Adams County

Land and Water Resource Management Plan

2026-2035

Prepared by: North Central Wisconsin Regional Planning Commission

ACKNOWLEDGEMENTS

Adams County's Land and Water Resource Management Plan was developed with the following residents and staff. Special thanks are extended to the following people:

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This plan was prepared under the direction of the Adams County Land & Water and UW Extension Committee by the North Central Wisconsin Regional Planning Commission.

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PLAN SUMMARY

The Adams County Land and Water Resource Management Plan is drafted as a 10-year plan (2026-2035) with included Work Plan goals and objectives in accordance with the requirements set forth in Chapter 92 of the Wisconsin Statutes.

Plan Development

To assist in the revision of the land and water resource management plan, Adams County Land and Water Conservation invited participants from a variety of resource protection agencies, farmers, lake groups, and interested citizens to discuss and prioritize conservation concerns – the Resource Advisory Committee (RAC).

The RAC's **April 3, 2025** meeting included current resource assessments and concerns unique to Adams County. Participants were then working in small groups to 1) identify the overarching goal topics to focus on, and 2) prioritize the top 3 goal topics.

In **September and October**, the updated draft chapters were provided to Adams County Land & Water and UW Extension Committee members for additional review and comments; draft plan was sent to DATCP for review.

The **November 4, 2025** public hearing on the plan was noticed in the official newspaper. (**Attachment A**)

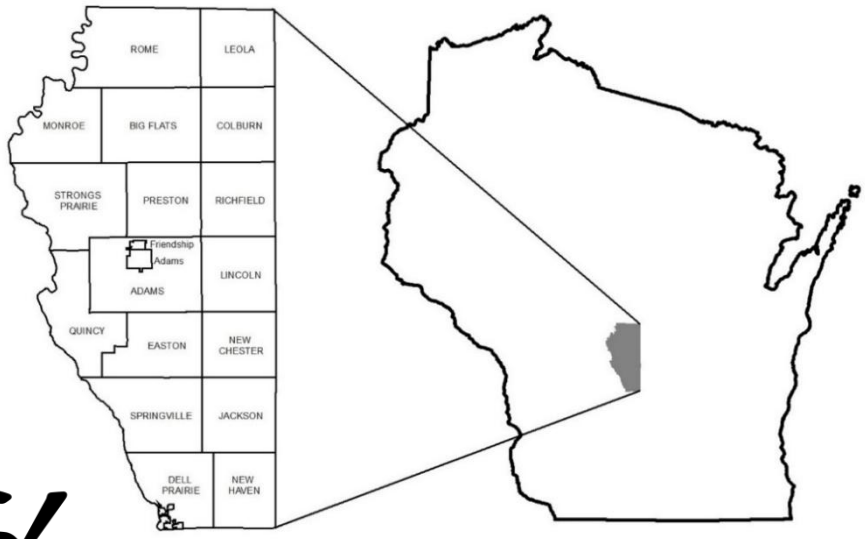
December 2, 2025 – Presentation of Plan to the Wisconsin Land and Water Conservation Board.

December 2025 – DATCP sends letter adopting the plan following LWCB recommendations.

December 2025 – Adoption of the plan by the Adams County Board of Supervisors.

Adams County

Adams County is in central Wisconsin, with its western border along the Wisconsin River.



The Central Sand Plains ecological landscape includes Adams County. The vast, remarkably flat, sandy plain was once the bed of Glacial Lake Wisconsin—the enormous body of water fed primarily by glacial runoff.

The largest land use change from 2015 through 2025 is the transfer of industrial forest to golf course and mansion development in the Sand Valley Golf Course Complex that includes 7 golf courses.

Sand Valley

Adams County is considered a *non-metro recreation county* by DNR, which means that it has high levels of tourism, recreation, entertainment, and seasonal housing. About 38% of housing is seasonally vacant (about 6,500 units), and most of that housing stock is in the Town of Rome and along Castle Rock and Petenwell Lakes.

Many seasonal homes continue to be converted to year-round residences as their owners retire and permanently move here. New permanent and seasonal homes are being built too. Both trends are projected to continue.

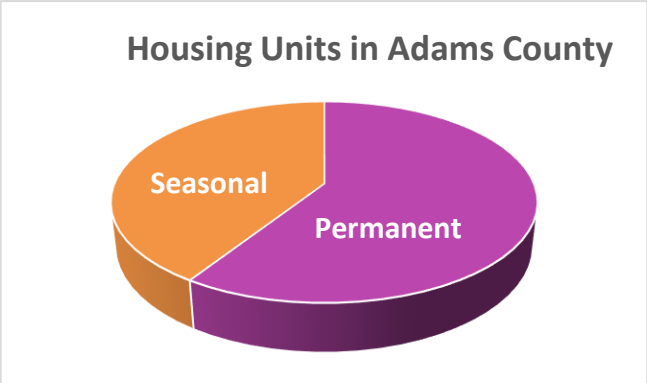
Table 1 Adams County Land Use

Land Use	2015	2020
Agriculture	22.6%	22.7%
Commercial	0.4%	0.4%
Industrial (includes quarries)	0.2%	0.2%
Government/Institutional	0.2%	0.2%
Open Lands	4.4%	3.6%
Outdoor Recreation	0.4%	0.6%
Residential	4.4%	4.4%
Transportation	3.4%	3.4%
Woodlands	57.7%	58.0%
Water	6.3%	6.3%

Source: WROC & NCWRPC 2015, & 2020

Land use away from lakes is largely oriented towards timber and pulp production, and agriculture. Public and private forests and forested wetlands cover about 58% of the county. Some of the wetlands in the Town of Leola are used for cranberry production.

Adams County's median age is 55.5 years. About 95% of the population is European, with about 4% Latino, and the remainder a mix.



Natural Resources and their Management in Adams County

The **soil** types in Adams County are primarily sandy and loamy which are well suited to forest uses, and due to a long enough growing season, then many agricultural crops are possible.

Most **agricultural production** in Adams County consists of vegetables, melons, potatoes, and sweet potatoes.

Performance Standards and Enforcement

The Adams County Land and Water Conservation Department (LWCD) shall pick **priority farms** per the following ranking: (1) landowners who allow unfiltered stormwater runoff into state waters; (2) those farms that have converted forested areas into agricultural crop production; (3) newly developed farms, irrigated fields; (4) farms in high nitrate well contamination areas; (5) Farmland Preservation Program participants that come out of compliance with pollution controls; and (6) farms located in 9KE plan watersheds or TMDL subbasins with high phosphorus loading or TP impairment.

The **cost-share program** in Adams County continues to be equally available to riparian landowners and farmers. Each of the cost-sharable conservation practices available to landowners are ranked based on wetland proximity, drainage ditch locations, extremity of project, and impacted waters in relevance to project location.

Land disturbance activities, beyond farming, that are subject to stormwater management and erosion control are outlined under the **Non-Agricultural Performance Standards** fact sheet in **Attachment F**. A landowner who is out of compliance with State performance standards and prohibitions and refuses technical and financial assistance from the LWCD will be notified by mail that they are subject to enforcement action if they choose not to work with us voluntarily.

Minerals

Sand deposits and sandstone formations exists throughout the County. Sand in Adams County is suitable for a variety of uses including frac sand, foundry sand, glass sand, bedding sand, filter sand or aggregate (gravel and sand) for roads and other types of construction, and other types of uses.

Forestry

The overall forest cover in Adams County includes a mix of oak, aspen and pine, reflecting the Central Sands ecological landscape, covering 58% of the County. Only about 5% of forestland in Adams County is publicly owned; see **Map 2 – Public Use Lands**. Non-industrial forestland enrolled in the Managed Forest Law (MFL) is dually certified under American Tree Farm System® (ATFS), and Forest Stewardship Council® (FSC) through DNR's group forest certification program. These certifications promote sustainable forest management through required adherence to Wisconsin's Forestry Best Management Practices.

Terrestrial Invasive Species

Not all terrestrial plants classified in Wisconsin as invasive pose the same environmental or economic threat to all regions of the state. Some are of great concern in agricultural areas while of lower priority in areas dominated by woodlands and wetlands, and vice versa. The Central Wisconsin Invasives Partnership (CWIP), serving Adams County and 7 other Central Wisconsin counties, places highest priority for early detection monitoring and rapid response management on species classified as "Prohibited," which are those species that are not yet well

established, and early detection could enable effective control. Of secondary priority to CWIP are plants classified as "Regulated," which are well established and beyond hope of managing in many areas of Wisconsin, but not yet common within the CWIP region. Detecting those species along roadsides and other areas where they are likely to first appear will present opportunities to slow or stop their advance locally.

Lakes and Rivers

Adams County has a high level of tourism, recreation, and seasonal housing resulting from people being drawn to mainly the waters of Castle Rock and Petenwell Lakes, the Tri-Lakes area in Rome, and 17 other inland-lakes with public access. See **Map 1 – Existing Land Use** for the general distribution of lakes and rivers, and **Map 3 – Watersheds**.

Since 2004, volunteers have monitored the lakes using the Citizen Lake Monitoring Program and recorded their data in the SWIMS database. Since 2007, thirty streams also have active volunteers monitoring water quality.

In 2021, the DNR's Water Quality Program launched the Healthy Watersheds, High-Quality Waters (HWHQW) initiative (now known as The Wonderful Waters of Wisconsin). This new focus on the "healthiest" waterbodies and watersheds is intended to celebrate these treasures and draw attention to the ecological, financial and societal benefits of protecting clean water.

High-Quality Waters in Adams County *(See **Attachment E** for a full list)* include:

- 23 High-Quality lakes, rivers, and streams
- 4 Healthy Wetlands
- 7 Rare & Unique Wetlands

As of 2025, there are 9 lake associations in Adams County and 13 lake districts. Goose Lake and Sherwood Lake have both. These organizations work to protect and restore the lakes and to educate their membership about how to keep the waterbodies healthy.

Aquatic Invasive Species

The aquatic invasive species program in Adams County has evolved to concentrate efforts in three areas:

1. Public awareness and prevention
2. Early detection presence/absence monitoring, particularly for species that can be managed.
3. Effective management of manageable species (plants)

Impaired Waters [303(d) Waters]

Waters in Adams County are 303(d) impaired due to:

1) PCBs – 2 lakes
2) mercury, which is deposited from the atmosphere – 2 lakes;
3) total phosphorus, from non-point sources – 5 lakes; and
4) elevated water temperatures – 1 creek.

See **Map 4–Designated Waters** for all the current impaired waters countywide. See a list of these waters in **Attachment C**.

Petenwell and Castle Rock Lakes are both impaired due to total phosphorus that mainly comes from upstream sources that are not in Adams County, per the Wisconsin River TMDL.

Outstanding and Exceptional Resource Waters

- Outstanding resource waters (ORW) in Adams County include 2 creeks.
- Exceptional resource waters (ERW) in Adams County include 12 creeks.

See **Map 4–Designated Waters** for all the ORWs and ERWs countywide.

Groundwater

The groundwater in Adams County is generally of good quality and is the primary source of drinking water for most residents here. The county is susceptible to groundwater contamination in most areas due to the predominance of sandy soil. See **Map 6–Groundwater Contamination Susceptibility.** Local differences in groundwater quality are the result of the composition, solubility, and surface of the soil and rock through which the water moves, and the length of time that the water is in contact with these materials.

Accomplishments and Initiatives

Accomplishments and activities completed from the 2016-2025 Adams County work plans are discussed in Chapter 4. Knowing what has been completed or needs more attention helps us to determine what actions or activities to include or expand on in future work plans. Land & Water Conservation accomplishments are listed here in the following categories: Information and Education; Civic Action; Best Management Practices; Grants and Funding; and Coordination and Administration.

INFORMATION & EDUCATION
Youth education; Limited success of various education strategies.

CIVIC ACTION
Actions by County Board Resolution; Public Representation and Committee Participation.

BEST MANAGEMENT PRACTICES
Water Quality Monitoring; Lake Management; Phosphorus Loading; Nutrient Management; Forestry.

GRANTS & FUNDING
Staffing (DATCP); SWRM Implementation (DATCP); Surface Water Grants (WDNR); Wildlife Damage and Abatement (WDNR); and many others.

COORDINATION & ADMINISTRATION
Partnerships; Sponsorships; Administration Actions

There are a few new management tools that conservation professionals can utilize for planning and phosphorus modeling purposes. The Adams County Land & Water Conservation Department plans on using these tools extensively in the future. They are: The Wonderful Water of Wisconsin, and the Storm Water Management Model (SWMM) Modeling Tool. During the next few years, we will be working on a few proposed projects that align with our vision of protecting the natural resources of the County. We hope to use cost-share dollars to properly abandon wells and will seek funding to do some strategic groundwater monitoring. We will also continue to work on AIS and TIS prevention projects throughout the County.

Educating the public will continue to be an important component of the Adams County Conservation programming in the years ahead as noted by the creation of Goal 1: Create a culture where landowners take ownership of their impact on the environment. The programs and topics of education can be found in detail under Proposed Project Summaries in Chapter 4.

New 2026-2035 Goals and Objectives

Our mission to protect the county's natural communities from degradation will be implemented through the following work plan over the course of a ten-year period, from 2026-2035.

The goals are listed in order of priority as determined by the Adams County Land and Water Committee/ Department in partnership with recommendations from the Resource Advisory Committee. For more information and a listing of objectives, refer to Chapter 5.

Goal 1: Create a culture where landowners take ownership of their impact on the environment.

Goal 2: Protect and improve groundwater quality and quantity as well as surface water quality.

Goal 3: Reduce wind erosion.

Goal 4: Engage and support our local youth in conservation efforts.

Goal 5: No net loss of existing wetlands.

Goal 6: Promote working Forests.

Regulations and Funding

Adams County offers reimbursement cost-share funding to farmers to help offset the total cost of implementing practices on the land that move them toward compliance with **agricultural performance standards and prohibitions under NR 151**.

We will place effort toward meeting **non-ag performance standards** by continuing a beach monitoring program in partnership with the Public Health Department that will close public beaches in response to environmental concerns such as high bacterial counts. Land disturbance activities such as construction erosion control or controlling stormwater runoff will be other ways that Adams County will employ to control sediment and meet the standards. The standards and prohibitions are listed on fact sheets in **Attachment F.**

Enforcement Process – If a site is identified within the county that needs practice implementation because it is located near a WQMA, and the landowner has not voluntarily contacted the Land & Water Conservation Department, the County Conservationist will send a letter to the landowner informing them of the issues and their options to come into compliance with the state standards. If the landowner chooses not to move ahead with any practice implementation activity within 6 months of the first letter, a second letter to the landowner will be sent and copied to the county Corporation Counsel. If no activity commences within 3 months of the second letter, then Adams County will communicate with DNR about enforcement action.

An annual **assessment of progress** to implement the Land and Water Resource Management will be monitored by the County Conservationist and the Conservation Committee. Improvement to quantify accomplishments were made during this revision, however, there are still in instances of longer-term activities or programs that do not dictate a means to measure numerically (on-going or as-needed), activity progress will be measured by a qualifying means in these cases.

As required within the operation and maintenance portion of the contract agreement signed between a landowner and Adams County, a landowner must maintain installed practices for a minimum of ten years following project completion and distribution of reimbursement funding. Conservation staff evaluate the land conditions for each site (pre and post project install), along with the DATCP Conservation Engineer. This formal evaluation of practices installed assures us that our designed plans were adhered to during construction and that WI Construction Specifications were followed. Following BMP installation, the site goes on our list for conducting random compliance checks within 10 years of project completion.

Cooperation

The LWCD staff seeks cooperation from and works closely with a diverse group of agencies, associations, and organizations involved in resource management and protection in Adams County. Each agency, organization, association, and individual have its individual resource issues, programs, and plans; but cooperatively we can work together for the greater good of Adams County's land and water resources.

INTRODUCTION
Chapter 1

1.1 Purpose

The Wisconsin Legislature created Chapter 92 in the State Statutes because the soil resources of this state are being depleted by wind and water erosion and that the waters of this state are being polluted by nonpoint sources of pollution. The legislature further finds that these are statewide problems endangering the health and welfare of the state's citizens, its recreational resources, agricultural productivity and industrial base. (92.02 Wis. Stats.)

Chapter 92 has clearly defined roles and responsibilities. The Department of Agriculture, Trade and Consumer Protection (DATCP) has the primary responsibility to set state conservation program policy. County land and water conservation committees (LWCC's), through their respective land and water conservation departments, have primary responsibility for implementation of conservation programs within their jurisdiction. Both DATCP and county land and water conservation committees have joint responsibility to develop and administer the conservation programs. Chapter ATCP 50 (the Soil and Water Resource Management Administrative Rule) further articulates land and water resources management planning program roles and responsibilities.

As part of the partnership created by Chapter 92 between the Department of Agriculture, Trade and Consumer Protection (DATCP), the Land and Water Conservation Board (LWCB), and the various county Land & Water Conservation Committees (LWCCs), each county is to develop a 10-year land and water resource management plan. A locally-led planning process gives counties greater responsibility in the overall provision of conservation programs within their boundaries.

The development of this document provides Adams County with guidance to address the natural resource needs of the county over the next ten years. It also provides an opportunity for Adams County to further develop and expand coordination with other partners and agencies involved in resource management to accomplish the goals and objectives identified in the plan.

1.2 Plan Development

To assist in the update of the Land and Water Resource Management Plan, Adams County Land and Water Department invited participants from a wide variety of resource protection agencies, interested citizens, and lake groups to discuss and prioritize conservation concerns. A *Resource Advisory Committee (RAC)* was assembled and met once in 2025. Representatives from a wide variety of backgrounds and agencies participated in the meetings. Membership of the RAC was comprised of; county personnel from the Land & Water Conservation Department; county board supervisors; Lake Stewards; County Lake Alliance Members; Lead Farmers; partners from Central Wisconsin Windshed Partnership; staff from the Department of Agriculture, Trade and Consumer Protection (DATCP); staff from North Central Regional

Planning Commission (NCWRPC); several state personnel from the WI Department of Natural Resources (WDNR); and federal personnel from Natural Resource Conservation Service (NRCS) and United States Department of Agriculture (USDA).

The first Resource Advisory Committee meeting took place on **April 3, 2025,** at the Adams County Community Center in Adams, and lasted 4 hours. There were 18 people in attendance. After the group introductions, the RAC was told about the purpose and planning processes for updating the Land & Water Resource Management Plan (LWRMP), and then became familiar with the specific activities and programs offered to the public by the Adams County Land & Water Department. Next, the RAC was briefed on the *current* Resource Assessment and Resource Concerns unique to Adams County. During the presentations, the members were free to ask questions which generated relevant conversation about the next plan update. To encourage full participation, the full group was broken into 3 sub-groups to discuss some questions. The questions were designed to get them thinking about differences in our resources today versus 10 years ago; and what goals might be added, expanded, or removed.

The 3 sub-group discussion results are combined and summarized as follows:

1) Identify 5-9 overarching goals –
   Water Resources, Drinking Water, Recreational Waters, Non-Point Source (NR. 151), Wetlands, Outreach, Education, Youth Education, Neonic, Woodland Fragmentation, Producer/Resident Connections, Forest Resource Protection, Riparian Buffers, Erosion Control, Wildlife Habitat, Prairie Restoration, Nutrient Management Planning, Climate Change Resiliency
2) Prioritize top 3 goals –
   a) Erosion Control Practices, Education and Outreach
   b) Water Quality Measures, Wetland Conservancy
   c) Watershed Protection, Youth Education, Sustainable Forestry

Input from the sub-groups were noted, and the concerns were then sorted and summarized into the following goals. Many of the issues and concerns were similar to the older plan, with a few changes. The most notable of those differences were the addition of climate change resiliency, although it was not noted as a priority, but also the need to protect high quality watersheds and surface waters throughout the county starting with erosion control practices.

Preliminary goals were drafted for the current revision to address the resource concerns that were identified:

- Goal: Reduce soil loss and degradation in order to maintain soil fertility and protect water quality
- Goal: Monitor, Manage, and Protect Water Resources by minimizing agricultural runoff and restoring natural habitats like wetlands to filter pollutants.
- Goal: Maintain biodiversity and ensure the health of forest ecosystems in a way that meets current ecological, social, and economic needs.
- Goal: Monitor & protect groundwater resources
- Goal: Instill an understanding and appreciation for the environment, empowering young people to become active stewards of natural resources.

The Land and Water Conservation Committee placed a Class I notice in the Adams-Friendship Times Reporter and held a **public hearing** at the Adams County Courthouse in Friendship on **November 4th, 2025** at 9:00 a.m. The hearing was held specifically to solicit public feedback and comments on the draft 5-year work plan and the 10-year draft plan document. In addition to the Committee and staff members, no citizens were present at the hearing for a total attendance of 10 Committee members.

After the public hearing, the County Conservationist presented a summary of the revised 2026-2035 LWRMP. Goals for the next 10 years were communicated, with questions from the committee pertaining to Nutrient Management Plans and producer involvement for water quality. Further information on Adams County's Priority Farm Strategy was discussed to give more information on the direction the department is taking with Nutrient Management Planning and criteria used to identify weightage farms. No changes to goals or the plan were made.

1.3 Related Plans

Plan summaries that affect land and water resource management in Adams County are referenced below:

Adams County Comprehensive Plan, 2018

This plan is a local government's guide to a community's physical, social, and economic development. Comprehensive plans are not land use regulations in themselves; instead, they provide a rational basis for local land use decisions with a twenty-year horizon for future planning and community decisions.

In the Land Use Chapter, see the Existing Land Use Map and Future Land Use Map for where a variety of land uses (e.g., housing, commercial, industrial, woodland, agriculture, and transportation) currently exist and where they are projected to exist over the next 10 years.

Adams County Forest Comprehensive Land Use Plan, 2021–2035

Note: *Adams County established their county forest in 2020, so this is the first 15-year plan for Adams County.*

This plan is a management guide for the Adams County Forest and will be updated every fifteen years. The mission of the plan is to manage and protect natural resources within the county forest on a sustainable basis for the ecological, economic, educational, recreational, and research needs of present and future residents throughout the county. The report includes a number of recommendations for timber management, wildlife habitat and game management, land acquisition and forest boundary management, biodiversity management, watershed management and tourism.

Chapter 100 notes that the Adams County Forest management will use WisFIRS as the primary tool for forest management planning decisions. Additional resources such as forest habitat type classification, soil surveys, and DNR's Best Management Practices for Water Quality guidelines may be utilized in management decisions.

Chapter 600 is all about conservation and protection of the forest resources. The objective is to conserve, manage and protect the trees and resources of the forest from preventable losses resulting from fire, insects, diseases and other destructive elements including those caused by wildlife and people. Protective methods shall include proactive management through silvicultural methods, mechanical treatments and controls, chemical treatments, biological controls, proper planning, regulation establishment and regulation

enforcement. Subjects include fire control; forest pests & pathogens management; a list of about 7 invasive plant species and how to control each one.

Chapter 700 identifies roads and driveway access. The layout and construction of any new road or trail situated on the County Forest shall adhere to Wisconsin's Best Management Practices for Water Quality. Soil disturbance activities in highly erodible soil areas may require mitigating measures in excess of those currently listed.

Adams County Farmland Preservation Plan, 2016

This plan inventories and analyzes the agriculture related resources of Adams County including components such as farmland, utilities infrastructure, communications and land use. It describes programs available to help maintain and preserve productive farmland and woodlands. This plan also discusses the importance of the agriculture industry to the local economy. It establishes the goal of promoting working forests and farms, and includes a number of objectives and policies to meet this goal, as well as criteria for designating farmland preservation areas.

Wisconsin River TMDL for Phosphorus, 2019

Several reservoir lakes and tributaries in the Wisconsin River Basin are 303(d) impaired by excessive phosphorus nutrient loading. As a result, a comprehensive study of the Wisconsin River Basin (WRB) was initiated by the Wisconsin Department of Natural Resources (WDNR) that has now culminated in the development of the Total Maximum Daily Load (TMDL) report to improve the water quality of the river, its impoundments, and tributaries in 2019.

The Wisconsin River Basin TMDL defines total amount of phosphorus and suspended solids that can be discharged into the river, its tributaries and reservoirs, and still meet water quality standards. Under existing conditions, many reservoirs and tributaries in the Wisconsin River do not meet water quality standards due to excess nutrient and sediment pollutant loads, meaning they are not suitable for their designated uses, such as fishing, wildlife habitat, and/or recreational activities such as boating and swimming.

The impoundments along the Wisconsin River support formation of algae growth - as water from the large watershed is slowed and warmed behind the dams. Runoff from contributing watersheds sometimes carries high levels of phosphorus, which is a primary food source for algae growth and development of Blue-Green Algae (BGA) blooms on Petenwell, Castle Rock and other Wisconsin River Basin Lakes. The peak blooms are normally in summer months (the peak of recreation season) and often appear as "pea soup" scum with a foul smell floating on the surface.

The Total Maximum Daily Load (TMDL) study provides a strategic framework and prioritize resources for water quality improvement in the Wisconsin River Basin. The Wisconsin River TMDL study area spans Wisconsin's central corridor from the headwaters in Vilas County to Lake Wisconsin in Columbia County, covering 9,156 square miles (approximately 15 percent of the state).

Over two-thirds of Adams County (85%) is within the Wisconsin River watershed, and therefore covered by the Wisconsin River TMDL.

Healthy Watersheds, High-Quality Waters (HWHQW) Action Plan, 2022

To draw attention to the state's finest waterbodies, the DNR's Water Quality Program has launched a Healthy Watersheds, High-Quality Waters (HWHQW) initiative. This new focus on the "already healthy" waterbodies and

watersheds – or land area draining to a lake, stream or wetland – is intended to celebrate these treasures and draw attention to the ecological, financial and societal benefits of protecting clean water.

A guiding principle of the HWHQW Action Plan is that watershed scale protection is essential for high-quality waters to thrive. Tasked with answering the big question of "where are the healthy waters of Wisconsin," a DNR Healthy Waters Team completed a peer-reviewed modeling and assessment project. Predictive modeling is necessary because Wisconsin's tremendous amount of water resources makes it nearly impossible – both in time and cost – to directly monitor everything. The data and information generated provides a foundation for planning, implementing and evaluating the Plan.

14 Mile Creek 9 Key Element watershed based plan (2020-2040)

In 2019, Adams County received a DNR grant to develop a watershed based plan for the 14 mile Creek watershed, which consists of three HUC 12 sub-watersheds of the Wisconsin River Basin located in primarily in Adams, and also Portage, Waushara, and Wood Counties. The 20-year plan (2020-2040) reflects US EPA Nine Key Elements criteria and describes the current land uses (primarily agriculture and recreation, including some cranberry and timber production) and water quality conditions in the watershed. It then outlines steps to be taken to, first, widen understanding of land use and watershed conditions by landowners and users, and then increase the use of agricultural and urban best management practices in the watershed to reduce nutrient and sediment loss, and, over time, improve surface and groundwater quality. The plan refers and incorporates the phosphorus reduction targets for the watershed established by the 2019 Wisconsin River TMDL report and is posted on DNR's watershed plans webpage: https://dnr.wisconsin.gov/topic/Nonpoint/9keyElement .

Estimated costs, potential funding sources, critical areas for practices and measures of success are also included. Meeting the plan's goals will be challenging and require ongoing input and efforts from many stakeholders in the watershed.

Watershed Plan Goals
Goal #1: Improve surface water quality and reduce nutrients to meet Wisconsin River TMDL goals.
Goal #2: Improve groundwater quality by reducing nitrogen sources and other pollutants.
Goal #3: Improve lake and stream bank stability by restoring banks and reducing bank degradation.
Goal #4: Increase public involvement in improving water quality in the watershed.

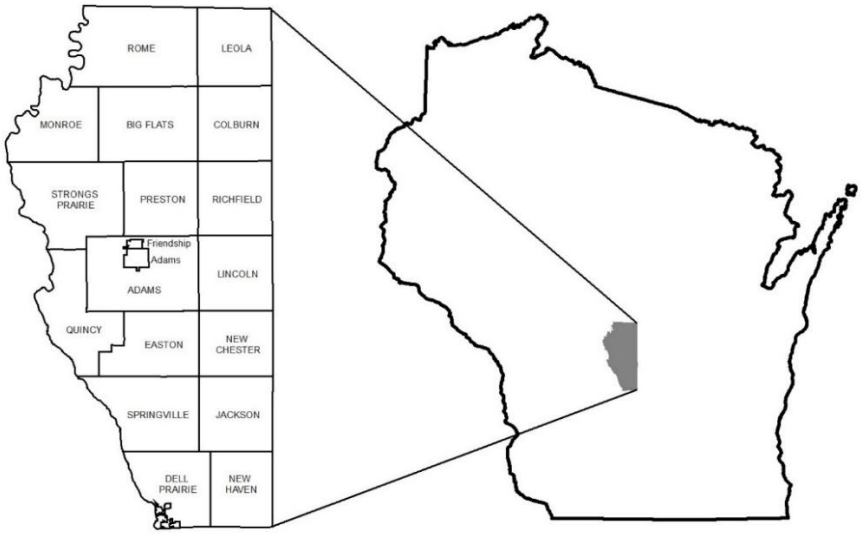
RESOURCE ASSESSMENT
Chapter 2

Adams County is predominantly a rural area with a large proportion of its land in agriculture, wetlands, and forests. Residents and visitors from both near and far utilize its water and expansive natural areas for recreational purposes and agricultural enterprise. The landscape is characterized by flat or gently undulating topography. Elevations along the Wisconsin River bottoms range from 850 feet in the southern part of the County to 950 feet in the northern part.

2.1 Location and Geography

Adams County is located in central Wisconsin (**Figure 1**) and is separated from Juneau County on the west by the Wisconsin River. Marquette and Waushara Counties bound the county on the east, on the north by Portage and Wood Counties, and on the south by Columbia County. The incorporated communities in the county are the City of Adams (1,905 population, 2020 Census), and the Village of Friendship (676 population, 2020 Census), which border each other and are located in the center of the county. A larger population of over 3,000 people live around the three artificially created lakes to the north in the Town of Rome.

Figure 1 **Adams County**



The county's total area is about 685 square miles, or 440,646 acres, and ranks 43rd in area among Wisconsin's 72 counties. Adams County has approximately 40 square miles or 26,099 acres in surface water area, largely due to the Petenwell and Castle Rock flowages on the Wisconsin River, and ranks 18th in the state with respect to total surface water. The county is approximately 41 miles north to south and about 21 miles east to west, and narrows at its southern end to 9.5 miles.

2.2 Land Use

Forestry

Adams County is about 58% covered with woodlands, with the majority of these lands in private ownership. Combined federal, state, county and town governments own over 20,000 acres or about 5% of the land in Adams County. Federal ownership is concentrated in the Town of New Chester where a federal prison is located with over 900 acres that are mostly forested. Adams County has approximately 411 acres of state parks and 7,938 acres of wildlife and natural conservancy areas within the county. See **Map 1–Generalized Existing Land Use**, and **Map 2–Public Access Lands**.

In 2020, Adams County created the 30th county forest in Wisconsin with 140 acres. In 2025, there are now 740 acres in the Adams County Forest. About 3,900 acres are owned by the County. Industrial forest holdings offer vast areas of managed forest law lands that are open to the public, about 17,600 acres total after the ownership transfer to Sand Valley Golf Course Complex.

Sand Valley Golf Course Complex

As of 2025, there are 7 golf courses and mansions that exist or are under development on about 4,752 acres of former industrial forest land. In 2025, 2,832 acres are golf courses and mansions with the remaining 1,920 acres in forestry, available for additional golf course and mansion development. An extensive free public walking trail system is blazed in the rustic areas of each course. The rolling topography in the original Sand Valley golf course is original to the site. Only the playing areas are slightly sculpted topography.

About 7,600 acres of former industrial forest owned lands south of the Sand Valley golf course complex are permanently in forestry through use of the Forest Legacy Easement. See Sand Valley Restoration on **Map 2 – Public Access Lands**. Activities allowed by deed on all of this land are: hiking, fishing, hunting and trapping. As of 2020, about 2,210 acres of this land is agricultural. The management plan for these 7,600 acres is to remove all the red pine and restore the whole property to a mosaic of sand barrens, black oak savannas and sand prairies habitat, which is the same type of habitat within the out-of-play areas of the 7 golf courses (as of 2025).

The federally endangered Karner blue butterfly and the state-endangered slender glass lizard are common throughout the whole golf course complex and 7,600 acre conservancy.

Agriculture

Irrigated vegetable farming is the primary agricultural enterprise (e.g. potatoes, corn, snap beans, soybeans, and peas). Cranberry production is increasingly important too. One CAFO lies within the County in the Town of New Chester. It has over 47,000 acres of Nutrient Management plans under contract, with over 14,000 animal units.

Residential Development

Most residential development occurs around the lakes in the Town of Rome, within the City of Adams and the Village of Friendship, and in the communities of Monroe and Dellwood along Castle Rock and Petenwell Lakes. Many housing subdivisions and scattered residential uses exist along town roads and inland lakes throughout the County.

Commercial & Industrial Development

Resorts are expanding out of Wisconsin Dells along the STH 13 corridor. Many stores exist in the Adams and Friendship area. Mining, manufacturing, and agricultural warehousing and processing are scattered throughout the County.

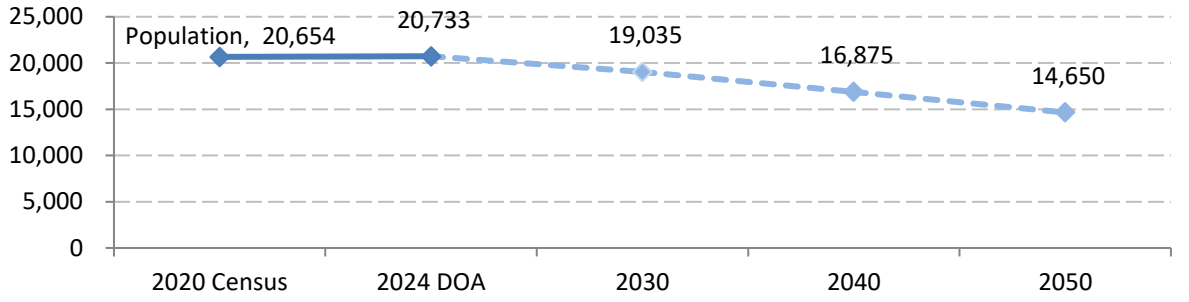
2.3 Demographics

A. Population

In 2024, Wisconsin's Department of Administration produced population projections based on the U.S. Census Bureau's 2020 counts. These projections are largely driven by shifts in age distributions, which are primarily influenced by long-term trends in fertility rates. Differences in both age distribution and fertility rates contribute to varying expectations for total population change. Adams County is expected to experience a significantly less favorable population trend compared to Wisconsin. (OEA in WDWD, 2025)

From 2020 to 2050, the population of Adams County is projected to decline by 29.1%, while Wisconsin's population is projected to decrease by just 3.1%. Population declines are generally driven by either decreasing fertility rates, or the age distributions shifting older, or both. During this period, the proportion of Adams County residents aged 65 and older is expected to rise from 28.8% to 36.3%. In Wisconsin, the share of this age group is projected to increase from 18.0% to 23.0%. (OEA in WDWD, 2025)

Figure 2: Adams County Population Change



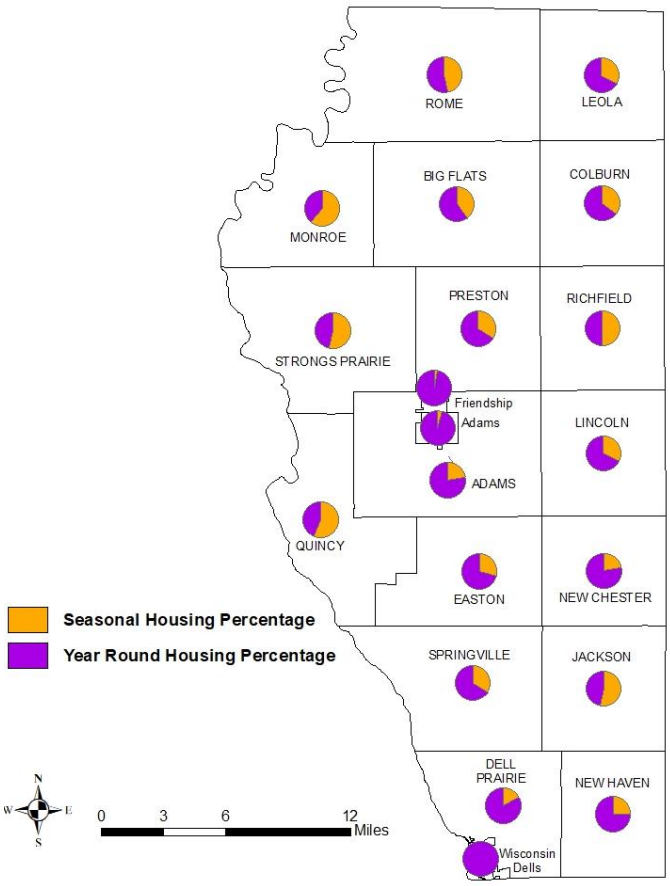
Source: U.S. Census (2000, 2010, & 2020)
Wisconsin Department of Administration, 2024 projections.

B. Housing

Adams County has a larger proportion of vacant housing than Wisconsin or the United States. Much of this vacant housing is seasonal, recreational, and occasional use housing (see **Figure 3**). In the 2023 American Community Survey, Adams County had 16,873 housing units, and about 38.4% of that housing was vacant for seasonal, recreational, or occasional use, compared to approximately 7.1% in Wisconsin and 4.0% in the United States. There are four municipalities with more seasonal housing than year-round housing—the City of Wisconsin Dells (Adams County portion), and the Towns of Jackson, Monroe, Quincy, and Strong Prairie The towns with high proportions of seasonal housing will have greater fluctuations in population throughout the year.

The trend since the 1980s has been for seasonal home owners to retire in Adams County, thus becoming permanent residents in their former "cottages." New permanent and seasonal homes are being built too. Both of these trends are projected to continue. Since 2017 Wisconsin Act 59 was enacted (which prohibits local governments from restricting the rental of single family homes for a term of seven days or more) then seasonal dwellings are being purchased and used as lodging facilities. So, seasonal homes in Adams County are converting to full-time use either by seasonal owners becoming permanent residents or owners renting their seasonal homes out whenever they can.

Figure 3: Permanent and Seasonal Housing, 2023

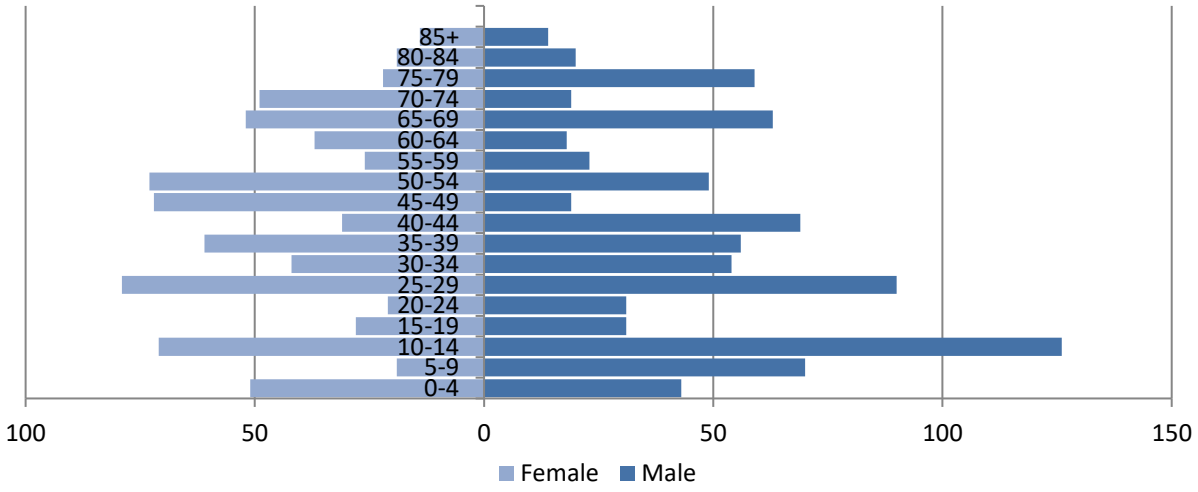


Source: ACS 2023, NCWRPC GIS

C. Age

The median age of Adams County in 2023 was 55.5 years old, while Wisconsin was 40.1. The median age has increased in both Adams County and Wisconsin between 2010 and 2023, from 49.8 to 38.1 years old, respectively. It is evident that the median age in Adams County has grown faster than the state. **Figure 4** shows the 2023 age distribution in Adams County. The age distribution in Adams County is concentrated in the 55-79 year old age groups. The most heavily concentrated age groups are very near to the typical retirement age, which will likely have a greater use of medical services and restaurant/bars.

Figure 4: Adams County 2023 Age Pyramid



Source: American Community Survey, 2023 (5-year)

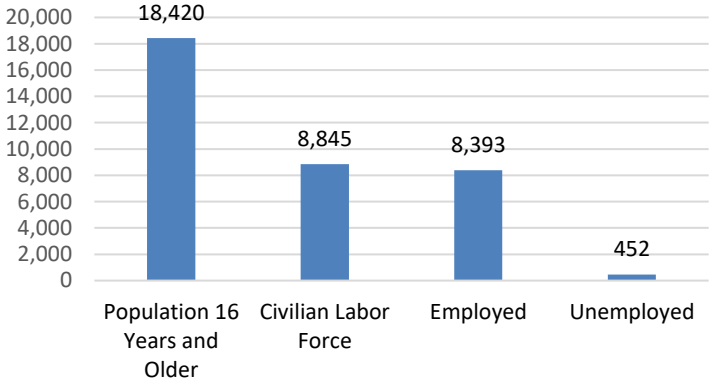
D. Ethnic Background

The people of Adams County mostly identify as white, at approximately 95.5% of people, per 2023 American Community Survey. About 1.7% identify as Native American, and about 3.5% African American or 0.9% Asian, with about 4.4% identifying as some combination of races.

E. Employment and Economy

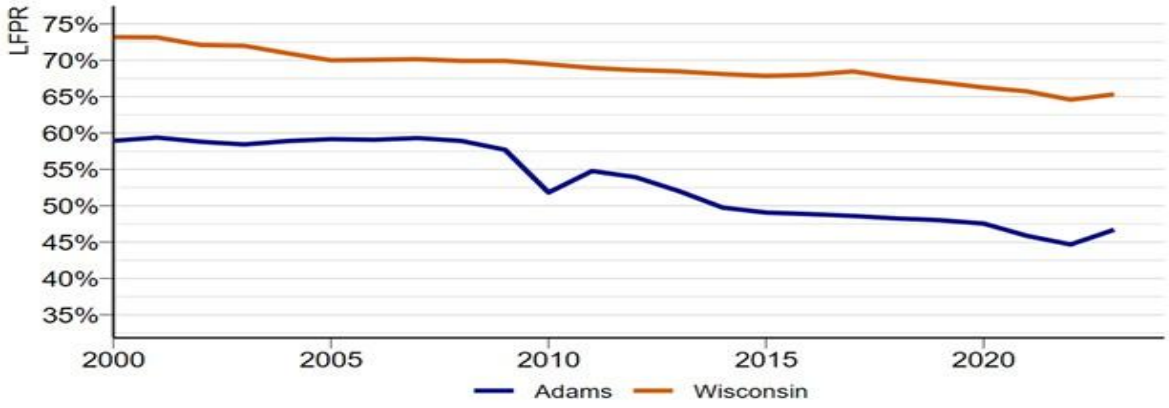
According to the 2023 ACS 5-year estimates, Adams County has 18,420 people aged 16 and over, 48.1% of which are in the labor force, e.g., actively working or seeking work. See **Figure 5**. The labor force participation rate for Wisconsin as a whole is 65.1%, significantly higher than Adams County. The unemployment rate in Adams County in 2023 was 2.5%, which is only slightly higher than 2.2% in the state and lower than the 3.3% in the United States.

Figure 5: Adams County Employment



Even though much of the recent attention on the labor market has focused on the difficulty employers face with finding and retaining workers, it is important to remember that some of those pressures were building up well before the pandemic – and will likely persist for a long time afterward. One important labor market measure, called the labor force participation rate (LFPR), looks at the relative labor resources available and is expressed as the percentage of the civilian noninstitutional population 16 years and older that is working or actively looking for work. This rate faces downward pressure anytime there is an aging population. Adams County's LFPR has been trending steadily downward since 2000 when the oldest members of the Baby Boomer generation were in the latest stages of their prime working years (see **Figure 6**). The local LFPR was 58.9% in 2000 and diminished to 48.1% in 2023. (ACS, 2023 and OEA, 2025))

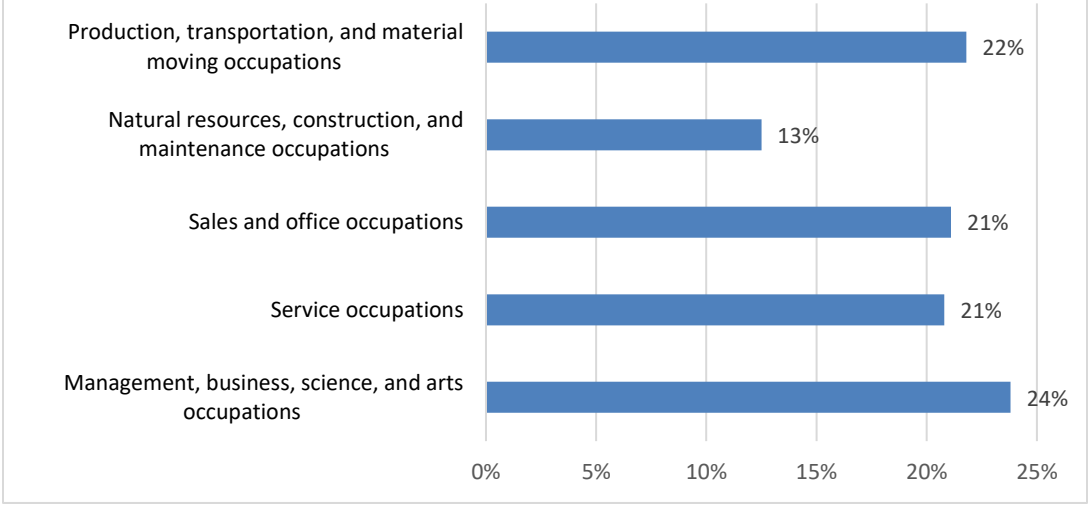
Figure 6: Labor Force Participation Rate



Source: WI Department of Workforce Development Office of Economic Advisors

As shown in **Figure 7**, most residents of Adams County are employed in Management, business, science and arts occupations at 23.8%; Production, transportation, and material moving occupations at 21.8%; and Sales and Office occupations at 21.1%.

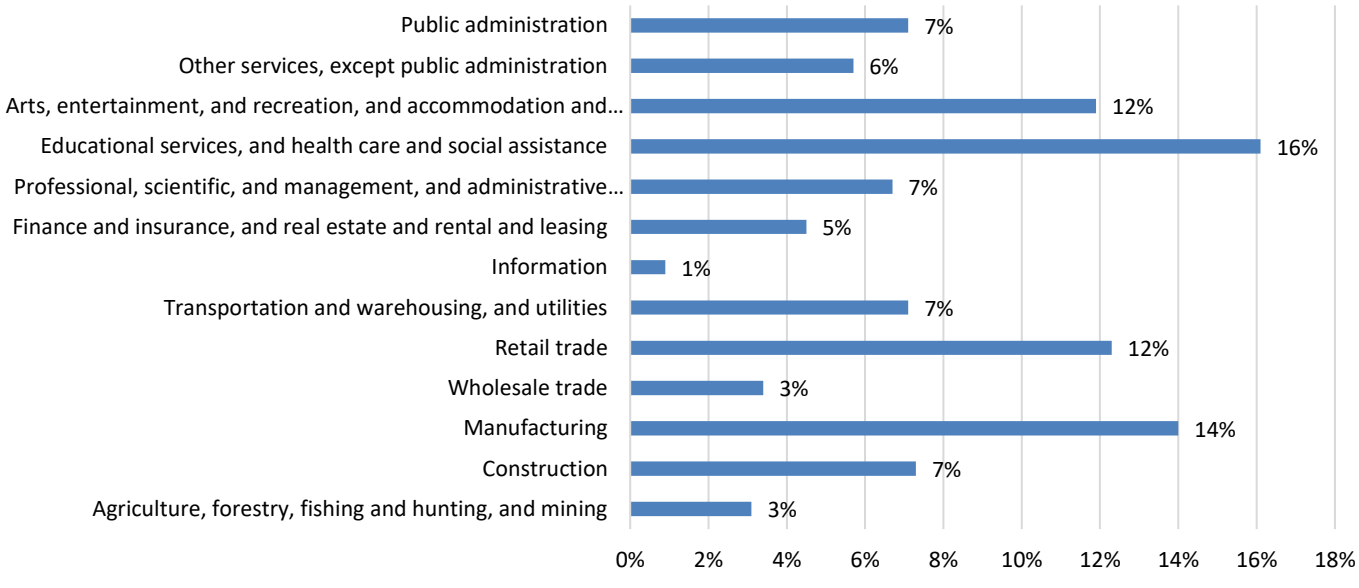
Figure 7: Adams County Resident Occupation



Source: American Community Survey, 2023 (5-year)

The most common industry for Adams County residents is Education services, health care and social assistance at 16.1%, followed by Manufacturing industry at 14%, and then the Retail Trade industry at 12.3%. See **Figure 8**.

Figure 8: Adams County Resident Industry

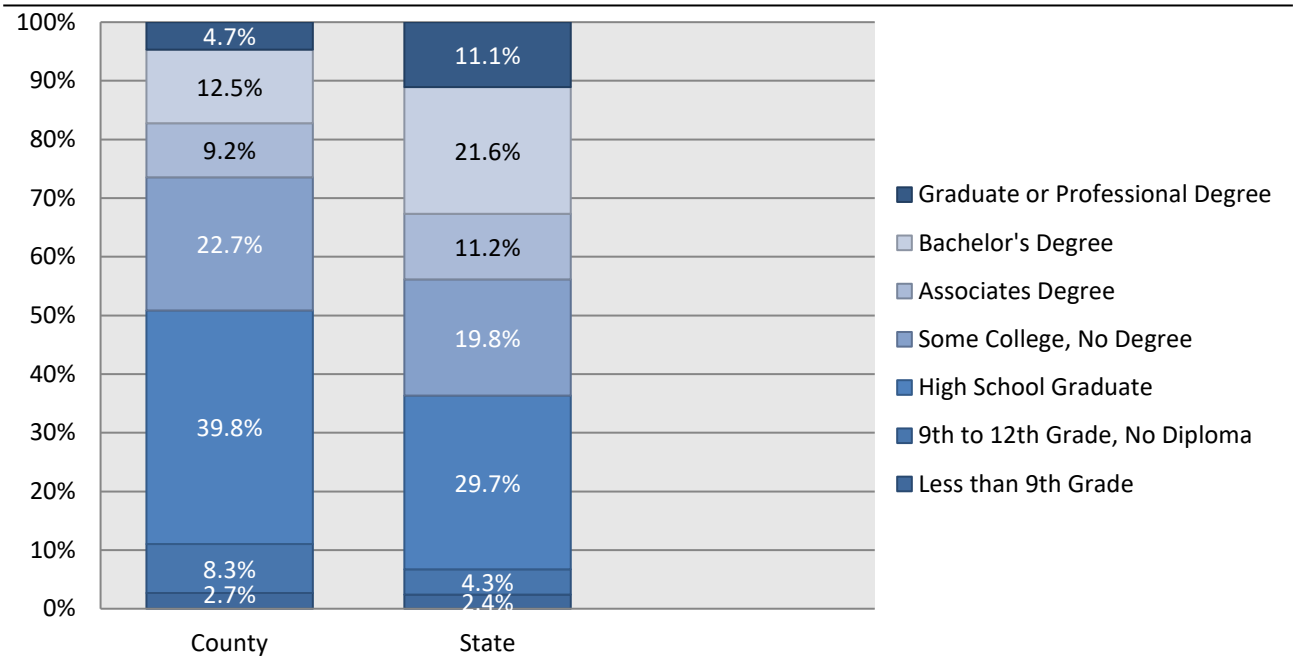


Source: American Community Survey, 2023 (5-year)

As of the 2023 ACS 5-Year estimates, median household income in Adams County was $59,153, with the State median at $75,670. Adams County's 2023 per capita income was $35,145, vs the State at $42,019.

Figure 9 notes that about 89% of Adams County residents 25 years and over have graduated high school; a few percentage points lower than the 93.4% of State residents. About 17.3% of Adams County residents have a bachelor's degree or higher, while 32.8% of Wisconsin residents have a bachelor's degree or higher.

Figure 9: Educational Attainment, Age 25 and Older, 2023



Source: American Community Survey,2023 (5-year)

2.4 Topography and Geology

The surface features of Adams County resulted from glacial activity that occurred 10,000 - 25,000 years ago. Most of Adams County is nearly flat on the sand plain of former Glacial Lake Wisconsin. The sandstone rises above the surrounding landscape, called buttes, in over 20 named rock formations. These buttes are the remnants of islands in Glacial Lake Wisconsin. The slightly hilly area of eastern Adams County is the maximum extent of the Green Bay Lobe of the last glacier (Johnston moraine). Glacial Lake Wisconsin formed when ice of the Green Bay Lobe advanced onto the eastern end of the Baraboo Hills, damming the Wisconsin River (roughly **Figure 10**). The area of the central sand plain flooded until the level of the water was high enough to drain out an outlet to the northwest. Eventually the ice dam at the east end of the Baraboo Hills failed resulting in a catastrophic flood as Glacial Lake Wisconsin drained in a very short period of time. This flood resulted in the erosion of the gorges that are the Wisconsin Dells. The modern course of the Wisconsin River could not have become established across the Central Sand Plain until after Glacial Lake Wisconsin drained.

Figure 10 Glacial Adams County

2.5 Climate

Adams County's climate is classified as typically continental, with cold winters and mild to hot summers. Storms usually move from west to east or southwest to northeast. Like much of the Midwest, warming weather has been concentrated in the winter and spring, while summers have warmed less. Warmer spring temperatures present the additional threat of frost-freeze damage to early-budding fruit trees. The number of very cold days has been near or below average since 2000, reflecting a winter warming trend. The increase in winter temperatures has also reduced lake ice cover. Ice-cover duration on Lake Mendota [in Dane County] has exhibited a consistent downward trend since the late 19th century. The 30-year average seasonal snowfall at Wisconsin Dells is 39.8 inches (NWS La Crosse 2015). Total winter precipitation and total summer precipitation have been mostly above average over the last 26 years. The frequency of 2-inch extreme precipitation events has increased, with the highest number occurring during the 2015–2020 period. (Excerpt from NOAA State Climate Summaries - Wisconsin 2022)

In the 1984 Adams County Soil Survey, the growing season was reported as generally extending from late May to early September, for an average frost-free growing season of 135 days. In 2025, the USDA's Midwest Regional Climate Center notes the average 32 degree growing season length from 1950-2024 was 144.4 days, lasting from approximately May 10 to September 30. Winters in Adams County have much less snow for snowmobiling

and skiing due to its longer growing season which has removed almost 20 days of winter over the last 3 decades. Summer provides a comfortable environment for camping, fishing, and other activities.

Weather *changes hour-to-hour and day-by-day.*
Climate *is the long-term average of weather over at least 30 years.*

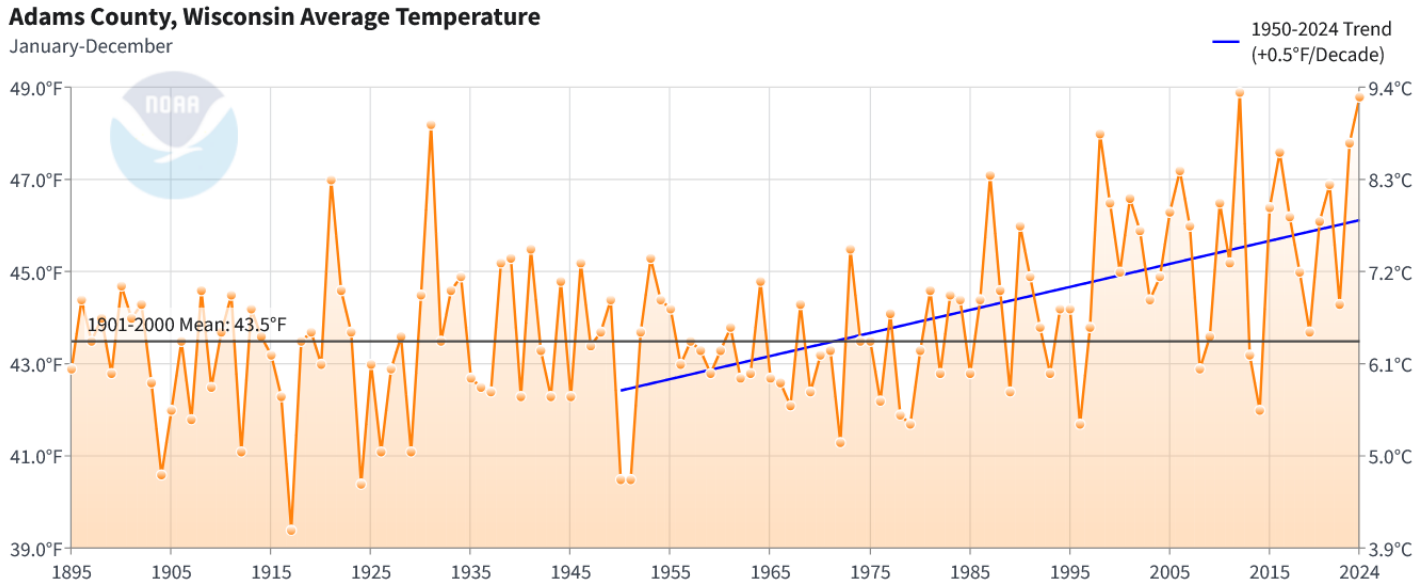
A. Historical Temperature and Precipitation Trends

Annual temperature and precipitation trends are provided by the National Centers for Environmental Information (NCEI), is a sub-bureau of the National Oceanic and Atmospheric Administration (NOAA). The NOAA Monthly US Climate Divisional Database (NClimDiv) provides data for temperature, precipitation, drought indices, and heating and cooling degree days for US climate divisions, states, multi-state regions, and the nation from 1895 to the present. County-level temperature and precipitation averages were leveraged to showcase climatic anomalies in comparison to the 20th century average.

Figure 11 is **annual average temperature** for Adams County, WI, 1895-2024. Long-term temperature records show that Adams County is becoming warmer, with average annual temperatures increasing by approximately 3° F since 1950. Much of this warming has occurred in winter, with average winter temperatures increasing by 6° F, compared to 3° F in spring and fall and 2° F in summer. (NOAA Climate at a Glance)

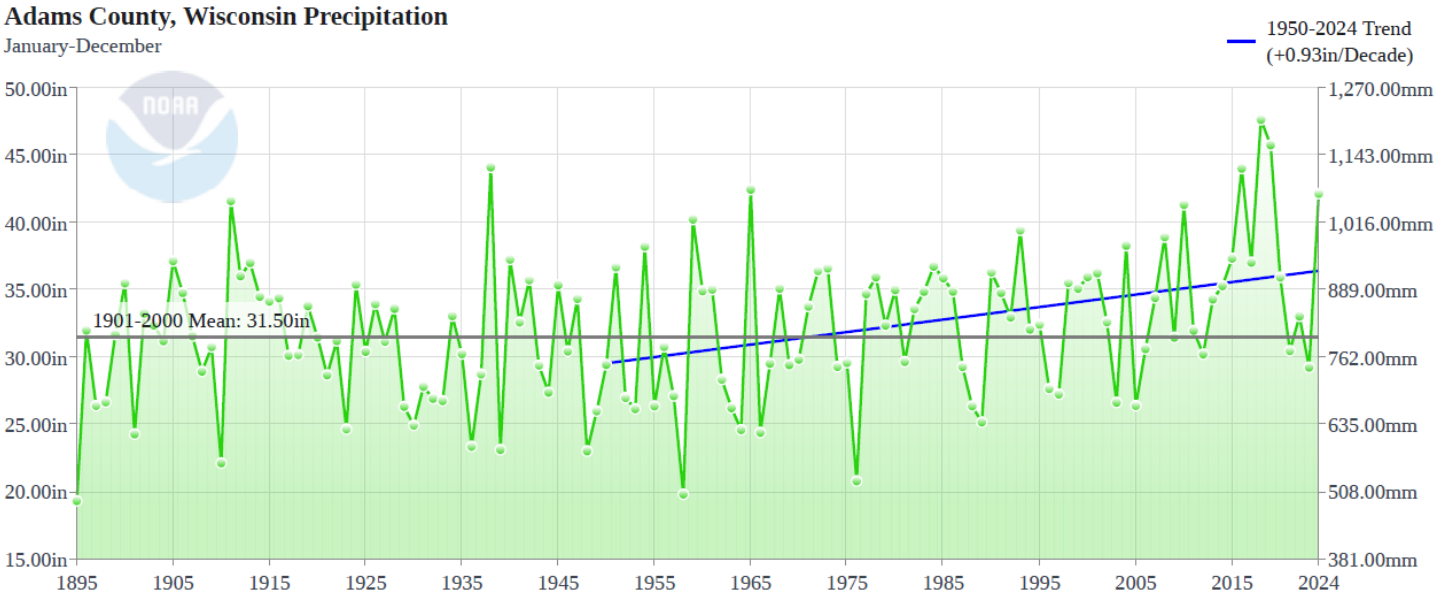
Figure 12 shows **annual precipitation** for Adams County, WI, 1895-2024. Long-term precipitation records show that Adams County is becoming wetter, with annual precipitation increasing by approximately 20% since 1950. Precipitation has increased significantly in all seasons, though slightly less in fall (+10%) compared to winter, spring, and summer (+20%). (NOAA Climate at a Glance)

Figure 11 **Temperature Trend in Adams County, Wisconsin**



Source: NOAA National Centers for Environmental Information, Climate at a Glance and USA Facts.org

Figure 12 **Precipitation Trend in Adams County, Wisconsin**



Source: NOAA National Centers for Environmental Information, Climate at a Glance and USA Facts.org

B. Projected Future Climate Trends

Adams County, like the rest of Wisconsin, is projected to continue warming in the future (**Figure 13A**), with winters warming more rapidly than other seasons (Wisconsin Initiative on Climate Change Impacts 2021 Assessment Report). With warming winters, Adams County can expect to see fewer nights per year with below-freezing temperatures (**Figure 13B**) and With a warming climate comes a shift in lakes predictably freezing over from annually to intermittently. Lake Mendota (Dane County) will likely have intermittent ice by 2040. Trout Lake (Vilas County) will likely start having intermittent ice by 2100. (John J. Magnuson et al, Center for Limnology, UW-Madison, 2019)

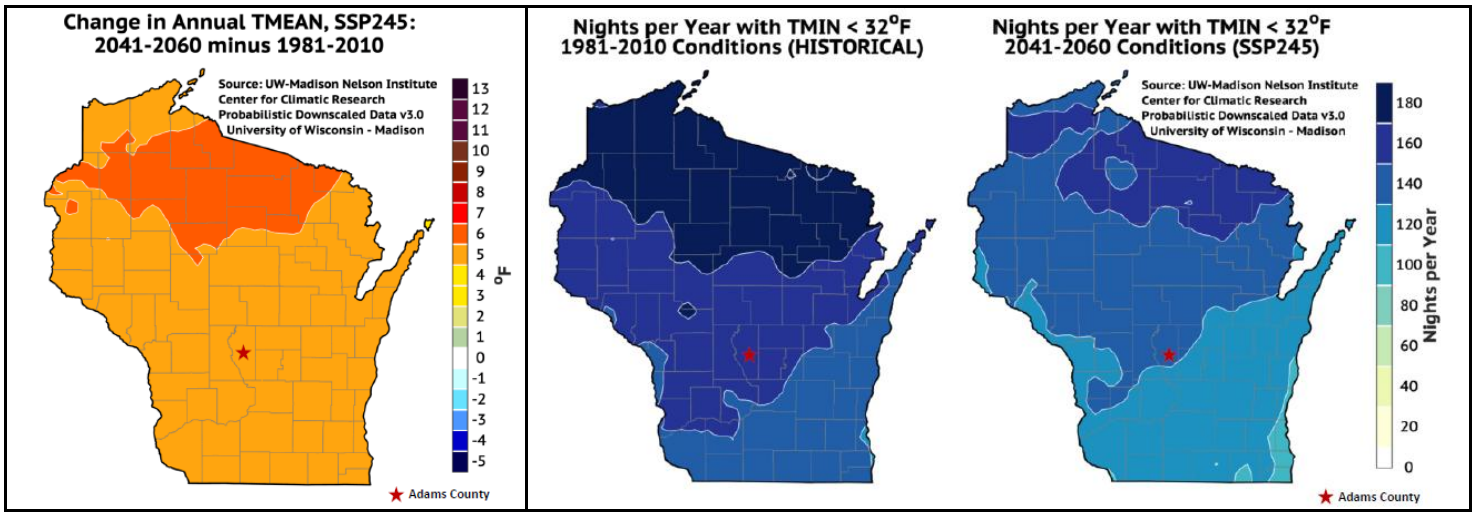
Precipitation is projected to continue increasing in Adams County and the rest of Wisconsin (**Figure 14A**). Most of the precipitation increase is projected to occur during the winter and spring, but snowfall is projected to decline due to warmer temperatures. Additionally, extreme precipitation is projected to increase, potentially increasing the frequency and intensity of floods and causing increased runoff and erosion (**Figure 14B**). Above normal precipitation enhances the risk of springtime flooding, which could pose a threat to Wisconsin's agricultural industry by delaying planting and causing yield losses. (Excerpt from NOAA State Climate Summaries - Wisconsin 2022)

The intensity of future droughts is projected to increase. Even if precipitation increases in the future, rising temperatures will increase the rate of soil moisture loss during dry periods. Thus, future summer droughts, a natural part of Wisconsin's climate, are likely to be more intense. (Excerpt from NOAA State Climate Summaries - Wisconsin 2022)

Figure 13A shows the projected change in annual mean temperature by mid-21st century, compared to recent historical averages. Annual mean temperatures in Adams County are projected to increase by approximately 5°F. **Figure 13B** shows the historical frequency of below-freezing (32°F) nights (left) compared to future projections (right). Adams County is projected to see approximately 20 fewer below-freezing nights per year by the mid-21st century.

Projected Temperature Changes

Figure 13A **Figure 13B**

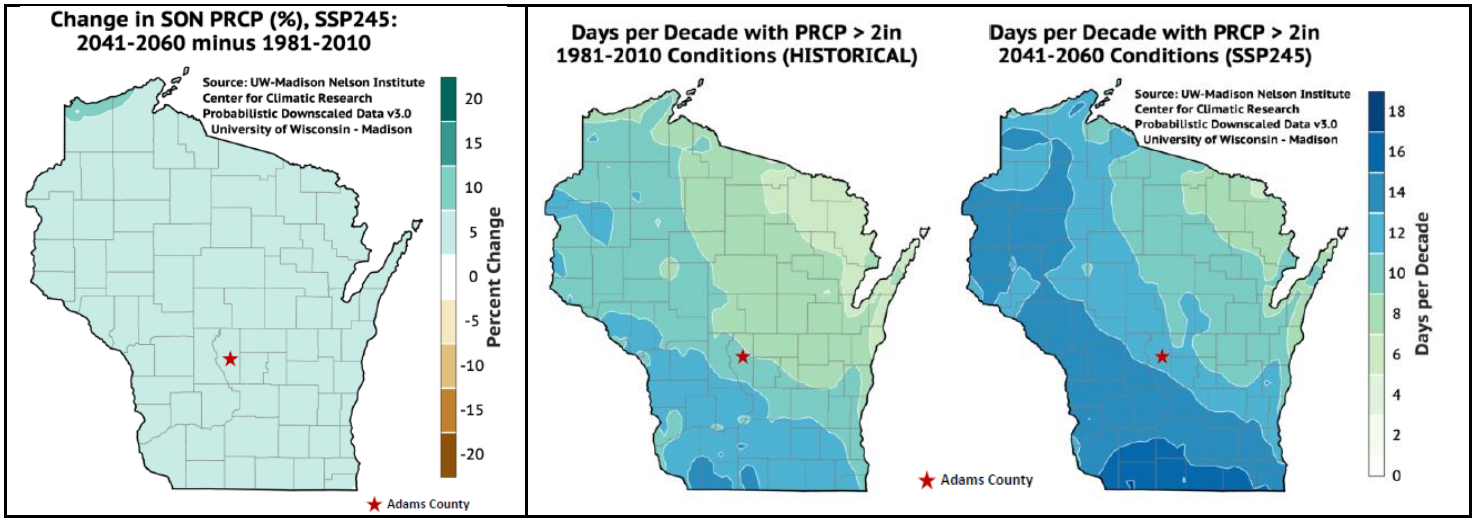


Source: University of Wisconsin-Madison Nelson Institute Center for Climatic Research

Figure 14A shows the projected change in annual precipitation by mid-21st century, compared to recent historical averages. Adams County, like the rest of Wisconsin, is projected to see an approximately 5% increase in annual precipitation. **Figure 14B** shows the historical frequency of extreme rainfall events (>2 inches per day, left) compared to future projections. Adams County is expected to see an increase in extreme rainfall events and is on the border of potentially experiencing slightly more intense rainfall than northcentral and northeastern portions of Wisconsin.

Projected Precipitation Changes

Figure 14A **Figure 14B**



Source: University of Wisconsin-Madison Nelson Institute Center for Climatic Research

2.6 Soils

A. General Soils

The majority of the soils in Adams County result from glacial sandstone deposits, while southeast Adams County has glacial till. **See Maps 5 and 7.** The soil erosion problem areas in Adams County contain annually cultivated glacial sandstone soils that are prone to wind erosion or annually cultivated glacial till soils located on slopes that are prone to water erosion.

Soils are classified based upon physical characteristics between the soils and the topography of the area. The U.S. Natural Resources Conservation Service (NRCS) has grouped Adams County soils into ten associations.

Briggsville-Kewaunee-Poygan: This association occurs in the southeast corner of the County on undulating relief. Soils in this group developed in sandy to clay material and range from well to poorly drained and are **susceptible to water erosion.** The clay soils in this group have slow permeability and have high shrink-swell potential.

Delton-Wyeville-Plainfield: These soils occur on nearly level slopes bordering on the Wisconsin River and its major tributaries. This association is comprised of well-drained, sandy soils developed in old glacial lake deposits and **are susceptible to wind erosion.**

Dickinson-Dakota-Billett: These soils occur on nearly level relief in the south central region of Adams County. They are comprised of well drained, loamy and sandy soils developed over glacial outwash and **are susceptible to wind erosion**.

Fordum-Sturgeon-Dunnville: This association occurs on nearly level to undulating relief. This loamy sand may be found in areas adjacent to the Wisconsin River and is comprised of poorly drained sandy soils **susceptible to wind erosion**.

LaFarge-Urne-Norden: This association is found on rolling relief in the southwestern part of the County along the Wisconsin River. Soils in this association are loess and loamy deposits over sandstone **susceptible to wind erosion**, well drained, and closely associated with sandstone bedrock.

Newson-Meehan-Friendship: This association is found on nearly level relief and is comprised of sandy soils with high water tables and organic soils in depressional areas. These soils are primarily found in the northeast portion of the County and in areas south of the Adams-Friendship community. The soils are **susceptible to wind erosion**.

Plainbo-Boone-Eleva: This association is found on rolling relief in the southern part of the County. Soils in this association are sandy-to-sandy loam, well drained, and closely associated with sandstone bedrock. Soils are **susceptible to wind erosion**.

Plainfield-Friendship-Meehan: This association occurs on nearly level to undulating relief. It is primarily found in the western part of the County and is comprised of well-drained sandy soils (with inclusions of organic soil) and sandy soils with high water tables. **Groundwater contamination and wind erosion** can be a hazard on these soils.

Plainfield-Richford-Friendship: These soils occur on nearly level relief and are confined mainly to the eastern portion of the County. They are comprised of well-drained, loamy and sandy soils **susceptible to wind erosion**.

Plainfield-Wyocena-Okee: These soils are found on undulating to rolling relief in the southeastern part of the County. Soils in this association are sandy to sandy-loam, well drained and stony in places. Because of their sloping relief and sandy nature, these soils are **susceptible to water and wind erosion**.

B. Preventing Wind Erosion on Erodible Soils

Understanding the problem: Wind erosion occurs when high winds sweep away light, sandy soils within Adams County. This can lead to:

- Loss of fertile topsoil.
- Damage to crops due to abrasion from blowing soil.
- Reduced soil productivity and water-holding capacity.

Effective farming practices to prevent wind erosion:

The key to preventing wind erosion is to keep the soil surface covered and protected.

Here are some proven methods:

1. Keep the ground covered:
   - **No-Till and Conservation Tillage:** Minimize or eliminate tillage to leave crop residues on the soil surface, providing a protective barrier against wind. No-till farming, for example, can reduce soil erosion by over 80%.
   - **Cover Crops:** Plant cover crops during the off-season to provide vegetative cover, anchoring the soil with their root systems and reducing the impact of wind and rain. Cereal rye and wheat are popular choices for their ability to establish quickly and grow vigorously in cool conditions.
   - **Residue Management:** Leave crop residues on the field after harvest, especially high-residue crops like wheat, to reduce wind velocity and trap moving soil particles. Avoid using residue movers that detach residues and increase the risk of erosion.
2. Reduce wind speed at the soil surface:
   - **Windbreaks and Shelterbelts:** Plant rows of trees or shrubs around field perimeters or within fields, oriented perpendicular to the prevailing winds, to reduce wind speed at the soil surface. Windbreaks can protect an area downwind up to 10 times their height or more.
   - **Strip Cropping:** Alternate strips of row crops with close-growing crops like hay or small grains across the slope, perpendicular to the prevailing winds, to intercept wind flow and trap soil particles.
3. Increase soil moisture and aggregation:
   - **Irrigation (in specific situations):** Irrigating dry soil surfaces can increase moisture and reduce wind erosion, particularly for high-value crops, but it should be used cautiously as it can also damage soil structure and waste water.
   - **Increase Organic Matter:** Practices like adding manure or incorporating cover crops and crop residues into the soil can improve soil structure and aggregation, making it more resistant to wind erosion. Biochar can enhance soil aggregate stability and organic matter.

Conclusion: By combining the above proven methods, farmers can effectively reduce the risk of wind erosion and protect their valuable soil resources.

C. Manage for Soil Carbon

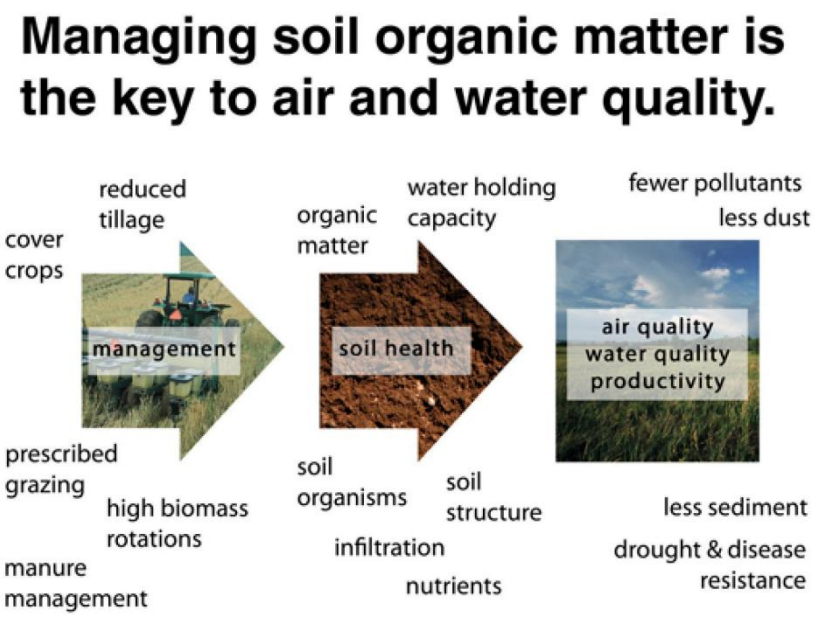
Erosion Control is Not Enough

Soil conservation policy in the United States stems from the devastating erosion events of the 1920s and ’30s. Out of concern for preserving agricultural productivity came the concept of tolerable soil loss and the creation of the "T" factor, which is the maximum annual soil loss that can occur on a particular soil while sustaining long-term agricultural productivity. Conservationists focused on reducing soil loss to T by applying practices, such as terraces, contour strips, grassed waterways, and residue management. (NRCS)

By the end of the twentieth century, concerns about air and water quality became as important as concerns about agricultural productivity. To address these environmental goals and maintain the land’s productive potential, we must now go beyond erosion control and manage for soil health. How soil functions on every inch of a farm, not just in buffers or waterways, affects erosion rates, agricultural productivity, air quality, and water quality. The most practical way to enhance soil health today is to promote better management of soil organic matter or carbon (C). In short, we should go beyond T and manage for C. (NRCS)

Why Focus on Soil Organic Matter?

Many soil properties impact soil health, but organic matter deserves special attention. It affects several critical soil functions, can be manipulated by land management practices, and is important in most agricultural settings across the country. Because organic matter enhances water and nutrient holding capacity and improves soil structure, managing for soil carbon can enhance productivity and environmental quality, and can reduce the severity and costs of natural phenomena, such as drought, flood, and disease. In addition, increasing soil organic matter levels can reduce atmospheric CO2 levels that contribute to climate change. (NRCS)



2.7 Mineral Resources

There are a number of clay, top soil, rock, sand, and other aggregate mines throughout the county that are often referred to as pits or quarries. Sites are currently producing unconsolidated material such as sand or gravel. Rock and sand deposits are mostly mined in the area of the Town of Rome. Meanwhile, gravel pits may be found in a variety of locations in the County.

Metallic Minerals

Metallic mineral deposits are defined as naturally occurring, local concentrations of metal-bearing minerals.

The majority of Adams County contains no useful deposits of metallic mineral ore since these deposits are generally associated with Precambrian bedrock (most of Adams County is Cambrian sandstone). There is, however, a small "pocket" of Precambrian Quartzite bedrock in the eastern edge of the Town of Rome near Lake Camelot. This site could potentially yield iron ore.

Sand

Sand mining has occurred in Wisconsin for more than 100 years. Fracking has been used by our domestic oil and gas industry for the past 75 years. Recently, the development of new horizontal drilling technology using hydraulic fracturing has made possible production of previously unrecoverable natural gas resources in the eastern, western, and southwestern United States. See **Figure 15** for the extent of frac sand deposits in Wisconsin.

Wisconsin's sands, especially from the bedrock of western and central Wisconsin, have all the right characteristics in addition to being near the surface and easy to mine.

Glaciation in Wisconsin led to the deposition of sand as melting and glacial retreat occurred, but those sands are too impure to make frac sand. The frac sand industry in Wisconsin involves removal of the sand and processing it. The map in **Figure 15** shows where sandstone formations are located.

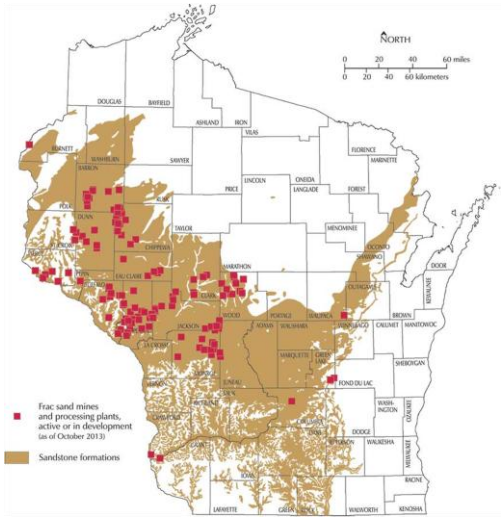
Sand in Adams County is suitable for a variety of uses including frac sand, foundry sand, glass sand, bedding sand, filter sand or aggregate (gravel and sand) for roads and other types of construction, and other types of uses.

Frac Sand

A type of sand perfect for fracking. Characteristics of frac sand include: spherical shape, high silica (quartz) content, hardness (can withstand high pressure), uniform particle shape and size.

Source: UWSP CLUE.

Figure 15 Frac Sand in Wisconsin

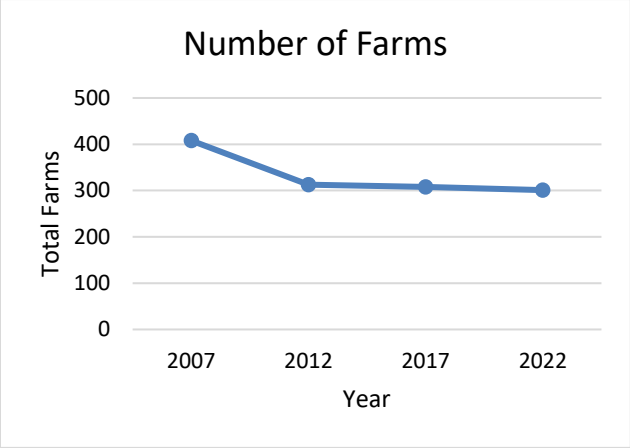


Source: WGNHS, 2014.

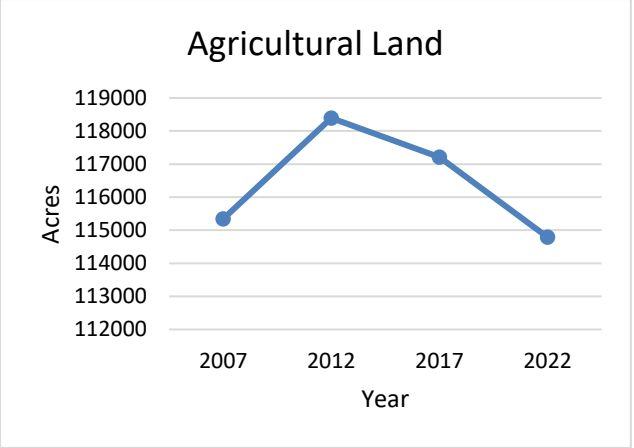
2.8 Agriculture

According to the 2022 USDA Census of Agriculture there was a 41.2% decrease in agricultural land since 2007 in Adams County. **Figure 16** shows the changes in the number of farms from 408 farms (2007), to 301 (2022). **Figure 16** shows that the amount of agricultural land spiked in 2012 to 118,393 acres, then gradually declined to just under the 2007 acreage in farming.

Figure 16: Number of Farms and Agricultural Land in Adams County



Source: Census of Agriculture 2007-2022



Source: Census of Agriculture 2007-2022

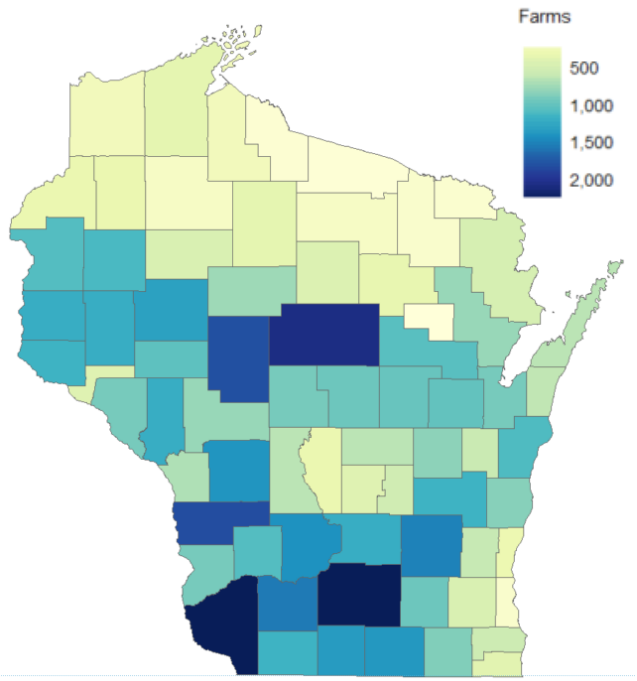
The 2022 Census of Agriculture highlighted the continuation of many historical and national trends for the Wisconsin farming economy. Many operators continued to exit, and this happened rapidly among Wisconsin dairy farms. At the same time, the farms that remained were increasing in size, as both the share and number of farms producing over $500,000 in annual revenue increased since 2017. Still, smaller farms (those with sales under $100,000) accounted for the majority of all Wisconsin farms. See **Figures 17 & 18**. (Windicators, UW-Extension, Vol.7, Issues1, 2024)

Most agricultural production in Adams County consists of vegetables, melons, potatoes, and sweet potatoes. About 47% of farms practice reduced or no till, and 22% grow cover crops. per the 2022 Ag Census.

<u>Nutrient Management Plans</u>

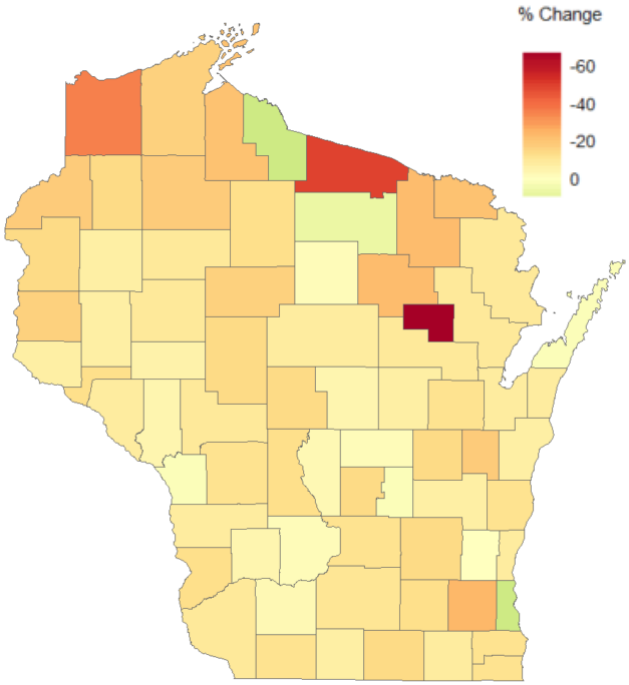
According to the DATCP 2024 Nutrient Management Program Annual Report, 58% of cropland acres in Adams County (45,739 acres) have a nutrient management plan that reflects the NRCS 590 NM standard.

Figure 17: Number of Farms by County, 2022



Source: UW-Madison Extension

Figure 18: Percent Change in Number of Farms, 1997-2022



Source: UW-Madison Extension

A. Soil Erosion from Cropland

Croplands are located in most towns throughout Adams County. The main concern regarding cropland erosion is from wind erosion. Soil erosion from farmland is estimated in tons per acre per year. The RUSLE2 modeling program is used to estimate the soil loss based on land cover, soil type, and run off intensity. Soils are classified at T1, T2, etc. T1 is a low level of erosion and is described as 1 ton of soil/acre/year.

Adams County's 83,000 cropland acres with average soil losses from row crops at 2 to 3 tons per acre means each year the county loses about 160,000 to 240,000 tons of soil. Pollutants attached to soil particles, such as phosphorus, are a major reason for the surface waters being listed as impaired waters by DNR.

A key strategy to reduce soil erosion is for agricultural operations to develop a nutrient management plan and also participate within Adams County Farmland Preservation Program. The LWCD takes an educational and technical approach to achieve soil erosion control standards in Adams County. Agricultural acres located in a health hazard area due to the vicinity of erosion control areas will work with the LWCD, along with the Central Wisconsin Windshed Partnership, and provide a plan for prevention. This plan may include a variety of prevention control measures including; irrigation schedules, windbreak implementation, or cover crop timing.

B. Cranberry Farm Nutrient Management

Cranberry bogs are located mainly in the NE portion of the County within the Town of Leola. There is concern about nutrients applied to cranberry bogs, because flooded bogs may drain directly to surface waters. All cranberry bogs in Adams County operate as a closed-loop system through the use of recovery ponds that capture and reuse water. All of the cranberry bogs in Adams County have nutrient management plans.

Wet harvesting begins the night before the harvest. The grower floods the dry bog with up to eighteen inches of water. The next day, water reels, nicknamed "egg beaters" are used to stir up water in the bogs. The cranberries are loosened from the vines and float to the surface of the water. They are corralled and loaded into trucks. The berries are then delivered to a central receiving station where they undergo a thorough sorting process. After the bog is harvested, the water is pumped to another bog, and the process starts over again.

An on-site study within an Adams County bog has shown that the reservoirs this one bog used for water control came into the cranberry operation with high levels of nitrates and left the system with significantly lower levels just through the biological process, which leads to less nitrates reaching surrounding surface and groundwater.

All Wisconsin farmers are required, by NR 151 agricultural performance standards and prohibitions, to have a nutrient management plan in place that meets the NRCS Nutrient Management Conservation Practice Standard (the so-called “590 Standard”) for fields they apply nutrients to. The NRCS guidelines for cranberry nutrient management are included within Wisconsin Conservation Planning Technical Note WI-1, which is a companion document to the 590 Standard. See **Attachment B** for this document.

2.9 Forestry

Adams County boasts a significant forest cover, encompassing roughly 58% of its total land area, making it #21 among Wisconsin counties in terms of forested land percentage. In 2020, Adams County created the 30th county forest in Wisconsin with 140 acres. In 2025, there are now 740 acres in the Adams County Forest. See **Map 1– Generalized Existing Land Use**, and **Map 2 – Public Access Lands**.

The overall forest cover in Adams County includes a mix of oak, aspen and pine, reflecting the Central Sands ecological landscape it occupies. A minor portion is maple-basswood forest and lowland hardwood. Conifer swamps occupy a significant portion of the wetlands. Timber management is focused on pulp production, giving rise to an abundance of pine plantations.

As of 2025 there are about 80 acres enrolled under the **Forest Crop Law (FCL)** in Adams County, which are open to the public to hunt and fish.

As of 2025 there are about 91,600 acres enrolled in the **Managed Forest Law (MFL)** program in Adams County. Of that MFL acreage, there are about 17,627 acres designated “open” to the public for hunting (not trapping), fishing, hiking, sightseeing, and cross-country skiing only (s. 77.83(2)(a), Wis. Stats.).

A. Soil Erosion from Woodlands

The primary concern in protecting soil is to make sure areas where soil is exposed are covered as soon as possible. Timber harvests may require either temporary or permanent road construction, which exposes areas to soil erosion.

The Department of Natural Resources (DNR) manages a group forest certification program for non-industrial forestland enrolled in the Managed Forest Law (MFL). The MFL Certified Group is dually certified under American Tree Farm System® (ATFS), a program of the American Forest Foundation, and Forest Stewardship Council® (FSC). These certifications promote sustainable forest management through required adherence to Wisconsin's Forestry Best Management Practices.

B. Terrestrial Invasive Species

Invasive plants can cause significant negative impacts to the forest. Invasive species can displace native plants and hinder the forest regeneration efforts. Preventing them from dominating habitats is critical to the long-term health of the forest. There are a number of invasive plant species in varying densities on the County Forest. Some warrant immediate and continual treatment efforts while others may be allowed to remain due to extent and financial ability to control them. The County will continue to train staff in invasive species identification as well as attempt to secure funding sources to control them as much as is practical. Invasive plants on the forest should be documented as well as potential response to new infestations. (Adams County 15-year County Forest Plan)

C. Climate Adaption in Forestry (WI 2020 Statewide Forest Action Plan)

Climate change is and will continue to be one of the most critical factors affecting Wisconsin's forests. Adapting Wisconsin's forests to climate change will be critical. Forests are a natural way for carbon mitigation and Wisconsin has a high potential for both mitigation and adaptation actions due to its larger forested areas.

Climate change refers to the observable and predictable changes in the Earth system processes that affect Earth's climate due the relationships among greenhouse gas emissions and atmospheric concentrations of these gases. Greenhouse gases cause an imbalance of heat trapped by the atmosphere compared to an equilibrium state (Melillo, Richmond, & Yohe, 2014).

One of the most common and known greenhouse gases is carbon dioxide (CO_2), which is removed from the atmosphere by natural processes at a rate that is roughly half of the current rate of emissions from natural and human activities. Therefore, mitigation efforts that only stabilize global emissions will not reduce atmospheric concentrations of carbon dioxide but will only limit their rate of increase.

In the U.S., sources of carbon have been relatively stable over the last two decades, while sinks have been more variable. Studies have shown that there is a large land-use carbon sink in the United States (Birdsey, Pregitzer, & Lucier, 2006; Pacala et al., 2007; USDA, 2011). Many publications attribute this sink to forest re-growth, and the sink is projected to decline as a result of forest aging (Pan et al., 2011; Williams, Collatz, Masek, & Goward, 2012; Zhang et al., 2012; Zheng, Heath, Ducey, & Smith, 2011) and factors like drought, fire and insect infestations reducing the carbon sink of these regions.

Wisconsin's climate is changing, and forests will respond to these changes in a variety of ways. Some of which include:

- Currently, Wisconsin already receives about 2 inches more annual precipitation than in the earlier 1900s and the projection is to continue to increase by another 1 to 3 inches by the end of the century. Most of

the increases will be concentrated in spring and winter and from heavier rainfall events, which have impacts on soil moisture, depth of snowpack, frozen ground duration, flooding, and surface runoff.

- Wisconsin's growing season has already increased by almost two weeks over the past 70 years and this trend is expected to continue by 14 to 49 days by the end of the century. A longer growing season has both advantages and disadvantages depending on the species and if the trees acquire the additional water and nutrients needed. Earlier warm temperatures will lead to trees breaking dormancy sooner, creating a greater risk for frost damage. Due to these changes, some forest types could have their ranges expand or contract. Central Hardwoods may expand their range, although it is uncertain how this forest type will be affected by much wetter or much drier conditions. Boreal species are at risk due to warmer winter temperatures and possible late summer droughts. White-tailed deer are expected to benefit from warmer winters and reduced snow depth, which can result in greater impacts on forests across Wisconsin. Heavy browsing of some species that are anticipated to gain suitable habitat with warmer temperatures, such as sugar maple, white oak, and northern red oak, can limit their actual ability to increase on the landscape. While other species that are not browsed so heavily, such as ironwood and black cherry or invasive species, like buckthorn or Japanese barberry, can be favored. Jack pine could be resilient because it's adapted to extremely dry sandy sites and not so dependent on climate. Conifer lowlands are vulnerable due to sensitivity to changes in water tables and snow cover. Urban forests can respond well if cities replant with species suited to warmer temperatures.
- Wildfires are expected to increase in both frequency and intensity and therefore burn more acres, particularly in boreal and temperate conifer forests. However, more wildfire could be beneficial for some forest types, such as jack pine and other fire-dependent systems.

2.10 Terrestrial Invasive Species

Invasive non-native plants can alter and even destroy habitat critical to the survival of native flora and fauna that have evolved together over time to be dependent on one another. Some species can cause harm to human health, or damage the economic value of landscapes and natural communities.

Adams County Land & Water Conservation Department (LWCD) works in partnership with the Central Wisconsin Invasives Partnership, Cooperative Invasive Species Management Area (CWIP CISMA) to identify, map and control terrestrial invasive species (TIS) and to educate the public about them. TIS awareness by the public in Adams County lags behind awareness of aquatic invasive species in Adams County lakes and rivers. Meanwhile many of the common invasives such as common tansy, non-native thistles, and the knapweeds are being spread from gravel pits along most town and county roads during roadwork. Mowing and utility installation activities in the right-of-way (ROW) then spread their seeds across the county as well as other TIS including garden valerian, dames rocket, reed canary grass, leafy and Cypress spurges, crown vetch, garlic mustard, and white bedstraw.

Gardeners are also planting and spreading invasive species such as woodland forget-me-not, non-native lupine, garden yellow loosestrife, moneywort, Japanese knotweed, Bishop's goutweed, and creeping bellflower amongst others. As the population of Adams County grows, more opportunities for the introduction of non-

native species occurs. The species of most concern are those listed as Prohibited and Restricted under the state invasive species rule NR 40.

Because the invasions are so slow across the county, or some of the species were planted intentionally before knowledge of their damaging effects were know (especially landscaping shrubs like Eurasian honeysuckles, Buckthorns, Japanese barberry and Japanese knotweed) public awareness is limited. Most landowners and road managers are not knowledgeable about plants, let alone TIS, so interest in this issue is limited. In Wisconsin, funding for education, mapping, and management of TIS is limited compared to AIS so less time and effort are available to increase public awareness and concern about the impact of TIS on natural communities.

Additional threats to forest communities in Adams County come from invasive pests. According to monitoring by DNR both Oak Wilt and Emerald Ash Borer are attacking forest lands in Adams County. Loss of ash species are affecting urban trees in the City of Adams and Village of Friendship, requiring removal and possible replacement of urban trees. Ecologically, the more significant effects will be the loss of black ash in forested wetlands across the county. This will diminish the amount of forested deciduous wetlands and bird habitat if other wetland tree species are not planted. Oak wilt is significantly changing community composition on public forest lands, private industrial lands, and private non-industrial lands. Oak are significant keystone species that provide significant pollinator habitat, bird and wildlife habitat and food resources. Unfortunately, the red oak group are more susceptible to oak wilt than the white oak group. Other communities are looking to replace red oaks with less susceptible species like burr oak to try and maintain some oak species in the forest communities. Education is needed to make sure the public and local road crews limit cutting/mowing/trimming of oak species to the time of year less likely to encourage the spread of oak wilt, which is August through March.

2.11 Watersheds

Hydrologic unit codes (HUCs) provide a hierarchical, numeric code that uniquely identifies hydrologic units or watershed boundaries. There are six HUC levels: 2-digit (region of USA), 4-digit (subregion of USA), 6-digit (accounting unit), 8-digit (sub-basin), 10-digit (watershed), and 12-digit (sub-watershed).

HUCs provide a common geographic area for counties to: 1) focus and track Land & Water Resource Management Plan implementation efforts, 2) submit grant applications, 3) develop and implement 9 Key Element plans, 4) work to restore impaired waters, and 5) coordinate with DNR to complete water quality monitoring.

There are 9 watersheds (HUC 10s) contained completely or partially within Adams County as shown on **Map 3 – Watersheds**. The majority of Adams County drains into the Wisconsin River. A small area in the southeastern part of the County drains into Lake Michigan.

2.12 Groundwater

Groundwater is the primary source of drinking water and irrigation water in Adams County. Groundwater quality is generally good in Adams County.

Coarse-textured soils, such as sand, allow water to infiltrate very quickly. Sandy soils, which is much of Adams County, don't generate nearly as much runoff as fine-textured soils, such as clay. Sandy soils also don't provide as much protection to the groundwater as clay and silt soil types.

According to the Adams County Soil Survey report, most groundwater is obtained from glacial deposits or Upper Cambrian sandstone aquifers. Well yields in sandy outwash plains is more than 1,000 gallons per minute in the northern part of the county, and slightly less in the southern part. Wells in the sandstone bedrock yield 100 to 500 gallons per minute. (Soil Survey)

Most groundwater in Adams County is soft, ranging from 0 to 60 milligrams of dissolved solids per liter. Areas within the Johnstown moraine have moderately hard water of 61 to 120 milligrams per liter. To the east of the moraine, the water is hard, ranging from 121 to 180 milligrams per liter. (Soil Survey)

A. Susceptibility of Groundwater to Contaminants

The groundwater quality in Adams County is generally good, however most of the County is susceptible to groundwater contamination due to the predominance of sandy soils, which has resulted in some concentrated areas of high nitrate contamination in the County.

"Susceptibility of Groundwater to Pollutants" is defined here as the ease with which a contaminant can be transported from the land surface to the top of the groundwater called the "water table." Many materials that overlie the groundwater offer good protection from contaminants that might be transported by infiltrating waters. The amount of protection offered by the overlying material varies, however, depending on the materials. Thus, in some areas, the overlying soil and bedrock materials allow contaminants to reach the groundwater more easily than in other areas of the state.

In order to identify areas sensitive to contamination, the Wisconsin Department of Natural Resources, in cooperation with the University of Wisconsin-Extension, Wisconsin Geological and Natural History Survey and the USGS, have evaluated the physical resource characteristics that influence this sensitivity.

Five physical resource characteristics were identified as important in determining how easily a contaminant can be carried through overlying materials to the groundwater.
These characteristics are:

1. depth to bedrock,
2. type of bedrock,
3. soil characteristics,
4. depth to water table; and
5. characteristics of surficial deposits.

The resulting map shows that most of Adams County is in the upper third of "more susceptible" to groundwater contamination, but parts of the Towns of New Haven and Jackson are "less susceptible" based upon soil characteristics, surficial deposits, depth to water table, depth to bedrock, and type of bedrock. See **Map 6– Groundwater Contamination Susceptibility.**

Many land use activities have the potential to impact the quality of groundwater. Gasoline may leak from an underground storage tank into groundwater. Fertilizers and pesticides can seep into the ground from application on farm fields, golf courses, or lawns. Leaking fluids from cars in junkyards, intentional dumping or accidental spills of paint, used motor oil, or other chemicals on the ground can result in contaminated groundwater.

B. Drinking Water Test Results

Safe drinking water is something that many people commonly take for granted. Adams County residents within the Rome Water Utility, the City of Adams, the Village of Friendship, and federal correctional institution in New Chester get their water from municipal wells. Most other residents in Adams County draw their water supply from private wells. In the past 5 years (2020-2024), 695 households in Adams County tested their well water through the UW-Stevens Point Environmental Task Force Lab. Please note that the following information represents averages for samples received in a 5-year period.

Bacteria

From 2020 through 2024, 12% of the water sampled had evidence of coliform bacteria. Coliform bacteria are microorganisms commonly found in surface water and soil. Coliform bacteria usually do not cause disease; however, its presence indicates the potential for other harmful pathogenic (disease causing) organisms may be contaminating the water. The presence of E. coli is rare, but its presence is evidence that human and/or animal fecal waste are contaminating the water. When E. coli is present there is a significant risk of gastrointestinal diseases, many of which can be severe, particularly to immune compromised individuals. From 2020 through 2024, 1% of wells in Adams County detected E. coli bacteria.

Nitrate

From 2020 through 2024, 17% of the water samples had nitrate levels above the Federal Drinking Water Standard (10mg/L). Levels that are above the naturally occurring level usually indicate contamination from fertilizer, septic system effluent, animal wastes, and landfills. Adams County appears not as good as the statewide average; as it is estimated that 9% of private wells statewide are above the 10mg/L drinking water standard. **Figure 19** is the Nitrate Statistics Report.

See **Figure 20** for a map of private well areas with high nitrates in Adams County as of 2025.

Figure 19: Nitrate Statistics Report

NITRATE (mg/l as N)

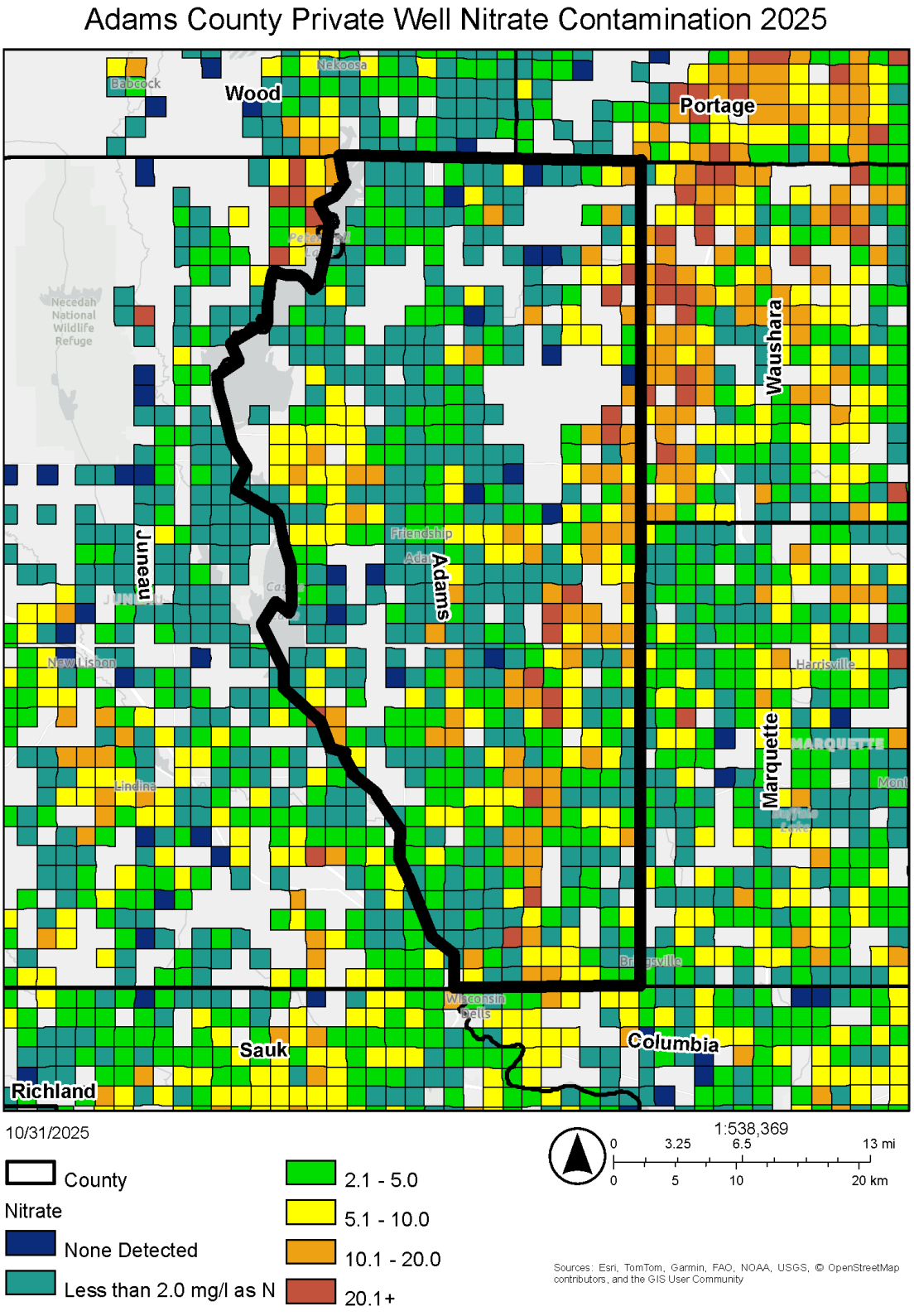
Adams County

Report By Geography

Range	Sample	Percent Total	Summary
None Detected	1,465	19%	Minimum: 0.00
Less than 2.0 mg/l as N	3,116	41%	
2.1 - 5.0	1,258	17 %	Median: 1.18
5.1 - 10.0	724	10%	Average: 4.17
10.1 - 20.0	573	8 %	
20.1+	407	5 %	Maximum: 85.00
Total Samples	7,543		
> 10mg/l N	980	13 %	Exceeds Health Standard

Zoom To Pan To Print Close

Figure 20


Adams County Private Well Nitrate Contamination 2025
Wood
Portage
Waushara
Juneau
Adams
Marquette
Sauk
Columbia
Richland
Babcock
Nekoosa
Necedah National Wildlife Refuge
Friendship
New Lisbon
Harrisville
MARQUETTE
Lindina
Wisconsin Dells
10/31/2025
County
Nitrate
None Detected
Less than 2.0 mg/l as N
2.1 - 5.0
5.1 - 10.0
10.1 - 20.0
20.1+
1:538,369
0 3.25 6.5 13 mi
0 5 10 20 km
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

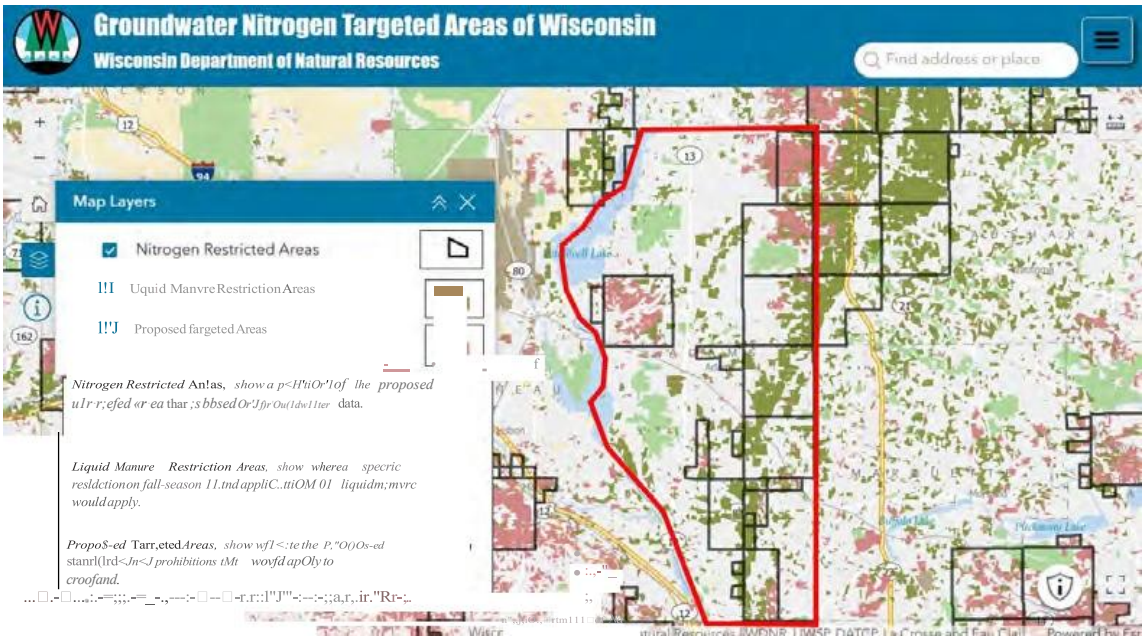
Chloride

From 2020 through 2024, 40% of the water sampled had chloride levels above the naturally occurring range. There is no health standard for this contaminant. Chloride at levels greater than 10 mg/L (the natural level) usually indicate contamination by onsite wastewater treatment systems (including water softener regeneration), road salt, fertilizer, animal waste, or other wastes. Chloride is not toxic in concentrations typically found in groundwater, but some people can detect a salty taste at 250 mg/L (9% of samples tested above 200 mg/L). Levels of chloride that are above what is typical under natural conditions indicate that groundwater is being affected by human activities, and extra care should be taken to ensure that land use activities do not further degrade water quality.

DNR's Proposed Targeted Standard for Nitrate and N Restricted Areas

In 2020 and 2021, the DNR began working on revising the NR151 administrative rule to include a targeted performance standard aimed at reducing nitrate in groundwater in areas of the state that are susceptible to groundwater contamination. The update rule was not approved by legislature, but information and maps that were produced are helpful for prioritizing areas for groundwater protection efforts in Adams County (**Figure 21**).

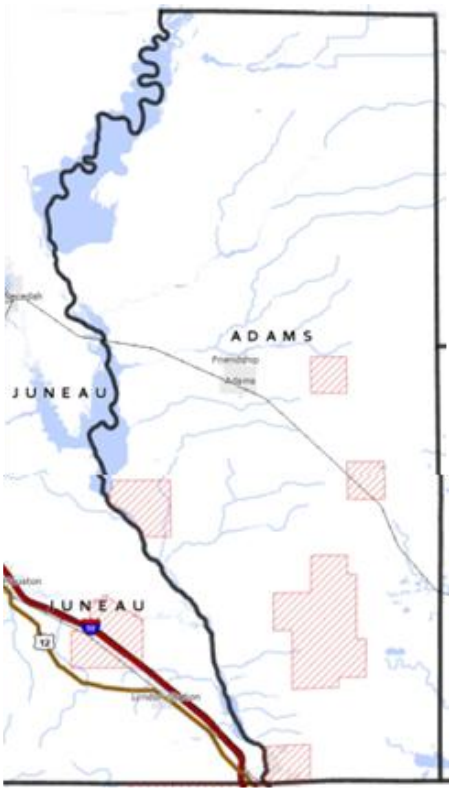
Figure 21



Atrazine

From 2020 through 2024, 6% of the water sampled had 0.3ppb atrazine in them. Some wells in the county have tested above the state standard for atrazine levels. To help reduce the levels of atrazine in groundwater, Atrazine Prohibition Areas are identified in Adams County (see **Figure 22**) where ***no atrazine*** may be applied to the land. For more detailed maps of the prohibition areas see ATCP 30.

Figure 22 Atrazine Prohibition Areas



Source: DATCP Viewer

C. Municipal Wellhead Protection Plans and Ordinances

- 2 of 4 municipal water systems serving Adams County have a wellhead protection plan: Adams and Rome.
- 1 of 4 municipal water systems serving Adams County have a wellhead protection ordinance: Adams.

Wellhead protection plans are developed to achieve groundwater pollution prevention measures within public water supply wellhead areas. A wellhead protection plan uses public involvement to delineate the wellhead protection area, inventory potential groundwater contamination sources, and manage the wellhead protection area. All new municipal wells are required to have a wellhead protection plan. A wellhead protection ordinance is a zoning ordinance that implements the wellhead protection plan by controlling land uses in the wellhead protection area.

Of those municipal water systems that have wellhead protection (WHP) plans, some have a WHP plan for all of their wells, while others only have a plan for one or some of their wells. Similarly, of those municipal water systems that have WHP ordinances, some ordinances apply to all of their wells and others just one or some of their wells.

D. Landfills

In Adams County there is 1 licensed landfill (Adams County Landfill and Recycling Center, 1420 STH 21, Strongs Prairie).

Open landfills do not mean that environmental contamination has occurred, is occurring, or will occur in the future. DNR requires a 1,200-foot buffer away from landfills where no wells are allowed.

E. Contaminated Sites

Adams County hosts a hazardous waste collection every other year, typically in May, with a Clean Sweep grant from DATCP. Waupaca County takes out-of-county household hazardous waste from May-October of each year.

The DNR Internet database known as the **Bureau of Remediation and Redevelopment Tracking System (BRRTS)** provides information about contaminated properties and other activities related to the investigation and cleanup of contaminated soil or groundwater in Wisconsin.

ERP sites are sites other than LUSTs that have contaminated soil and/or groundwater.
AC sites had abandoned containers on them.
LUST site has contaminated soil and/or groundwater with petroleum, which includes toxic and cancer causing substances.
Spills are a discharge of a hazardous substance that may adversely impact, or threaten to impact public health, welfare or the environment.

The BRRTS listing showed 29 *closed* ERPs, 4 *closed* ACs, 70 *closed* LUSTs, and 240 *closed/ historical* Spills. A "*closed*" site means that the DNR has approved the final clean-up of that site, and now it is available for re-use or continued use. A “historical” spill refers to a spill that occurred between 1978 and 1996, prior to the establishment of a formal closure process

The BRRTS listing showed 1 *open* ERP, 1 *open* AC, 1 *open* LUST, and no *open* Spills. Sites listed as "*open*" still need remediation before being reused.

F. PFAS – Perfluoroalkyl and Polyfluoroalkyl Substances

Perfluoroalkyl and polyfluoroalkyl substances (PFAS) are a large group of human-made chemicals that have been used in industry and consumer products worldwide since the 1950s.

The following municipal water systems are in Adams County: Rome Water Utility, Adams Waterworks, Friendship Waterworks, and federal correctional institution in New Chester (FCI Oxford). Castle Rock and Petenwell Flowages both have PFAS-based fish consumption advisories in Adams County.

<u>PFAS Sampling Results for Municipal Water Systems in Adams County</u>

Rome Waterworks – PFAS detected below hazard index in one or more samples from the water system.

Adams Waterworks – PFAS above the WI DHS health advisory level in one or more samples from the system.

> ***Note:*** *The City of Adams has decided to continue to operate Well #4 [elevated PFAS levels] in a reduced capacity, while Well #5 that has had No PFAS detection will operate in an increased capacity. The City is currently working with an engineering firm to design a treatment facility for a more permanent solution.*

Friendship Waterworks – Friendship buys bulk water from the Adams Waterworks for distribution.

FCI Oxford – No PFAS test results found.

2.13 Surface Water

Adams County has a high level of tourism, recreation, and seasonal housing resulting from people being drawn to mainly the waters of Castle Rock and Petenwell Lakes, the Tri-Lakes area in Rome, and 17 other inland-lakes with public access. See **Map 1 – Generalized Existing Land Use** for the general distribution of lakes and rivers, and **Map 3 – Watersheds**.

Total surface water in Adams County exceeds 26,000 acres. Thirty-two named lakes are located within the county, although they don't all have public access. Many of the lakes have been heavily developed over the years for recreational purposes. In addition, there are 30 unnamed lakes located in the county. About 73 streams stretch 235 linear miles and cover 450 surface acres. Three drainage districts cover about 28,340 acres, and contain about 17 ditches (about 44 linear miles).

As of 2025, 21 of the 22 lakes (all except Deep Lake) with public access have approved lake management plans. Since 2004, volunteers have monitored the lakes using the Citizen Lake Monitoring Program and recorded their data in the SWIMS database. Since 2007, thirty streams also have active volunteers monitoring water quality.

As of 2025, 22 lakes in Adams County have either a lake association or lake district. Lake associations can form without any formal requirements, although many incorporate under Chapter 181 of the Wisconsin Statutes to be eligible for state cost sharing grants. The focus of many of the lake associations is to provide lake education and information to its members. Lake districts are governmental bodies with elected or appointed leaders and annual budgets funded from tax levies or special assessments. Lake districts also have some capabilities to regulate lake use, such as local boating ordinances and sewage management. Many of these groups (lake associations and districts) have initiated comprehensive lake management efforts, volunteer AIS protection efforts, and volunteer water quality monitoring programs. Several organizations are also participating in lake management studies funded through the DNR Lake Planning Grant program.

A. Wetlands

Wetlands perform many undervalued roles in the proper function of the hydrologic cycle and local ecological systems. In terms of hazard mitigation, they act as water storage devices in times of high water. Like sponges, wetlands are able to absorb excess water and release it back into the watershed slowly, preventing flooding and minimizing flood damage. As more impermeable surfaces are developed, this water runoff storage becomes increasingly important.

Plants and soils in wetlands have the capacity to store and filter pollutants ranging from pesticides to animal wastes. Calm wetland waters, with their flat surface and flow characteristics, allow particles of toxins and nutrients to settle out of the water column. Plants take up certain nutrients from the water. Other substances can be stored or transformed to a less toxic state within wetlands. As a result, the lakes, rivers and streams are cleaner.

Wetlands that filter or store sediments or nutrients for extended periods may undergo fundamental changes. Sediments will eventually fill in wetlands and nutrients will eventually modify the vegetation. Such changes may result in the loss of this function over time. Eradication of wetlands can occur through the use of fill material. This can destroy the hydrological function of the site and open the area to improper development. The DNR has promulgated minimum standards for managing wetlands.

Wetlands contribute both directly and indirectly to the economic base of Adams County, most especially through the health of the rivers and lakes. When wetlands are damaged or destroyed, these ecological functions are lost. To restore or replace these functions is incredibly expensive and not always effective. Per unit area, wetlands contribute more ecological services than their area predicts.

See **Map 1 – Generalized Existing Land Use** for the location of wetlands in Adams County.
See **Map 2 – Public Access Lands** for large land holdings that are permanently protecting wetlands.

B. Outstanding and Exceptional Resource Waters

The DNR has given special designations to water resources throughout the State of Wisconsin that have the highest water quality and fisheries in the State and therefore deserve special protection. Outstanding Resource Waters (ORWs) and Exceptional Resource Waters (ERWs) share many of the same environmental and ecological characteristics. The primary difference between the two is that ORWs typically do not have any direct point sources discharging pollutants directly to the water. In addition, any pollutant load discharged to an ORW must meet background water quality at all times. Exceptions are made for certain types of discharge situations to ERWs to allow pollutant loads that are greater than background water quality when human health would otherwise be compromised. See **Map 4–Designated Waters** for all the ORWs and ERWs countywide.

Outstanding resource waters (ORW) in Adams County include 2 creeks.

Exceptional resource waters (ERW) in Adams County include 12 creeks.

C. Impaired Waters – 303(d) Waters

Section 303(d) of the federal Clean Water Act requires states to develop a list of impaired waters, commonly referred to as the "303(d) list." A water body is considered impaired if a) the current water quality does not meet the numeric or narrative criteria in a water quality standard or b) the designated use that is described in Wisconsin Administrative Code is not being achieved. A documented methodology is used to articulate the approach used to list waters in Wisconsin. Every two years, states are required to submit a list of impaired waters to EPA for approval. See **Map 4–Designated Waters** for all the 2025 *impaired waters* countywide. See a list of these waters in **Attachment C**.

As of 2025, there are 7 impaired waterbodies [303(d) listed] in Adams County, which is up from 5 in 2014. Petenwell and Castle Rock Lakes have been on the impaired waters list since 1998 due to mercury and PCBs, and now total phosphorus. Mason Lake was placed on the list in 2002, but was removed sometime before 2024. Lakes Arrowhead, Sherwood, and Friendship were newly listed in 2014 due to total phosphorus, but Friendship Lake was removed sometime before 2024. Big Roche A Cri Creek was added in 2018 due to elevated water temperature. Easton Lake was newly listed in 2024 due to total phosphorus.

Mercury in lakes comes from atmospheric deposition of exhaust from coal fired power plants.
PCBs in waterbodies comes from a paper coating that made carbonless copy paper.
PFAS in waterbodies comes mainly from 1) a paper coating for food packaging to become grease and water resistant, and 2) firefighting foam.

C.1 Phosphorus Impairment

About 7 waterbodies are impaired in 2024 due to total phosphorus levels, which is down from 8 waterbodies in 2015. **Map 4 – Designated Waters** shows where the impaired waters are in the County.

A leading cause of phosphorus pollution in Adams County lakes is from "nonpoint" sources. A “point” source would come out of a pipe, like from a factory or water treatment plant. Such nonpoint source pollution occurs when rains and melting snow wash over and through the ground transporting sediment and nutrient pollutants to nearby surface waters or into groundwater. Runoff from farms, feedlots, fertilized lawns, building roofs, and streets & parking areas; failing septic systems, and decomposing natural sources like leaves, needles, and vegetation, are all sources of phosphorus entering rivers and lakes in Adams County.

- **Mason Lake Data**

  Mason Lake has high levels of Total Phosphorus due to non-point sources within that lake’s basin. The creeks, along with Mason Lake itself, were placed on the 303(d) list of impaired waterways in 2002 due to five recognized problems: (1) high sedimentation; (2) high nuisance-level aquatic plant growth; (3) high phosphorus levels; (4) heavy algal growth; and (5) degraded habitat. The Mason Lake watershed is located within the US EPA approved (2020) Upper Fox Wolf River TMDL basin and has a 79% TP and TSS reduction target for nonpoint sources (**Figures 41, 42, & 43**).

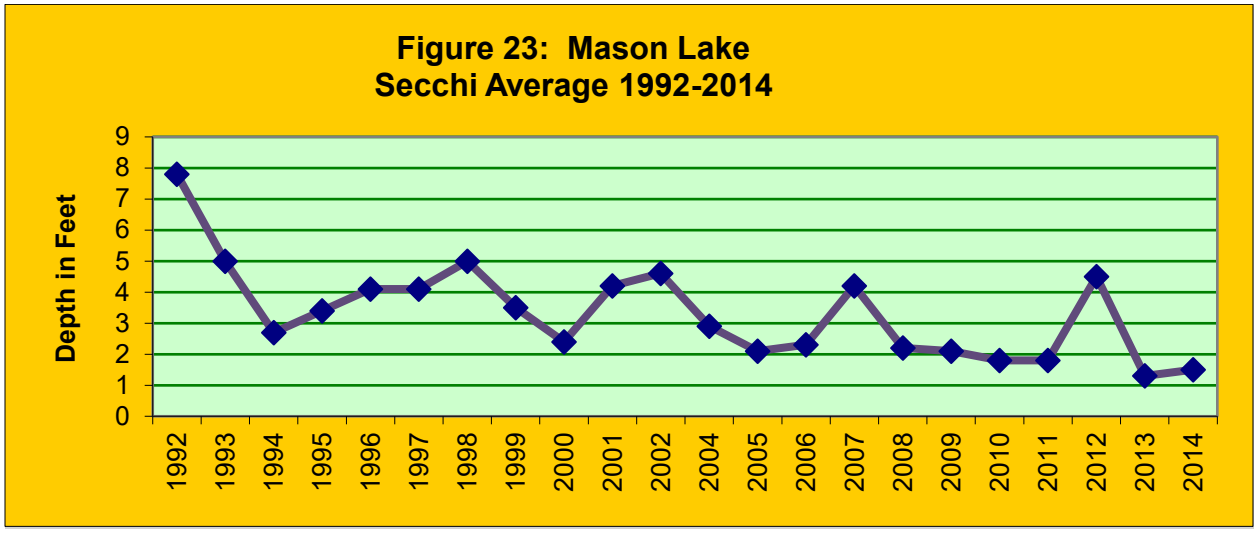
  The Mason Lake watershed was part of the Neenah Creek Priority Watershed Program from 1992 through 2002. Certain goals and projects were identified by that plan, published in 1992, although not all were achieved. A Targeted Runoff Management Grant was awarded to Adams County Land & Water Conservation Department for 2004 for the Mason Lake Management Plan. Currently the Mason Lake District and Neenah Creek Watershed have been identified as an area which needs to have a “Social and Ecological Resource Assessment” plan developed to consider addressing the water quality issues that still persist in the watershed. Adams County is considering hiring the University of Wisconsin Stevens-Point to conduct the assessment with the intentions of following up with water quality sampling if the entire watershed is interested in addressing the water quality issues. A plan for addressing non-point source pollution entering Mason Lake will need to be identified to meet the water quality standard desired by the Adams County LWCD and the DNR.

  Mason Lake is located in the Town of New Haven, Adams County, WI, in the Town of Douglas, Marquette County, and in the Town of Lewiston, Columbia County, in the south central part of Wisconsin. The largest part of the impoundment lies in Adams County. The impoundment (man-made lake) has 855 surface acres, maximum depth of 9 feet, with a surface watershed covering 28 square miles. The Town of Douglas owns the dam forming Mason Lake. A dam was first installed in 1852-1853 to operate a sawmill.

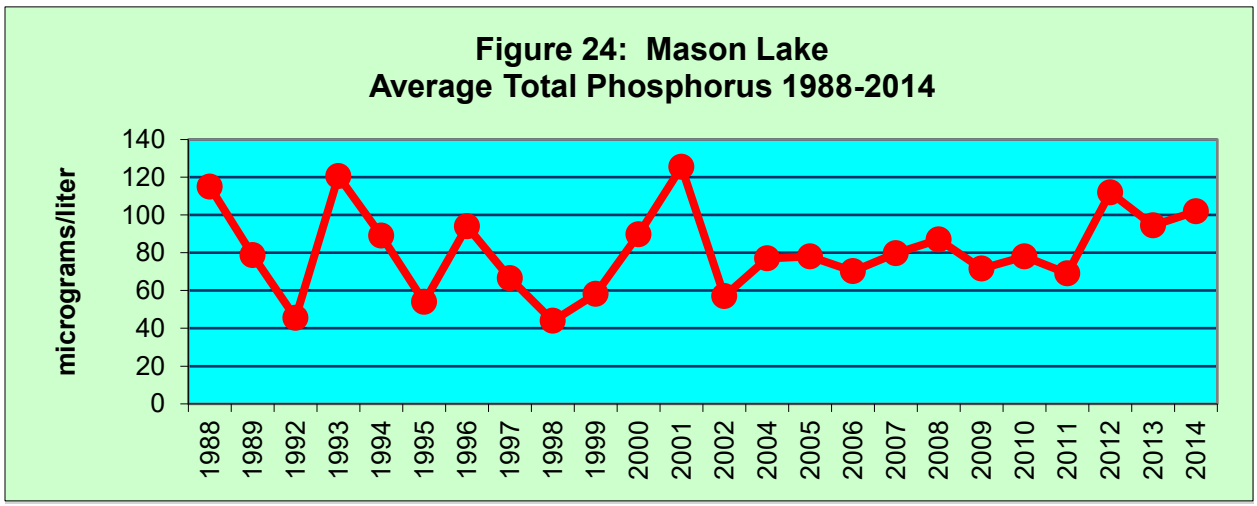
  In 2002, Mason Lake was placed on the federal impaired waterways list (commonly called the “303(d)” list). The reasons for this placement included highly-elevated phosphorus level, eutrophication, high turbidity, pH problems, NPS contamination and degraded habitat. Two streams that feed Mason Lake are also on the impaired waterways list. Mason Lake is one of the WDNR’s “trend lakes”, meaning that the WDNR regularly examines the lake for water quality and related issues. The Mason Lake District, formed in 1955, manages

Mason Lake. Sporadically, volunteers have also taken water quality samples through the Citizen Lake Monitoring Program and Adams County LWCD has also taken samples.

Overall, the water clarity readings in Mason Lake are poor (see **Figure 23**). Occasionally, there will be a spike into a better category, but the average growing season level remains at 3.34 feet, in the "poor" category.

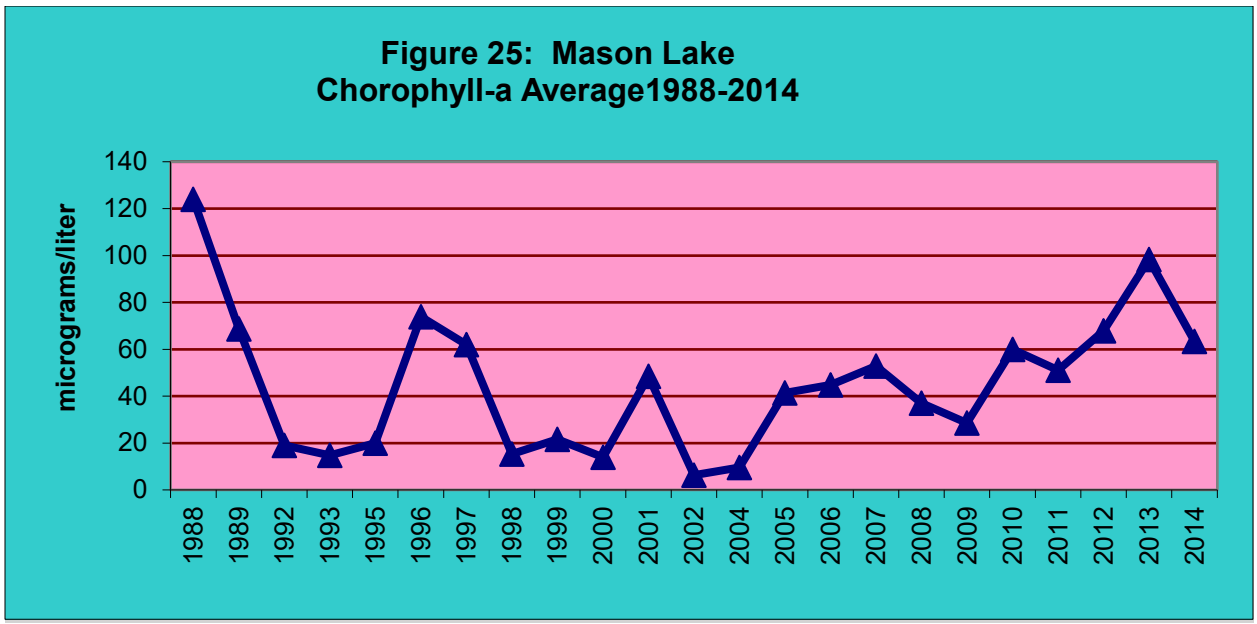


Phosphorus levels have been routinely elevated in Mason Lake (see **Figure 24**). The lowest annual average recorded is 54 micrograms/liter (in the "poor" category) in 1995; the highest annual average was 240 micrograms/liter in 1977. The average total phosphorus level for all the years for which records could be found is 87.5 micrograms/liter; the average for the past ten years is 84.2 micrograms/liter. This TP concentration is well above Wisconsin's 40ug/L TP criteria for shallow lakes.



Chlorophyll-a, associated with the presence of algae, has also remained high in Mason Lake (see **Figure 25**). The overall average level for all years for which records were found is 48.4 micrograms/liter (very poor), with the average for the past ten years standing at 54.5 micrograms/liter.

Impaired Waters



There is a long history of high plant and algae growth and overall water quality problems for Mason Lake. As early as 1935, the water was called "green" with "thick weeds." In 1945, a survey also noted "green" water, with lots of floating and emergent aquatic vegetation, and a water clarity reading of only 1 foot. Intense algal blooms, dense aquatic plant growth and frequent winterkills continued over the years until the early 1950s, when the large number of carp in the lake had nearly denuded the lake bottom of aquatic plants. After a drawdown of the lake and a poisoning to remove carp in 1955, the aquatic vegetation came back, and water clarity readings continued to be generally low: in July 1956, the water clarity was 17 inches; in August 1956, it was 10 inches. Remarks such as "film of algae over most of the lake" and "water always dirty" continued to be noted. Problems with heavy algal blooms, thick aquatic plant growth and fishkills continued for many years. As recently as 2005, the lake was described as "over vegetated", with aquatic plant and algae growth so thick that boating was slow and difficult.

However, since 2005, aquatic plant growth has drastically decreased in Mason Lake, for reasons unknown at this time. A 2005 aquatic plant survey found 18 aquatic plant species, with the lake bottom over 90% vegetated. By 2009, although the same number of species were found, only 49.7% of the lake bottom was vegetated. In 2013, time of the most recent survey, 37 species were found—but only 24.4% of the lake bottom was vegetated. Further, the species number included at least five invasive species, including one found in only four other lakes in Wisconsin. The co-dominant species in 2013 were Coontail (*Ceratophyllum* demersum), the invasive Eurasian Watermilfoil (*Myriophyllum spicatum*) and the free-floating species, Watermeal (*Wolffia columbiana).* Aquatic invasive species comprised over 20% of the aquatic plant community in 2013.

Based on water clarity and the concentrations of algae and nutrients, Mason Lake was an eutrophic/hypereutrophic lake with poor/very poor water quality and poor water clarity from 1986-2014. Between 2014-2025, Mason Lake has remained hypereutrophic and continued to have poor water quality. Since 1986, nutrient levels have increased, and water clarity has decreased. Although aquatic plant growth

in Mason Lake should be favored by the high nutrients of its trophic state, hard water, dominance of rich sediments, the shallow depth of the lake and the very gradually sloped littoral zone, such growth is no longer occurring in Mason Lake. The aquatic plant growth in Mason Lake continues to decrease coverage of the lake, even by plants tolerant of high disturbance and lower water quality and clarity.

The field study for possible critical habitat areas in Mason Lake was conducted in September 2003. Ultimately, five areas, shown on **Figure 26**, were designated as "critical habitat" as defined by NR 107.

Figure 26 Mason Lake Designated Critical Habitat Areas

MASON LAKE DESIGNATED CRITICAL HABITAT AREAS

Impaired Waters

Mason Lake Designated Critical Habitat Areas
Note: ML 1 = "1" on **Figure 26**.

Area ML1 – Burn's Cove *extends along approximately 4000 feet of shoreline in the cove and up the stream, averaging 3 feet in depth and supports important near-shore terrestrial habitat, shoreline habitat and shallow water habitat. The area provides visual and sound buffers and a unique area of outstanding beauty for lake residents and visitors. The aquatic plant community includes several emergent and submergents, as well as some free-floating species. Eurasian watermilfoil and curly-leaf pondweed are present. The area is important to Mason Lake because the submerged and floating-leaf vegetation in this area ties up nutrients in their tissues that would otherwise be available for algae growth; the wetlands are filtering water that enters the lake and preventing shoreline erosion.; the submergent vegetation protects the lake bottom from resuspension of sediments; the site is a stream inlet that provides water for the lake. The area provides spawning and nursery sites for several species of fish. Carp and rusty crayfish are present. A wild rice bed was found in this area in 2013.*

Area ML2: 2a Northwest Shore *This sensitive area extends along 800 feet of shoreline and supports near-shore terrestrial habitat. The shoreline is wooded and shrub growth sandwiched between cottages. The value of the large woody debris for fish habitat that is abundant in the shallow zone. Submergent and free-floating vegetation are common. Eurasian watermilfoil and curly-leaf pondweed are present. The area provides spawning and nursery sites for several species of fish. Carp and rusty crayfish are present.*

2b – Big Spring Inlet *covers 800 feet along the lake shore at the mouth and up the Big Spring tributary, averaging 2 feet in depth and supports important near-shore terrestrial habitat, shoreline habitat and shallow water habitat. The shoreline is entirely wooded with small areas of shrub and herbaceous plant growth. The wetlands contain emergent herbaceous wetlands and shallow open water wetlands. Fallen woody material is present in the shallow zone for habitat. The area provides visual and sound buffers and a unique area of outstanding beauty for lake residents and visitors. Emergent, rooted floating-leaf plants, submergents are all present, as are Eurasian watermilfoil and curly-leaf pondweed. The site is a stream inlet water source for Mason Lake.*

Area ML3 – West Wetland *extends along 2000 feet of shoreline, averaging 2 feet in depth and supports important shoreline habitat and near-shore terrestrial vegetation. The shoreline at this sensitive area extends for about half of its length along a wooded shoreline and half of its length along and emergent wetland. Large woody cover for habitat is present along the wetland, but is common along the wooded stretch. All four structure types of aquatic plants—emergent, rooted floating-leaf, free-floating, and submergent—are present here. Eurasian watermilfoil and curly-leaf pondweed are also present.*

Area ML4 – Amey's Pond *covers approximately 60-acres, the entire wetland pond south of the highway, averaging 3 feet in depth and supporting important near-shore terrestrial habitat, shoreline habitat and shallow water habitat. Similar vegetation to the other sites occur here.*

Area ML5 –Spawning Site *area extends along 1000 feet of shoreline and supports important spawning habitat (Figure 1). The shoreline is 75% developed, 20% wooded and 5% shrub and native herbaceous growth. Similar vegetation is present. Panfish spawning occurs here.*

Impaired Waters

Lake Arrowhead, Lake Sherwood, and in central Adams County, **Friendship Lake** are all listed (2014) as Impaired Waters due to elevated phosphorus levels that are causing algal blooms that exceed recreational use thresholds. These three lakes are polluted due to residential non-point sources of pollution as well as the agricultural non-point sources entering through the tributaries. **Map 4** shows that Friendship Lake's inlet waters are both listed as Exceptional Streams (extremely low levels of water pollutants flowing into the lake). Due to the low pollutant load flowing in from the watershed into Friendship Lake, residential uses and internal loading may be the source of pollution that placed Friendship Lake on the Impaired Waters list in 2014. The watershed for these three lakes is called the 14 mile Creek watershed. This watershed is identified within the US EPA approved Wisconsin River TMDL basin report (2019) with TP and TSS reduction targets for nonpoint sources - see section C2 of plan for TMDL report information. The 14 mile creek watershed has a nine key element watershed based plan (adopted in 2020) to help reduce TP and TSS loads to the three lakes and the Wisconsin River.

Since the lake physiology and surrounding land uses are similar for all of the Tri-Lakes in Rome as they are around Friendship Lake, then a direct correlation can be made that residential uses in Rome are cumulatively providing the sources of pollution that have placed 2 of the 3 Tri-Lakes onto the Impaired Waters list in 2014.

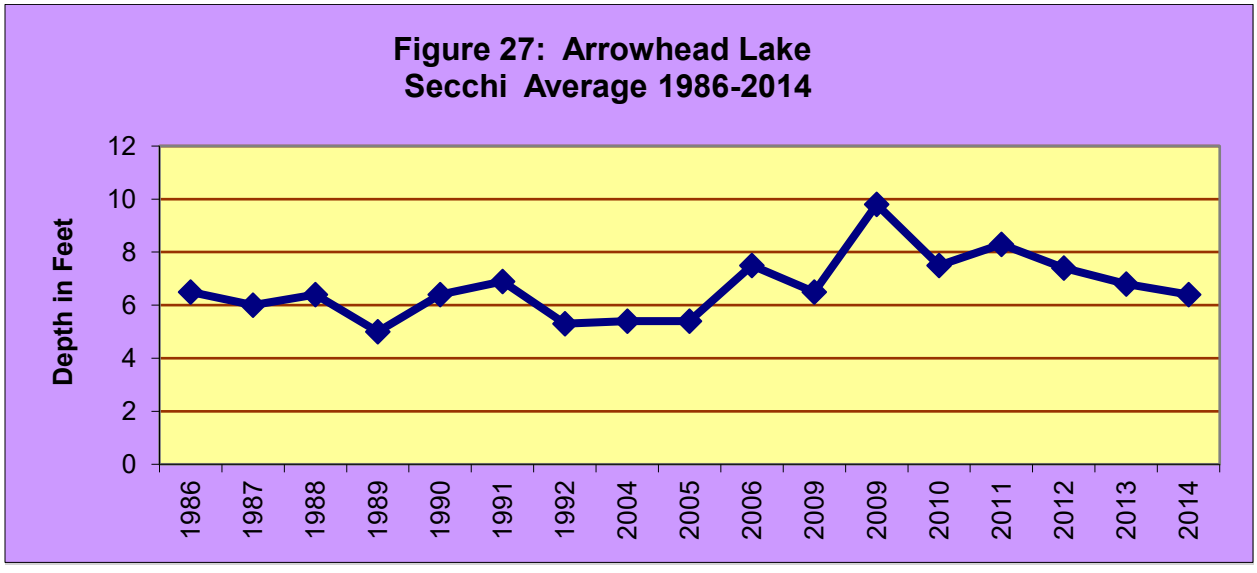
- **Lake Arrowhead Data**

  Arrowhead Lake is located in the Town of Rome, Adams County, Wisconsin. The impoundment is 300 surface acres in size. Its maximum depth is just over 25 feet, with an average depth of 8 feet. The dam impounds Fourteen-Mile Creek downstream from the dams at Lower and Upper Camelot Lakes, Lake Sherwood, and Arrowhead Lake, on its way to the Wisconsin River. The dams on these lakes are owned and operated by Adams County. There is a public boat ramp located on southwest side of the lake owned by The Adams County Parks Department, as well as a public swimming beach. Heavy residential development around the lake is found along most of the lakeshore. The first 100 feet landward from the water is owned by the Lake Arrowhead Association, which also operates two golf courses, a restaurant, swimming pool and marinas around the lake for use by Lake Arrowhead property owners.

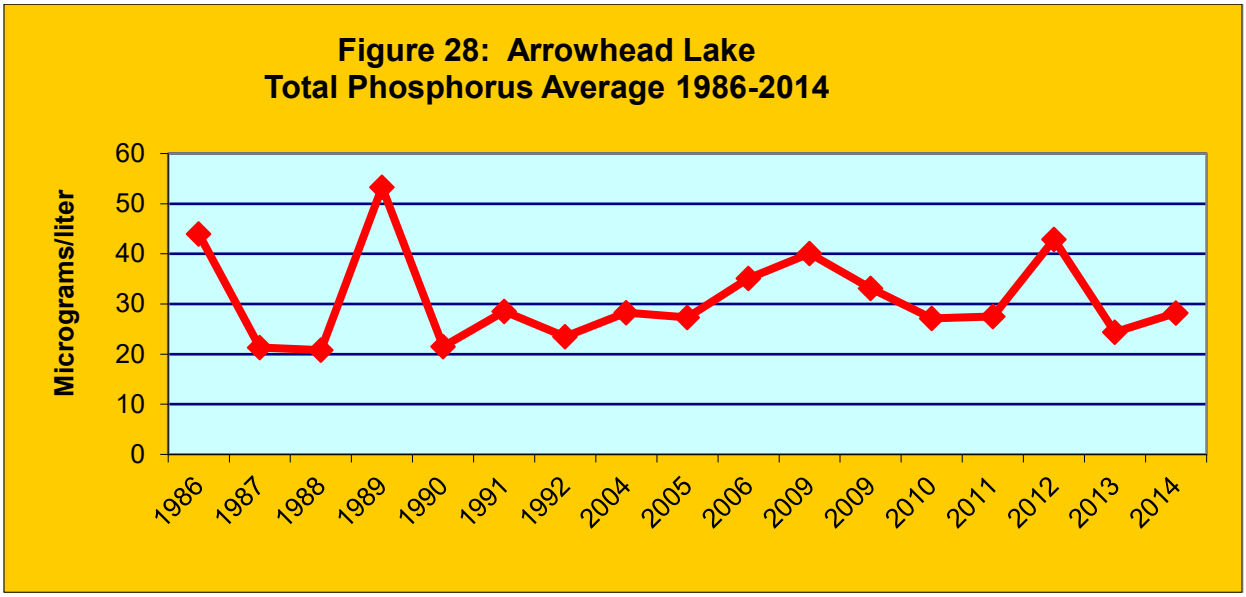
Impaired Waters

In 2014, Lake Arrowhead was placed on the federal impaired waters list for Wisconsin at the request of the Wisconsin Department of Natural Resources. According to the WDNR short report, "water is impaired due to one or more pollutants and associated quality impacts…chlorophyll sample data exceed 2014 WisCALM listing thresholds for Recreation use; however, total phosphorus data to not exceed REC thresholds. Total phosphorus and chlorophyll data do not exceed Fish and Aquatic Life threshold." The impairment specifically listed was "excess algal growth", and a priority determination for addressing non-point source pollution was "low."

Water quality monitoring has been occurring for many years at Lake Arrowhead (see **Figure 27**), sometimes with volunteers, sometimes with paid staff. The average growing season water clarity of 6.67 feet has remained in the "good" category (6 to 8 feet).

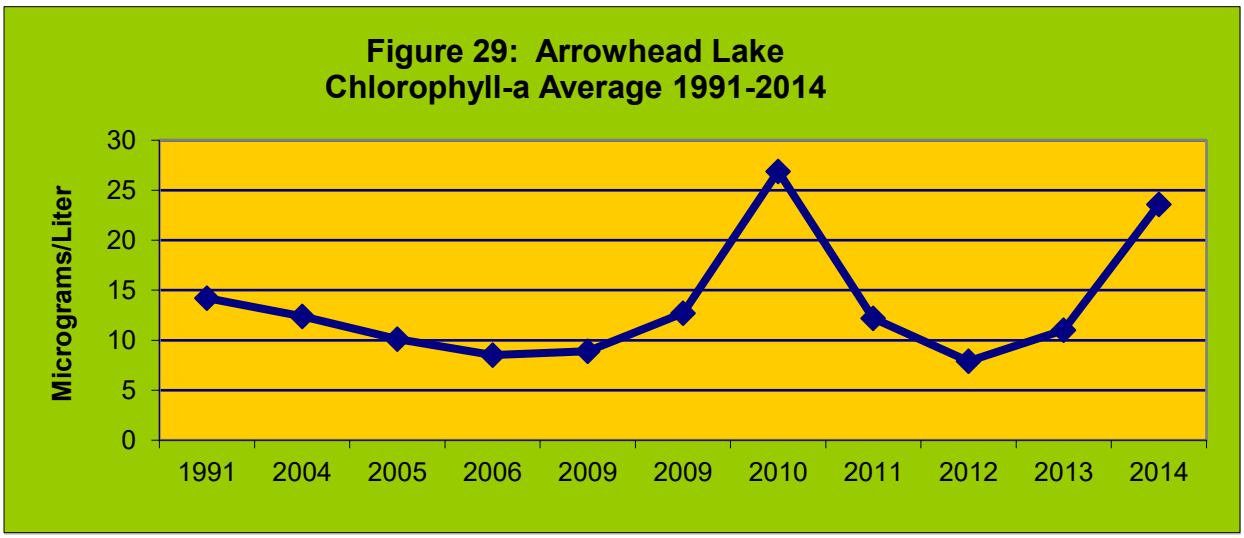


The total phosphorus levels have also been checked several times each year (see **Figure 28**). The average growing season total phosphorus level is 30.99 micrograms/liter, just on the border between "good" and "fair". The average for the past 10 years (2004-2014) is 31.4 micrograms/liter, still at the "fair" level.



The WDNR 303(d) short report specifically mentions high chlorophyll levels as an issue on Lake Arrowhead. The overall average of this parameter is 13.49 micrograms/liter, which is in the "fair" category (see **Figure 29**). Average for the past ten years is similar at 13.42 micrograms/liter. It is true, however, that in the past five years, annual average for chlorophyll has crept toward 30 micrograms/liter in two of the years.

Impaired Waters



Information about the diversity, density and distribution of aquatic plants is an essential component in understanding the lake ecosystem due to the integral ecological role of aquatic vegetation in the lake and the ability of vegetation to impact water quality (Dennison et al, 1993). Aquatic plant surveys have been

conducted on Arrowhead Lake several times over the past fifteen years, with the most recent one completed in 2014. Sufficient nutrients (trophic state), hard water, good water clarity, shallow lake, and nutrient-rich inputs from increased shore development at Arrowhead Lake favor plant growth.

The lake does have a mixture of emergent, free-floating, and submerged plants. Since 2000, the percentage of emergent plants has been slowly increasing. Coontail (*Ceratophyllum* demersum) remains the most frequently-occurring species in the lake, although other more sensitive native species like Northern Milfoil (*Myriophyllum sibiricum)* and Water Stargrass (*Heranthia* dubia) are nearing its frequency of occurrence. Submergent plants are the top six most-commonly occurring aquatic species. Although the coverage of submergent plants has reduced slightly, they continue to dominate the aquatic plant community in Arrowhead Lake.

There remain several invasive aquatic plant species. Currently, none of the exotic species appear to be taking over the aquatic plant community, but Eurasian Watermilfoil (*Myriophyllum spicatum)*, although declining from its highest frequency of occurrence in the 2010 survey, is still over 3% of the overall aquatic community. Since this species spreads most by fragmentation, mechanical harvesting needs to be carried out carefully to avoid further spreading this species.

Overall, the aquatic plant community in Arrowhead Lake is in the category of those very tolerant of disturbance, probably due to selection by a series of past disturbances. In Arrowhead Lake, the likely disturbances include the high recreational use of the lake (which includes boat traffic, tubing, jet-skiing, and water-skiing), the on-going mechanical harvesting from May to September each year, heavy shore development, high level of docks and other hard structures close to the water, erosion, and the presence of aquatic invasives. A comparison of the aquatic plant results suggest that although some of the aquatic plant species found have changed, to the extent that the aquatic plant community and water quality results mirror the health of Arrowhead Lake, Arrowhead Lake has remained relatively stable for at least the past 10 years.

Arrowhead Lake was found to have zebra mussels (*Dreissena polymorphya*) in 2004. The Tri-Lakes Management District, the Adams County Land & Water Conservation Department and the WDNR have been monitoring the presence every year since then using a number of methods. Aquatic plants collected in 2009, 2010 and 2014 were covered with zebra mussels of various sizes. Some of the plants were so covered that it was difficult to determine their identification. Zebra mussels have obviously spread throughout the lake, attaching not only to docks, rocks and other hard structures, but also to grains of sand and aquatic plants (and to each other).

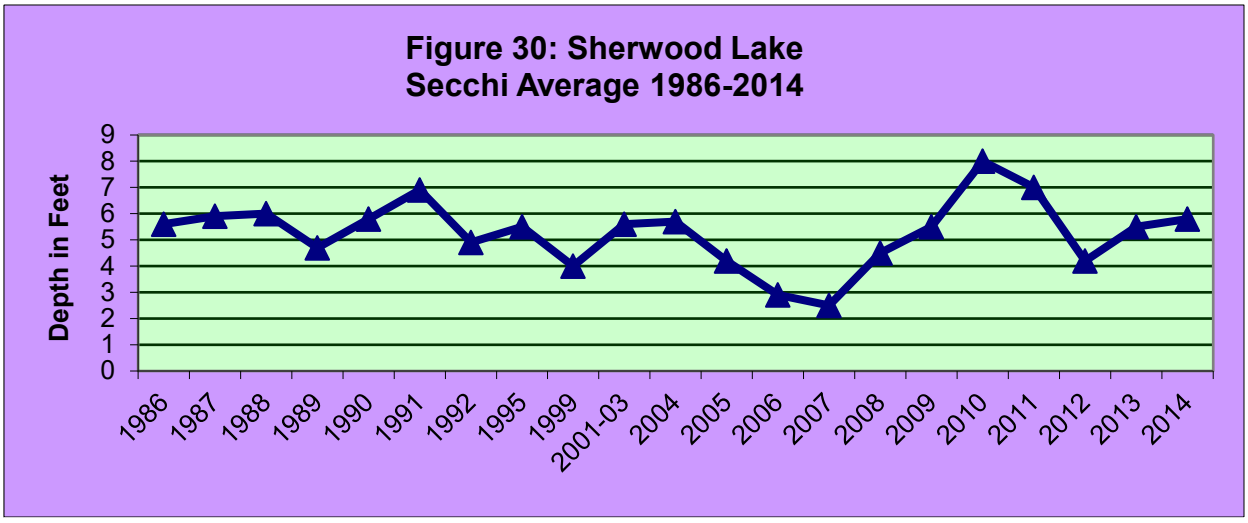
- **Lake Sherwood Data**

Sherwood Lake is located in the Town of Rome, Adams County, WI, in the south central part of Wisconsin. The impoundment of 14-Mile Creek is slightly over 243 surface acres in size. Maximum depth is 24 feet, with an average depth of 8 feet. Both Upper and Lower Camelot Lakes flow through dams into Sherwood Lake. Sherwood Lake flows through a dam into Arrowhead Lake. All the Tri-Lakes dams are owned and operated by Adams County. There is a public boat launch on Sherwood Lake on the southwest edge of the lake owned by the Parks Department of Adams County. Heavy residential development around the lake is

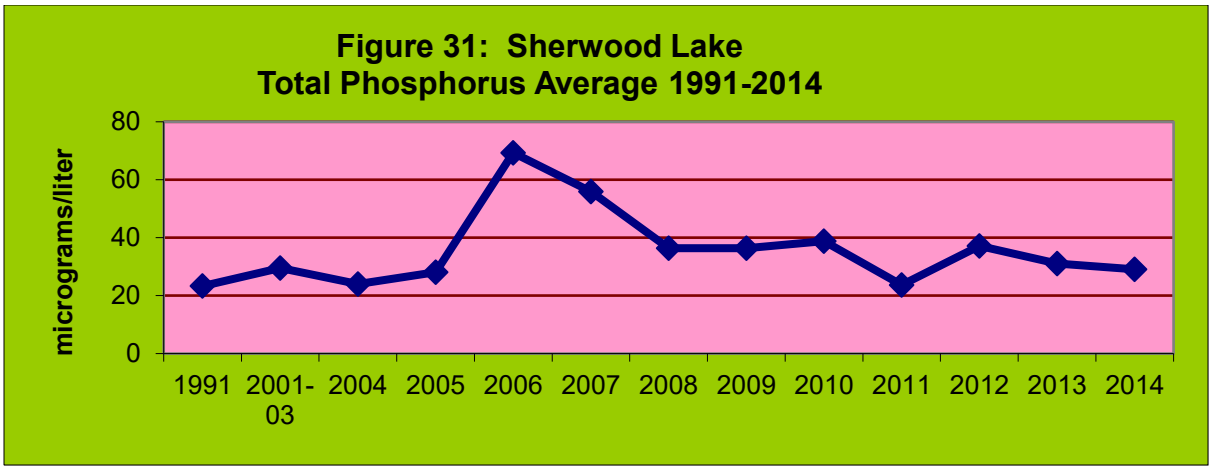
found along most of the lakeshore. Sherwood Lake is managed by the Tri-Lakes Management District. There is also an active Sherwood Property Owners Association.

In 2014, Lake Sherwood was placed on the federal impaired waters list for Wisconsin at the request of the Wisconsin Department of Natural Resources. According to the WDNR short report, "water is impaired due to one or more pollutants and associated quality impacts…chlorophyll sample data exceed 2014 WisCALM listing thresholds for Recreation use; however, total phosphorus data to not exceed REC thresholds. Total phosphorus and chlorophyll data do not exceed Fish and Aquatic Life threshold." The impairment specifically listed was "excess algal growth", and a priority determination for addressing non-point source pollution was "low."

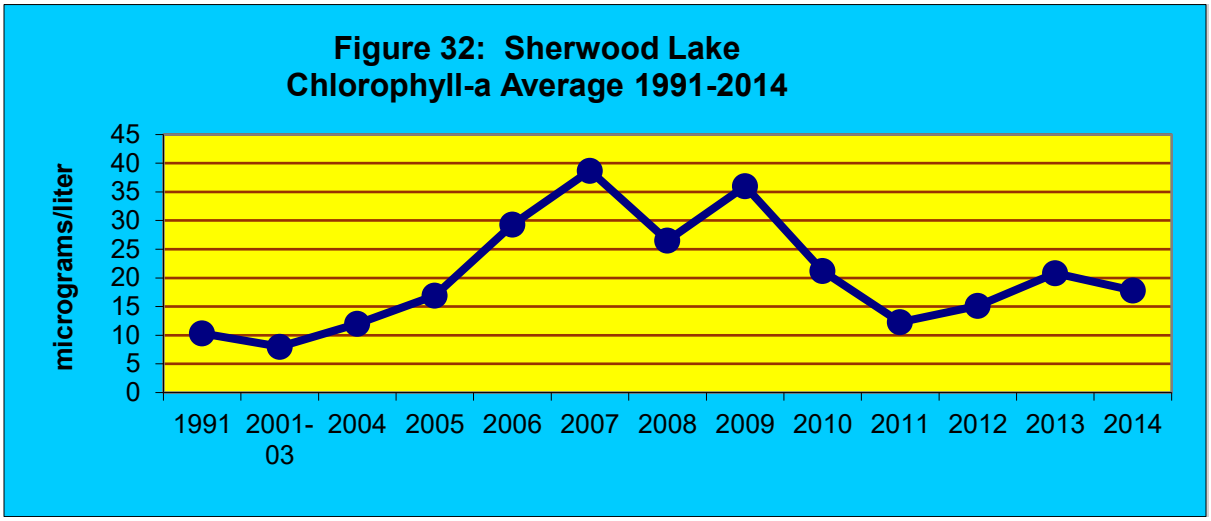
Water quality monitoring has been occurring for many years at Lake Sherwood (see **Figure 30**), sometimes with volunteers, sometimes with paid staff. It is one of the WDNR's "trend lakes", so testing is done by both volunteers and WDNR staff. The average growing season water clarity of 5.27 feet has remained in the "fair" category (5 to 6 feet).



The total phosphorus levels have also been checked several times each year (see **Figure 31**). The average growing season total phosphorus level is 35.6 micrograms/liter, in the "fair" category. The average for the past 10 years (2004-2014) is 37.3 micrograms/liter, still at the "fair" level.



The WDNR 303(d) short report specifically mentions high chlorophyll levels as an issue on Lake Sherwood. The overall average of this parameter is 20.38 micrograms/liter, which is in the "poor" category (see **Figure 32**). Average for the past ten years is similar at 22.4 micrograms/liter, still squarely in the "poor" category.



Impaired Waters

Information about the diversity, density and distribution of aquatic plants is an essential component in understanding the lake ecosystem due to the integral ecological role of aquatic vegetation in the lake and the ability of vegetation to impact water quality (Dennison et al, 1993). Aquatic plant surveys have been conducted on Sherwood Lake several times over the past fifteen years, with the most recent one completed in 2014. Sufficient nutrients (trophic state), hard water, good water clarity, shallow lake, and nutrient-rich inputs from increased shore development at Sherwood Lake favor plant growth.

The most frequently occurring aquatic plant in the 2014 survey were *Heteranthia* dubia (Water Stargrass), and *Potamogeton pusillus* (Small Pondweed). No other 2014 species came close to this frequency of occurrence. All five of the most frequently-occurring plants were submergent species. There remain several invasive aquatic plant species. Currently, none of the exotic species appear to be taking over the aquatic plant community, but Eurasian Watermilfoil (*Myriophyllum spicatum)* is still a significant part of the overall aquatic community. Since this species spreads most by fragmentation, mechanical harvesting needs to be carried out carefully to avoid further spreading this species.

Sufficient nutrients (trophic state), hard water, good water clarity, shallow lake, and nutrient-rich inputs from increased shore development at Sherwood Lake favor plant growth. Structurally, the aquatic plant community contains emergent plants and a few submergent plants, but has no rooted floating-leaf and little free-floating aquatic vegetation. The aquatic plant community in Sherwood Lake is in the category of those very tolerant of disturbance, probably due to selection by a series of past disturbances and heavy shoreline development.

Zebra mussels (*Dreissena polymorphya*) were verified in Sherwood Lake in 2010. The Tri-Lakes Management District, the Adams County Land & Water Conservation Department and the WDNR have been monitoring the presence every year since then using a number of methods. Aquatic plants collected in 2009, 2010 and 2014 were covered with zebra mussels of various sizes. Some of the plants were so covered that it was difficult to determine their identification. Zebra mussels have obviously spread throughout the lake, attaching not only to docks, rocks and other hard structures, but also to grains of sand and aquatic plants (and to each other).

- **Tri-Lakes Implementation**

  Since 2014, when 2 of the three lakes within the Town of Rome were listed on the impaired waters list, as requested by the WDNR, Tri-Lake Management District has had sights on repairing these waterbodies beyond what a lake management plan can entail. Working with several state and national partners, the Management District was able to secure a Nanobubbler project to assist in water quality control. Nanobubbles have a diameter of less than 200 nanometers in size. They form naturally in natural sources like crashing waves, but can also be created through advanced technology by the use of specialized generators. Nanobubbles optimize gas dissolution and accelerate key physical, chemical, and biological processes making them an innovative solution for water treatment. They help mitigate contaminants naturally and boost aerobic processes – helping reduce pathogens, algae blooms, and unpleasant odors while improving water quality.

- **Friendship Lake Data**

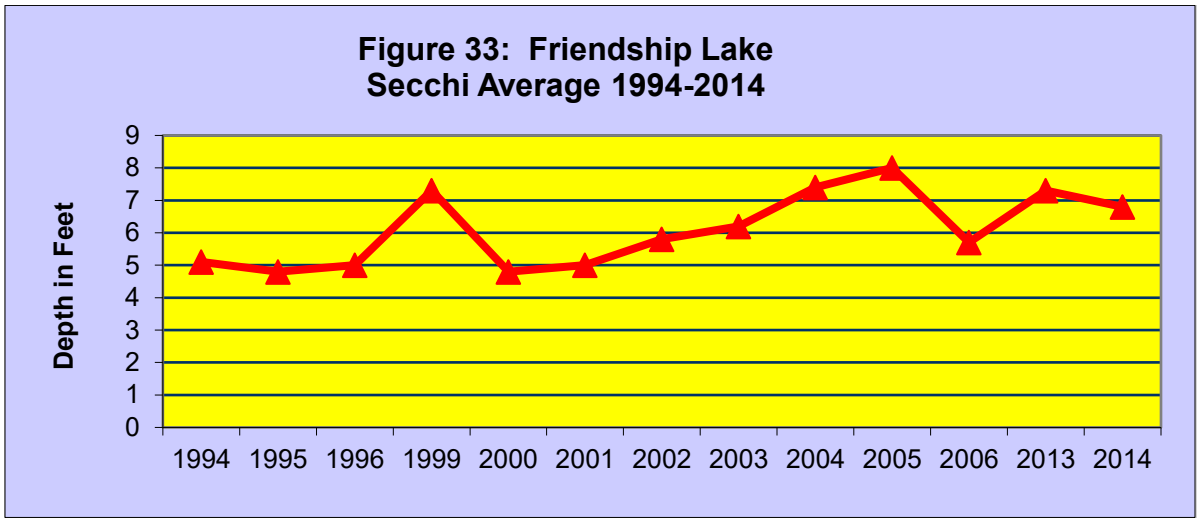
Impaired Waters

Friendship Lake is located adjacent to the Village of Friendship and is a 115-acre impoundment (man-made) lake located in the Towns of Adams and Preston, Adams County, in the Central Sand Plains Area of Wisconsin. This lake is formed by an impoundment of Little Roche a Cri Creek. Little Roche a Cri Creek ultimately empties into the Wisconsin River. The Little Roche a Cri Creek watershed is large, covering 196.20 square miles and extending into the next county east of Adams. Friendship Lake has two public boat ramps, one connected to a public park and beach; the other a rough ramp near a bridge.

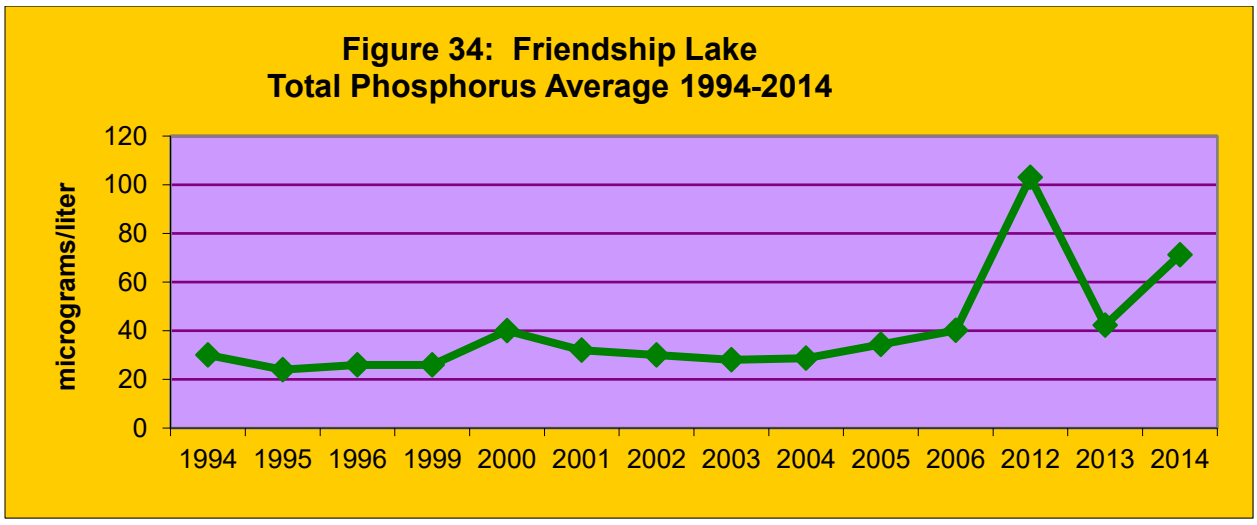
In 2014, Friendship Lake was placed on the federal impaired waters list for Wisconsin at the request of the Wisconsin Department of Natural Resources. According to the WDNR short report, "water is impaired due to one or more pollutants and associated quality impacts…chlorophyll sample data exceed 2014 WisCALM listing thresholds for Recreation use; however, total phosphorus data to not exceed REC thresholds. Total phosphorus and chlorophyll data do not exceed Fish and Aquatic Life threshold." The impairment

specifically listed was “excess algal growth”, and a priority determination for addressing non-point source pollution was “low.”

Water quality monitoring has been occurring for several years at Friendship Lake, usually by volunteers (see **Figure 33**). The average growing season water clarity of 6.1 feet has remained in the “good” category (6 to 8 feet).

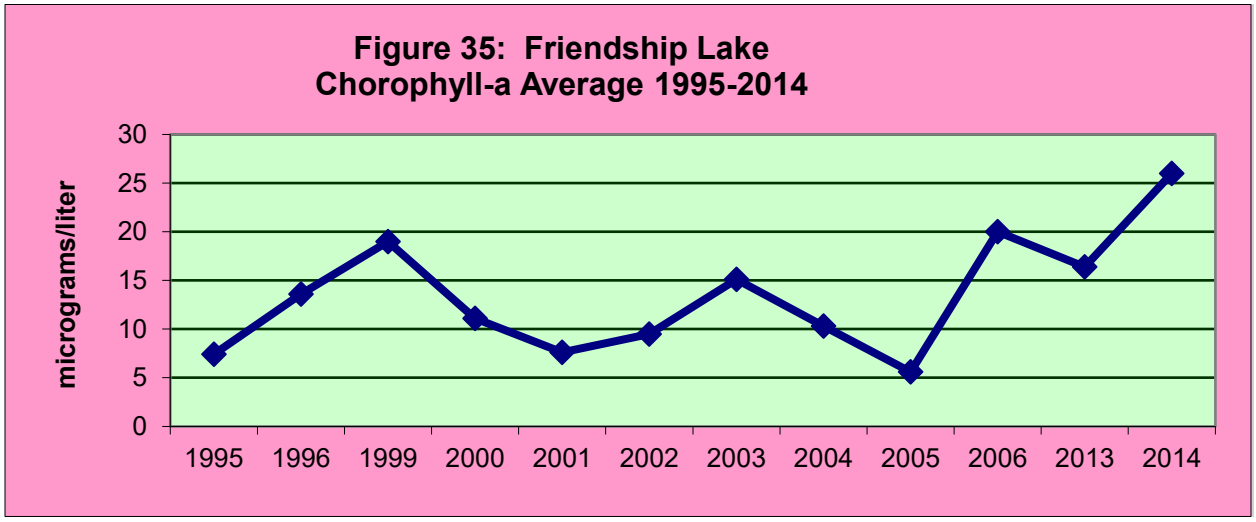


The total phosphorus levels have also been checked several times each year (see **Figure 34**). The average growing season total phosphorus level is 39.7 micrograms/liter, in the “fair” level. However, in the last ten years, average total phosphorus in Friendship Lake has increased to 53.3 micrograms/liter, putting the lake into the “poor” category for total phosphorus.



The WDNR 303(d) short report specifically mentions high chlorophyll levels as an issue on Friendship Lake. The overall average of this parameter is 13.5 micrograms/liter, which is in the “fair” category (see **Figure**

35). Average for the past ten years is similar at 17.0 micrograms/liter, which would move the lake into the "poor" category for chlorophyll.



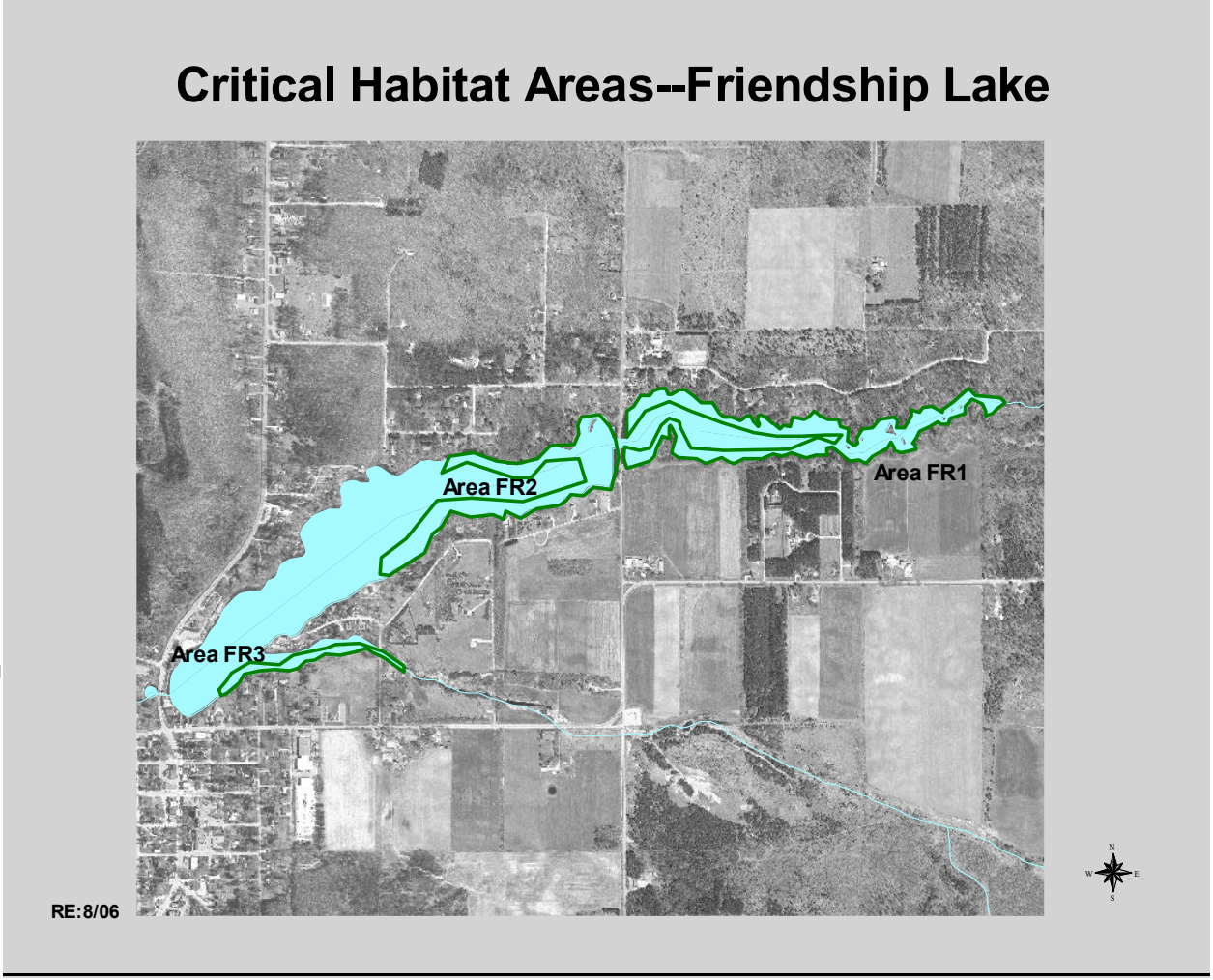
Information about the diversity, density and distribution of aquatic plants is an essential component in understanding the lake ecosystem due to the integral ecological role of aquatic vegetation in the lake and the ability of vegetation to impact water quality (Dennison et al, 1993). Aquatic plant surveys have been conducted on Friendship Lake several times over recent years, with the most recent one completed in 2012. Sufficient nutrients (trophic state), hard water, good water clarity, shallow lake, and nutrient-rich inputs from increased shore development at Friendship Lake favor plant growth.

Friendship Lake is a mesotrophic/eutrophic lake with poor water clarity and fair water quality. The aquatic plant community colonized almost the entire lake. In the most recent survey, Common Waterweed (*Elodea canadensis*) dominated, with Coontail (*Ceratophyllum demersum*) co-dominant, Eurasian Watermilfoil. The Friendship Lake aquatic plant community is characterized by average quality and good species diversity.

Myriophyllum spicatum (Eurasian Watermilfoil), has been present in Friendship Lake since at least 2003, when it was found with just over 13% occurrence frequency. It has continued to spread, so that by 2012, it had an occurrence frequency of about 40%. *Potamogeton crispus* (Curly-Leaf Pondweed), another invasive, was also found during the 2003 survey, with an occurrence frequency of 11.7%. Unlike Eurasian Watermilfoil, it has stayed at about the same occurrence (12% in 2012). The presence of these highly-aggressive invasive species, along with the heavy use history of the lake, suggests that the lake continues to be vulnerable to incursions of invasives.

Field work for a critical habitat area study was performed in September 2006, on Friendship Lake, Adams County (see **Figure 36**). Three areas were designated as "critical habitat" as defined in NR 107.

Figure 36 **Friendship Lake Designated Critical Habitat Areas**



Friendship Lake Designated Critical Habitat Areas

Note: FR 1 = "Area FR1" on **Figure 36**.

Critical Habitat Area FR1 *extends along over 6000 feet of the shoreline on both sides of the eastern end of Friendship Lake. This area of Friendship Lake is very shallow and is largely undeveloped. 46.7% of the shore is wooded; 21.7% has shrubs; the remaining shore (31.6%) is native herbaceous cover. Much of this area is a marsh. Large woody cover is common for habitat. With little human disturbance along this shoreline, the area has natural scenic beauty. Maximum rooting depth of aquatic vegetation in FR1 was 5 feet. Nine emergent species were found at this site. Three species of free-floating plants and one species of floating-leaf rooted plant were found here. Ten submergent aquatic plant species, including the invasive Myriophyllum spicatum, were found in this area. Emergents provide important fish habitat and spawning areas, as well as food and cover for wildlife. Floating-leaf vegetation provides cover and dampens waves, protecting the shore. A diverse submergent community provides many benefits.*

Critical Habitat Area FR2 *covers approximately 5000 feet of the north and south shoreline in the middle of the lake's length. 35% of the shore is wooded; 14% has shrubs; 38% is native herbaceous cover. The remaining shoreline is bare/eroded sand and some hard structures. Large woody cover is common for habitat. With minimal human disturbance along this shoreline, some of the area has natural scenic beauty. Maximum rooting depth in FR2 was 18 feet. No threatened or endangered species were found in this area. Two exotic invasives, Myriophyllum spicatum (Eurasian watermilfoil) and Phalaris arundinacea (Reed Canarygrass) were found in this area. Filamentous algae occurred at all sites, especially near the shores. Found at this site were seven species of emergent aquatic plants, three species of free-floating aquatic plants, one species of floating-leaf rooted plant, and eleven submergent aquatic species.*

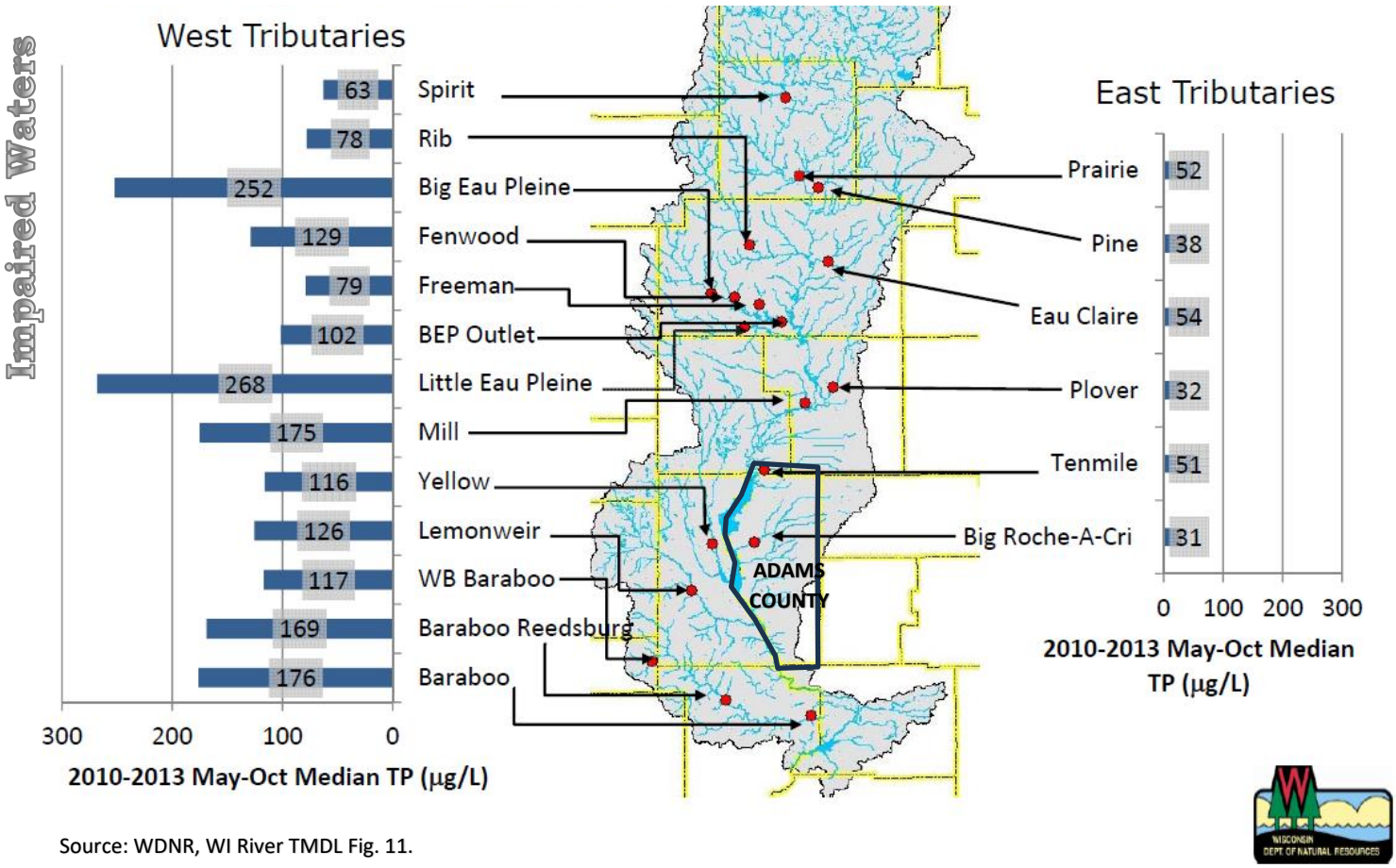
Critical Habitat Area FR3 extends along approximately 2100 feet of the southwest shoreline. 47.5% of the shore is wooded; 5% has shrubs; 15% is native herbaceous cover—the remaining shore is bare sand and hard structure. This critical habitat area includes some of most developed area of Friendship Lake, although the southeast side of this area is currently undeveloped. Large woody cover is present, but not as much as in the other two critical habitat areas. Scenic beauty in part of the area is lessened on the north and southwest sides due to the human development, but the southeast area of this site is still pretty. This area does still provide spawning and nursery areas for many types of fish, as well as several types of wildlife. Maximum rooting depth in FR3 was 13 feet. No threatened or endangered species were found in this area. All of the area had filamentous algae, especially near the shores. Only one emergent species was found here. Two species of floating-leaf rooted plants were present. Also present were three species of free-floating plants. Six submergent plant species were found. This is a less diverse submergent community than the other critical habitat sites in Friendship Lake.

C.2 Phosphorus Impairment – Wisconsin River TMDL, 2019

Due to very high annual amounts of algae in Petenwell and Castle Rock Lakes, the DNR and stakeholders created the Wisconsin River TMDL report in 2019.. This Total Maximum Daily Load (TMDL) for total phosphorus (TP) study provides a strategic framework and prioritizes resources for water quality improvement in the Wisconsin River Basin. The Wisconsin River TMDL study area spans Wisconsin's central corridor from the headwaters in Vilas County (Lac Vieux Desert) to Lake Wisconsin in Columbia County, covering 9,156 square miles (approximately 15 percent of the state). The U.S. EPA approved the Wisconsin River TMDL in 2019.

A review of the TMDL study shows that non-point source pollution in tributaries north of Adams County (measurements higher than the acceptable 100 µg/L per tributary, **Figure 37**) are causing algae blooms in Petenwell and Castle Rock Lakes (more than the acceptable 40 µg/L per measurement in **Figure 38**).

Figure 37 Total Phosphorus in Tributaries



Source: WDNR, WI River TMDL Fig. 11.

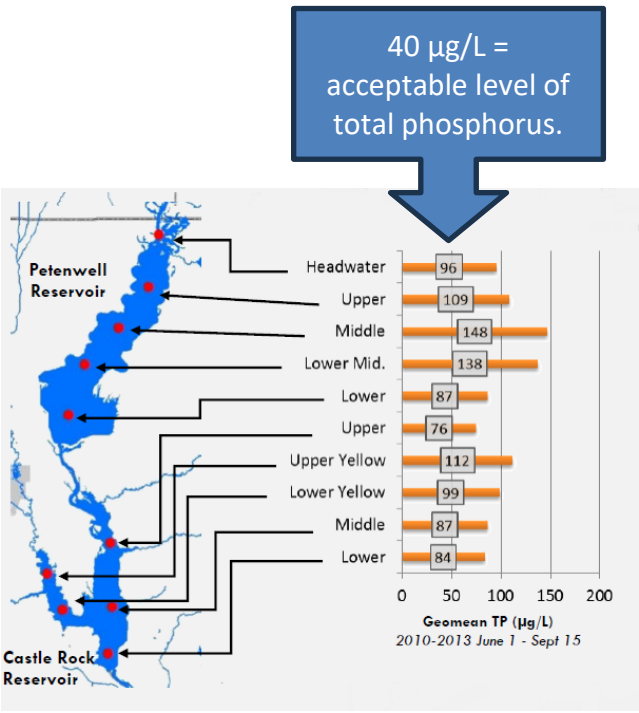
Soils and landscape morphology are also important factors governing pollutant yields. Areas with high densities of agriculture may have low pollutant load yields if crops are cultivated on highly porous soils, such as the potato/vegetable cultivation areas in the Central Sand Plains Ecological Landscape [Adams County]. Similarly, areas that have more internal drainage (such as the Plover River which is located along a remnant glacial terminus) have much lower total suspended solids (TSS) and total phosphorus (TP) yields regardless of heavy agricultural use. (WI River TMDL)

Total Phosphorus (TP) in Adams County

The total phosphorus yield for subbasins in Adams County overall is illustrated in **Figure 39**. For reference, "<0.1" is the same overall level as occurs in Vilas County, the headwaters of the Wisconsin River.

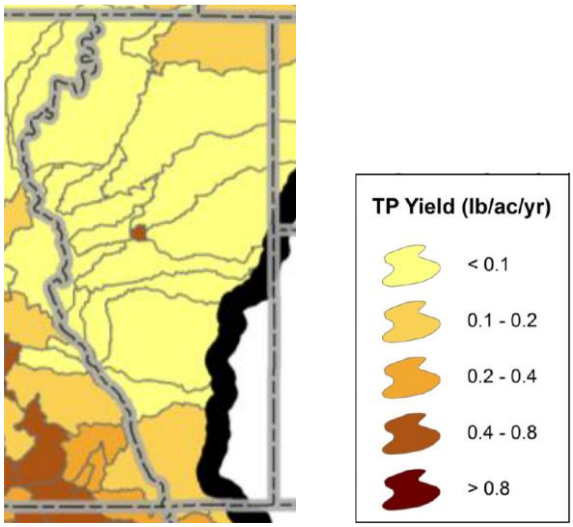
TMDL Baseline Phosphorous Reductions and Site-Specific Criteria, both targeted by HUC 12 watersheds in Adams County are documented in **Attachment D**. These reductions are part of the Wisconsin River TMDL agricultural phosphorus target goals outlined In Appendix N of the Wisconsin River TMDL Report. The entire Appendix N can be viewed online: https://dnr.wisconsin.gov/topic/TMDLs/WisconsinRiver.html. The TMDL based phosphorus reduction targets for the 14 mile creek watershed are also captured within the 14 mile creek nine key element watershed based plan (2020).

Figure 38 Total Phosphorus in Petenwell & Castle Rock Lakes



Source: WDNR, Wisconsin River TMDL Fig. 12.

Figure 39
Total Phosphorus Yields in Adams County



Source: WDNR, Wisconsin River TMDL Fig. 24.

Figure 40 Contribution of Different Sources at Various Points Along the Wisconsin River Mainstem

Legend

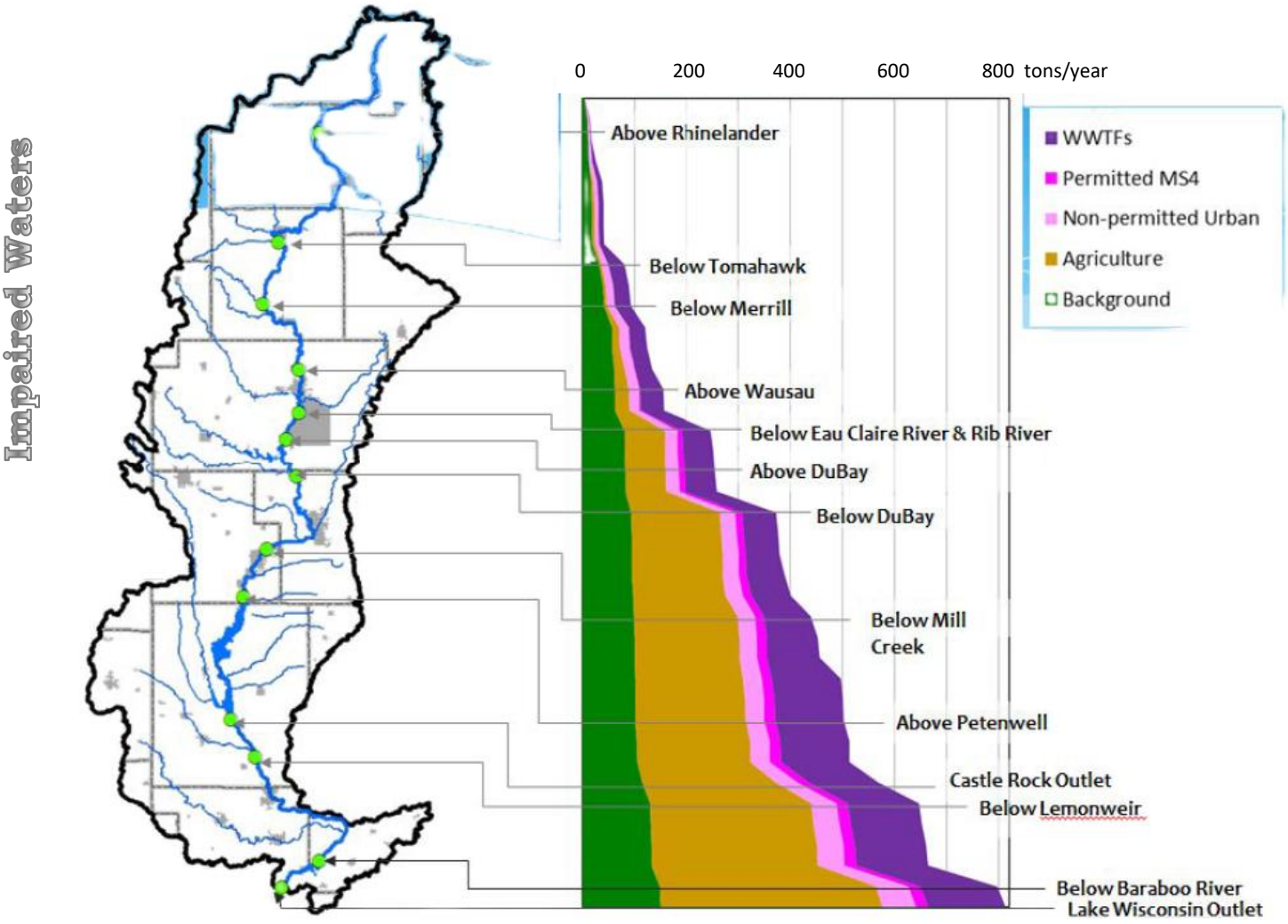
WWTF = Waste water treatment facility (a pipe or ditch that discharges treated effluent from a municipal or industrial plant).

Permitted MS4 = Usually a municipality above 10,000 population (other entities are also MS4s per DNR).

Non-permitted Urban = All urban, suburban, and developed rural land uses not within permitted MS4 communities.

Agriculture = Runoff from agricultural lands.

Background = Naturally occurring phosphorus in rocks, plant material, soils, and wildlife waste (forests and wetlands).



Source: WI River TMDL, Appendix R

C.3 Phosphorus Impairment – Upper Fox Wolf River TMDL, 2020

Due to many surface water pollution issues documented in various county Land and Water Resource Management Plans in these two basins, the DNR and stakeholders created the Upper Fox Wolf River TMDL. See this TMDL in Adams County in **Figures 41 & 42**. This Total Maximum Daily Load (TMDL) for total phosphorus (TP) study provides a strategic framework and prioritizes resources for water quality improvement in the Upper Fox and Wolf River Basins. The Upper Fox and Wolf River Basins (UFW) are two separate basins that converge within a series of pool lakes in Winnebago County before finally flowing collectively into Lake Winnebago. All the surface water draining to Lake Winnebago is contained within these two basins. Lake Winnebago flows into the Lower Fox River Basin, where it eventually flows into Green Bay. The Upper Fox Wolf River (UFW) TMDL study area spans Wisconsin's east-central corridor from the headwaters in Forest County and the City of Portage (Columbia County) to Lake Winnebago, covering 5,900 square miles, approximately 10 percent of the state. The U.S. EPA approved the UFW TMDL in 2020.

Figure 41

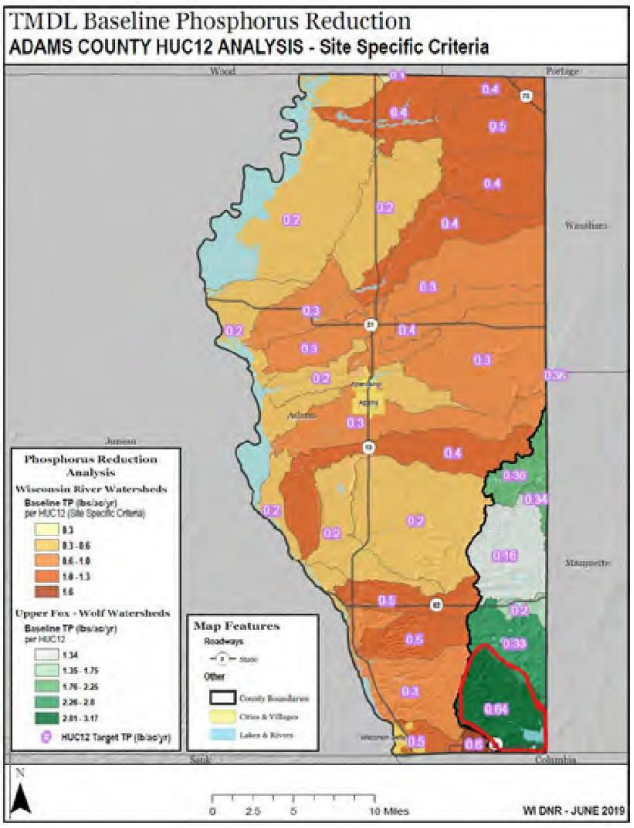
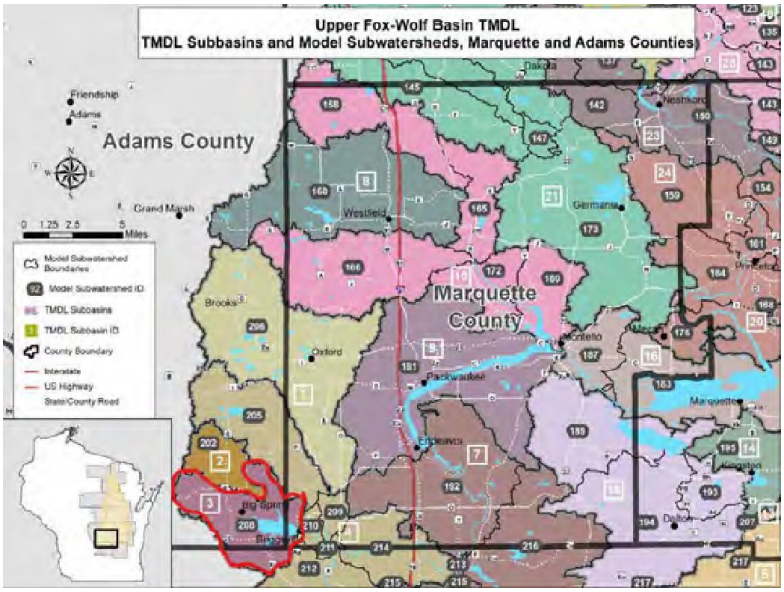


Figure 42



D. Healthy Watersheds, High Quality Waters (DNR)

Background & General Overview

In 2022, the DNR's Water Quality Program launched the Healthy Watersheds, High-Quality Waters (HWHQW) initiative. This new focus on the "already healthy" waterbodies and watersheds – or land area draining to a lake, stream or wetland – is intended to celebrate these treasures and draw attention to the ecological, financial and societal benefits of protecting clean water.

This initiative utilized the US EPA Watershed Recovery Potential Screening Tool to model watershed health at the HUC12 scale throughout the state. The DNR also identified individual high-quality lakes, streams, rivers, and wetlands utilizing existing monitoring data and resource classifications. The modeled watersheds (HUC12 scale) can be sorted statewide and by 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. As outlined in the Healthy Watersheds, High-Quality Waters Action Plan, the statewide goal is to keep 100% of the watershed protection priorities and high-quality waters within them healthy through 2030. The HWHQW website features an accompanying technical report, action plan for how to use this data, and ready-made maps and information dashboards.

Historically, much of the DNR'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.

HEALTHY WATERSHED

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 (adapted from EPA, epa.gov/hwp).

HIGH-QUALITY WATERS

Lakes, streams, and rivers with *at least two* of the following attributes:

- **unique or rare resource,**
- **attaining state water quality standards,**
- **or good-to-excellent biotic integrity.**

Also included are unique wetlands and those with least disturbed or reference conditions.

Modeling & Assessment Results for Adams County

Here are the overall results for Adams County based on the 2021 WI DNR modeling and assessment effort. For the most up to date information, please refer to the HWHQW webpage.

High-Quality Waters in Adams County (*See **Attachment E** for a full list*) include:

- 23 High-Quality lakes, rivers, and streams
- 4 Healthy Wetlands
- 7 Rare & Unique Wetlands

In Adams County, there are thirty-one (31) HUC12 watersheds that were modeled as part of the HWHQW initiative. This includes watersheds whose area overlaps with other counties.

Watershed Protection Priorities in Adams County (*see **Attachment E** for a full list and maps*) include:

- Four (4) watersheds (13%) are considered a Top 30% Statewide Watershed Protection and five (5) watersheds (16%) are considered a Top 30% Wisconsin River Basin (HUC6) Watershed Protection Priority:
    - Dead Horse Creek (70700030802)*
    - Carter Creek (70700030903)*
    - Lower Big Roche a Cri Creek (70700030804)*
    - Bingham Creek (70700030902)*
    - Plainville Creek-Wisconsin River (070700031903)

    **Statewide Protection Priority Watershed*

See **Attachment E** for the following Adams County HWHQW maps and tables:

- Table of High-Quality Waters
- Table of HUC12 Watershed Health Scores & Ranks
- Map of Watershed Protection Priorities – Statewide Top 30%
- Map of Watershed Health Index – Wisconsin River Basin

2.14 Aquatic Invasive Species

The aquatic invasive species program in Adams County has evolved to concentrate efforts in three areas:

1. Public awareness and prevention
2. Early detection presence/absence monitoring, particularly for species that can be managed.
3. Effective management of manageable species (plants)

A. Public Awareness and Prevention

With the majority of area lakes populated with at least one species of AIS, the objective of awareness and prevention is to help boaters understand how to prevent the spread of harmful plants and animals. General public awareness of AIS laws intended to promote good boater hygiene practices provides a foundation for prevention, but some aspects of the laws are not understood by all boats resulting in less than optimal compliance. If boaters fail to understand that some AIS are small-bodied microorganisms capable of being moved in on-board water, such as the spiny water flea, there will be a reluctance to properly drain all water from boats when moving equipment between lakes.

The perception that “weeds are the only species we need be concerned about” is becoming less attentive as spiny water flea populations are spreading throughout central and north central Wisconsin. With heavily used boat launches and lake recreation on the rise, this is a wake-up call that transporting water between lakes in live wells, bilges and bait containers could easily result in the spread of harmful small-bodied microorganisms. Increased interest in wake sports that require boats with ballast tanks or bladders may exacerbate this issue, as these tanks can be difficult or sometimes impossible to thoroughly drain, retaining gallons of water.

In 2014 the Clean Boats, Clean Waters (CBCW) program was revised to emphasize explaining the reasons for the AIS prevention laws in WI. Using the spiny water flea as an example of how moving seemingly harmless water between lakes can have potentially devastating results to fish populations, it is believed that boaters will more readily comply with a law that may not have been understood previously. DNR and Extension Lakes continue to conduct a boater behavior survey which attempts to track overall boaters' behavior in relation to AIS prevention steps, and continue to find draining water from boats, equipment, and livewells is the most difficult behavior to change.

The CBCW program is regarded by many local lake organizations as their best defense against spreading AIS. While originally intended to be a program of limited duration and therefore sustainable by volunteers for as long as needed, it is now regarded as necessary for well into the future. The DNR CBCW grant program was simplified in 2012 making funding easy to obtain for hiring seasonal employees to interact with boaters at public landings. Every year, lake groups in Adams County have an opportunity to learn more about the CBCW and participate in training sessions held by staff. A few lake districts in Adams County hire their own CBCW inspectors for education and outreach measures while other rely on the department to educate the community on this personally aware program.

B. Early Detection Presence/Absence Monitoring

Since it is only plant species that can be managed effectively and many of the animal species require special equipment and training to detect, citizen monitoring in Adams County for presence/absence of AIS is predominantly for Eurasian watermilfoil and Curly-leaf pondweed. Shoreline invasives such as Phragmites, purple loosestrife, and knotweeds are also best managed if detected early, and are included in training efforts. Lake organizations have come to understand that early detection of these plants, before their populations are well established, typically results in more effective and lower cost management efforts. Seasonal workshops to help citizen monitors detect and report suspicious plants are an important aspect of effective monitoring.

C. Effective Management of Manageable Species

DNR and other professional partners have been monitoring managed and unmanaged populations of Eurasian watermilfoil statewide. Invasive plant management options like hand harvesting, diver assisted suction harvesting (DASH), biocontrol such as milfoil weevils, and mechanical harvesting can be permitted methods of control in addition to, or in place of, herbicide treatments.

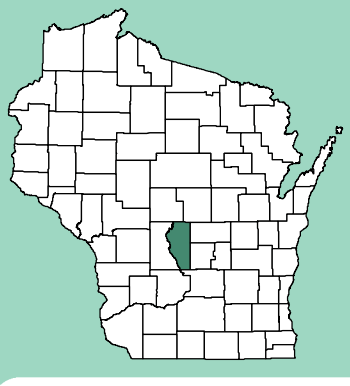
Curly leaf pondweed management in Adams County has been more challenging likely due to the persistence of its turions in lake sediments. Treatment with herbicides, DASH, and hand pulling have been the primary methods for control. There is no approved biocontrol for curly leaf pondweed. More needs to be learned about curly leaf pondweed management and collaboration with partners is essential to build collective knowledge on how and when to best manage it.

Tactics for management of shoreline invasives such as Phragmites, knotweeds, purple loosestrife, and yellow iris have been teased out from projects elsewhere in WI and surrounding states. Strategies for hand removal, how and when to best apply which herbicides, and understanding the need for site restoration after treatment have been developed with collaborative groups. There is an effective biocontrol for purple loosestrife (*Gallerucella* beetles), that has been used for many years in Adams County with the help of community volunteers. There is currently no approved biocontrol for yellow iris, Phragmites, knotweeds, or garden yellow loosestrife.

Adams County, Wisconsin

Generalized Existing Land Use

Map 1



Legend

- Minor Civil Divisions
- State Highways
- County Highways
- Local Roads
- Agriculture
- Commercial
- Cranberry Bog
- Governmental / Institutional
- Industrial
- Multi-Family
- Open Lands
- Outdoor Recreation
- Quarry
- Residential
- Transportation
- Utility
- Woodlands
- Water
- Wetlands

0 1.25 2.5 5 7.5 Miles

SOURCE: NCWRPC, WiDNR, Adams County

This map is neither a legally recorded map nor a survey of the actual boundary of any property depicted. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.

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Wood County

Portage County

Juneau County

Waushara County

Marquette County

Juneau County

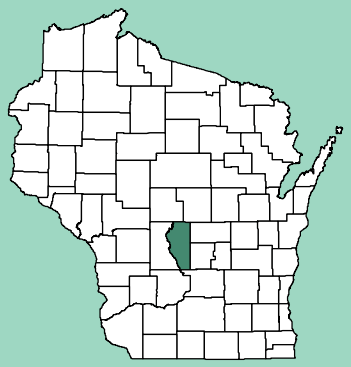
Sauk County

Columbia County

Adams County, Wisconsin

Public Access Lands

Map 2



Legend

- Minor Civil Divisions
- State Highways
- County Highways
- Local Roads
- County Forest Land
- DNR Owned - Open
- Forest Legacy Easement

Wood County

Portage County

Juneau County

Waushara County

Marquette County

Sauk County

Columbia County

Leola Marsh Wildlife Area

Sand Valley Restoration

Colburn Wildlife Area

The Nature Conservancy

Quincy Bluff and Wetlands Statea Natural Area

0 1.25 2.5 5 7.5 Miles

SOURCE: NCWRPC, WiDNR, Adams County

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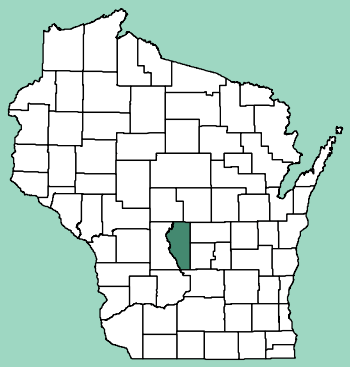
Adams County, Wisconsin

Watersheds

Map 3



Legend

- State Highways
- County Highways
- Minor Civil Divisions
- Water
- Hydrologic Units 12-digit

Watershed Boundaries

- Big Roche A Cri Creek
- Duck and Plainville Creeks
- Fourteenmile Creek
- Little Roche A Cri Creek
- Lower Baraboo River
- Lower Yellow River
- Montello River
- Neenah Creek
- Sevenmile and Tenmile Creeks

0 1.25 2.5 5 7.5 Miles

SOURCE: NCWRPC, WiDNR, Adams County, FEMA

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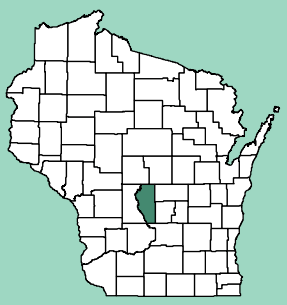
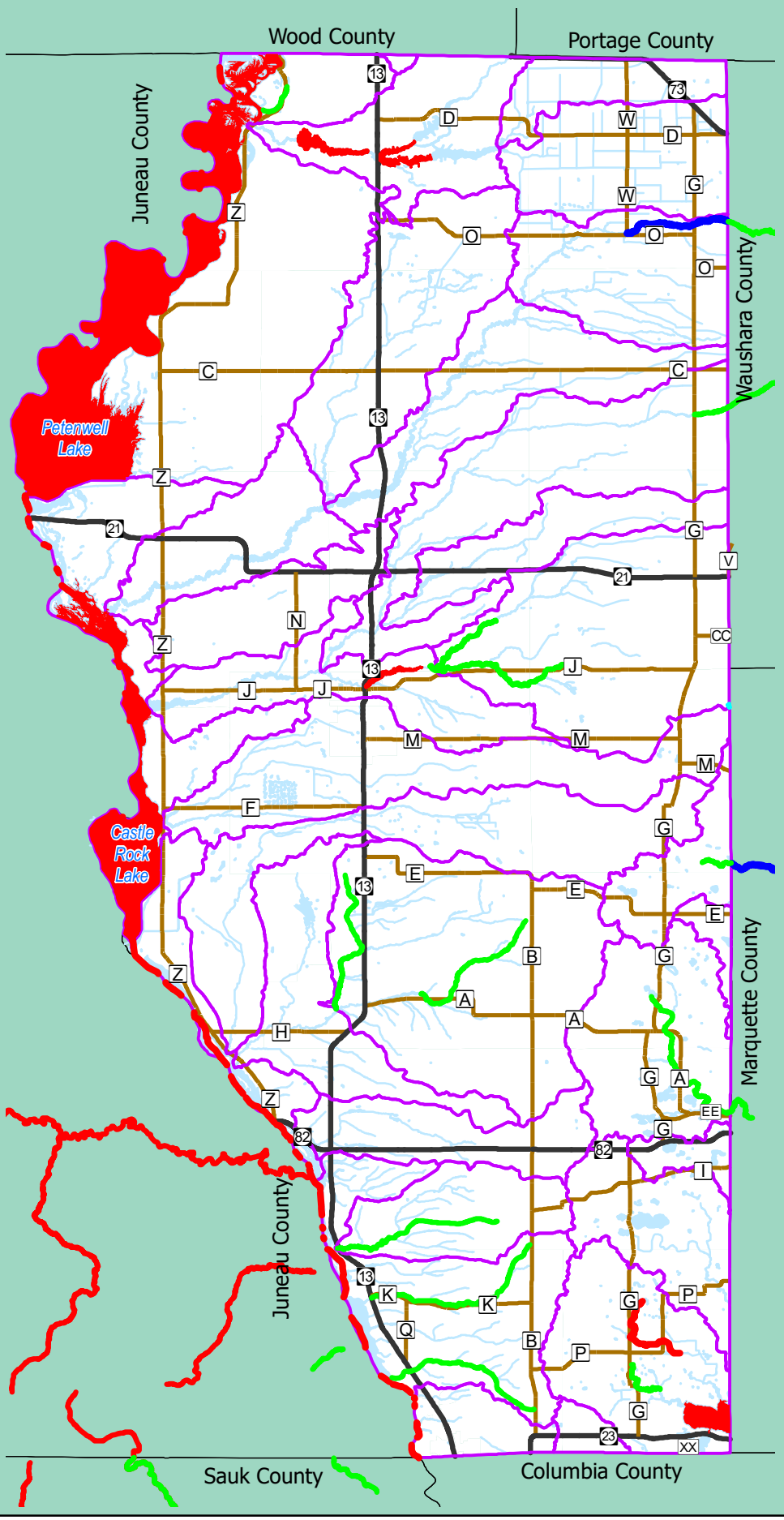
Adams County, Wisconsin

Designated Waters

Map 4





SOURCE: NCWRPC, WiDNR, Adams County

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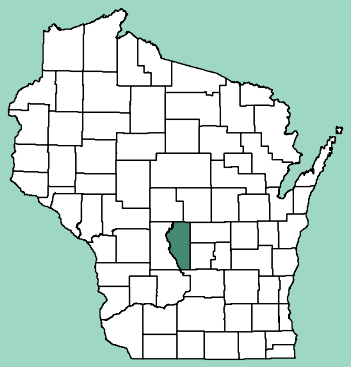
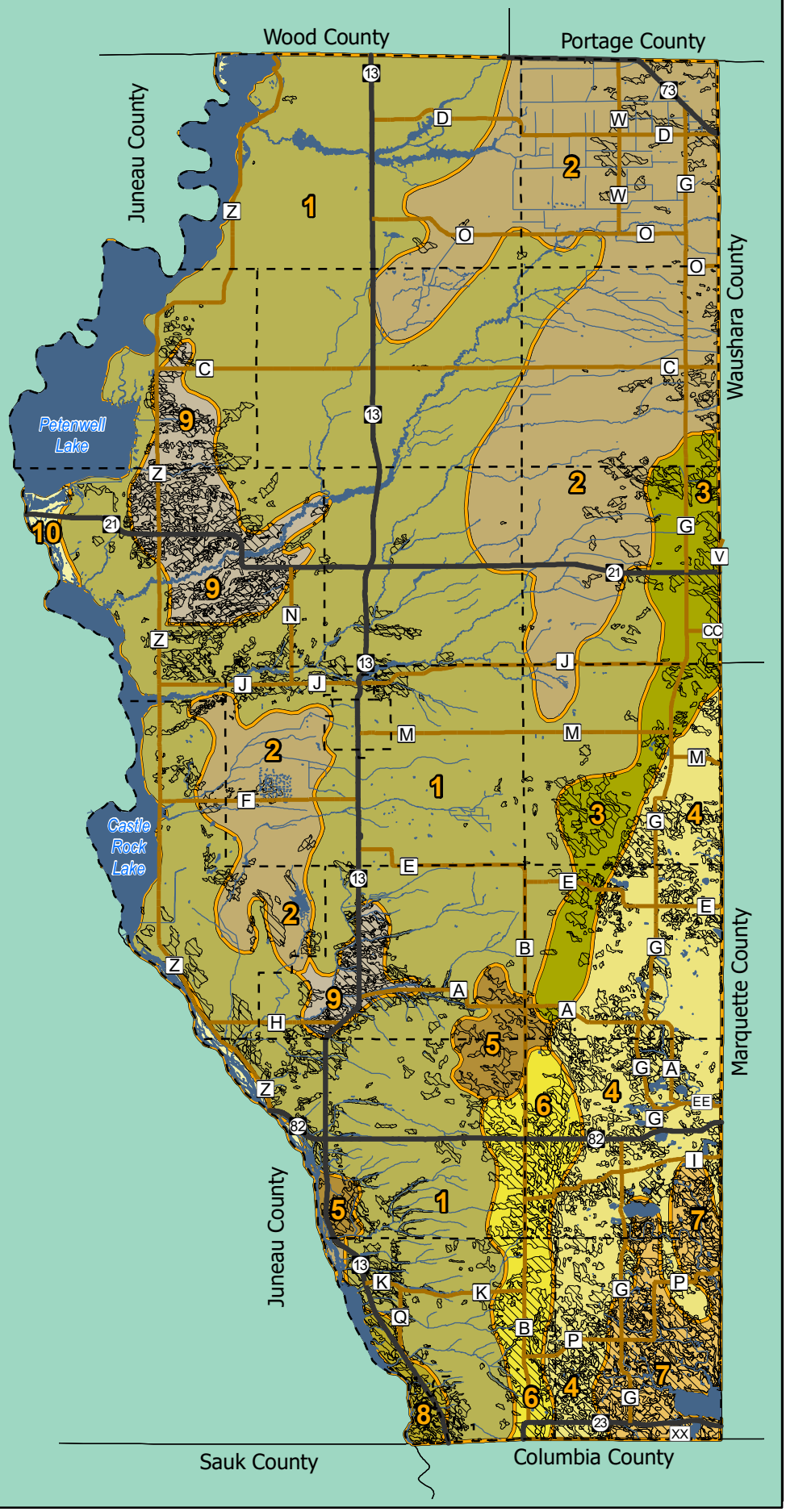
Adams County, Wisconsin

Generalized Soils

Map 5





Legend

- Minor Civil Divisions
- State Highways
- County Highways
- 1 PLAINFIELD-FRIENDSHIP-MEEHAN (WI084)
- 2 NEWSON-MEEHAN-FRIENDSHIP (WI085)
- 3 PLAINFIELD-RICHFORD-FRIENDSHIP (WI083)
- 4 PLAINFIELD-WYOCENA-OKEE (WI069)
- 5 PLAINBO-BOONE-ELEVA (WI088)
- 6 DICKINSON-DAKOTA-BILLETT (WI087)
- 7 BRIGGSVILLE-KEWAUNEE-POYGAN (WI089)
- 8 LA FARGE-URNE-NORDEN (WI097)
- 9 DELTON-WYEVILLE-PLAINFIELD (WI086)
- 10 FORDUM-STURGEON-DUNNVILLE (WI045)
- Water
- Prime Farmland Areas

0 1.25 2.5 5 7.5 Miles

SOURCE: NCWRPC, WiDNR, Adams County NRCS

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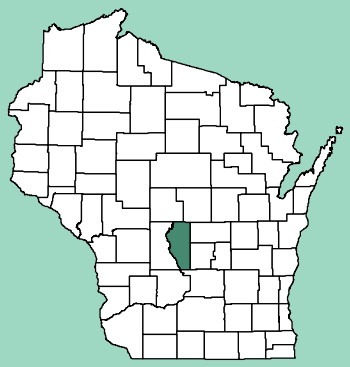
Adams County, Wisconsin

Groundwater Contamination Susceptibility

Map 6



Legend

- Minor Civil Divisions
- State Highways
- County Highways
- Water

Groundwater-contamination susceptibility

More susceptible — Less susceptible

Wood County

Portage County

Juneau County

Waushara County

Marquette County

Juneau County

Sauk County

Columbia County

Petenwell Lake

Castle Rock Lake

0 1.25 2.5 5 7.5 Miles

SOURCE: NCWRPC, WiDNR, Adams County NRCS

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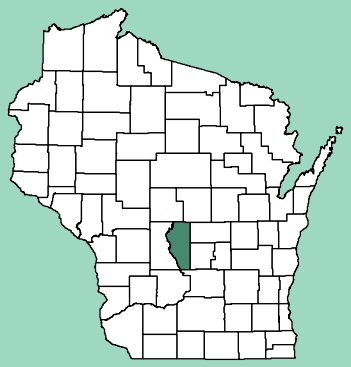
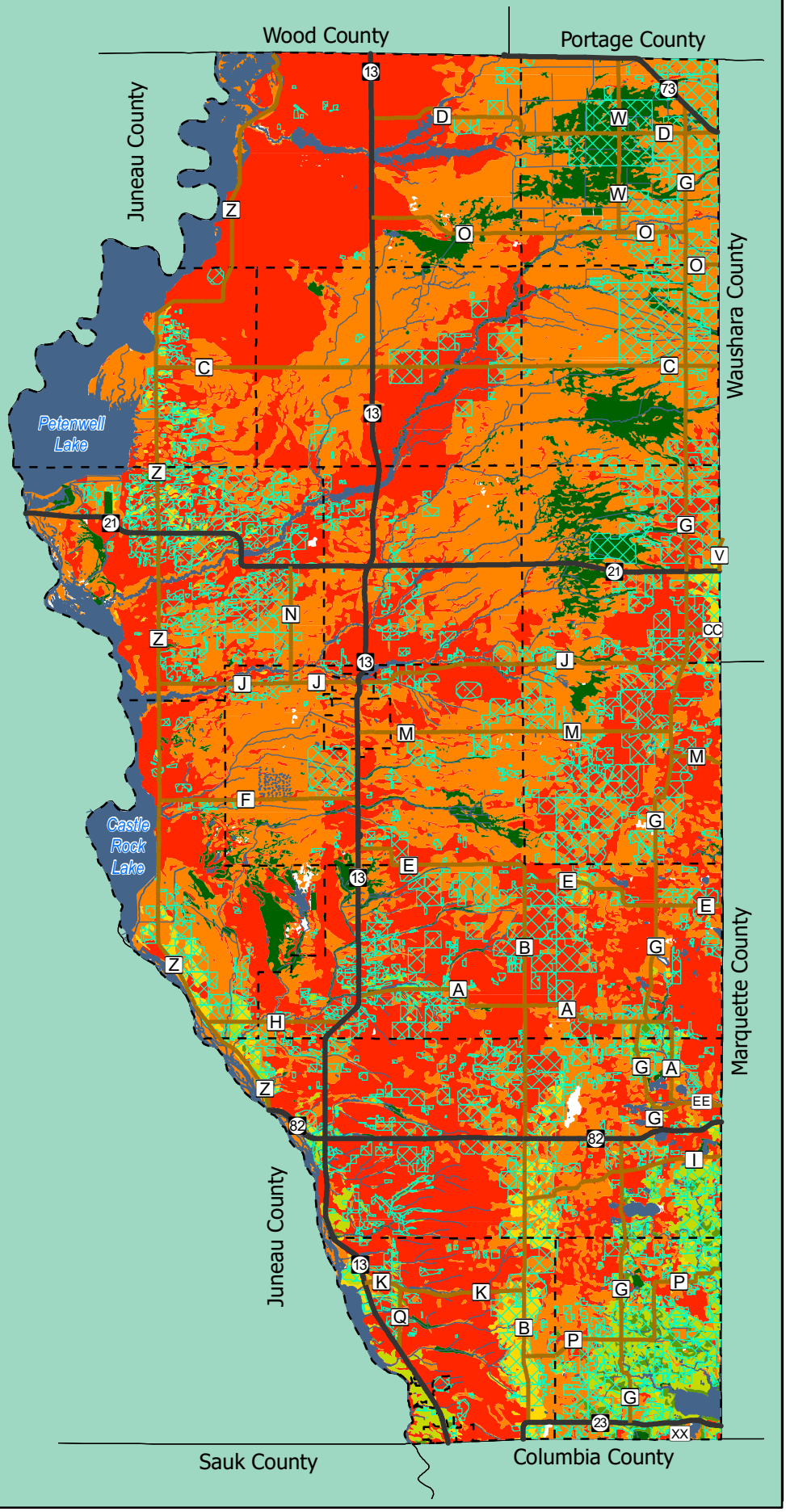
Adams County, Wisconsin

Wind Erodible Soils

Map 7





Legend

- Minor Civil Divisions
- State Highways
- County Highways
- Existing Agriculture Areas

Wind Erodibility Group Rating

Low — High

0 1.25 2.5 5 7.5 Miles

SOURCE: NCWRPC, WDNR, Adams County
NRCS Web Soil Survey (Wind Erodibility Group)

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NR 151 PERFORMANCE STANDARDS & PROHIBITIONS
Chapter 3

The County land and water resource management plans are the local mechanism to implement NR 151 performance standards and prohibitions. Through Wisconsin Act 27, the Wisconsin Legislature amended State statutes to allow LWCCs to develop implementation strategies for addressing local water quality priorities related to controlling erosion, sedimentation, and nonpoint source water pollution. Wisconsin DNR Rule NR 151, sub-chapter II – Agricultural Performance Standards and Prohibitions became effective October 1, 2002, revised in 2010 and became effective January 1, 2011. These performance standards and prohibitions are the premise for which this plan will be implemented to help reduce nonpoint source pollution and aid in the reduction of nitrogen and phosphorus to ground and surface waters. Administrative Rule ATCP 50 is DATCP's rule that establishes the guidelines to implement Wisconsin's Soil and Water Resource Management program as specified in state statute 92.14. Adams County LWCD will utilize NR 151, ATCP 50 along with Adams County's Ordinances to enforce prohibition standards. Adams County will cooperate with the DNR and DATCP for enforcement of the NR 151 performance standards. Enforcement will be utilized as a last resort if non-compliance is not achieved through voluntary conditions.

Fact sheets for NR 151, both agricultural and non-agricultural performance standards, are in **Attachment F**.

3.1 Implementation Strategies for each part of the Agricultural Performance Standards (NR 151)

NR 151.02 Sheet, rill and wind erosion: All land where crops or feed are grown shall be cropped to achieve a soil erosion rate equal to, or less than, the "tolerable" (T) rate established for that soil. A snapshot of cropland soil loss due to water erosion calculated by RUSLE 2 from 43,614 acres tabulated in SNAP Plus V2 for 2015 came up with an average soil loss of .5 Tons/Acres. Wind erosion calculations for the county need to be updated and this will be a priority in this plan. Livestock pastures and winter grazed areas will also need to meet tolerable soil loss as of July 1, 2012.

Conservation practices that will achieve compliance with this standard are: contour farming; cover and green manure crop; crop rotation; diversion; field windbreaks; residue management; strip cropping; grassed waterways; filter strips and terrace systems.

NR 151.03 Tillage Setback: The purpose of this standard is to prevent tillage operations from destroying stream banks and depositing soil directly in surface waters.

Conservation practices that will achieve compliance with this standard are: filter strips, buffers and tillage set-backs greater than 5 feet but no more than 20 feet. 70% ground cover is required.

NR 151.04 Phosphorus Index: Cropland, pastures and winter grazing areas shall average a phosphorus index of 6 or less over the accounting period and may not exceed a phosphorus index of 12 in any individual year within the accounting period.

Conservation practice that will achieve compliance with this standard are: nutrient management plan.

NR 151.05 Manure storage facilities: All livestock producers building new manure storage facilities, substantially altering existing manure storage facilities, or choosing to abandon their manure storage facilities shall comply with this standard. If a facility is altered or built after January 1, 2011 the storage shall be capable of containing the volume of a 25 year, 24 hour storm. Manure storage volume cannot exceed the margin of safety level or Maximum Operating Level (MOL) identified at any time during the year.

Compliance shall be achieved by meeting USDA-NRCS design, construction and maintenance standards for waste storage facility; closure of waste impoundments; manure transfer; and referencing Adams County Manure Storage Ordinance.

NR 151.055 Process Waste Water Handling: All livestock producers shall comply with this section. There may be no significant discharge of process wastewater, defined by NR 243.03(53) to waters of the state.

Compliance shall be achieved by meeting USDA-NRCS design, construction and maintenance standards for process waste water systems.

NR 151.06 Clean Water Diversions: All livestock producers within a Water Quality Management Area shall divert clean water from feedlots, manure storage areas and barnyard areas. A Water Quality Management Area is: land within 1,000 feet from the ordinary high water mark of a lake, pond or flowage; land within 300 feet from the ordinary high water mark of a navigable stream or river; land susceptible to groundwater contamination or land with potential to be a direct conduit for contamination to reach groundwater

Conservation practices that will achieve compliance with this standard are: diversion; roof runoff system; subsurface drains and underground outlets.

NR 151.07 Nutrient Management: All livestock and crop producers that apply manure, commercial fertilizers and/or other forms of nutrients to agricultural fields shall control nutrient runoff into the waters of the state. Adams County Manure Storage Ordinance and Farmland Preservation Participation work toward this goal by requiring NMPs.

Compliance shall be achieved by implementing a nutrient management plan that meets USDA-NRCS 590 Nutrient Management standard.

NR 151.08 Manure Management Prohibitions: All livestock producers shall comply with no overflow from manure storage facilities, no unconfined manure stacks within Water Quality Management Areas, no direct runoff from feedlots and manure storage facilities and no unlimited access of livestock to state waters preventing maintenance of adequate sod cover on the shoreland area.

Compliance shall be achieved by meeting USDA-NRCS design, construction and maintenance standards for waste storage facility, closure of waste impoundments and manure transfer, barnyard runoff system, roof runoff system, sediment basin, subsurface drains, underground outlets, wastewater treatment strip, fencing, access road, cattle crossing, livestock watering facility, prescribed grazing.

3.2 Identification of Priority Farms

Administrative Code ATCP 50.12(2)(f) requires Adams County to identify farms located in the county requiring priority assistance. The Adams County Land and Water Conservation Department (LWCD) shall pick priority farms per the following ranking: (1) landowners who allow unfiltered stormwater runoff into state waters; (2) those farms that have converted forested areas into agricultural crop production; (3) newly developed farms, irrigated fields; (4) farms in high nitrate well contamination areas; (5) Farmland Preservation Program participants that come out of compliance with pollution controls; and (6) farms located in 9KE plan watersheds or TMDL subbasins with high phosphorus loading or TP impairment.

Newly converted, irrigated agricultural fields will be another area of focus due to the intensive tillage and crop management that contributes to wind erosion issue. As per NR 151.09 implementation and enforcement procedures for cropland performance standards the newly converted cropland will require a nutrient management plan that is updated annually to meet the NR 151.07 standards. Several thousand acres have been converted since the October 1st 2002 deadline and these cropped fields will be evaluated by the Adams LWCD during the implementation of this plan and continue as deforestation occurs. The Wind Erosion Prediction System (WEPS) model will be used to assess the impacts of agricultural crop production on the lands within Adams County and utilized to soil loss calculations to address nutrient loading via wind transported sediment as external loading to water bodies, especially 303(d) listed waters. Nutrient management plans will also be identified as a priority for new CAFO's. CAFO nutrient management plans fall within NR243 for the years manure is applied and then NR 151 Agricultural Performance Standards specifically NR 151.02 and NR 151.07 will be areas of emphasis for the years when manure is not being applied to reduce the impact of nutrients reaching the ground water and surface waters in Adams County. Areas with high nitrate well contaminations areas will be an area of focus for assessing compliance with the NR 151 agricultural standards and prohibitions.

3.3 Compliance Determination

Adams County LWCD has completed compliance determination in the Adams County portion of 14 Mile Creek and Mason Lake subwatersheds. Mason Lake, located within the Neenah Creek Watershed has been identified as an area which needs to have a "social assessment" conducted to identify if more water quality issues can be addressed and if there is an interest by the agricultural and riparian landowners to move toward a more focused environmental assessment and water quality monitoring program to address the 303(d) impaired waters and TMDL nutrient reduction goals. Continual assessment and evaluation for water quality shall occur throughout Adams County over the next 5 years.

Utilizing current staff and meeting other department workload demands, we anticipate contacting 50 landowners per year who operate farms within TMDL sub-basins or nine-key element watersheds to determine compliance in the following order:

1. Fourteen Mile Creek.
2. Neenah Creek Watershed/Mason Lake
3. Duck Creek/Plainville Watershed;
4. Big Roche A Cri Watershed; and
5. Little Roche A Cri Watershed.

The above order for compliance determination was selected based upon the amount of land that is actively managed for agricultural production and has been identified as an area of concern due to deforestation and conversion into agricultural crop production or intensive crop rotations and irrigation.

Complaints filed stating a farm is in violation of the NR 151 Performance Standards will become priority and an on-site visit to determine compliance will occur immediately.

After completing a visit, the producer will receive from the Adams County LWCD a letter containing the status of compliance, instructions for appeals and suggested measures needed for compliance. Adams County LWCD goal is to utilize our Global Position System (GPS) to record compliance. The Department staff will record data on the GPS and transfer the data to a geo-database to produce reports and maps.

Utilizing current staff and meeting other department workload demands, we anticipate contacting 50 landowners per year to determine compliance. We estimate it will take 5 years to inventory all the agricultural producers in Adams County.

3.4 Compliance Assistance

Adams County LWCD will provide technical and financial assistance to landowners for the purpose of installing hard and soft practices to meet NR151 requirements. Adams County LWCD will utilize financial assistance from DATCP, WDNR and USDA-NRCS to provide the landowners with an offer of cost-share to help them comply with NR 151 standards and prohibitions.

3.5 Enforcement

Enforcement will be coordinated with the Wisconsin DNR Non-point Source Coordinator for Adams County. A working agreement will be developed with the WDNR to define roles and implementation strategies for compliance with the performance standards and prohibitions to ensure a seamless and efficient approach. This agreement will eliminate duplication of efforts and develop a line of communication for managing NR 151 violations. If an agricultural producer chooses to remain in noncompliance or refuses financial assistance for compliance, the Adams County LWCD will forward all violation information to DATCP and WDNR and will notify the agricultural producer by registered mail they may be subject to an enforcement action pursuant to NR 151.09.

Adams County has adopted Animal Waste Management and Stormwater Management Ordinances. The Animal Waste Management Ordinance pertains to NR151.09, NR151.095 and ATCP 50.08, which regulates the location, design, construction, installation, alteration, closure, and use of animal waste storage facilities at the county level. The Stormwater Runoff Ordinance will define the regulation of cropland erosion such as sheet, rill and gully erosion due to concentrated storm events. This ordinance will help provide authority for Adams County LWCD to require NR151 compliance for NR 151.02 for Sheet, rill and gully erosion, but Adams County also needs to address wind erosion issues. NR 151.03 - tillage setback will be addressed by the Stormwater Runoff Ordinance as well as NR 151.06 clean water diversions.

ACCOMPLISHMENTS AND INITIATIVES
Chapter 4

DATCP uses annual county work plans to guide conservation efforts and manage soil and water resources. Annual work plans must align with the goals of the County Land and Water Resource Management Plan. The work plans outline specific activities, benchmarks, and performance measures related to soil and water conservation, farmland preservation, and estimate staff & funding costs related to implementation.

This section does two things: 1) summarizes Adams County's annual work plans submitted to DATCP from 2016-2025; and 2) describes what initiatives are planned for the next 10 years (2026-2035).

4.1 Information and Education

Accomplishments

Throughout the past 10 years, the Land and Water Department has been involved in the statewide Youth Education Poster Contest, where we present information on a conservation concern to classrooms, and students design posters that are then submitted to a statewide contest on youth conservation efforts. The department has also taken the lead on a student based "Conservation Field Day" where several stations are established that represent the pillars of conservation to teach students about the efforts taking place on the land and on the water. Adams County hosted a Nutrient Management Workshop in 2022 where we invited local producers to come, learn, and write their own nutrient management plans and get them involved with the available cost-share opportunities that come with an approved plan. This workshop resulted in 9 additional Nutrient Management Plans being adopted in Adams County.

The Adams County LWCD takes part in the Adams County Fair each year, providing an informative and interactive booth to showcase what is occurring on the landscape, and what available resources there are for all landowners to help. This booth increases awareness of specific threats (e.g., invasive species, climate change, etc.) on wildlife species, habitats, forestlands, and croplands with an emphasis on how the threats can be reduced.

Adams County has been a key contributor to providing essential knowledge and skills for understanding and managing the central sands area of Wisconsin. Information and Education strategies are an integral part of this plan and Adams County's soil and water conservation programs. Educational opportunities for youth and property owners are necessary to heighten awareness about protecting and enhancing the land and water resources they enjoy daily.

Based on limited success of various education strategies in the 2016-2025 Work Plans, a different educational strategy will be utilized through 2035, such as working with the Extension office and DATCP to provide articles and promote conservation practices; participating in local lake district/association meetings, attending watershed group meetings, and producer/agricultural group meetings to inform them of resources the LWCD can provide. The information will explain cost share opportunities that are broadly available to all types of landowners, including hobby farmers and riparian landowners. Newsletters and information packets may be

mailed out to those that are interested in environmental issues throughout the county, inserted into widely distributed newspapers, or posted on town bulletin boards and lake organization web sites. Other possible educational strategies include creating new brochures and holding workshops.

Initiatives

Information and education strategies play a fundamental role in this plan and in Adams County's conservation programs. Educational opportunities for youth and property owners need to remain available to create and maintain a heightened awareness of the importance of resource protection, enhancement and stewardship. Many of the objectives in the work plan emphasize educational strategies like social media posts, giving presentations, training and workshops that are offered to the public, working with the local media, participation in WI Land + Water sponsored youth programs, and distribution of informational brochures. As work plan implementation proceeds the LWCD will adapt how to create additional information and education strategies as needs arise.

There are other general networking activities that are regularly performed by LWCD staff that keep us informed of the latest news and information about conservation which allow us to inform the public, such as: partnering with local and State conservation associations to coordinate a multi-County and/or State approach to conservation programs; planning and coordination of the public information and educational programs of the LWCD, such as hosting youth poster contests, encouraging participation in the annual WI Land + Water Youth Conservation Camps, and award recognition of outstanding conservation stewards and educators. County staff also participate in Golden Sand Resource, Conservation and Development (RC&D) council meetings; our regional Lake Winnebago Land & Water Conservation Association (LWLWCA) meetings; we serve on various committees of the WI Land + Water association; we serve in an advisory capacity for Adams County Lake Alliance (ACLA)); and attend professional conferences that are relevant for our programs.

The Wonderful Waters of Wisconsin

To draw attention to the state's finest waterbodies and surface waters, the Wisconsin DNR launched its Healthy Watersheds, High Quality Waters (HWHQW) initiative in 2021. One goal of this program for the state is to inspire meaningful protection planning for the healthiest waters and watersheds statewide. Predictive modeling completed as part of this initiative resulted in numeric scores and rankings (top 10-30%) for every HUC 12 scale watershed and it identified the highest-quality surface waters in Wisconsin. Detailed information about this initiative can be found on the WDNR website Healthy Watersheds, High-Quality Waters | Protecting Wisconsin's Water Resources | Wisconsin DNR. Maps and tables that list the healthiest waters in Adams County are included in **Attachment F**. Adams County LWCD will use this information to conduct education and outreach to landowners about land conservation opportunities to protect high quality waters and watersheds and meet work plan goal 1.

4.2 Best Management Practices

The LWCD has worked closely with numerous state, federal, and local partners to tailor the Best Management Practices to the sandy soils found across Adams County. Methods to protect our soil and water quality in the central sands include: cover crops, filter strips, nutrient management crop rotations, irrigation management, alongside specific guidelines for forestry and invasive species prevention. For Best Management Practices for sandy soils in Adams County, we focus on improving water and nutrient retention by adding organic matter by the use of cover crops, using strategic irrigation, and carefully managing fertilization. Unique crops in sandy soils, such as potatoes, are handled by consistent watering, mulching to conserve moisture, using split applications of fertilizer, and employing regenerative agriculture techniques such as cover crops to reduce erosion.

Water Quality Monitoring

We have utilized the Citizen Lake Monitoring Network (CLMN) introduced by WDNR for lakes and streams in Adams County. LWCD coordinates and supervises the volunteers, as well as entering the data into the WDNR SWIMS database.

Accomplishments – Citizen volunteers on 20 inland lakes take water quality samples, 3 per year; while Adams LWCD takes a spring ice-out sample on the same lakes within 2 weeks of ice-out. These samples are checked for total phosphorus and chlorophyll-a levels. Tri-Lakes Management District has conducted in-lake water quality monitoring in the Town of Rome through grants which they have received. Water quality samples on Castle Rock and Petenwell lakes are performed collectively by the DNR, the County, and volunteers.

Initiatives – We plan to keep prioritizing water quality monitoring over the next 10 years at a county-wide level.

SWMM Modeling Tool

Adams County will utilize a new (and simplified) SWMM modeling procedure to track pounds of total phosphorus "saved" from entry into surface waters by implementation of various BMPs placed throughout the county. Pounds of total phosphorus will be calculated annually by use of the model for relevant cost share or Healthy Lakes practices and will be reported to DATCP through the annual reporting process. Over time, significant phosphorus loads are saved from entry into surface waters throughout the county by very small installation practices on shorelands. This simple model now allows us to monitor those savings. The model allows managers to report even small amounts of TP savings, with the idea that these savings will accumulate over time and demonstrate that even by small BMP placements, there is an accumulative progression toward higher quality surface water.

Water Quality & Lake Monitoring

Many citizen volunteers monitor our lakes through participation in the Citizen Lake Monitoring Network (CLMN) program. Volunteers continue to collect valuable lake chemistry and water clarity data, and presence/absence data related to aquatic invasive species and native macrophyte growth within the county's lake ecosystems. Adams County supports volunteer monitoring efforts and will continue to encourage lake associations, lake property owners, and lake users to participate in the CLMN program. Adams County will continue to pursue Lake Planning and Protection Grants from the state to fund lake monitoring projects through the county Conservation Department. We strive to complete about 1-2 strategically selected lakes each year for a comprehensive monitoring effort. The comprehensive monitoring program includes completion of five surveys of the lake: aquatic plants, AIS early detection, shoreland habitat, coarse woody habitat, and water quality. Adams County staff will continue to provide this service to monitor water quality.

Proper Well Abandonment & Groundwater Monitoring

We want to increase awareness of the importance of groundwater protection in the county because for most landowners, our groundwater serves as the main drinking water source. To address groundwater protection, management, and education, Adams Conservation staff will continue to properly abandoned wells in the county by use of cost share dollars. The primary purpose in doing so will be to protect county residents and visitors from potential groundwater contamination issues because of open, abandoned wellheads.

The staff will also seek funding for and hold a targeted outreach effort for groundwater monitoring. We will reach out to landowners who own parcels near areas of known septage spreading sites or areas of known waste dumping. We will seek volunteers to test their wells for PFAS or other pollutants like E. coli or nitrates. Once the results are in from the lab, we will share them with the landowners at an educational presentation. Staff will seek assistance from the County Zoning and Public Health Departments as needed to implement the voluntary program with an educational emphasis for residents.

Lake Management

Adams County LWCD coordinates and supervises citizen volunteers to monitor the presence of AIS within the lakes, assist in developing and updating lake management plans that cover topics such as; aquatic plan management recommendations and goals, AIS determinations, recreational management, shoreland and buffer management, educational efforts and other environmental concerns.

Accomplishments – The LWCD completed aquatic plant surveys (point intercept survey) on at least 4 lakes per year to provide information to lake organizations for making management decisions and keeping the lakes eligible for grant processes.

Initiatives – Adams County plans to work with all lake districts/associations in updating their lake management plans and keep utilizing The Healthy Lakes Grant, supplied by the DNR, for riparian buffer restoration as an initiative to enhance resilience of lake ecosystems.

Phosphorus Loading

Nutrient loading can adversely affect water quality by promoting excessive plant and algae growth. In order to reduce nutrient loading by animal waste, all newly installed barnyard systems were evaluated to ensure compliance with the Wastewater Treatment Strip Standard (ATCP 50.94), which requires phosphorus reduction. The LWCD has been working with riparian landowners to implement shoreline buffers replanted with natural vegetation to reduce runoff, control nutrient loading, and prevent erosion.

Accomplishments – Adams County developed a nine key element watershed-based plan for the 14-mile creek watershed in 2020. A main focus of this plan is to reduce nitrogen and phosphorus loading within the watershed using various cropland conservation practices and make progress towards Wisconsin River TMDL P reduction goals. Adams County has also been a key partner in establishing two Producer Led Watershed Groups, Farmers of the 14 Mile and Farmers of the Roche-A-Cri, supporting the groups as their fiscal agents.

Initiatives – Adams County plans to use monitoring programs, source tracking, agricultural BMP's, research and innovation, and collaboration and partnership initiatives to effectively manage phosphorus loading and improve water quality.

Phosphorus Loading & Nutrient Management

Phosphorus loading can adversely affect water quality by promoting excessive plant and algae growth. To reduce nutrient loading by animal waste, any newly installed barnyard systems will be evaluated to ensure compliance with STEPL calculations, which will require annual phosphorus runoff reductions.

In cooperation with DATCP and NRCS, Adams County will monitor and measure nutrient management progress by tracking nutrient management plan checklists for the acreage with the planner (NRCS or an individual), and by annual tracking of nutrient management plans.

All the methods outlined above can relate to each other since phosphorus loading will be noticed when monitoring water quality. If there is phosphorus loading, then a nutrient management plan can be developed. If citizen lake monitoring and evaluation is not working, then more volunteers will be necessary to increase water quality testing. Nutrient management will be accomplished by monitoring the 5 R's which are: right source, right rate, right time, right place, and with the right technology or irrigation method. These steps ensure nutrients are used effectively to meet crop needs while minimizing waste and environmental impact.

Nutrient Management

Accomplishments – In cooperation with DATCP, Adams County has monitored and measured nutrient management adoption and progress by tracking nutrient management plan checklists annually for the acreage with the planner. The department has lacked performing periodic plan reviews to monitor compliance with soil tests levels, but have been working with other counties and DATCP on how to proceed with a protocol to ensure we are making the best effort that unnecessary nutrients are not reaching out ground and surface waters. This process may also include DNR NPS staff over the next ten years. We have assisted them in selecting species appropriate for the climate and soil type, and managed planting and termination carefully, and using them in conjunction with nutrient management strategies, such as using them after manure application to capture residual nutrients. As of 2024, 58% of the cropland acres in Adams County (45,000 acres) have a nutrient management plan.

Initiatives – Farmer training will be conducted for landowners to develop their own nutrient management plans on the most current SNAP Plus database. One-on-one farmer training will be conducted, if requested, to update farmer developed plans. We have/will keep reaching out to several large-scale producers to cost-share non-cash crops to improve soil health, prevent erosion, and reduce nutrient loss during the non-crop period.

Forestry

Accomplishments – Through the Adams County Comprehensive Land Use Plan (15-year Plan), we have evaluated practices that minimize the impact of timber harvests on water resources on County Forest Land. Before harvests, we identify water resources and erosion concerns. We have strategic placement of logging roads to avoid sensitive areas, using proper techniques for stream and wetland crossings. We establish riparian management zones and our management limits invasives being reintroduced.

Initiatives – We will continue practicing sustainable forest management by updating our comprehensive plans that balance ecological, economic, and social objectives that meet standards through certifications such as the Sustainable Forestry Initiative (SFI). We will also be taking climate change mitigation and adaptation into account by participating in carbon trading markets by implementing practices that enhance carbon storage in forests.

AIS / TIS Prevention Projects

Adams County Conservation will continue efforts to prevent (and contain the spread of) aquatic invasive species. We will strive to secure annual funds to continue and improve our prevention efforts regarding both aquatic and terrestrial invasive species. We will continue to engage in prevention activities throughout the life of this plan, such as our CB/CW training events. For the 2026 field season, we have additional AIS and TIS prevention projects as described below.

The latest prevention project involves looking into a water pressure washing station that will be placed at strategically selected boat landings in the county (Decontamination). Offering this equipment, decontamination washing at lakes throughout the open water season, would lessen the potential spread of harmful species to neighboring waterbodies.

We also place high priority to containing further spread of terrestrial invasive species (TIS). In partnership with Central Wisconsin Invasive Partnership (CWIP), we will embark on a multi-tiered educational campaign to increase public awareness of TIS such as Phagmites, knotweeds, and purple loosestrife. We will create easy to understand brochures about these species so that people are aware of what they look like and how to reduce their spread. Workshops will be held throughout the busy summer season (when tourists and visitors are here). The third approach to this prevention effort will be to engage our County Highway Department crew in training for identification and proper equipment cleaning to manage further spread along roadways.

4.3 NR 151 Performance Standards and Prohibitions

Wisconsin adopted revised NR 151 administrative rules in 2011 (fact sheets in **Attachment F**), which set statewide performance standards and prohibitions for all Wisconsin farms. All Wisconsin farmers must follow these standards and prohibitions. Adams County offers reimbursement cost-share funding to landowners to help offset the total cost of implementing practices on the land that move them toward compliance with these standards. Some state and local programs may require compliance whether cost-share funds are available or not. A listing of the standards is as follows.

Agricultural Performance Standards

- Sheet, rill and wind erosion: All cropped fields shall meet the tolerable (T) soil erosion rate established for that soil.
- Tillage setback: No tillage operations may be conducted within 5 feet of the top of the channel of surface waters.
- Phosphorus index: Croplands, pastures, and winter grazing areas shall average a phosphorus index of 6 or less over the accounting period and may not exceed a phosphorus index of 12 in any individual year within the accounting period.
- Manure storage facilities: All new, substantially altered, or abandoned manure storage facilities shall be constructed, maintained or abandoned in accordance with accepted standards. Failing and leaking existing facilities posing an imminent threat to public health or fish and aquatic life or violate groundwater standards shall be upgraded or replaced.

- Process wastewater handling: There may be no significant discharge of process wastewater to waters of the state.
- Clean water diversions: Runoff from agricultural buildings and fields shall be diverted away from contacting feedlots, manure storage areas and barnyards located within water quality management areas (300 feet from a stream or 1,000 feet from a lake or areas susceptible to groundwater contamination).
- Nutrient management: Agricultural operations applying nutrients to agricultural fields shall do so according to a nutrient management plan.

Accomplishments – Adams County has completed multiple projects relative to clean water diversions including buffer strips, rain gardens, and assisting with wetland restoration.

Initiatives – Adams County will continue working with the Central Wisconsin Windshed Partnership in implementing windbreaks for wind erosion and partnering that with supporting cover crops and conservation tillage to enhance vegetative cover and improve soil health and agricultural productivity.

WEPS Modeling Tool

The Wind Erosion Prediction System (WEPS) modeling tool predicts many forms of soil erosion by wind using a process-based, continuous, daily time-step model that simulates weather, field conditions, crop growth, and hydrology. Adams County will utilize this WEPS tool to align with the County's goal of reducing soil loss from wind erosion.

Manure Management Prohibitions

- No overflow of manure storage facilities.
- No unconfined manure piles in a water quality management area.
- No direct runoff from feedlots or stored manure into state waters.
- No unlimited livestock access to waters of the state in locations where high concentrations of animals prevent the maintenance of adequate or self–sustaining vegetative cover.

Accomplishments – Adams County has worked with several farmers in managing their manure pits, and installing practices such as gutter systems and mound systems to manage manure issues.

Initiatives – Adams County will continue working with local producers and DATCP Engineers to plan, design, and implement practices that will prevent unnecessary manure from reaching our surface waters.

Implementation Strategies for
Agricultural Performance Standards and Prohibitions

For a listing of all relevant conservation practices to achieve compliance with Agricultural and Non-Agricultural performance standards and prohibitions and to address water quality and soil erosion issues, refer to **Attachment G**.

A. Cost-share program funding to minimize nonpoint source pollution: The program is designed to conserve Wisconsin's soil and water resources, reduce soil erosion, prevent nonpoint source pollution and enhance water quality. The LWCD offers a cost-share program for County landowners through ATCP 50 SWRM grant funding. The primary emphasis of the program continues to be implementation of shoreland stabilization practices and restoration of native vegetation to reestablish riparian buffer areas (including WQMAs), and to reduce soil erosion by installing erosion control practices. As part of the ATCP 50 SWRM grant funding, Segregated Funds are also used for providing cost-share grants to farmers for implementing nutrient management plans and related conservation practices (e.g., cover crops).

B. County land and water resource management plans are the local mechanism to implement NR 151 performance standards and prohibitions. The Wisconsin Legislature amended State statutes (through Act 27) to allow counties to develop implementation strategies for addressing water quality priorities that relate to erosion, sedimentation, and nonpoint source (NPS) water pollution.

   Landowners who request technical assistance will be the most common method used to promote soil conservation in Adams County. County conservation staff will continue to distribute educational brochures that review best management practices (BMPs) most suited to reduce soil erosion and slow down stormwater runoff.

   All Cranberry operators in Adams County follow the nutrient management plan standard. County Conservation partners with the local NRCS office to determine if these operators remain in compliance on an annual basis.

   Animal waste is generally not a pollution concern due to the relatively low number and size of livestock operations in this county. Yet small-scale farms of horse, goat, and beef cattle do exist and the county offers priority cost-share assistance to these landowners so that they may be in compliance with manure management prohibitions.

C. Farmland Preservation Plan (FPP): Conservation plans, which plan individual crop fields to the tolerable soil loss rate or "T", are prepared for participants in the Farmland Preservation Program. To meet farmland preservation compliance requirements landowners must meet revenue and residency requirements, comply with state soil and water conservation standards, have valid farmland preservation agreement, and obtain a certificate of compliance from the county. There are currently over 2,600 acres enrolled in FPP that are in compliance Participation in the tax incentive program has been on the rise in Adams County. Participation in the tax incentive program is voluntary and completed through an individual agreement process. During the most recent revision to the Farmland Preservation Plan, there are many large and small scale producers in the appropriate zoning areas

identified in Adams County. The Land and Water Conservation Department will continue to manage future agreements for the Farmland Preservation Program.

D. Management of croplands is the usual focus of Land and Water Resource Management plans because soil erosion is a vitally important resource concern. Adams County's largest crop is timber followed by vegetable crops. Implementation of forestry BMPs is a land-based resource focus. The Adams County Land and Water Department administers the County Forest Comprehensive Land Use Plan 2021-2035 (§28.11, Wis Stats.), which addresses erosion on county forest lands. The WDNR oversees the creation of private forest management plans when landowners enroll their land in the Managed Forest Law (MFL) program to receive a low pre-set property tax rate per acre. The LWCD will offer cost-share assistance for landowners residing in water quality management areas (WQMAs), and highly erodible lands draining to outstanding and exceptional resource waters in Adams County.

E. The Adams County Land and Water Conservation Department (LWCD) shall pick priority farms per the following ranking:
   (1) landowners who allow unfiltered stormwater runoff into state waters;
   (2) those farms that have converted forested areas into agricultural crop production;
   (3) newly developed farms, irrigated fields;
   (4) farms in high nitrate well contamination areas;
   (5) Farmland Preservation Program participants that come out of compliance with pollution controls; and
   (6) farms located in 9KE plan watersheds or TMDL subbasins with high phosphorus loading or TP impairment.

Implementation Strategies for
Non-Agricultural Performance Standards and Prohibitions

For a listing of all relevant conservation practices to achieve compliance with Agricultural and Non-Agricultural performance standards and prohibitions and to address water quality and soil erosion issues, refer to **Attachment G**.

Beach Monitoring: A beach monitoring program has been created by the Adams County Public Health Department in response to public health and other environmental concerns over the levels of total coliform bacteria and *E. coli* in area surface waters.

Accomplishments – Monitoring work for this program is accomplished by lake organizations, public health officials, land and water employees, and others to make sure that recreational beaches are safe for public use. Protocols have been developed to close heavily polluted beaches until concerning levels decrease and are safe for use.

Initiatives – Adams County Land & Water will continue sampling 7 lakes in Wisconsin while educating and supporting other lake districts to take part in E.coli sampling for the health and safety of the public.

Land Disturbances: Construction site erosion and uncontrolled stormwater runoff from land disturbing and land development activities can have significant adverse effects on nearby surface water resources; the health, safety and general welfare of the community; and can diminish public enjoyment of recreational areas.

Land Disturbance Activities Subject to Stormwater Management and Erosion Control:
All activities directly related to the planting, growing, and harvesting of agricultural crops are not considered land disturbance activities under this section. Land disturbance activities to the shoreland zone are regulated by the Adams County Zoning and Shoreland Protection Ordinance. Adams County also requires new businesses to address erosion control and stormwater management through Administrative Review permits and Conditional Use permits.

Accomplishments – Adams County has worked with several construction companies, wireless infrastructure operators, and private businesses for public opportunity in building stormwater management plans and approving permits when needed.

Initiatives – Adams County will work with private and public sectors in implementing green infrastructure like rain gardens by using structural best management practices such as infiltration basins and bioretention areas. We will also look into adopting policy-driven and community-focused programs geared towards public education.

Standards for Stormwater Management and Erosion Control:
Stormwater runoff, soil erosion, siltation, or sedimentation from all land disturbing and development activities shall meet standards in NR 151 and NR 216, Wis. Adm. Code and/or shall be controlled in accordance with Technical Guidelines as developed by the U.S. Department of Agriculture, Natural Resources Conservation Service, or the Wisconsin Department of Natural Resources. Land disturbing activities related to non-metallic mining must remain in compliance with NR 135 and Wis. Stats. 283.33, which may require stormwater discharge permits, stormwater pollution prevention plan (SWPPP), or certified reclamation plans.

Accomplishments – Adams County has worked with 10 mines over the past 10 years in making sure reclamation plans are accurate and up to date with the amount of acres affected in land disturbance.

Initiatives – Adams County will work with all mines within the county, with each encouraged to write up a SWPPP that identifies potential pollution sources and outlines procedures to minimize and control stormwater runoff pollution.

Performance Standards and Prohibitions Monitoring and Evaluation

County staff regularly visit landowner parcels through voluntary requests. Conservation staff evaluate the land conditions for each site (pre and post project install), along with the DATCP Conservation Engineer. This formal evaluation of practices installed assures us that our designed plans were adhered to during construction and that WI Construction Specifications were followed. Following BMP installation, the site goes on our list for conducting compliance checks within 10 years of project completion. Conservation staff visit a minimum of six, randomly selected "past" project sites to check on the efficacy of the practice(s), ensure that the landowner is adhering to their contract requirements, and to discuss any further water quality or erosion problems that we may see at the site. The landowner then receives a follow up letter that describes the site visit and addresses any issues that were discovered during the compliance check.

4.4 Civic Action

Through civic action, we advocate to support conservation laws, policies, and funding by contacting governmental representatives to showcase the importance of each unique situation, and participate in town hall meetings to voice environmental concerns.

4.5 Cooperation and Administration

The LWCD staff seeks cooperation from and works closely with a diverse group of agencies, associations, and organizations involved in resource management and protection in Adams County. These agencies and groups include: United States Department of Agriculture – Farm Service Agency (FSA), Natural Resource Conservation Service (NRCS), Animal and Plant Health Inspection Service – Wildlife Services (APHIS-WS), and United States Forest Service (USFS); Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP); Wisconsin Department of Natural Resources (WDNR) staff such as Water Resources Management Specialists, Fisheries Biologists, Water Regulations and Zoning Specialists, Water Program Management staff, Watershed Management Staff, Invasive Species Management staff, and Forestry staff; Army Corp of Engineers, University of Wisconsin – Extension Lakes; County Mapping, Public Health, Zoning, Emergency Management, and Highway Departments; individual Adams County Lake Organizations; Adams County Lake Alliance, Adams County Farm Bureau, and Wisconsin Lakes (WL).

Each agency, organization, association, and individual has its individual resource issues, programs, and plans; but cooperatively we can work together for the greater good of Adams County's land and water resources.

GOALS AND OBJECTIVES 2026-2035
Chapter 5

These goals and objectives were identified by the Resource Advisory Committee to guide development of annual LWCD work plans over the next ten years (2026-2035). The LWCD along with agency partners will implement the action items listed in the annual work plans as staff and funding are available.

The goals and objectives are listed below in priority order as determined by the Adams County Land and Water Conservation Committee in association with recommendations from the Resource Advisory Committee.

Goal 1: Create a culture where landowners take ownership of their impact on the environment.

- Objective 1.1 Provide training sessions for agricultural producers to develop and implement nutrient management plans.
- Objective 1.2 Provide information on sustainable land management and water resources management to producers.
- Objective 1.3 Continue to assist building relationships with producers and lakeshore owners and educate them on their impacts within the watershed.

Goal 2: Protect and improve groundwater quality and quantity as well as surface water quality.

- Objective 2.1 Implement 9KE plan county wide & support local watershed groups.
- Objective 2.2 Monitor water quality and collect data to identify potential sources of contamination.
- Objective 2.3 Protect groundwater from contamination by providing technical assistance.

Goal 3: Reduce wind erosion.

- Objective 3.1 Reduce wind erosion, and utilize models to gain knowledge and install conservation practices to reduce sedimentation into streams and lakes within the county.
- Objective 3.2 Provide funding for BMPs to reduce soil loss and develop tracking methods to document the reductions.
- Objective 3.3 Reduce erosion and habitat degradation caused by trail use (e.g., recreational vehicles, logging roads, and producer harvest paths).

Goal 4: Engage and support our local youth in conservation efforts.

- Objective 4.1. Attend, present, and encourage local 4H chapters on conservation efforts.
- Objective 4.2. Invite students to field days to learn hands-on activities that they can take part in outside of the classroom.

Goal 5: No net loss of existing wetlands.

Objective 5.1 Protect natural wetlands from threats such as draining, filling, and other forms of development to maintain their current conditions.

Objective 5.2 Restore degraded wetlands to their ecological health and improve their functions.

Objective 5.3 Replace lost wetlands in agricultural landscapes to improve water quality.

Goal 6: Promote working forests.

Objective 6.1 Maintain economically viable forests.

Objective 6.2 Improve forest management to control sediment, erosion and protect habitat cover types.

Objective 6.3 Acquire and preserve additional acres to be added to the county forest program.

Work Plan Progress Assessment

The Adams County LWRM plan is intended to be a reference document with the annual work plans updated accordingly based on intentions laid out in the LWRM plan. An annual assessment of the Land and Water Resource Management Workplan will be implemented by both quantifiable and qualifying means to determine the overall accomplishments or specific successes of a given objective or activity. Because program accomplishments do not always lend themselves to specific measurable units, there will be observations made and conclusions drawn as to forward progress. Quantifiable tracking measures will be assessed annually and in instances of longer-term activities or programs that do not dictate a means to measure numerically (On-Going or As Needed), activity progress will be measured by qualifying means. For example, as time progresses, some of the objectives will be illustrated by a percentage (%) of the total goal met, the specific number of trained volunteers, or whether a program was successful by certain behaviors occurring (or NOT occurring) within the public sector.

All ATCP 50 BMPs placed on the land are logged in an on-going spreadsheet. Conservation staff tracks the annual implementation of practices and reports that progress to DATCP. Timely annual reporting of workplan accomplishments to DATCP helps to serve as a guide for assessment of our work plan progress.

REGULATIONS AND FUNDING
Chapter 6

This section provides a list of regulations at the state, county, and local levels; identifies the enforcement process the County uses; and provides a list of funding and grant opportunities along with a 10-year budget table.

6.1 Regulations

State: Adams County has relied on the following State regulations for the protection of natural resources:

- Department of Natural Resources – Chapter 30, Wisconsin Statutes – Navigable Waters.
- Department of Natural Resources – Administrative Code NR 102 – Water Quality Standards for Wisconsin Surface Waters.
- Department of Natural Resources – Administrative Code NR 103 – Water Quality Standards for Wetlands.
- Department of Natural Resources – Administrative Code NR 140 – General Groundwater Quality.
- Department of Natural Resources – Wisconsin Pollution Discharge Elimination System Permits.
- Department of Natural Resources – Administrative Code NR 151, Performance Standards.
- Department of Natural Resources – Administration Code NR 216, Storm water Discharge Permits and Construction Site Erosion Control.
- Department of Natural Resources – Administration Code NR 135, Administration of a Non-Metallic Mining Reclamation Program
- Department of Natural Resources – Administration Code NR 107, Aquatic Plant Management. (Page 60).
- Department of Natural Resources – Chapter 29.601, Wisconsin Statutes – Noxious Substances.
- Department of Agriculture, Trade, & Consumer Protection – ATCP 50, Soil and Water Resource Management Program.
- Department of Agriculture, Trade, & Consumer Protection – ATCP 30, Pesticide Product Restrictions, atrazine pesticides. (Page 53)
- Drainage Districts – Dissolution or reinstate per ATCP 48 & Chapter 88.

County: Adams County has a ranking system to improve the distribution of conservation funding and practice implementation on the land:

- Cost Share Program by Ranking Practices to improve the distribution of conservation practice implementation on the land. Each of the cost-sharable conservation practices available to landowners are ranked based on wetland proximity, drainage ditch locations, extremity of project, and impacted waters in relevance to project location.

Local: Local regulations/County Chapters used to protect natural resources in Adams County are:

- Chapter 313 Stormwater Management Ordinance
- Chapter 405 Comprehensive Zoning
- Chapter 130 Agricultural Practices
- Chapter 396 Shoreland, Wetland, and Habitat Protection
- Chapter 245 Mining, Nonmetallic
- Chapter 415 County Forests

6.2 Enforcement Process

It is by Land & Water and UW Extension Committee recommendation that the Ag and Non-Ag Performance Standards continue to be implemented on a voluntary basis in Adams County.

If a site is identified within the county that needs practice implementation because it is located near a WQMA, and the landowner has not voluntarily contacted the Land & Water Conservation Department, the County Conservationist will send a letter to the landowner informing them of the issues and their options to come into compliance with the state standards. If the landowner chooses not to move ahead with any practice implementation activity within 6 months of the first letter, a second letter to the landowner will be sent and copied to the county Corporation Counsel. If no activity commences within 3 months of the second letter, then Adams County will communicate with DNR about enforcement action.

6.3 Funding

Adams County has been successful in attaining funding from a number of sources in the past. During the implementation phase of the following work plan, we intend to continue applying for grants to sustain the current level of staff and project funding. Previous and possible future sources of conservation funding may come from the following:

- NRCS Public Assistance Programs (Wildlife Damage)
- DATCP Soil and Water Resource Management funding
- DNR Surface Water Grant Programs; and AIS Education & Management Programs
- DNR Targeted Runoff Management Program - Small scale non-TMDL projects
- NACD Technical Assistance Grant
- Central Sands Resource Conservation & Development
- Federal / State Government Ecological Protection Funding
- Other funding sources as they may become available

BUDGET ESTIMATE: An annual estimated budget for the 2026-2035 work plans is outlined here. In estimating the budget, it accounts for the County continuing to staff the Land and Water Conservation Department at its current level of 3 full-time equivalent employees. This budget also plans for DATCP and WDNR continuing with existing staffing of local conservation personnel and continuing with existing project funding.

YEAR	COUNTY	DATCP	WDNR	OTHER	TOTAL ESTIMATE
2026	$ 150,000	$ 279,000	$ 15,000	$ 20,000	$ 464,000
2027	$ 152,000	$ 281,000	$ 15,000	$ 20,000	$ 468,000
2028	$ 154,000	$ 283,000	$ 15,000	$ 20,000	$ 472,000
2029	$ 156,000	$ 285,000	$ 15,000	$ 20,000	$ 476,000
2030	$ 158,000	$ 287,000	$ 15,000	$ 20,000	$ 480,000
2031	$ 160,000	$ 289,000	$ 15,000	$ 20,000	$ 484,000
2032	$ 162,000	$ 291,000	$ 15,000	$ 20,000	$ 488,000
2033	$ 164,000	$ 293,000	$ 15,000	$ 20,000	$ 492,000
2034	$ 166,000	$ 295,000	$ 15,000	$ 20,000	$ 496,000
2035	$ 168,000	$ 297,000	$ 15,000	$ 20,000	$ 500,000

GLOSSARY
Chapter 7

303(d) Waters – Also called **impaired waters**. This list identifies waters that do not meet water quality standards, including both water quality criteria for specific substances or their designated uses. It is used as the basis for development of Total Maximum Daily Loads (TMDLs) under the provisions of section 303(d)(1)(C) of the Clean Water Act, U.S. Environmental Protection Agency (EPA). The EPA requires that the DNR update its list every 2 years.

9KE Plan – See **Nine Key Element Watershed Plan**.

Animal Waste Management Program – This regulatory program, administered by the DNR via NR 243, seeks to identify and correct animal waste-related water quality problems.

Animal and Plant Health Inspection Service – Wildlife Services (APHIS-WS) – Part of USDA, APHIS-WS that aids producers in the management of animal crop damage.

Aquatic Invasive Species (AIS) – AIS are aquatic flora or fauna that invade ecosystems beyond their natural, historic range. Their presence may harm native ecosystems or commercial, agricultural, or recreational activities dependent on these ecosystems.

ATCP 50 – The chapter of Wisconsin's Administrative Code that implements the Land and Water Resource Management Program as described in Chapter 92 of the WI Statutes. It identifies those conservation practices that may be used to meet performance standards.

Best Management Practices (BMPs) – The most effective conservation practice or combination of conservation practices for reducing nonpoint source pollution to acceptable levels.

Central Wisconsin Invasives Partnership (CWIP) – CWIP is a multi-agency cooperative weed management unit serving 8 counties in central Wisconsin, including Adams County. CWIPs were created by RC&Ds to educate, manage, and protect against invasive terrestrial plants. CWIP is one of roughly 14 Cooperative Invasive Species Management Areas (CISMAs) across Wisconsin, and there are many more nationwide.

Chapter 92 – Portion of Wisconsin Statutes outlining the soil and water conservation, agricultural shoreland management, and animal waste management laws and policies of the State.

Conservation Plan – A record of decisions and intentions made by land users regarding the conservation of the soil, water and related natural resources of a particular unit of land.

Conservation Reserve Enhancement Program (CREP) – An add-on to the CRP program, which expands and builds on CRP's success in certain areas of the State.

Conservation Reserve Program (CRP) – A provision of the federal Farm Bill that takes eligible cropland out of production and puts it into grass or tree cover for 10-15 years.

Cooperator – A landowner or operator who is working with, or has signed a cooperative agreement with a County LWCC.

Cooperative Weed Management Area (CWMA) – a non-profit group of volunteers working together to plan and implement weed management projects. In Adams County this group is called CWIP – the Central Wisconsin Invasives Partnership.

County Conservationist – County Land and Water Conservation Department head, responsible for implementing programs assigned to the LWCD and for supervising LWCD staff.

Critical Sites – Those sites that are significant sources of nonpoint source pollution upon which best management practices shall be implemented as described in s. 281.65(4)(g) 8.am., WI stats.

Certified Crop Advisors (CCA) or Crop Consultants – Independent crop consultants provide services to growers in integrated crop and farm management programs, working directly with farmers, and advising them in areas such as watershed management, integrated nutrient and pest management, and animal waste management. Their primary purpose is implementing scientific and technological advances to enhance environmental sustainability and profitability on clients' farms.

CWWP – Central Wisconsin Windshed Partnership. The Central Wisconsin Windshield Partnership (CWWP) provides tree planting services, including windbreak and living snow fence design, fabric installation, and a three-year maintenance program. Wildlife habitat development, and public information and education are among the other services offered.

Department of Administration (DOA) – The State agency responsible for establishing the comprehensive planning grant program.

Department of Agriculture, Trade, and Consumer Protection (DATCP) – The State agency responsible for establishing Statewide soil and water conservation policies and administering the State's soil and water conservation programs. The DATCP administers State cost-sharing funds for a variety of LWCC operations, including support for staff, materials and conservation practices. Referred to in the LWRM plan guidelines as the "department."

Department of Natural Resources (DNR) – The State agency responsible for managing State owned lands and protecting public waters. DNR also administers programs to regulate, guide and assist LWCCs, LWCDs and individual land users in managing land, water, fish and wildlife. The DNR administers State cost-sharing funds for priority watershed projects, Targeted Runoff Management (TRM) grants, and Urban Nonpoint Source Construction and Planning grants.

District Conservationist (DC) – NRCS employee responsible for administering federal conservation programs at the local level.

Environmental Protection Agency (EPA) – The agency of the federal government responsible for carrying out the nation's pollution control laws. It provides technical and financial assistance to reduce and control air, water, and land pollution.

Environmental Quality Incentives Program (EQIP) – Federal program to provide technical and cost-sharing assistance to landowners for conservation practices that provide water quality protection.

Extension, University of Wisconsin-Madison (Ext) – Extension's mission is to connect people with the University of Wisconsin=Madison. We teach, learn, lead and serve, transforming lives and communities.

Farm Service Agency (FSA) – USDA agency that administers agricultural assistance programs including price supports, production controls, and conservation cost sharing.

Farmland Preservation Program (FPP) – A DATCP land-use program under Chapter 91, Wisconsin Statutes, that helps preserve farmland through local planning and zoning, promotes soil and water conservation, and provides State tax relief to participating landowners.

Forest Crop Law (FCL) – FCL is a landowner incentive program that encourages long-term, sustainable management of private woodlands. The FCL program was enacted in 1927, and enrollment was closed on January 1, 1986. MFL took its place in 1986.

Geographic Information System (GIS) – A computerized system of maps and layers of data about land including soils, land cover, topography, field boundaries, roads and streams. Such geographically based data layers improve the ability to analyze complex data for decision making.

Highway (Hwy) – The Highway Department of Adams County.

HUC 12 – Hydrologic unit code (HUC) consisting of several numbered digits based on the classification in the hydrologic unit system. HUC 12 is a more local sub-watershed level (12 numbered digits) that captures tributary systems.

Impaired Waters – See **303(d) Waters**.

Land and Water Conservation Board (LWCB) – This statewide board is composed of three local elected officials; four appointed by the Governor (one shall be a resident of a city with a population of 50,000 or more; one shall represent a governmental unit involved in river management; one shall be a farmer; and one shall be a member of a charitable corporation, charitable association or charitable trust; and leaders from DNR, DATCP, and DOA. The LWCB oversees the approval of County land and water management plans (s.92.04, stats.).

Land and Water Resource Management Plan (LWRM plan) – A locally developed and implemented multi-year strategic plan with an emphasis on partnerships and program integration. The plan includes a resource assessment, identifies the applicable performance standards and related control of pollution from nonpoint sources, identifies a multi-year description of planned activities, establishes a progress tracking system, and describes an approach for coordinating information and implementation programs with other local, State and federal agencies, communities and organization (s. ATCP 50.12).

Land and Water Conservation Committee (LWCC) – The unit of County government empowered, by Chapter 92 of the Wisconsin Statutes, to conserve and protect the County's soil, water and related natural resources. Referred to in the LWRM guidelines as the "committee."

Land and Water Conservation Department (LWCD) – The department of County government responsible for administering the conservation programs and policies of the Land and Water Conservation Committee.

Light Detection and Ranging (LiDAR) – A remote sensing technology that measures distance by illuminating a target with a laser and analyzing the reflected light.

Limited Term Employee (LTE) – Limited term employees are those persons who are hired to perform a grouping of duties and responsibilities on a seasonal basis. LTE positions are temporary in nature and the conditions for these appointments do not provide for permanent employment status.

List of Impaired Waters – Also called **303(d) Waters.** This list identifies surface waters that are not meeting water quality standards, including both water quality criteria for specific substances and the designated uses. It is used as the basis for development of Total Maximum Daily Loads (TMDLs) under the provisions of section 303(d)(1)(C) of the Clean Water Act, U.S. Environmental Protection Agency (EPA). The EPA requires that the DNR update its list every 2 years.

Managed Forest Law (MFL) – This DNR program is a landowner incentive program that encourages sustainable forestry on private woodland. In exchange for following sound forest management, the landowner pays reduced property taxes. It was enacted in 1985 and replaced the Woodland Tax Law and the Forest Crop Law.

Natural Resources Conservation Service (NRCS) – Part of USDA, NRCS provides soil survey, conservation planning and technical assistance to local land users.

Nine Key Element Watershed Plan (9KE Plan) – Watershed plans consistent with EPA's nine key elements provide a framework for improving water quality in a holistic manner within a geographic watershed. The nine elements help assess the contributing causes and sources of nonpoint source pollution, involve key stakeholders and prioritize restoration and protection strategies to address water quality problems.

Nonpoint Source Pollution (NPS) – Pollution from many small or diffuse urban and rural sources. Livestock waste finding its way into a stream and causing water pollution is an example of non-point source pollution.

Nonpoint Source Pollution Abatement Program – A DNR water quality program under Chapters 120 and 281, Wisconsin Statutes, that provides technical assistance and cost-sharing to landowners to develop and maintain management practices to prevent or reduce nonpoint source water pollution in designated watersheds.

North Central Conservancy Trust (NCCT) – The North Central Conservancy Trust is a non-profit organization whose mission is to protect the worthy, scenic, working lands and environmental resources for the benefit of the people of Central Wisconsin. The NCCT is based in Stevens-Point, WI.

North Central Wisconsin Regional Planning Commission (NCWRPC) – A voluntary association of governments established in 1973 under Wisconsin Statute §66.0309, to provide: economic development, geographic information systems (GIS), intergovernmental cooperation, land use, and transportation services to member communities.

NR 115 – DNR's administrative code that requires counties to adopt DNR's minimum shoreland zoning standards to limit the direct and cumulative impacts of shoreland development on water quality; near-shore aquatic, wetland and upland wildlife habitat; and natural scenic beauty.

NR 151 – DNR's administrative code that establishes runoff pollution performance standards for non-agricultural facilities and transportation facilities and performance standards and prohibitions for agricultural facilities and practices designed to meet water quality standards.

NR 216 – DNR's administrative code to minimize the discharge of pollutants carried by storm water runoff from certain industrial facilities, construction sites and municipal separate storm sewer systems (MS4s).

Nutrient Management Plan – The Nutrient Management Plan means any of the following: (a) A plan required under s. ATCP 50.04 (3) or 50.62 (5) (f). (b) A farm nutrient plan prepared or approved, for a landowner, by a qualified nutrient management planner.

Office of Economic Advisors (OEA) – This Office is within the Wisconsin Department of Workforce Development (WDWD) and they create countywide workforce profiles.

Outstanding Resource Waters/Exceptional Resource Waters (ORW/ERW) – DNR classifies streams as Outstanding Resource Waters (ORW) and Exceptional Resource Waters (ERW) as listed in NR 102.10 and NR 102.11. ORW waters have excellent water quality and high-quality fisheries and do not receive wastewater discharges. ERW waters have excellent water quality and valued fisheries but may already receive wastewater discharges.

PACRS – Petenwell and Castle Rock Stewards lake organization.

Parks – Adams County Parks Department.

P&Z – Planning and Zoning Department in Adams County.

Priority Farms – Farms identified by the County for having excessive runoff from soil erosion and/or manure resulting in existing or potential water quality problems.

Producer-Led Watershed Group – An organized collection of at least five farmers within a specific watershed who work together to improve soil and water quality. (Farmers of the Fourteen Mile, Farmers of the Roche-a-Cri).

Resource Conservation and Development (RC&D) – Adams County is one of 12 counties in the Golden Sands RC&D Council.

Resource Advisory Group (RAG) – This is the advisory group that was assembled for this land and water resource management plan. RAG members are identified on the back of the cover under Acknowledgements.

Revised Universal Soil Loss Equation 2 (RUSLE2) – The "Revised Universal Soil Loss Equation 2" (RUSLE2) is an advanced computer-based model used to estimate soil erosion rates, particularly focusing on rill erosion, across various land types, by taking into account factors like vegetation cover, slope characteristics, and soil properties, allowing for more accurate predictions compared to its predecessor, RUSLE, especially on complex slopes where deposition can occur; it is primarily used for conservation planning and sediment yield calculations. This model was created and maintained by USDA Agricultural Research Service.

Shall – The term “shall” in the guideline represents components of a LWRM plan that are required in law and rule.

Soil and Water Resource Management Program (SWRM) – DATCP program that provides counties with funds to hire and support Land and Water Conservation Department staff and to assist land users in implementing DATCP conservation programs (ATCP 50).

Soil Loss Tolerance (“T”) – Erosion rate in tons per acre per year of soil that a field could lose and still maintain productivity.

Soil Survey – NRCS conducts the National Cooperative Soil Survey and publishes soil survey reports. Soils data is designed to evaluate the potential of the soil and management needed for maximum food and fiber production.

State Natural Area (SNA) – State natural areas (SNAs) protect outstanding examples of Wisconsin's native landscape of natural communities, significant geological formations and archeological sites.

Spreadsheet Tool for Estimating Pollutant Load (STEPL) – a management tool to estimate phosphorus load reductions on the landscape over a given year.

Storm Water Management Model (SWMM) – SWMM is a dynamic rainfall-runoff-routing simulation tool for designing and analyzing stormwater and sanitary sewer systems.

Surface Water Integrated Monitoring System (SWIMS) – SWIMS is the WDNR's repository for water and sediment monitoring data collected for Clean Water Act work and is the source of data sharing through the federal Water Quality Exchange Network.

Total phosphorus (TP) is a way to measure phosphorus in lakes, because it includes both ortho-phosphate and the phosphorus in plant and animal fragments suspended in lake water.

Terrestrial Invasive Species (TIS) – TIS are non-native plants, animals and other organisms that evolved to live on the land.

Total Maximum Daily Load (TMDL) – A Total Maximum Daily Load is a regulatory term in the U.S. Clean Water Act, describing a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

Targeted Runoff Management (TRM) – The Targeted Runoff Management (TRM) Grant Program offers competitive grants for local governments for the control of pollution that comes from diffuse sources, also called "nonpoint source (NPS)" pollution.

United States Department of Agriculture (USDA) – Branch of federal government with responsibilities in the areas of food production, inspection, and storage. Agencies with resource conservation programs and responsibilities, such as FSA, NRCS, APHIS-WS, and Forest Service and others are agencies of the USDA.

University of Wisconsin-Extension – See **Extension**.

Water Quality Management Area (WQMA) – The area within 1,000 feet from the ordinary high water mark of navigable waters that consist of a lake, pond or flowage, except that, for a navigable water that is a glacial pothole lake, the term means the area within 1,000 feet from the high water mark of the lake; the area within 300 feet from the ordinary high water mark of navigable waters that consist of a river or stream; and a site that is susceptible to groundwater contamination, or that has the potential to be a direct conduit for contamination to reach groundwater.

Watershed – (Also see **HUC 12**) The geographic area that drains to a particular river, stream, or water body providing its water supply.

Wind Erosion Prediction System (WEPS) – The Wind Erosion Prediction System (WEPS) modeling tool predicts many forms of soil erosion by wind using a process-based, continuous, daily time-step model that simulates weather, field conditions, crop growth, and hydrology.

Wetlands Reserve Program (WRP) – A provision of the federal Farm Bill that compensates landowners for voluntarily restoring and protecting wetlands on their property.

Wildlife Habitat Incentives Program (WHIP) – Federal program to help improve wildlife habitat on private lands.

Wisconsin Lakes (WL) – A state non-profit agency working to protect the lakes of Wisconsin through sound policy and legislation.

Wisconsin Land and Water Conservation Association (WLWCA) – Membership organization that represents the State's 72 County Land and Water Conservation Committees and Departments.

Wisconsin Wetlands Association (WWA) – A non-profit agency working to protect Wisconsin's Wetlands.

Attachment A

Public Hearing Notice

From:
Adams County

ADAMS COUNTY LAND & WATER DEPARTMENT

401 ADAMS ST. STE 4, FRIENDSHIP, WI 53934
PHONE: (608) 339-4268 WEBSITE: WWW.CO.ADAMS.WI.US

PUBLIC HEARING NOTICE

Per Wis. Stats. 92.10 (6)(c), the Adams County Land & Water Committee will conduct a public hearing on November 4th, 2025, at 3:00pm in the County Board room at the Adams County Courthouse on the 10 Year Land and Water Plan (2026-2035).

The plan was written by the Adams County Land & Water Department and the North Central Wisconsin Regional Planning Commission with assistance from a Resource Advisory Committee which consisted of state partners, local work groups and community members who assisted in prioritizing goals. The primary focus of the plan is improving ground and surface water quality and quantity, implementing effective erosion control measures, and enhancing education and outreach initiatives within our community to address nutrient management influxes through all watersheds.

The proposed 10 Year Plan may be viewed during normal business hours at the Adams County Land and Water Conservation Department located at the Adams County Courthouse, 401 Adams Street, Suite 4, Friendship, WI.

Anyone may attend the public hearing and be heard. Interested parties who are unable to attend may send written comments prior to the hearing to: Adams County Land & Water Department, Attn: Colton Wolosek, County Conservationist, 401 Adams Street, Suite 4, Friendship, WI 53934.

All interested persons are invited to attend said hearing and be heard.

Respectfully Submitted,
John West, Chairman
Land & Water Committee
Dated this 15th day of October, 2025.

TO RUN:
October 22nd, 2025 and October 29th, 2025
Submitted on October 15th, 2025

Attachment B

Cranberry Farm Nutrient Management Conservation Practice Standard

From: Natural Resources Conservation Service (NRCS)

APPENDIX 2. NUTRIENT MANAGEMENT FOR WISCONSIN CRANBERRY PRODUCTION

This appendix to the Wisconsin Conservation Planning Technical Note WI-1 (WI CP-TN-1) has been developed in order to provide guidance for nutrient management planning on cranberry production systems. A cranberry nutrient management plan that meets the criteria included in this appendix should satisfy the requirements of the Wisconsin NRCS Nutrient Management Conservation Practice Technical Standard (WI NRCS CPS, Nutrient Management (Code 590)) and the technical note. Reference is made to particular sections of the 590 standard and the technical note, where special attention may be needed.

The guidance and instructions included in this appendix are in addition to those found in the 590 standard. Implementation of a plan developed based upon the guidance included in this document must be in accordance with the 590 standard. Federal, state, and local laws may provide additional requirements.

This appendix provides detailed guidance on the following:

Section I: Criteria Unique to Cranberry Nutrient Management Planning

Section II: Cranberry Nutrient Management Tables

Section III: Cranberry Nutrient Management Plan

Section I: Criteria Unique to Cranberry Nutrient Management Planning

A. General

1. Cranberry nutrient management planning shall be based on plant tissue analysis. Plant tissue analysis shall be performed annually, on each individual nutrient management unit, in accordance with Cranberry Tissue Testing for Producing Beds in North America (Extension publication EM-8610). Tissue analysis should be performed by a reputable laboratory—preferably one that participates in the North American Proficiency Testing Program. A minimum of one sample shall be collected per management unit per year. In addition, a total of at least one sample per 5 acres of cranberry beds, within each nutrient management unit, shall be collected every 4 years. (For example, on a 25-acre nutrient management unit, collect at least one tissue sample every year and a total of at least 5 samples over a 4-year period.) Refer to EM- 8610 and "How to Take a Cranberry Tissue Sample," (Teryl R. Roper, Professor and Extension Fruit Crops Specialist, UW- Madison, 2006) for further guidance.

2. Soil fertility analysis should also be considered in cranberry nutrient management planning. Soil samples must be analyzed by an approved Wisconsin laboratory. (Refer to Appendix 2 of this technical note for contact information.) Consider collecting a total of at least one composite sample per 5 acres of producing cranberry beds, within each nutrient management unit, every 4 years. Refer to Sampling Soils for Testing (UW-Extension publication A2100) and "How to Take a Cranberry Soil Sample," (Teryl R. Roper, Professor and Extension Fruit Crops Specialist, UW-Madison, 2006) for further guidance.

3. Additional considerations in cranberry nutrient management planning should include monitoring and observation of plant vigor and appearance, production history, and grower experience, in addition to the considerations described in the Extension publications referenced in this document.

4. Ensure that application equipment is properly calibrated.

5. Applications of nutrient and soil amendments should not be made when soil temperatures are low (<50 deg. F) or fields are saturated with water.

6. Applications of nutrient and soil amendments should be rescheduled when predicted weather conditions are likely to transport these amendments to non-target areas (i.e. precipitation events, planned irrigation events, frost protection events, etc.). The nutrient management plan shall document mitigation practices to be implemented when rescheduling is not possible.

7. An analysis of the water chemistry of irrigation and/or flood water should be considered when the conservation planning resource assessment has identified that water chemistry may significantly

influence nutrient management by altering soil acidity and/or resulting in the application of significant quantities of plant nutrients.

8. Efforts should be made to limit the detachment and transport of vegetation and soil materials (i.e. material that is removed or disturbed in the processes of bed renovation/construction or managed "floods"), which may result in the deposition of these materials into surface waters.

B. Soil Acidity

1. Maintain soil pH at or below 6.0, where practical. The "target pH" is 5.6 for mineral soils and 5.4 for organic soils, as identified in Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin (UWEX publication A2809). Note circumstances where the difference between the actual soil pH and the target pH is greater than 0.5, and describe procedures utilized to adjust pH, if such efforts are made.

2. Annual sulfur applications should not exceed 500 lbs elemental S per acre.

3. Individual sulfur applications should not exceed 150 lbs elemental S per acre.

C. Nitrogen (for producing beds)

1. Nitrogen management strategies shall be in accordance with Nitrogen for Bearing Cranberries in North America (Extension publication EM-8741). Note: Hybrid varieties, such as Stevens and Pilgrim, may benefit from tissue-N concentrations up to 1.3% (2006 Wisconsin Cranberry School Proceedings, Teryl Roper, UW-Extension).

2. Ammonium or urea forms of nitrogen fertilizer should be used.

3. Individual nitrogen applications should not exceed 20 lbs/ac.

4. Identify and implement water quality mitigation practices for beds where soil pH is greater than 5.5 and 70 lbs or more of nitrogen fertilizer are applied per acre per year.

5. Annual applications of fertilizer containing N should be made using a minimum of three passes, unless total planned applications for the season do not exceed 20 lbs N per acre.

6. Applications of fertilizer containing N should be timed to coincide with peak crop demand (active growth).

D. Phosphorous (for producing beds)

1. Phosphorous management strategies shall be in accordance with Phosphorous for Bearing Cranberries in North America (UW- Extension publication, Nov. 2004).

2. Annual phosphorous applications shall not exceed 20 lbs actual P per acre (~45 lbs P2 O5 per acre), unless the need for additional annual P is documented by plant tissue analysis or other considerations as outlined in Phosphorous for Bearing Cranberries in North America.

3. Develop a fertilizer reduction strategy where planned, annual applications of phosphorous fertilizer exceed 20 lbs actual P per acre (~45 lbs P2 O5 per acre), on producing beds; tissue analysis demonstrates that nutrient concentrations are within or exceed recommended levels; and no deficiency of phosphorous has been demonstrated through soil fertility analysis. Cranberry tissue nutrient content guidelines for producing beds and soil test interpretation categories for phosphorous are summarized in Section II of this appendix.

4. Applications of fertilizer containing P should be timed to coincide with peak crop demand (hook to fruit set). Multiple, lighter applications of fertilizer containing P are preferred over fewer, heavier applications.

E. Potassium (for producing beds)

1. The goal of potassium fertility management should be to maintain plant tissue concentrations within the recommended range (refer to EM-8610 or Section II).

2. Large doses of potassium fertilizer have the potential to disrupt the balance of available cations (positively-charged ions) in the soil. Because of this, individual applications of fertilizer containing potassium should not exceed ~62 lbs actual K per acre (75 lbs K20 per acre).

3. Multiple, lighter applications of fertilizer containing K are preferred over fewer, heavier applications.

F. New Plantings

1. Nutrient management strategies for new plantings shall be based upon soil fertility analysis and consideration of soil characteristics. Collect soil samples for analysis at a rate of one composite sample per 5 acres of cranberry beds after the beds have been prepared for planting. Refer to UWEX publication A2809, or Section II of this Appendix, for fertilizer application guidelines based on soil test results.

2. Annual applications of nitrogen should not exceed 150 lbs/ac.

3. Individual applications of fertilizer should not exceed 15 lbs N per acre.

4. If fertilizers containing phosphorous and/or potassium are to be applied after the plants have become established, consider alternating fertilizer applications between nitrogen-only products [i.e. urea or ammonium sulfate (21-0-0)] and complete, N-P-K blends [i.e. 13-13-13, 10-10-30, or similar products].

5. Pre-plant applications of fertilizer containing phosphorous and/or potassium should be incorporated into the soil. Applications must be based upon soil test results and UW-Extension guidelines (see A2809 or Section II of this Appendix).

6. Frequent, lighter applications of fertilizers are preferred on new plantings over fewer, heavier applications.

SECTION II: CRANBERRY NUTRIENT MANAGEMENT TABLES

Table 1: Soil test interpretation categories for phosphorous (P) and potassium (K) for *common cranberry soils

Nutrient	Very Low	Low	Optimum	High	Very High	Excessively High
P (ppm)	<18	18-25	26-37	38-55	>55	
K (ppm)	<50	50-80	81-120	121-160	161-220	>220

*These categories apply to Subsoil Group E [Sandy, coarse-textured soils (sands and loamy sands)] and Subsoil Group O [Organic soils (mucks and peats)], as defined in Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin (UWEX publication A2809). Refer to A2809 if the dominant soil type does not meet either of these descriptions.

Table 2: Phosphorous and potassium fertilizer application rate guidelines [from UWEX publication A2809]

Fertilizer Component	Very Low	Low	Optimum	High	Very High	Excessively High
P2 O5 (lbs/ac)	†200	†125	NA	NA	--	NA
K2 O (lbs/ac)	†250	†200	NA	NA	NA	NA

†These rates are only applicable prior to cranberry bed establishment. Incorporate all P2 O5 and K2 O before planting. For established cranberry beds, use tissue testing to guide fertilizer application rates.

Table 3: Cranberry tissue nutrient content guidelines for producing beds

Nutrient	Normal Concentration (%)	Nutrient	Normal Concentration (ppm)
Nitrogen (N)	0.90 – ‡1.10	Boron (B)	15 – 60
Phosphorous (P)	0.10 – 0.20	Iron (Fe)	>20
Potassium (K)	0.40 – 0.75	Manganese (Mn)	>10
Calcium (Ca)	0.30 – 0.80	Zinc (Zn)	15 – 30
Magnesium (Mg)	0.15 – 0.25	Copper (Cu)	4 – 10
Sulfur (S)	0.08 – 0.25		

‡Hybrid varieties, such as Stevens and Pilgrim, may benefit from tissue-N concentrations of up to 1.30%.

SECTION III: CRANBERRY NUTRIENT MANAGEMENT PLAN OUTLINE AND OPTIONAL FORMS

A cranberry nutrient management plan shall be developed according to the 590 standard, as well as the criteria included in this technical note. The following outline should be used as a guide in the development of a cranberry nutrient management plan. The attached forms may be useful tools when developing a plan. These forms are not required. [Bracketed references to individual forms are included, for guidance, within this outline.] Note: Completing the optional forms may satisfy some of the items listed below. However, use of the optional forms will not preclude the need to develop a plan narrative, as some items will require further explanation.

Consider organizing the plan around nutrient management units. *Nutrient management units are groups of fields or beds that are managed similarly. A single management unit may include a group of beds with similar soil conditions, production status (new plantings, plantings of similar age, fresh-fruit beds, non-producing beds, etc.), or other considerations, which allow the unit to be managed as a whole.*

A cranberry nutrient management plan should satisfy the requirements of the 590 standard by satisfying the following items, as well as the criteria outlined in Section I of this appendix:

I. Plan Narrative:

The purpose of the narrative is to provide an overview of the operation and describe the nutrient management strategies for the growing season, including descriptions of how the plan will be implemented and why the proposed strategies were selected. The narrative should provide an overview of the operation, identify the nutrient management units on the marsh, explain past practices and results, explain how current strategies have been developed or refined, and discuss potential factors that may cause deviation from the intended strategies.

The narrative should explain how the nutrient management plan will be implemented, with an explanation of how nutrient management decisions will be made.

A. Identify nutrient management units and include the following information:

[Management Unit Identification Worksheet]

1. Current production status.
2. A general description of the soil, including subsoil characteristics and soil characteristics within the rooting zone. Explain bed construction/renovation and management histories, including sanding practices. Focus on those characteristics and past activities that may influence nutrient management.

B. Summarize records of nutrient and soil amendment applications, tissue and soil fertility test results, and crop yields from previous years. If available, records from the most recent four years should be summarized in the narrative and either included with the plan or referenced if available in another format or easily accessible location. Include the following details per individual management unit:

[5-Year Nutrient Management Summary per Management Unit]

1. Applications of commercial fertilizers, organic byproducts (i.e. fish waste), and soil amendments (i.e. elemental sulfur), including the form, rate, and timing.

2. Plant tissue analysis results.

3. Soil fertility analysis results.

4. Historic crop yields.

C. Planned nutrient and soil amendment applications, including the rate, form, and timing. In addition, identify anticipated or expected yields per management unit. These should be based on historical production records, crop conditions, crop varieties grown, and grower experience.

[Planned Nutrient Management Practices worksheet]

[Fertilizer Decision-Making Checklist]

II. Aerial photographs and/or maps of the farm containing:

A. Boundaries, identification numbers, and acreage for all beds and nutrient management units. The Wisconsin DNR has a free, internet mapping program, which may be used to generate marsh maps based on aerial photography or topographic maps: http://maps.dnr.state.wi.us.

B. A soil map. NRCS has a free, internet mapping program, which may be used to generate soil maps: http://websoilsurvey.nrcs.usda.gov.

C. Locate and identify features that require additional protection. These may include groundwater risk areas (i.e. abandoned wells), surface water risk areas (i.e. water conveyance ditches, reservoirs, streams or lakes, wetlands, etc.), or other sensitive areas. Delineate boundaries for nutrient application restriction areas. Consider depicting routes of surface water flow, reservoirs, and key surface water control points (i.e. water control structures or bulkheads), which allow for the storage or recovery of discharges from beds. Include a legend of map symbols.

III. Documentation of nutrient management activities:

Document the following within-season activities per individual nutrient management unit:

A. Actual nutrient and soil amendment applications, including the rate, form, and timing.

[Actual Nutrient Management Practices worksheet]

B. Monitoring efforts (i.e. measurements of crop potential, upright growth, soil temperatures, precipitation, etc.) and observations (i.e. plant vigor and appearance, weather events and climatic conditions, etc.) made in support of nutrient management decisions. Nutrient management activities that are inconsistent with the plan narrative should be documented.

[Annual Nutrient Management Observation Checklist]

Cranberry Nutrient Management Optional Forms are included on the following pages

Attachment C

Impaired Waters List – 303(d)

From:
Wisconsin Department of Natural Resources (WDNR)

Local Waterbody Name	Water Type	Size (Miles or Acres)	Cycle Listed	Source	Pollutants (Causes)	Impairments (Observed Effects)	TMDL Priority	Use(s) Not Attained	Counties	Watershed Name
Big Roche A Cri Creek	RIVER	20.3	2018	NPS	CAUSE UNKNOWN	Elevated Water Temperature	Low	FAL	Adams	Big Roche A Cri Creek
Castle Rock Flowage	RESERVOIR	12,386	2024	PS/NPS	PERFLUOROOCTANE SULFONATE (PFOS)	PFOS Contaminated Fish Tissue	Low	FC	Adams, Juneau	Little Roche A Cri Creek
Easton Lake	IMPOUNDMENT	32.6	2024	NPS	CAUSE UNKNOWN	Excess Algal Growth	Low	REC	Adams	Duck and Plainville Creeks
Lake Arrowhead	RESERVOIR	295.1	2014	NPS	CAUSE UNKNOWN	Excess Algal Growth	Low	REC	Adams	Fourteenmile Creek
Lake Sherwood	RESERVOIR	214.7	2014	NPS	CAUSE UNKNOWN	Excess Algal Growth	Low	REC	Adams	Fourteenmile Creek
Petenwell Flowage	RESERVOIR	23,001	1998	Contam. Sed.	DIOXIN	Dioxin Contaminated Fish Tissue	Low	FC	Adams, Juneau	Wisconsin Rapids
Petenwell Flowage	RESERVOIR	23,001	1998	Contam. Sed.	MERCURY	Mercury Contaminated Fish Tissue	Low	FC	Adams, Juneau	Wisconsin Rapids
Petenwell Flowage	RESERVOIR	23,001	2022	PS/NPS	PERFLUOROOCTANE SULFONATE (PFOS)	PFOS Contaminated Fish Tissue	Low	FC	Adams, Juneau	Wisconsin Rapids
Petenwell Flowage	RESERVOIR	23,001	1998	Contam. Sed.	POLYCHLORINATED BIPHENYLS (PCBS)	PCBs Contaminated Fish Tissue	Low	FC	Adams, Juneau	Wisconsin Rapids
Wisconsin River	RIVER	20.6	1998	Contam. Sed.	MERCURY	Mercury Contaminated Fish Tissue	Low	FC	Adams, Juneau, Sauk, Columbia	Little Roche A Cri Creek
Wisconsin River	RIVER	20.6	1998	Contam. Sed.	POLYCHLORINATED BIPHENYLS (PCBS)	PCBs Contaminated Fish Tissue	Low	FC	Adams, Juneau, Sauk, Columbia	Little Roche A Cri Creek
Wisconsin River	RIVER	16.4	2022	PS/NPS	CAUSE UNKNOWN	Degraded Biological Community	Low	FAL	Adams, Juneau, Wood	Fourteenmile Creek
Wisconsin River	RIVER	16.4	1998	Contam. Sed.	POLYCHLORINATED BIPHENYLS (PCBS)	PCBs Contaminated Fish Tissue	Low	FC	Adams, Juneau, Wood	Fourteenmile Creek
Wisconsin River (At Castle Rock Lake)	RIVER	14.6	1998	Contam. Sed.	MERCURY	Mercury Contaminated Fish Tissue	Low	FC	Adams, Juneau	Big Roche A Cri Creek
Wisconsin River (At Castle Rock Lake)	RIVER	14.6	1998	Contam. Sed.	POLYCHLORINATED BIPHENYLS (PCBS)	PCBs Contaminated Fish Tissue	Low	FC	Adams, Juneau	Big Roche A Cri Creek
Wisconsin River (At Petenwell Lake)	RIVER	14.8	1998	Contam. Sed.	DIOXIN	Dioxin Contaminated Fish Tissue	Low	FC	Adams, Juneau	Lower Yellow (Juneau Co.) River
Wisconsin River (At Petenwell Lake)	RIVER	14.8	1998	Contam. Sed.	MERCURY	Mercury Contaminated Fish Tissue	Low	FC	Adams, Juneau	Lower Yellow (Juneau Co.) River
Wisconsin River (At Petenwell Lake)	RIVER	14.8	1998	Contam. Sed.	POLYCHLORINATED BIPHENYLS (PCBS)	PCBs Contaminated Fish Tissue	Low	FC	Adams, Juneau	Lower Yellow (Juneau Co.) River

Attachment D

TMDL Baseline Phosphorous Reductions and Site-Specific Criteria Maps

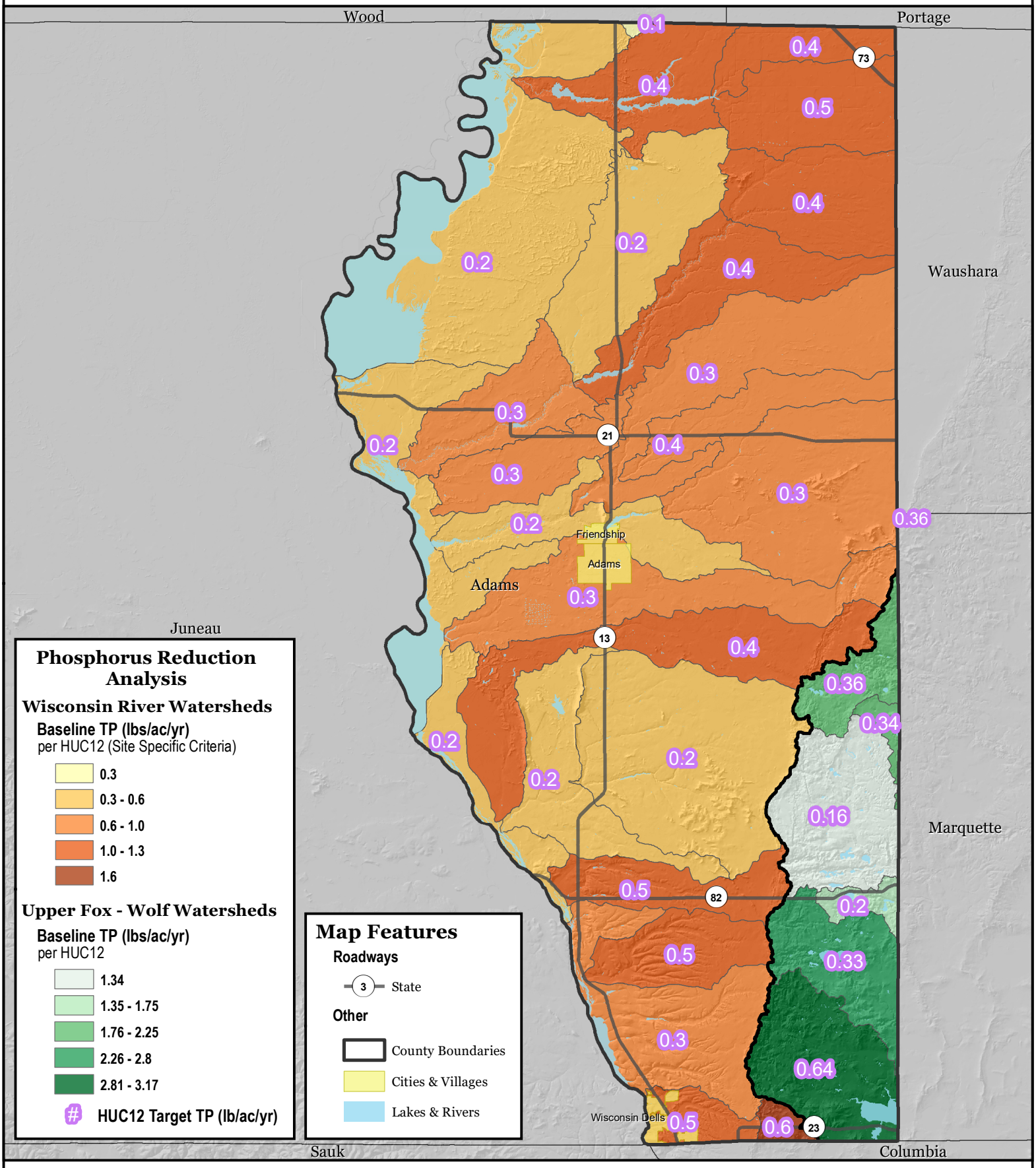
From:
Wisconsin Department of Natural Resources (WDNR)

Contents Within This Attachment:

1. **Map:** Baseline Phosphorus Reduction - Site Specific Criteria – Adams County
2. **Map:** Reference HUC 12s – Adams County

TMDL Baseline Phosphorus Reduction

ADAMS COUNTY HUC12 ANALYSIS - Site Specific Criteria



Phosphorus Reduction Analysis

Wisconsin River Watersheds

Baseline TP (lbs/ac/yr)
per HUC12 (Site Specific Criteria)

- 0.3
- 0.3 - 0.6
- 0.6 - 1.0
- 1.0 - 1.3
- 1.6

Upper Fox - Wolf Watersheds

Baseline TP (lbs/ac/yr)
per HUC12

- 1.34
- 1.35 - 1.75
- 1.76 - 2.25
- 2.26 - 2.8
- 2.81 - 3.17

\# HUC12 Target TP (lb/ac/yr)

Map Features

Roadways

- 3 State

Other

- County Boundaries
- Cities & Villages
- Lakes & Rivers

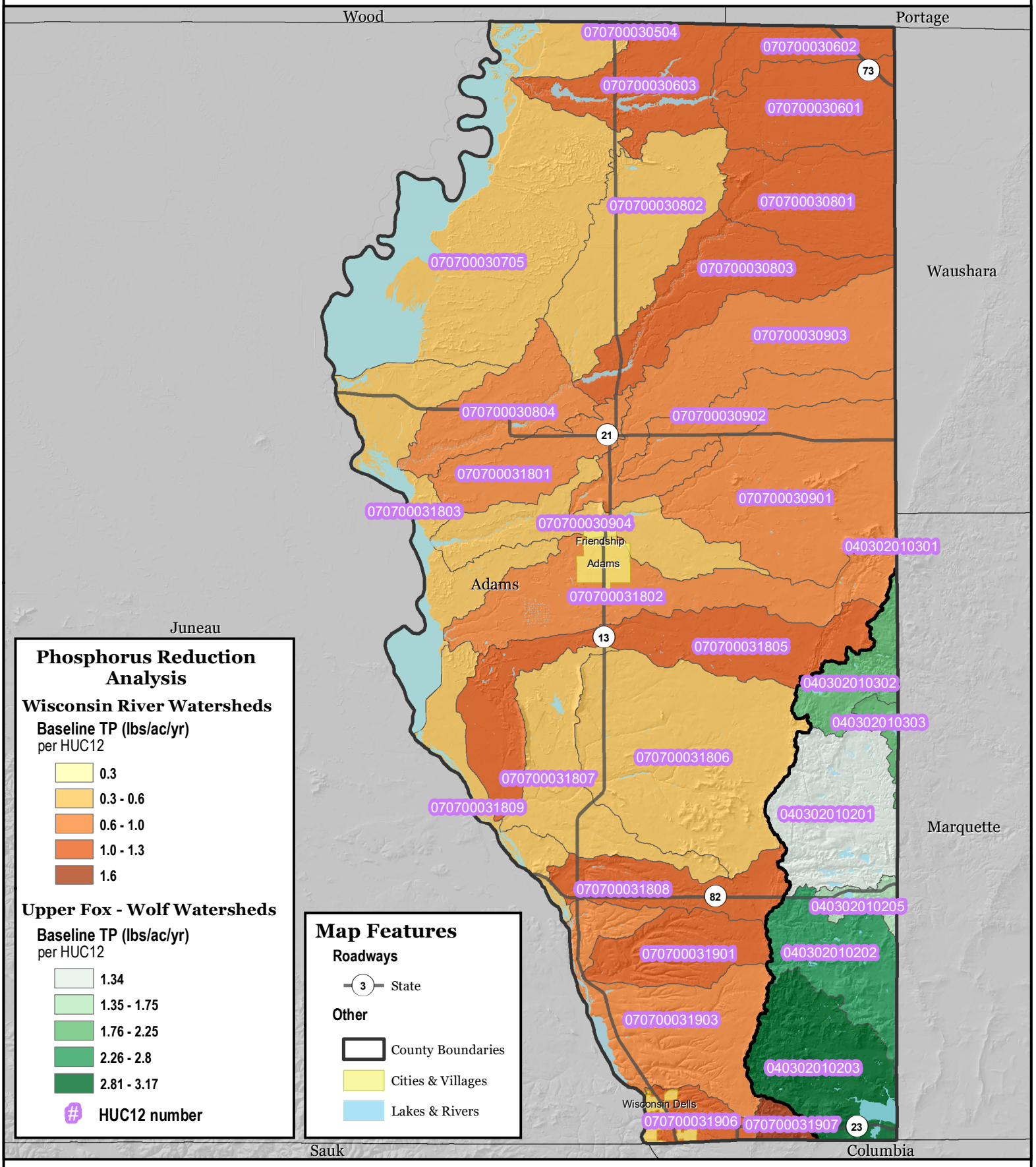
N

0 2.5 5 10 Miles

WI DNR - JUNE 2019

TMDL Baseline Phosphorus Reduction

ADAMS COUNTY HUC12 REFERENCE MAP



WI DNR - JUNE 2019

Attachment E

Healthy Watersheds, High Quality Waters Maps & Tables

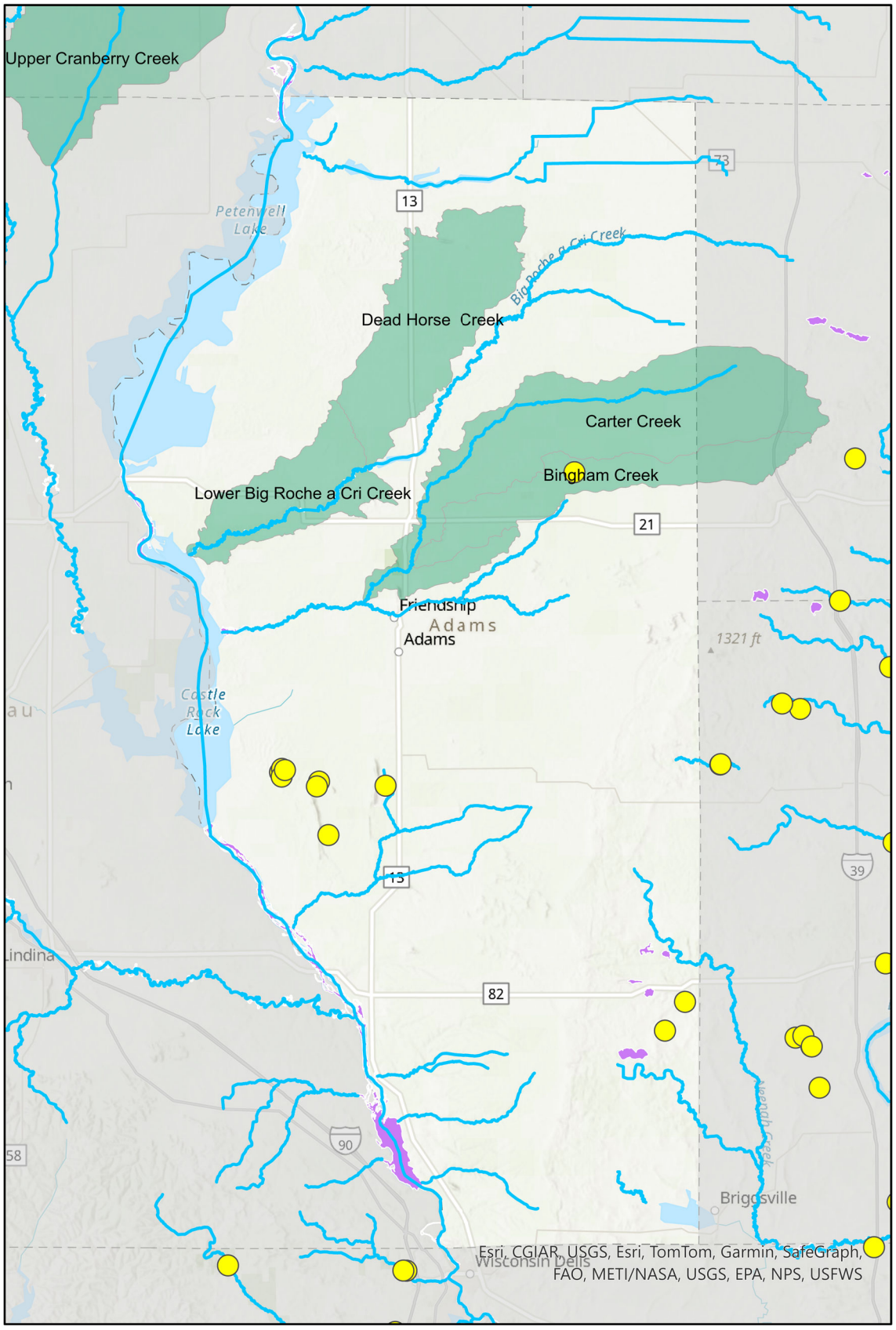
From:
Wisconsin Department of Natural Resources (WDNR)

Contents Within This Attachment:

3. **Map:** Statewide Watershed Protection Priorities – Adams County
4. **Map:** Wisconsin River Watershed Health – Adams County
5. **List** of High Quality Waters in Adams County
6. **Map & List** of Watershed Protection Priorities in whole Wisconsin River Watershed

Statewide Watershed Protection Priorities - Adams County

Healthy Watersheds, High-Quality Waters (WI DNR 2021)



Legend

High-Quality Waters

- Healthy & Rare Wetlands
- High-Quality Streams
- High-Quality Lakes & Large Rivers

Statewide 30% Healthiest Watersheds

Watershed Health Index

- Top 10%
- Top 10 - 20%
- Top 20 - 30%

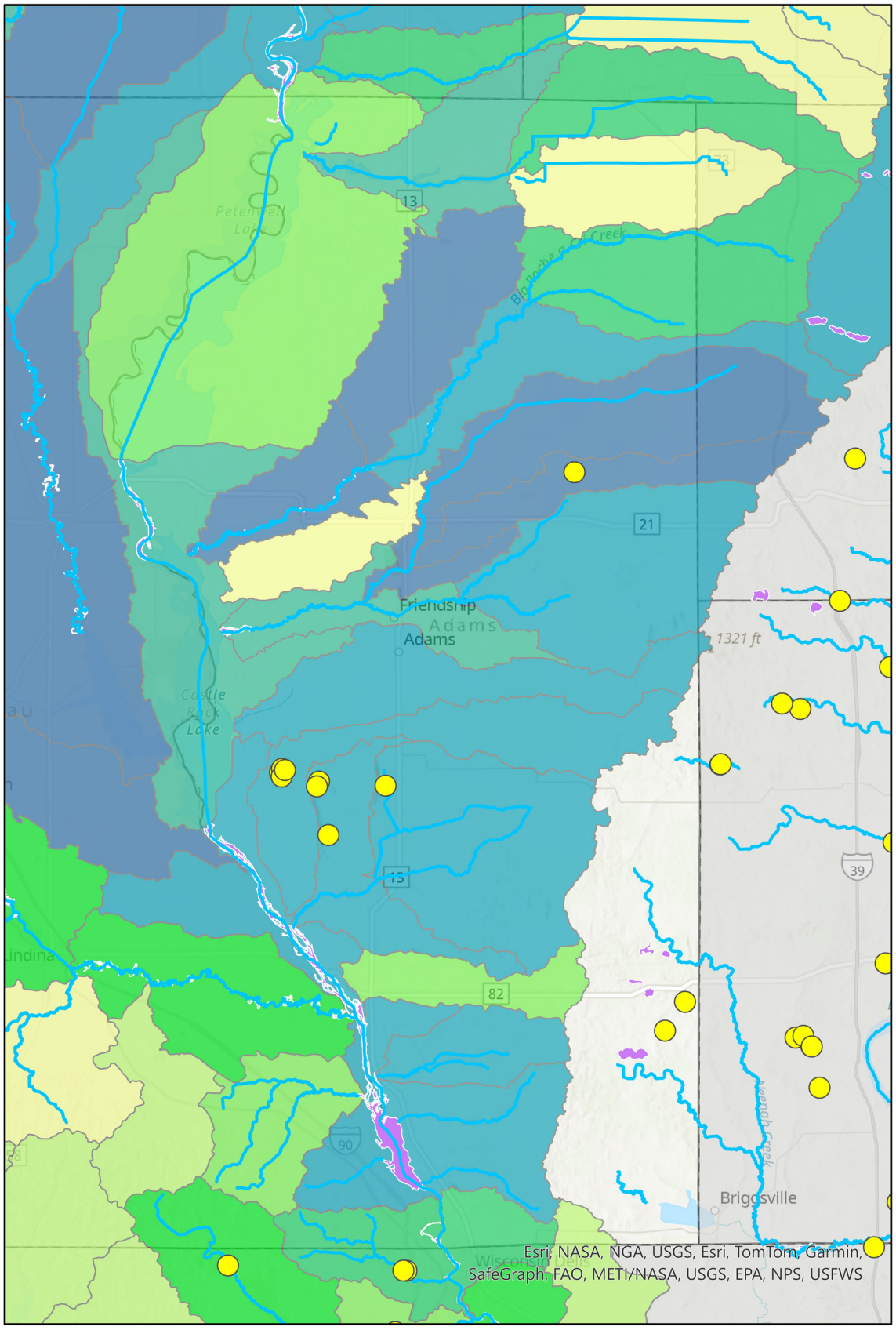
N

0 20 40 80 Miles

WISCONSIN DEPT. OF NATURAL RESOURCES

Wisconsin River (HUC6) Watershed Health - Adams County

Healthy Watersheds, High-Quality Waters (WI DNR 2021)



Legend

High-Quality Waters

- Healthy & Rare Wetlands
- High-Quality Streams
- High-Quality Lakes & Large Rivers

Full HUC6 Watershed

Watershed Health Index

- Healthiest (Top 10 Percentile)
- Least Healthy (Bot. 10 Percentile)

N

0 20 40 80 Miles

WISCONSIN DEPT. OF NATURAL RESOURCES

2021 High-Quality Waters: Lakes, Rivers, Streams

Adams County - 23 High-Quality Waters identified in 2021

Data sorted by alphabetical county and alphabetical waterbody name

OFFICIAL NAME	LOCAL NAME	WBIC	PRIORITY WATERSHEDS HUC6: • State: •• Both: •••	COUNTY NAME (STREAM MOUTH & LAKE LOCATION)	HUC6	HUC12 CODE (STREAM MOUTH & LAKE LOCATION)	UNIQUE & RARE RESOURCES (COUNT)	Attaining WQS (COUNT)	IBIs (COUNT)	HQW CRITERIA (COUNT)
Big Roche A Cri Creek		1374100	•	Adams	Wisconsin	070700030804	5	3	9	3
Big Spring Creek		176400		Adams	Fox	040302010203	2		1	2
Campbell Creek	Reed	1343400		Adams	Wisconsin	070700031806	3	2	1	3
Carter Creek		1351200		Adams	Wisconsin	070700030904	4	2	2	3
Chester Creek		1377200		Adams	Wisconsin	070700030705	2		1	2
Corning Creek		1301400		Adams	Wisconsin	070700031901	2	1	1	3
Crooked Lake	Cooks	102600		Adams	Wisconsin	040302010205		1	5	2
Deep Lake		102800		Adams	Fox	040302010201		1	8	2
Fairbanks Creek		1343800		Adams	Wisconsin	070700031806	2	1		2
Fordham Creek		1352200		Adams	Wisconsin	070700030901	2	1	3	3
Fourteenmile Creek		1377500		Adams	Wisconsin	070700030705		2	1	2
Goose Lake		103600		Adams	Fox	040302010201		1	2	2
Gulch Creek		1299700	•	Adams	Wisconsin	070700031903	3		1	2
Jordan Lake	Long	104000		Adams	Fox	040302010202	1	1	7	3
Leola Ditch		1378300		Adams	Wisconsin	070700030601	1	2		2
Little Roche A Cri Creek		1351100		Adams	Wisconsin	070700030904	4	4	2	3
Parker Lake		106500		Adams	Wisconsin	040302010205		1	8	2
Plainville Creek		1300200	•	Adams	Wisconsin	070700031903	3		2	2
Risk Creek		1343900		Adams	Wisconsin	070700031806	1	1		2
Unnamed		1375100		Adams	Wisconsin	070700030801		1	1	2
Unnamed		5027852		Adams	Wisconsin	070700031901		1	1	2
White Creek		1342800		Adams	Wisconsin	070700031807	1	1	2	3
Wolf Lake		117500		Adams	Fox	040302010201		1	4	2

2021 High-Quality Waters: Healthy Wetlands

Adams County - 4 Healthy Wetlands identified in 2021

Data sorted by alphabetical county and increasing Healthy Wetland ID

WETLAND ID	SITE NAME	SITE ID	PRIORITY WATERSHEDS HUC6: • State: •• Both: •••	COUNTY NAME	HUC6	HUC12 CODE	DISTURBANCE RANK	PLANT COMMUNITY CONDITION	LAT	LONG
Healthy_152	Quincy Bluff	NC005		Adams	Wisconsin	070700031807	1	1	43.859337	-89.869038
Healthy_155	Quincy Bluff SNA	NC060		Adams	Wisconsin	070700031807	1	1	43.885006	-89.877387
Healthy_157	Sohlberg Silver Lake	NC061		Adams	Wisconsin	070700031805	1	1	43.890204	-89.903083
Healthy_159	Sohlberg Silver Lake	NC067		Adams	Wisconsin	070700031805	1	1	43.893644	-89.900696

2021 High-Quality Waters: Rare & Unique Wetlands

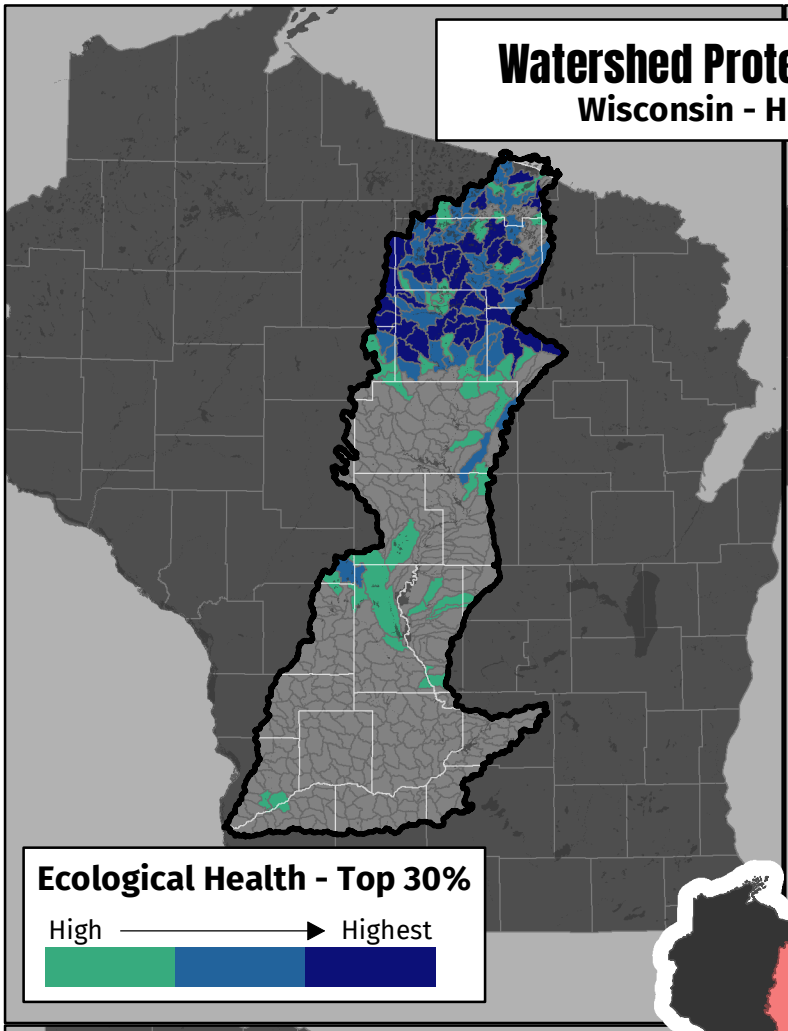
Adams County - 7 Rare & Unique Wetlands identified in 2021

Data sorted by alphabetical county and increasing Rare & Unique Wetland ID

WETLAND ID	WETLAND TYPE	SITE ID	PRIORITY WATERSHEDS HUC6: • State: •• Both: •••	COUNTY NAME	HUC6	HUC12 CODE	SRANK	GRANK	LAT	LONG
Rare_162	Calcareous Fen	CPHER064WI		Adams	Fox	040302010202	S3	G3	43.755291	-89.623616
Rare_163	Calcareous Fen	CPHER064WI		Adams	Fox	040302010205	S3	G3	43.770419	-89.60892
Rare_173	Calcareous Fen	CPHER064WI		Adams	Wisconsin	070700031806	S3	G3	43.885322	-89.827282
Rare_174	Central Poor Fen	CPHER061WI		Adams	Wisconsin	070700031807	S3	G3G4	43.887532	-89.875805
Rare_176	Coastal Plain Marsh	CPHER066WI		Adams	Wisconsin	070700031805	S1	G2?	43.892452	-89.904273
Rare_177	Central Poor Fen	CPHER061WI		Adams	Wisconsin	070700031805	S3	G3G4	43.894276	-89.90286
Rare_197	Central Poor Fen	CPHER061WI	•••	Adams	Wisconsin	070700030902	S3	G3G4	44.050414	-89.68799

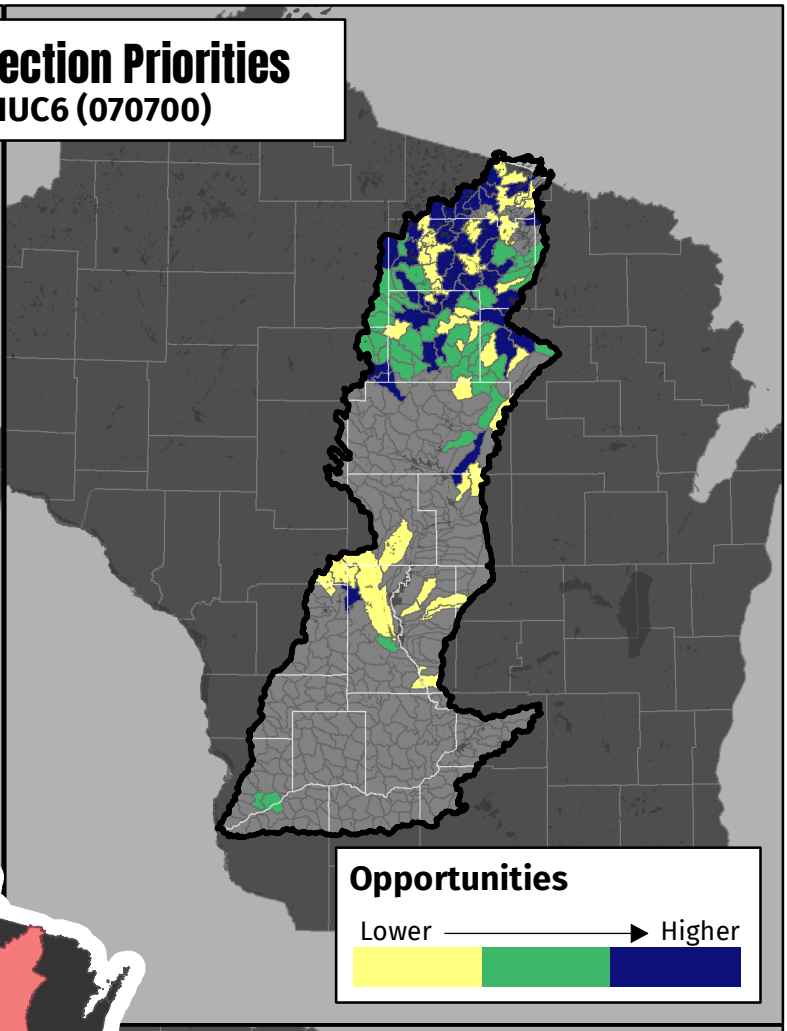
Watershed Protection Priorities

Wisconsin - HUC6 (070700)



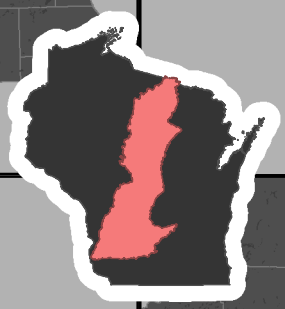
Ecological Health - Top 30%

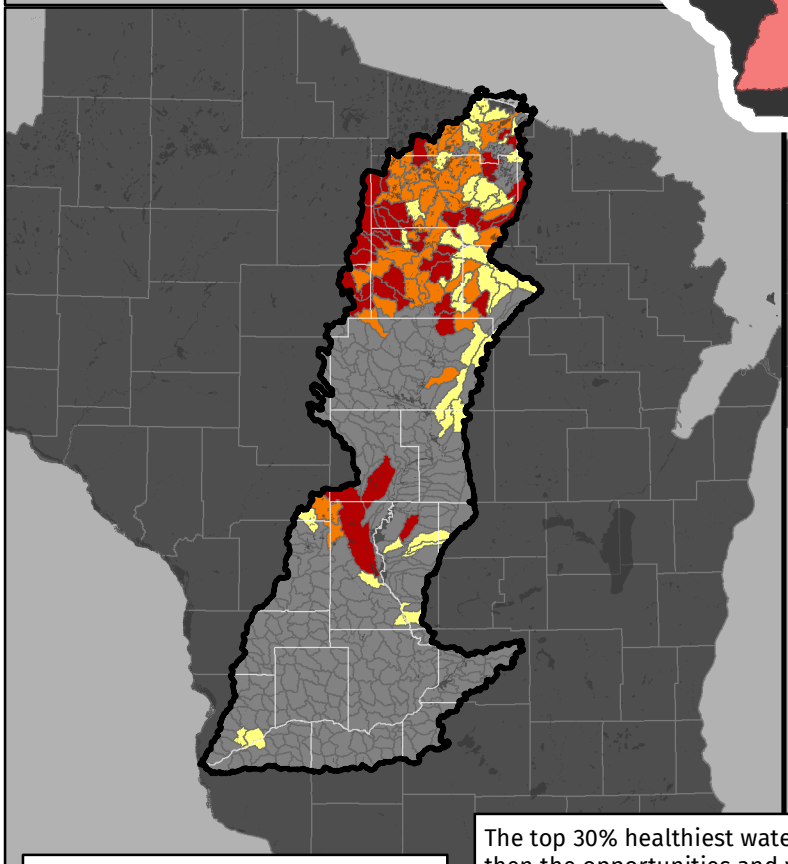
High → Highest



Opportunities

Lower → Higher



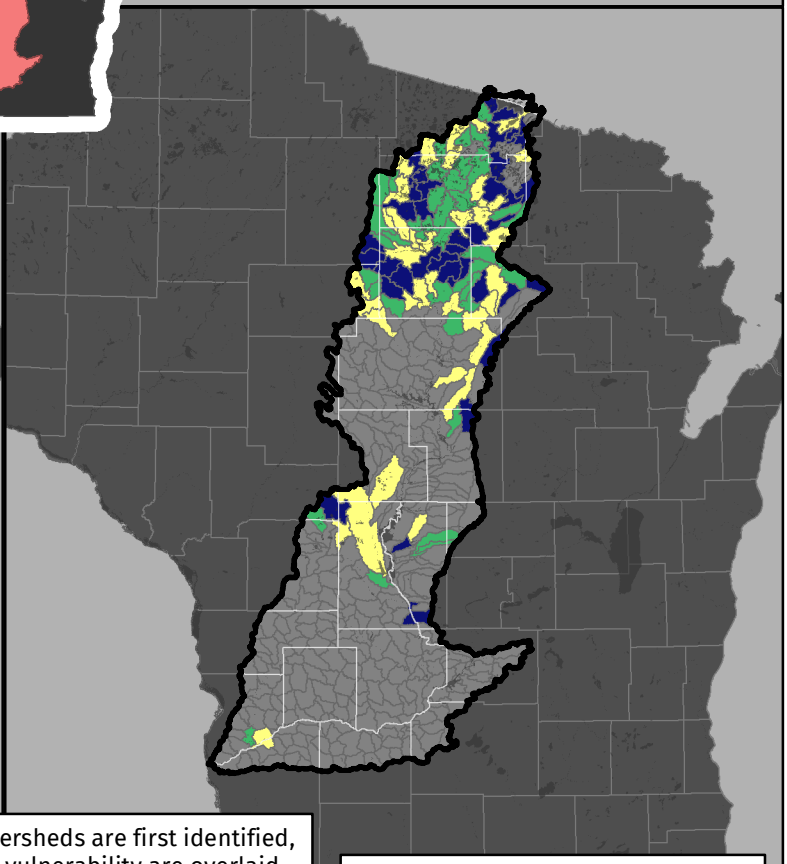


Vulnerability

Lower → Higher

The top 30% healthiest watersheds are first identified, then the opportunities and vulnerability are overlaid upon those healthiest watersheds to identify the protection potential of the healthiest watersheds.

Protection Potential = (Eco + Opp) - Vulnerability



Protection Potential

Lower → Higher

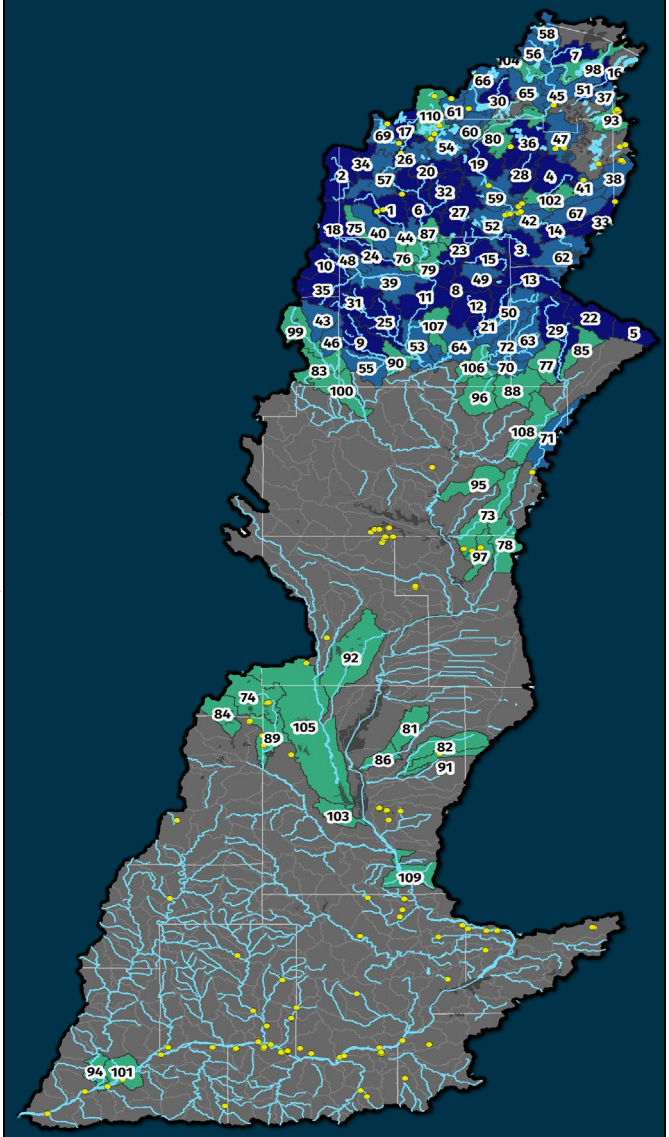
Watershed Protection Priorities

Wisconsin - HUC 070700

RANK & MAP ID	HUC12 NUMBER	HUC12 NAME	ECOLOGICAL HEALTH SCORE	PROTECTION PRIORITY SCORE	HIGH-QUALITY LAKES	HIGH-QUALITY RIVERS	HIGH-QUALITY WETLANDS
1	070700011002	Little Rice R.	100	67.0		1	2
2	070700010901	Headwaters-Willow R.	98.1	61.4		3	
3	070700011301	Noisy Creek	95.9	65.9		1	
4	070700010704	Gudegast Creek	95.4	66.3		1	
5	070700021101	Peters and Lawrence Lakes-Spring Brook	95.2	65.6			
6	070700010907	Swamp Creek-Tomahawk R.	95	67.2		1	
7	070700010304	Muskrat Creek-Wisconsin R.	94.3	66.5		2	
8	070700020401	Little Pine Creek	93.6	69.4			
9	070700020201	North Fork of the Copper R.	93.5	63.5		3	
10	070700011201	North Fork Spirit Creek	93.3	63.0		1	
11	070700020402	Berry Creek-Wisconsin R.	93.1	64.3		1	
12	070700020302	North Branch of the Prairie R.	93	64.3		1	
13	070700020301	Upper Prairie R.	92.3	61.0	1	1	
14	070700010707	Middle Pelican R.	91.8	64.5		1	
15	070700011304	Big Pine Creek	91.7	64.4		1	
16	070700010104	Deerskin R.	91.1	71.0		1	
17	070700010806	Cedar Falls-Shishebogama-Tomahawk R.	91.1	67.5	2	1	
18	070700011102	Headwaters-Somo R.	90.9	62.5		1	
19	070700010601	Tom Doyle Creek-Wisconsin R.	90.8	60.1	2	1	
20	070700010904	Rocky Run	90.8	66.2		1	
21	070700020304	Middle Prairie R.	90.6	69.4		1	
22	070700021201	Bogus Swamp-East Fork Eau Claire R.	90.5	61.0			
23	070700011305	Lake Alice-Wisconsin Rvier	90.2	60.1		3	
24	070700011104	Landwehr Creek-Somo R.	90.1	62.4		1	
25	070700020102	Averil Creek-New Wood R.	90.1	63.2		5	
26	070700010905	Bear Creek-Tomahawk R.	90	66.4	1		
27	070700011001	Little Rice Creek	89.9	60.6	3	1	
28	070700010602	Pine Lake Creek	89.4	58.7		1	
29	070700021204	West Branch of the Eau Claire R.	89.3	57.6		2	
30	070700010501	Lost Creek-Big St. Germain Lake	89.2	60.0		1	
31	070700020101	East and Center Forks New Wood R.	89.2	68.7		3	
32	070700010906	Bearskin Creek	89.1	59.9		1	
33	070700010701	Monico Creek	88.5	62.0			1
34	070700010902	Swamsauger Creek	88.5	62.3			
35	070700011202	Spirit R.	88.5	63.2		2	
36	070700010402	Sugar Camp Creek	88.2	59.5	5		
37	070700010102	Blackjack Creek	87.7	65.3	2		
38	070700010201	Headwaters-Eagle R.	87.4	62.8			4
39	070700011204	Spirit R. Flowage	87.4	57.5		2	
40	070700011103	Little Somo R.	87.3	55.4			
41	070700010703	Twin Lakes Creek	87	63.0		1	1
42	070700010708	Lower Pelican R.	86.3	55.9	1	1	4
43	070700020801	Wood Creek	86.2	61.3			
44	070700011003	Rice R. Flowage	85.9	61.7		1	
45	070700010308	Sucker Creek-Wisconsin R.	85.8	64.8	1	1	
46	070700020802	Lemke Creek	85.7	60.9			
47	070700010401	Mud Creek	85.6	63.4			3
48	070700011203	Squaw Creek	85.5	60.5		1	
49	070700011303	Green Meadow Creek	85.5	67.5			
50	070700020303	Big Hay Meadow Creek	85.5	62.0		3	
51	070700010103	Little Deerskin R.	85.4	62.7	1	1	1
52	070700011302	Cresent Creek-Wisconsin R.	85.2	58.3	2	1	
53	070700020404	Joe Snow Creek-Wisconsin R.	85.2	55.8	1	2	
54	070700010802	Tomahawk Lake-Tomahawk R.	84.9	59.4	4		
55	070700020202	Middle and South Forks Copper R.	84.9	60.9		2	
56	070700010303	Tamarack Creek	84.6	59.6	1		
57	70700010903	Willow Reservoir	84.6	56.0		1	
58	70700010301	Portage Creek	84.3	65.4	3	1	
59	70700010603	Rhinelander Flowage	84.3	62.7	1	2	
60	70700010503	Gilmore Creek	84	58.3			1
61	70700010801	Arbor Vitae Lakes	84	59.6	2		1
62	70700010702	Upper Pelican R.	83.9	57.4		1	
63	70700020501	Upper Pine R.	83.8	66.1		5	
64	70700020306	Lower Prairie R.	83.7	62.1		1	
65	70700010307	Rice Creek	83.5	60.2	1	1	2
66	70700010502	Plum Creek-Big St. Germain Lake	82.5	58.4	7	1	2
67	70700010706	North Branch Pelican R.	82.1	61.7			
68	70700010805	Kaubashine Creek	82.1	62.7	2		
69	70700010804	Squirrel R.	82	57.6	1	1	
70	70700020503	Middle Pine R.	81.6	60.5		3	
71	70700030101	Headwaters of the Plover R.	80.7	69.1		1	
72	70700020502	North Branch of the Pine R.	79.1	59.3		1	
73	70700021805	Little Eau Claire R.	79	55.1		1	
74	70700031401	Meadow Valley-Beaver Creek	79	63.0		1	3
75	70700011101	Brant Creek	78.7	59.1			
76	70700011105	Hay Creek-Somo R.	78.6	54.9		1	
77	70700021202	Black Brook	78.6	58.1			
78	70700030103	Jordan Pond-Plover R.	78.5	63.3	1	1	
79	70700011306	Lake Mohawksin-Wisconsin R.	78.4	55.3	1		
80	70700010404	Rainbow Flowage-Wisconsin R.	78	62.1		1	
81	70700030802	Dead Horse Creek	77.9	59.1			
82	70700030903	Carter Creek	77.9	61.9		1	
83	70700020804	Mink Creek-Big Rib R.	77.4	52.3		3	
84	70700031506	Jay Creek-East Fork of the Lemonweir R.	77.2	61.8			
85	70700021203	Antigo Flats-East Branch Eau Claire R.	77.1	64.7			
86	70700030804	Lower Big Roche a Cri Creek	76.9	62.7		1	
87	70700011004	Lake Nokomis	76.7	61.6	2	1	
88	70700020601	Prospect Creek-Trappe R.	76.7	58.2			
89	70700031402	Eagle Nest Flowage-Beaver Creek	76.4	55.7	1	1	3
90	70700020203	Copper R. Outlet	75.9	57.5		2	
91	70700030902	Bingham Creek	75.9	61.9			1
92	70700031201	Upper Cranberry Creek	75.9	58.0		1	
93	70700010204	Ninemile Creek-Eagle R.	75.8	57.1	1	1	3

62 High-Quality Lakes in Top 30% Healthiest Watersheds
92 High-Quality Lakes in HUC6 Watershed
67% **High-Quality Lakes are within the Healthiest Watersheds**

96 High-Quality Streams in Top 30% Healthiest Watersheds
324 High-Quality Streams in HUC6 Watershed
30% **High-Quality Streams are within the Healthiest Watersheds**



Watershed Features

Ecological Health Score & ID

Healthiest

High Quality Wetlands

High Quality Waters

The top 30% healthiest watersheds in the HUC6 were selected to identify watershed protection priorities based on the ecological health score. High quality lakes and streams (based on waterbody identification code - WBIC), and high quality wetlands were then summed within each of the watersheds.

Watersheds are ranked and color-coded by ecological health score.

Watershed Protection Priorities

Wisconsin - HUC 070700

RANK & MAP ID	HUC12 NUMBER	HUC12 NAME	ECOLOGICAL HEALTH SCORE	PROTECTION PRIORITY SCORE	HIGH-QUALITY LAKES	HIGH-QUALITY RIVERS	HIGH-QUALITY WETLANDS
94	70700060507	Kickapoo R.	75.7	60.0		1	
95	70700021802	Bull Junior Creek	75.5	57.6			
96	70700020602	Little Trappe R.-Trappe R.	75.4	62.5		1	
97	70700030301	Hay Meadow Creek	75.4	60.7			3
98	70700010305	Pioneer Creek	75.2	55.7	2	2	
99	70700020803	Silvernagel Creek-Big Rib R.	75.1	57.6		1	
100	70700020806	Baldwin Creek-Big Rib R.	74.9	52.4		1	
101	70700051707	Clear Creek-Wisconsin R.	74.6	59.1		2	2
102	70700010705	Headwaters-North Branch Pelican R.	74	53.6			
103	70700031804	Juneau County Ditch	74	60.0			
104	70700010306	Buckatabon Creek	73.9	56.3	2	1	
105	70700031301	Mead Marsh-Yellow R.	73.7	59.0		1	1
106	70700020504	Lower Pine R.	73.5	56.5		4	
107	70700020305	Lilly Hay Meadow Creek	73.3	53.3			
108	70700021301	Mole Brook-Eau Claire R.	73.3	57.5		2	
109	70700031903	Plainville Creek-Wisconsin R.	73	69.9		4	
110	70700010803	Mishonagon Creek-Tomahawk R.	72.6	54.4	7	1	4

Attachment F

NR151 Performance Standards and Prohibitions Fact Sheets

From:
NRCS, Extension, DNR, DATCP, & WI L+W

Wisconsin's Runoff Rules

what farmers need to know

January 2013 DNR Pub. No. WT 756 REV 1/13




Farms, like all major industries, must follow environmental requirements to control runoff from fields, pastures and livestock facilities. Otherwise this pollution can harm our lakes, streams, wetlands and groundwater.

Wisconsin adopted administrative rules in 2002 (NR 151), with revisions effective in 2011 that set statewide performance standards and prohibitions for all Wisconsin farms. All farmers must comply with these standards and prohibitions. Cost-share funding may be available to assist with compliance. Some state and local programs may require compliance whether or not cost-share funds are available.

This fact sheet explains the basic information that farmers need to know about these rules and how to comply with them. It is recommended that farmers contact their county land conservation staff for further details on these rules and their impact on farm operations.

► Agricultural Standards and Prohibitions:

ALL FARMERS MUST:

- *Meet tolerable soil loss ("T") on cropped fields and pastures.*
- *Annually develop and follow a Nutrient Management Plan (NMP) designed to keep nutrients and sediment from entering lakes, streams, wetlands and groundwater. Farmers may hire a certified crop advisor or prepare their own NMP if they have received proper training.*
- *Use the phosphorous index (PI) standard to ensure that their NMP adequately controls phosphorous runoff over the accounting period.*
- *Avoid tilling within 5 feet of the edge of the bank of surface waters. This setback may be extended up to 20 feet to ensure bank integrity and prevent soil deposition.*

► Additional Standards:

FARMERS WITH LIVESTOCK MUST:

- *Prevent direct runoff from feedlots or stored manure from entering lakes, streams, wetlands and groundwater.*
- *Limit access or otherwise manage livestock along lakes, streams and wetlands to maintain vegetative cover and prevent erosion.*
- *Prevent significant discharges of process wastewater (milkhouse waste, feed leachate, etc.) into lakes, streams, wetlands, or groundwater.*

FARMERS WHO HAVE, OR PLAN TO BUILD, MANURE STORAGE STRUCTURES MUST:

- *Maintain structures to prevent overflow and maintain contents at or below the specified margin of safety.*
- *Repair or upgrade any failing or leaking structures to prevent negative impacts to public health, aquatic life and groundwater.*
- *Close idle structures according to accepted standards.*
- *Meet technical standards for newly constructed or significantly altered structures.*

FARMERS WITH LAND IN A WATER QUALITY MANAGEMENT AREA *(300 feet from streams, 1,000 feet from a lake, or in areas susceptible to groundwater contamination)* **MUST:**

- *Avoid stacking manure in unconfined piles.*
- *Divert clean water away from feedlots, manure storage areas, and barnyards located within this area.*

Photos: Jeffrey J. Strobel, Duane Popple and Lynda Schweikert

Wisconsin's Runoff Rules

what farmers need to know

DNR Pub. No. WT 756 REV 1/13

► Farmland Preservation Tax Credit:

A farmer must comply with applicable state standards to receive the Farmland Preservation Tax Credit, even if cost sharing is not available. Farmers may be considered in compliance by entering into a schedule of compliance.

This requirement applies to farmers whose land is located in a certified farmland preservation zoning district (i.e. exclusive agriculture), or for farmers who signed a farmland preservation agreement after standards were in effect for that county. Farmers should contact their county land conservation staff for more information regarding applicable standards and compliance documentation.

► Implementation and Financial Assistance:

Under DNR rules, a landowner is normally entitled to cost sharing if the landowner is required to implement best management practices on "existing cropland" or an "existing" livestock facility or operation in order to comply with a DNR performance standard. Cropland or livestock facilities brought into service after the effective date of the standard are considered "new" and must meet standards and prohibitions without cost-share funding. Farmers with existing cropland or livestock facilities may be eligible for state or federal cost sharing and are encouraged to contact their county land conservation staff or USDA Natural Resources Conservation Service (NRCS) office for information about current funding sources, rates and practices eligible for cost sharing.

Farmers also should work with their land conservation staff to determine how these performance standards and prohibitions may affect their participation in various federal, state and local programs, such as Farmland Preservation. You can find a directory of land conservation offices and related agencies at http://datcp.wi.gov/Environment under "Land and Water Conservation."

► Permits and Licensing:

Farmers may be required to meet NR 151 Standards in order to obtain local and state permits. For livestock siting and manure storage ordinance permits, for example, nutrient management plans and other requirements may be imposed on livestock operations without providing cost sharing. Contact your local officials for additional information.

Farmers with 1,000 or more animal units must operate under a Wisconsin Pollutant Discharge Elimination System (WPDES) permit and do not qualify for state cost sharing to meet permit requirements. Contact your DNR Service Center for more information about WPDES permits.

For more information about runoff management in Wisconsin and topics found in this brochure please visit:

runoffinfo.uwex.edu

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

UW Extension
Cooperative Extension

Wisconsin Department of Natural Resources

Department of Agriculture, Trade & Consumer Protection · Wisconsin

Wisconsin Land and Water Conservation Association, Inc.
wlwca.org

Wisconsin Department of Natural Resources (WDNR), Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), in cooperation with: USDA Natural Resources Conservation Service (NRCS), University of Wisconsin-Extension (UWEX), County Land Conservation Departments (LCD).

Graphic design by Jeffrey J. Strobel
UW–Extension Environmental Resources Center

Wisconsin's Runoff Management Rules

NON-AGRICULTURAL PERFORMANCE STANDARDS FOR CONSTRUCTION EROSION CONTROL AND STORM WATER MANAGEMENT

NR 151 Subchapter III

NR 151 became effective Oct. 1, 2002 as part of a package of Department Natural Resources and Department of Agriculture, Trade and Consumer Protection rules that address runoff pollution (also known as nonpoint source pollution), the major cause of polluted waters in Wisconsin and the United States.

Complete versions of the Runoff Management rules can be obtained by visiting the DNR Runoff Management Program Web page http://dnr.wi.gov/org/water/wm/nps/

or by contacting:

Wisconsin DNR
Runoff Management/ WT 2
Attn.: Carol Holden
P.O. Box 7921
Madison, WI 53707

(608)266-0140

NR 151 includes agricultural performance standards and prohibitions, non-agricultural performance standards, transportation performance standards, implementation and enforcement provisions, and a process to develop and disseminate non-agricultural technical standards.

This fact sheet focuses on the non-agricultural performance standards outlined in Subchapter III, the procedures to implement the standards, and the non-agricultural technical standards process.

The non-agricultural performance standards in NR 151 encompass the construction and post-construction phases of new development and redevelopment areas, as well as certain requirements for developed urban areas. The standards are intended to protect water quality by minimizing the amount of sediment and other nonpoint source pollutants that enter waterways.

The standard for **construction sites** requires implementation of an erosion and sediment control plan using Best Management Practices (BMPs) that, by design, reduce to the **m**aximum **e**xtent **p**racticable (MEP) 80 percent of the sediment load on an average annual basis. No one will be required to exceed 80 percent reduction and some exceptions to meeting this requirement are allowed, provided a proper justification is presented.

Sediment and erosion control practices contained in the 1993 *Wisconsin Construction Site Best Management Practice Handbook* will be accepted as meeting the performance standard until new or revised technical standards replace them. The erosion and sediment control plan also needs to address: minimization of tracking; sewer inlet protection; minimizing sediment discharge from de-watering; and proper use and storage of chemicals, cement and other compounds. Sediment control practices must be installed before runoff enters waters of the state.

This performance standard applies to sites where land-disturbing construction activity affects one or more acres. This threshold is consistent with federal Environmental Protection Agency Phase 2 Storm Water Regulations.

The landowner (or other person performing services to meet the performance standard through a contract or agreement) is responsible for meeting this standard. The standard is implemented and enforced through storm water construction permits issued by the DNR through NR 216. It is expected that the Department of Commerce will require implementation and enforcement of these performance standards for projects permitted or approved under their authority.

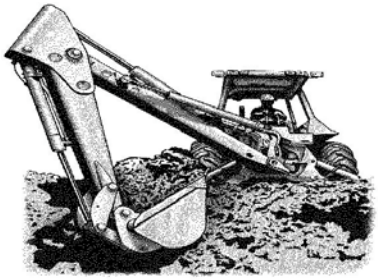
The **post-construction site** performance standards set a minimum level of control of runoff pollution from construction sites after construction is completed and final stabilization has occurred. They apply to sites subject to the construction site erosion control standard, with some specific exceptions.

A written storm water management plan must be developed and implemented for each site and must incorporate the performance standards.

Total Suspended Solids Control. This standard requires BMPs to control to the Maximum Extent Practicable (MEP) 80 percent of the total suspended solids that would normally run off the site, based on an average annual rainfall. For redevelopment and for in-fill development under 5 acres, the reduction goal is 40 percent.

Peak Discharge Rate. This standard requires that BMPs be used to maintain or reduce the peak runoff discharge rate of the 2 year-24 hour design storm, to the MEP. The pre-development land use is assumed to be in good hydrologic condition. Redevelopment sites and in-fill development of less than 5 acres are exempt.

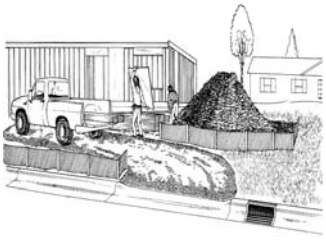
Infiltration. This performance standard requires that, to the MEP, a portion of the runoff volume be infiltrated. The amount to be infiltrated is different for residential and non-residential (commercial,



industrial, institutional) land uses.

Residential – 90 percent of pre-development infiltration volume or 25 percent of the 2 year-24 hour design storm. No more than 1 percent of the project site is required (cap).

Non-residential – 60 percent of pre-



development infiltration volume or 10 percent of the 2 year-24 hour design storm. No more than 2 percent of the project site is required (cap).

To protect groundwater, this standard identifies areas where infiltration is discouraged: areas associated with Tier 1 industries; storage and loading areas of Tier 2 industries; fueling and maintenance areas; areas near karst features; areas in close proximity to wells; areas with inadequate separation distance to groundwater or bedrock; areas where the soils are contaminated and areas where the soils are too coarse.

For practical reasons, the standard further identifies areas where infiltration is not required, such as areas where the infiltration rate is less than 0.6 inches per hour; areas with less than 5,000 square feet of parking lot or roads in commercial and industrial development; redevelopment areas; in-fill areas less than 5 acres; and certain roads.

Protective Areas. This standard identifies where, to the MEP, a permanent vegetative buffer area must be maintained around lakes, streams, and wetlands to filter pollutants and protect against erosion. Buffer sizes vary according to the type and classification of the waterbody: 75 feet for outstanding and exceptional resource waters and wetlands of special natural resource interest; 50 feet for streams, lakes, and most wetlands; and 10-30 feet for less susceptible wetlands; 10 feet for concentrated flow channels draining more than 130 acres. Some limited exemptions apply.

Fueling and Maintenance Areas. This standard requires, to the MEP, that petroleum product runoff from fueling and vehicle maintenance areas must be controlled to remove all visible sheen in the runoff.

The practices identified in the storm water management plan must be installed during or immediately after construction. (The practices may be located off-site, but the runoff must be treated to meet the performance standards before it enters the waters of the state.) This standard will be implemented through storm water construction permits issued by the DNR under NR 216. It is expected that the Department of Commerce will require implementation and enforcement of these performance standards for appropriate projects regulated under its authority.

Information and Education. This performance standard applies to **developed urban areas** — incorporated cities, villages, towns, and counties with a population density of 1,000 or more people per square mile. By March 10, 2008, local governments will be responsible for implementing a storm water management plan that includes public education, leaf and grass management where appropriate, application of nutrients on municipally owned property in accordance with a nutrient application schedule, and detection and elimination of illicit discharges. Public education programs need to address proper management of leaves, grass clippings, lawn and garden fertilizers and pesticides, pet wastes, oil and other chemicals to reduce polluted runoff.

Permitted Municipalities. By March 10, 2008, municipalities subject to a municipal storm water permit under NR 216 must reduce total suspended solids by 20 percent. By March 10, 2013, these permitted municipalities will be required to reduce total suspended solids by 40 percent. Meeting this stricter performance standard may require the use of high efficiency sweepers, which are more effective at picking up smaller pollutants than brush sweepers. In highly polluted areas such as heavy industrial or commercial areas, structural treatment practices may be necessary to control pollutants.

Municipalities covered under a storm water permit issued under Subchapter I of NR 216 are required to meet the developed urban area performance standards as a permit requirement. If a municipality is not regulated under Subchapter I of NR 216, it will *not* receive a permit. However, these municipalities will still be expected to meet the information and education performance standard, enforceable under Section 281.98 of Wisconsin Statutes.

Non-municipal Property Fertilizer. Owners of properties that apply fertilizer to more than 5 acres of pervious surface (e.g. lawns or turf) must apply nutrients in accordance with a nutrient management schedule. This requirement needs to be met by March 10, 2008.

The **technical standard development process** for formulating and disseminating technical standards to support non-agricultural and transportation performance standards is described in Subchapter V of NR 151. The process includes the roles and responsibilities of agencies requesting or revising technical standards; the procedures to develop technical standards, including the DNR's responsibility to determine effectiveness; and the process for making the technical standards available. The DNR will maintain a list of acceptable technical standards.

Prepared by the Wisconsin Department of Natural Resources, Runoff Management Section.

PRINTED ON RECYCLED PAPER

Attachment G

Cost Share Rates and Conservation Practices

From:
Adams County Land and Water Conservation Department

List of conservation practices from:

Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP)

Adams County
Cost-Share Rates and Conservation Practices

Adams County promotes the following practices and maximum cost share rates:

Wisconsin Department of Agriculture Funding: ATCP 50 SWRMP

Practices – ATCP 50.61 through ATCP 50.98

Maximum Cost Share Rates - ATCP 50.42

Wisconsin Department of Natural Resources Lake Protection Grant

Practices – Riparian Buffer, Biological Shoreline Erosion Control Practices, Rain Gardens and necessary storm water conveyance systems.

Maximum Cost Share Rate – 75%

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SECTION 2.2

COST-SHARE FUNDING SOURCE TABLE AND NR 151 CODING

The following will help you in signing cost-share contracts and completing reimbursement requests. It consists of two parts:

(1) A table listing all conservation practices cost-shareable under ch. ATCP 50, the source of funds you must use for cost-sharing the specific practice, and the units of measurement to quantify each cost-shared practice, and

(2) Guidance for completing the column on the reimbursement form related to the NR 151 compliance.

COST-SHARE PRACTICE/FUNDING SOURCE TABLE

PRACTICE or ACTIVITY	ATCP 50 Reference	Funding Source	Units of Measurement
Land taken out of agricultural production (Cost-share contract must list the new or existing farm practice that takes land out of production)	50.08(3)	Structural	Acres
Riparian land taken out of agricultural production (CREP Equivalent) (Cost-share contract must list the new or existing farm practice that takes land out of production)	50.08(4), 50.42(1)	Structural	Acres
Manure storage systems	50.62	Structural	Number
Manure storage closure	50.63	Structural	Number
Barnyard runoff control systems (specify components including heavy use area protection)	50.64	Structural	Number
Access road	50.65	Structural	Linear Ft.
Trails and walkways	50.66	Structural	Linear Ft.
Conservation cover	50.663	SEG[1]	Acres
Conservation crop rotation	50.668	SEG[1]	Acres
Contour farming	50.67	SEG[1]	Acres
Cover crop – single species + termination	50.68(1)	SEG[1]	Acres
Cover crop – single species	50.68(2)	SEG[1]	Acres
Cover crop – multi-species	50.68(3)	SEG[1]	Acres
Critical area stabilization	50.69	Structural	Number
Diversions	50.70	Structural	Linear Ft.
Feed storage runoff control systems	50.705	Structural	Number
Field windbreaks	50.71	Structural	Linear Ft.
Filter strips	50.72	Structural	Acres
Grade stabilization structures	50.73	Structural	Number
Habitat diversification	50.733	SEG[1]	Acres
Harvestable buffers	50.738	SEG[1]	Acres
Hydrologic restoration	50.74	Structural	Acres
Livestock fencing	50.75	Structural	Linear Ft.
Livestock watering facilities	50.76	Structural	Number
Milking center waste control systems	50.77	Structural	Number
Nutrient management for cropland or pasture	50.78(1)	SEG[1]	Acres

[1] *See footnote on page 3*

COST-SHARE PRACTICE/FUNDING SOURCE TABLE			
PRACTICE or ACTIVITY	**ATCP 50 Reference**	**Funding Source**	**Units of Measurement**
Nutrient management for Silurian	50.78(2)	No Funds Available	Acres
Nutrient treatment systems	50.785	Structural	Number
Pesticide management	50.79	Structural	Number
Prescribed grazing	50.80		
1. Management plan	50.80(1)	No Funds Available	Number
2. Fencing (not permanent)	50.80(2)	No Funds Available	Linear Ft.
3. Fencing (permanent)	50.80(3)	Structural	Linear Ft.
4. Establish permanent pasture (seeding)	50.80(4)	Structural	Acres
Relocating or abandoning animal feeding operations	50.81	Structural	Number
Residue management	50.82	SEG[1]	Acres
Riparian buffers	50.83	Structural	Acres
Roofs	50.84	Structural	Number
Roof runoff systems	50.85	Structural	Number
Sediment basins	50.86	Structural	Number
Sinkhole treatment	50.87	Structural	Number
Stream bank and shoreline protection	50.88	Structural	Linear Ft.
Stream restorations	50.882	Structural	Linear Ft.
Stream Crossing	50.885	Structural	Linear Ft.
Strip-cropping	50.89	SEG[1]	Acres
Subsurface drains	50.90	Structural	Number
Terrace systems	50.91	Structural	Linear Ft.
Underground outlet	50.92	Structural	Number
Verification depth to bedrock	50.925	No Funds Available	Number
Waste transfer systems	50.93	Structural	Number
Wastewater treatment strips	50.94	Structural	Linear Ft.
Water and sediment control basins	50.95	Structural	Number
Waterway systems	50.96	Structural	Acres
Well decommissioning	50.97	Structural	Number
Wetland restoration	50.98	Structural	Acres
Engineering services provided in connection with a completed cost-share practice for which Structural revenue may be used (also refer to 50.40(7)).	50.34(4)	Structural	
Other practices with DATCP's written approval	50.40(3)(a)		