

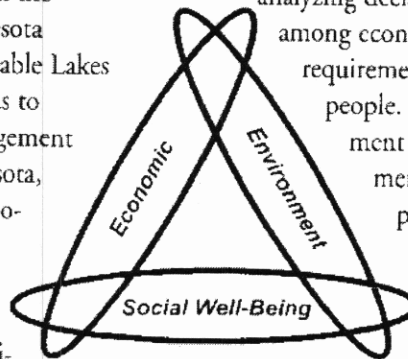
SUSTAINABLE LAKES PROJECT: A LAKE MANAGEMENT MODEL FOR THE FUTURE

Please complete
the enclosed
2000 legislative
survey and
return to
MLA.



Thank you!

In 1997, The Minnesota Lakes Association, in cooperation with the University of Minnesota's Center for Urban and Regional Affairs (CURA), received \$270,000 in funding from the Legislative Commission on Minnesota Resources for the two-year Sustainable Lakes Project. The goal of the project was to develop comprehensive lake management plans for five pilot lakes in Minnesota, with the assistance of their lake associations, and to use their experiences and lake plans to develop a Sustainable Lake Management planning tool that other lake associations and communities could follow in planning for their own lake's future quality.

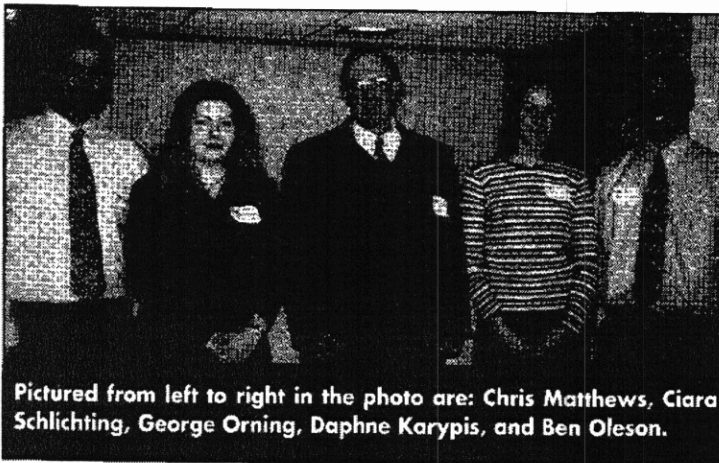


The Sustainable Lakes Management Project is a model developed around the general goals of sustainable development, which is a process of analyzing decisions in order to find a balance among economic activity, environmental requirements and the social needs of the people. "Essentially, sustainable development is the goal of a system of development that meets the basic needs of all people without compromising the ability of future generations to use and enjoy a high quality lake resource," said George Orning, Project Director.

The goal of each pilot lake association was to develop a vision of what they wanted their lake to look like 20 years from now and what needs to be accomplished to achieve the vision. Both short-term and long-term goals to accomplish the vision were set. The lake management planning process was community-based, involving community members and organizations that will be directly or indirectly affected by efforts to manage the lake.

The pilot plans are comprehensive and cover shoreland development, lake uses, water management, and water quality. In addition to creating a framework for managing individual lakes, the plans also create a framework within which major public developments can be planned and prioritized, as well as other public lake management efforts.

Funding for the Sustainable Lakes Project ended in June 1999, with the completion of the five lake plans. A workbook detailing the planning model will be published later this fall by MLA and will be available to other lake associations as a model to use in managing their own lakes.



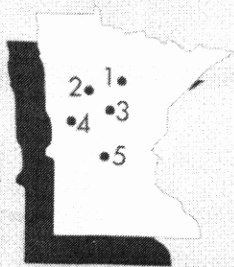
Pictured from left to right in the photo are: Chris Matthews, Ciara Schlichting, George Orning, Daphne Karypis, and Ben Oleson.

George Orning, who has a long history of lake management research in Minnesota, directed the project through the Center for Urban and Regional Affairs at the University of Minnesota, with assistance from the four graduate students pictured with him. His work over 20 years ago led directly to the creation of the Minnesota Shoreland Management Program and the classification of all state lakes for zoning purposes. He has taught land use planning at the University of Minnesota, and has been active with the Minnesota Lakes Association for a number of years, including serving on the board of directors.

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Pilot Lakes Chosen

Five lakes, representing different geographic areas of the state, were chosen to participate in the Sustainable Lakes Management Project. The five lakes were: Clitherall Lake (4), Otter Tail County, West Region; Sugar Lake (5), Wright County, Metro Fringe Region; Deer Lake (1), Itasca County, Northeastern Region; Whitefish Chain of Lakes (3), Crow Wing County, Central Lakes Region; and Kabekona Lake (2), Hubbard County, North Central Region.



Each pilot lake association was extensively involved in the planning process and committed to a 12- to 15-month process to create a Sustainable Lake Management Plan. The associations helped develop the scope of information to be collected, helped organize focus groups, and agreed to the responsibility of implementing the plan's objectives.

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Sustainable Plan Objectives

There were three objectives established for each pilot lake's Sustainable Lake Management Plan. One, to improve development and management practices of lakeshore property owners. Two, enhance resource productivity and improve the environmental qualities and aesthetics of each lake's watershed. Third, to enhance the quality of life of each resident and visitor in the watershed.

Development of the Sustainable Lake Management Plans was divided into four phases.

- Phase One: data collection.
- Phase Two: analysis of information for public review and comment.
- Phase Three: Assembly of lakeshore residents, users and resource managers to discuss the data collected and develop issues and potential solutions.
- Phase Four: The creation of a Sustainable Lake Management Plan for each pilot lake with goals, implementation steps, and indicators of success. Because each lake is a unique environment, the plans differed from lake to lake.

Phase 1: Data Collection

Data was gathered on the pilot lake's watershed, lake basin and shoreland management practices. The data was divided into two parts. The first part was the collection of physical and cultural information such as lake, shoreline and watershed information. The second part was the collection of information on lake use patterns and lakeshore property owners' desires and concerns.

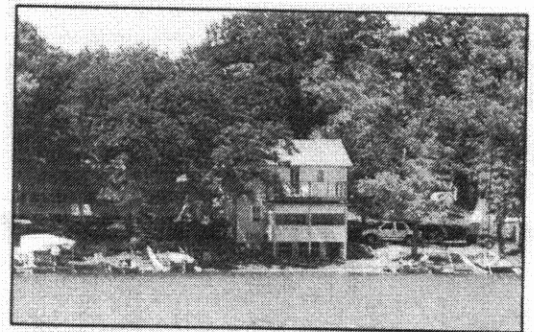
Data Collection Approach	Data Collection Tools
Physical/Cultural Data	
Watershed Data Land use, irrigation, pasture land/crops, development patterns.	Watershed Atlas Maps
Shoreland Data Development, erosion buffer strips, septic systems, and lawn management	Parcel Map/Database
Lake Basin	Monitoring Data Lake Basin Maps
Lake Use & Property Owner Concerns	Property Owner Survey

Parcel maps

Parcel mapping is based on the concept that each individual lakeshore property owner is a land use manager and their parcel of land is the basic level of lake management. If each individual property owner's

management practices can be enhanced, collectively the overall water quality and landscape character of the lake can be preserved. If each lake association, working cooperatively with their local government planning unit, can develop and maintain a parcel file on each lakeshore property, then the individual parcel manager's impact on the lake can be assessed and monitored, and intervention can take place as necessary.

For the Sustainable Lakes Project, information was collected on lakeshore properties surrounding each of the five pilot lakes, including a parcel photo taken from the lake, and real estate codes were used to build a parcel database. Property information was obtained from various county departments. Septic system information, well information, length of property shoreline, market value, residential versus nonresidential homesteads, and parcel identification are some of the information that was incorporated into the parcel maps.



Parcel photos taken from the water are a key part of the parcel assessment. From these photos, baseline information can be obtained, such as: how much natural shoreline is left, should it be preserved? How much lakeshore is without a natural buffer from lawns? Where should shoreland education efforts be directed? Which sewer systems are conforming, which not?

The parcel maps could also be used to map which parcels have received permits for shoreland alteration and aquatic plant renewal.

The parcel information, in addition to the lake basin and watershed information, helped the pilot lake associations assess the management needs of their lake and determine what approaches to take in planning for its sustainable future. For example, education and enforcement efforts can be targeted at parcels where systems have not been pumped on a regular schedule. Or, education can be targeted at parcel owners whose lawns are improperly managed or shorelines show evidence of soil erosion. Lake Kabekona is doing this. Parcel data can be used to develop common sewer maintenance programs, such as lakewide septic tank pumping contracts. They can

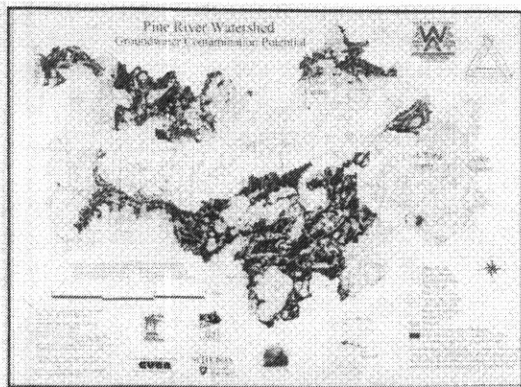
also identify and document the need for preserving the natural state of shoreline parcels with development problems, like wetlands. Better linking of assessor records to the parcel's physical characteristics can help ensure that revenue streams from lakeshore property continue to exceed the costs of providing government services.

Lake basins

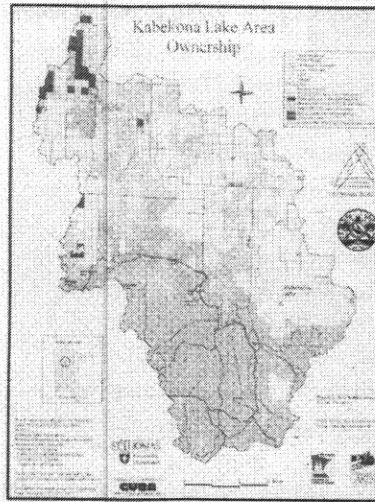
Each pilot lake association received maps prepared by the Department of Natural Resources of depth contours, aquatic vegetation inventories, and high/low water levels for their lake. No specific water quality data was collected. Instead, water clarity and other monitoring data was assimilated into the lake basin reports. Aquatic plant inventories, when combined with depth contours and water clarity measurements, can help lake associations be better lake managers by knowing where the important aquatic resources are for fish management. High/low water levels impact real estate development, recreation, weed growth, and fish habitat.

Watershed maps

Assuming that water quality and land use practices in a lake's watershed are directly related, resource data was collected on soils, zoning, land cover, the amount and type of development within the lake's watershed, and other resource variables. The data was converted into 28 resource maps using the newest mapping technology in a joint effort of the University of Minnesota, the St. Thomas University computer laboratory, and the Department of Natural Resources. This project represents the first integrated and computerized watershed-wide database requiring the



Whitefish Chain of Lakes map of areas susceptible to groundwater contamination. The darker areas on the map correspond to areas in the watershed that are very susceptible to groundwater contamination. In these areas, there is abundant groundwater and very porous, sandy soils which create no protection between the surface and the water table. These areas also correspond to areas undergoing the most rapid development.



A Public Ownership map, such as this map of Kabekona Lake, shows dark areas where public land management can emphasize water quality outputs and areas that could be developed for recreation and scenic values or potential uses for municipal services.

cooperation of state agencies, local governments, and higher education institutions.

The watershed maps served as a key education tool for the lake associations. The maps define the neighborhood of water impact for each lake, and help answer questions such as: What goes on in each watershed (e.g. land use activities) that directly impacts the quality of water runoff into the lake and in turn the water quality of the lake?

Lake user survey

Another important part of the management planning process was obtaining background information about problems facing the pilot lakes, the people that use the lakes, and the amount and type of uses the lake endures. A property owners' survey was used to generate this information. The

survey also inquired about potential ways property owners think problems should be addressed and specifically what management actions are supported or opposed.

For example, the survey of property owners on Sugar Lake in Wright County determined that approximately one-third of the shoreline properties were used year-round with approximately 20 percent of those having been converted to year-round use. On average, septic systems were last upgraded in 1987. Proximity to the Twin Cities was a high factor in the decision to buy property on the lake. Thirty-two percent of the respondents felt the quality of the lake and lake living was getting worse over the past five years due to motorized recreation, a decline in water quality, the introduction of muskies, and problems associated with shoreland development.

Phase 2 & 3: Data Assessment and Presentation

Combining the information from the watershed maps, shoreline information organized by parcel, and public input from the lake user survey, it was possible to develop a set of recommended issues that each lake association should address. These issues were then presented to each association.

The planning phase of the project directly involved the members of the pilot lakes associations in making planning decisions based on the data collected in phase one and the recommendations from phase two. The objective was to provide each participating lake association with information on their lake and surrounding watershed area that could be used to create a Sustainable Lake Plan unique to their individual lake.

Lake association meetings were held to present the collected data and data assessment recommendations. The data was examined in light of the lake association's pre-established vision and goals for lake management. Specific goals were then formulated into a Sustainable Lake Management Plan for that lake.

Phase 4: Lake Management Planning

The Sustainable Lake Management Plan for each lake had both short-term and long-term goals that can be quantitatively measured; specific actions, timelines and areas of responsibility spelled out; and a commitment to review the plan at regular intervals to assess progress and realign goals, if necessary. The plans also

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Sustainable lakes Project, Continued from Page 5

fostered integrated planning efforts with local government officials, through the local water planning process, to continuously evaluate and update the plans. For Sugar Lake, Wright County Environmental Services Department has agreed to update the initial data collected, plus the county will use the Sugar Lake plan as a model for the management of other County lakes.

Here are some examples of specific lake management goals for the pilot lakes.

- Land cover, slope, and soil maps of the Pine River Watershed are being used to locate areas on the Whitefish Chain of Lakes where development easements can be used to control land use and protect water quality. The Whitefish Property Owners Association is now involved in a cooperative effort with Crow Wing County and the City of Crosslake to assess the compliance status of over 2,000 septic systems.
- On Lake Kabekona, parcel maps identified undeveloped shoreland parcels with potential development problems; the lake association has purchased some parcels and is looking at purchasing others to prevent development. The Kabekona parcel database is being used by the association to track septic system maintenance, by parcel, and alert parcels about pumping on a three-year rotation. They have also negotiated lakewide pumping services and are exploring the purchase or lease of land for a "honey wagon" dumping site.
- On Sugar Lake, parcel maps helped target specific parcels for better lawn management and identified the need for more education on proper shoreland lawn management. The aquatic vegetation lake maps are being used to develop an aquatic vegetation management plan for the lake. In addition, the Association is attempting to form a Lake Improvement District to comprehensively handle sewer management.
- For Clitherall Lake, irrigation concerns were a major focus of their lake plan. They'll try to influence the control of pivot irrigation near the lake, lobby for additional regulation of irrigation in the County, and monitor enforcement of shoreland ordinances to ensure that a setback for all new irrigation machinery and feedlots is developed. Another goal is to develop a recreational trail system, which was identified as a need on the property owner survey.

Other lake associations can use the model

A Sustainable Lake Management Workbook will be available later this fall from MLA to help lake associations create a management plan for their own lake following the Sustainable Lakes model. It will describe how to collect baseline data and interpret it, how to develop, implement and analyze a lake user survey, how to hold stakeholder meetings and what to address, and finally, it will provide a framework to implement the lake management plan.

At the new Science Museum in St. Paul, their map lab will be equipped with a database and customized software to produce a basic lake watershed atlas of maps—like those produced for the pilot lakes—for any lake in Minnesota.

Lake associations are critical lake managers

In conclusion, "Increasing levels of development and use of lake resources will mean a long-term commitment from each lake association to the management of their lake and watershed, including the development of clear goals for watershed and shoreline development, water surface use management, and fish management," said Orning. "Minnesota's decentralized lake management structure spread throughout a number of state agencies necessitates that lake associations take on the critical role of coordinating the management of their lake's resources and that state agencies work closely with these local lake managers if our Minnesota lake resources are to be protected for the future enjoyment of all." ♦

Improving Lake Management Statewide

Information gathered from the pilot lakes' watershed and lake basin maps, shoreline parcel maps, and property owner surveys identified broader critical needs for successful lake management that should be addressed statewide and incorporated into a Minnesota Lakes Initiative for future funding by the Minnesota State Legislature.

Key observations from the Sustainable Lakes Project

- The major need for lake management is not water quality data, but information and monitoring of land resources and activities within the watershed. In most watersheds, only a small part of the watershed has a major impact on water quality (shoreline areas, steep slopes near water, urbanized areas and cultivated areas).
- Public land management policy needs to be changed, especially for state lands in the immediate vicinity of lakes.
- More land-based recreational opportunities (primarily walking and hiking trails) in the immediate vicinity of major recreation lakes is needed to reduce the pressure of water-based recreation.
- Intensive agricultural development in the immediate lake watershed can have negative impacts on lake and groundwater quality, including well contamination. Most local and state zoning does not contain special provisions for water quality or public health protection from intensive agricultural practices in shoreline areas.
- There are no easily used models that link water quality data to land uses in a lake watershed. Among state resource management agencies, there is no standardized set of local watershed boundaries across agency or program lines.
- A structure for parcel mapping needs to be an important component of any state lake initiative, and implemented at the local county level.
- To improve fishing for users will require limiting fishing hours, restricting the use of certain fishing equipment, reducing bag limits, encouraging catch-and-release practices, and possibly support the statewide use of "barbless" hooks, as in Manitoba.
- The state does not have an effective policy to manage surface water use, e.g. boating practices, especially as it relates to jet skies, weekend and holiday use, and the separation of different types of water users. ♦