High Quality Waters of Walworth and Waukesha Counties

Southeastern Wisconsin Regional Planning Commission

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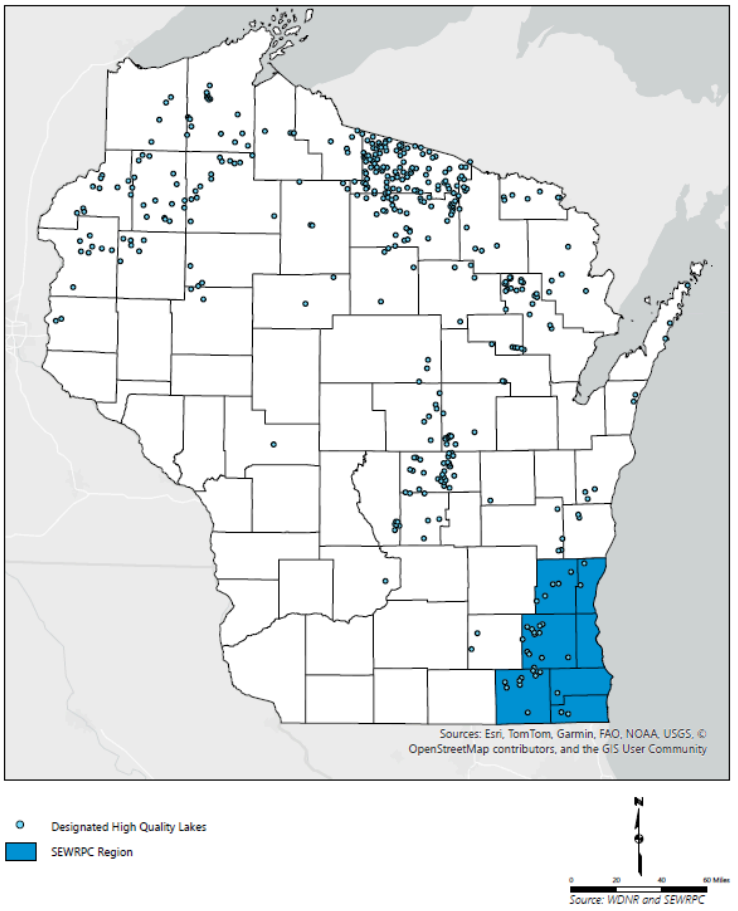
Funded by WDNR Surface Water Grants

Introduction and Overview

In spring of 2023 the Southeastern Wisconsin Regional Planning Commission received four Wisconsin Department of Natural Resources (WDNR) Surface Water Education Grants. The Commission's grant projects aimed to establish a network of well-informed stakeholders from high-quality lakes, as identified by the WDNR Wonderful Waters of Wisconsin and the SEWRPC Regional Natural Areas programs, in Walworth and Waukesha Counties. These programs are discussed below. The Commission conducted interviews and hosted a practice-based workshop to inform and train stakeholders on lake data inventory, best management practices (BMPs), and funding as well as to form connections and inspire protection of these lakes. There are 34 lakes, 24 streams and 105 wetlands in Southeastern Wisconsin that are listed as High Quality Waters (HQW), of which 24 lakes are in Walworth and Waukesha Counties (see Figure 1 and Figure 2).

Figure 1
Lakes Designated as High Quality Waters in Wisconsin



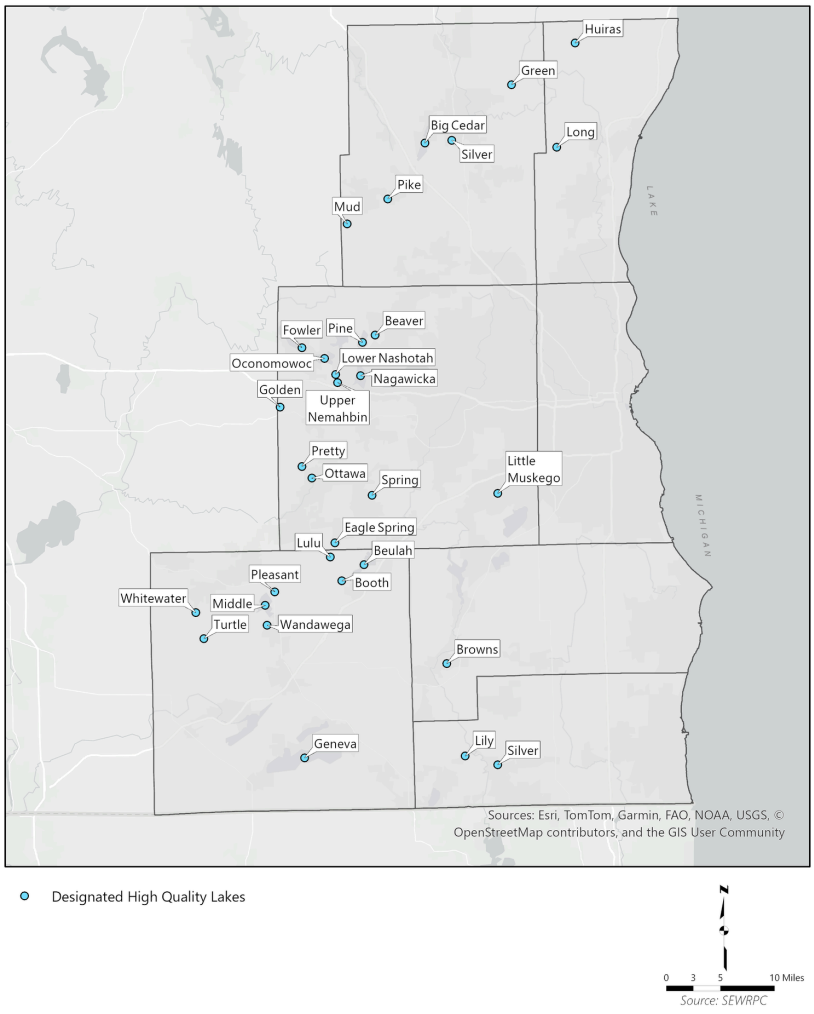
Source: WDNR and SEWRPC

The Commission's main goals for the grants were to:

- Collect information about WDNR-identified high-quality lakes in Walworth and Waukesha Counties and active stakeholder organizations affiliated with these lakes.
- Educate stakeholders on how to collect information about lake conditions and management. Facilitate learning and communication between similar lake type network members through a practice-based workshop.
- Publish a best management practice toolkit.

In early 2024, the Commission asked representatives from the stakeholder groups that managed the high-quality lakes to participate in interviews as a chance for the Commission to collect information on how lake groups manage their lakes and discuss topics of concern or interest. The representatives were given the option to meet in-person, virtually, or fill out the interview questions as a questionnaire. Additionally, the Commission planned a full-day workshop that provided stakeholders a chance to network with other High Quality Water lakes. The results of the interviews are discussed in the "Project Results" section and responses were used as a framework to build this toolkit and the topics for the workshop.

Lakes Designated as High Quality Waters in the Region



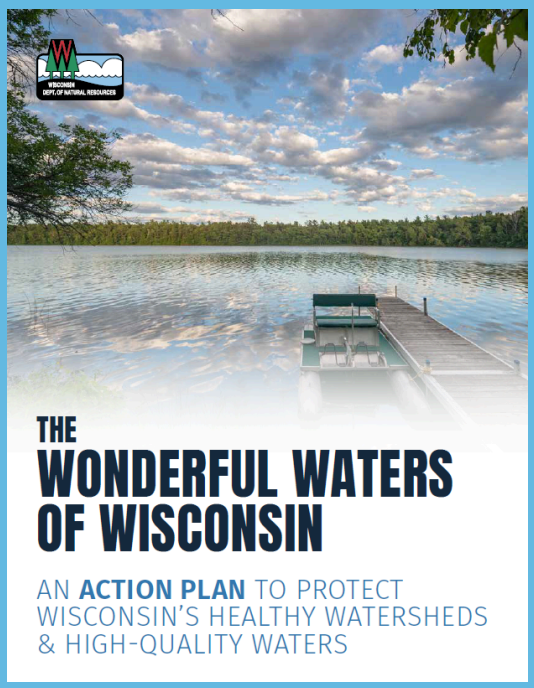
Interview Questions:

1. What kind of organization do you represent (municipal, district, conservancy, association etc)?
2. What are the main goals/mission of your organization?
3. What other organizations/groups do you work closely with?
4. What are your organization's main goals for your waterbody? How do you plan on attaining those goals?
5. Have you had a lake management plan completed for you by the Commission or another entity? When was the most recent plan completed?
6. Please describe how your organization uses the lake management plan. For example, what are the most helpful or most often utilized aspects of the plan/report?
7. Have you applied for, received, or completed any WDNR Surface Water Grants?
8. If yes, what were those grants for?
9. What sort of activities on your lake does your organization sponsor or fund?
10. Does your organization (or other organizations on your waterbody) often apply for WDNR permits and if so, what kinds of permits (e.g., aquatic plant management)?
11. What monitoring programs does your group participate in (Citizen Lake Monitoring Network, Clean Boats, Clean Waters, Water Action Volunteers, self-directed, etc)?
12. What are perceived barriers to adequately managing and protecting your lake?
13. What do you think are some key threats to your lake as a High Quality Water of Southeastern Wisconsin?
14. In the face of these threats, how is your lake still maintaining high-quality aquatic environments?
15. How can lake organizations adapt to future changes in Wisconsin's climate and lake environments?
16. What strategies and practices have been helpful in protecting your waterbody?
17. What are effective means for sharing these strategies and practices with other lake organizations?
18. What other groups do you regularly communicate/participate with?
    Who are your partners?

Wonderful Waters of Wisconsin

In 2022, the WDNR's Water Quality Program launched the Healthy Watersheds, High-Quality Waters (HWHQW) initiative. Historically, much of the WDNR's emphasis has been to restore polluted waters as required by the federal Clean Water Act. Evidence is mounting, however, that actively protecting healthy water resources is a wise public investment, and the shift towards protection efforts is growing nationally. Identifying watershed protection priorities also serves to expand funding opportunities as more agencies, such as the EPA, promote the use of watershed planning monies for protection efforts. This new focus on the "already healthy" waterbodies and watersheds is intended to celebrate these treasures and draw attention to the ecological, financial and societal benefits of protecting clean water.

Published in March of 2022 the Action Plan provides a framework for protection the waters of Wisconsin.



This initiative utilized the US Environmental Protection Agency (EPA) Watershed Recovery Potential Screening Tool[1] to model watershed health at the HUC12[2] scale throughout the state. A healthy watershed is defined in the Action Plan as “an area draining to a stream, lake or wetland where natural land cover supports the dynamic processes, habitat size and connectivity, and water quality conditions able to support healthy biological communities. The modeled watersheds (HUC12 scale) were ranked statewide and within each major drainage basin (HUC6). The 30% healthiest watersheds in the state and within each major drainage basin are the geographic protection priorities for this statewide plan. The WDNR also identified individual high-quality lakes, streams, rivers, and wetlands utilizing existing monitoring data and resource classifications. High-quality waters (HQW) are defined as “lakes, streams and rivers with at least two of the following attributes: unique or rare resource, attaining state water quality standards, and/or good-to-excellent biotic integrity. Also included are unique wetlands and those with least disturbed reference conditions.”[3]

As outlined in the HWHQW Action Plan (Action Plan)[4], the statewide goal is to keep 100 percent of the watershed protection priorities and high-quality waters within them healthy through 2030. The HWHQW website features an accompanying technical report, an Action Plan for how to use this data, prepared maps of the watershed rankings and designated high-quality waters, and information dashboards.

[1] For more information on the US EPA Watershed Recovery Potential Screening Tool see https://www.epa.gov/rps
[2] “HUC” stands for Hydraulic Unit Code, a geographic watershed measurement established by the US Geological Service. Watersheds within the US are delineated by the USGS using a nationwide system based on surface hydraulic features. For more information see https://nas.er.usgs.gov/hucs.aspx
[3] Definitions taken from Healthy Watersheds, High-Quality Waters Action Plan.
[4] The entire HWHQW plan can be accessed at the following link: https://dnr.wisconsin.gov/topic/SurfaceWater/HQW.html

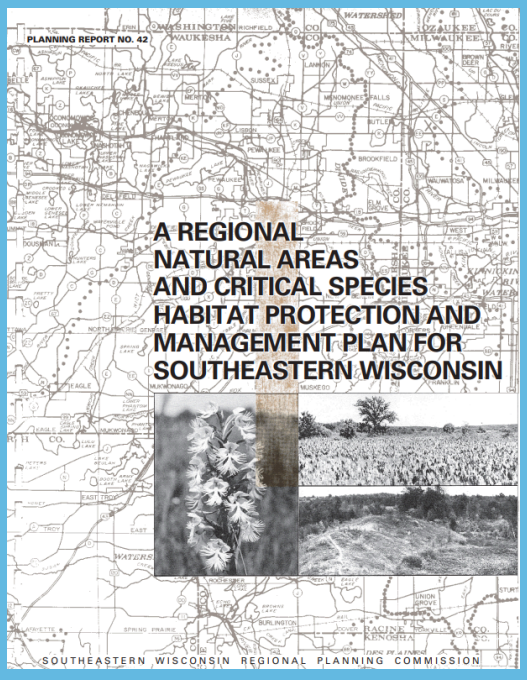
Natural Areas Plan Update

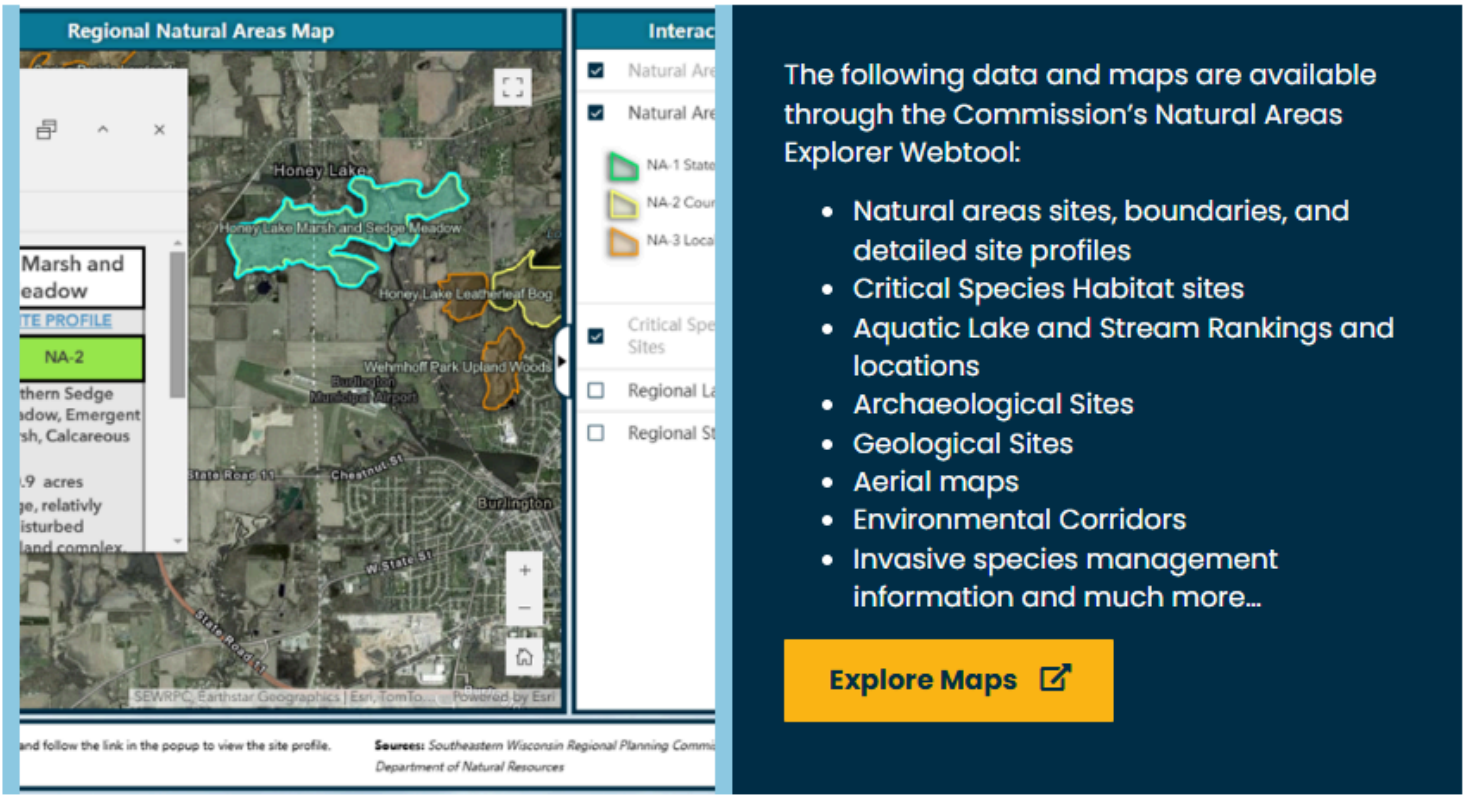
First adopted and published in 1997, the Regional Natural Areas and Critical Species Habitat Protection and Management Plan has identified the most significant remaining natural areas in the southeastern Wisconsin Region. The planning effort was undertaken to identify the most significant remaining natural areas—irreplaceable, biodiverse remnants of the pre-European landscape—as well as other areas vital to maintaining endangered, threatened, and rare plant and animal species in the Region. Most recently updated in 2025, the plan identifies a total of 478 natural areas, 412 critical species habitat sites, 87 geological areas, 15 archeological sites, and 11 sites for largescale grassland and forest interior re-establishment.

As part of the 2025 update, the Commission developed a ranking system for waterbodies that, while similar to the WDNR's raking system, utilizes additional criteria. The Commission's ranking system scores lakes based on morphology and classification, water quality, aquatic plants, shoreline buffer, connectivity, fisheries, and natural heritage inventory listings. Significant revisions were made to the aquatic area assessment scheme, which identified 91 stream reaches and 53 lakes for a total of 144 aquatic areas.

Using a classification system originally developed by the Wisconsin Department of Natural Resources and refined by the Regional Planning Commission, each of the identified aquatic natural areas were classified as being of statewide or greater significance ("AQ-1"), of County-wide or regional significance ("AQ-2"), or of local significance ("AQ-3"). AQ-1 sites represent excellent examples of nearly complete and relatively undisturbed plant and animal communities which are believed to closely resemble those present during pre-European-settlement times. AQ-2 sites represent native biotic communities judged to be of lower than AQ-1 significance because of evidence of limited human disturbance. AQ-3 sites represent native biotic communities judged to have been substantially altered by human activities, but which are of local significance, often containing good wildlife habitat or providing refuge for several native plant species which no longer exist in the surrounding area. The aquatic natural area lakes can be found listed in Table 1. Eleven lakes were ranked as AQ-1, 50 as AQ-2 and 89 as AQ-3.

The original 1997 Regional Natural Areas Plan





In addition to updating the plan itself, the Commission has developed the Natural Areas Explorer webtool. This interactive webtool provides access to data and site information used to develop Planning Report No. 42, 2nd Amendment to the Natural Areas and Critical Species Habitat Management and Protection Plan for the Southeastern Wisconsin Region, preliminary draft December 2024. The webtool provide easy access to data and maps such as:

- Natural areas sites, boundaries, and detailed site profiles
- Critical Species Habitat sites
- Aquatic Lake and Stream Rankings and locations
- Archaeological Sites
- Geological Sites
- Aerial maps
- Environmental Corridors
- Invasive species management information

The Natural Areas Explorer can be accessed via the following link: https://www.sewrpc.org/Regional-Planning/Natural-Areas

Project Results

As previously mentioned, SEWRPC received four Wisconsin Department of Natural Resources (WDNR) Surface Water Education Grants. Across the four grants the lakes were split by lake type. There are a variety of types of HQWs in southeastern Wisconsin. This lake "type" is determined using WDNR Natural Community model which categorizes lakes based on surface area, stratification status, hydrology, and watershed size. Headwater lakes are lakes with a watershed less than 4 square miles and lowland lakes are lakes with watershed greater than 4 square miles

Natural Community	Stratification Status	Hydrology
Lakes/Reservoirs <10 acres		
• Small	Variable	Any
Lakes/Reservoirs ≥10 acres		
• Shallow Seepage	Mixed	Seepage
• Shallow Headwater		Headwater Drainage
• Shallow Lowland		Lowland Drainage
• Deep Seepage	Stratified	Seepage
• Deep Headwater		Headwater Drainage
• Deep Lowland		Lowland Drainage
Other Classification (any size)		
• Spring Ponds	Variable	Spring Hydrology
• Two-Story Fishery Lakes	Stratified	Any
• Impounded Flowing Waters	Variable	Headwater or Lowland Drainage

Lake Types in Southeast Wisconsin

Two-Story Lakes

Some lakes are considered a Two-Story lake. According to Wisconsin Legislature a two-story fishery lake is “a lake greater than 5 acres in size that is typically stratified in the summer, with the potential for an oxygenated hypolimnion, that has documentation at any time since 1975 of a population of cold-water fish species such as cisco, whitefish, or trout that is sustained through natural reproduction or long-term active stocking with year-to-year survival.”[1]

Two-story lakes can have varying major water sources, but they often have high groundwater contribution. These deep and often large lakes are given the name “two-story” due to unique oxythermal characteristics. In Southeastern Wisconsin, two-story lakes have intense urban development in their watersheds and along their shorelines. This is often due to them being a very desirable lake type to live on since they are generally deep with clear waters. Many designated two-story lakes no longer support cisco populations in Southeastern Wisconsin due to warming lake temperatures and excessive nutrient pollution which both can cause low dissolved oxygen concentrations.

Deep Headwater Lakes

Deep Headwater lakes are deep lakes located high within their watersheds that have no major tributaries contributing water. For deep headwater lakes, groundwater and minor tributaries are the main water sources. They have a small watershed-to-lake ratio. There is typically little to no agricultural land uses in contributing watershed. These lakes are often fringed by residential development, making shoreline practices particularly important. Deep Headwater lakes often have better water clarity due to lower watershed pollutant loading. Additionally, groundwater contributions lower water temperature and enhance dissolved oxygen concentrations within these lakes.

[1]Wisconsin State Legislature Code NR 102.03(6s)

Lake Types in Southeast Wisconsin

Shallow Lowland/ Reservoir Lakes

A reservoir is “a waterbody with a constructed outlet structure intended to impound water and raise the depth of the water by more than two times relative to the conditions prior to construction of the dam, and that has a mean water residence time of 14 days or more under summer mean flow conditions using information collected over or derived for a 30-year period.” Reservoirs are often also classified as shallow lowland lakes and vice versa.

Shallow Lowland lakes are shallow lakes located lower within their watersheds. These lakes have a larger watershed-to-lake ratio than headwater lakes. Tributaries are often a major source of water for this lake type. Within these larger watersheds, land use is the main pollutant loading concern leading to excessive soil runoff and nutrient loading. Agricultural conservation practices (improving “soil health”) are important to protect the lakes. Many lowland lakes are fringed by residential development. Major tributaries and watershed land uses and practices are larger drivers of these lakes’ water quality.

Seepage Lakes

A seepage lake is “a lake that does not have an outlet stream that continually flows under average summer conditions based on the past 30 years.”[1] Seepage lakes are lakes that have no streams contributing to or draining water from these lakes. Their main water sources are groundwater and precipitation, with their main sources of water loss coming from evaporation and loss to groundwater. Because of this, lake water levels can fluctuate substantially with weather conditions. In general, seepage lakes are smaller with small watershed-to-lake ratios. Seepage lakes’ watershed land use can vary with many high-quality seepage lakes having natural watersheds. In many cases, most of the watershed development is along the lake’s shoreline. When it comes to water quality for seepage lakes, protecting groundwater recharge areas is essential to maintain water quantity and quality. Additionally, since most of the development is along the shoreline, having good shoreline practices in place is important for improving water quality.

Interviews

At the start of 2024, Commission staff reached out to nearly 50 stakeholder groups known to manage the 23 HQW lakes in Waukesha and Walworth Counties. 22 of those groups agreed to be interviewed on how they manage their lake(s). Some groups that were interviewed managed multiple lakes while some lakes had several groups working together to manage them.

Representatives from the groups were given the option to be interviewed in-person, virtually or to fill out the questionnaire and return it. The vast majority of groups opted for in-person or virtual interviews.

What kind of organization do you represent?

Commission staff interviewed groups that had an active role in managing their lake. Some groups that the Commission reached out to did not manage the lake they were on or near to and thus those groups declined to participate in the interviews. In total, 22 groups participated in interviews across Walworth and Waukesha Counties.

District - 9 groups @ 41%

Association- 4 groups @ 18%

Municipalities- 3 groups @ 14%

Conservancy- 2 groups @ 9%

County or State government– 2 groups @ 9%

Agency- 1 group @ 4.5%

Stormwater permitting- 1 group @ 4.5%

District or **lake district**: a public inland lake protection and rehabilitation district formed in accordance with the provisions of ch. 33, Stats.

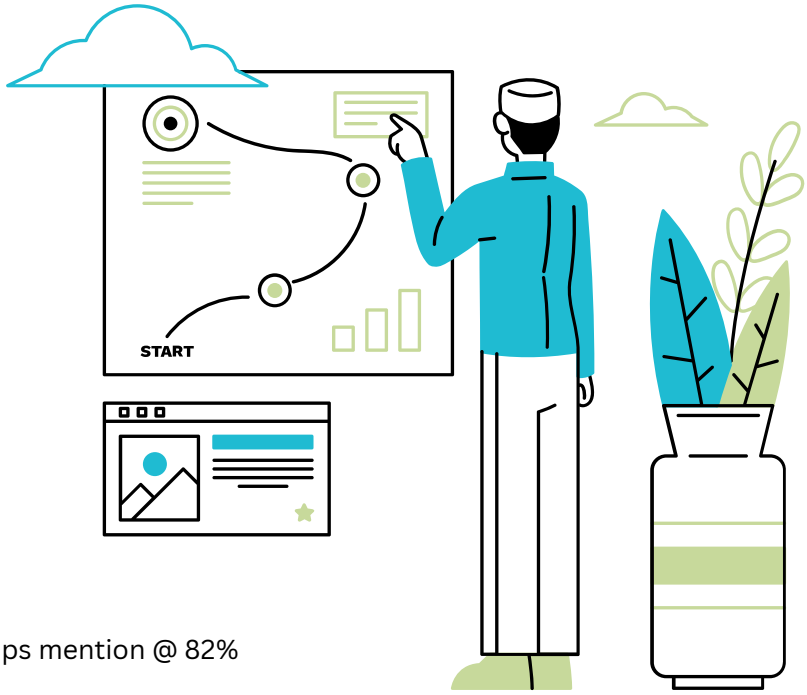
Lake associations: voluntary organizations with members who own land on or near a lake

Municipality: means any city, village or town.

Conservancy : a group or body concerned with the preservation of nature, specific species, or natural resources.

What are the main goals/mission of your organization?

Commission staff not only asked groups what their goals and missions were during interviews but also looked at what the groups mission and purpose statements had in them. As to be expected, “lakes and waters” appeared in mission statements commonly. However, preservation, protection, or conservation, themes that are core to the Wonderful Waters of Wisconsin Action Plan, turned up in the vast majority of groups’ goals and missions.



Inclusion of ‘lakes/waters’: 19 groups mention @ 86%

Word ‘preservation/protection/conservation’: 18 groups mention @ 82%

Inclusion of lands, shorelines: 9 @ 41%

Water quality, water clarity: 8 @ 36%

Themes of ‘restoration, rehabilitation, enhancement’: 7 groups mentioned @ 32%

Education, outreach, raising awareness, communication: 6 groups mentioned @ 27%

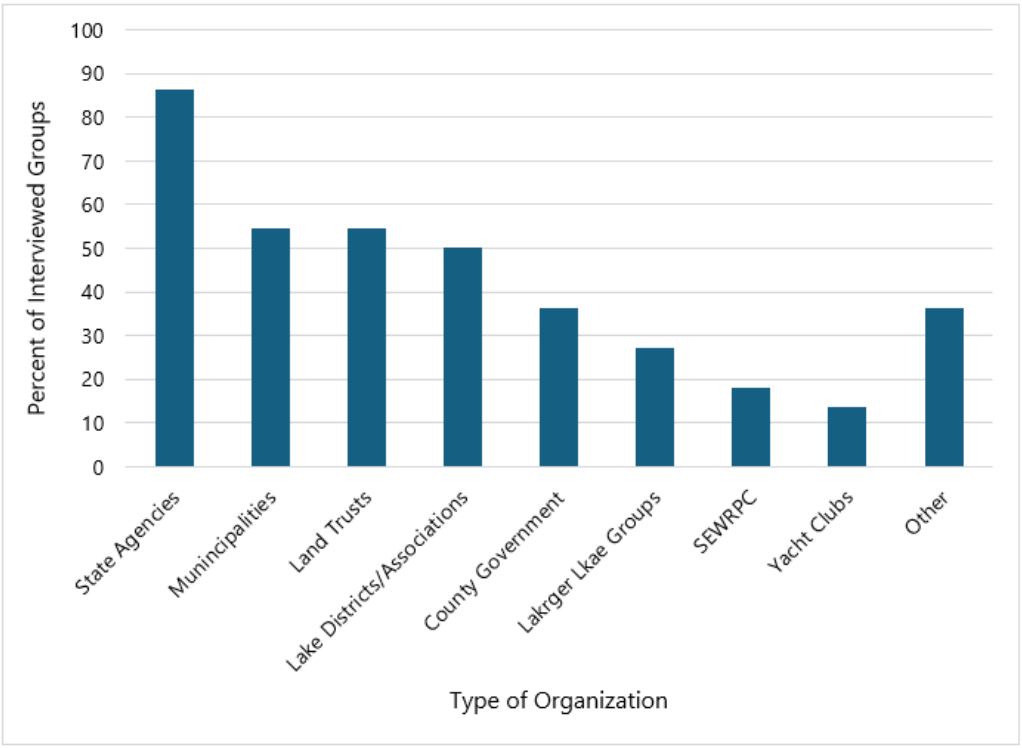
Monitoring, data collection: 3 groups mentioned @ 14%

Watershed: 3 groups mentioned @ 14%

Laws/ordinances: 2 groups mentioned @ 9%

What other organizations/groups do you work closely with?

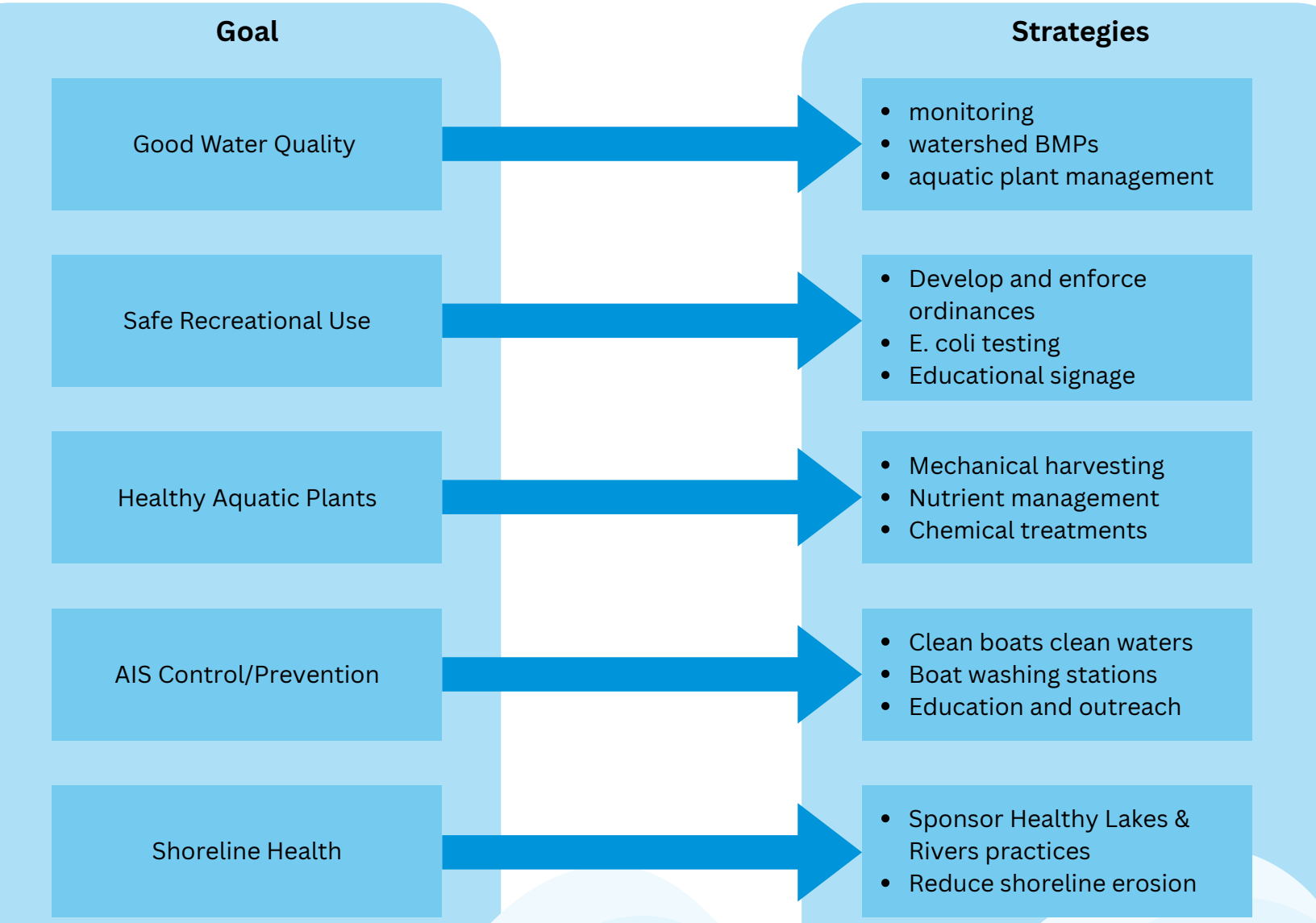
Figure 4
Percent of Lake Groups That Network With Other Organizations



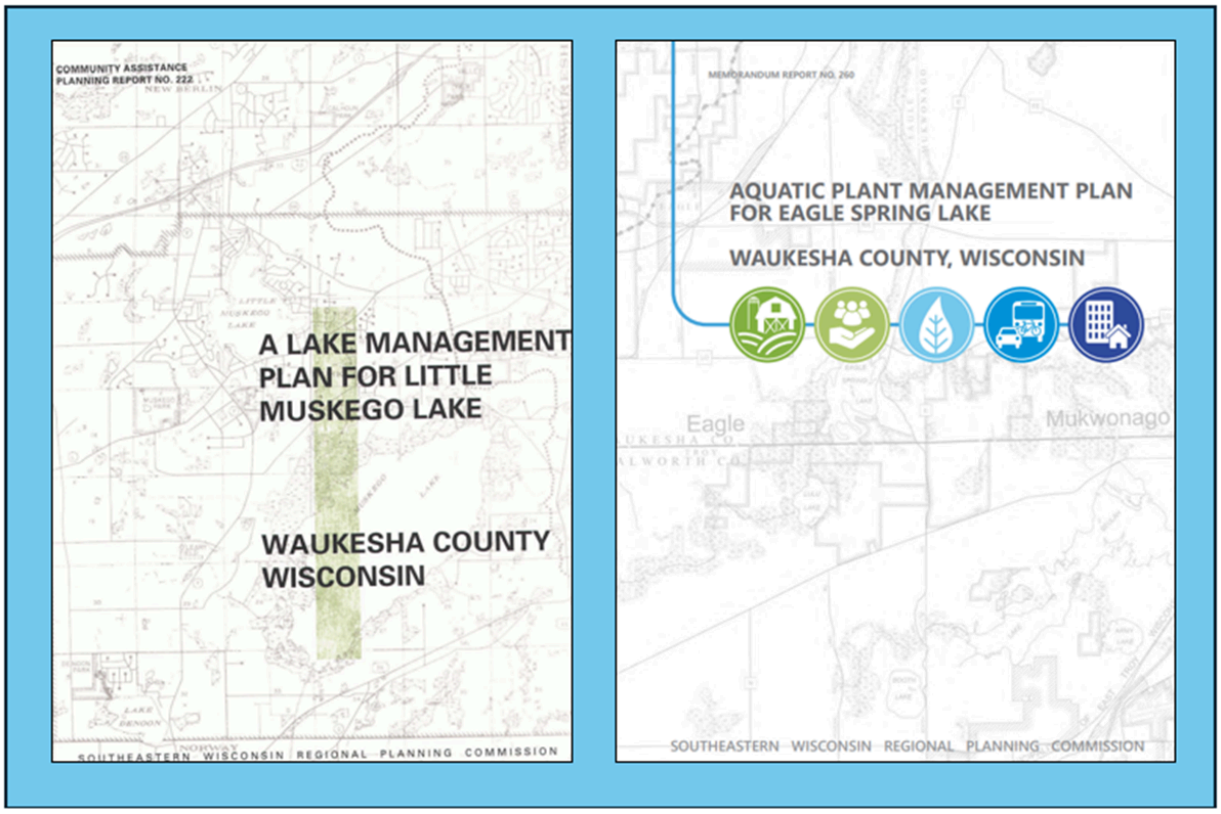
Note: "Other" encompasses universities, country clubs, landowners, farming groups, river groups, contractors and the United States Geological Survey.

Source: SEWRPC

What are your organization's main goals for your waterbody? How do you plan on attaining those goals?



Have you had a lake management plan completed for you by the Commission or another entity? When was the most recent plan completed?



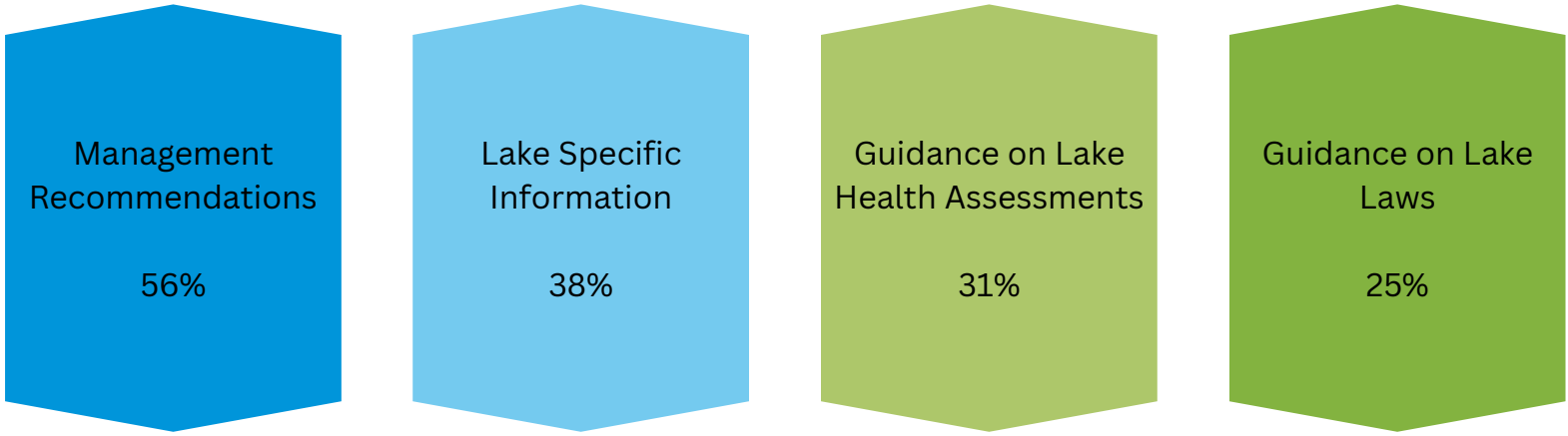
Age of Plans

- Plans 0-5 years old: 26%
- Plans 6-10 years old: 16%
- Plans 11-15 years old: 16%
- Plans >16 years old: 21%
- No management plan: 21%

Purpose of plans:

- to provide summary/inventory of lake data and characteristics
- to provide recommendations for science-based lake management

Describe how your organization uses the lake management plan. What are the most helpful or most often utilized aspects of the plan/report?



16 groups have a Commission-developed lake management plan.

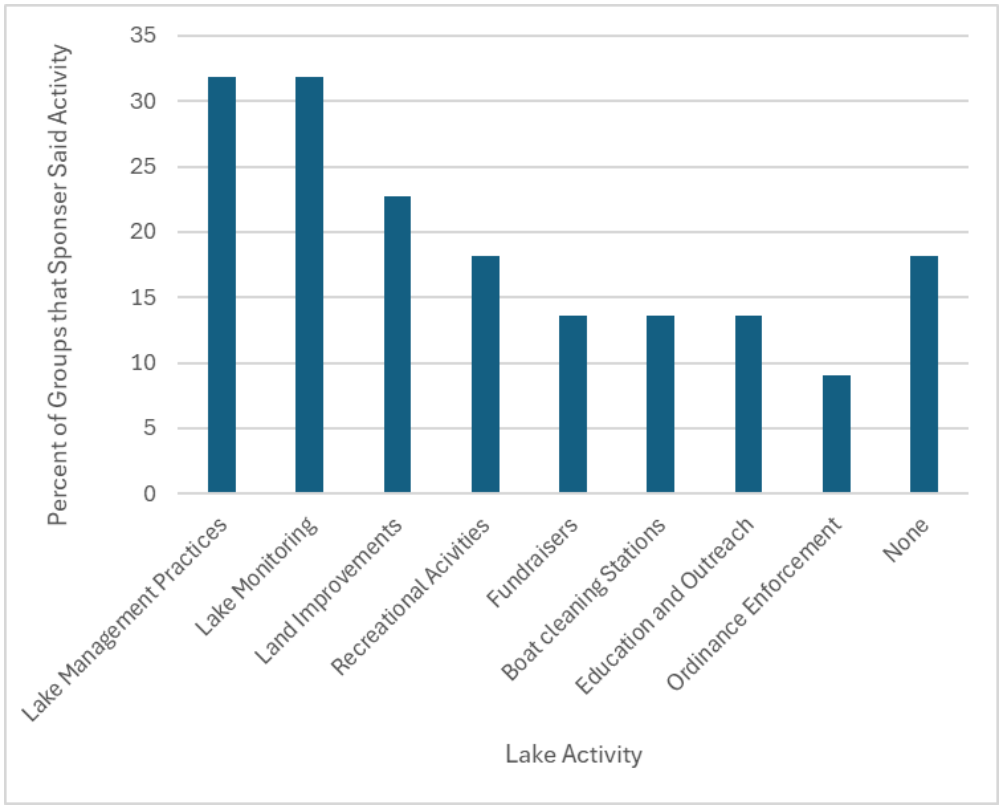
Have you applied for, received, or completed any WDNR Surface Water Grants?

The majority of surveyed groups had applied for recieved or completed a WDNR SWG.

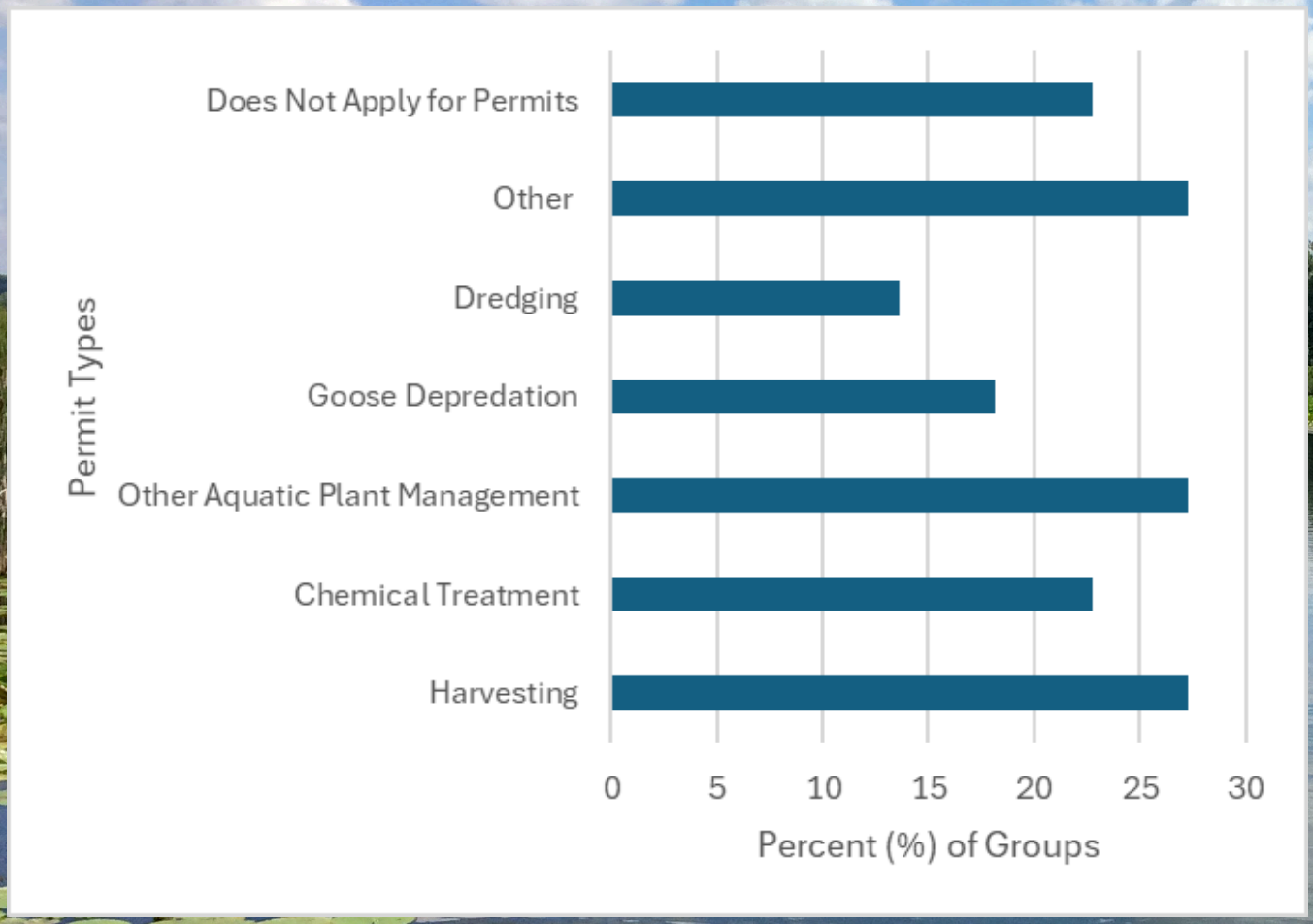
If yes, what were the grants for?

Those grants were mostly for Lake Management Plans, Aquatic Plant Management, Comprehensive Lake Plans, Clean Boat-Clean Waters, AIS monitoring and Lake Protection.

What sort of activities on your lake does your organization sponsor or fund?



Does your organization (or other organizations on your waterbody) often apply for WDNR permits and if so, what kinds of permits (e.g., aquatic plant management)?



What monitoring programs does your group participate in (Citizen Lake Monitoring Network, Clean Boats, Clean Waters, Water Action Volunteers, self-directed, etc)?

- CLMN: 14 @ 64%
- CBCW: 12 @ 55%
- WAV:2 @ 9%
- Self-directed: 10 @ 45%
- None/no answer: 2 @ 9%

Many groups in SE Wisconsin will contract with other organizations such as SEWRPC or USGS to conduct one-time or multiyear monitoring on their lakes.

Nearly 60% of groups participate in more than one program!

What are perceived barriers to adequately managing and protecting your lake?

Limited funding (55%, 12)

Agreement and coordination (46%, 10)

Ordinance enforcement (27%, 6)

Education and outreach (23%, 5)

Technical Expertise Available (14%, 3)

What do you think are some key threats to your lake as a High Quality Water of Southeastern Wisconsin?

Most Commonly Stated Threats

- Increased shoreline development and thus increased lake usage
- Aquatic Invasive Species
- Pollution/Runoff
- Watershed Management (or lack thereof)
- Climate Change

In the face of these threats, how is your lake still maintaining high-quality aquatic environments?

- Coordination and communication amongst entities: 11, **50%**
- Helpful people:8, **36%**
- Ordinances/regulations in place: 7, **32%**
- Erosion control practices:5, **23%**
- Being a part of lakes focused groups: 4, **18%**
- Efficient road salt usage: 3, **14%**
- Lake depth, size, water source: 3, **14%**
- Education and outreach: 3, **14%**
- Reduced rec use on week days compared to weekends: 1, **4%**

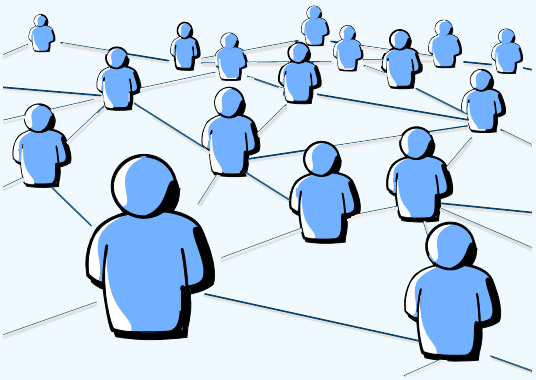
How can lake organizations adapt to future changes in Wisconsin's climate and lake environments?

- Sustainable/ best management practices: 10, **45%**
- Monitoring: 8, **36%**
- Education: 4, **18%**
- Collaboration: 4, **18%**
- Ordinances: 3, **14%**
- Having a plan in place: 3, **14%**
- Unknown: 3, **14%**

What strategies and practices have been helpful in protecting your waterbody?

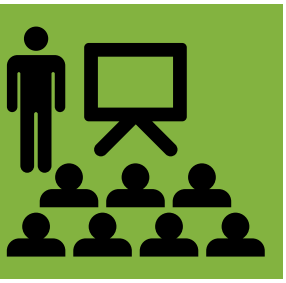
Groups were asked about helpful strategies that they already use to help manage and protect their lakes. Below are the top responses, with effective communication and land management being the op strategies.

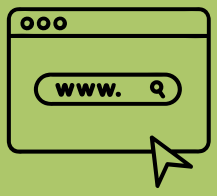
- Communication: 10, groups @ 48%
- Land management: 10 groups @ 48%
- Regular monitoring and maintenance: 8 groups @ 38%
- Participation in lake health efforts/groups: 7 groups @ 33%
- Zoning, ordinances, laws: 7 groups @ 33%
- Education: 2 groups @ 10%
- Unknown: 1 group @ 5%



What are effective means for sharing these strategies and practices with other lake organizations?

Attendance at Conferences (62%, 13)





Website (10%, 2)

Social Media (19%, 4)

Newsletter (10%, 2)

Educational Efforts for Riparian Landowners (5%, 1)

Email (10%, 2)

Workshop

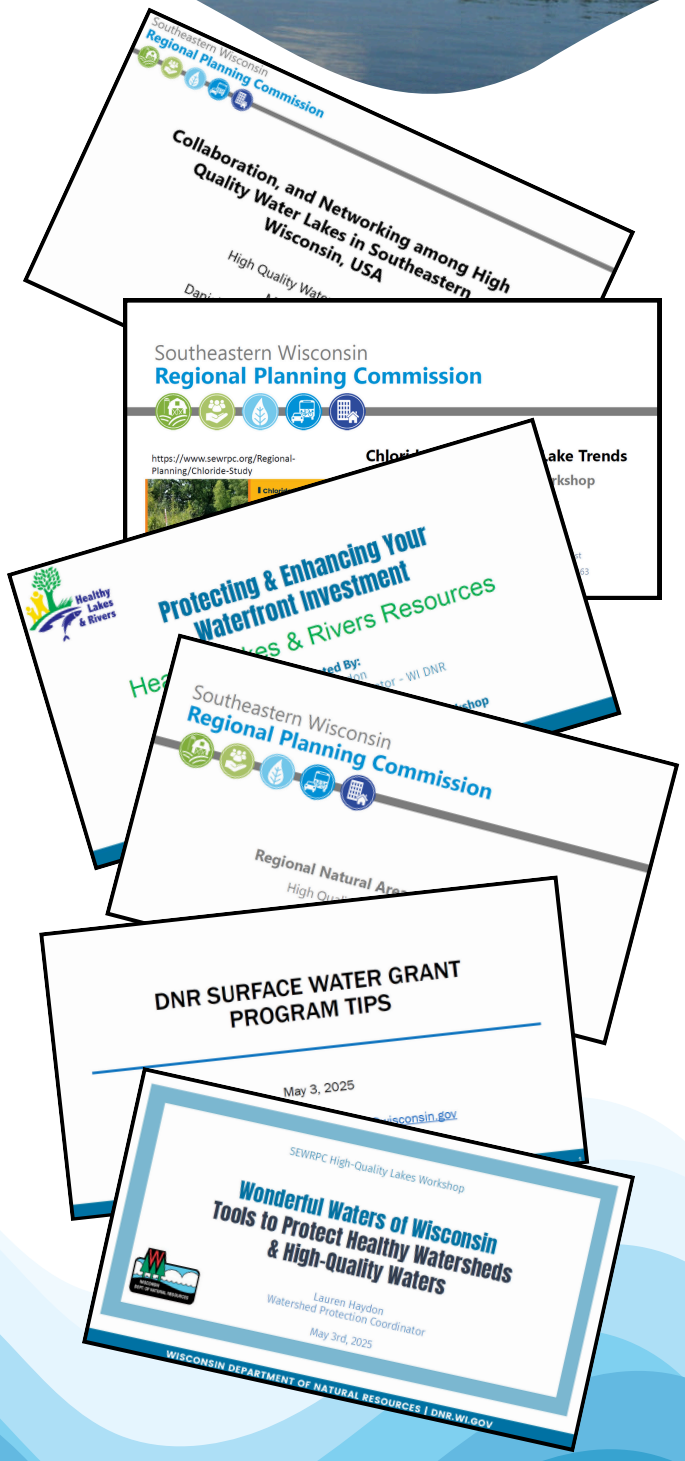
The workshop for this project took place on May 3, 2025, and was held at the Retzer Nature Center. While originally designed for high-quality lakes, the workshop was opened up to all lakes in the region. The workshop had a turnout of 25 people from lakes across the region, regardless of HQW status.

The workshop was designed to have targeted presentations that covered topics that were commonly mentioned during the interview portion of the project.

Topics at the workshop included:

- HQW Project Recap
- Wonderful Waters of Wisconsin
- SEWRPC Natural Areas Plan Update
- WDNR Surface Water Grants
- SEWRPC Chloride Study
- WDNR Healthy Lakes and Rivers Program

Presentations from the workshop are available upon request. [1] In addition to the presentations, time was built into the agenda to allow for lake group representatives time to talk to each other and share ideas and experiences. The workshop concluded with an hour of dedicated networking time, with several groups taking their conversations out to the nature center beyond the end of the workshop.



[1] Email lakeandstream@sewrpc.org to request PDF copies of the presentations from the May 3rd, 2025 Workshop.

Making the Case for Protection

A common concern is how to convince lake groups and users that protection is just as valuable for restoration. As a result of the interviews, Commission staff took the mission statements of the groups interviewed into a word-cloud generator. Unsurprisingly, “lake” and “water” are the two most used words in the mission statements of these groups. However, if those two words are removed, we see that the most prominent word is “protect” (see Figure 6). This indicated that many groups are already setting goals to protect their lakes and the surrounding watershed in addition to restoring lakes once issues arise.

Many lake groups raised concerns during the interviews that many stakeholders do not see the need to dedicate time, funds or volunteering to protection of their water bodies since “nothing is wrong.” A good analogy is that of a leaky boat. Many boat owners will conduct preventative maintenance of their watercraft to ensure it is in good condition and is not leaking. However, if the watercraft were left to the elements, not protected or maintained, or if an uneducated person drove the boat, it could become damaged and leak. If the leak is not fixed, the boat will be unpleasant to use. However, regular preventative maintenance, safety checks and making sure those who use the boat are aware of how to properly and safely recreate with it can ensure that the boat able to be used for years to come.

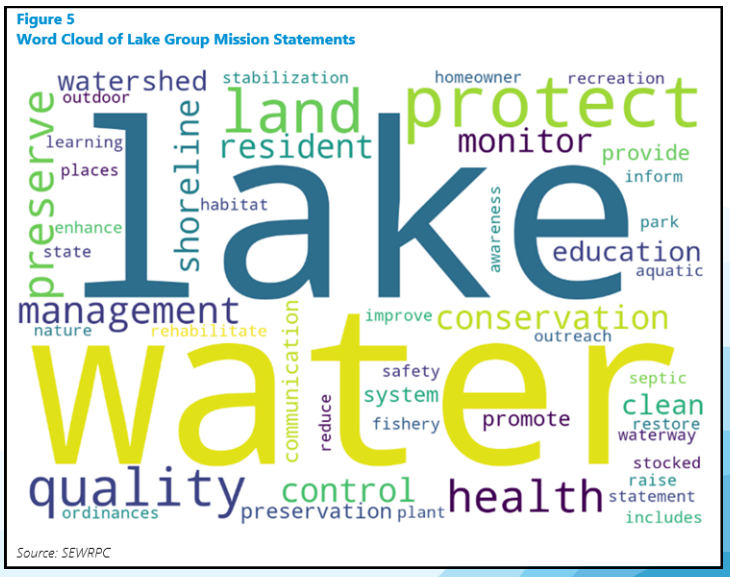


Figure 5
Word Cloud of Lake Group Mission Statements

Source: SEWRPC

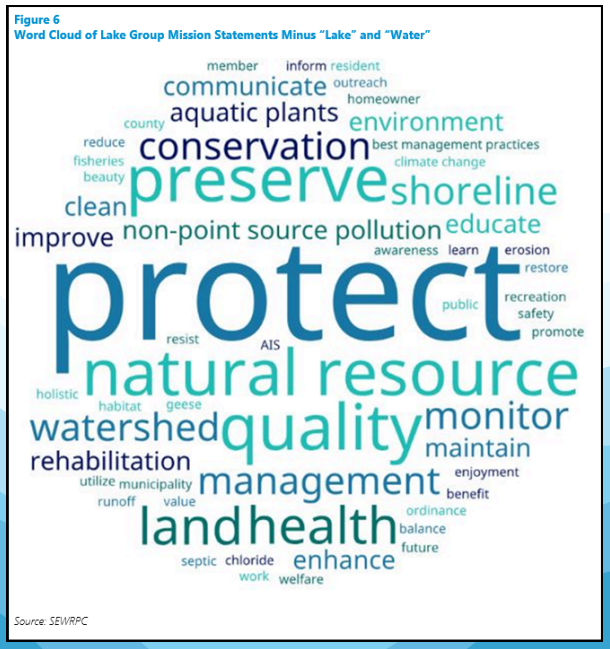


Figure 6
Word Cloud of Lake Group Mission Statements Minus “Lake” and “Water”

Source: SEWRPC