

---

**WDNR Lake Planning Grant Proposal  
Large-Scale Project**

**Lake Alice Stewardship Program:  
Phase I – Baseline Information Gathering  
and Adaptive Lake Management Plan**

**Submitted to:**

Wisconsin Department of Natural Resources  
Attention: Kevin Gauthier, Lake Coordinator  
107 Sutliff Avenue  
Rhineland, Wisconsin 54501  
Phone 715-365-8937, Fax 715-365-8932

**Prepared and Submitted by:**

Lake Alice Association  
Contact: Glenn Mott  
W 4945 Echo Point  
Tomahawk, WI 54487  
Phone: (715) 453-7378; E-mail: glen.mott@yahoo.com

And

White Water Associates, Inc.  
Contact: Dean B. Premo, Ph.D., President  
429 River Lane, P.O. Box 27  
Amasa, Michigan 49903  
Phone: (906) 822-7889; E-mail: dean.premo@white-water-associates.com

**Date:** January 26, 2009

---

---

## TABLE OF CONTENTS

INTRODUCTION .....	1
PROJECT AREA .....	2
PROBLEM STATEMENT .....	5
PROJECT GOALS AND OBJECTIVES .....	7
METHODS AND ACTIVITIES .....	11
PROJECT PRODUCTS.....	12
DATA TO BE COLLECTED.....	12
EXISTING AND PROPOSED PARTNERSHIPS.....	13
ROLE OF PROJECT IN PLANNING AND/OR MANAGEMENT OF LAKE ALICE .....	14
TIMETABLE FOR IMPLEMENTATION OF KEY ACTIVITIES.....	14
PLAN FOR SHARING PROJECT RESULTS .....	15
BUDGET FOR PHASE I.....	16
SUPPLEMENTAL INFORMATION IN SUPPORT OF PROJECT.....	16

---

---

## INTRODUCTION

This proposal seeks a large-scale lake management planning grant from the Wisconsin Department of Natural Resources (WDNR) Lake Planning Grants program. Our vision is to ensure the perpetuation of a healthy Lake Alice and its surrounding landscape far into the future. We believe that the tool by which to realize this vision is an adaptive management plan for the Lake Alice watershed. We conceive of a several year program, composed of annual phases that progress toward the overall vision. In the first phase proposed herein, we plan to gather and review relevant information and begin the development of an adaptive lake management plan for Lake Alice. Among other topics, future annual phases will focus on water quality monitoring, native aquatic plants, littoral zone and near-shore riparian area condition, photographic documentation of the shoreline, and identifying and mapping aquatic invasive species. This is the first large-scale project that addresses the long-term health of Lake Alice. The proposal is presented by the Lake Alice Association (LAA) with technical assistance by White Water Associates, Inc.

The Lake Alice Association has committed to stewardship of Lake Alice by way of a lake management plan. At the 2008 annual meeting, the Association Board voted unanimously to move forward in developing a lake plan. After review and approval of the management plan developed in the Phase I project, they will formally adopt the plan through Board action.

We adopt the concept of “adaptive management” in our approach to the Lake Alice Stewardship Program. Simply stated, adaptive management uses findings from planned monitoring activities to inform future management actions and periodic refinement of the plan. An adaptive management plan accommodates new findings by integrating this information into successive iterations of the comprehensive plan. The plan will therefore be a dynamic entity, successively evolving and improving to fit the needs of Lake Alice and its watershed. Adaptive management admits to our uncertain knowledge about natural ecosystems and allows us to adjust the plan to changing conditions and new information. Monitoring the outcomes of plan implementation is absolutely essential to the process of adaptive management. We think that monitoring should focus on specific indicators designed to measure the progress toward program goals. Future project phases will define indicators for monitoring plan implementation.

---

Besides this introduction section, we organize this proposal around the topics outlined in the WDNR Lake Management Grant Application including (1) Project Area, (2) Problem Statement, (3) Project Goals and Objectives, (4) Methods and Activities, (5) Project Products, (6) Data to be Collected, (7) Existing and Proposed Partnerships, (8) Role of Project in Planning and/or Management of Lake, (9) Timetable for Implementation of Key Activities, (10) Plan for Sharing Project Results, (11) Budget for Phase I, and (12) Supplemental Information in Support of Project.

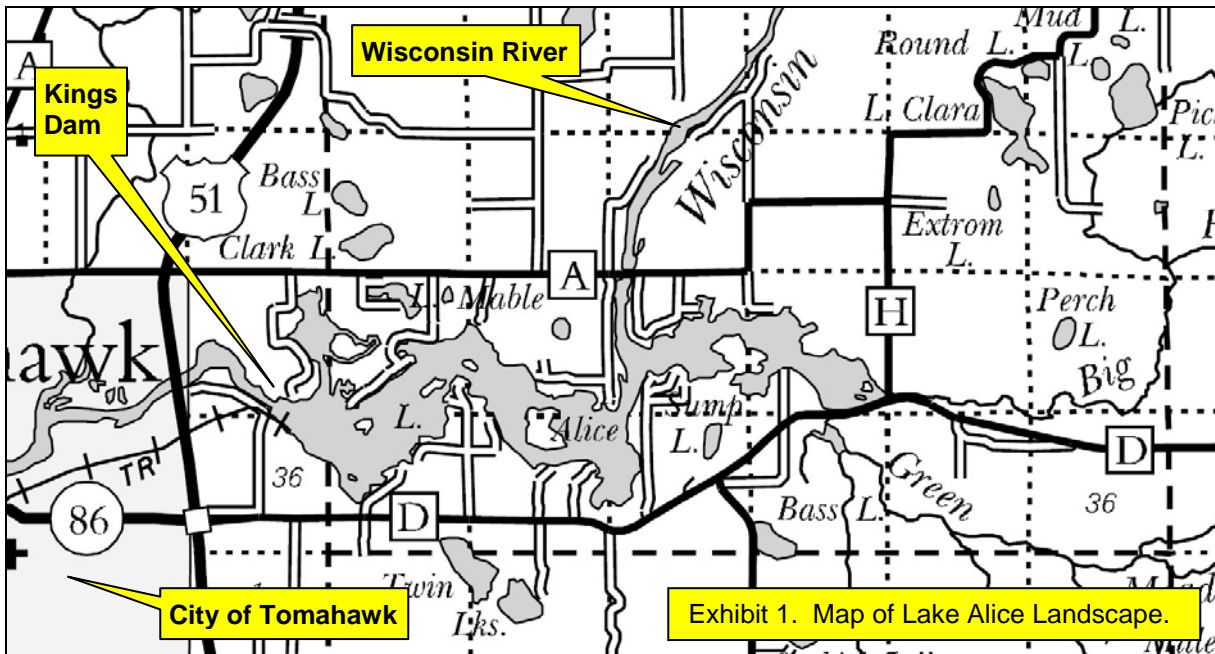
## **PROJECT AREA**

The proposed project views Lake Alice as part of a larger landscape ecosystem (for purposes of this program, the “Lake Alice Watershed”). Since Lake Alice is a part of the Wisconsin River system, its overall watershed is enormous. Lake Alice also has its own smaller surrounding watershed. The lake is affected by the watershed and the watershed is influenced by the lake in an integrated ecological system. Although Phase I of the program will focus on Lake Alice itself and the associated riparian ecosystem, future phases will address others aspects of the watershed as part of an integrated and adaptive management system. In this section, we briefly describe Lake Alice and its surroundings.

Lake Alice is a 1,369 lake on the Wisconsin River. It is in the Upper Wisconsin River Watershed and located near the town of Tomahawk in Lincoln County, Wisconsin. Despite its large surface area, Lake Alice is a fairly shallow lake and has a maximum depth of about 32 feet. It has a tremendous diversity of aquatic habitats. Lake Alice can be best described as an “impoundment” in the Wisconsin River as its water level is controlled by King’s Dam (operated by Tomahawk Power and Pulp and controlled by Wisconsin Valley Improvement Company). Exhibit 1 shows the Lake Alice area and identifies major features.

Lake Alice is an important resource used by the public for a diversity of recreational pursuits. There are seven public access sites on Lake Alice with a total of forty-one parking spaces. A portage has been installed and maintained around King’s Dam to facilitate canoe and kayak enthusiasts in getting around the dam. There are twelve daily rental and one-hundred yearly rental campsites available around Lake Alice. Public access for fishing from shore is available at the ends of township roads and at several points along Hwy D and Echo Valley Road. Public access for shore fishing is also available on the Kings Dam property (except in the immediate vicinity of the dam). Lincoln County owns several small islands on

Lake Alice that are used for camping and waterfowl hunting. Up the river from Lake Alice, The State of Wisconsin owns 1,785 acres of land available for public use including hunting and fishing. Some of the land is only accessible by water route from public access sites on Lake Alice. Fishing tournaments are a fairly frequent occurrence on Lake Alice.



Some volunteer collected water quality data is available for Lake Alice. Secchi readings typically range less than five feet. Since it is a reservoir licensed by the Federal Energy Regulatory Commission (FERC), it is likely that other Lake Alice data exists and can be available to this project. This baseline information will be extremely useful in the initial phase of the project.

Because of Lake Alice's proximity to human population centers, it is a popular body of water for fishing and other forms of water-based recreation. Because of this high level of use, it is important to understand the water quality and watershed conditions that influence this recreational value.

Lake Alice provides habitat for rare species such as common loon, bald eagle, and likely rare plants. As can be seen from the aerial photo (Exhibit 2), Lake Alice has a significant amount of undeveloped riparian area (both wetland and upland) and this harbors habitat for many plant and animal species including rare forms.

---

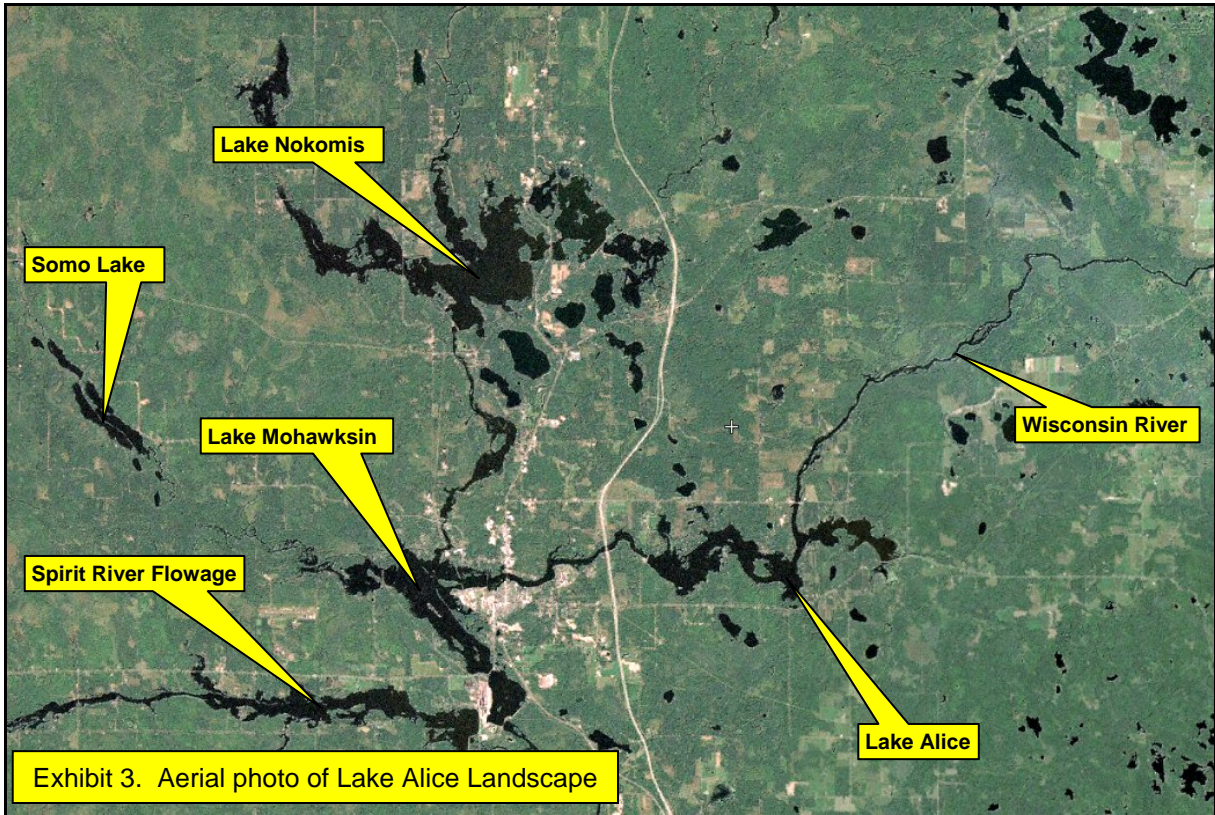
Exhibit 2. Aerial photo of Lake Alice



Reportedly, Lake Alice is host to the non-native, invasive purple loosestrife and curly leafed pondweed. It is also reported to harbor the Chinese mystery snail and the potentially destructive rusty crayfish. As far as we understand, Eurasian water milfoil has not been found in Lake Alice. All of these invasive, non-native species need to be part of an adaptive management plan for Lake Alice. Future phases of the plan will focus on aquatic invasive species. Identifying where they exist and mapping their distribution will be a priority for Lake Alice planning and management.

The immediate Lake Alice landscape has numerous lakes including Bass L., Clark L., Lake Mable, Sump L., Twin Lakes, Lake Clara, Round L., Perch L., Mud L., Extrom L., Gerbick L., Pickerel L., and Reno L. all within a two to three mile radius. In addition to the Wisconsin River, two smaller streams enter Lake Alice: Green Meadow Creek and Big Pine Creek. This complex of aquatic habitats forms an abundance of riparian habitats for birds, mammals, amphibians, reptiles, and invertebrates that require this kind of habitat.

The larger Lake Alice landscape is also dominated by large bodies of water (see aerial photo, Exhibit 3). Lake Nokomis, Lake Mohawksin, Spirit River Flowage, and Somo L. form an enormous interconnected water landscape that is certainly a target for migrating and breeding waterfowl and other birds. Lake Alice has value and function in this larger landscape as well.



The various attributes of the Lake Alice watershed described above combine to make this area exceedingly unique. It is therefore a worthy goal to develop a management plan that serves to perpetuate this high quality ecosystem far into the future. The next section describes the opportunities we now have to progress toward this goal.

## **PROBLEM STATEMENT**

This section describes the unique opportunity that exists to create an adaptive comprehensive lake management plan for the Lake Alice watershed that will stand the difficult test of successful implementation. As the previous section described, the Lake Alice watershed is large and diverse. It is an essentially healthy and functioning landscape ecosystem. Our challenge is to perpetuate that condition into the future by conserving high quality features and restoring aspects that have been degraded. The opportunity for success stems from an unusual and capable set of program partners that are prepared to devote

---

themselves to the realization of the program vision. These partners include the members of the Lake Alice Association, science faculty and students of Tomahawk High School, the ecological scientists of White Water Associates, Inc., and the WDNR. These partners are described in later sections. As previously stated, the Lake Alice Association is highly motivated to prepare and adopt a lake management plan. This active group of Lake Alice stakeholders is a ready and willing source of in-kind talent in creating and implementing the Lake Alice management plan.

The mantra of watershed restoration groups across North America is, “Protect the best and restore the rest.” Lake Alice and its watershed has high quality areas that are worthy of a management plan that seeks to protect this high quality condition. Other aspects may need more active restoration. Funding this program that seeks to establish baseline conditions and create a plan of action is a good investment by the WDNR.

The challenge of the first phase of this program is to gather and assess existing relevant information, identify important gaps in that information, and create a practical initial plan that serves specific goals. The team of participants is up to this challenge and the specific goals and objectives of the first phase of the project are addressed in the next section. In the spirit of adaptive management, the lake management plan that results from Phase I will be the first iteration plan and will form the basis for more expanded versions to be developed and refined in subsequent project phases.



---

## PROJECT GOALS AND OBJECTIVES

Our goals in Phase I of the Lake Alice Stewardship Program are to (1) inventory relevant information on the lake and its watershed, (2) prepare an initial version of the adaptive comprehensive lake management plan, (3) deliver educational elements that serve to convey information about Lake Alice and the project.. There are several objectives and associated tasks that support these goals and we consider these in this section.

***Objective 1. Develop a strategy to perpetuate the quality of Lake Alice and its watershed.***

**Task 1A:** Articulate a general strategy in the form of a Lake Planning Grant proposal.

**Task 1B:** Meet with project partners to identify and prioritize lake management needs and establish long-term goals for the Lake Alice Stewardship Program.

**Task 1C:** Meet with project partners at outset of project to develop agreed upon strategy and specific approach to the Phase I project (Inventory of Relevant Information and Adaptive Lake Management Plan).

**Task 1D:** Finalize assignment of tasks to various project partners.

***Objective 2. Gather, consolidate, assess, and manage information about fish and aquatic life and habitats of Lake Alice.***

**Task 2A:** Collect and review historical information regarding Lake Alice fish. (This will be done in consultation with Kevin Gauthier, WDNR Lakes Coordinator, to ensure completeness. Sources include FERC records, WDNR records, anecdotal information.)

**Task 2B:** Interview WDNR Fish Biologist for detailed information about the Lake Alice fishery. (This effort will be coordinated with Kevin Gauthier, WDNR Lakes coordinator, to ensure completeness of questions.)

**Task 2C:** Collect and review existing information about other aquatic life in the lake (including invertebrates and plants).

**Task 2D:** Collect and review existing information about other aquatic or wetland habitats that influence Lake Alice.

***Objective 3. Gather, consolidate, assess, and manage information about Lake Alice water quality and potential risks to water quality.***

---

**Task 3A:** Collect and review existing limnological information about Lake Alice. (This will be coordinated with Kevin Gauthier, WDNR Lakes Coordinator, to ensure completeness. Sources may include FERC records, WDNR records, and available volunteer information.)

**Task 3B:** Analyze and summarize existing Lake Alice water quality data.

**Task 3C:** Prepare a regimen of water quality sampling for future phases that will include water sampling, trophic status analysis, and modeling. (This task will be undertaken in consultation with Kevin Gauthier, WDNR Lakes Coordinator).

***Objective 4. Gather, consolidate, assess, and manage information about the Lake Alice Watershed, especially those attributes relevant to lake health.***

**Task 4A:** Delineate the Lake Alice watershed.

**Task 4B:** Map land cover/use and soils of the watershed.

**Task 4C:** Map slopes to identify runoff patterns and environmentally “risky” areas in terms of contribution of non-point source (NPS) pollution to Lake Alice. (**NOTE:** In future phases, we plan to estimate potential pollutant loadings into Lake Alice.)

**Task 4D:** Determine existing institutional programs that effect lake quality. (For example soil and sediment control, FERC license requirements/restrictions on Kings Dam, GMU basin plan, county land and water resources management plan, and township zoning ordinances.)

***Objective 5. Prepare a catalog of Lake Alice environmental, cultural, and aesthetic attributes with a qualitative evaluation of quality and associated potential threats.***

**Task 5A:** Through collaboration with students, teachers, and LAA members, list Lake Alice environmental, cultural, and aesthetic attributes and describe each.

**Task 5B:** Articulate a qualitative evaluation of each of the identified attributes. Are the attributes of high, medium, or low quality?

**Task 5C:** Identify and briefly describe potential threats to the quality of each of the identified attributes.

**Task 5D:** Site visit to Lake Alice for reconnaissance of attributes.

(**NOTE:** In future phases, we plan to use USEPA habitat assessment protocol and the WDNR supplemental methodology to evaluate and document shoreline and littoral zone quality. A future phase will also include photographic records of Lake Alice shoreline.)

---

***Objective 6. Prepare a history of the Lake Alice human community.***

**Task 6A:** Conduct interview of selected living lake residents and lake users.

**Task 6B:** Inventory existing written information about the Lake Alice community.

**Task 6C:** Prepare a written history that documents and consolidates findings of first two tasks and that can be incorporated or appended in the lake management plan.

***Objective 7. Create an initial adaptive lake management plan for Lake Alice that will serve to ensure high quality lake management and will serve as a firm foundation for future iterations of the plan.***

**Task 7A:** Using information gathered in Objectives 2, 3, 4, and 5 develop adaptive management recommendations for Lake Alice. These recommendations should include topics such as water quality, fish habitat, special species habitat (rare plants and animals), sensitive areas, non-native species, and threats to Lake Alice health.

**Task 7B:** Prepare a written adaptive management plan that follows standard scientific format and includes sections on implementation, monitoring, and adaptive management.

In the initial version (Phase I), the plan will lay the basis for its expansion in future phases. It will identify where more information is required.

***Objective 8. Integrate recommendations from the GMU/basin plan and/or County Land and Water Resources Management Plan into the Lake Alice Plan.***

**Task 8A:** Review existing GMU/basin plan and County Land and Water Resources Management Plan and draw from these as appropriate in the Lake Alice Plan.

**Task 8B:** Prepare a written section of the Lake Alice Plan that documents this review.

***Objective 9. Deliver an educational program that serves to increase support, capacity, and involvement of the Lake Alice Association, Tomahawk High School faculty and students, and other stakeholders and enhances local understanding of Lake Alice water quality and factors that affect lake health.***

**Task 9A:** Provide formal and informal technical assistance to Tomahawk High School faculty and students. (**NOTE:** This includes site visit as part of Objective 5 where White Water Associates staff and Tomahawk High School teacher(s) and students will be present. This also includes two phone conferences with LAA, THS, and White

Water. It also includes availability of White Water staff by phone and email to THS teachers and students and LAA members.)

**Task 9B:** Provide written education material about the project and about water quality aspects of Lake Alice that can be used for press releases and as handouts at lake association gatherings and other meetings.

**Task 9C:** Contribute materials to the Lake Alice Association website that highlights ongoing aspects of the Lake Alice Stewardship Program and the Phase I project.

By adopting the “adaptive management” paradigm, we anticipate that the planning, implementation, and monitoring process will be ongoing over several years and we will design the resulting adaptive comprehensive lake management plan to accommodate future findings and management direction modifications. Future phases will build on the foundation established in Phase I. Monitoring indicators will be developed and applied. Other aspects of the Lake Alice watershed ecosystem will be explored. For example, future phases will address water quality sampling, AIS mapping, watershed wetlands, more thorough aquatic and riparian vegetation assessment and mapping, current and anticipated land use and land cover, survey of lake users on desired future conditions of Lake Alice, and education of lake users on topics such as the importance of the riparian zone to lake health. Future phases will include revisions to the comprehensive lake management plan and monitoring tasks that support adaptive management. The timeline (Exhibit 4) illustrates the various anticipated project phases.

Exhibit 4. Time line for anticipated phases of Lake Alice stewardship.				
Year 1	Year 2	Year 3	Year 4	Year 5
Baseline information review and 1 <sup>st</sup> Lake Management Plan (LMP)	Water quality sampling, trophic status, modeling, AIS, and 2 <sup>nd</sup> iteration of LMP.	Water quality sampling, continue with AIS, Aquatic Plant Survey, 3 <sup>rd</sup> iteration of LMP	Water quality, lake shore photo archive, USEPA/WDNR habitat assessment, 4 <sup>th</sup> iteration of plan.	Water quality analysis, develop monitoring indicators, 5 <sup>th</sup> iteration of plan.

In the next section, we discuss the methods and activities that will be undertaken to meet the first phase goals and objectives. We also provide initial task assignments.

## METHODS AND ACTIVITIES

The three principal partners in the proposed Phase I project (Lake Alice Association, White Water scientists, and Tomahawk High School faculty and students) will conduct tasks outlined in the previous section. Existing information will be gathered, reviewed, assessed as to its relevancy to the project, and summarized. When appropriate, scientific literature will document project recommendations. An assignment of tasks is outlined in Table 1.

<b>TABLE 1. TASKS AND RESPONSIBILITIES FOR PHASE I</b>			
<i>1=Primary responsibility; 2=Secondary responsibility</i>			
<i>Key to Organizations: Lake Alice Association (LAA), Tomahawk High School (THS), White Water Associates, Inc. (WWA)</i>			
TASK	LAA	THS	WWA
Task 1A: Conceive and articulate general strategy.	1	2	1
Task 1B: Identify/prioritize initial management needs and long-term goals.	1	2	1
Task 1C: Develop Phase I strategy and approach.	1	2	1
Task 1D: Finalize task assignments.	1	1	1
Task 2A: Collect and review fishery information.	2	2	1
Task 2B: Interview WDNR fish biologist.	2	2	1
Task 2C: Collect and review info about other aquatic life.	2	2	1
Task 2D: Collect and review info about aquatic and wetland habitats.	2	2	1
Task 3A: Collect and review existing limnological information.	2	2	1
Task 3B: Analyze/summarize water quality data.		2	1
Task 3C: Prepare water quality sampling regimen.	2	2	1
Task 4A: Delineate the Lake Alice watershed.		2	1
Task 4B: Map land cover/use and soils of the watershed.		2	1
Task 4C: Map slopes to identify runoff patterns.		2	1
Task 4D: Determine existing institutional programs.	1		
Task 5A: List Lake Alice environmental, cultural, and aesthetic attributes.	1	1	2
Task 5B: Qualitatively evaluate each of the attributes.	1	1	2
Task 5C: Identify and describe potential threats to Lake Alice attributes.	1	1	2
Task 5D: Site visit to Lake Alice for reconnaissance of attributes.	2	2	1
Task 6A: Conduct interviews.	1		
Task 6B: Inventory written information about community.	1		
Task 6C: Prepare a written history.	1		
Task 7A: Develop adaptive management recommendations.	2	2	1
Task 7B: Prepare management plan.	2	2	1
Task 8A: Review existing GMU/basin plan and other plans.	1		2
Task 8B: Prepare written section of plan that documents this review.	2		1
Task 9A: Technical assistance to THS faculty/students.	2		1
Task 9B: Written education material/press release.	1	2	2
Task 9C: Contribute project-related information to LAA website.	1	2	1

---

## PROJECT PRODUCTS

There are two principal products during Phase I of the Lake Alice Stewardship Program: (1) the initial version of the Adaptive Lake Management Plan integrating the findings and outcomes of Phase I, and (2) the educational program. Each of these is described in below.

***Adaptive Lake Management Plan*** – The principal product of the Phase I effort will be the initial version of the adaptive lake management plan for Lake Alice. This document will summarize the existing information on Lake Alice and other aspects of the Phase I effort. It will follow standard format and examples of lake management plans in much of its presentation, but will also include implementation and monitoring sections. There will also be a section on adaptive management. A more complete development of the plan will take place during subsequent phases of the Stewardship Program. Nevertheless, we propose to have an initial working version completed as a product of Phase I. This Phase I version will have recommendations and actions to implement that are designed to further progress toward program goals.

***Education Program*** – The educational program will have formal and informal components. The management plan itself will be a formal educational document. A summary section will be a more “bite-sized” version of the plan and will be suitable for distribution to interested parties. Tomahawk High School students and White Water staff will contribute materials to the Lake Alice Association website that reports project activities and other information. Some educational activities will take place as technical assistance provided via phone, e-mail, and at meetings (primarily between White Water scientists, Lake Alice Association members, and Tomahawk High School faculty and students). Project partners will develop written documents suitable for use as press releases and information summaries.

## DATA TO BE COLLECTED

We are uncertain about the amount of existing information on Lake Alice and its watershed. An important part of this proposed project is to gather all available pertinent information. Some volunteer-collected data (Sechhi readings) are available from WDNR. We speculate that limnological and possibly other related natural resource data was collected

---

as part of the FERC re-licensing process for the dam. Perhaps educational organizations have collected data as well. WDNR likely has data on the Lake Alice fishery and some associated limnological measures. Anecdotal information is also available about common loon and bald eagle use of the lake. In addition to existing data, ongoing water quality and biological sampling will continue to add to the knowledge base on Lake Alice and its surroundings. This will be incorporated as available. Historical data about the Lake Alice human community also exists in the form of written and oral histories.

### **EXISTING AND PROPOSED PARTNERSHIPS**

The proposed project will benefit from a partnership between the Lake Alice Association (LAA), Tomahawk High School, and White Water Associates. These three entities will play complimentary roles in the proposed Phase I project. Tomahawk High School has two teachers Todd Fredrickson (teaches Environmental Science & Biology) and Jen Pfannerstill (teaches Advanced Placement Biology) who have expressed interest in the project for themselves and their students. Tomahawk High School is located just two miles from Lake Alice and a few hundred feet from the Wisconsin River (downstream of Lake Alice). Environmentally education and student projects focused on Lake Alice will engage students in a real-world environmental project and will benefit the project from increased participation and assistance. White Water Associates has discussed with LAA and Tomahawk High School faculty the prospects of a collaborative effort on lake study and management planning for the Lake Alice watershed. This was the beginning of the current partnership. The Tomahawk High School facility, faculty, and students bring the eagerness and interest of true stakeholders in the welfare of Lake Alice. “Project-based” learning will lends itself perfectly to the Lake Alice Stewardship Program. LAA has an active and committed membership and a willing pool of volunteers eager to contribute in a variety of ways to the Phase I project. White Water scientists bring special landscape and aquatic ecology expertise and experience to this project. There is a synergy that exists among these partners that will ensure a strong approach and high quality products.

---

## **ROLE OF PROJECT IN PLANNING AND/OR MANAGEMENT OF LAKE ALICE**

Phase I (Inventory of Relevant Information and Adaptive Lake Management Plan) will form the foundation for the entire Lake Alice Stewardship Program. It will gathering existing information and assess where information gaps exist. It will establish the first iteration of an adaptive management plan for the lake and its watershed. It will introduce the concept of “adaptive management” and set the stage for future phases that add valuable new information, monitor plan implementation, and refine the comprehensive plan. It will educate project participants and users of Lake Alice and its watershed and promote interest and involvement in the ongoing program. It will lay the ground work for the engagement and direct participation of young people in the Tomahawk community.

### **TIMETABLE FOR IMPLEMENTATION OF KEY ACTIVITIES**

We anticipate that Phase I will take place from March 15, 2009 – March 15, 2010 (if the grant award cycle differs significantly, we will adjust accordingly). Although it is difficult to accurately predict all aspects of project timing, Table 2 provides our best estimate of the timing and duration of major project tasks. Adjustments to this schedule will be made as required. Oversight of scheduling and progress on tasks and objectives will be accomplished by a team consisting of a representative from each of the three project participants (LAA, Tomahawk High School, and White Water Associates).



<b>TABLE 2. PROJECT CALENDAR</b>	
<b>TASK</b>	<b>CALENDAR</b>
Task 1A: Conceive and articulate general strategy.	March 2009
Task 1B: Identify/prioritize initial management needs and long-term goals.	
Task 1C: Develop Phase I strategy and approach.	
Task 1D: Finalize task assignments.	
Task 2A: Collect and review fishery information.	April – May 2009
Task 2B: Interview WDNR fish biologist.	
Task 2C: Collect and review info about other aquatic life.	
Task 2D: Collect and review info about aquatic and wetland habitats.	
Task 3A: Collect and review existing limnological information.	April – June 2009
Task 3B: Analyze/summarize water quality data.	
Task 3C: Prepare water quality sampling regimen.	
Task 4A: Delineate the Lake Alice watershed.	April 2009
Task 4B: Map land cover/use and soils of the watershed.	
Task 4C: Map slopes to identify runoff patterns.	
Task 4D: Determine existing institutional programs.	
Task 5A: List Lake Alice environmental, cultural, and aesthetic attributes.	April – May 2009
Task 5B: Qualitatively evaluate each of the attributes.	
Task 5C: Identify and describe potential threats to Lake Alice attributes.	
Task 5D: Site visit for reconnaissance of Lake Alice attributes.	July 2009
Task 6A: Conduct interviews.	March – November 2009
Task 6B: Inventory written information about community.	
Task 6C: Prepare a written history.	
Task 7A: Develop adaptive management recommendations.	January – February 2010
Task 7B: Prepare management plan.	
Task 8A: Review existing GMU/basin plan and other plans.	November 2009
Task 8B: Prepare written section of plan that documents this review.	
Task 9A: Technical assistance to THS faculty/students.	Throughout Project
Task 9B: Written education material/press release.	
Task 9C: Contribute project-related information to LAA website.	

## **PLAN FOR SHARING PROJECT RESULTS**

As discussed in a previous section, our Education Program deliverable for the project has significant elements that share project results with Lake Alice stakeholders. Four elements will be especially important in this regard: (1) the Adaptive Plan, (2) written education material/press releases, (3) project components of the Lake Alice Association website, and (4) technical assistance to THS faculty/students.

## BUDGET FOR PHASE I

We will investigate opportunities to use WDNR funds allocated for Phase I as leverage for other financial assistance. Already the Lake Alice Association has received a grant of \$500 from the Star Foundation. There is significant value in terms of in-kind contribution to this project. The LAA, Tomahawk High School, and White Water will contribute significant in-kind value to the project. For Phase I, we request \$10,000 from the WDNR. This will primarily be used for reimbursement of consultant time (White Water Associates). We anticipate that these funds will be allocated into the categories and approximate effort presented in Table 3.

<b>TABLE 3. BUDGET FOR PHASE I PRESENTED BY MAJOR PROJECT OBJECTIVE, CONSULTANT STAFF HOURS, AND BUDGET PORTION</b>		
Major Project Objective	Staff Hours	Budget Portion
Objective 1. Develop strategy to perpetuate quality of Lake Alice & watershed.	8	\$ 640
Objective 2. Gather, consolidate, assess, and manage information about fish and aquatic life and habitats of Lake Alice.	8	\$ 640
Objective 3. Gather, consolidate, assess, and manage information about Lake Alice water quality and potential risks to water quality.	8	\$ 640
Objective 4. Gather, consolidate, assess, and manage information about the Lake Alice Watershed, especially those attributes relevant to lake health.	16	\$ 1,280
Objective 5. Prepare catalog of Lake Alice environmental, cultural, & aesthetic attributes with qualitative evaluation of quality & associated potential threats.	20	\$ 1,600
Objective 6. Prepare a history of the Lake Alice human community.	--	--
Objective 7. Create adaptive management plan that serves to ensure high quality lake management & acts as foundation for future iterations of the plan.	37	\$ 2,960
Objective 8. Integrate recommendations from the GMU/basin plan and/or County Land and Water Resources Management Plan into Lake Alice Plan.	12	\$ 960
Objective 9. Deliver educational program elements.	8	\$ 640
Project management, project administration, and consultant communication with project participants	4	\$ 320
Other Direct Costs (ODCs) – Estimated at \$320 in printing/photocopy costs. Additional ODCs are estimated at \$500 and will be donated as match by WWA		\$ 320
<b>Total</b>	<b>125</b>	<b>\$ 10,000</b>

Table 4 summarizes the anticipated effort (as measured in person hours) that will be contributed by the LAA and Tomahawk High School to Phase I of the project. Table 4 also

indicates the anticipated hours (and monetary value) of donated time by White Water Associates. This is an indication of the significant in-kind value of the proposed project. In Table 4, LAA hours stem from various association members and Tomahawk High School hours are assumed to be a combination of faculty, staff, and students.

<b>TABLE 4. LAKE ALICE ASSOCIATION (LAA), TOMAHAWK HIGH SCHOOL (THS), and WHITE WATER ASSOCIATES (WWA) EFFORT BUDGET (MEASURED IN PERSON-HOURS) FOR PHASE I PRESENTED BY MAJOR PROJECT OBJECTIVE</b>			
<b>Major Project Objective</b>	<b>LAA Hours</b>	<b>THS Hours</b>	<b>WWA Hours</b>
Objective 1. Develop strategy to perpetuate quality of Lake Alice & watershed.	32	32	4
Objective 2. Gather, consolidate, assess, and manage information about fish and aquatic life and habitats of Lake Alice.	12	12	4
Objective 3. Gather, consolidate, assess, and manage information about Lake Alice water quality and potential risks to water quality.	32	24	4
Objective 4. Gather, consolidate, assess, and manage information about the Lake Alice Watershed, especially those attributes relevant to lake health.	32	75	8
Objective 5. Prepare catalog of Lake Alice environmental, cultural, & aesthetic attributes with qualitative evaluation of quality & associated potential threats.	72	150	10
Objective 6. Prepare a history of the Lake Alice human community.	180	--	--
Objective 7. Create adaptive management plan that serves to ensure high quality lake management & acts as foundation for future iterations of the plan.	48	--	10
Objective 8. Integrate recommendations from the GMU/basin plan and/or County Land and Water Resources Management Plan into Lake Alice Plan.	16	--	--
Objective 9. Deliver educational program elements.	32	24	10
Project Administration	40		10
Total Hours	496	317	60
Dollar Value	\$6,504		\$4,800

---

## **SUPPLEMENTAL INFORMATION IN SUPPORT OF PROJECT**

In this section we provide information on each of the three project partners: (1) Lake Alice Association, (2) Tomahawk High School, and (3) White Water Associates. For additional information, website addresses for Tomahawk High School and White Water Associates are provided. Finally, letters of support of the project are attached at the end of this document.

### **Lake Alice Association**

The Lake Alice Association was organized in 1999 and incorporated under Chapter 181 Wisconsin Statutes in 2000. The Association exists for the benefit of the general public. The purpose of the Association is to protect, preserve and improve the integrity of Lake Alice and its ecosystems through education of and communication between concerned citizens.

### **Tomahawk High School**

Two Tomahawk High School teachers have contacted Glenn Mott (President Lake Alice Association) to express interest in being part of the Lake Alice project. Jen Pfannerstill is the Advanced Placement Biology teacher at THS and her AP Biology class is appropriate to involvement in the project. This class is comprised of thirty are junior and senior students, most of them honor students. Todd Frederickson teaches Environmental Science & Biology at Tomahawk High School. He indicates that his classes are also available for involvement.

### **White Water Associates, Inc. - Biographical Summaries for Selected Staff**

Established in 1985, White Water Associates, Inc. comprises a seasoned team of science professionals that approaches environmental problem-solving systematically and objectively. White Water is a certified small, disadvantaged business enterprise with big-business acumen. White Water teams well with other professionals and excels in clear, accurate communication. White Water carries necessary insurances to ensure protection for its clients, including Workers

---

Compensation and Employers Liability; Commercial General Liability; Professional Liability, Errors and Omissions; and Automobile Liability insurance. White Water Associates' website is <http://www.white-water-associates.com>.

**Dean Premo, Ph.D.**, is President and co-founder of White Water Associates, Inc., an ecological consulting firm and analytical laboratory in northern Michigan. His academic training is in zoology and ecology (with a specialty in herpetology, the study of reptiles and amphibians). His undergraduate degree included certification for secondary science education. His graduate studies research emphasized ecology of salamanders and frogs. Dr. Premo serves as a consultant to the U.S. Environmental Protection Agency Science Advisory Board (Ecological Processes and Effects Committee, and Research Strategies Advisory Committee). He is a member of the National Research Council (research arm of the National Academy of Sciences) Committee on Inland Aquatic Ecosystems. He is on the Dean's Board of Advisors for the College of Natural Science at Michigan State University. During 1994-95, Dr. Premo was the principal project scientist for the Ecosystem Stewardship Program: Great Lakes Tribal Lands, a comparative risk analysis project with Native American communities in Michigan and Wisconsin. Dr. Premo's work regarding biodiversity and ecosystem health with forest managers has received regional and national recognition and has been featured in The New York Times. Dr. Premo served as a member of the Science Committee of Michigan's Relative Risk Assessment Project as an expert in biodiversity and landscape ecology. He served on the Project Advisory Committee for National Wildlife Federation's Lake Superior Biodiversity Project and later as a project scientist for the same endeavor. Dr. Premo is an adjunct professor in the School of Forestry and Wood Products at Michigan Technological University. Dean Premo is a Certified Senior Ecologist (Ecological Society of America).

**Kent Premo, M.S.** is the systems support scientist, publications specialist, and technical editor for White Water Associates. His degrees bachelor's and master's degrees are in botany and plant pathology. Mr. Premo is a project scientist for a White Water study of car-deer accidents in a Michigan county that includes Grand Rapids, Michigan's second largest city. This study involves an innovative geographical information system (GIS) approach to evaluating many layers of information including land cover/use, deer accident records (precise location, time of day, age of driver, and more), stream locations, traffic density, and housing development trends. Mr. Premo assisted Oneida County, Wisconsin develop a GIS database for classification of its

---

1,200 lakes. In 1998, he attended a training workshop on lake classification and shoreland zoning sponsored by the North American Lake Management Society and Wisconsin Association of Lakes. In many water quality projects, Mr. Premo is responsible for deployment and maintenance of remote sensing devices for continuous monitoring of dissolved oxygen, temperature, and other water quality measures. This work includes data management and interpretation. Mr. Premo has considerable experience with scientific writing, education, and publication. From 1992 through 1997, he edited and published *Strategies*, a periodical that provided unique, practical information to resource managers. Mr. Premo has edited two scientific review texts; one dealt with biomarkers for toxicological exposure and effects, the other with a modeling initiative involving the effects of such exposures to birds. His publishing skills also include production of camera-ready graphics (illustrations, maps, and photographs).

***Bette Premo, Ph.D.***, is White Water Associates Chief Executive Officer, with graduate training in limnology (freshwater ecosystem science) and 21 years of professional experience. Her doctoral research involved watershed management as related to nonpoint source phosphorus inputs in agricultural landscapes. For her M.S. degree, Dr. Premo studied aquatic invertebrate communities. She spent 16 months as a research scientist in Java, Indonesia studying water quality problems as related to agriculture and other land management practices. Dr. Premo is a member of Michigan Governor John Engler's Environmental Science Board and as such reviews environmental issues and translates them for general public presentation, in formats that include white papers, handbooks and public hearings. For White Water Associates, Dr. Premo consults on hydrological studies of groundwater movement, lake and stream bathymetry, flow studies, water quality monitoring, baseline inventories and sediment contamination and transport. She has served as principal scientist for water quality studies and aquatic ecosystem habitat assessments related to FERC relicensing projects for major hydroelectric companies. She recently assisted Oneida County, Wisconsin in designation and classification of 1,200 lakes for purposes of establishing shoreland ecosystem management and zoning regulations. Dr. Premo has written and procured grants for environmental, cultural, education, and recreation projects for municipalities, intermediate school districts, universities, and corporations. Most recently, she procured nearly \$200,000 for a municipality to establish a river walk and interpretive trail. Bette Premo is the president of the Iron River Watershed Council, a grassroots organization that coordinates and funds watershed restoration and education. She is on the board of directors of Operation Action U.P. (a northern Michigan Chamber of Commerce). Dr. Premo has been

---

involved with many water quality and ecosystem health assessment projects at White Water Associates. In addition to her duties as White Water's CEO and project scientist, Bette manages White Water's laboratory staff and consults on data quality control issues. She serves as an adjunct faculty member for Michigan Technological University's School of Forestry and Wood Products. Bette Premo is now a recreational canoeist and kayaker, but was a professional river guide with her husband, Dean Premo in the late 1980's.