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Lake Trophic Status and Lake Health



*Mission Lake
Photo by Roger Zimmermann*

The amount of nitrogen, phosphorus, and other nutrients determine a lake's trophic status. Lakes are classified as oligotrophic, mesotrophic, or eutrophic.

Oligotrophic lakes have low productivity, low nutrient content, and minimal algal production. These characteristics result in clear water, high oxygen content, and high drinking water quality. They usually support fish species such as trout that require cold water and high oxygen.

Mesotrophic lakes have intermediate productivity and nutrient content. Their characteristics are intermediate between oligotrophic and eutrophic.

Trophic status & productivity
Oligotrophic = low
Mesotrophic = medium
Eutrophic = high

Eutrophic lakes have high productivity and excessive nutrients which results in an abundance of aquatic plants. Due to the algae population fluctuation, the water may change from clear to dark. Eutrophic lakes occasionally experience fish kills due to the decomposition of excessive algae depleting the oxygen supply.

The trophic status of the lakes in the study will be determined to help determine lake health.

Mark Your Calendars! Preliminary Results Meetings

UW-Stevens Point will present preliminary results based on the first year of data collection and analysis.

Saturday August 25, 10 am
Reid Town Hall
Corner of Plover River Rd
and County Road Y
Emphasis will be on Rice,
Pike, Lily, Mission, Big Bass,
and Wadley lakes.

Saturday September 15, 10 am
Norrie Town Hall
Corner of Cornell St and
County Road D
Emphasis will be on Mud,
Mayflower, Norrie, Bass, and
Lost lakes.

Algal Community and Seasonal Dynamics



Algae need carbon dioxide, water, sunlight, and nutrients in differing amounts based on the type of algae. Seasonal changes in the lakes cause fluctuations in the amount of carbon dioxide, sunlight, and nutrients available, and therefore alter the quantity and type of algae present.

Algae are a food source for zooplankton, snails, and some fish. These in turn feed the larger predatory fish. Therefore, a healthy fishery is dependent on a balanced population of algae. When the algae population is much larger than what is being consumed, algal blooms result.

When this occurs, the excess algae die and their decomposition reduce oxygen and can result in fish kills.

Algae will be sampled and identified in the lakes. This information can be used in the future to monitor changes in water chemistry and quality.



Zooplankton

Zooplankton are tiny, microscopic aquatic animals. They are an important link in the aquatic food chain.

The balance of population and diversity of zooplankton are indicators of the biological health of a lake.

The zooplankton assessment portion of the study will establish a baseline for future monitoring for invasive species and changes in the food web.

Zooplankton populations fluctuate in response to environmental conditions, predatory demand, and water quality conditions over time.

Zooplankton has been sampled from all 11 lakes to determine species and population.



Groundwater

Groundwater can be a substantial source of water to lakes. It can also carry with it minerals, nutrients, and contaminants.

The eastern lakes study includes a groundwater assessment. Piezometers (small, temporary wells) will be placed around the lakes.

These data can then be used to determine water quality and identify concerns.

Herbicides used in agriculture and lawn care, fertilizers from lawn and garden applications, and natural sources of nutrients such as from wetlands and sediment can make their way into groundwater and ultimately into lakes.

Data will be collected from these wells including temperature, pH, nutrient content, and atrazine (commonly used herbicide).



Invasive Species

Invasive species are not native to the area **and** cause harm to the environment or human health. In Wisconsin, they include crayfish, snails, and mussels. Rusty crayfish eat small fish, insects, fish eggs, and aquatic vegetation, damage underwater habitat, and displace native crayfish.

Chinese mystery snails displace native snails, may carry parasites, and can lead to lower lake nutrient levels.

Zebra mussels attach to the shells of native mussels and smother them, reducing the diversity and population of native species.

This study will sample and identify invasive species if present.

Information collected will be used to determine what, if any, invasive species control steps should be taken.



Zebra mussel
Usually less than 1 inch

What about the FISH???

The project includes a fisheries assessment. Likely the characteristic that most draws us to the lakes!

Each lake will have a species list of all fish found in the lake, lengths and weights of all sport fish, and a frequency distribution of the weights and size of all sport fish.

The fish assessment includes electrofishing, fyke netting, and seining.

Electrofishing uses electricity to stun the fish. It does not permanently harm the fish. In fact, they return to their normal state in about 2 minutes.

Fyke (hoop) netting will be conducted from boats in July and August.

Seining will be conducted from shore for smaller non-game species.



Macrophytes

Macrophytes are plants that grow in or near the water. They can be emergent, submergent, or floating. They provide cover for fish, are home to small aquatic animals, produce oxygen, and are a food source for fish and wildlife.

Data including species, frequency, location, and depth will be collected.

These data provide the information needed for an aquatic plant lake management program for each lake sampled.

An aquatic lake management program protects native vegetation and the environment while allowing lakeshore property owners some control of aquatic vegetation for water access.

Management activities may include pesticide use, plant control devices, and vegetation destruction.

Aquatic plants in public waters are owned by the state.

Permits are required for aquatic plant control activities.

DNR aquatic plant management:
715-421-7881

Nonprofit
US Postage
PAID
Permit #186
Wausau, WI

Marathon County CPZ
210 River Drive
Wausau, WI 54403-5449
715-261-6000

Do you have suggestions for articles
or photos to share?
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This newsletter is sponsored by:
Big Bass Lake District
Mayflower Lake District
Pike Lake Sportsmans Club
Pike Lake Fishing Club
Wadley Lake Sportsmans Club



Eurasian Water Milfoil

*Kaycie Stushek, Regional Aquatic Invasive Species Specialist
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A few lakes in Eastern Marathon County have the invasive plant Eurasian watermilfoil (EWM).

This nuisance invader quickly spreads in lakes and can form mats on the surface, making recreation on or in the water difficult. This plant is easily spread by boaters, anglers and swimmers, because any plant fragment broken off sprouts roots to form a new plant.

Mission Lake has a very small amount of EWM that volunteers have been hand-pulling for the past two years, which has kept it from spreading.

Wadley Lake also has EWM, and has a proactive landowner who has been applying for permits to treat it every year. Unfortunately those plants are spreading despite his efforts. The next plan of attack is to assist Wadley Lake landowners in writing a grant for the assistance they need to combat the growing EWM.

Prevention and proactive efforts are key in the fight against invasive species. The majority of Eastern Marathon County Lakes do not have EWM, so it is so important to be monitoring for changes in your lake and to educate others about invasive species and the negative effects they have on our beautiful waters.

For more information, or to volunteer for hand removal parties, contact:
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