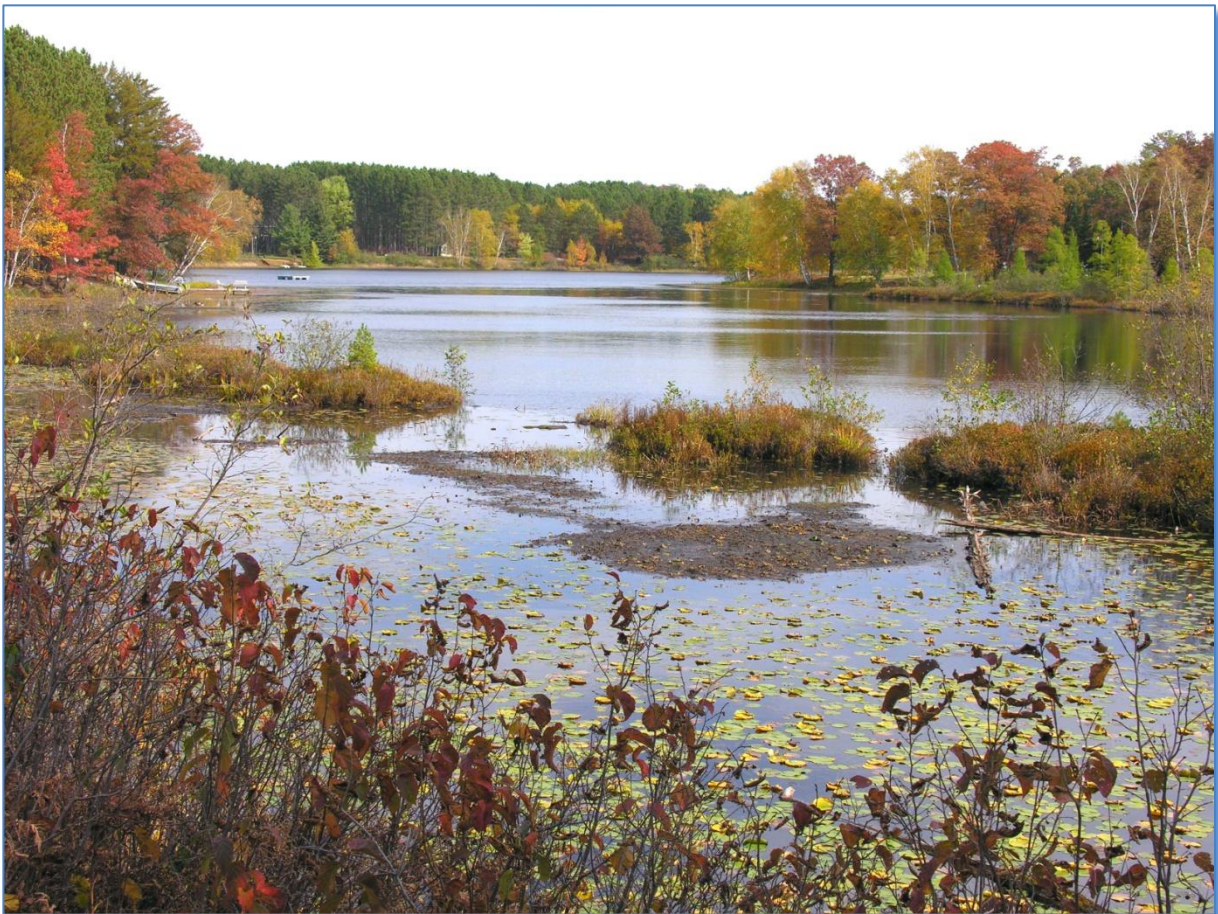

The Mable Lake Association: Stewardship for a High Quality Lake in Lincoln County, Wisconsin

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Mable Lake (looking east; photo by Dean Premo, White Water Associates)



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INTRODUCTION TO MABLE LAKE STEWARDSHIP

In 2011, the Mable Lake Association was awarded a small-scale planning grant from the Wisconsin Department of Natural Resources (WDNR). The Association was in the early stages of identifying and clarifying issues of management concern for Mable Lake and felt it would benefit from a project phase that allowed them to solidly establish an organizational footing. A recent discovery of Eurasian watermilfoil caused a heightened concern for the lake's long-term well being, although other management issues exist as well.

This stewardship prospectus summarizes the first steps taken by the Mable Lake Association along the path of lake stewardship and sets the stage for the serious undertaking of long-term care of a healthy lake. The Mable Lake Association has not been alone in this undertaking. White Water Associates, Inc. (White Water)¹ was selected as the consultant in this process. The AIS Coordinator for Lincoln, Langlade, and Forest Counties, Chris Hamerla, and the WDNR have also been closely involved with the Mable Lake Association.

As result of this deliberate and measured beginning, the Mable Lake Association has come to view Mable Lake stewardship as an ongoing effort and plans to develop future grant applications to develop and implement practical management activities on Mable Lake. The Association has taken to heart what Aldo Leopold referred to as “... ***the oldest task in human history: to live on a piece of land without spoiling it.***”

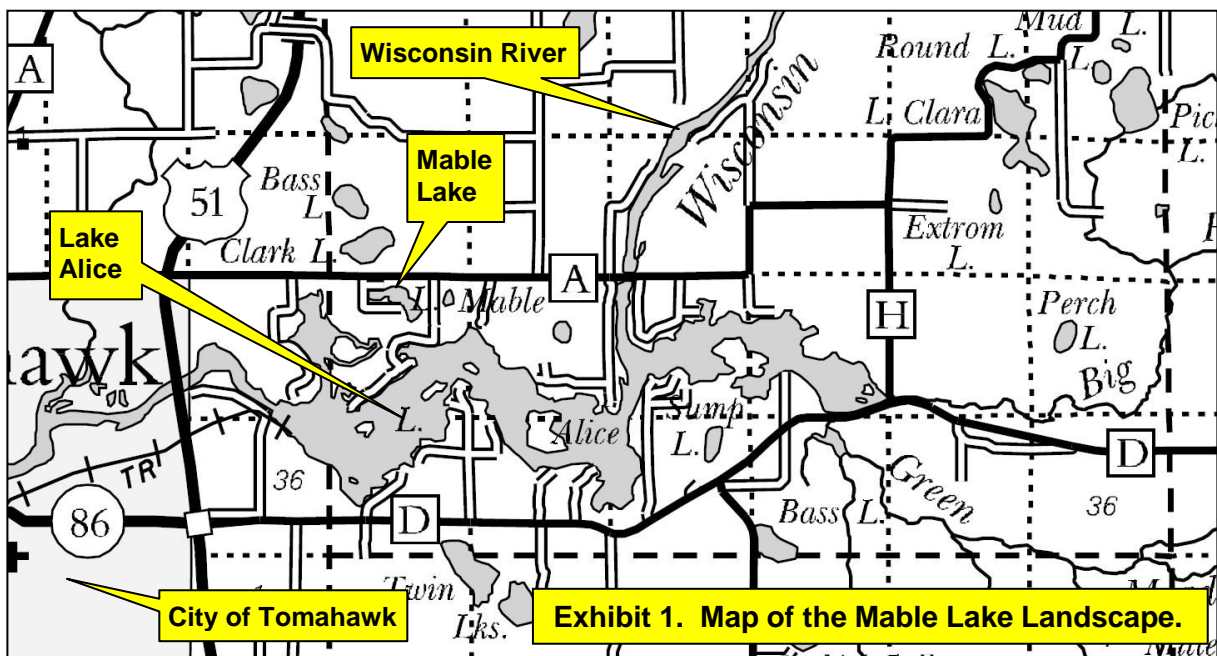
The prospectus is organized in nine headings. We summarize the geographic, ecological, and human community context for Mable Lake. This is the environment in which lake stewardship will occur. We describe the history and composition of the Mable Lake Association. The section called “The Mable Lake Ecosystem” outlines what is known about water quality, biological attributes, and riparian and littoral zone habitats. Management considerations and concerns are summarized. The Association's overarching stewardship goal and several initial stewardship objectives are presented. The section entitled “Strategic Partnerships” summarizes available and willing participants in future Mable Lake stewardship. We present a calendar of stewardship activities anticipated for the next several years. The final section, Conclusions, encourages the stewardship process.

¹ *White Water Associates, Inc. is an independent ecological consulting firm and environmental laboratory in Michigan's Upper Peninsula and has worked on Wisconsin lake management issues for more than 25 years.*

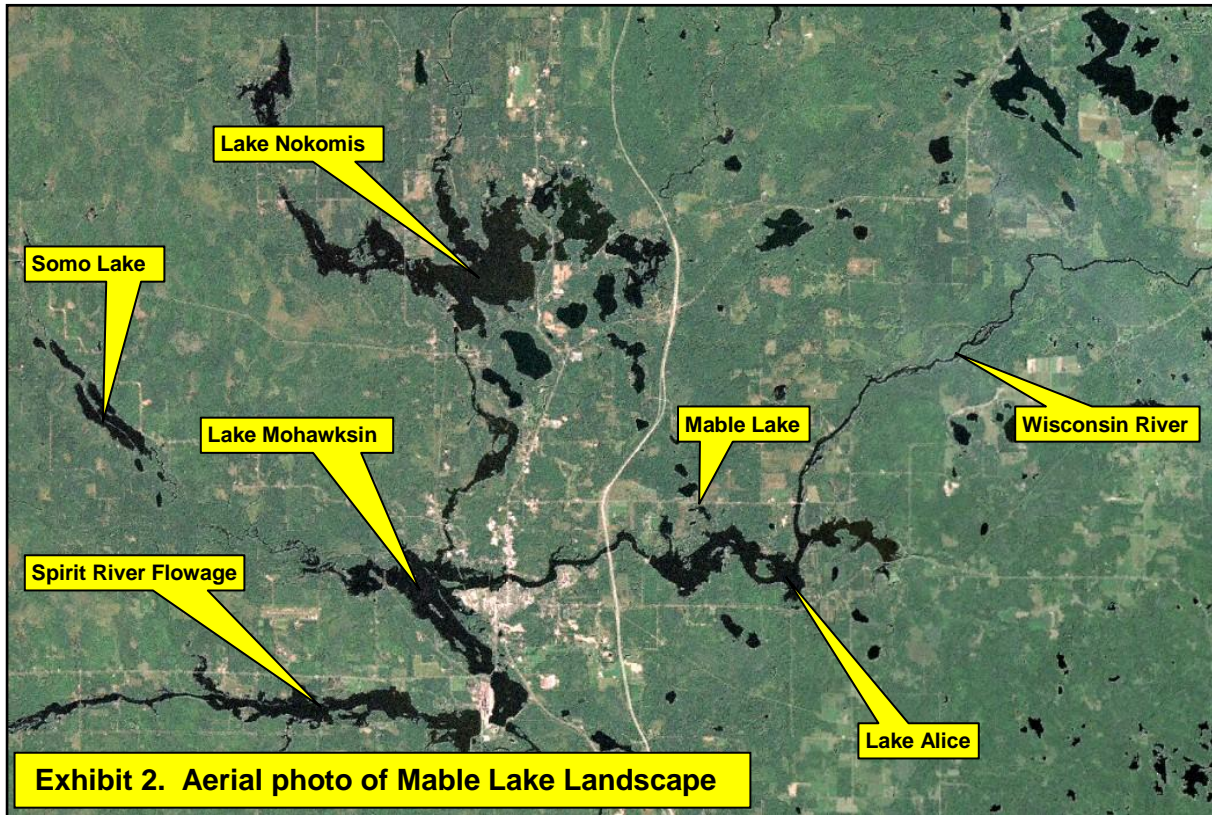


GEOGRAPHIC, ECOLOGICAL, AND COMMUNITY SETTING

Mable Lake is located in King Township, Lincoln County, Wisconsin about three and one-half miles northeast of Tomahawk, Wisconsin (see Exhibit 1). It is about 1.5 miles east of Highway 51 and 350 feet south of County Road A. The immediate Mable Lake landscape has numerous water bodies including the Wisconsin River, Green Meadow Creek, Big Pine Creek, Lake Alice, Bass L., Clark L., Sump L., Twin Lakes, Lake Clara, Round L., Perch L., Mud L., Extrom L., Gerbick L., Pickerel L., and Reno L., all within a three mile radius. This complex of aquatic habitats forms an abundance of riparian habitats for birds, mammals, amphibians, reptiles, and invertebrates. The water body identification code (WBIC) for Mable Lake is 995300.



The landscape surrounding Mable Lake has several large bodies of water (see aerial photo, Exhibit 2). Lake Nokomis, Lake Mohawksin, Spirit River Flowage, Lake Alice, and Somo L. form an enormous interconnected water landscape that is certainly a target for migrating and breeding waterfowl and other birds. Mable Lake has value and function in this larger landscape as well. The terrestrial landscape for Mable Lake is a mix of agriculture and forested land. Both forested and emergent wetlands are in the vicinity of Mable Lake and contribute to the biodiversity of the area.



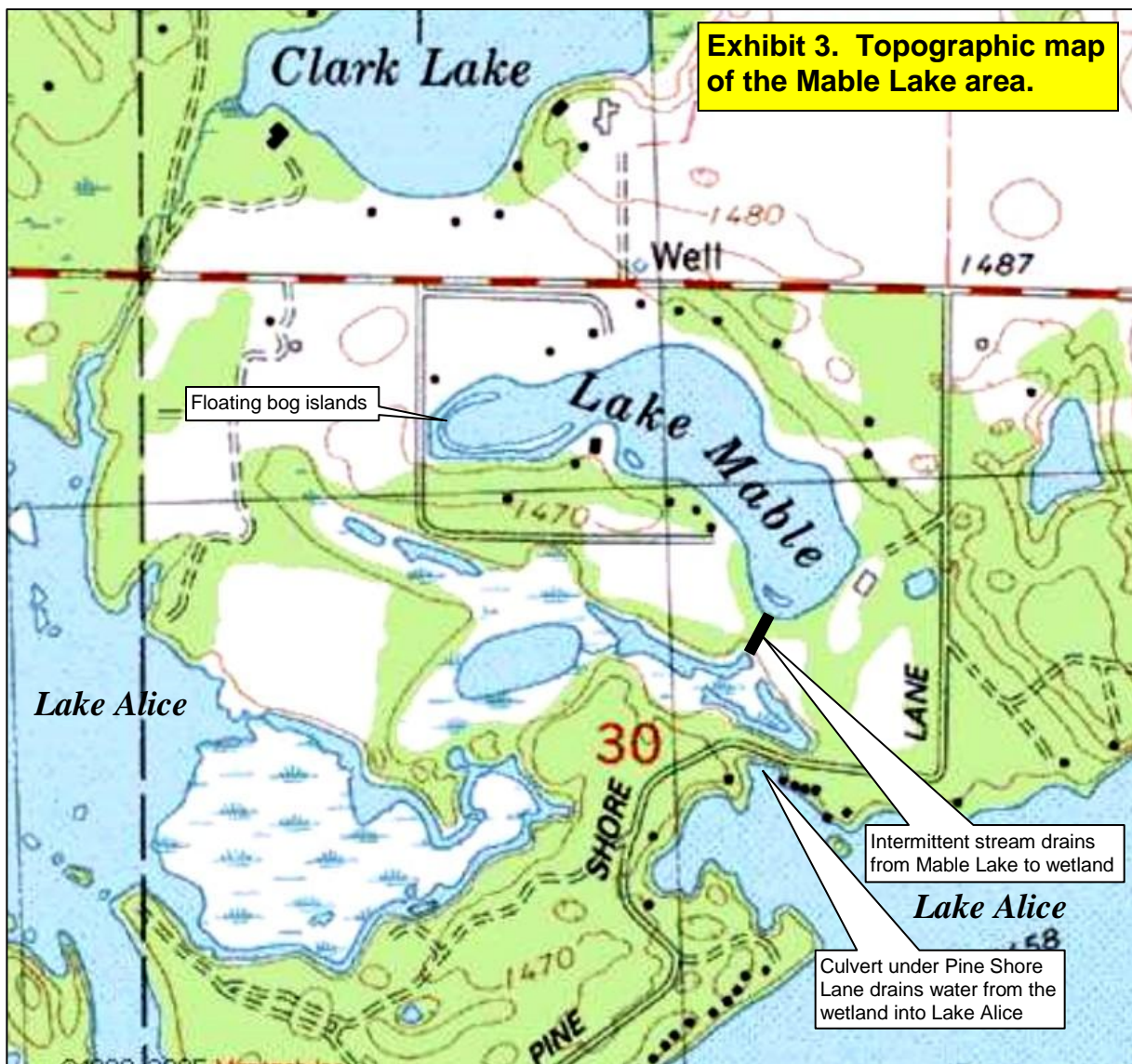
Mable Lake is 25 acres in surface area and about 25 feet deep at the deepest point. No bathymetric map is known to exist. Exhibit 3 is an aerial view of Mable Lake. The lake is just under one-half mile long and is about 0.2 mile wide (at the widest point). Its shoreline is about one mile in length. Mable Lake is most easily characterized as a groundwater seepage lake with no major inlet or outlet. A small intermittent stream does exit the lake at the southeastern-most point and during times of high water drains into a large wetland that is connected by surface water to Lake Alice (see Exhibit 3). Mable Lake is at an elevation of 1,467 feet above sea level (10 feet higher than Lake Alice). The watershed for Mable Lake is quite small. The topographic relief in the vicinity of the lake is low (see Exhibit 3).

The watershed surrounding Mable Lake is comprised of soils with good infiltration capacity. Soils are classified by the Natural Resource Conservation Service into four Hydrologic Soil Groups based on the soil's runoff potential.² The four Hydrologic Soils Groups are A, B, C and D and range from Group A soils with the smallest runoff potential to

² Details of this classification can be found in 'Urban Hydrology for Small Watersheds' published by the Engineering Division of the Natural Resource Conservation Service, United States Department of Agriculture, Technical Release-55.



Group D soils with the greatest. Group A soils predominate in the vicinity of Mable Lake and are comprised of sand, loamy sand or sandy loam types of soils with low runoff potential and high infiltration rates even when thoroughly wetted. Group A soils consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission. Rain water or snow melt water tends to be readily absorbed by Group A soils making the risk of erosion relatively low. This is especially the case in the areas of low topographic slope that dominate the area around Mable Lake.





Judging from aerial photography (see Exhibit 4), Mable Lake has about 29 dwellings (roughly averaging one residence for each 180 feet of frontage). A fairly narrow band of mixed forest (some of it pine plantation) surrounds the lake. There is no improved boat landing on Mable Lake although public land allows access to the lake via the right-of-way of Mable Highland Drive on the far western tip of the lake. In spite of this access area, it is a fairly rare event for the public to launch a boat in the lake. Some winter time access occurs for the purpose of ice-fishing. Because of its relatively small size and the existence of the public access, Mable Lake is a “no wake” lake.





HISTORY AND COMPOSITION OF THE MABLE LAKE ASSOCIATION

On September 27, 2008, seventeen residents of the Mable Lake area gathered to discuss their concerns about the lake. They decided that the best way to protect the lake and bring about needed improvements was to form an association. The name ***Mable Lake Association*** was chosen and a slate of temporary officers was selected: President, Kenley Cordts; Vice President, Terry Carney; Secretary, Rachel Heldt; Treasurer, Lisa Miller; and Su DaWalt as Director-at-large. These five were asked to meet and discuss what actions should be taken to get the organization recognized by the WDNR. A goal was established of meeting all requirements so the association could apply for a state grant in 2009. The grant would help pay for a study which would document the condition of Mable Lake and fund a plan to address its problems.

The officers drew up a set of by-laws and presented it to the whole association at a special meeting on November 15, 2008. There were 12 people in attendance and the by-laws were approved with minor changes. The temporary slate of officers was elected to be the permanent board, and it was decided that Terry Carney would serve as President and Kenley Cordts as the Vice President. It was also announced that the association would need a minimum of 25 members and be in existence as a formal lake association for at least one year before grant application could begin.

Mable Lake Association Inc. became incorporated on December 2, 2008 as a non-stock corporation. The purpose as stated in the Articles of Incorporation “is to protect, preserve, and improve the ecosystems of Mable Lake and its surroundings, and to enhance the water quality, fishery, boating safety, and aesthetic values of Mable Lake as a public recreational facility for today and for future generations. This purpose will be accomplished through education of and communication among concerned citizens.” Care was taken to write the by-laws so that they would conform to WDNR requirements for grant application. The association also registered as a non-profit organization and obtained an Employer Identification Number (EIN) on 5-14-2009.

Since its establishment, the Mable Lake Association has met annually on the last Saturday of September. It has succeeded in recruiting a sufficient number of members to exceed the 25 required by the WDNR and elected officers according to the by-laws. The Association has held one fund-raiser, a brat fry, and continues to notify all residents on the



lake of meetings and activities. All residents are encouraged to join the Association and share their concerns about the lake.

Five Association members were trained in performing Secchi disc readings to monitor the clarity of the water in Mable Lake, beginning in 2008. They continue to take readings. In April, 2009, Lisa Miller resigned and Su DaWalt took her place as treasurer. The board appointed Jim Norman to serve as Director at Large. In September 2011, Terry Carney resigned his position on the board. The directors were authorized at the annual meeting to appoint someone to take his place. Maria Dymora agreed to serve as Director-at-Large and Jim Norman became the President.

As soon as the association was eligible to apply for a grant to fund a lake study, it began a search for a suitable consultant. White Water Associates Inc. was chosen and the association was successful in receiving a \$3,000 grant for the period of 4-1-2011 to 6-30-2012. At this point, the Association is planning to apply for a second grant so it can continue the process of completing a lake study and begin addressing the concerns about Mable Lake.

THE MABLE LAKE ECOSYSTEM

Mable Lake is a beautiful lake with interesting shoreline contours and a considerable amount of forested riparian area (see Exhibit 5). Relatively little information has been collected on the Mable Lake ecosystem in terms of its chemistry and biology, but we characterize the current available information in this section in three subsections (water quality, biological attributes, and riparian and littoral habitat).



Exhibit 5. Northeast shore of Mable Lake.



Photo by Dean Premo, White Water Associates

Water Quality

Mable Lake has a fairly recent history of volunteer-collected water quality data (Secchi transparency). The average transparency reading for 2009 to 2011 was 10.8 feet putting Mable Lake in a mesotrophic category with respect to water clarity (other important indicators of trophic status such as chlorophyll “a” and phosphorus have not been measured). Mesotrophic lakes are characterized by moderately clear water, but can have low dissolved oxygen in deep water during the summer.

Biological Attributes

Mable Lake has a variety of gamefish and panfish species including smallmouth bass, largemouth bass, bluegill, pumpkinseed, black crappie, walleye, northern pike, and bullhead. Occasional winter-time fish kills have been reported on Mable Lake. According to residents, this has kept the maximum size of largemouth bass rather small. They also report a large population of stunted bluegills. The WDNR anticipates conducting a fish survey in Mable



Lake in the near future. Fishing pressure on Mable Lake is relatively light and most of this is by riparian owners. There is a low amount of boat traffic in and out of the lake via an unimproved access site on township land.

The riparian area is used by songbirds and other vertebrates allowing canoeists and kayakers an opportunity to see and hear these animals. Lake residents report common loons use the lake for fishing, but not nesting. Appropriate habitat for common loon nesting does appear to be present. Bald Eagles are also seen on the lake. Great blue herons, Canada geese, and a variety of ducks nest and/or feed in Mable Lake. Western painted turtles and snapping turtles reside in Mable Lake and the surrounding wetlands as well as a variety of anurans (frog and toads). The Lake Alice Association conducts a frog and toad survey that includes some listening sites in wetlands near Mable Lake.

The aquatic plant community of Mable Lake is quite robust and is present throughout a broad littoral zone. Diversity appears to be quite high. The floating plant, watershield, is a visually abundant member of the plant community (from surface view), but many other native species are present. Aquatic plant survey data (see next paragraph) will better characterize the aquatic plant community.

In August 2010, Chris Hamerla (AIS Coordinator for Lincoln, Langlade, and Forest Counties) discovered Eurasian watermilfoil in an area along the northern shore of Mable Lake. He hand-pulled the specimens he observed at that time. As result of this aquatic invasive plant discovery, the WDNR conducted a point-intercept aquatic plant survey on Mable Lake in the summer of 2011. This data will be available for analysis in the near future. In early September 2011, Hamerla snorkeled Mable Lake and removed four smaller Eurasian watermilfoil plants from the known area of establishment. Hamerla described this small number as “pretty encouraging from where it was even this spring.” He plans to visit Mable Lake early in the spring of 2012, prior to the native aquatic plants growing too high, to reassess the Eurasian watermilfoil population status.

Plants characteristic of bog habitats and *Sphagnum spp.* moss are also present on Mable Lake. These add to the biodiversity of the plant and animal communities. Wild cranberries and the insectivorous pitcher plant are abundant.

Riparian and Littoral Habitats

The riparian zone of a lake is the area of nearby land that both influences the lake and is influenced by the lake. It may extend back from the shoreline for several hundred feet. A natural riparian area is diverse and important to the health of the lake. The littoral zone is the



relatively shallow water areas of a lake where rooted aquatic plants grow. In relatively shallow lakes with high transparency, the littoral zone might include much of the lake. The littoral zone is a rich and dynamic habitat that serves many purposes in a lake, including the major source for fish spawning and feeding.

The U.S. Environmental Protection Agency's **2007 National Lakes Assessment** found that poor lakeshore habitat (riparian vegetation) is the number one stressor of lake ecosystems. Poor littoral zone habitat is number two. The study found that lakes with poor lakeshore habitat are three times more likely to exhibit poor biological condition as measured by the planktonic community (food web). Managing for healthy, natural riparian zones and lakeshores and littoral zones makes a profound difference in a lake's biological health. Tools that help achieve this condition include development standards (such as zoning and shoreland ordinances) and *best management practices* (leave wood in place, minimize clearing of littoral vegetation, natural armoring instead of artificial rip-rap, and more).

Although it is fairly narrow in some spots, the riparian area of Mable Lake is fairly intact with native vegetation and diverse structure ranging from herbaceous plants to shrubs and mature trees. Exhibits 4, 5, and 6 illustrate this valuable habitat. Nevertheless, some areas could stand some restoration to further protect and maintain lake quality. Human developments such as, houses, buildings, roadways, and lawns disrupt the riparian area and diminish its functional value.

Mable Lake is relatively shallow and quite clear. Light usable by rooted plants can penetrate to the bottom in much of the lake so the littoral zone is quite extensive. This makes for a very productive lake in terms of a rich and complex food web.



Exhibit 6. Littoral zone of Mable Lake

Photo by Dean Premo, White Water Associates

Exhibit 6 shows an example of the Mable Lake littoral zone as viewed looking east from Mable Highland Drive. It shows emergent plants near the shoreline and floating plants in the shallow water. Abundant submergent plants are rooted in the sediment, but not visible in this photo. Exhibit 6 also shows a rather unusual feature of Mable Lake vegetation: floating bog islands. These islands are comprised of an organic substrate (dead parts from *Sphagnum* moss, shrubs, and herbaceous plants) on which grows living *Sphagnum* moss, leatherleaf and other bog shrubs, cranberries, pitcher plants, and many other herbaceous bog plant species (including orchids). From a habitat standpoint, these form great areas for songbird nesting and feeding, waterfowl nesting and loafing, and potential nest sites for common loons. Turtles, frogs, and toads use them as habitat as well. These islands are quite numerous and fairly stable in their position although occasional high water might cause them to move somewhat. The relatively shallow water between some of these islands and the shoreline hinders navigation in some areas (see next section).

MANAGEMENT CONSIDERATIONS AND CONCERNS

When humans live and play in natural ecosystems, issues of convenience, aesthetics, and recreation become subjects of concern and sometimes management. Not every person will



view an issue in the same way. For example, a patch of aquatic vegetation might be a great fishing spot for an angler, but a nuisance to a swimmer. If one were to be able to invite the opinions of plants and animals that use the lake, the diversity of viewpoints would become even more complex. For example, a dense population of stunted bluegills is an anathema to a fisheries biologist, but perfectly fine with the great blue heron or common loon. Some issues for management, such as controlling an aquatic invasive species, enjoy broad support. Underlying our efforts to manage ecosystems is that they inherently and naturally change, usually slowly, but not always. Humans, on the other hand, tend to prefer stability in the natural environment. This is not always easy to achieve.

Mable Lake has several issues that are worthy of consideration in future lake stewardship. These have been discussed at Association meetings and with White Water Associates. This section presents the issues identified to date as a starting point for future research, education, and management planning.

Lake water level – As in many Wisconsin lakes, Mable Lake has experienced some decline in water level in the past few years above and beyond what might be considered a normal annual variation from springtime high water to late summer low water. This is a concern to lake residents and affects other issues of concern such as navigation. At this time no official lake stage monitoring has been conducted.

Lake draining through intermittent stream – An intermittent stream at the southeast-most bay of Mable Lake drains into wetland that eventually flows through a culvert under Pine Shore Lane and into Lake Alice. This natural stream was modified many years ago by channelizing and deepening at the point where it leaves the lake. In recent years, an active beaver dam was apparently removed. Further downstream, a new culvert on Pine Shore Lane may have increased the flow from the wetland into Lake Alice. Some Association members express concern that this may play a role in lower lake levels positing that spring time runoff waters are more quickly flushed from Mable Lake.

Native plant abundance – A few Association members express concern about abundance of some native aquatic plants such as watershield hindering swimming and boating in Mable Lake. The aquatic plant survey completed by the WDNR in 2011 will document the distribution of native plants and establish a baseline for understanding this phenomenon.



Eurasian watermilfoil – All Association members are in agreement regarding control of this aquatic invasive species. The concern extends to others in the region as well since a new population of Eurasian watermilfoil is a potential source for the infestation of other lakes. The direct surface water connection between Mable Lake and Lake Alice is a concern for those involved with Lake Alice stewardship.

Navigation in shallow water areas behind floating bog islands – Along part of the shoreline on the west part of Mable Lake lies a string of floating bog islands as seen in Exhibits 3 and 4. These form visually interesting and valuable habitat features, but tend to trap organic material between the island and the shoreline. In the past, the waterway between the islands and the shoreline was navigable and allowed boat access for property owners to the lake. With recent lower water levels and increasing organic material and rooted aquatic plants this shallow water “moat” has become more challenging to navigate and a significant concern to affected landowners. The phenomenon also affects the ability for the public to enter the lake via the right-of-way from Mable Highland Drive (the unimproved boat landing).

Fish kills – Association members report that at least twice in the past two decades, fairly major fish kills have been witnessed at Mable Lake. These seem to have primarily affected largemouth bass and walleye. Reasons for these fish kills are unexplained but are likely related to diminished wintertime dissolved oxygen concentration. This issue can be researched as part of long term stewardship of Mable Lake.

Stunted panfish populations – Panfish in Mable Lake are numerous, but individuals are stunted according to Association members. This condition may have been exacerbated by the diminished population size and smaller sizes of largemouth bass that resulted after two major winterkills. Bass are significant predators on bluegills and pumpkinseeds. Chemistry and other information will be gathered as part of Mable Lake stewardship that will shed light on this aspect of the fish community. The Association anticipates that the WDNR will conduct a fish survey in the near future.

No-wake designation on the lake – One Association member expressed concern that the no-wake designation present on Mable Lake encourages excessive plant growth in the lake. This issue can be the subject of information gathering and education during Mable Lake stewardship efforts.



STEWARDSHIP GOAL, OBJECTIVES, AND COMMITMENT

The Mable Lake Association working with its consultant White Water Associates has crafted the following overarching goal statement for its stewardship undertaking:

“The goal of the Mable Lake Association is to protect, preserve, and improve Mable Lake and surroundings. The Association endeavors to maintain or enhance water quality, fisheries, biodiversity, and aesthetic values of Mable Lake for today and the future. The Association seeks to minimize opportunities for aquatic invasive species.”

The Mable Lake Association recognizes that work toward this goal will sometimes mean protecting what is good about the lake and its surroundings and sometimes it may mean restoring features that have been degraded. This implies rehabilitating and protecting sufficient components of the ecosystem so that it functions in a natural way, provides habitat for native biota, and supports reasonable human uses. The Association will be guided in their stewardship actions by the human health care mantra: ***first, do no harm***. The Mable Lake Stewardship Program objectives outlined below support the Association’s overarching goal.

Objectives that support this goal:

1. Gather, review, and summarize existing information about Mable Lake;
2. Analyze point-intercept aquatic plant survey data;
3. Develop and establish a program of water chemistry monitoring;
4. Delineate and characterize the watershed;
5. Prepare an aquatic plant management plan;
6. Monitor and manage Eurasian watermilfoil;
7. Monitor dissolved oxygen-temperature profiles at critical periods of the year;
8. Establish lake level monitoring program;
9. Implement a volunteer angler journal as means to track fish community dynamics;
10. Characterize rare plant and animal species’ use of the lake and riparian habitats;
11. Characterize riparian vegetation;
12. Characterize bog island habitats and vegetation;
13. Conduct lake user survey;
14. Create bathymetric model (map) of the lake;



15. Develop and institute native plant bed monitoring for potential nuisance level plants;
16. Create photo archive of shoreline and near-shore riparian area;
17. Conduct qualitative assessment of shoreline and near-shore riparian area;
18. Conduct USEPA/WDNR habitat assessment littoral zone and riparian area;
19. Identify areas of protection, restoration, or enhancement in littoral and riparian zones;
20. Create the Mable Lake Stewardship Program Adaptive Management Plan;
21. Provide education that increases support, capacity, and involvement of lake stewards;
22. Engage Mable Lake stewards with the water stewardship community in the area.

The Mable Lake Association is committed to development of a management plan and intend to initiate it by vote at an Association meeting and implement it as an ongoing process.

STRATEGIC PARTNERSHIPS

One value of the small-scale planning grant and the steps that have been taken to prepare this stewardship prospectus has been the consolidation of a strong work team. The Mable Lake Association has directly engaged with a diversity of organizations and individuals whose collective effort will be strategic as they partner in lake stewardship. AIS Coordinator Chris Hamerla (affiliated with Lumberjack RC&D Council) was involved with the discovery, characterization, and initial management of Eurasian watermilfoil on Mable Lake. He has met with landowners and presented to the Association's annual meeting (fall 2011). The Lake Alice Association has been an active and effective stewardship organization for the nearby Lake Alice. Lake Alice Association President Glenn Mott and Board Member Linda Mott attended an October 2011 meeting with the Mable Lake Association (as part of the development of this prospectus). They offered advice and assistance as neighbors in lake stewardship. This demonstrates an important aspect of lake management: lakes are not isolated features but are influenced by surrounding lakes and uplands. It makes sense for stewardship organizations to share experiences and collaborate. Another strategic partner is White Water Associates. White Water scientists will apply a combination of landscape and aquatic ecology expertise, environmental education skills, and practical resource management experience to the Mable Lake stewardship undertaking. In addition to providing crucial project funding, the WDNR plays an advisory role in Mable Lake stewardship and contributes valuable field effort in the form of aquatic plant and fish surveys of Mable Lake.



CALENDAR OF ACTION

The Mable Lake Association intends to seek financial assistance from the WDNR in the form of large-scale lake planning grants in the future. The process of creating this stewardship prospectus has helped the Association to focus energies on several issues of importance to Mable Lake. The objectives listed in an earlier section of this prospectus will be expanded and refined in formal proposal(s) to the WDNR lakes planning grant program. By planning ahead, stewardship activities can work to gather a set of baseline information about Mable Lake, develop management actions, and carry out those actions over time. This process has already commenced. Below is a table that outlines a calendar of actions for the next few years of stewardship. This calendar is not “hard and fast” but indicates the Association’s commitment to long-term and informed lake stewardship.

Exhibit 7. Time line for representative actions in anticipated phases of Mable Lake stewardship.				
Year 1	Year 2	Year 3	Year 4	Year 5
Existing information collection & review; delineate and characterize watershed; analyze aquatic plant survey data; develop and begin water chemistry sampling program; monitor and manage Eurasian watermilfoil (EWM); monitor dissolved oxygen (DO); research lake level information; commence volunteer angler journaling; research rare species use; Create Aquatic Plant Management Plan.	Continue information review; continue water quality sampling & characterize trophic status; monitor and manage Eurasian watermilfoil (EWM); continue DO monitoring; characterize riparian vegetation; characterize bog island vegetation; continue volunteer angler journaling; conduct lake user survey; create bathymetric model (map) of lake; develop and institute native plant bed monitoring (nuisance level plants)	Water quality and DO monitoring; lake shore photo archive; qual. assessment of riparian and littoral zone; USEPA/ DNR habitat assessment; incorporate ideas from lake user survey into stewardship activities; continue volunteer angler journaling; monitor and manage Eurasian watermilfoil (EWM); continue native plant bed monitoring; create 1 st Lake Management Plan (LMP)	Water quality sampling and analysis; continue volunteer angler journaling; monitor and manage Eurasian watermilfoil (EWM); continue native plant bed monitoring; identify areas of potential protection or restoration in littoral and riparian areas. Create restoration and/or protection plans.	Water quality sampling and analysis; 2nd iteration of LMP. Implement restoration & protection plans; continue volunteer angler journaling; monitor and manage Eurasian watermilfoil (EWM); continue native plant bed monitoring



CONCLUSION

Undertaking of stewardship for Mable Lake is commitment to an ongoing process of engaging with the natural environment. This process itself should result in an enhanced learning and appreciation of the Mable Lake ecosystem and all its components. It should make the Mable Lake resident feel all the more fortunate to live near such a lovely feature. Since the process unavoidably must engage and inspire future generations of lake stewards, involving young people today, ensures a source of tomorrow's Mable Lake advocates.