plants, with purple loosestrife and common reed (Phragmites) having a high potential for being invasive. Within the lake itself, sampling in over time indicates that over 90% of the lake less than 10 feet deep has aquatic plant growth. Although many of the dominant species are native plants (e.g., *Chara*, pondweeds, water lilies), there is also a preponderance of non-native plants (e.g., Eurasian watermilfoil, starry stonewort). Of particular concern is the rapid expansion of starry stonewort. Prevalence of starry stonewort increased from 2% of sites in 2012 to 26% of sites in 2013. Since then, starry stonewort has been found at 60 to 85% of sites sampled.

Results of plant sampling for 2019 are presented in Appendix D. In 2019, prevalence of starry stonewort remained high, being found at 62% of sites sampled. Despite the wide extent of starry stonewort distribution, growth tended to be lower in the water column, and as such, did not present as much of an impediment to boating as in previous years.

Eurasian water milfoil was reduced to low abundance in 2016 following a whole-lake treatment with floridone. It's occurrence increased to 15% of sites in 2017, and had rebounded to 49% of sites in 2018, demonstrating the ability of this species to rapidly recolonize areas previously cleared with herbicide. In 2019, no Eurasian water milfoil was found following treatment with ProcellaCOR ®. The prevalence of native plants such as pond weeds (*Potamogeton* and *Najas*) and native milfoil remained at similar levels as seen in 2018.

Reports from lake users indicate that the increase in the invasive plant growth is causing a problem for beneficial lake uses such as boating, swimming and fishing. The rapid expansion of starry stonewort in the lake is particularly worrisome, and will require continued monitoring. This invasive species has the potential in some lakes, but not all, to create dense beds extending from 8 feet or more in depth to the water surface, essentially choking out all beneficial plants and impeding boating and fishing. Unfortunately there is not presently a cost-effective way of treating large-scale infestations of this species.

Objectives for the aquatic plant community include:

a. Maintain a balance of areas where plant growth is suppressed to allow for human uses with areas where native plant growth is unimpeded. Initial targets for this balance are to have a minimum of 50% of the lake where boating can be conducted unimpeded during normal water levels.

b. Continue monitoring plant distribution, focusing on potentially problematic species, particularly *Phragmites*, Eurasian watermilfoil, starry stonewort, and purple loosestrife.

c. Work with Friends of Park Lake to raise public awareness of invasive plant species, and benefits of native plant species.

Wildlife diversity
Park Lake supports a diverse fish community, with at least 19 species of fish caught in sampling conducted from 2011 through 2019 by students from MSU (Appendix H). Bird usage of the lake, particularly by waterfowl, is also high; seeing hundreds to thousands of ducks and geese is common during spring and autumn migrations. There has also been documentation of successful nesting by Least Bittern, a state-listed threatened bird species, along the lake. In the wetland habitats adjacent to the lake, there is a variety of reptiles and amphibians. The increase in lake level due to the water control structure installed in 2014 is anticipated to increase the productivity of the lake riparian area. Observations by members of the Park Lake Advisory Board suggest that usage of the lake by waterfowl has increased. A preliminary survey of goose and swan nesting in April of 2019 indicated that there was a minimum of 8 goose nests, 1 swan nest, and 1 sandhill crane nest readily visible from a kayak tour of the lake (Appendix O)

a. Maintain the quality of the lake and surrounding habitats to support the current levels of biodiversity seen on and near the lake.

b. Minimize negative impacts (e.g., nutrient input, coliform bacteria) of excessive goose population on the lake.

Outreach/education
Park Lake provides a wonderful opportunity to engage the community in learning about its natural resources and how to protect them. It has the potential to be a natural laboratory and can engage students and adult learners in the community. Opportunities exist to educate the general public about water quality, invasive species, natural history, and fish and wildlife species. With more community engagement it is likely that stewardship of the lake will become a community endeavor and initiatives for lake improvements will be easier to accomplish with more people invested in its natural history. We have not formalized our outreach and education plans as of yet, but we would like to start to build this component into our mission over time. Friends of Park Lake already perform some outreach and education activities, and we can partner with them to reach a broader audience. Other ideas include class room visits to the lake, learning labs and tours on the lake, and public seminars in the community. Outreach and education activities would complement the development of the Park Lake Preserve.

Grant opportunities
The current funding climate is such that grants to support management on individual lakes are becoming less common, and collaborative efforts are being supported.

a. Initiate discussions with nearby lakes facing similar problems to better position the township for grant applications, as well as general sharing of lake management information.

b. Collaborate with other Township entities to pool resources and explore opportunities that benefit multiple stakeholders within the Township.

Park Lake Advisory Board Accomplishments 2019

- Members of the Board have continued to monitor lake levels in response to the dike and water control structure that was installed in early 2014. The structure performed well in 2019 and water levels were sustained at a substantially higher level than in years prior to when the structure was completed (Appendix B). High levels of precipitation during 2019 led to high water levels for much of the year.

- The PLAB assisted the Parks and Recreation Committee develop a proposal for the creation of Park Lake Preserve. This was presented to the Township Board of Trustees, but was not funded.

- Maintain the strong relationship between the Friends of Park Lake and the PLAB, with many of the members of each group attending both meetings.

- The PLAB reviewed the results of the lake survey performed by Jennifer Jermalowicz-Jones of Restorative Lake Sciences and data collected by the Board and Friends of Park Lake to evaluate options for weed treatment. Based on these considerations, Professional Lake and Land Management tried a new herbicide treatment (ProcellaCOR ®) in 2019. A survey of the plant community indicates that this treatment was highly effective in reducing the prevalence of Eurasian water milfoil.

- In cooperation with Friends of Park Lake, participated in the Michigan Cooperative Lake Monitoring Program to sample lake water phosphorus, chlorophyll concentrations, water clarity (Secchi disk clarity), and to map aquatic vegetation in the lake. Detailed results of this sampling are provided in appendices to this report.

- Sampled the beach for coliform bacteria, July 2019. Results were within guidelines by DEQ for swimming beaches.

Aquatic Plant Management

As in past years, the reduction in the abundance of aquatic plants remains a major concern for the management of Park Lake. In addition to exotic species such as Eurasian watermilfoil (*Myriophyllum spicatum*) and starry stonewort, excessive growth of native species such as eelgrass or wild celery (*Vallisneria americana*) and water lilies (*Nymphaea sp.* and *Nuphar sp.*) is problematic. Steve Hanson with PLM Lake & Land Management Corp. provided lake and aquatic plant management services in 2017, and their activities are summarized below. Lake residents often have questions about permit requirements for managing aquatic and emergent plants on their property. The Michigan DEQ oversees such permits, and provides the following web resources to help answer questions for residents:

http://www.michigan.gov/deq/0,4561,7-135-3313_3681_28734-161112--,00.html
https://www.michigan.gov/documents/deq/wrd-anc-faq_565051_7.pdf

Due to the increase of Eurasian watermilfoil over the past few years, a whole lake treatment for milfoil was implemented using Fluridone in 2016, and no Eurasian watermilfoil was found during the August 2016 survey. Eurasian watermilfoil distribution was limited in 2017, allowing for a reduction in the amount of herbicide application. Although Eurasian watermilfoil rebounded greatly in 2018 (see appendix D), treatments were limited due to the timing of its resurgence. Although starry stonewort was widespread in Park Lake during 2018, it did not appear to grow high enough in the water column to impact boating or swimming. Select portions of the lake were treated in to test the effectiveness of a new herbicide (ProcellaCOR®) that has proven to be selective for treating Eurasian watermilfoil, and importantly, has a 3-year guarantee for areas treated (with some limiting conditions). Results of the plant survey in late summer 2019 indicate that the ProcellaCOR treatment was more effective than anticipated, with no Eurasian watermilfoil being found at any sites. We will follow up in 2020 with additional surveys to determine the long-term effectiveness of this treatment.

Recognition of Township, County and Community Activities in the Park Lake Area

- The Bath Public Works Department continued clean up and removal of vegetation from public areas and continued maintenance of the beach area.

- Parks and Recreation Department sponsored a tagged fish contest in 2019.

- The Friends of Park Lake had a productive 2019 and participated/organized numerous activities. The 5th Annual Summer Solstice Party at the lake was a huge success. The Friends of Park lake partnered with Bath High School and advanced math and science students built cardboard boats for the Bath Police and Fire Department The Cardboard Boat Race saw 7 cardboard boats compete, and brought 600+ community members to the shores of Park Lake for free family summer fun! The Friends of Park Lake participated in the ad hoc committee involved with the discussion about Park Lake Preserve, and continue to advocate with the Township for a safe walkway down Park Lake Road. The group hosted several speakers, including Dr. Jen Owen who introduced them to mist netting and banding of birds here in Bath at the Burke Lake Bird Banding Station and the Corey Marsh Ecological Research Station. In April 2019, volunteers planted 75 pine trees between I-69 and Park Lake and have received an MDPT Right of Way permit to continue to work on MDOT properties in the neighborhood.

- The Parks and Recreation Committee took the lead in submitting a proposal for the Park Lake Preserve.

- The Friends of Park Lake is a member of the MiCorps' Cooperative Lakes Monitoring Program (CLMP), and in conjunction with the Park Lake Advisory Board, monitored the lake for chlorophyll, phosphorus, water clarity, and aquatic plant coverage. This program provides a mechanism for educating and training people in scientific methods for lake sampling and assessment. A few new individuals have become involved, and the Friends of Park Lake and the Park Lake Advisory Board are hoping to increase this number over time.

- The lake also serves as a valuable teaching resource for two classes at MSU. Through these classes, we are able to highlight the value of Park Lake to students, and to introduce them to Bath Township. During the course of student sampling, people often stop to see what is going on, providing students with the valuable experience of sharing their knowledge with the lay public. Further, this engages students with township residents, creating better communication between these diverse groups.

- The Friends of Park Lake and the Ingham Conservation District worked together as part of the Mid-Michigan Cooperative Invasive Species Management Area (CISMA) across Ingham, Clinton, Eaton and Ionia Counties. The CISMA has focused on strategic management through education, prevention, early detection, rapid response, and control of terrestrial and aquatic species across jurisdictional lines.

Park Lake Advisory Board Action Item List Jan 2019

Action Item	Status
5-year plan for Lake Improvement	Ongoing review and revision. We probably need to work in more detail on this – discuss how in specific (i.e., budget, rotation of treatment, benefits to township, etc.)
Phragmites problem	Dan H is pretty sure that Steve Hanson's crew treated the Phragmites by the lake.
Test lake sediments for contaminants	Cheryl will follow up with Susan Jones
Coliform bacteria testing	Plan to sample in July 2019
Explore methods to achieve lake restoration and sediment removal	On hold? Move to Future Item list?

Park Lake Advisory Board Action Item List Jan 2020

Action Item	Status
5-year plan for Lake Improvement	Ongoing review and revision. Further refine budget, rotation of treatment, benefits to township, etc.
Phragmites problem	Check in spring
Test lake sediments for contaminants	Cheryl has touched base with Susan Jones, and is waiting for more information.
Coliform bacteria testing	Plan on sampling in July 2020
Waterless boat cleaning station	No action needed at this time.
Lake monitoring	Phosphorus, chlorophyll, Secchi clarity, and aquatic plant mapping completed for 2019. Lead by Friends of Park Lake, but includes several members of this board.

Park Lake Advisory Board Future Item List Jan 2019

Future Item	Status
Work with Friends of Park Lake to develop informational brochures on fish and aquatic plants	Proposed to initiate when the appropriate board members have time available.
Research means to restore canals leading to water control systems	Restoration of canals would be good for recreational kayaking. Eric Muska – potenial options with oxygen and enzyme system
Explore grant possibilities for Park Lake	Ongoing.
Monitor use of lake by motorized vehicles during winter for potential conflicts	Ongoing.
Boat wash station	Limitations by sewage plant make this more complicated than originally thought. Maintain on wish list, but not as an immediate action item.

Park Lake Advisory Board Future Item List Jan 2020

Future Item	Status
Work with Friends of Park Lake to develop informational brochures on fish and aquatic plants	Initiate when the appropriate board members have time available.
Research means to restore canals leading to water control systems	Restoration of canals would be good for recreational kayaking. Eric Muska – potenial options with oxygen and enzyme system
Explore grant possibilities for Park Lake	Ongoing.
Monitor use of lake by motorized vehicles during winter for potential conflicts	Ongoing.
Explore methods to achieve lake restoration and sediment removal	
Considering developing an amphibian (frog, toad, salamander) monitoring program	