50% Cost Sharing Available!

Eligible Conservation Practices*	Minimum Standards
Conservation easements for land preservation	Wetlands, shorelands or other "critical" areas; terms effective in perpetuity
Lakeshore/stream/ditch-bank repair (bank shaping, erosion control, etc.)	Applicable permit approvals; clear evidence of significant bank erosion; minimum 30 ft of lakefront; erosion-control measure meets technical standards
Shoreline/aquatic plantings	1,000-sq-ft minimum upland planting area; 20-ft minimum average planting depth along the shore; native species at approved planting densities
Lakeshore tree-drops for fish habitat	Applicable permit approvals; tree must be dead, diseased or pose safety hazard; must serve habitat-enhancement purpose; cannot obstruct navigation
Rain gardens and rain barrels	100 sq ft minimum for rain gardens; must meet site-specific design standards
Wetland restorations	Applicable permit approvals; restoration must encompass 1/2-acre or more
Tree/shrub establishment	10-acre minimum area; native species; approved plan by certified forester
Farmland nutrient management planning	Must follow Jefferson County Land & Water Conservation Department standards and procedures (higher cost-share rate may be available via county)
Conservation farming practices (no-till, contour stripcropping, etc.)	Must follow Jefferson County Land & Water Conservation Department standards and procedures (higher cost-share rate may be available via county)

*This is not a complete list of eligible conservation practices. Any landowner with property located within the Lake District or watershed may be eligible for technical and financial assistance. Proposed projects are scored against various ranking criteria, with cost sharing dependent upon merit, funding availability and Board approval. Contact us today to learn if the project you're considering is a good candidate for cost sharing.

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Lake Ripley Management District

Vol. 15, No. 1 Spring 2007

FROM THE HELM

As I sit staring at my computer, I have been racking my brain trying to come up with 4 or 5 succinct paragraphs for the spring newsletter. After more than 15 years of these columns, it can be a challenge not to repeat or generalize or bore. So, as I watched the snow melt I tried to decide what will be new this year.

The major change from years past is that we no longer rely on a grant from the Department of Natural Resources to fund the majority of our programs at the Lake District. Although we are very grateful to have had the grant that has served as the base of our operations, there is no doubt that it guided how we did business. Now we are free to review where we are in relation to the management of Lake Ripley and choose the direction we need to go. This does not mean that we will not apply for additional grants to help fund our work. As a matter of fact, we have applied for and are optimistic of receiving two grants this year. The difference is that we decided what work needs to be done, and then applied for the funds to help accomplish our goals.

For a long time we focused much of our attention on the shoreline of Lake Ripley, and how it affected water quality. Now we are looking more at our needs beyond the shoreline. This year we will review what has been accomplished and evaluate our efforts. We will see what has been successful, and determine what still needs to be done.

Some things remain constant, and some things have been evaluated on a regular basis, and they will continue. With the help of some very talented lake managers over the years, we have always been in the forefront of lake issues. I look forward to the challenges ahead and the continued improvement and protection of our beautiful lake.

John Molinaro
Chair, Lake Ripley Management District

Paleolimnology
History in the Mucking

P. Garrison

Sediment core extraction device.

Lake folks often get into lively discussions over what the lake used to be like... more plants, fewer plants, clear water, murky water... Is there any way to really know for sure? Well, the answer is yes! In fact, we can get a good idea of what lakes used to be like hundreds of years ago with a science called Paleolimnology.

Paleolimnology is the interpretation of past conditions and processes in lake basins. This is done by studying the fossil record preserved in lake-bottom sediment. Each year since their formation, a steady rain of sediments, plant pieces, creature parts and other materials settle to the bottom of our lakes. Over the eons, this fascinating historical record builds up on the lake bed, waiting for someone to unearth and unlock its secrets. In addition to providing clues about prior lake health, the sediments hold evidence of natural and human-induced watershed disturbances. They can even reveal the effectiveness of past pollution-control measures. The response of the lake to disturbances (or rehabilitation measures) provides insight into how the lake functions, and presents a better understanding of the significance of trends observed with modern monitoring programs.

(Continued) ▶

Paleolimnology (cont.)

Obtaining a Sediment Core

To extract the lake's past history, a sediment core is collected using a hollow tube. The core is sectioned into 1-2 cm intervals after it is retrieved. Each section represents a sequential chapter in time, with the top of the core representing the most recently deposited material. The timeframe of interest is often the last 200 years, which covers the impacts of European settlement.


P. Garrison

A sediment core extracted from a lake

Questions Answered

Paleolimnology can reveal many secrets from a lake's past life. These include pre-settlement condition, timing and severity of land-use impacts, changes in soil erosion rates, abundance and types of aquatic plants, past fish populations, and even the frequency and intensity of algal blooms. Gaining this type of historical perspective is useful for setting realistic restoration objectives. By learning more about a lake's history, we can better customize lake-protection and improvement programs and avoid repeating the errors of the past.

Dating Sediment Cores

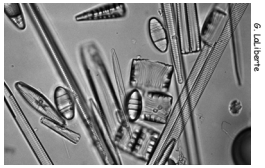
Cores are dated to establish the timing of past environmental changes, and to determine the rate of input of materials into the lake. The most common dating technique for sediments deposited within the last 200 years looks at levels of lead-210. Lead-210 is a naturally occurring atom that exhibits radioactivity. It enters lakes primarily through rainfall and dry deposition (i.e., dust) following the decay of an atmospheric gas called radon-222.

Paleolimnologists can accurately date sediment layers because they can be cross-checked against known historical events.

For example, testing of atomic weapons during the Cold War has left a byproduct called cesium-137 in the sediments of all lakes around the world. Atmospheric testing by the former Soviet Union peaked in 1963, dramatically declining following the Nuclear Test Ban Treaty that same year. Another dating marker that can be traced in lake sediments is stable lead. It was used in leaded gasoline until its removal in the mid-1970s. Sodium arsenic, which was widely used on lakes during the 1950s-60s to control aquatic plants, is still another marker that can be used to confirm sediment dates.

A Record in Glass

Fossils are one of the guides to the past life of a lake. The fossils used most are diatoms. Diatoms are a special type of algae with cell walls made of silica. Silica is the same as glass, so diatoms can be preserved for thousands of years in the sediments. Diatoms are particularly useful because most of them live under well-known environmental conditions. This makes them ideal to characterize what past environmental conditions were like when they were living. Diatoms have been used to infer trends in phosphorus concentrations, acidification, water clarity, salinity and plant communities, and whether these trends are due to human activities.


G. LaBarre

Diatoms (a type of free-floating algae) viewed under a microscope.

Other fossils that are deposited and are useful for re-creating past environments are aquatic insect larvae and zooplankton. Insect larvae can be used to track changes in a lake's oxygen content over time. Zooplankton are often eaten by fish and invertebrates, so changes in their numbers offer clues about past fish populations. For example, a decline in large zooplankton is an indication of an increase in plankton-eating fish like perch and bluegills.

A water flea called Daphnia (a type of zooplankton) viewed under a microscope.

Lake Ripley's Past and Future

Paleolimnology is a powerful tool to discover where a lake has been and help predict where it is going. It was first used on Lake Ripley in 1991. As a result, its prior condition and the impact of past land-use changes are well documented (but only until the formation of the Lake District and prior to the start of watershed-rehabilitation efforts). We know the lake first shifted to a degraded state at the time of European settlement. Problems began in the mid-1800s when land clearing and wetland drainage started in earnest for agricultural development. At the time, few measures were put in place to curb soil erosion and farm runoff. Conditions worsened again during the shoreline residential construction boom following World War II, and subsequently began stabilizing.

What does the sediment record tell us about the last 16 years? To find out, a state grant is being sought that will allow us to take a second core. The information should add clarity as to whether rehabilitation efforts are adequate at meeting today's evolving threats and challenges.

Thank you to Paul Garrison, Research Scientist with the Wisconsin Department of Natural Resources, for permission to reprint portions of his original article published in Lake Tides (Vol. 32, No. 1, Wisconsin Lakes Partnership).

Lake Ripley News Bulletins

Lake District Competes for $20,000 in Lake Grants

The Lake District is currently vying for $20,000 in grants to fund a number of projects intended to benefit Lake Ripley. Among the proposed activities: 1) perform a paleolimnological study and watershed assessment; 2) evaluate the effectiveness of past and ongoing lake-improvement programs; 3) pinpoint current sources of polluted runoff; and 4) update key plans that guide Lake District actions. This work will allow us to stay ahead of problems and better target limited resources. We are encouraged by the preliminary scoring of our grant applications, and remain optimistic about our chances of receiving the award. Stay tuned!

Remembering Vernon Davis, Town Chair

We are saddened by the passing of Vernon Davis on February 1, 2007, as the result of a tragic farming accident. Davis was born and raised in the Town of Oakland, and owned a farm near Lake Ripley with his wife, JoAnn, since 1971. He joined the Town's planning committee in 1996, was elected as a Town Board supervisor in 1999, and was appointed chairman in 2003. During his tenure on the Board, a new Town Hall and rain garden were built, several Lake District-sponsored ordinances were adopted, and the restoration of a publicly-owned shoreline was initiated. Davis was a local leader in using conservation farming practices, like no-till cropping, that reduce soil erosion and help protect our lakes and streams. Our heartfelt condolences to his family and friends for their loss.

The Rise and Fall of Lake Ripley

Natural fluctuations in lake levels are an important part of a lake ecosystem. In fact, many aquatic species depend on this natural variability for their survival. Lake levels fluctuate both seasonally and annually, primarily in response to precipitation patterns. Well pumping and land-use development around a lake can also influence these fluctuations. A 28-year study on Lake Ripley showed that water levels varied an average of 0.78 feet per year over the study period (maximum: 1.21 feet), which is quite low compared to other similar lakes.


J. Kats

Staff gage used to track water levels

While some variability is both natural and desirable from a lake-health standpoint, extreme fluctuations can create problems and inconveniences. Severe droughts can lead to low levels that may stress certain types of fish, increase nuisance plant growth, or strand boats on docking stations. Conversely, high water levels are often associated with increased runoff that contributes to shoreline flooding, erosion and murky water conditions. This begs the question: Should water levels be artificially and mechanically controlled?

On Lake Ripley, the answer seems to be no. This comes after a review of the lake's historic water level fluctuations and its suitability for an outlet control device. Considerations included the need and likely effectiveness of a control device, site limitations, installation and maintenance costs, liability risk, permitting and regulatory requirements, and the potential implications to water quality and aquatic life. Minutes from the Lake District's 10/15/05 meeting provides a summary of recent expert testimony and public discussion on the subject of water levels, and can be downloaded at www.lakeripley.org.

Friends of the Preserve

Thank you to our generous contributors supporting the Friends of the Preserve Fund. With your help, the Lake District was able to cover the full cost of a new nature-viewing platform! The platform is access by an existing trail, and offers visitors panoramic views of a restored marsh. The marsh is critically located adjacent to Lake Ripley's only inlet tributary stream, and serves an important role in protecting downstream water quality.

Don and Kim Catherall
Richard and Beverly Pieritz
John and Patricia Logli
Thomas and Judith Smrcka
James and Susan Rank
William O'Connor and Krista Roys
The Michael Monosmith Family
Roy and Helen Monosmith (In Memory)
Michael and Marilyn Sabella
Kent Brown and Jane Jacobsen-Brown
Dennis McCarthy
Paul and Andrea Dearlove
John and Ann Molinaro
Cambridge Aquatic Environmental Club

Nature-viewing platform at the Preserve.

Mark Your Calendars!

Prairie Burn	Earth Day Cleanup
Tuesday, April 17	Friday, April 20
9:30-12:30	8:00-3:00