WISCONSIN DEPARTMENT OF NATURAL RESOURCES
LAKE MANAGEMENT PLANNING GRANT PROGRAM

Application Materials

Half Moon Lake Management Planning Project

Prepared for the

Half Moon Lake Protection & Rehabilitation District

August 2013

Onterra LLC
Lake Management Planning

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INTRODUCTION

Half Moon Lake, Lincoln County, is a 100-acre seepage lake with a maximum depth of 14 feet and a mean depth of 5 feet.. Half Moon Lake is a popular destination with a single boat landing supporting 12 vehicle-trailer parking spots and surpassing maxim public access. The lake is also home to a single resort.

The Half Moon Lake Protection and Rehabilitation District (HMLPRD) was formed in 1992 to plan for the long-term management of the lake. Since its inception, the district has worked to protect Half Moon Lake, educate the people that use and care for the lake, and manage the lake through professional and volunteer monitoring. The district is a member of the Lincoln County Lakes Association, routinely sends members to the annual Wisconsin Lakes Partnership Convention, and represents the lake during county variance requests. The group has supported numerous management projects, including the completion of the lake's first management plan using Lake Management Planning Grant funds in 1994, district member surveys, a barley-straw feasibility study, participation in the Citizen Lake Monitoring Network, and a county-wide lake seminar on invasive species, shoreland plantings, fisheries, and wetland protection.

In 2012, the HMLPRD initiated a new Adopt-a-Shoreline program. As a part of this program, volunteers monitor specific sections of the Half Moon Lake shoreline for invasive species. This program would be carried through this proposed project during the summers of 2014 and 2015 with the volunteer time spent completing the surveys standing as an in-kind contribution in this project.

From the time the district was formed, its members have been concerned with the lake's nutrient content and resulting algal abundance. Recently, the district enlisted the assistance of Jim Kreitlow of the WDNR to collect and identify algae within the lake. While this project would include collection of water quality data and the integration of available historical data within in its analysis, the district is also interested in having a better understanding of the lake's nutrient content prior to settlement. To obtain that information, Paul Garrison of the WDNR would collect a single core from the deepest location of the lake and complete a top/bottom paleolimnological study. A brief report discussing the lake's current and presettlement condition would be provided by Mr. Garrison with its pertinent information being integrated within the management plan.

PROJECT GOALS

The scope of work described outlines a project and study design that looks at the lake from more of an ecosystem perspective than managing its plants or water quality alone. The scope outlines assessments of the lake's plants, watershed, shoreline condition, and water quality. It also describes the integration of available fisheries information, past aquatic plant and water quality assessments, and an intensive stakeholder participation component. The study components would provide the baseline data required to assess the lake ecosystem's condition, while the stakeholder participation portion would shed light on the expectations and needs of the lake users. The combination of these components and communications with WDNR specialists would allow a long-term and implementable plan to be created for Half Moon Lake.

The work required to develop the plan would rely on partnerships between the WDNR, the HMLPRD, and local municipalities as applicable.

Overall, the scope of work outlined in the following phase scopes would provide the HMLPRD with the following information:

- The drainage area definition (watershed) for the lake.
- The potential point-sources of pollution that may be affecting the lake.
- The areas of the lake's watershed that may be supplying excessive amounts of sediment and nutrients.
- A determination of plant community diversity for the lake and how the lake's diversity compares with other lakes in the region.
- An identification and location of important plant communities (emergent, submergent, floating-leaf) within the lake and a listing of the dominant species within those communities.
- The identification and location of any rare or threatened plant species within the lake.
- A determination of where exotic plant species (e.g., Eurasian water milfoil, curly-leaf pondweed, purple loosestrife) occur in and around the lake.
- Of the plant species found in the lake, their abundances relative to each other.
- A summary and analysis of specific chemicals found in the lake, how these concentrations compare with other lakes in the region, and what these concentrations indicate concerning the health of the lake.
- An analysis of the limiting plant nutrient (phosphorus or nitrogen) in the lake.
- The trophic state (e.g., oligotrophic, mesotrophic, eutrophic) of the lake.
- Analysis of aquatic plant management alternatives.
- A summary of recent historic fisheries data, biological information relating to specific fish species, and how it applies to the management plan.
- A listing of management options that may be utilized to protect and enhance the important and sensitive areas of the lake.
- The steps that could be taken to help improve the lake, such as work in the watershed (e.g., agricultural best management practices), shoreland restoration opportunities, in-lake native plant introductions, etc.
- The funding sources available to assist in the implementation of the pertinent management and protection options that are outlined in the lake management plan.
- An assessment of the shoreline condition and abundance of course woody habitat.
- An outline of how Onterra would assist the HMLPRD in implementing and funding the management plan.

PROJECT SCOPE

Stakeholder Participation

Stakeholder participation is a very important element in any environmental planning exercise. It is important not only from the perspective of informing participants and stakeholders about the project, but also from the standpoint of enhancing their understanding of natural ecosystems and their value to a healthy environment. If participants do not understand the value of the natural ecosystem, they will not strive to protect or enhance it.

This component of the management planning effort is intended to create an exchange of information between Onterra and the lake stakeholders, including those that own property on the lake and those that enjoy the lake through its public access. The exchange of information would flow bidirectionally between the lake stakeholders and the ecologists/planners. The ecologists/planners would provide information and guidance to help stakeholders understand the ecosystem more fully and to prepare them for the development of realistic goals and objectives concerning the management of their lake. The stakeholders would provide information pertaining to their use of the lake and their management expectations. In the end, this information would be combined to create a long-term and implementable lake management plan.

This component, as described below, would also help the ecologists/planners develop a better understanding of specific sociological needs within the district. For instance, if communication were lacking between the district board and its general membership a goal would be included within the management plan with specific actions addressing the deficiency. The need for specific or general educational initiatives would also be brought to light during this process so they too could be addressed within the management plan.

Further, during the planning process, current lake-related ordinances (at the county and town level) would be researched and discussed with the HMLPRD, county, and town. It is the experience of Onterra planners that lake residents often do not have a good understanding of ordinance specifics for their waterbody; therefore, the current ordinances would be discussed with the HMLPRD, as well as possible modifications to those ordinances or totally new ordinances that could be proposed to the town and/or county

Kick-off Meeting

Near the start of the project, a *Kick-off* meeting would be held to inform stakeholders about the project and its goals. This meeting would also provide an excellent educational opportunity that would grant an introduction to important concepts in lake ecology, such as the value and importance of a diverse aquatic plant community and the benefits of maintaining natural buffer areas around a lake. The Kick-off meeting would also provide an important forum allowing stakeholders to express their concerns and provide information about Half Moon Lake and its watershed to Onterra ecologists.

Stakeholder Survey

Comments and opinions would be solicited from Half Moon Lake stakeholders to gain important information regarding their understanding of the lake and thoughts on how it should be managed. The information would be collected through a written survey/comment form supplied to each

member household during the Kick-off meeting or by mail. This information would be critical to the development of a realistic plan by supplying an indication of the needs of the stakeholders and their perspective on the management of the lake. It would be the responsibility of the Planning Committee to prepare the survey mailing and collect and summarize the results. Onterra would create the survey content and lead the interpretation of the results. Below is an outline of these activities:

1. Onterra distributes standard survey to planning committee
2. Planning committee develops additional questions and options to be included within the survey
3. Onterra updates survey and submits to WDNR for approval
4. WDNR approved survey is provided to planning committee
5. Planning committee prints survey, stuffs surveys in envelopes, and mails out surveys to distribution list they develop
6. Onterra provides customized Excel spreadsheet to the planning committee
7. Completed surveys are returned to planning committee and they tally results in provided electronic format
8. Excel spreadsheet of entered data is emailed to Onterra for analysis

Planning Meetings

Following the completion of data analysis, up to two meetings between the ecologists/planners and a sub-committee (Planning Committee) of the HMLPRD would be conducted to facilitate the following:

- An in-depth knowledge of the conditions and ecological process within Half Moon Lake among the Planning Committee members.
- An understanding of suitable management alternatives for the lake and their possible outcomes.
- The development of realistic goals for the management of the lake.
- The creation of an *Implementation Plan* containing specific management actions that would guide the HMLPRD in meeting their management goals.

The first meeting would include a detailed presentation of the study results followed by the creation of a working-set of goals to base the implementation plan upon. The second meeting would be used to finalize the goals and formulate specific management actions that would allow the district to meet the management goals. The end-product of these meetings would be the Implementation Plan which would be included in the management plan for the lake. The final task of the Planning Committee would be to review the draft management plan/report and provide comments before it is finalized and presented to the district board of directors and general membership.

Wrap-up Meeting

At the conclusion of the project, Onterra would facilitate a *Wrap-up* meeting to present the findings and recommendations of the study and corresponding management plan to the HMLPRD. The presentation would be in an easy-to-follow format that would explain the study results and the reasons as to why certain alternatives were selected for inclusion within the plan.

It would also allow stakeholders to express concerns and ask specific questions about the Half Moon Lake ecosystem that could not be answered by Onterra ecologists before they were familiarized with the system.

Additional Public Information Forums

In addition to the meetings described above, public awareness of the project would be promoted by a district-submitted news release to local newspapers, by an informative article provided to the district members through a special mailing, and by providing a progress report approximately halfway through the study. The latter two documents would be provided to the district by Onterra. The initial news release would be used to inform stakeholders outside of the district membership that a management project is being conducted at the lake and that the district and WDNR are sponsoring and spearheading the project.

The special mailing is often used to notify the district members that a lake management project will be occurring on the lake and to inform them of the kick-off meeting. In some cases, the article contains an educational topic aimed at increasing the membership's general knowledge of lake stewardship or in some instances, for dispelling a specific myth or misunderstanding among the district members.

The project update would be in the form of a newsletter article or a special mailing and would contain information pertaining to what tasks had been completed in district with the lake management project. Study results may be included in the update, but they would be limited to those that would not be counter-productive to the planning process. Study results that could be included may refer to the fact that no exotic species were located in the lake or that measured water quality parameters are similar to those found in the past. Inappropriate results would include information that may raise undue concern among the district membership. For example, the discovery of a new exotic species would likely not be discussed unless a logical solution to the problem could be included.

Special Note on Meeting Schedule

As described above, stakeholder participation is an important aspect of a management planning project. Two types of meetings are outlined in the paragraphs above: those involving the general public (Kick-off and Wrap-up Meetings) and those involving a subcommittee of the district (planning meetings). In an effort to maximize attendance at the meetings involving the general public, Onterra suggests that those meetings be held on a Saturday. Onterra staff members enjoy spending their holiday weekends with their families just as our clients enjoy spending those same weekends with their families at the lake; therefore, Onterra cannot schedule meetings for holiday weekends. Further, not all meetings can be facilitated by Onterra's founder, Tim Hoyman, some meetings and other project aspects would be handled by Onterra's other well-trained and experienced staff members

Because the planning meetings involve a smaller group of people, we suggest that these meetings be held during a weekday afternoon or evening, preferably Monday – Thursday. Often, these meetings are held on a Thursday afternoon at a residence or other location on or near the lake.

Shoreline Condition and Course Woody Habitat Assessment

Using a GPS data collector with sub-meter accuracy, the immediate shoreline of Half Moon Lake would be surveyed and classified based upon its potential to negatively impact the system due to shoreline development and other anthropogenic impacts. Examples of these negative impacts include shoreland areas that are maintained in an unnatural manner and impervious surfaces. Further, incidences of course woody habitat, an important component of a healthy fishery, would be assessed and.

The resulting map would delineate the lake's shoreline, from the water's edge to approximately 35-feet shoreward, into one of five categories ranging from "Urbanized" to "Natural/Undeveloped". Ultimately, the information would be used to prioritize areas for restoration and protection that would likely have a benefit to the Half Moon Lake ecosystem.

During the shoreline assessment survey, all incidences of course woody debris extending at least 5 feet into the lake, in water depths exceeding 1 foot, and with trunk diameters exceeding 2 inches would be mapped and described based upon size and complexity. This type of structure is important habitat for fish and other aquatic organisms; therefore, this information would be useful in determining whether the lake management plan should include the enhancement of woody structure in the lake.

Watershed Definition and Phosphorus Load Modeling

The first step in this component would be an accurate delineation of the lake's watershed. GIS software would be used to generate a map of existing land cover types located within the watershed. The acreage of land currently attributed to each cover type would then be input into the Wisconsin Lake Model Suite (WiLMS) and a partitioning of watershed phosphorus loading, based on land cover type would be calculated. The sources of phosphorus loading for the watershed would also be graphically displayed using GIS software. During the watershed definition process, site visits would be conducted and information collected from shoreland landowners to identify potential problem point-sources (e.g., agricultural drain tile inlets) and nonpoint sources of pollution and identify land use trends, as applicable.

Using WiLMS, a response model would be created by altering the land cover types found within the Half Moon Lake watershed to indicate different scenarios (e.g. agriculture lands converted to forests). This exercise would be useful in prioritizing conservation work conducted in the watershed and would lead to realistic goals for water quality preservation and possible improvement. These goals would be expressed using Wisconsin Trophic State Index values.

This component is useful in accomplishing three goals; 1) to help target specific areas for improvement within the lake's watershed, 2) to bring a better understanding to the lake stakeholders concerning how the lake's watershed plays a key role in its water quality regardless if problems exist or not within its watershed, and 3) to determine the need for more detailed study of the watershed and the lake's nutrient budget. Particular to point 3, if the watershed analysis and in-lake phosphorus levels do not compare reasonably well, this may be an indication that other sources of phosphorus are impacting the lake, such as internal loading, point-sources, and/or private septic systems, and that further study (outside the scope of this project) would be required to fully understand the nutrient dynamics within the lake.

Lake Water Quality

Water quality conditions would be monitored within Half Moon Lake in order to complete the following:

- Assist in identifying potential water quality problems within Half Moon Lake, such as elevated nutrient levels, anaerobic conditions, etc.
- Determine the trophic state of the lake using the Carlson Trophic State Index (TSI).
    - Historic data would also be used to calculate TSI values for long-term trend analysis. This analysis would be useful in determining realistic target values for maintaining or improving the lake's water quality through watershed or in-lake management actions.
- Determine the limiting nutrient.
- Supplement and calibrate watershed assessment modeling.

The Citizens Lake Monitoring Network (CLMN) volunteers on Half Moon Lake currently collect Secchi disk transparency data and we ask that this data continue to be collected during the project. Water quality would be monitored at the deepest point in Half Moon Lake by Onterra staff. Samples would be collected at subsurface (S) and near bottom (B) depths and would occur once in spring, winter and fall, and three times during the summer. All samples requiring laboratory analysis would be processed through the Wisconsin State Laboratory of Hygiene. The parameters to be measured and sample collection timing are contained in Table 1.

Table 1. Water Quality Sample Parameters and Timing

Parameter	Spring		June		July		August		Fall		Winter	
	S	B	S	B	S	B	S	B	S	B	S	B
Dissolved Phosphorus	●	●			●	●					●	●
Total Phosphorus	●	●	●	●	●	●	●	●	●	●	●	●
Total Kjeldahl Nitrogen	●	●			●	●					●	●
Nitrate-Nitrite Nitrogen	●	●			●	●					●	●
Ammonia Nitrogen	●	●			●	●					●	●
Chlorophyll-*a*	●		●		●		●		●			
True Color	●				●							
Hardness	●				●							
Total Suspended Solids	●	●			●	●			●	●		
Laboratory Conductivity	●	●			●	●						
Laboratory pH	●	●			●	●						
Total Alkalinity	●	●			●	●						
Calcium	●				●							

Furthermore, during each sampling event, Secchi disk transparency would be recorded and a temperature and dissolved oxygen profile would be completed.

All samples requiring laboratory analysis would be processed through the Wisconsin State Laboratory of Hygiene (SLOH). The parameters to be measured, sample collection timing, designated collector, and cost coverage are contained in Table 1 (above). Secchi disk

transparency would also be included during each visit. During professionally collected samples temperature, pH, conductivity, and dissolved oxygen profiles would be completed.

Paleolimnological Study

A single bottom sample would be collected by WDNR Science Services staff for the purpose of determining nutrient conditions of Half Moon Lake prior to settlement of the area. Diatoms and other types of algae would be enumerated within the upper and lower few centimeters to determine the amount of phosphorus found in the lake during their respective times. The results of this analysis would be included within the Water Quality Section of the management plan and would shed light on how the lake has changed over the past 2 centuries.

Aquatic Plant Surveys

Aquatic plants are very important because they are the foundation of the lake ecosystem; therefore a complete and accurate assessment of the aquatic plant community is vital in every lake management project. In order to fully assess the aquatic plants, three different types of surveys would be performed: an early season AIS survey, a point-intercept survey, and an aquatic plant community mapping survey. The early season AIS survey is aimed at locating exotics early in the growing season while curly-leaf pondweed is at its peak growth and Eurasian water milfoil is higher in the water column than most native plants. The point-intercept survey is a plot-based inventory intending to characterize the relative frequency of all plants, native and exotic, and is performed at the height of the growing season. The aquatic plant community mapping survey is completed following the comprehensive survey and provides a *snapshot* of the lake's emergent and floating-leaf communities.

Overall, this task would serve to provide an accurate characterization of the lake's macrophyte community. It would indicate what species were present and where they were located, and allow for comparisons with past and future surveys. It would also help to determine where and what types of aquatic plant control, protection, and enhancement methods would be appropriate for the lake.

Early Season AIS Survey

Curly-leaf pondweed has a very unusual life cycle compared to our native plants and is at peak biomass within Wisconsin lakes during late spring/early summer. Further, Eurasian water milfoil, which begins growing much earlier than most Wisconsin native plants, is often easily spotted from the surface during early summer as it towers above other lake plants. Therefore, an inventory would be conducted on the lake during the early summer to map curly-leaf pondweed and Eurasian water milfoil occurrences within the lake. Please note that this would not be a transect- or plot-based survey, but instead, would consist of a meander survey of the lake to locate these species. If curly-leaf pondweed is found, the colonies would be mapped utilizing the submeter-accuracy GPS technology. A map depicting each colony's location and density (through color-gradients) would be created based upon the data collected in June. If Eurasian water milfoil is mapped during this survey, these sites would reassessed and the plants remapped later in the summer when Eurasian water milfoil is most likely at its peak biomass.

Point-intercept Survey

A comprehensive survey of aquatic macrophytes is used to characterize the existing communities within the lake and includes inventories of emergent, submergent, and floating-leaved aquatic plants within the lake. The point-intercept method as described in Recommended Baseline Monitoring of Aquatic Plants in Wisconsin: Sampling Design, Field and Laboratory Procedures, Data Entry, and Analysis, and Applications (WDNR PUB-SS-1068 2010) was used to complete this study by the WDNR during 2011. The survey would be completed with a point spacing of 37 meters, resulting in approximately 311 sample locations (Map 1).

The data collected by the WDNR would be analyzed by Onterra and used in the management plan. To characterize spatial distribution, *relative frequency of occurrence* would be calculated for each species found within the lake. In addition, the plant communities of the lake would be compared to those of other lakes in the ecoregion and the state using the Floristic Quality Assessment (FQA) procedures described in Nichols (1998). In general, the FQA evaluates the species found in a lake with those found in a natural, undisturbed system; indicating the health of the current plant community in the lake.

Native and Exotic Plant Community Mapping

The aquatic vegetation community types within the lake (e.g., emergent, submergent, and floating-leaved vegetation) would be mapped using the GPS technology described above, and would be based on dominant species (e.g., soft-stem bulrush, common arrowhead, large-leaf pondweed, etc.). In other words, the primary mapping unit would be the community type, but a secondary classification based on dominant species would be included on the vegetation maps. The final map would show the location of each vegetation type in the lake in relation to the lake's bathymetry. It is these communities that respond the quickest to ecological changes in the lake and the survey would provide a baseline understanding of the relative locations of these communities.

Furthermore, additional maps would indicate the areas of the lake inhabited by exotic/invasive species such as pale-yellow iris, giant reed grass, and purple loosestrife if these species are located.

Fisheries Data Integration

Summary of Baseline Data

Available historic fisheries data within the past decade from the Great Lakes Indian Fish and Wildlife Commission (GLIFWC), and the WDNR would be compiled from Half Moon Lake. This would include information relating to fish stocking, creel surveys, comprehensive fish surveys, and spear harvest data. A list of the known fish species present in the lake along with general biological information pertaining to important fish species would be provided considering spawning habitat requirements, nursery areas, and food sources.

Integration within Management Plan

Although current fish data would not be collected, the compiled historic data along with the natural history information would be considered as it pertains to the management plan. As

applicable, individual management actions within the implementation plan would be analyzed as they pertain to the health of the fish populations (e.g. timing of Eurasian water milfoil control practices, if discovered, to limit interference with spawning activities).

Professional *Dreissena* Mussel Monitoring

The WDNR samples over 100 waterbodies annually in search of larval and adult zebra and quagga mussels (both *Dreissena* sp.). Following discussions with the WDNR during the spring of 2006, Onterra purchased the necessary equipment and was trained by WDNR staff to sample lakes in search of these mussels. During each lake visit, the water column would be sampled at three sites using a 64-micron mesh plankton net in search of larval mussels (veligers). Mussel Monitoring would be completed once in June during the CLP survey and again in July or August during the community mapping survey. Samples would be preserved and packaged according to the methodology outlined in the 2005 WDNR publication, "*Dreissena* Mussel Monitoring Protocol." Because ethyl alcohol is used in the preservation process, specific rules apply for shipment and arrangements have been made to hand-deliver samples to WDNR staff at the Northeast Region Headquarters in Green Bay where they would be responsible for shipment to the location of analysis. During these and other visits to the lake, Onterra would periodically search docks, piers, and other structures for adult forms of the mussels.

PROJECT DELIVERABLES

The final product for this project would be a single report that would include the methodologies and results of the tasks described above; a discussion concerning those results as they apply to the current health, rehabilitation, and protection of Half Moon Lake; and the full-color maps described in the Project Scope. Management, protection, enhancement alternatives and recommendations would be presented along with continued public education issues. Furthermore, recommendations for remedial actions and further study options (if needed) would be included expressly for Half Moon Lake and its drainage basin; including possible funding sources and an indication as to how Onterra could assist the HMLPRD in obtaining the funding required for future projects.

Upon finalization of the report and acceptance by the WDNR, 5 hard copies of the management plan would be provided to the HMLPRD. In addition, the HMLPRD, WDNR, and county would receive two copies of the report, data, and maps on CD-ROM in Adobe's Portable Document Format (PDF).

TENTATIVE PROJECT SCHEDULE

Table 2 provides an approximate timeline for completion of the tasks. The schedule needs to be flexible to accommodate for weather, scheduling conflicts, etc., but it provides a general indication of the dates for completing the proposed components. The meeting times would be very flexible.

Table 2. Approximate Project Schedule for 2013 – 2014.

Task	2014											2015							
	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Water Quality Sample			■		■	■	■		■				■							
Kick-off Meeting					■	■														
Early-Season AIS Survey					■															
Comprehensive Plant Survey						■	■													
Project Update									■											
Shoreland Assessment Survey									■											
Data Analysis										■	■	■								
Planning Comm. Meeting													■	■						
Report – First Draft															■					
Report – Final Draft																	■			
Wrap-up Meeting																				■

VOLUNTEER EFFORTS

Task/Item	Quantity	Cost/ Unit	In-kind Match
Planning Comm. – Stakeholder Survey	5 peop. x 6 hours = 30 hrs	$12.00	$360.00
Planning Comm. – Plan Development	5 peop. x 6 hours = 30 hrs	$12.00	$360.00
Kick-off Mtg Attendance	30 peop. x 1.5 hours = 45 hrs	$12.00	$540.00
Wrap-up Mtg Attendance	30 peop. x 2 hours = 60 hrs	$12.00	$720.00
Adopt-a-Shoreline AIS Monitoring	8 peop. x 12 hours = 96 hrs	$12.00	$1,152.00
HMLPRD Grant Project Administration	2 peop. x 25 hours = 50 hrs	$12.00	$600.00
Total Estimated In-kind Match			**$3,732.00**

PROJECT COST BREAKDOWN

	Cash Cost	Donated Value
Onterra Fees		
Project Administration & Communications	$1,055.00	
Stakeholder Participation	$3,260.00	
Watershed Assessment	$1,690.00	
Water Quality Assessment	$3,300.00	
Fishery Data Compilation & Integration	$845.00	
Shoreline & Course Woody Habitat Assessment	$785.00	
Early-Season AIS Survey	$1,065.00	
Point-Intercept Survey	$2,265.00	
Aquatic Plant Community Mapping	$1,025.00	
Data Analysis and Report/Plan Creation	$4,770.00	
Onterra Printing & Shipping	$300.00	
Travel (Lodging, Incidentals, & Mileage @ 0.58/mi)	$1,375.00	
Professional Dreissena Mussel Monitoring		$800.00
Subtotal	*$21,735.00*	
Other Fees		
State Laboratory of Hygiene Fees	$1,407.78	
Stakeholder Survey Printing and Mailing Costs	$900.00	
HMLPRD Project-Related Printing Costs	$500.00	
Paleolimnological Sampling & Reporting	$800.00	
Subtotal	*$3,607.78*	
Volunteer & In-kind Match Opportunities		
Planning Comm. – Stakeholder Survey		$360.00
Planning Comm. – Plan Development		$360.00
Kick-off Mtg Attendance		$540.00
Wrap-up Mtg Attendance		$720.00
Adopt-a-Shoreline AIS Monitoring		$1,152.00
HMLPRD Grant Project Administration		$600.00
Subtotal	*$25,342.78*	*$4,532.00*
Project Total	**$29,874.78**	
State Share Requested (67%)	**$20,016.10**	

Resolution of Half Moon Lake Protection and Rehabilitation District

County of Lincoln Town of Bradley

Whereas, Half Moon Lake is an important resource used by the public for recreation and enjoyment of natural beauty; and
Whereas, a study and examination of the lake will lead to better understanding and will promote the public health, comfort, convenience, and public welfare: and
Whereas, we recognize the need for responsible and holistic long-range planning to better manage the lake, its watershed, and its use; and
Whereas, we recognize the need to provide information and education on the use of the lake and the natural lake ecosystem; and
Whereas, we are qualified to carry out the responsibilities of the planning project; and
Whereas, we understand the importance of a continuing management program for Half Moon Lake and intend to proceed on that course.

Therefore, be it resolved that Half Moon Lake Protection and Rehabilitation District requests grant funding and assistance available from the Wisconsin Department of Natural Resources under the " Lake Management Planning Grant Program" and hereby Authorizes John Penn to act on behalf of the Half Moon Lake Protection and Rehabilitation District to submit an application to the State of Wisconsin for financial aid for lake planning purposes; sign documents; take necessary action to undertake, direct and complete an approved lake planning grant; and submit reimbursement claims along with necessary supporting documentation within six months of project completion date.

Be it further resolved that the Half Moon Lake Protection and Rehabilitation will meet the obligations of the planning project including timely publication of the results and meet financial obligations under the lake planning grant including the prompt payment our 33% commitment to project costs.

Adoption: Unanimously passed by annual meeting

Date: June 15, 2013

Vote: See minutes June 15, 2013 meeting

John Penn

John Penn
W5963 Elizabeth Lane
Tomahawk, WI 54487

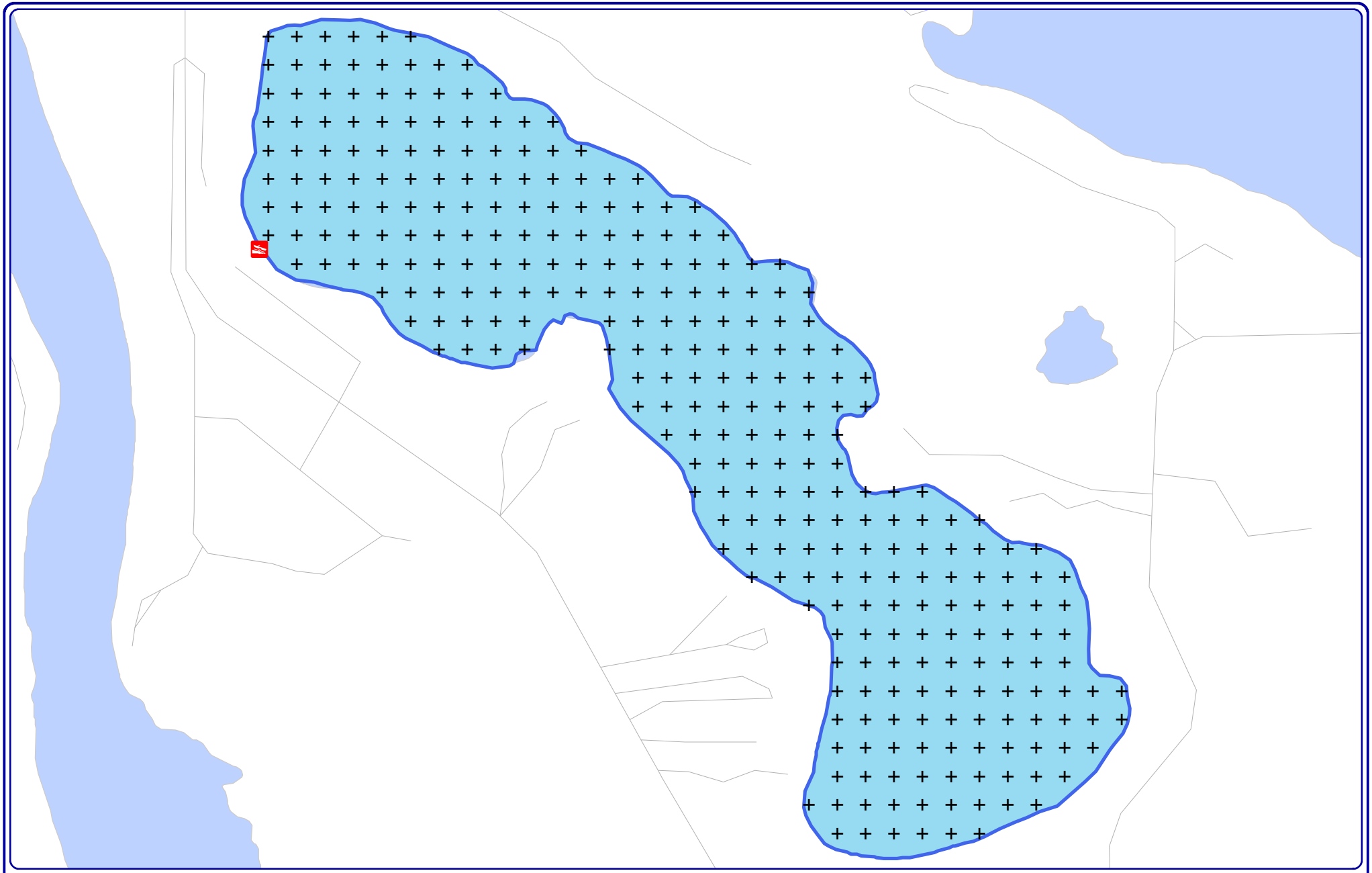
715 612 -2034

jpmams@hotmail.com

Half Moon Lake Management District Annual Meeting Minutes
~~July~~ June 15th, 2013

Members Present: John & Bonnie Penn, Rand & Diane Foss, Garth & Carla Gerstenberger, Tom Kelly, Clarann Stalker, Jerry & Pat Lamer, Fran & Kathy Lamer, Chis & Kay Lynn, Barb Augustine, Jack Lauder, Howard & Donna Elliot, Betsy Parker, Steve & Stacy Lucia, Cliff Frey, John Wanie, Mike & Marguerite Cummings, Pat & Bruce Bishop, John & Jude Running.

1) Approved Minutes from 2012. (Elliot & Kelly) Approved Unanimously.
2) Treasurer's Report (Lamer & Penn) Approved Unanimously
    a. June 2012 balance: $4283.86
    b. Disbursements: $1554.99
    c. Income: $1976.60
    d. June 2013 balance: $4705.47
    e. CD's at Tomahawk Community Bank:
        i. Matures 1/28/13 $4458.13
        ii. Matures 11/30/13 $8242.33
        iii. Matures 8/9/13 $5489.13
    f. Total Available Funds: $22,895.43
3) Audit Report (books all looked good) Audit by: Garth Gerstenberger
4) Water Quality Report by: Carla Gerstenberger
    a. No reports of invasive at this time, please continue to monitor and report to Carla.
    b. Adopt a shoreline project volunteers will continue to monitor for invasive species.
    c. Water clarity and lake levels have improved.
5) Fishing Report by Garth Gerstenberger: Keep promoting catch and release for bass. Fish are healthy, but many bass were taken last year by others coming onto our lake.
6) Lake Planning Grant by John Penn:
    a. Reviewed what we have done in the past.
    b. Onterra Corporation will be working with our District to adopt a management plan.
    c. The district will pay 33% of the cost or about $6000.
    d. Onterra will do a lake analysis and evaluate the lake, they will then make suggestions of what can be done to improve lake quality. Plant, fish, septic, and chemical analysis will be conducted. Onterra will look into point sources of any problems.
    e. A motion was made to approve the resolution of the Lake Planning Grant from Onterra. (Stalker & Foss) Approved Unanimously
7) Fosses reported on Lincoln County Lakes Association meeting.
8) Oak wilt has been found in our area, please watch your oak trees for dying leaves. Do not cut or trim oaks between April and July. (it increases the spread of oak wilt) Contact Brian Schwingle: Forest Insect and Disease Specialist: 715-536-0889.
9) Discussed purchasing land in the sensitive area of the lake. (as defined by the DNR in the 2002 lake survey)
    a. A motion was made to pursue research into the purchase three properties (Weiss, Hein, and 10.89 acres north of the channel) and to pursue a grant to purchase these three properties. (Gerstenberger & Lamer) Approved Unanimously. If the grant is received a special meeting will be called before any money will be spent.
10) Tom Kelly and Clarann Stalker will share the secretary duties. Carla Gerstenberger was re-elected at a commissioner.



N
W E
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550
Feet

Onterra LLC
Lake Management Planning
815 Prosper Road
De Pere, WI 54115
920.338.8860
www.onterra-eco.com

Sources:
Roads and Hydro: WDNR
Map Date: October 22, 2012

Project location shown in red.

Legend

- Half Moon Lake ~ 105 acres
  WDNR Definition
- \+ Point-Intercept Survey Location
  37-meter spacing, 311 total points
- Public Access

Map 1

Half Moon Lake

Lincoln County, Wisconsin

Proposed Project Location & Boundaries

State of Wisconsin
Department of Natural Resources

Lake Management Grant Application

Form 8700-283 (R 11/07)

Notice: Use of this form is required by the DNR for any application filed pursuant to ch. NR 190 or 191, Wis. Adm. Code. Personal information (PI data) collected on this form, including such data as your name, address, phone number, etc., will be used for management and enforcement of DNR programs, and is not intended to be used for any other purpose. Information will be made accessible to requesters under Wisconsin's Open Records laws (s. 19.32 – 19.39, Wis. Stats.) and requirements.

Section I: Application Type

☒ **Lake Management Planning Grant**

Check one:

- ☒ Large-scale planning grant
- ☐ Small-scale planning grant

Check one:

- ☐ Self-help lake trend monitoring package
- ☐ Lake education
- ☐ Organizational development
- ☐ Other study or assessment, or multiple-purpose project

☐ **Lake Management Protection Grant**

Check one:

- ☐ Wetland restoration
- ☐ Ordinance development
- ☐ Lake Improvement
- ☐ Lake classification
- ☐ Land or easement acquisition

Legislative District Numbers	
Senate	Assembly
12	35

To determine your legislative district, go to
http://165.189.139.210/WAML//
Type in complete address, next screen shows information

Section II: Applicant Information

Applicant
Half Moon Lake Protection and Rehabilitation District

Lake Name
Jersey Flowage

Size in Acres
433

Project County/Township/Section/Range
15

Type of Eligible Applicant

- ☐ County
- ☐ Tribe
- ☐ Other Governmental Unit
- ☐ City
- ☐ Sanitary District
- ☐ Non Profit Conservation Organization
- ☐ Village
- ☒ Lake District
- ☐ Town
- ☐ Lake Association
- ☐ School Districts (Planning)

Authorized Representative Named by Resolution John Penn	Project Contact Name Tim Hoyman
Authorized Representative Title Chairman	Project Contact Title Aquatic Ecologist, Onterra, LLC
Address W5963 Elizabeth	Address 815 Prosper St.
City / State / ZIP Code Tomahawk / WI / 54537	City / State / ZIP Code De Pere / WI / 54115
Daytime Phone (area code) 715.612.2034	Daytime Phone (area code) 920.338.8860
Evening Phone (area code)	Evening Phone (area code)
E-mail Address jpmams@hotmail.com	E-mail Address thoyman@onterra-eco.com

Mail Check to: (if different from applicant)

Name and Title	Address		
Organization	City	State	ZIP Code

For DNR Use Only

Application Type	Date Received	Date Reviewed (LC)	Lake Coordinator Approval / Date
Waterbody ID#	Adequate Public Access ☐ Yes ☐ No	Environmental Grants Specialist Approval / Date	
Eligible Project ☐ Yes ☐ No	Eligible Applicant ☐ Yes ☐ No	Project Priority Rank	
Prior Grant Award(s) ☐ Yes ☐ No	Fiscal Year(s)	Amount Received To Date $	Project Awarded ☐ Yes ☐ No

Section III: Project Information

Project Title	Proposed Ending Date
Half Moon Lake Management Planning Project	December 31, 2015

Other Management Units Around Lake	Letter of Support	Other Management Units Around Lake	Letter of Support
1. Town of Bradley (Will be sent separately)	☒	4.	☐
2. Lincoln County LWCD (Will be sent separately)	☒	5.	☐
3.	☐	6.	☐

Section IV: Lake Access

Number of Public Vehicle Trailer Parking Spaces Available at Public Access Sites:	12
Number of Public Access Sites on Lake Including Boat Launches and Walk-ins:	1

Section V: Cost Estimate and Grant Request

Section V must be completed or application will be returned. Details in support of Section V are welcome.	**Project Costs**		
	Column 1 Cash Costs	**Column 2 Donated Value**	**DNR Use Only**
1. Salaries, wages and employee benefits			
2. Consulting services	$21,735.00	$800.00	
3. Purchased services – District printing costs	$500.00		
4. Other purchased services (specify): Survey printing and mailing	$900.00		
5. Plant material			
6. Supplies (specify)			
7. Depreciation on equipment			
8. Hourly equipment use charges			
9. State Lab of Hygiene (SLOH) Costs	$1,407.78		
10. Non-SLOH Lab Costs - Paleolimnology	$800.00		
11. Land or easement acquisition value			
12. Associated acquisition costs			
13. Other (specify) Volunteer Efforts		$3,732.00	
14. **Subtotals** (sum each column)	$25,342.78	$4,532.00	
15. **Total Project Cost Estimate** (sum of **column 1 plus** sum of **column 2**)	$29,874.78		
16. **State Share Requested** (up to 67% of total costs may be requested)	$20,016.10		

Up to 67% of total costs may be requested, subject to the following maximum grant amounts:

- Large-scale lake planning projects—up to $25,000
- Small-scale lake planning projects—up to $3,000
- Lake classification and regulation or ordinance development projects—up to $50,000
- Lake protection projects (other than lake classification and regulation or ordinance development projects)--up to $200,000

Section VI: Attachments (check all that are included)

A. For all applicants:

- [x] 1. Authorizing resolution
- [x] 2. Letters of support
- [x] 3. Map of project location and boundaries
- [x] 4. Itemized breakdown of expenses
- [x] 5. For projects that entail sending samples to the State Laboratory of Hygiene (SLOH) only: a completed SLOH Projected Cost Form
- [x] 6. Project scope/description:
  - [x] a. Description of project area
  - [x] b. Description of problem to be addressed by project
  - [x] c. Discussion of project goals and objectives
  - [x] d. Description of methods and activities
  - [x] e. Description of project products or deliverables
  - [x] f. Description of data to be collected, if applicable
  - [x] g. Description of existing and proposed partnerships
  - [x] h. Discussion of role of project in planning and/or management of lake
  - [x] i. Timetable for implementation of key activities
  - [x] j. Plan for sharing project results
  - [x] k. Other information in support of project not described above

B. For applicants that are Lake Management Organizations (LMOs) or Non-profit Conservation Organizations (NCOs):

- [ ] 1. For first time applicant LMOs only: A completed Form 8700-226 (Lake Association Organizational Application)
- [ ] 2. For first time applicant NCOs only: Copy of IRS 501(c)(3) determination letter and copies of your Articles of Incorporation and Bylaws
- [ ] 3. List of national and/or statewide organizations with which you are affiliated
- [ ] 4. List of board members' names, including municipality and county of residence. Designate officers
- [ ] 5. Documentation of current financial status
- [ ] 6. For land or easement acquisition projects: Detailed description of your organization's land management experience
- [ ] 7. Brochures, newsletters, annual reports or other information about your organization

C. Wetland Restoration Projects:

- [ ] 1. Deed, easement, or land control agreement
- [ ] 2. Preliminary engineering plans
- [ ] 3. Water regulatory permits

D. Ordinance Development Projects:

- [ ] 1. Inventory of applicable existing ordinances
- [ ] 2. Description of resources each jurisdiction allocates to enforcement
- [ ] 3. Preliminary surveys

E. Lake Improvement Projects:

- [ ] 1. Engineering and design plans
- [ ] 2. Water regulatory permits
- [ ] 3. Map of project location and boundaries

Section VI: Attachments, continued

F. Land or easement acquisition projects:

- ☐ 1. DNR Form 1800-1 (Environmental Hazards Assessment Form)
- ☐ 2. Legal description of the property
- ☐ 3. Project location boundary map
- ☐ 4. Property or easement appraisal (if not previously submitted to the Department)
- ☐ 5. If escrow closing, the title insurance commitment
- ☐ 6. Evidence of compliance with Uniform Relocation Act requirements, if applicable
- ☐ 7. Agricultural Impact Statement, if applicable
- ☐ 8. Status of acquisition negotiations, including expected time frame for closing
- ☐ 9. A land management plan
  - ☐ a. Full description of property and conditions
  - ☐ b. Description of current and proposed uses of property and adjoining properties
  - ☐ c. Management requirements for property
  - ☐ d. If roads, piers or grading are proposed, a topographic survey with feature locations, and design cross sections

Section VII: Certification

I certify that information in this application and all its attachments are true and correct and in conformity with applicable Wis. Statutes.

Print/Type Name of Authorized Representative	Title of Authorized Representative
John Penn	Chairman
Signature of Authorized Representative	Date Signed

LAKE/RIVER PLANNING GRANTS PROJECTED LAB COSTS First Year FY 2014

Lake Name: Half Moon Lake
Waterbody ID#: 988000
County: Lincoln
Applicant Name: Half Moon Lake Protection & Rehabilitation District
Will the Lab be doing filtation for dissolved parameters? (Y/N) N
Will field tests be recorded on the Lab Slip? N

Review Period:
Application Period:

Test ID	Parameter	Samples/Month 2013 July	Aug	Sept	Oct	Nov	Dec	2014 Jan	Feb	Mar	Apr	May	Jun	Analyses/ Fiscal Year	Price/ Analysis	Annual Cost For Parameter
	NUTRIENTS															
I530CLD	DISSOLVED REACTIVE P (ORTHO)										2			2	$16.67	$33.34
I520PLT	TOTAL PHOSPHORUS										2		2	4	$23.60	$94.40
I520PLD	TOTAL DISS PHOSPHORUS (AS P), (EPA 365.1)													0	$23.60	$0.00
I470DLT	TOTAL KJELDAHL NITROGEN										2			2	$32.99	$65.98
I460MLD	NITRATE+NITRITE (AS N), DISS (EPA 353.2)										2			2	$27.00	$54.00
I440NLD	AMMONIA-N, DISSOLVED										2			2	$25.89	$51.78
	OTHER WET CHEMISTRY															
I305ALT	AUTOMATED CONDUCTIVITY, PH & ALKALINITY										2			2	$22.00	$44.00
I120ALT	ALKALINITY, GRAN TECHNIQUE													0	$54.00	$0.00
I240FLT	CHLORIDE													0	$20.00	$0.00
I251UNF	CHLOROPHYLL A, FLUORESCENCE, FIELD FILTERED													0	$23.28	$0.00
I251UNL	CHLOROPHYLL A, FLUORESCENCE LAB FILTERED										1		1	2	$24.52	$49.04
I290ALT	COLOR, TRUE, PT-CO										1			1	$25.00	$25.00
I340IR1	HARDNESS, CALCULATION METHOD (When Metals Done)										1			1	$5.37	$5.37
	HARDNESS, CALCULATION METHOD (When Metals not Done)													0	$52.82	$0.00
I600ELT	SULFATE (EPA 375.2)													0	$26.00	$0.00
I650JLT	SUSPENDED SOLIDS										2			2	$18.80	$37.60
I640ILD	TOTAL DISSOLVED SOLIDS, 180 C													0	$17.13	$0.00
I650JLV	TOTAL VOLATILE SOLIDS													0	$10.03	$0.00
I660NLT	TURBIDITY													0	$10.00	$0.00
I720BLT	FIELD TESTS (For each labslip with Field Testing Recorded)										2		2	4	$3.00	$12.00
	TOTAL METALS															
I230IR1	CALCIUM, TOTAL RECOVERABLE, ICP	0	0	0	0	0	0	0	0	0	1	0	0	1	$13.00	$13.00
I370IR1	IRON, TOTAL RECOVERABLE, ICP													0	$13.00	$0.00
I390IR1	MAGNESIUM, TOTAL RECOVERABLE, ICP													0	$13.00	$0.00
I400IR1	MANGANESE, TOTAL RECOVERABLE, ICP													0	$13.00	$0.00
I540IR1	POTASSIUM, TOTAL RECOVERABLE, ICP													0	$13.00	$0.00
I580IR1	SODIUM, TOTAL RECOVERABLE, ICP													0	$13.00	$0.00
I322IR1	DIGESTION, TOT. RECOV. LOW LEVEL, ICP + ICP SETUP	0	0	0	0	0	0	0	0	0	1	0	0	1	$21.45	$21.45
	WATER BACTI															
B152ALT	E COLI ENZYMATIC SUBTRATE QUANTITRAY MPN													0	$37.00	$0.00
B200ALT	Fecal Coliform (MFFCC)	0	0	0	0	0	0	0	0	0	0	0	0	0	$37.00	$0.00
														Grand Total =		$506.96
	Number of Inorganic Lab Slips (Machine Determined)	0	0	0	0	0	0	0	0	0	2	0	2	4	**=Total Inorganic Lab Slips for Fiscal Year**	
	Number of Bacti Lab Slips (Machine Determined)	0	0	0	0	0	0	0	0	0	0	0	0	0	**=Total Bacti Lab Slips for Fiscal Year**	
	Number of Inorganic Lab Slips (from workplans)															

LAKE/RIVER PLANNING GRANTS PROJECTED LAB COSTS Second Year FY 2015

Lake Name: Half Moon Lake
Waterbody ID#: 988000
County: Lincoln
Applicant Name: Half Moon Lake Protection & Rehabilitation District
Will the Lab be doing filtation for dissolved parameters? (Y/N) N
Will field tests be recorded on the Lab Slip? N

Review Period: 2014 2015
Application Period:

Parameter	Samples/Month July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Analyses/ Fiscal Year	Price/ Analysis	Annual Cost For Parameter
NUTRIENTS															
DISSOLVED REACTIVE P (ORTHO)	2							2					4	$17.17	$68.68
TOTAL PHOSPHORUS	2	2		2				2					8	$24.31	$194.46
TOTAL DISS PHOSPHORUS (AS P), (EPA 365.1)													0	$24.31	$0.00
TOTAL KJELDAHL NITROGEN	2							2					4	$33.98	$135.92
NITRATE+NITRITE (AS N), DISS (EPA 353.2)	2							2					4	$27.81	$111.24
AMMONIA-N, DISSOLVED	2							2					4	$26.67	$106.67
OTHER WET CHEMISTRY															
AUTOMATED CONDUCTIVITY, PH & ALKALINITY	2												2	$22.66	$45.32
ALKALINITY, GRAN TECHNIQUE													0	$55.62	$0.00
CHLORIDE													0	$20.60	$0.00
CHLOROPHYLL A, FLUORESCENCE, FIELD FILTERED													0	$23.98	$0.00
CHLOROPHYLL A, FLUORESCENCE LAB FILTERED	1	1		1									3	$25.26	$75.77
COLOR, TRUE, PT-CO	1												1	$25.75	$25.75
HARDNESS, CALCULATION METHOD (When Metals Done)	1												1	$5.53	$5.53
HARDNESS, CALCULATION METHOD (When Metals not Done)													0	$54.40	$0.00
SULFATE (EPA 375.2)													0	$26.78	$0.00
SUSPENDED SOLIDS	2			2									4	$19.36	$77.46
TOTAL DISSOLVED SOLIDS, 180 C													0	$17.64	$0.00
TOTAL VOLATILE SOLIDS													0	$10.33	$0.00
TURBIDITY													0	$10.30	$0.00
FIELD TESTS (For each labslip with Field Testing Recorded)	2	2						2					6	$3.09	$18.54
TOTAL METALS															
CALCIUM, TOTAL RECOVERABLE, ICP	1	0	0	0	0	0	0	0	0	0	0	0	1	$13.39	$13.39
IRON, TOTAL RECOVERABLE, ICP													0	$13.39	$0.00
MAGNESIUM, TOTAL RECOVERABLE, ICP													0	$13.39	$0.00
MANGANESE, TOTAL RECOVERABLE, ICP													0	$13.39	$0.00
POTASSIUM, TOTAL RECOVERABLE, ICP													0	$13.39	$0.00
SODIUM, TOTAL RECOVERABLE, ICP													0	$13.39	$0.00
DIGESTION, TOT. RECOV. LOW LEVEL, ICP + ICP SETUP	1	0	0	0	0	0	0	0	0	0	0	0	1	$22.09	$22.09
WATER BACTI															
E COLI ENZYMATIC SUBTRATE QUANTITRAY MPN													0	$38.11	$0.00
Fecal Coliform (MFFCC)	0	0	0	0	0	0	0	0	0	0	0	0	0	$38.11	$0.00
													Grand Total =		$900.82

Number of Inorganic Lab Slips (Machine Determined)	2	2	0	2	0	0	0	2	0	0	0	0	8	**=Total Inorganic Lab Slips for Fiscal Year**
Number of Bacti Lab Slips (Machine Determined)	0	0	0	0	0	0	0	0	0	0	0	0	0	**=Total Bacti Lab Slips for Fiscal Year**
Number of Inorganic Lab Slips (from workplans)														

LAKE/RIVER PLANNING GRANTS PROJECTED LAB COSTS Grand Total

Lake Name: Half Moon Lake
Waterbody ID#: 988000
County: Lincoln
Applicant Name: Half Moon Lake Protection & Rehabilitation District

Review Period:
Application Period:

Parameter	Analyses For Grant	Grant Cost For Parameter
NUTRIENTS		
DISSOLVED REACTIVE P (ORTHO)	6	$102.02
TOTAL PHOSPHORUS	12	$288.86
TOTAL DISS PHOSPHORUS (AS P), (EPA 365.1)	0	$0.00
TOTAL KJELDAHL NITROGEN	6	$201.90
NITRATE+NITRITE (AS N), DISS (EPA 353.2)	6	$165.24
AMMONIA-N, DISSOLVED	6	$158.45
OTHER WET CHEMISTRY		
AUTOMATED CONDUCTIVITY, PH & ALKALINITY	4	$89.32
ALKALINITY, GRAN TECHNIQUE	0	$0.00
CHLORIDE	0	$0.00
CHLOROPHYLL A, FLUORESCENCE, FIELD FILTERED	0	$0.00
CHLOROPHYLL A, FLUORESCENCE LAB FILTERED	5	$124.81
COLOR, TRUE, PT-CO	2	$50.75
HARDNESS, CALCULATION METHOD (When Metals Done)	2	$10.90
HARDNESS, CALCULATION METHOD (When Metals not Done)	0	$0.00
SULFATE (EPA 375.2)	0	$0.00
SUSPENDED SOLIDS	6	$115.06
TOTAL DISSOLVED SOLIDS, 180 C	0	$0.00
TOTAL VOLATILE SOLIDS	0	$0.00
TURBIDITY	0	$0.00
FIELD TESTS (For each labslip with Field Testing Recorded)	10	$30.54
TOTAL METALS		
CALCIUM, TOTAL RECOVERABLE, ICP	2	$26.39
IRON, TOTAL RECOVERABLE, ICP	0	$0.00
MAGNESIUM, TOTAL RECOVERABLE, ICP	0	$0.00
MANGANESE, TOTAL RECOVERABLE, ICP	0	$0.00
POTASSIUM, TOTAL RECOVERABLE, ICP	0	$0.00
SODIUM, TOTAL RECOVERABLE, ICP	0	$0.00
DIGESTION, TOT. RECOV. LOW LEVEL, ICP + ICP SETUP	2	$43.54
WATER BACTI		
E COLI ENZYMATIC SUBTRATE QUANTITRAY MPN	0	$0.00
Fecal Coliform (MFFCC)	0	$0.00
	Grand Total =	$1,407.78

LINCOLN COUNTY
LAND INFORMATION & CONSERVATION DEPARTMENT
Lincoln County Service Center
801 N Sales Street-Suite 105
Merrill, WI 54452

Phone (715) 539-1049
Fax (715) 539-8093

July 29, 2013

Mr. Jim Kreitlow
Wisconsin Department of Natural Resources
107 Sutliff Avenue
Rhinelander, WI 54501-3349

Dear Jim,

The Lincoln County Land Information and Conservation Department is in support of the Half Moon Lake District proposal for the development of a Comprehensive Lake Management Plan.

A management plan will provide the lake association with information and recommendations on how to continue to protect and/or improve Half Moon Lake and its resources. Lincoln County has identified lake resource issues as a resource concern and objective within the Lincoln County Land and Water Resource Management Plan. This proposed planning effort will coincide with the action items identified in the Land and Water Resource Management Plan and data gathered during this proposed project will be utilized by the County in updating this plan as well as program planning.

The Land Information and Conservation Department staff is willing to cooperate with and assist the Half Moon Lake District with this proposal.

Sincerely,

Diane Hanson
Land Services Administrator

Lake Planning Grant Priorities Large-Scale Ranking Questions	Ranking Points	Half Moon Lake	Notes
A. The degree to which the project contributes toward a holistic set of alternatives to assist local decision-making or contributes to the formation of a strategy to enhance or maintain the quality of a lake ecosystem.			
1) Completes or updates a comprehensive lake management plan.	2 points	2	Completes Management Plan
2) Identifies and prioritizes lake management needs and sets goals (long-term focus).	1 point	1	Implementation Plan Development
3) Provides specific lake water quality management objectives (resource desired conditions in TSI or other accepted index).	1 point	1	Watershed scenario development using WiLMS would lead to realistic TSI value goals.
4) Provides specific objectives for watershed or land use management (loading reduction strategy, identify critical sites, or develops land management ordinances).	1 point	1	Land cover & WiLMS modeling will point to troublesome areas. Shoreline condition and course woody habitat assessment will identify critical areas in need of restoration.
5) Provides specific management objectives for fish, aquatic life or wildlife habitat.	1 point	1	Implementation Plan Development
6) Provides a specific sociological management objective (recreational use, education, organization, regulatory, incentive program).	1 point	1	Plan is largely and educational initiative, complete with meetings and stakeholder survey to integrate sociological components
B. The degree to which the planning project will enhance knowledge and understanding of a lake's fish, aquatic life and their habitats.			
1) Project inventories fish, aquatic life or wildlife and their habitats ~~but will not include management recommendations.~~	1 point	1	Fisheries section, Emergent/floating-leaf vegetation surveys, Shoreline assessment
2) Develops a comprehensive assessment of fish, aquatic life or wildlife habitat with management recommendations (aquatic plant management plan, shoreland restoration plan, spawning site protection plan, species habitat management plan, etc.).	2 points	2	Shoreline assessment may lead to shoreland restoration within implementation plan. Aquatic plant management needs, if any, will be outlined
3) Information will be used in development of a DNR Sensitive Area Designation or shoreland restoration and protection program for the lake.	2 points	2	Shoreline condition and course woody habitat assesment plus implementation plan
4) Project has direct benefit to the protection of listed threatened, rare or endangered species that are known to use the lake for habitat.	1 point	0	Listed as NHI water and is considered ASNRI, though no specific aquatic species listed - WDNR NHI search may indicate specific species.
C. The degree to which the planning project will enhance knowledge and understanding of a lake's watershed conditions that affect or have potential to affect a lake's ecosystem.			
1) Delineate watershed boundary, map existing and future land uses and associated acreage and estimate annual pollutant loadings from watershed using standard runoff coefficients. For regional land use planning projects loading estimates may be substituted by an analysis of the quantity, type and location of various land uses and their relationship to lake water quality.	1 point	1	Watershed delineation, land cover type assessment, and WILMS modeling utilizing water quality data
2) Identify surface runoff patterns and delineates environmentally sensitive areas in the lake watershed (wetlands, habitat, steep slopes, riparian buffer zones, etc).	1 point	1	Combination of watershed assessment and emergent/floating-leaf community mapping.
3) Inventory and review in detail the adequacy of institutional programs effecting lake quality (land use planning, management, regulations, enforcement).	2 points	2	Ordinance review and possible enhancement/development with planning committee
4) Develops a comprehensive assessment and management strategy for watershed pollution source(s). Partition actual load(s) by subwatershed or source(s) [septic, feedlots, etc.] conducts a loading reduction feasibility analysis and creates a nutrient or stormwater management plan that recommends BMPs, ordinances, etc.	2 points	0	Not Applicable
D. The degree to which the proposed planning project enhances local understanding of the lake's water quality, potential uses and factors which affect a lake's water quality.			
1) Secchi or other single parameter monitoring will be conducted and reported.	1 point	1	Contains Secchi water clarity monitoring
2) Condition specific monitoring for a specific purpose (Three parameter TSI, internal loading, tributary contribution, algae speciation, etc.).	1 point	1	WTSI would be created for Chlorophyll, phosphorus, and water clarity
3) Development of a lake nutrient budget. Multiple parameter lake and tributary monitoring with sufficient frequency to characterize whole lake conditions and make management decisions.	2 points	0	Not Applicable
4) Generates lake condition response model output.	2 points	2	Use WILMS modeling and creating response scenarios based on changing land cover types
E. The degree to which the project will likely result in significant improvement in the management of a lake or lakes and lake ecosystems. (What implementation activities will result?)			
1) Project completes a planning effort including a strategy (who, what, when) for implementation.	1 point	1	Implementation plan development
2) Project will provide design information (technical specifications) for specific management project implementation (e.g. lake protection grant application).	1 point	0	If specific management action components are deemed necessary through the management planning process, the implementation plan would outline those technical specifications.
3) Project results are critical to support larger specific planning or management efforts (TMDL, water quality standards, ordinance development, lake restoration, etc.).	1 point	1	Implementation plan will develop ways to maintain or enhance the ecosystem by addressing water quality, aquatic plants, shoreland restoration, ect. Current/potential ordinances will be examined and discussed with lake group.

Lake Planning Grant Priorities Large-Scale Ranking Questions	Ranking Points	Half Moon Lake	Notes
F. The availability of public access to, and public use of, the lake. (Check only one)			
1) The lake has more than the minimum public boating access as defined in s. NR 1.91(4), (5) or (6) and is 100 surface acres or greater.	1 point	1	Has one public access site with 7+ vehicle-trailer parking spaces (must exceed 5)
2) The lake has significant other public access and use opportunities that include two of the following at separate locations: public swimming beach; park or other public land with accessible lake frontage; public fishing pier; platted access sites and road rights-of-way reaching the water's edge, two or more private resorts or youth camps; or more than 50% of the lakeshore is in public ownership as documented on the map provided with application.	1 point	0	Only has one resort
G. The degree to which the proposed planning project complements other lake management efforts, is supported by other affected management units and leverages other local community funds for the project.			
1) 10% or more of the financial or in-kind project match is coming from a management unit or interest group other than the sponsor.	1 point	0	All project funds and volunteer efforts will be borne by sponsor
2) Grant is being used as matching funds to leverage other financial assistance beyond required sponsor match for lake planning grant.	1 point	0	Not applicable
3) Letters of support from 2 or more eligible management units.	1 point	1	This is included
4) This project continues or completes a previously started project. A phased project where other phases are specifically defined and scheduled.	1 point	0	Not a phased project
H. The importance of the information obtained from a planning project to the state as identified in its resource management plans.			
1) Implementation of specific recommendations from the GMU/basin plan or County Land and Water Resources Management Plan.	2 points	2	Addressed in County's letter of support
2) Project results will be used to amend these plans at the time of the next update.	1 point	1	CD copy of plan will be sent to the county for use in their county plan update.
I. Whether the project is a first time large-scale project for a lake.	1 point	0	