

Bill Tischendorf

From: Tim Hoyman [thoyman@onterra-eco.com]
Sent: Tuesday, October 26, 2010 11:56 AM
To: 'Bill Tischendorf'
Subject: Hancock Lake Proposal
Attachments: Hancock_Oneida_Proposal_Planning_Oct10_v1.pdf

Hello Bill,

Attached to this email, please find a proposal for developing a lake management plan for Hancock Lake, Oneida County. While the proposal is pretty much self-explanatory, I would like to reiterate a few points. First, the proposal should be seen as a starting point in developing a project design. With many groups, it meets the needs of the lake association; however, with others, there is some tweaking done to assure that the project meets the group's and the lake's needs. Also, we will write the grant applications at no charge to the association if the association agrees to use Onterra to complete the project as outlined in the proposal. Further, the group is not required to complete the project if we are not successful in our grant applications.

I look forward to hearing from you regarding this proposal,

Tim

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Please Note: No part of the attached proposal can be used for the creation of a Request for Proposal, Grant Application, or any other purpose, without the permission of Onterra, LLC.

INTRODUCTION

Onterra, LLC (Onterra) is pleased to provide this proposal for studies and reports related to *Lake Management Planning* for Hancock Lake, Oneida County (Map 1). Specifically, the proposed project design is tailored to meet the goals and the needs of the Hancock Lake Association (HLA).

Overall, the studies outlined in the following proposal would provide the HLA 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.
- 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 outline of how Onterra would assist the HLA in implementing and funding the management plan.

PROJECT SCOPE

Task 1 – Stakeholder Participation & Education

Education 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.

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 Hancock Lake and its watershed to Onterra ecologists.

Stakeholder Survey

Comments and opinions would be solicited from Hancock 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 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 the data collection and analysis, up to two meetings would be held in order to present the project's results and preliminary recommendations to a sub-committee (Planning or Steering Committee) of the HLA and to complete a prioritized implementation plan. These would be very important meetings because they would facilitate the combination of the technical aspects of the project and the prioritized goals of the lake stakeholders. The result of this combination would be the *Lake Management Plan* for Hancock Lake.

Onterra would facilitate both meetings by making the necessary contacts and by supplying result summaries in the form of hardcopy maps and narratives along with projected presentations.

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 HLA. 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 Hancock 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, Onterra would also promote public awareness of the project by writing an article for the HLA's newsletter (or create a special mailing if one does not exist) and by providing a progress report approximately halfway through the study. Onterra requests the HLA submits press releases to the local newspapers describing the project and announcing the general membership meetings (*Kick-off* and *Wrap-up* meetings).

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 association (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.

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.

Task 2 – 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.

Overall, this task is useful in accomplishing two goals; 1) to help target specific areas for improvement within the lake's watershed, and 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 the watershed.

Task 3 – Lake Water Quality

Water quality conditions would be studied to assist in identifying potential water quality problems in Hancock Lake (e.g., elevated phosphorus levels, anaerobic conditions, etc.). In addition, the water quality monitoring effort would continue the process of creating a water quality database that could be used to track long-term trends within the lake.

Members of the HLA currently collect data as a part of the Citizen's Lake Monitoring Network (CLMN). The trained volunteers would continue to collect samples using WDNR Citizen Lake Monitoring Network protocols, occurring once in spring and three times during the summer. These volunteers would also collect nitrogen samples (outside of CLMN) to be used in the planning process. In addition to the samples collected by HLA members, professional water quality samples would be collected at subsurface (S) and near bottom (B) depths and would occur once in spring, winter and fall. This would allow determinations of limiting nutrients and internal nutrient dynamics to be made. Although HLA members would collect a spring total phosphorus sample, professionals would also collect this sample to coincide with the bottom total phosphorus sample. The parameters to be measured, sample collection timing, designated collector, and cost coverage are contained in Table 1.

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

Table 1. Water Quality Sample Parameters and Timing

Parameter	Spring		June	July	August	Fall		Winter	
	S	B	S	S	S	S	B	S	B
Total Phosphorus	■◆	■	◆	◆	◆	■	■	■	■
Dissolved Phosphorus	■	■						■	■
Chlorophyll- <i>a</i>	■		◆	◆	◆	■			
Total Kjeldahl Nitrogen	■	■	●	●	●	■		■	■
Nitrate-Nitrite Nitrogen	■	■	●	●	●	■		■	■
Ammonia Nitrogen	■	■	●	●	●	■		■	■
Laboratory Conductivity	■	■							
Laboratory pH	■	■							
Total Alkalinity	■	■							
Total Suspended Solids	■	■				■	■	■	■
Calcium	■								

◆ indicates samples collected as a part of the Citizen Lake Monitoring Network.

● indicates samples collected by volunteers under proposed project.

■ indicates samples collected by consultant under proposed project.

Task 4 – Shoreline Assessment

Using a GPS data collector with sub-meter accuracy, the immediate shoreline of Hancock Lake will be surveyed and classified based upon its potential to negatively impact the system. Examples of these negative qualities include shoreland areas that are maintained in an unnatural manner and impervious surfaces. The map created would attempt to prioritize areas for restoration that would likely have a benefit to the Hancock Lake ecosystem.

Task 5 - 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: a curly-leaf pondweed survey, a comprehensive survey, and an aquatic plant community mapping survey. The curly-leaf pondweed survey is aimed at locating this exotic early in the growing season before it dies back in early summer. The comprehensive 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.

Curly-leaf Pondweed Assessment

Curly-leaf pondweed (*Potamogeton crispus*) has a very unusual life cycle compared to our native plants and is at peak biomass within Wisconsin lakes during late spring/early summer. Therefore, an inventory would be conducted on the lake during the early summer to map curly-leaf 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 curly-leaf pondweed colonies. If curly-leaf pondweed is found, the colonies would be mapped utilizing the GPS technology discussed above. If curly-leaf pondweed were to be discovered (it is believed to be in the lake), a map depicting each colony's location and density (through color-gradients) would be created.

Comprehensive Survey

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) will be used to complete this study by the WDNR during 2011 (as it was in preceding years). The survey will be completed with a point spacing of 45 meters, resulting in approximately 514 sample locations (Map 1).

The data collected would be further 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 (please see the enclosed figure from Muskellunge Lake, Vilas County for an example of this type of map). 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 Eurasian water milfoil (*Myriophyllum spicatum*) and purple loosestrife (*Lythrum salicaria*), both of which are known to exist in or around Hancock Lake.

Task 7 – Fisheries Data Integration

Summary of Baseline Data

Available historic fisheries data within the past decade from the WDNR and other available resources would be compiled from Hancock Lake. This would include information relating to fish stocking, creel surveys, and comprehensive fish surveys. 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 to limit interference with spawning activities).

Task 8 - 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 curly-leaf pondweed 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. Hancock Lake has never been surveyed for mussels. The results of the 2011 survey would be important in future management planning activities.

Not only would Onterra complete these surveys at no cost to the association, the HLA would be able to use the professional time need to collect the zebra mussel veliger (larval stage) samples as an in-kind contribution, lowering the cash costs of the project.

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 Hancock 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 Hancock Lake and its drainage basin; including possible funding

sources and an indication as to how Onterra could assist the HLA in obtaining the funding required for future projects.

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

It is important to remember that a management plan is worthless unless its strategies are followed and its alternatives are implemented. It is our goal to partner with the HLA to complete this proposed project and the lake management plan; and we are prepared to continue that partnership in the coming years by assisting with implementation of that plan, if applicable. We would do this by not only providing consultation on specific management alternatives outlined in the plan, but also by assisting the HLA in obtaining grant funding for a portion of project costs, if applicable. In other words, Onterra would be available to assist with the implementation of the plan and help find ways to fund it.

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 2011 – 2012. Lake Planning Grant applications are due August 1 and February 1 of each year.

Task	2011												2012											
	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S				
Grant Due																								
Water Quality Sample																								
Kick-off Meeting																								
Curly-leaf Pondweed Survey																								
Comprehensive Plant Survey																								
Project Update																								
Data Analysis																								
Planning Comm. Meeting																								
Report – First Draft																								
Report – Final Draft																								
Wrap-up Meeting																								

VOLUNTEER AND IN-KIND OPPORTUNITIES

The use of volunteers within a lake management project is important for two reasons; first and foremost, it gives stakeholders the opportunity to be involved with the project and as a result increases their understanding of the lake while providing ownership in the project. Second, if the management project is being partially funded through a WDNR grant, the volunteer involvement stands as in-kind labor and offsets the local share of the project.

In order for volunteer efforts to be considered as an in-kind match, those efforts must be clearly outlined within the grant application and play an integral role within the project. Applicable volunteer efforts would include participation at project meetings, planning committee work, etc. Within the project described here, we believe the following opportunities exist as detailed in Table 3. Please note that Table 4 also includes Onterra's contribution of professional time for collecting the zebra mussel veliger samples.

Table 3. Possible in-kind match opportunities for project.

Task/Item	Unit	Quantity	Cost/ Unit	In-kind Match
Planning Comm. – Stakeholder Survey	hr	8 peop. x 6hr = 48hr	\$12.00	\$576.00
Planning Comm. – Plan Development	hr	8 peop. x 6hr = 48hr	\$12.00	\$576.00
Kick-off Mtg Attendance	hr	40 peop. x 1hr = 40hr	\$12.00	\$480.00
Wrap-up Mtg Attendance	hr	40 peop. x 2hr = 80hr	\$12.00	\$960.00
HLA Grant Project Administration	hr	50hr	\$12.00	\$600.00
Total Estimated In-kind Match				\$3,192.00

PROJECT COST ESTIMATE

The cost for completing the study and management plan is outlined in Table 4, including, travel time billed at ½ normal rates and mileage at \$0.58/mi.

Table 4. Project Cost Breakdown

	Cash Cost	Donated Value
Onterra Fees		
Project Setup & Administration	\$1,265.00	
Stakeholder Participation	\$3,260.00	
Watershed Assessment	\$1,690.00	
Water Quality Assessment	\$1,955.00	
Fishery Data Compilation & Integration	\$1,175.00	
Shoreline Assessment	\$1,085.00	
Curly-leaf Pondweed Survey	\$1,550.00	
Point-intercept Plant Survey (Analysis & Integration Only)	\$1,120.00	
Aquatic Plant Community Mapping	\$1,995.00	
Data Analysis and Report/Plan Creation	\$4,335.00	
Printing, Shipping, & Plant Vouchering Materials	\$500.00	
Travel (Lodging, incidentals, & mileage @ \$0.58/mi)	\$1,580.00	
Professional Dreissena Mussel Monitoring		\$800.00
<i>Subtotal</i>	\$21,510.00	
Other Fees		
State Laboratory of Hygiene Fees	\$1,420.52	
Stakeholder Survey Printing & Mailing	\$800.00	
Volunteer & In-kind Match Opportunities		
Planning Comm. – Stakeholder Survey		\$576.00
Planning Comm. – Plan Development		\$576.00
Kick-off Mtg Attendance		\$480.00
Wrap-up Mtg Attendance		\$960.00
HLA Grant Project Administration		\$600.00
<i>Subtotal</i>	\$23,730.52	\$3,992.00
Project Total	\$27,722.52	
Grant Specifics		
WDNR Portion	\$20,791.89	
Local Match	\$6,930.63	
Actual Cash Cost to HLA	\$2,938.63	
WDNR Planning Grant Prepayment to HLA	\$14,173.40	

As related in the Table 4 described above, the total project cash cost before the grant is applied, would be \$23,730.52 if all components were included within the project. Further, after the grant is applied, including all in-kind opportunities, the final cash cost to the HLA would be approximately \$2,938.63. Please note the following:

- Onterra's contracts are completed on a lump-sum basis billed periodically as work is completed.
- Travel wages are proposed based on ½ billable rates and are included within the respective component requiring travel.
- Travel mileage is based on \$0.58 per mile.

- Inkind volunteer contributions will further reduce the overall cash costs for the HLA. There may be a possibility that some of the ongoing volunteer efforts being conducted within the HLA can be utilized – as long as the volunteer time is not already being used to offset the costs of an existing grant. It is important to note that once the project total (including inkind contributions) exceeds \$26,666.66, additional inkind dollars are no longer able to reduce the cash costs of the project unless a third lake management planning grant is obtained. The third grant would need to be applied for during the next grant cycle as each lake can only apply for two grants per cycle.

GRANT WRITING ASSISTANCE

The project outlined above would qualify for partial funding through the Wisconsin Lake Planning Grant Program. Specifically, the WDNR would cover 75% of the total costs involved with the project.

In Table 4 above, project costs, as they relate to a grant-funded project are listed:

WDNR Portion accounts for 75% of the project total which includes all cash costs and in-kind contributions (donated value).

Local Match is the amount of the project total that is responsibility of the project sponsor (HLA). This equals 25% of the project total and includes in-kind and cash costs.

Actual Cash Cost to HLA is the amount of cash outlay the HLA would incur if the project was completed according to budget and all in-kind volunteer labor was completed as outlined.

WDNR Prepayment to HLA is the amount of money the WDNR would provide to the HLA before the project begins. This amount equates to 75% of the WDNR Portion less State Laboratory of Hygiene Fees, as these are paid immediately upon acceptance of the project.

Please note that the grant is truly a reimbursement program, meaning that after the prepayment is spent, the HLA would need to incur costs and then file for reimbursements upon project completion and acceptance of the report.

Also note that the Lake Management Planning Project would need to be completed in two concurrent phases in order to receive the full 75% funding from the WDNR because each grant would only pay for 75% up to \$10,000. This also requires that two separate grant applications be completed.

Onterra would write the grant applications, at no charge if the HLA agrees to use Onterra as their consultant to complete the studies and management plan if the project is funded. Please note that the HLA would not be obligated to complete the project with Onterra if the grants were not approved.



Map 1
Hancock Lake
 Oneida County, Wisconsin
Project Location
& Lake Boundaries

- Legend**
-  Hancock Lake MDNR Definition
 -  Point-intercept Sample Location
45-meter spacing, 514 total locations
 -  Public Boat Landing



Extent of large map shown in red.



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Sources:
 Reotis & Hydro: WDNR
 Map date: October 25, 2010
 File name: Hancock_Lake_mpl_project.mxd



Draft Map

Muskellunge Lake

Vilas, County, Wisconsin

Aquatic Plant Communities

Large Plant Communities

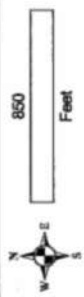
- Emergent
- Floating-leaf
- Mixed Floating-leaf & Emergent

Small Plant Communities

- Emergent
- Floating-leaf
- Mixed Floating-leaf & Emergent



Extent of large map shown in red.



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Source:
 Aquatic Plant: Olesen, 2009
 Orthophotography: NADP, 2005
 Map Date: February 25, 2010