

2015

Wadley Lake Management Plan



Prepared by staff from the Center for Watershed Science and Education
University of Wisconsin-Stevens Point.



Center for Watershed Science and Education
College of Natural Resources
University of Wisconsin-Stevens Point

Wadley Lake Management Plan

The Wadley Lake Management Plan was prepared after obtaining input from residents and lake users at a series of public planning sessions held at the Bevent Town Hall in Bevent, Wisconsin on January 30, February 27, March 27, April 24 and May 13, 2014. The inclusive community sessions were designed to identify key community concerns, assets, opportunities, and priorities. Representatives from state agencies, local agencies, and nonprofit organizations also attended the planning sessions to offer assistance to the group in developing a strategic Lake Management Plan (LMP).

The plan was adopted by the Town of Bevent on:

September 3, 2014

The plan was adopted by Marathon County on:

August 18, 2015

The plan was approved by the Wisconsin Department of Natural Resources on:

A special thanks to all who helped to create the Wadley Lake Management Plan and provided guidance during the plan's development:

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Mayflower Lake District, Pike Lake Sportsman Club, and Wadley Lake Sportsman Club
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Overarching Vision for Wadley Lake:

Wadley Lake will provide a peaceful place to enjoy time with family, characterized by clear water, preserved shorelines, ample habitat to support fish, and a balanced aquatic plant community free of invasives. The area near the lake will be minimally altered from its current state by development or clearing of trees, providing future residents and lake users with an appreciation for lake stewardship.

Wadley Lake is a 47 acre seepage lake located in quiet, rural southeastern Marathon County, Wisconsin. The lake is bordered to the west by County Road J/Y and to the east by forests, which make up much of the watershed. A moderate level of development exists around the perimeter; many of the shoreland residents helped to develop this lake management plan. Residents and non-residents alike enjoy Wadley Lake, with a boat launch just off County Road J/Y. The lake is a central part of the community, and though Wadley Lake does not have an official organization, there has been a history of fish habitat and aquatic invasive species management activities. Wadley Lake residents strongly value the peacefulness that encompasses their lake, the fishing opportunities it provides, and the quality of its water. In 2014, these values inspired community members of Wadley Lake to come together in partnership with local professionals to learn about Wadley Lake and to create a lake management plan to protect and improve their lake for generations to come.

Based on discussions throughout the planning process, Wadley Lake planning session participants identified several priority issues and goals that they would like to focus on in upcoming years:

- Maintaining a healthy and sustainable fishery
- Monitor and manage invasive Eurasian watermilfoil while preventing new aquatic invasive species
- Building partnerships with town, county and other lake groups

Introduction and Background

This lake management plan and its planning process allow a community to control the fate of its lake and make decisions together. It is a dynamic document that identifies goals and action items for the purpose of maintaining, protecting and/or creating desired conditions in a lake. It can correct past problems, improve on current conditions, and provide guidance for future residents, board members, lake users, and technical experts by identifying which issues have been addressed and gauging the success of previous efforts. Each lake plan is unique, dependent upon the conditions of the lake and its watershed and the interests of the stakeholders involved. The actions identified in this lake management plan serve as a gateway for obtaining grant funding and other resources to help implement activities outlined in the plan. Because many entities are involved in lake and land management, it can be challenging to navigate the roles, partnerships, and resources that are available. The planning process and content of this plan have been designed to identify where some of the key assistance exists.

Many individuals and organizations are involved in assuring that the Wadley Lake ecosystem is healthy. It is essential for key partners who are responsible for lake and land management work together to achieve this goal. The planning process and content of this plan have been designed to identify where some of the key assistance exists. Following is a list of key partners; this list is not all inclusive.

- **Individuals:** People living near Wadley Lake can have the greatest positive influence on the lake by choosing lake-friendly choices to manage their land.
- **Wadley Lake Sportsman Club and community members:** Resources and funding opportunities for management activities are made more available by clarification of goals in the lake management plan and the community can identify partners to help achieve their goals for Wadley Lake.
- **Neighboring lake groups:** Neighboring groups with similar goals for lake stewardship can combine their efforts and provide each other support, improve competitiveness for funding opportunities, and make efforts more fun.
- **The Town of Bevent:** The Town can utilize the visions, wishes, and goals documented in this lake management plan when considering town-level management planning or decisions within the watershed that may affect the lake.
- **Marathon County:** The County will better know where to identify needs, provide support, and allocate resources to assist in plan implementation when documented in a plan.
- **Wisconsin Department of Natural Resources:** Professionals working with lakes in Marathon County can use this plan as guidance for management activities and decisions related to the management of the resource, including the fishery, and invasive species. Lake management plans help the WDNR identify and prioritize needs within Wisconsin's lake community, and decide where to best apply resources and funding. A well thought out lake management plan increases an application's competitiveness for funding from the State – if multiple Marathon County lakes have similar goals in their lake management plans, they can join together when seeking grant support to increase competitiveness for statewide resources. Information about WDNR grants is located on their website <http://dnr.wi.gov/lakes/grants/>. Grant contacts are also listed in Appendix A.

One of the first steps in creating the Wadley Lake Management Plan was to gather and compile data about the lake and its ecosystem. The Eastern Marathon County Lakes Project was initiated by citizens who encouraged Marathon County to work in partnership with UW-Stevens Point to assess 11 lakes located in the eastern portion of the county. Wadley Lake was one of these lakes. Many of the lakes had insufficient data available to help evaluate current water quality concerns, aquatic plant communities, invasive species, or fisheries, so the project began with a study of the 11 lakes and their ecosystems that gathered and compiled data in order to understand past and current lake conditions (Eastern Marathon County Lakes Study, 2010-12). Professionals and students from UW-Stevens Point conducted the study and interpreted the data for use in lake management planning. The results of this project (including this document) will assist citizens, municipalities, Marathon County, and State staff to efficiently manage these water resources and help make informed decisions and policies that affect the lakes. Funding for this effort was provided by the Wisconsin Department of Natural Resources Lake Protection Grant Program, the county's environmental fund, and monetary and in-kind contributions from citizens.

The purpose of this plan is to learn about Wadley Lake, identify factors important to lake residents and users, and develop goals to protect and improve Wadley Lake for generations to come.

In addition to the Eastern Marathon County Lakes Study, data collected by citizens, consultants, and professionals from the WDNR were incorporated into the planning process to provide a robust set of information from which informed decisions were made in this plan. Sources of information used in the planning process are listed at the end of this document for future reference.

Several reports from the Wadley Lake Study and the materials associated with the planning process and reports can be found on the Marathon County website: <http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning/ConservationServices/LakePrograms.aspx>. The purpose of this plan is to learn about Wadley Lake and identify features important to the Wadley Lake community to provide a framework for the protection and improvement of the lake. A series of meetings were held at the Bevent Town Hall to assist area residents, lake users, and representatives of local municipalities with the development of the lake management plan. Five meetings took place between January and May 2014 that enabled meeting participants to learn about and discuss the topics of the fishery, recreation, algal and aquatic plant communities, current and historic water quality and land use, shoreland health, and communication as they related to Wadley Lake. Professionals provided insight and recommendations to consider in the lake management plan, as well as environmental and regulatory considerations. Meeting participants then identified goals, objectives, and actions for the lake management plan.

The Wadley Lake Planning Committee consisted of community members and town board members, with technical assistance provided by the Marathon County Conservation, Planning, and Zoning Department (CPZ), and professionals from the Wisconsin Department of Natural Resources (WDNR), Golden Sands Resource Conservation and Development, Inc., and the UW-Stevens Point Center for Watershed Science and Education (CWSE). This plan is intended to identify opportunities for ensuring that the lake's ecological, aesthetic, and recreational opportunities are plentiful into the future, as recorded in the planning meetings by professionals from UW-Stevens Point.

Goals, Objectives and Actions

The following goals, objectives and actions are derived from the values and concerns of the members of the Wadley Lake Management Planning Committee (including local citizens) and the background science about Wadley Lake, its ecosystem and its watershed. Implementing the goals and actions in the Wadley Lake Management Plan will ensure that the vision is supported.

Although each lake is different, the Wisconsin Department of Natural Resources requires that a comprehensive lake management plan address, at a minimum, a list of topics that affect the character of a lake, whether each topic has been identified as a priority or as simply something to consider. These topics comprise the chapters in this plan. For the purposes of this plan, the chapters have been grouped by interrelated content as follows:

In-Lake Habitat and a Healthy Lake

Fish Community—fish species, abundance, size, important habitat and other needs

Aquatic Plant Community—habitat, food, health, native species, and invasive species

Critical Habitat—areas of special importance to the wildlife, fish, water quality, and aesthetics of the lake

Landscapes and the Lake

Water Quality and Quantity—water chemistry, clarity, contaminants, lake levels

Shorelands—habitat, erosion, contaminant filtering, water quality, vegetation, access

Watershed Land Use—land use, management practices, conservation programs

People and the Lake

Recreation—access, sharing the lake, informing lake users, rules

Communication and Organization—maintaining connections for partnerships, implementation, community involvement

Updates and Revisions—continuing the process

Governance—protection of the lake, constitution, state, county, local municipalities

Resources listed within the plan identify the primary organizations or individuals that are able to provide information, suggestions, or services to accomplish the goals and objectives. This list should not be considered all-inclusive – assistance may also be provided by other entities, consultants, and/or organizations. Listed below are common acronyms for the resources mentioned in the following pages.

Acronym	Organization/Resource
CBCW	Clean Boats Clean Waters
CLMN	Citizen Lake Monitoring Network
CWSE	UWSP Center for Watershed Science and Education
CPZ	Land Conservation Department (Marathon County)
MC	Marathon County
NCCT	North Central Conservancy Trust
NRCS	USDA Natural Resources Conservation Service
RC&D	Golden Sands Resource Conservation and Development Council, Inc.
UWSP	University of Wisconsin-Stevens Point
UWEX	UW-Extension
WEAL	UWSP Water and Environmental Analysis Lab
WDNR	Wisconsin Department of Natural Resources
WDOT	Wisconsin Department of Transportation

A management plan is a living document that changes over time to meet the current needs, challenges and desires of the lake and its community. **The goals, objectives and actions listed in this plan should be reviewed annually and updated with any necessary changes.**

In-Lake Habitat and a Healthy Lake

Many lake users value Wadley Lake for its fishing, wildlife, and good water quality. These attributes are all interrelated; the health of one part of the lake system affects the health of the rest of the plant and animal community, the experiences of the people seeking pleasure at the lake, and the quality and quantity of water in the lake. Habitat is the structure for a healthy fishery and wildlife community. It can provide shelter for some animals and food for others.

Lake habitat occurs within the lake, along all of its shorelands, and even extends into its watershed for some species. Many animals that live in and near the lake are only successful if their needs – food, a healthy environment, and shelter – are met. Native vegetation, including wetlands, along the shoreline and adjacent to the lake provides habitat for safety, reproduction, and food, and can improve water quality and balance water quantity. Some lake visitors such as birds, frogs, and turtles use limbs from trees that are sticking out of the water for perches or to warm themselves in the sun. Aquatic plants infuse oxygen into the water and provide food and shelter for waterfowl, small mammals, and people. The types and abundance of plants and animals that comprise the lake community also vary based on the water quality and on the health and characteristics of the shoreland and watershed. Healthy habitat in Wadley Lake includes the aquatic plants, branches, and tree limbs above and below the water.

Fish Community

A balanced fish community has a mix of predator and prey species, each with different food, habitat, nesting substrate, and water quality needs in order to flourish. Activities in and around a lake that can affect a fishery may involve disturbances to the native aquatic plant community or substrate, excessive additions of nutrients or harmful chemicals, removal of woody habitat, shoreline alterations, and/or an imbalance in the fishery. Shoreland erosion can cause sediment to settle onto the substrate, causing the deterioration of spawning habitat. Habitat can be improved by allowing shoreland vegetation to grow, minimizing the removal of aquatic plants, providing fallen trees or limbs in suitable areas, and protecting wetlands and other areas of critical habitat.

People are an important part of a sustainable fish community, as their actions on the landscape and the numbers and sizes of fish taken out of the lake can influence the entire lake ecosystem. Putting appropriate fishing regulations in place and adhering to them can help to balance the fishery with healthy prey and predatory species and provide for excellent fishing, and can be adjusted as the fish community changes.

Managing a lake for a balanced fishery can result in fewer expenses to lake stewards and the public. While some efforts may be needed to provide a more suitable environment to meet the needs of the fish, they usually do not have to be repeated frequently. Protecting existing habitat such as emergent, aquatic, and shoreland vegetation, and allowing trees that naturally fall into the lake to remain in the lake are free of cost. Alternatively, restoring habitat in and around a lake can have an up-front cost, but the effects will often continue for decades. Costs in time, travel, and other expenses are associated with routine efforts such as fish stocking and aeration. Ideally, a lake contains the habitat, water quality, and food necessary to support the fish communities present within the lake and provide fishing opportunities without a lot of supplemental effort and expense to maintain these conditions.

Wadley Lake supports a warm water fish community. Eleven fish species were sampled in the 2012 survey conducted by UW-Stevens Point, including green sunfish, which are relatively uncommon to the area, and young bass and sunfish which indicated that successful reproduction of these species was taking place. Fish stocking records date back to 1938 but are sparse; minimal management has been conducted historically on Wadley Lake (Meronek, 2014).

The eastern and southern ends of the lake exhibited high quality fish habitat when surveyed in 2012 (Figure 1). This area was surrounded by forested and natural land, which contributed to the woody habitat within the lake. This structure is utilized by young prey fish and other aquatic organisms for spawning, foraging, and protective cover. There were also areas of sand and cobble along the shoreline, which is important for pan fish reproduction.

Fish cribs were added in 2007 and 2014 to provide additional spawning habitat and cover for young fish. At the time of plan formation, Wadley Lake had just been approved for fish crib placement within the lake until January 22, 2017 (see Appendix B: Fish Crib Permits for permit details).



Figure 1. Fish habitat assessment in Wadley Lake, 2012.

Guiding Vision for the Fish Community in Wadley Lake

Wadley Lake will have a balanced fish community with natural high quality habitat preserved from present conditions.

Goal 1: Understand and optimize the fish community in Wadley Lake.

Objective 1.1: Collect and record more fish community data over a longer period of time.

Actions	Lead person/group	Resources	Timeline
Work with the WDNR or UWSP to continue sampling efforts in future years to collect more complete fish data and adjust regulations to support a sustainable fishery.		WDNR Fisheries Biologist UWSP	

Objective 1.2: Maintain bluegill Proportional Stock Density (PSD) at 35-60% (currently 13%) and largemouth bass PSD at 40-60% (currently 73%).

Actions	Lead person/group	Resources	Timeline
Explore slot/bag limits for bluegill and bass.		WDNR Fisheries Biologist UWSP	
Communicate to lake users a wish for catch-and-release for perch by word of mouth.		WDNR Fisheries Biologist	

Goal 2: Protect, restore, and enhance lake-wide fish habitat.

Objective 2.1: Enhance fish habitat along the shoreline of the lake.

Actions	Lead person/group	Resources	Timeline
Encourage shoreland owners to apply for tree drop permit(s) to enhance woody habitat in sparse areas of the lake.	Shoreland property owners		
Restore shoreland vegetation along the developed portions of the lake to at least 35' from the lake, where possible.	Shoreland property owners	CPZ	
Explore the installation of rain gardens or retention ponds near the highway.	Interested citizen	CPZ	

If placing fish cribs, locate them in shallow areas of the lake where the depth is less than 12 feet.		WDNR Fisheries Biologist	
Maintain native emergent and submergent vegetation.	Shoreland property owners		

Objective 2.2: Protect existing habitat on the western and southern ends of the lake.

Actions	Lead person/group	Resources	Timeline
Avoid removal of woody habitat near shore throughout the lake.	Shoreland property owners	WDNR Fisheries Biologist	
Protect natural shoreland by supporting placement of land into conservation programs (i.e. conservation easements, purchase of development rights).	Interested shoreland property owners	NCCT CPZ	

Aquatic Plant Community

Aquatic plants provide the forested landscape within Wadley Lake. They provide food and habitat for spawning, breeding, and survival for a wide range of inhabitants and lake visitors including fish, waterfowl, turtles, amphibians, as well as invertebrates and other animals. They improve water quality by releasing oxygen into the water and utilizing nutrients that would otherwise be used by algae. A healthy lake typically has a variety of aquatic plant species which creates diversity that makes the aquatic plant community more resilient and can help to prevent the establishment of non-native aquatic species.

Aquatic plants near shore and in shallows provide food, shelter and nesting material for shoreland mammals, shorebirds and waterfowl. It is not unusual for otters, beavers, muskrats, weasels, and deer to be seen along a shoreline in their search for food, water, or nesting material. Eighteen species of aquatic plants were identified in Wadley Lake or in wet areas of the shore during the 2012 survey, with the greatest diversity found in the northeastern and northwestern bays. This is below average compared to other eastern Marathon County lakes, ranking 10th out of the 11 studied. The dominant plant species in the survey was muskgrass, followed by slender naiad and Illinois pondweed. Muskgrass is a favorite food source for a wide variety of waterfowl. Beds of muskgrass offer cover and food for fish, especially young trout, largemouth bass, and smallmouth bass. The stems, leaves, and seeds of slender naiad are also important food sources for waterfowl and marsh birds. This common aquatic species provides habitat for fish as well. Illinois pondweed produces a fruit that can be a locally important food source for a variety of waterfowl. Fish and invertebrates make use of the plant for shade and cover.



Figure 3. Curly-leaf pondweed.



Figure 2. Eurasian water-milfoil.

Two species of non-native aquatic plants have been found in Wadley Lake during past surveys conducted by the Wisconsin Department of Natural Resources. A survey specifically for curly-leaf pondweed was conducted in 2011. No curly-leaf pondweed was found during this special survey or during the full vegetation survey of 2012. Curly-leaf pondweed (Figure 3) offers habitat to invertebrates and fish during winter and spring, a time of year when most other aquatic plants are reduced to rhizomes and winter buds. The plant becomes problematic when it dies-off in midsummer, releasing nutrients into the water column and triggering algal blooms. The second non-native aquatic species, Eurasian water-milfoil (Figure 2), was found during the 2012 survey (Figure 4). This aquatic plant is one of the earliest growers in spring and can quickly shade out native species. It is difficult to eradicate due to the ability of fragments broken from the main plant to take root elsewhere in the lake; however, a survey conducted by the Wisconsin Department of Natural Resources in 2013 after heavy chemical treatment documented no occurrences of the invasive plant. The treatment did not come without cost to the native plant community – many native pondweed populations within the lake also declined significantly after the chemical application (Provost, 2014). Discussion between the planning committee and professionals resulted in a decision to discontinue chemical treatment.

Overall, the aquatic plant community in Wadley Lake can be characterized as having low species diversity. The two non-native species found in Wadley Lake should continue to be monitored to ensure that populations are not increasing or changing. In addition, habitat, food source, and water quality benefits of a diverse plant community should be focal points in future decision making concerning lake management strategies. Golden Sands Resource Conservation and Development, Inc. will survey Wadley Lake for invasive species during the summer of 2014. A variety of aquatic plant management strategies were discussed at the February 27, 2014 planning session. A complete list of strategies can be found in Appendix A: Aquatic Plant Management Strategies, with the actions chosen by the lake group listed below.

Wadley Lake 2012 Aquatic Plant Survey: Eurasian water-milfoil (*Myriophyllum spicatum*)

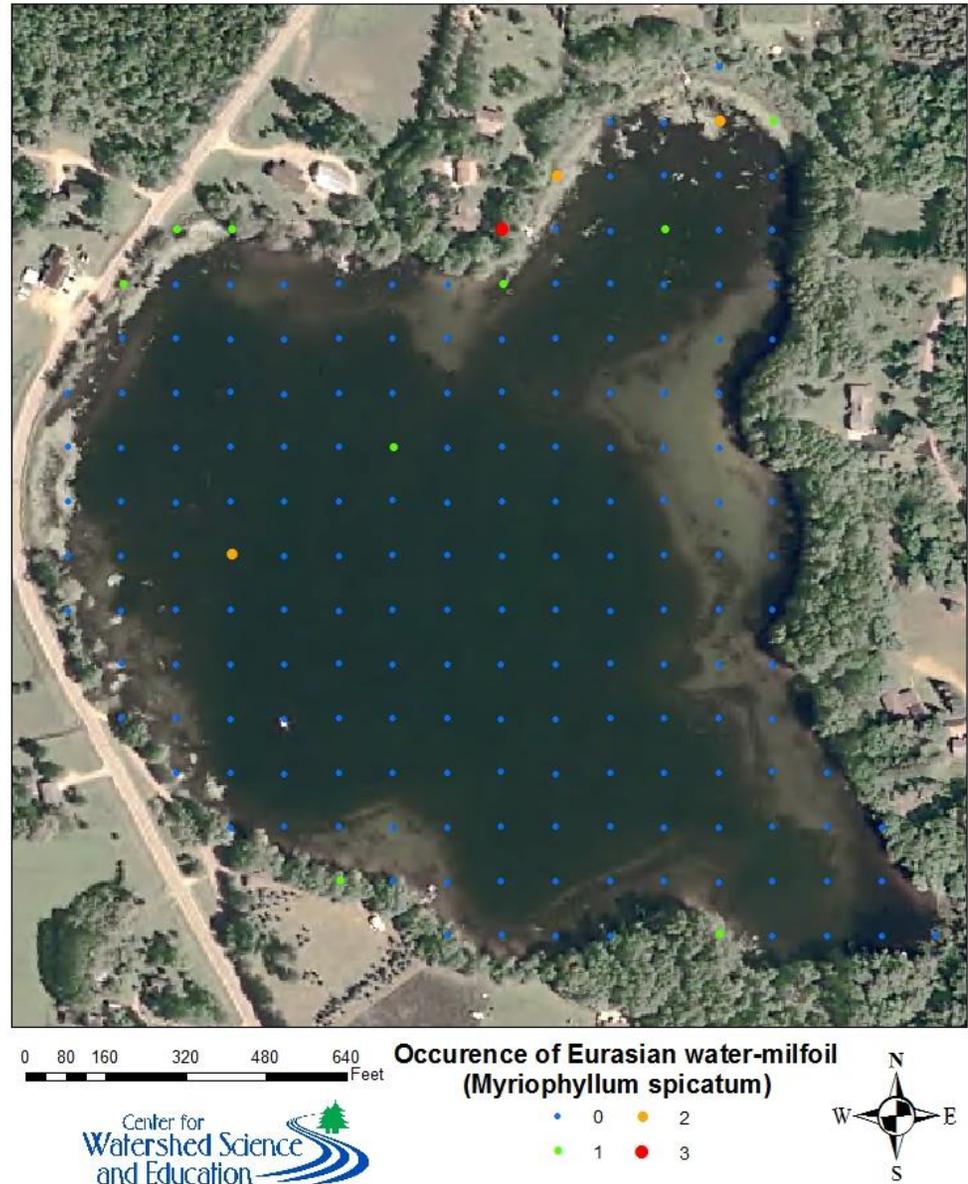


Figure 4. Occurrence of Eurasian water-milfoil in Wadley Lake during the 2012 plant survey.

Guiding Vision for the Aquatic Plant Community in Wadley Lake

Wadley Lake will be free of aquatic invasive plants without the use of chemicals.

Goal 3: Reduce or eliminate aquatic invasive species (AIS) in Wadley Lake.

Objective 3.1: Control populations of Eurasian watermilfoil (EWM).

Actions	Lead person/group	Resources	Timeline
Participate in aquatic invasive species manual removal training.	Interested citizen	RC&D* WDNR Aquatic Plant Biologist	
Hire trained divers to help hand pull invasive milfoil or find a local resident who can be trained in proper removal.		WDNR Aquatic Plant Biologist WDNR AIS Grant Program	
Coordinate identification and training efforts with Golden Sands RC&D* during their summer 2014 survey of Wadley Lake.	Interested citizen	RC&D*	Summer 2014
Continue Clean Boats, Clean Waters monitoring on holiday weekends and by personal contact on the lake.	Interested citizen	Local CBCW Coordinator RC&D*	
Contact CBCW Coordinator if there are more boats than volunteers can handle.	Interested citizen	Local CBCW Coordinator RC&D*	
Use available grant(s) to cover costs of divers.			
Work with Golden Sands RC&D* to search for evidence of native milfoil weevil.	Interested citizen	RC&D* WDNR	

Objective 3.2: Inform lake residents about invasive species and how to identify them.

Actions	Lead person/group	Resources	Timeline
Learn to identify native and non-native plants.	Interested citizen	RC&D*	
Post informational materials (such as brochures/pamphlets on AIS, critical habitat, perch catch-and-release, fish sizing chart w/ AIS info, etc.) in nearby restaurants, public buildings, etc. (including Corky's in Shantytown).			
Work with professors at UWSP to develop information materials.	Interested citizen	UWSP College of Natural Resources (Human Dimensions)	

* Note: Services offered by RC&D are dependent on available funds through grants or lake groups.

Critical Habitat

In 2007, the Wisconsin Department of Natural Resources designated three critical habitat areas on Wadley Lake based on their importance to fish habitat, water quality, high quality plant communities, and aesthetic beauty. The protection of these areas requires the protection of both in-lake habitat and shoreland habitat. Critical habitat designations should be taken into special consideration when moving forward with management actions.

Critical habitat area #1 is located in the northeastern bay (Figure 5). It includes shallow marsh wetlands and supports important near-shore terrestrial habitat, shoreline habitat, and littoral zone habitat composed of forest, wetland, and shrub cover. Fallen trees and gravel/sand, and silt are common, which benefits fish and wildlife habitat.

Critical habitat area #2 is located in the southeastern bay, and hosts a diverse aquatic plant community, scenic beauty, and valuable near-shore shoreland vegetation that contribute to fish and wildlife habitat.

Critical habitat area #3 is located along the western shore. It also hosts aquatic plants, deep and shallow marsh habitat, and large woody cover from fallen trees. All of these characteristics contribute to valuable wildlife and fish habitat.

General recommendations for critical habitat areas in Wadley Lake include the following:

- Maintain and restore shoreland vegetation between the residences and the road and the lake.
- Refrain from the use of erosion controls such as rip-rap or retaining walls; instead, use natural vegetation along the shoreline.
- Refrain from grading the bank.
- Maintain snags and other fallen woody habitat along the shore.
- Protect emergent and submergent aquatic vegetation.



Figure 5. Critical habitat areas in Wadley Lake (courtesy of WDNR Critical Habitat Designation Report, 2007).

- No permit approval for pea gravel beds or sand blankets, except for Wisconsin Department of Natural Resources fishery or wildlife approved projects.
- No dredging or lake bed removal or modifications.
- No additional pier placement or boat ramp placement in these areas.

See the Designation of Critical Habitat Areas: Wadley Lake, Marathon County (2007) for area-specific recommendations and more detailed information.

Guiding Vision for Critical Habitat in Wadley Lake

The critical habitat areas in Wadley Lake will remain in high quality condition and continue to provide cover, forage, and water quality benefits for the lake and its inhabitants.

Goal 4: Prevent the degradation of critical habitat areas in Wadley Lake.

Objective 4.1: Protect in-lake habitat and surrounding land within critical habitat areas.

Actions	Lead person/group	Resources	Timeline
Support land entry into conservation programs (i.e. conservation easements, purchase of development rights, etc.).	Interested citizen	CPZ NCCT	
Do not disturb existing native aquatic vegetation within critical habitat areas.	Lake users		
Post notices or signs on the lake informing visitors and lake users of the importance of these unique areas.		Town of Bevent	

Landscapes and the Lake

Land use (Figure 6 and Figure 7) and land management practices within a lake's watershed can affect both its water quantity and quality. While forests, grasslands, and wetlands allow a fair amount of precipitation to soak into the ground, resulting in more groundwater and good water quality, other types of land uses may result in increased runoff and less groundwater recharge, and may also be sources of pollutants that can impact the lake and its inhabitants. Areas of land with exposed soil can produce soil erosion. Soil entering the lake can make the water cloudy and cover fish spawning beds. Soil also contains nutrients that increase the growth of algae and aquatic plants. Development on the land may result in changes to natural drainage patterns and alterations to vegetation on the landscape, and may be a source of pollutants. Impervious (hard) surfaces such as roads, rooftops, and compacted soil prevent rainfall from soaking into the ground, which may result in more

Land Use in the Wadley Lake Watershed

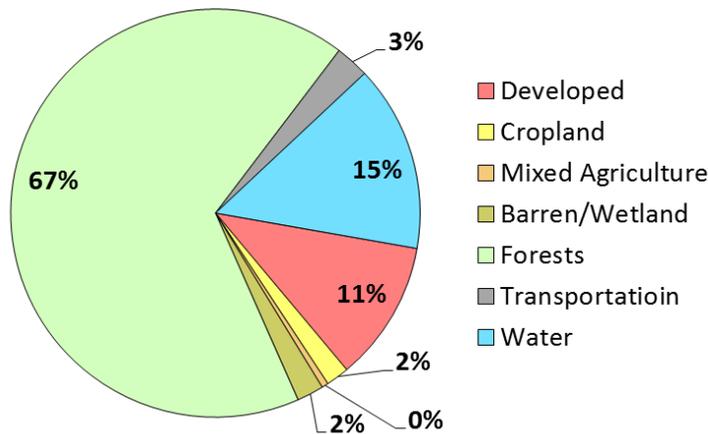


Figure 6. Area percentage of the Wadley Lake watershed by land use.

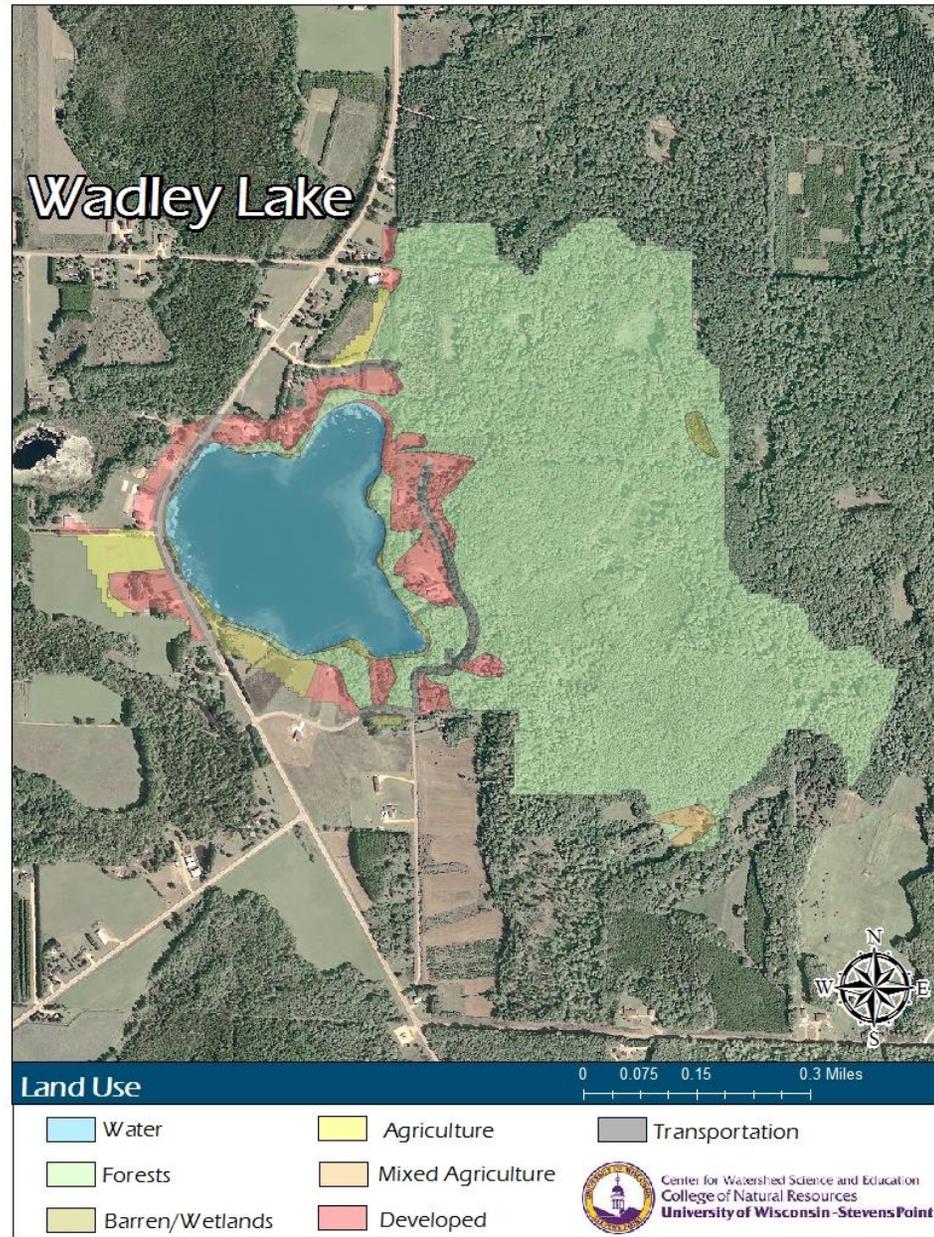


Figure 7. Land use within the Wadley Lake watershed.

runoff that carries pollutants to the lake. Wastewater, animal waste, and fertilizers used on lawns, gardens and crops can contribute nutrients that enhance the growth of algae and aquatic plants in our lakes. Land management practices can be put into place that better mimic some of the natural processes, and reduction or elimination of nutrients added to the landscape will help prevent the nutrients from reaching the water. In general, the land nearest the lake has the greatest impact on lake water quality and habitat.

Shoreland vegetation is critical to a healthy lake's ecosystem. It helps improve the quality of the runoff that is flowing across the landscape towards the lake. It also provides habitat for many aquatic and terrestrial animals including birds, frogs, turtles, and many small and large mammals. Healthy shoreland vegetation includes a mix of tall grasses/flowers, shrubs, and trees which extend at least 35 feet landward from the water's edge. Shorelands include adjacent wetlands, which also serve the lake by allowing contaminants to settle out, providing shelter for fish and wildlife, and decreasing the hazard of shoreline erosion by providing a shoreland barrier from waves and wind.

The water quality in Wadley Lake is the result of many factors, including the underlying geology, the climate, and land management practices. Since we have little control over the climate and cannot change the geology, changes to land management practices are the primary actions that can have positive impacts on the lake's water quality. The water quality in Wadley Lake was assessed by measuring different characteristics including temperature, dissolved oxygen, water clarity, water chemistry, and algae. All of these factors were taken into consideration when management planning decisions were made.

Water Quality

Water quality was assessed during the 2010-2012 study and involved a number of measures including temperature, dissolved oxygen, water chemistry, and phosphorus. Each of these interrelated measures plays a part in the lake's overall water quality.

Temperature profiles in Wadley Lake indicated that some stratification occurs near 15 feet in depth during the summer months. Dissolved oxygen maintained good levels for fish throughout the year, even in the upper 10 feet in late winter.

In Wadley Lake, water clarity ranged from 9.5 to 22 feet. When compared with historic data, the average water clarity measured during the study was slightly better in all months sampled. Fluctuations throughout the summer are normal, as algal populations and sedimentation (primary influences on water clarity) increase and decrease.

Chloride levels, and to a lesser degree sodium and potassium levels, are commonly used as indicators of how strongly a lake is being impacted by human activity. Chloride levels in Wadley Lake were low, but sodium and potassium levels were somewhat elevated. Although these nutrients are not detrimental to the aquatic eco-system, their presence indicated that sources of contaminants such as road salt, fertilizer, animal waste and/or septic system effluent may be entering the lake from either surface runoff or via groundwater.

Phosphorus is an element that is essential to most living organisms in trace amounts, including plants. Sources of phosphorus can include naturally occurring phosphorus in soils and wetlands, small amounts in groundwater, agricultural runoff, urban runoff, domestic and industrial sewage, septic systems and animal waste. Although a variety of compounds are important to biological growth, phosphorus receives a great deal of attention because it is commonly the “limiting nutrient”. Due to its relatively short supply compared to other substances necessary for growth, relatively small increases in phosphorus may result in a significant increase in aquatic plants and algae.

Total phosphorus concentrations in Wadley Lake ranged from a high of 24 µg/L in April 2012 to a low of 3 µg/L in August 2012, with median growing season concentrations of 12 µg/L and 12.5 µg/L in 2011 and 2012, respectively. This is well below Wisconsin’s phosphorus standard for shallow seepage lakes of 40 µg/L.

Managing phosphorus in the Wadley Lake watershed is key to protecting the lake itself. Watershed activities that increase the input of phosphorus to the lake include removing native vegetation (trees, bushes and grasses), mowing grass, and increasing the amount of impervious surfaces. Phosphorus inputs to Wadley Lake can be controlled through the use of Best Management Practices (BMP’s) that minimize the movement of phosphorus to the lake.

One pound of phosphorus entering a lake can result in as much as 500 pounds of algal growth!
Vallentyne, 1974

Zooplankton and Algal Community Analysis

The zooplankton and algal communities were sampled and analyzed concurrently with the lake study in 2010-2012. These communities are important biological indicators that can help show water quality health and trends.

The zooplankton community, when considered relative to the algal, phosphorus, and nitrogen values for Wadley Lake, presented a picture of a lake transitioning to mesotrophic. The one genus of rotifer, three genera of cladocerans, and two genera of copepods identified during sampling were relatively common and the majority of those are not classified as invasive or exotic. A stable, little-changing zooplankton community dominated by cladocerans and copepods, such as that seen in Wadley Lake, suggested that it is an oligotrophic lake (clear, less biologically productive) transitioning to mesotrophic (more biologically productive). This is also supported by the generally good water clarity seen throughout the sampling period.

Guiding Vision for Water Quality in Wadley Lake

Wadley Lake will continue to have clear, clean water.

Goal 5: Maintain current water quality conditions.

Objective 5.1: Reduce excess and additional nitrogen and phosphorus loading to Wadley Lake, and maintain a summer median concentration of <12 ppb total phosphorus and <0.3 ppm inorganic nitrogen.

Actions	Lead person/group	Resources	Timeline
Decrease or eliminate personal use of fertilizers on shoreland properties to prevent an increase in nutrient concentrations.	Interested citizen		
Encourage area property owners and farmers to test soil before applying fertilizers by encouraging the Marathon County Land Conservation Department to work with landowners.	Interested citizen	MC Extension	
Restore native shoreland vegetation around Wadley Lake (see Shorelands section).	Shoreland property owners		

Objective 5.2: Monitor water quality to evaluate improvements, declines, and trends over time.

Actions	Lead person/group	Resources	Timeline
Conduct annual monitoring of water clarity using a Secchi disk.	Keith Rasmussen	CLMN coordinator WDNR Lakes Manager	August 2014
Contact the regional Citizen Lake Monitoring Network (CLMN) coordinator to learn more about lake monitoring options and to become a volunteer lake monitor.	Keith Rasmussen	CLMN coordinator	August 2014
Explore participation in county (or state) wide lake level studies.	Interested citizen	CPZ	
Explore the installation of rain gardens, rain barrels, and other management practices that slow and filter water as it travels toward the lake.	Interested citizen	CPZ	

Shorelands

Wadley Lake has 6,332 feet of shoreline. The overall findings show that 3,361 linear feet of shoreline were classified as having grass/forb buffer depths of less than 35 feet, which does not meet the requirement for shoreland vegetation stated by Wisconsin and Marathon County shoreland zoning ordinances. Over 4,400 linear feet of shoreline were classified as having shrub layers less than 35 feet, the minimum depth required by Wisconsin and Marathon County shoreland zoning ordinances. Trees represented the most abundant vegetative layer around the lake, with 2,548 linear feet classified as having buffer depths greater than 35 feet (Figure 7). Although Wadley Lake's shoreland is in good shape now, changes can easily occur as development takes place. Minimizing impacts to Wadley Lake from future development should include planning to ensure that prospective developers have information to make good decisions and that zoning is in place to achieve habitat, water quality, and aesthetic goals.

Docks and artificial beaches can result in altered in-lake habitat. Denuded lakebeds provide good prospects for invasive species to become established and reduce habitat that is important to fish and other lake inhabitants. Erosion can contribute sediment to the lake, which can alter spawning habitat and carry nutrients into the lake. Unmanaged runoff from the rooftops of structures located near shore can also contribute more sediment to the lake. Alone, each human-made feature is unlikely a major problem for a lake, but on developed lakes where these features occur around the lake, their collective impact can be a problem for lake habitat and water quality.

Wadley Lake Vegetative Buffers

Eastern Marathon County Lakes Study

Map 1

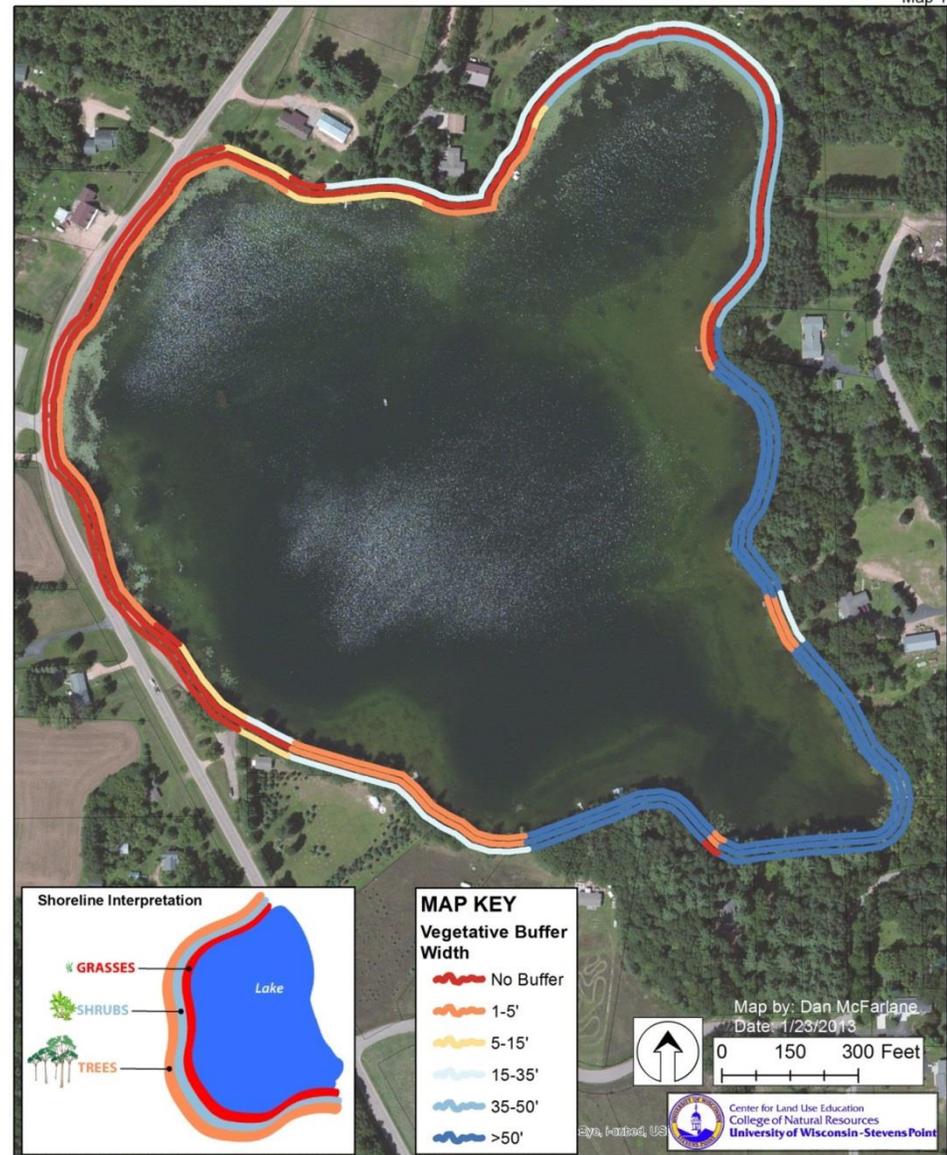


Figure 8. Shoreland vegetation around Wadley Lake, 2011 survey.

Guiding Vision for Wadley Lake's Shorelands

Wadley Lake will have healthy shorelands that provide wildlife habitat, reduce surface runoff into the lake and create a rustic, natural atmosphere.

Goal 6: Protect lake water quality by maintaining and improving healthy shorelands.

Objective 6.1: Control runoff from the road.

Actions	Lead person/group	Resources	Timeline
Enhance shoreline vegetation near County Road J/Y.	Shoreland property owners	CPZ	
Explore the installation of culverts under the road.		CPZ	
When highway is reinstalled on the western end of the lake, consider the addition of curb and drain.		CPZ	

Objective 6.2: Reduce runoff and restore shoreland vegetation on properties around the lake.

Actions	Lead person/group	Resources	Timeline
Enhance and/or restore shoreland vegetation. To meet state shoreland zoning ordinance and help improve water quality, at least 35 feet of vegetation should extend inland from the water's edge. Increase compliance with shoreland zoning (35' vegetation) by 10% over the next 5 years.	Shoreland property owners		
Minimize the amount of impervious surfaces on personal properties and reduce the impact of existing impervious surface by having professionals walk shoreland properties to provide recommendations and by distributing information on impervious surfaces at community events (polar plunge, fisheree).	Interested citizen	CPZ	
Communicate the importance of healthy shoreland vegetation with other shoreland property owners through shoreland walk/talk sessions with professionals, providing information at community events (polar plunge, fisheree).	Shoreland property owners	UWEX Lakes (educational materials)	

Watershed Land Use

The surface watershed of Wadley Lake is 306 acres. Primary land use is forest with residential development scattered throughout. The lake's shoreland is comprised of residential development, forests, wetlands, and agriculture. In general, the land closest to the lake has the greatest immediate impact on water quality.

Sediment Core Analysis

A sediment core was taken from the deepest area of Wadley Lake in November 2012 and analyzed. The colors, pollen grains, organic content, and algae from the sediment core can tell us about changes in the landscape and within the lake over time. Analysis of biological components and physical

properties of Wadley Lake's sediment core indicated an increase in erosion-induced processes such as land clearing, storm events, and shoreland disturbance since the time of land settlement around the lake. The analyses indicated that these activities did not occur abruptly. There has likely been an increase in nutrient delivery, including phosphorus, and possibly filamentous algae in the top layer of the sediment core. Physical properties of the sediment show that delivery of silica to the deepest part of the lake has increased, as well as more suspended sediment in the last century. The decrease in marl formation reflects a potential loss or change in the aquatic plant community or changes in groundwater flow into the lake over the same period of time. These analyses also suggested that Wadley Lake experienced a limited increase in phosphorus concentrations during the last century, but large changes in habitat over the same period.

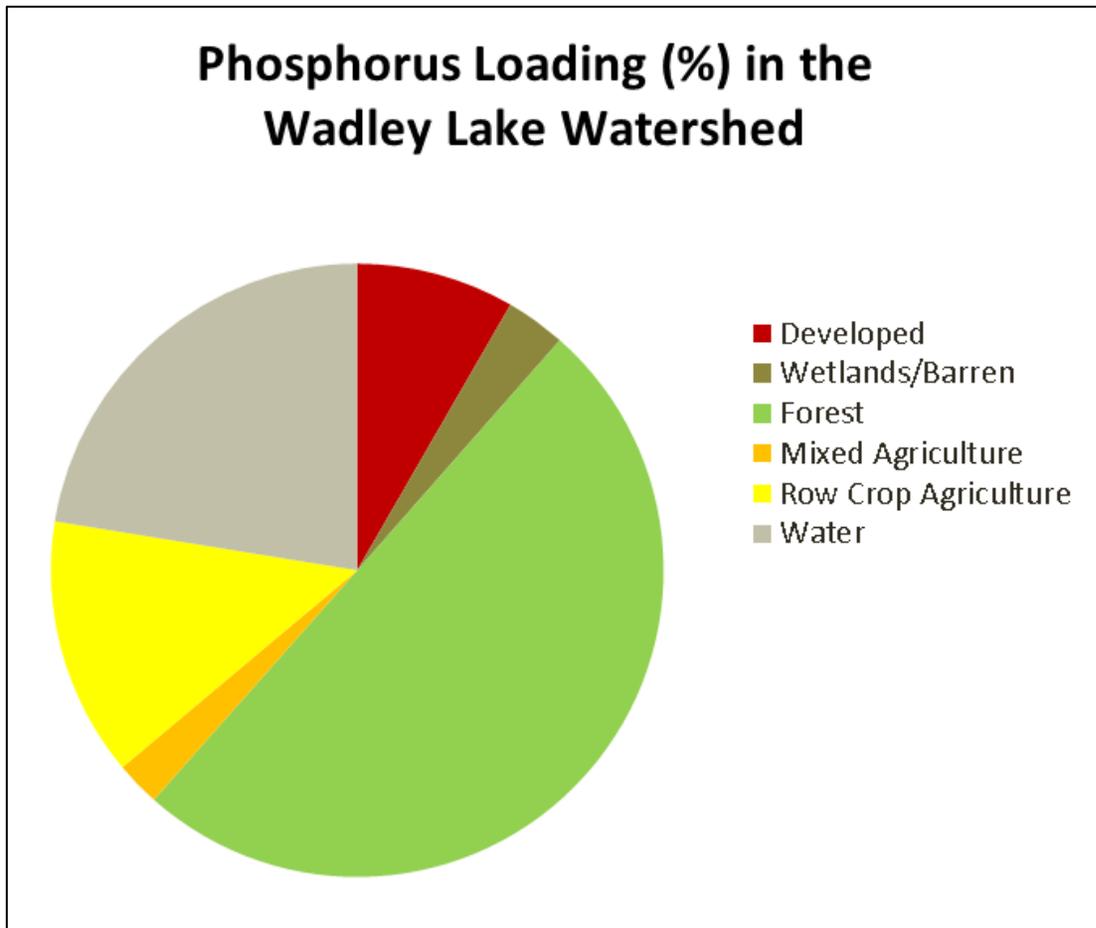


Figure 10. Estimated phosphorus loads from land uses in the Wadley Lake watershed.

Guiding Vision for Wadley Lake’s Watershed

The land around Wadley Lake will retain its peaceful, partially undeveloped character and will be used in a way to support lake health.

Goal 7: Encourage county and town land management decisions that reflect land preservation and lake stewardship.

Objective 7.1: Participate in community planning activities.

Actions	Lead person/group	Resources	Timeline
Encourage county staff to support the installation of water quality based Best Management Practices (BMPs) around the lake and within the watershed.		CPZ	
Participate in future planning activities with the county and the Town of Bevent in regard to revisions to zoning ordinances that may affect shoreland practices around the lakes and development or large-scale changes in land use.	Interested citizen	CPZ	
Inform developers about options such as conservation design.	Interested citizen	MC Extension CPZ	
Protect undeveloped land by supporting landowners interested in conservation easements, purchase of development rights, and other land protection programs.	Interested citizen	NRCS NCCT Gathering Waters	
Explore the installation of rain gardens, swales, and/or native vegetation between County Road JY and Wadley Lake and along other shoreline properties.	Interested citizen	CPZ landscaping consultants	
Encourage the town to communicate with County highway department, Town of Bevent, and Dept. of Transportation to build natural buffers, swales into plans for future work on nearby roads and highways.		MC Highway Dept. WDOT CPZ	

People and the Lake

The people that interact with the lake are the most important part of lake management. In essence, a lake management plan is a venue by which people decide how they'd like people to positively impact the lake and those who enjoy it. The plan is a summary of the people's decisions to take proactive steps to better their lake and their community. The personal decisions made by lake residents and visitors have an impact on the lake and thus on others that enjoy a common resource. Collaborative efforts have an even bigger impact; therefore, communication and cooperation within the community and suite of lake users is essential to maximize the effectiveness of plan implementation.

Boating hours, regulations, and fishing limits are examples of principles that are put into place to minimize conflicts between lake users and balance human activities with environmental considerations for the lake.

Recreation

At the time of plan formation, Wadley Lake was a no-wake lake. This is consistent with state regulations which require lakes of 50 acres or less to be designated "no-wake" (Boat Ed, 2013). "Slow, No Wake Speed" is defined as a speed at which a vessel moves as slowly as possible while still maintaining steering control. The Wadley Lake Management Planning Committee communicated that they would like the lake to retain its current designation regardless of any possible future changes to regulations.

Guiding Vision for Recreation at Wadley Lake

Wadley Lake will continue to be a quiet, no-wake lake.

Goal 8: Communicate boating rules with the community.

Objective 8.1: Keep visitors to the lake informed about no-wake boating.

Actions	Lead person/group	Resources	Timeline
Install/maintain noticeable signage about no-wake rules.		Town of Bevent	

Communication and Organizations

Many of the goals outlined in this plan are focused on disseminating information to lake and watershed residents and lake users, ultimately to help them make informed decisions that will result in a healthy ecosystem in Wadley Lake that is enjoyed by many people. Working together on common values will help to achieve the goals that have been outlined in this plan. Wadley Lake does not currently have an official organization, though there is a Wadley Lake Sportsman Club. At the May 13, 2014 planning session, several options were outlined to better organize a group of Wadley Lake community members to undertake lake management activities, which are recorded below.

Guiding Vision for Communication

Wadley Lake will have a dedicated group of lake stewards who communicate with one another, lake users, watershed residents, municipalities and other lake stewards.

Goal 9: Communicate important lake information, decisions, and actions within the group and with those that live around the lake.

Objective 9.1: Form a lake organization, such as a ‘Friends of Wadley Lake’ or a Town Board lakes subcommittee.

Actions	Lead person/group	Resources	Timeline
Explore establishment of a Town Board subcommittee with the Town Board and the Big Bass Lake District.	Interested citizen	Town of Bevent	
Explore establishment of the Friends of Wadley Lake group with area landowners and community groups (Wadley Lake Sportsman Club).	Interested citizen	UWEX Lakes	
Hold annual meeting with ‘Friends’ group or subcommittee to discuss issues and updates.	Interested citizen	UWEX Lakes	
Hold a summertime shoreland walk with area land owners and shoreland professionals.	Interested citizen	UWEX Lakes	

Updates and Revisions

Guiding Vision for Updates and Revisions

Wadley Lake will have an up-to-date, accurate and comprehensive lake management plan that is reviewed annually and documents all management activities and effects.

Goal 10: Review plan annually and update as needed.

Objective 10.1: Communicate updates with community members and those that live around the lake.

Actions	Lead person/group	Resources	Timeline
Meet annually (as Town subcommittee or 'Friends' group) to update the plan through discussion and evaluation of available surveys and data.			
Notify the town, county, and WDNR of any potential changes in the management plan.			

Governance

This section will identify plans, ordinances, and regulations that affect the lake and responsible authorities including the Lake District, local municipalities, state, and federal agencies.

Marathon County Strategic Plan: Marathon County's strategic plan states a clear intent to provide leadership and services focusing on improving land use and resource planning. This will assure the orderly development of retail and manufacturing business, agriculture/agribusiness, and residential growth while retaining the rural character of Marathon County. Specific objectives to support this leadership role are as follows:

- Develop comprehensive planning and zoning ordinances that provide towns with value so that 100% request participation in county planning and zoning.
- Improve water quality and residential, commercial, and industrial waste management resulting in 100% of all households, businesses, and industry sites meeting water quality standards.
- Inventory water resources, determine where we have adequate supplies, and encourage development in those areas.

Develop an educational program on the quantity and quality of water supplies for local and state policy makers.

Comprehensive Plans – Marathon County: Marathon County adopted a Comprehensive Plan in 2006. This plan outlines the direction of future growth within the County.

During the planning process, a set of guiding principles that describe broad characteristics of a desired future for local communities and Marathon County were developed. These guiding principles were used to provide a general framework for developing local and countywide goals and objectives. The guiding principles outlined in the Marathon County Comprehensive Plan are:

1. *Respect Local Governance* - Planning in Marathon County should build on local town, village and city government as a system that is unique, has served residents well, and is a strong component of local identity.
2. *Preserve Working Agriculture* - Agriculture has been central to the culture and economy of Marathon County for over 100 years. Farming has been a way of life for generations of county residents and is fundamental to both community and individual identity. Efforts such as protecting prime farmland from development, exploring niche markets, and supporting cooperative practices can be implemented at the local level to help maintain and preserve working agriculture.
3. *Maintain a Sense of Place* - As Marathon County's population grows and changes, communities will need to ensure that important physical features, buildings, and landscapes that exemplify their local identity are retained. These features provide a sense of heritage and continuity that contribute to a community's identity and sense of place.

4. *Preserve Rural Character* - Shifts in the farm economy and urban expansion are altering the County's rural landscape characterized by working farms, woodlands, rolling hills, marsh areas, and plentiful water bodies. As open spaces, farms, and woodlands are being lost or fragmented by development, Marathon County communities will need to make some important choices in order to preserve the qualities and character of the rural landscape.
5. *Safeguard Natural Resources* - Marathon County is graced with abundant natural resources including numerous rivers, wetlands, forests, and wildlife. Careful stewardship of natural resources is essential to protect against fragmentation and degradation and ensure these resources continue to contribute to the ecology, character, quality of life, and economy of Marathon County into the future.
6. *Foster Managed Growth and Coordinated Development* - Managing growth is important to ensure that no area is overwhelmed by development, land use conflicts are minimized, and development occurs in a quality manner that minimizes impacts on natural resources. Managing growth requires coordination of land uses and infrastructure, within and between communities,

From these Guiding Principles, the following goals were developed that are directly related to lake management planning and protection:

Goal 1: Enhance the natural character of Marathon County.

Objective: To encourage establishment of an open space network connecting woodlands, wetlands, shorelands, grasslands, and other natural areas.

Goal 2: Protect and enhance surface water resources and natural habitat areas.

Objective: To minimize development impacts that could affect the water quality and habitat of rivers, floodplains, and wetlands.

Objective: To provide leadership in disseminating information about shoreland, floodplain, and wetland preservation and management to County residents.

Goal 3: Protect and enhance the quantity and quality of potable groundwater and potable surface water supplies.

Objective: To continue to enforce, and update as necessary, ordinances and development standards to protect the quantity and quality of groundwater resources.

Objective: To continue to encourage local municipalities to protect groundwater quality and quantity.

Objective: To continue to work with the WDNR and others to address known contamination problems and ensure that sufficient measures are taken to prevent additional groundwater contamination.

Goal 7: Improve coordination regarding natural resource protection.

Objective: To foster coordinated and effective enforcement of the various regulations aimed at protecting natural resources.

Objective: To continue to serve as a liaison between State and Federal agencies and local municipalities regarding natural resource regulations and permitting procedures.

Objective: To ensure timely and effective communication of changes to natural resource regulations and permitting procedures.

The lake management plan, along with any proposed changes to the comprehensive plan, will be presented to the local municipality for review and possible incorporation into their comprehensive plans. Zoning, subdivision, and official mapping decisions must be consistent with the comprehensive plan.

Marathon County Land & Water Resource Management Plan

The Conservation, Planning and Zoning Department's mission is to create, advocate, and implement strategies to conserve natural and community resources. The department administers programs to implement the Land and Water Resource Management Plan which includes the Farmland Preservation Program, Managed Intensive Grazing, Lake Districts, Wildlife Damage and Abatement, as well as regulatory activities associated with the Waste Storage Facility and Nutrient Management Ordinance and the Livestock Facilities Licensing Ordinance.

The Land & Water Resource Management Plan outlines the following goals, objectives, programs, and regulations to support the implementation of the Lake Management Plan:

A. Goals and Objectives

1. **Reduce Agricultural Nonpoint Runoff.** Reduce the discharge of soil sediment, organic materials, pesticides and nutrients into surface and ground waters.
2. **Groundwater Protection.** Educate the public and users about groundwater use and resource management challenges. In April 2001, the Marathon County Groundwater Guide was updated to reflect the changing programs and policies within the county as well as to acknowledge the increased level of regulation by state agencies to protect the groundwater resources of Marathon County.
3. **Forestry.** Sustain private and public forests. The Marathon County Forest Comprehensive Land Use Plan (2006-2020) includes recommendations to guide management of forest land in Marathon County in accordance with the Parks, Recreation and Forestry Department's mission to manage and protect the county forest on a sustainable basis for ecological, economic, educational, recreational, and research needs of present and future generations.
4. **Land Conversion.** Minimize the conversion of prime agricultural lands and forests to other land uses to support watershed management and to maintain economic value of the working lands.

5. **Lake and Reservoir Management.** Support local communities to understand the environmental opportunities and challenges facing lakes. This resource concern encompasses the areas of wetland management and aquatic invasive species. There is a great participation by local landowners in securing information and resources to better protect our water resources.

B. Conservation Programs and Partnerships

1. **Aquatic Invasive Species.** In 2010, Marathon County has entered into a working relationship with the Golden Sands Resource Conservation & Development agency to conduct an inventory of lakes and flowages unassociated with the Wisconsin River for aquatic species. The inventory efforts involve educational outreach efforts to Park Department employees and students.
2. **Managed Grazing Project.** Marathon County Conservation, Planning and Zoning Department, UW-Extension, and the Natural Resources Conservation Service have joined forces to support the Central Wisconsin River Graziers Network. The Network promotes the feasibility of grazing-based farming as a profitable way of farming that enhances lifestyles and protects and improves the environment.
3. **Managed Forest Law (MFL) Program.** The MFL program provides incentives to protect privately owned woodlands from destructive timber cutting practices and over-harvesting and prevents land from becoming developed and/or converted to agricultural land use.
4. **Farmland Preservation Program.** Marathon County adopted its Farmland Preservation Plan in 2013. The goals of the program are twofold: to preserve Wisconsin farmland for production of commodities by means of local land use planning and soil conservation practices, and; to provide tax relief to landowners. For the landowner to receive tax credits they must be in compliance with current and applicable State Agricultural Performance Standards.
5. **Nutrient Management Program.** Nutrient management is defined as managing the amount, form, placement, and timing of applications of plant nutrients. The purpose of this program is to ensure a proper supply of plant nutrients for crop production while minimizing the entry of nutrients to surface water and groundwater. Marathon County requires nutrient management plans for landowners constructing and operating waste storage facilities.
6. **Federal Soil and Water Conservation Programs.** The Conservation, Planning and Zoning (CPZ) Department works closely with the United States Department of Agriculture through the Natural Resources Conservation Service (NRCS) and the Farm Service Agency (FSA). The NRCS, FSA, UW-Extension and CPZ staffs work together in the Local Work Group to identify program and funding priorities for federal and local conservation programs such as the Environmental Quality Incentive Program, Comprehensive Nutrient Management Planning, Conservation Reserve Enhancement Program and grazing initiatives.

C. Regulations: The lake management plan is superseded by federal, state, county, and municipal laws and court rulings; however, the plan may influence county and municipal ordinances and enforcement. Federal laws contain regulations related to water quality, wetlands, dredging, and filling. State laws contain regulations related to water quality, water and lake use, aquatic plants and animals, shoreline vegetation, safety, and development. County laws contain regulations related to development, safety, use, and aquatic plants and animals. Municipal laws contain regulation of use and safety. The rules and regulations are primarily enforced by the US Army Corps of Engineers, the Wisconsin Department of Natural Resources, the

Marathon County Sheriff's Department, and the Marathon County Conservation, Planning and Zoning (CPZ) Department. If considering development near or on a lake, addressing problem plants or animals, or altering the lake bottom contacts the Marathon County CPZ Department and/or the Wisconsin Department of Natural Resources.

1. **Waste Storage Facility and Nutrient Management Ordinance.** Dairy cattle in the county produce over 4,000,000 gallons of manure per day. To assure that this organic matter and nutrient source is contained and managed with sound practices, Marathon County has regulated these activities since 1985.
2. **Marathon County Livestock Siting Ordinance.** In October 2006, Marathon County adopted the General Code of Ordinances for Marathon County Chapter 13.01 Livestock Facilities Licensing Ordinance. The purpose of the ordinance is to establish the authority, technical standards, performance standards, and monitoring protocols necessary to protect public health, safety, and the environmental resources in Marathon County.
3. **Marathon County Zoning Ordinance (Chapter 17) and Land Division and Surveying Regulations (Chapter 18).** The Marathon County Zoning Ordinance (Chapter 17) is adopted to promote and protect public health, safety, comfort, convenience, aesthetics and other aspects of the general welfare of the population. More specifically, the ordinance establishes standards for buildings, structures, setbacks, lot coverage, land uses, streets and highways and other land use aspects. These regulations apply to all unincorporated areas that have adopted Marathon County Zoning. However, where a town has not adopted Marathon County Zoning but has adopted local regulations, the local regulations apply. In addition, the County regulates the division of land in accordance with Chapter 18 Land Division and Surveying Regulations. The County's land division regulations apply in all unincorporated areas of the County. However, where a town has land division regulations that are more restrictive than the County's, the local regulations apply.
4. **Floodplain and Shoreland Ordinance.** Shoreland, wetland, and floodplain regulations are applicable in all unincorporated areas of the County. Wisconsin law mandates counties to adopt and administer a zoning ordinance that regulates land use in shoreland/wetland and floodplain areas for the entire area of the county outside of villages and cities.
5. **Nonmetallic Mining Reclamation Ordinance.** Marathon County adopted the General Code of Ordinances for Marathon County Chapter 21 Nonmetallic Mining Reclamation Code in 1989. The ordinance applies to approximately 400 operating or abandoned excavations of sand, gravel, decomposed granite and stone. The ordinance requires restoration of the site to a purposeful and acceptable landscape appearance and use.
6. **Private Sewage System Ordinance.** Marathon County adopted Marathon County General Code of Ordinances Chapter 15 Private Sewage Systems in 1968. This ordinance is adopted to promote and protect public health and safety by assuring the proper siting, design, installation, inspection, and management of private sewage systems and non-plumbing sanitation systems, and to assure the timely repair or replacement of failing private sewage systems. All structures or premises in the County that are permanently or intermittently intended for human habitation or occupancy, which are not serviced by a public sewer or a privately owned wastewater treatment facility regulated by the Department of Natural Resources, shall have a system for holding or treatment and dispersal of sewage and wastewater which complies with the provisions of this ordinance.

7. **Construction Site Erosion – WI Administrative Code NR 216.** Construction site erosion and uncontrolled storm water runoff from land disturbing activities can have significant adverse impacts upon local water resources. Under subchapter III of NR 216, Wis. Adm. Code, a notice of intent shall be filed with the DNR by any landowner who disturbs one or more acres of land.

Lake Management Plan Approval

The final draft of the lake management plan will be approved through a vote of the Lake District/Association membership or board. The final draft will be approved by the Wisconsin Department of Natural Resources (DNR) to ensure compliance lake management plan requirements and grant requirements. The completed plan that has been approved by the Lake District/Association and the DNR will be presented to the municipalities containing the lake and Marathon County. The municipality may reference the lake management plan or parts of the plan in their comprehensive plan to guide municipal or county decisions.

Lake Assistance

The lake management plan will enhance the ability of the lake to apply for financial assistance. The lake management plan will be considered as part of the application for grants through the Wisconsin Department of Natural Resources. Current listings of grants available from the DNR can be found at <http://dnr.wi.gov/aid/>. Marathon County offers technical and financial assistance through the Conservation, Planning and Zoning Department and University of Wisconsin-Extension Department. Additional assistance may be available from other agencies and organizations, including DNR, UW-Extension Lakes Program, Golden Sands RC&D, Wisconsin Wetlands Association, and Wisconsin Trout Unlimited. Etc.

References and Important Documentation to Review

- Boat Ed, 2013. The Handbook of Wisconsin Boating Laws and Responsibilities. Approved by Wisconsin Department of Natural Resources. www.boat-ed.com
- Borman, Susan, R. Korth, J. Temte. 2001. Through the Looking Glass: A Field Guide to Aquatic Plants. Reindl Printing, Inc. Merrill, Wisconsin.
- McFarlane, D. 2011. Marathon County Shoreline Inventory. Center for Land Use Education. Final Report to Marathon County and Wisconsin Department of Natural Resources.
- Meronek, Tom. 2014. The Fishery in Big Bass and Wadley Lakes. Unpublished data. Presentation given March 27, 2014 at the Bevent Town Hall, Marathon County, Wisconsin. Wisconsin Department of Natural Resources.
- Provost, Scott. 2014. Wadley Lake Herbicide Treatment. Presentation given March 27, 2014 at the Bevent Town Hall, Marathon County, Wisconsin. Wisconsin Department of Natural Resources.
- Provost, Scott, 2014. Managing Aquatic Plants in a Lake. Presentation given March 27, 2014 at the Bevent Town Hall, Marathon County, Wisconsin. Wisconsin Department of Natural Resources.
- Turyk, Nancy. 2014. Aquatic Plants in Big Bass and Wadley Lakes. Unpublished data. Presentation given February 27, 2014 at the Bevent Town Hall, Marathon County, Wisconsin. UW-Stevens Point Center for Watershed Science and Education.
- UW-Stevens Point Center for Watershed Science and Education. 2014. Eastern Marathon County Lake Study—Wadley Lake 2010-2012 Mini-Report. Report to Marathon County and Wisconsin Department of Natural Resources.
- UW-Stevens Point Center for Watershed Science and Education. 2014. Eastern Marathon County Lake Study—Wadley Lake 2010-2012. Final Report to Marathon County and Wisconsin Department of Natural Resources.
- Vallentyne, J.R. 1974. The Algal Bowl-Lakes and Man. Ottawa Department of the Environment.
- Wisconsin Department of Natural Resources. 2007. Designation of Critical Habitat Areas: Wadley Lake, Marathon County. Eau Claire, Wisconsin.
- Presentations and notes from the planning meetings can be found on the Marathon County web page. Access the lake information by selecting Conservation Planning Zoning under the Departments tab, then selecting Eastern Lakes Project on the left side pane.

Appendices

Appendix A: Marathon County Lake Information Directory

Algae - Blue-Green

Contact: Scott Provost, WI Dept. of Natural Resources
Phone: 715-421-7881
Address: 473 Griffith Ave., Wisconsin Rapids, WI 54494
E-mail: scott.provost@wisconsin.gov
Website: <http://dnr.wi.gov/lakes/bluegreenalgae/>

Contact: Wisconsin Department of Health Services
Phone: 608-267-3242
Address: PO Box 2659, Madison, WI 53701
E-mail: dhswebmaster@dhs.wisconsin.gov
Website: www.dhs.wisconsin.gov/eh/bluegreenalgae/index.htm

Aquatic Invasive Species /Clean Boats Clean Water

Contact: Golden Sands RC&D
Phone: 715-343-6215
E-mail: info@goldensandsrcd.org
Address: 1100 Main Street, Suite #150, Stevens Point, WI 54481
Websites: <http://www.goldensandsrcd.org>
<http://dnr.wi.gov/invasives/>

Aquatic Plant Management (Native and Invasive)

Contact: Scott Provost, WI Dept. of Natural Resources
Phone: 715-421-7881
Address: 473 Griffith Ave., Wisconsin Rapids, WI 54494
E-mail: scott.provost@wisconsin.gov
Website: <http://dnr.wi.gov/lakes/plants/>

Aquatic Plant Identification

Contact: Golden Sands RC&D
Phone: 715-343-6215
E-mail: info@goldensandsrcd.org
Address: 1100 Main Street, Suite #150, Stevens Point, WI 54481
Website: <http://www.goldensandsrcd.org/>

Contact: Scott Provost, WI Dept. of Natural Resources
Phone: 715-421-7881
Address: 473 Griffith Ave., Wisconsin Rapids, WI 54494
E-mail: scott.provost@wisconsin.gov
Website: <http://dnr.wi.gov/lakes/plants/>

Aquatic Plant Management

Contact: Scott Provost, WI Dept. of Natural Resources
Phone: 715-421-7881
Address: 473 Griffith Ave., Wisconsin Rapids, WI 54494
E-mail: scott.provost@wisconsin.gov
Website: <http://dnr.wi.gov/lakes/plants/>

Best Management Practices (Rain gardens, shoreland buffers, agricultural practices, runoff controls)

Contact: Marathon County CPZ
Phone: 715-261-6000
Address: 210 River Dr., Wausau, WI 54403
E-mail: cpz@co.marathon.wi.us
Website: <http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>

Boat Landings (County) (Signage, permissions, etc.)

Contact: William Duncanson
Phone: 715-261-1550
Address: 212 River Dr., Suite 2, Wausau, WI 54403
E-mail: parkforestry@co.marathon.wi.us
Website: <http://www.co.marathon.wi.us/Departments/ParksRecreationForestry.aspx>

Boat Landings (State)

Contact: Tom Meronek, WI Dept. of Natural Resources
Phone: 715-359-7582
Address: 5103 Rib Mt. Drive, Wausau, WI 54401
E-mail: Thomas.Meronek@wisconsin.gov
Website: <http://dnr.wi.gov/org/land/facilities/boataccess/>

Boat Landings (Town)

Contact the clerk for the specific town/village in which the boat landing is located.

Conservation Easements

Contact: Gathering Waters Conservancy
Phone: 608-251-9131
Address: 211 S. Paterson St., Suite 270, Madison, WI 53703
E-mail: info@gatheringwaters.org
Website: <http://gatheringwaters.org/>

Contact: Buzz Sorge, WI Dept. of Natural Resources
Phone: 715-839-3794
Address: PO Box 4001, Eau Claire, WI 54702
E-mail: Patrick.Sorge@wisconsin.gov
Website: <http://dnr.wi.gov/aid/easements.html>

Contact: North Central Conservancy Trust
Phone: 715-341-7741
Address: PO Box 124, Stevens Point, WI 54481
E-mail: info@ncctwi.org
Website: <http://www.ncctwi.org/>

Contact: NRCS Wausau Service Center
Phone: 715-848-2330
Address: 326 River Dr., Wausau, WI 54403

Critical Habitat and Sensitive Areas

Contact: Buzz Sorge, WI Dept. of Natural Resources
Phone: 715-839-3794
Address: PO Box 4001, Eau Claire, WI 54702
E-mail: Patrick.Sorge@wisconsin.gov
Website: <http://dnr.wi.gov/lakes/criticalhabitat/>

Dams (Pike Lake) Town of Reid and Elderon

Contact: Town of Reid (Kittie Milanowski, Clerk)
Phone: 715-446-3767
Address: 7089 Plover River Rd., Hatley, WI 54440
E-mail: kitmil46@yahoo.com
Website:
<http://www.co.marathon.wi.us/Home/AboutMarathonCounty/Municipalities/Towns.aspx>

Contact: Town of Elderon (Mary Ostrowski, Clerk)
Phone: 715-454-6845
Address: 2021 Cherry Dr., Eland, WI 54427
E-mail: tnelder@comcast.net
Website:
<http://www.co.marathon.wi.us/Home/AboutMarathonCounty/Municipalities/Towns.aspx>

Fertilizers/Soil Testing

Contact: Marathon County UW Extension
Phone: 715-261-1230
Address: 212 River Dr., Suite 3, Wausau, WI 54403-5476
Website:
<http://marathon.uwex.edu/agriculture/agriculture-news-in-marathon-county/>

Contact: NRCS Wausau Service Center
Phone: 715-848-2330
Address: 326 River Dr., Wausau, WI 54403

Fisheries Biologist (management, habitat)

Contact: Tom Meronek, WI Dept. of Natural Resources
Phone: 715-359-7582
Address: 5103 Rib Mt. Dr., Wausau, WI 54401
E-mail: Thomas.Meronek@wisconsin.gov
Website: <http://dnr.wi.gov/fish/>

Frog Monitoring—Citizen Based

Contact: Andrew Badje, WI Dept. of Natural Resources
Phone: 608-266-3336
E-mail: Andrew.badje@wisconsin.gov
E-mail: WFTS@wisconsin.gov

Grants

Contact: Buzz Sorge, WI Dept. of Natural Resources
Phone: 715-839-3794
Address: PO Box 4001, Eau Claire, WI 54702
E-mail: Patrick.Sorge@wisconsin.gov

Contact: Marathon County CPZ
Phone: 715-261-6000
Address: 210 River Dr., Wausau, WI 54403
E-mail: cpz@co.marathon.wi.us
Website:
<http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>

Groundwater Quality

Contact: Kevin Masarik, UWSP Center for Watershed Science and Education
Phone: 715-346-4276
Address: 224 TNR, 800 Reserve St., Stevens Point, WI 54481
E-mail: kmasarik@uwsp.edu
Website: <http://www.uwsp.edu/cnr/watersheds/>

Groundwater Quantity

Contact: George Kraft, UW-Stevens Point
Phone: 715-346-2984
Address: TNR 224C, 800 Reserve St., Stevens Point, WI 54481
E-mail: George.kraft@uwsp.edu

Contact: Scott Provost, WI Dept. of Natural Resources
Phone: 715-421-7881
Address: 473 Griffith Ave., Wisconsin Rapids, WI 54494
E-mail: scott.provost@wisconsin.gov
Website:
[http://prodoasext.dnr.wi.gov/inter1/hicap\\$.startup](http://prodoasext.dnr.wi.gov/inter1/hicap$.startup)

Informational Packets

Contact: Ryan Haney, UWSP Center for Watershed
Science and Education
Phone: 715-346-2497
Address: 224A TNR, 800 Reserve St. Stevens Point, WI
54481
E-mail: mclakes@uwsp.edu

Lake Groups – Friends, Associations, Districts

Contact: Patrick Goggin, UWEX Lakes
Phone: 715-365-8943
Address: 107 Sutliff Ave., Rhineland, WI 54501
E-mail: pgoggin@uwsp.edu
Website:
<http://www.uwsp.edu/cnr/uwexlakes/>

Contact: Eric Olson, UWEX Lakes
Phone: 715-346-2192
Address: 800 Reserve St., Stevens Point, WI 54481
E-mail: eolson@uwsp.edu
Website: <http://www.uwsp.edu/cnr/uwexlakes/>

Contact: Susan Tesarik, Wisconsin Lakes
Phone: 1-800-542-5253
Address: 4513 Vernon Blvd., Suite 101, Madison, WI
53705
E-mail: lakeinfo@wisconsinlakes.org
Website: <http://wisconsinlakes.org/>

Lake Levels

See: Groundwater

Lake Related Law Enforcement (No-wake, transporting invasives, etc.)

Contact: Ben Harzfeldt or Paul Leezer, WI Dept. of
Natural Resources State Conservation Wardens
Phone: 715-359-1030 or 715-401-0644
Website: <http://dnr.wi.gov/org/es/enforcement/>

Land Use Planning and Shoreland Zoning

Contact: Dean Johnson, Marathon County CPZ
Phone: 715-261-6000
Address: 210 River Dr., Wausau, WI 54403
E-mail: dean.johnson@co.marathon.wi.us
Website:
<http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>

Contact: Marathon County CPZ
Phone: 715-261-6000
Address: 210 River Dr., Wausau, WI 54403
Website:
<http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>

Contact: UWSP Center for Land Use Education
Phone: 715-346-3783
Address: TNR 208, 800 Reserve St., Stevens Point, WI
54481
E-mail: Center.for.Land.Use.Education@uwsp.edu
Website: <http://www.uwsp.edu/cnr/landcenter/>

Nutrient Management Plans

Marathon County Conservation, Planning, and Zoning
Contact: Kirk Langfoss
Phone: 715-261-6008
Address: 210 River Dr., Wausau, WI 54403
E-mail: kirk.langfoss@co.marathon.wi.us
Website:
<http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>
<http://dnr.wi.gov/runoff/ag/manure.html>

Parks (County)

Contact: William Duncanson
Phone: 715-261-1550
Address: 212 River Dr., Suite #2, Wausau, WI 54403
E-mail: parkforestry@co.marathon.wi.us
Website:
<http://www.co.marathon.wi.us/Departments/ParksRecreationForestry.aspx>

Purchase of Development Rights

Contact: North Central Conservancy Trust
Phone: 715-341-7741
Address: PO Box 124, Stevens Point, WI 54481
E-mail: info@ncctwi.org
Website: <http://www.ncctwi.org/>

Purchase of Land

Contact: Buzz Sorge, WI Dept. of Natural Resources
Phone: 715-839-3794
Address: PO Box 4001, Eau Claire, WI 54702
E-mail: Patrick.Sorge@wisconsin.gov
Website:
<http://dnr.wi.gov/org/land/facilities/realestate/acquire.html>

Rain Barrels – Order

Contact: Golden Sands RC&D
Phone: 715-343-6215
Address: 1462 Strongs Ave., Stevens Point, WI 54481
Website:
http://www.goldensandsrcd.org/downloads/rain_barrel_order_form.pdf

Rain Gardens and Runoff

Marathon County Conservation, Planning, and Zoning
Phone: 715-261-6000
Address: 210 River Dr., Wausau, WI 54403
E-mail: cpz@co.marathon.wi.us
Website:
<http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>

Septic Systems

Marathon County Conservation, Planning, and Zoning
Contact: Dale Dimond
Phone: 715-261-6028
Address: 210 River Dr., Wausau, WI 54403
E-mail: dale.dimond@co.marathon.wi.us
Website:
<http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>

Shoreland Management

Marathon County Conservation, Planning, and Zoning
Phone: 715-261-6000
Address: 210 River Dr., Wausau, WI 54403
E-mail: cpz@co.marathon.wi.us
Website:
<http://www.co.marathon.wi.us/Departments/ConservationPlanningZoning.aspx>
<http://www.uwsp.edu/cnr/uwexplakes/ecology/shorelands/default.asp>

Shoreland Zoning Ordinances

See: Land Use Planning and Shoreland Zoning Ordinances

Soil Fertility Testing

See Fertilizers/Soil Testing

Water Quality Monitoring

Contact: Buzz Sorge, WI Dept. of Natural Resources
Phone: 715-839-3794
Address: PO Box 4001, Eau Claire, WI 54702
E-mail: Patrick.Sorge@wisconsin.gov
Website:
<http://dnr.wi.gov/environmentprotect/water.html>
<http://watermonitoring.uwex.edu/index.html>

Water Quality Problems

Contact: Buzz Sorge, WI Dept. of Natural Resources
Phone: 715-839-3794
Address: PO Box 4001, Eau Claire, WI 54702
E-mail: Patrick.Sorge@wisconsin.gov
Website:
<http://dnr.wi.gov/environmentprotect/water.html>

Contact: Nancy Turyk, UWSP Center for Watershed Science and Education
Phone: 715-346-4155
Address: 216 TNR, 800 Reserve St., Stevens Point, WI 54481
E-mail: nturyk@uwsp.edu

Wetlands

Contact: Wisconsin Wetland Association
Phone: 608-250-9971
Address: 214 N. Hamilton St., #201, Madison, WI 53703
E-mail: info@wisconsinwetlands.org
Website: www.wisconsinwetlands.org
<http://dnr.wi.gov/wetlands/>

Wetland Inventory

Contact: Emmet Judziewicz, UWSP Freckmann Herbarium
Address: 310 TNR, 800 Reserve St., Stevens Point, WI 54481
E-mail: ejudziewica@uwsp.edu

Woody Habitat

Contact: Tom Meronek, WI Dept. of Natural Resources
Phone: 715-359-7582
Address: 5103 Rib Mt. Drive, Wausau, WI 54401
E-mail: Thomas.Meronek@wisconsin.gov

If you are looking for any information that is not listed in this directory please contact:

Ryan Haney, **UWSP Center for Watershed Science and Education**

224 TNR, 800 Reserve St. Stevens Point, WI 54481

Phone: 715-346-2497

E-mail: mclakes@uwsp.edu

Or **Marathon County Conservation, Planning and Zoning**

210 River Dr., Wausau, WI 54403

Phone: 715-261-6000

E-mail: cpz@co.marathon.wi.us

Appendix B: Aquatic Plant Management Strategies

General recommendations:

- * Reduce nutrients traveling to the lake from the landscape
- * Avoid increasing algal blooms by maintaining a healthy amount of aquatic plants
- * Don't denude the lakebed
 - * Increases potential for aquatic invasive species establishment
 - * Sediments can add phosphorus to the water which may lead to increased algal growth
- * Choose options that are appropriate for your lake's situation
- * Monitor and adjust your strategies if you are not making headway!

List of Aquatic Plant Management Options (selection of options varies with situation):

No Action

ADVANTAGES

- * No associated cost
- * Least disruptive to lake ecosystem

LIMITATIONS

- * May not be effective in obtaining aquatic plant management objectives

Hand Pulling

ADVANTAGES

- * Can be used for thinning aquatic plants around docks
- * Can target specific plants - with proper training
- * Can be effective in controlling small infestations of aquatic invasive species
- * No associated cost

LIMITATIONS

- * Removes near-shore wildlife and fish habitat
- * Opens up areas where invasives to become established
- * If aquatic invasive species are not pulled properly, could worsen the problem

Hand Pulling Using Suction

ADVANTAGES

- * Can be used for thinning plants around docks
- * Can be used in deeper areas (with divers)
- * Can target specific plants with proper training
- * Can be effective in controlling small infestations of aquatic invasive species
- * May be useful in helping to remove upper root mass of aquatic invasive species

LIMITATIONS

- * Costs associated with hiring a diver may be comparable to chemical treatment expenses
- * Currently an experimental treatment – not readily available
- * If aquatic invasive species are not pulled properly, could worsen the problem

Mechanical Harvesting

ADVANTAGES

- * Removes plant material and nutrients
- * Can target specific locations
- * Used to manage larger areas for recreational access or fishery management

LIMITATIONS

- * Not used in water depths less than 3 feet
- * Some harm to aquatic organisms
- * Is a temporary control
- * Risk of introduction of new aquatic invasive species (on a hired harvester) or spread of some existing invasive species
- * Hired cost at least \$150/hr.

Water Level Manipulation

ADVANTAGES

- * Controls aquatic plants in shallower, near-shore areas
- * Can be low cost

LIMITATIONS

- * Requires a controlling structure on the lake
- * May cause undesired stress on ecosystem
- * Cannot be used frequently

Milfoil Weevils

ADVANTAGES

- * Natural, native maintenance of native and exotic milfoils
- * Prefers the aquatic invasive Eurasian Water Milfoil
- * Some lakes may already have a native populations; need a professional stem count and assessment of shoreland health, structure of fishery, etc.
- * Doesn't harm lake ecosystem

LIMITATIONS

- * Require healthy shoreline habitat for overwintering
- * Cannot survive in areas of mechanical harvesting or herbicide application
- * Effectiveness highly variable between lakes (only works well for some lakes)
- * Limited access to weevils for purchase in WI
- * Still considered experimental

Chemical Treatment: Spot

ADVANTAGES

- * May be less destructive to lake ecosystem than lake-wide treatment

LIMITATIONS

- * Only considered in lakes with aquatic invasive plants
- * Usually not fully effective in eradicating target species
- * Contaminants may remain in sediment
- * Effects on lake ecosystem not fully understood
- * Does not remove dead vegetation, which depletes oxygen and releases nutrients, adds to build-up of muck

- * Extra nutrients may spur additional aquatic plant and algae growth

Chemical Treatment: Lake-wide

ADVANTAGES

- * May reduce aquatic invasives for a time
- * Treatment not needed as frequently

LIMITATIONS

- * Only considered in lakes with aquatic invasive plants
- * Usually not fully effective in eradicating target species
- * Contaminants may remain in sediment
- * Does not remove dead vegetation, which depletes oxygen and releases nutrients, adds to build-up of muck
- * Extra nutrients may spur additional aquatic plant and algae growth
- * Negatively affects native vegetation
- * Effects on lake ecosystem not fully understood
- * Opens up space once taken up by natives for invasive species to colonize once again
- * ~\$4000 per 5 acres

CORRESPONDENCE/MEMORANDUM

DATE: January 22, 2014

FILE REF: GP-WC-2014-37-00122

TO: Tom Meronek

FROM: Stacey Carlson

SUBJECT: Fish Crib Placement on Wadley Lake

Approval of Department Project located in or adjacent to navigable waters.

Activity Description, Project Description and Location: The DNR c/o Tom Meronek proposes to build and place 12 fish cribs made out of wooden pallets on the bed of Wadely Lake.

The project is located SW1/4-NW1/4 Section 33, T26N, R9E, Town of Bevent, Marathon County.

Sponsor: DNR

The project has been reviewed and found to be consistent with the standards of: 30.206 Wis. Stats. and Chapters NR 102, 103, 115, 116, 150, 299, and 500 through 520 of the Wisconsin Administrative Code.

Conditions of Approval:

1. This permit expires on 01/22/2017 and all work must be completed by then.
2. Construction shall be accomplished in such a manner as to minimize erosion and siltation into surface waters. Erosion control measures (such as silt fence and straw bales) must meet or exceed the technical standards of ch. NR 151, Wis. Adm. Code. The technical standards are found at: <http://dnr.wi.gov/runoff/stormwater/techstds.htm>.

3. This permit does not authorize any work other than what you specifically describe in your application and plans, and as modified by the conditions of this permit.
4. All equipment used for the project including but not limited to tracked vehicles, barges, boats, hoses, sheet pile and pumps shall be de-contaminated for invasive and exotic viruses and species prior to use and after use.
5. The following steps must be taken every time you move your equipment to avoid transporting invasive and exotic viruses and species. To the extent practicable, equipment and gear used on infested waters shall not be used on other non-infested waters.
Inspect and remove aquatic plants, animals, and mud from your

Appendix C: Fish Crib Permits

equipment.

Drain all water from your equipment that comes in contact with infested waters, including but not limited to tracked vehicles, barges, boats, hoses, sheet pile and pumps.

Dispose of aquatic plants, animals in the trash. Never release or transfer aquatic plants, animals or water from one waterbody to another.

Wash your equipment with hot (>104° F) and/or high pressure water,

- OR -
- Allow your equipment to **dry thoroughly for 5 days.**

All necessary approvals shall be obtained from the Marathon County Zoning Administrator and the U.S. Army Corps of Engineers prior to the start of the project.

The below approval authorizes this Department of Natural Resources project according to Manual Code 3565.1.

APPROVED:


Stacey Carlson, Water Management Specialist

January 22, 2014

cc: Eric Norton, U.S. Army Corps of Engineers
Rebecca Frisch, Marathon County Zoning Administrator
Paul Leezer, Conservation Warden
Mike Rader, Conservation Warden



DEPARTMENT OF THE ARMY
DEPARTMENT OF ENGINEERS
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL MN 55101-1678

February 28, 2014

REPLY TO
ATTENTION OF
Operations
Regulatory (MVP-2007-00528-EMN)

Mr. Tom Meronek, WDNR
5301 Rib Mountain Drive
Wausau, Wisconsin 54401

Dear Mr. Meronek:

We have reviewed information about your permit application to place fish cribs (4-foot by 4-foot wood pallets or bundled Christmas trees) on the bed of Wadley Lake for fish habitat improvement purposes. The project site is located in the SW ¼ NW ¼ of Section 33, T. 26N, R. 9E, Marathon County, Wisconsin.

The work in Wadley Lake that you described in your application meets the description of Category 2. Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities of Department of the Army General Permit (GP-002-WI), which is a non-reporting category. Therefore, impacts to any waters of the U.S. due to the work that you described are authorized by the GP-002-WI provided the attached Standard Conditions are followed. This determination covers only the project as described above. If the design, location, or purpose of your project changes, you should verify that your project remains eligible for authorization under the non-reporting categories of the GP-002-WI. Otherwise, our office should be contacted to make sure the work would not result in a violation of federal law.

This General Permit is valid until May 31, 2016, unless reissued, or revoked. The time limit for completing the work described above ends on that date. It is the permittee's responsibility to remain informed of changes to the General Permit program. If this authorized work is not undertaken within the above time period, or the project specifications have changed, our office must be contacted to determine the need for further approval or re-verification.

It is the permittee's responsibility to ensure that the work complies with the terms of this letter and any enclosures, AND THAT ALL REQUIRED STATE AND LOCAL PERMITS AND APPROVALS ARE OBTAINED BEFORE WORK PROCEEDS.

If you have any questions, contact **Eric Norton** in our Stevens Point field office at (651) 290-5879. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

Eric Norton

for Tamara E. Cameron
Chief, Regulatory Branch

Copy furnished:

Keith Patrick, WDNR – Wausau (GP-WC-2014-37-00122)

Don Dulak 2185 Aveo Park Lane, Red Lake, MN 56473

Appendix D: Phosphorus Modeling

Wadley Lake Land Use	Phosphorus Export Coefficient (lbs/acre-yr)	Land Use Area Within the Watershed		Phosphorus Load	
		Acres	Percent	Pounds	Percent
Water	0.10	46	15	4-13	29
Developed	0.04	35	11	2-3	11
Wetland/Barren	0.09	7	2	1-2	4
Forest	0.04	210	69	9-17	65
Mixed Agriculture	0.27	2	1	0.4-1	3
Row Crop Agriculture	0.45	6	2	3-5	18
*Values are not exact due to rounding and conversion					