Summary of Accomplishments of the Red Cedar River Water Quality Partnership for the End of Year Eight (2023) of the Ten-Year Plan

Authored by the Partnership in 2024

Introduction

In 2015, *A River Runs Through Us: A Water Quality Strategy for the Land and Waters of the Red Cedar River Basin* was approved by the US Environmental Protection Agency and the Wisconsin Department of Natural Resources. The Red Cedar River Water Quality Partnership has been implementing this plan for the past eight years. This report is a brief summary of some of the activities of the Partnership in 2023.

The annual Red Cedar River Conference returned in person in 2023, after being held virtually in 2021 and cancelled at the last minute in 2022 due to a spike in the COVID pandemic. Many other activities took place in 2023 as well, all focused on working to improve the health of soils and the quality of water in the Red Cedar River watershed. While this report touches on some of the projects, accomplishments and events that took place in 2023, it is by no means comprehensive. Many people throughout the watershed continue to change land management practices, install best management practices like catchment basins, grass waterways, cover crops, detention ponds, rain gardens, soil analysis, and also find ways to decrease surface runoff, increase infiltration of precipitation where it lands, and generally improve the health and sustainability of soils. Much of this work happens beyond the reach of this Partnership. Such practices combined with others and augmented by many events where learning about such practices is the topic of discussion, are the reasons for continued optimism regarding water quality in the Red Cedar River watershed. This report tries to summarize the known activities conducted, attended, or assisted by members of the Partnership.

Lake Associations and Districts

There are many lake associations and districts within the Red Cedar River watershed. Some of these groups are active members of the Partnership, while others work mostly on their own, and a few others are, for one reason or another, idle. Below are reports from the active lake organizations in the watershed that participate with the Partnership.

Red Cedar Lakes Association (Red Cedar, Balsam, Hemlock Lakes, Bass, Mud Lakes & Murphy Flowage)

RCLA is continuing its management of Curly Leaf Pondweed (CLP) as part of a DNR Aquatic Invasive Species (AIS) Control Grant. A survey of CLP pre-treatment areas will be done in early 2024. Herbicide treatments for CLP will be undertaken if needed in 2024. In 2023 the RCLA did not do any herbicide treatments of CLP due to the sparce presence of CLP.

In the summer of 2023 RCLA identified that Yellow Flag Iris was present within Red Cedar Lake. A spring survey of all the RCLA lakes will take place in 2024 to determine the extent of this issue. We will be building a program to educate our members regarding this invasive species and how to effectively remove it from their lake property.

The RCLA is continuing to work to identify and eliminate sources of phosphorous (P) coming into our lakes via the four tributaries/streams that flow into our lakes. Past water quality studies have shown a significant increase in P coming from these sources. The RCLA will be working with the DNR, water and land conservationists and other constituents to develop a plan to lower the amount of P coming into our lakes.

We continued our DNR Clean Boats Clean Waters program in 2023. This program is funded through a DNR grant that allowed us to perform 400 hours of monitoring on the highest volume boat landings on our lakes. We continue to maintain decontamination sites at each of these four landings.

Chetek Lakes Protection Association

During the 2023 calendar year, the Chetek Lakes Protection Association (CLPA) continued to focus on public/visitor education, shoreline protection, algae mat management, and further development of the aquatic plant management plan.

Public/Visitor Education

Signage

We have completed our updates for the remaining public landing signs. In total, volunteers have constructed 16 new signs with weather-proof materials and a clean platform for consistent messaging. New for 2023, the CLPA added QR code signs to landing signs that will allow the user to follow the link to the CLPA website page that contains a Lake Chain Map and DNR Fishing Regulations.

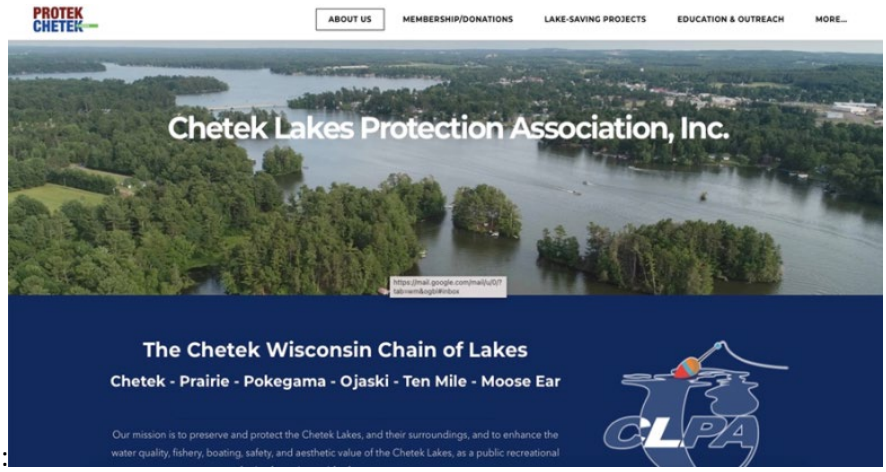
Digital Communication

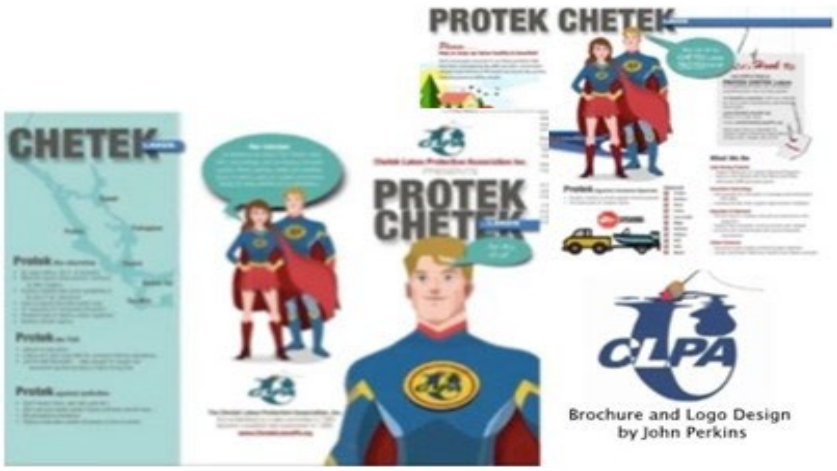
In addition, communication focus on digital platforms was increased with updates to Facebook and the CLPA website, and an informational lake newsletter is mailed to all water-front owners (approximately 1500 properties). The newsletter is also available on the CLPA website.

In 2023, our website had over 15,000 visits from 8,500 unique visitors, becoming a reliable source of information for local residents and visitors.

Red Cedar Newspaper Article

The CLPA wrote a 3-part series for the Chetek Alert Newspaper on the work being done to improve our lake health, and the health of the Red Cedar Watershed. Descriptions included work done by the Red Cedar Partnership, Learning Hub, DNR, County Conservation groups, lake association/districts, and other groups. This series was awarded 2nd place for Environmental Reporting in the 2023 Wisconsin State Newspaper Association Awards Ceremony.



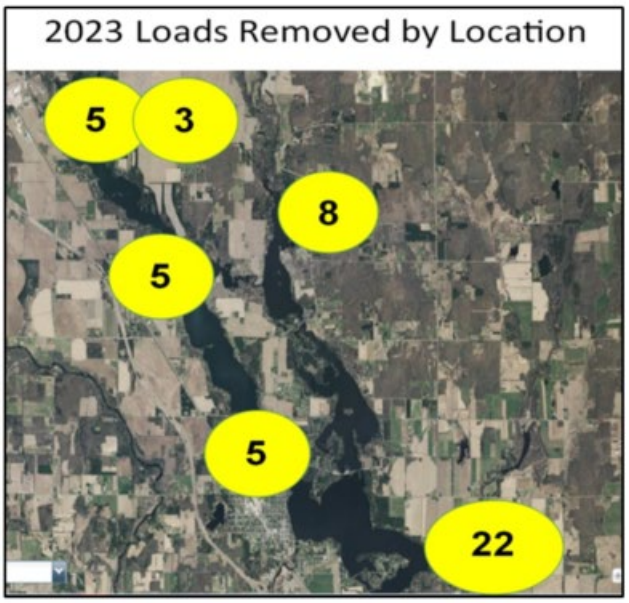


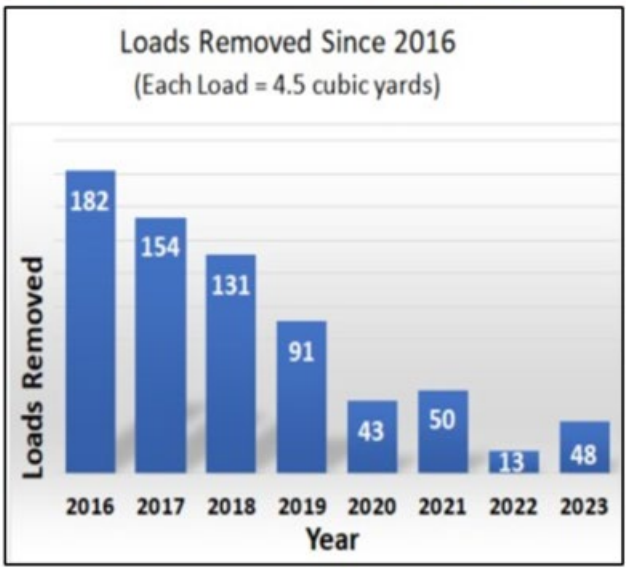
Shoreline Protection

The CLPA has continued to offer Healthy Lakes grant assistance to homeowners. This program has been active in the Chetek Chain since 2017. To date we have completed multiple projects at 31 properties which included native plantings, rain gardens, water diversions and rock infiltrations. Due to the mild winter temperatures and thin ice on the lake, no fish stick bundles were installed in 2023.

Algae Mat Management

2023 remained a light year for weed removal. Curly-leaf pondweed is our prime target and represents 50% of what is removed, but we also removed higher levels of coontail, duckweed, and lily pads as measured and reported in the graph below:





Aquatic Plant Management

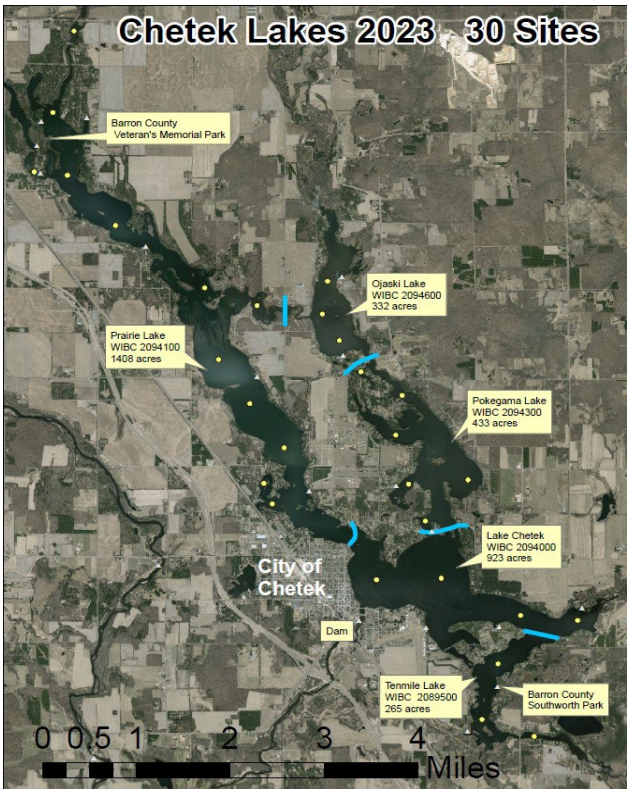
The CLPA contracted an engineering company in 2021 to start the process for updating the aquatic plant management plan in 2022/2023. In 2022, 3000 sites across our 5 lakes were sampled and reported. An updated Aquatic Plant management plan was completed and released in March 2023, and can be viewed on the CLPA website.

As part of the Aquatic Plant Management Plan development, the CLPA conducted an online public survey to gather input to assist the engineering team working on the plan. Here is a summary of the survey results:

- Of the 255 respondents, 86% were CLPA members, 14% non-members, 92% were property owners. 46% were full-time residents.
- How the lakes are used: 88% fishing, 79% water sports, 55% enjoyed the sponsored events, 52% ice fishing, and 18% for snowmobiling.
- Watercraft types were 82% pontoons, 62% kayak/canoe/paddle boat and 27% small fishing boats.
- The top issue for those using the lakes was weeds. Surface weeds such as duckweed, pondweed and milfoil are considered to be the key offenders due to the odors they create in mid-late summer as they die and decay.
- Shoreline management concerns: 75% said the continued loss of shoreline vegetation caused by wave action from boats and wind, 52% said lack of native vegetation aggravates the problem, and 28% said uncontrolled storm water run-off.

Lake Sediment Study

The CLPA contracted an engineering company in 2022 to perform sediment sampling at 1 ft and 4 foot depths at 30 locations as outlined in the map below, looking for content and characterization for making future decisions on lake project priorities. The project was supported through DNR grants, and Baron County Conservation Dept. The samples were evaluated and an engineering report was released in March 2023. The report and results can be viewed on the CLPA website.



Tainter Lake Rehabilitation District

Creation of a Lake District

The Tainter Lake Rehabilitation District (TLRD) was granted official status by the Dunn County Board of Supervisors in February of 2023. This status allowed TLRD to operate as a special purpose governmental body with powers and authority as defined by State Statute 33. Three commissioners were appointed by the Dunn County Board of Supervisors to serve until an election of permanent board members at the first annual meeting. The Tainter Township and Dunn County Board of Supervisors also appointed a representative to the TLRD. These five individuals formed the Initial Tainter Lake Rehabilitation District Board of Commissioners. The main goals of this Board of Commissioners were to conduct the business of the lake district and to prepare for the first Annual Meeting.

The TLRD met at least twice a month until the first Annual Meeting in August 2023. An initial budget was proposed for the organization at the Annual Meeting. This proposed budget included operational expenditures and a project budget for strategic planning. Two hundred and fifty people attended this meeting. The proposed budget and project were approved. Also approved at the meeting was the expansion of the Board of Commissioners to seven (expanding representation) and commissioners were elected to one-, two-, or three-year terms. The TLRD Annual Meeting will take place on the first Saturday in August in the future.

Grant Writing and Strategic Planning

The TLRD wrote and received a WDNR Surface Water Grant to write a strategic plan and hire a consultant. The planning process included surveying lake district residents, multiple community meetings and the expansion of communication capabilities. The goal of the grant is to develop a five-year plan with consultancy support to develop and manage future water improvement projects.

Ad Hoc Committee Structure

The TLRD developed an ad hoc committee structure to address three issues that were facing the lake district. These committees were given specific expectations and timelines to find solutions to these challenges. The committees are:
Sedimentation- the Committee will begin the research and planning for the reduction of sedimentation from the Red Cedar and Hay Rivers. The rivers are currently filling in the area where they enter the lake and reducing lake shore properties access to the lake. At the present time, one boat landing cannot be used to launch boats of any size because of sedimentation.
Aquatic Vegetation- the Committee researched the cost of creating and maintaining navigation channels through a weed bed in Upper Tainter Lake. This investigation has led to a proposal for the cutting of vegetation to create navigation channels. This proposed project and costs will need to be approved at the 2024 Annual Meeting for implementation in 2025.
Boating Ordinance- the Committee has recommended the TLRD assume responsibility for the No-Wake Zones Ordinance and the enforcement of this ordinance. The Committee has also recommended an implementation and yearly maintenance budget for the project. These proposed costs will need to be approved at the 2024 Annual Meeting for 2025 implementation.

Education and Partnerships

One of the three goals established by TLRD is to educate the board and community members regarding the conservation and water quality challenges facing the district. This goal was achieved through information gathered by the ad hoc committees, invited speakers at meetings, and attending regional and state-wide conventions or conferences.

Speakers were included in the regular monthly meeting and have addressed such issues as:

- Shoreline and river erosion
- Cyanobacteria (Blue/Green Algae)
- Shoreline ordnances and updates
- Tainter Lake Fish Survey
- Speakers for Red Cedar Basin Lake Associations.

This information will contribute to making well informed and appropriate future decisions regarding improving water quality and restoration of Tainter Lake.

The TLRD has also reached out to local, regional, and state institutions and organizations to develop partnerships and relationships. These entities include:

- UW-Stout
- Red Cedar River Water Quality Partnership
- Wisconsin DNR
- Dunn County Soil and Water Conservation Department
- University of Wisconsin Extension
- Grassland 2.0 (UW Madison Learning Hubs)
- Wisconsin Lakes
- Local conservation and sportsman's clubs.

The creation of Tainter Lake Rehabilitation District has been an endeavor that included the support of more than just lake district residents. TLRD commissioners, county board members and employees, Wisconsin Department of Natural Resources, local business, and institutional partners have all made valuable contributions to the first year of operation. It is with this support, TLRD will strive to restore, protect, and conserve the natural resource of Tainter Lake.

County Governments

Parts of nine counties are included in the Red Cedar River watershed. Many of these have small portions of their counties within the watershed, with Dunn and Barron Counties having the largest share. With the close contact county land conservation staff have with farmers and land managers in their counties, they are an integral part of the efforts to reduce runoff, promote infiltration, and decrease the pollutant loads flowing to both surface and groundwater in the watershed, and are key members of the Partnership.

Dunn County Land & Water Conservation Division

The Dunn County Land & Water Conservation Division (LWCD) completed the following work within the Red Cedar Watershed, specifically the Lake Menomin and Tainter Lake TMDL Watershed. The LWCD had 8 employees that worked to implement conservation practices and manage grants and financial responsibilities for conservation practices and programs within the watershed. It is important to note that LWCD staff work and administer conservation practices and programs throughout Dunn County. While many more technical and financial resources were expensed throughout the county, this report is specific to the TMDL watershed.

In 2021 Dunn County revised its Manure Storage Ordinance to include the State of Wisconsin's Agriculture Performance Standards as described in Administrative Code NR151. The County Ordinance is now known as the "Agriculture Performance Standards and Manure Storage and Management Ordinance" – Chapter 10 of the Dunn County Code of Ordinances. This ordinance is applicable to all agricultural lands in Dunn County and is not limited to those lands or farms with manure. All farms must meet tolerable soil loss (T) and follow a nutrient management plan on all cropland and pastureland that receives nutrients, including commercial fertilizers. In some instances an offer of cost-share is required prior to enforcement of the standards. A large Notice of Discharge (NOD) Grant project ($796,150) was started in 2023 to properly close a manure storage structure and construct a new storage structure. The project was not completed in 2023. The figures associated with it will be included in the 2024 report. Stepped enforcement of our ordinance, in partnership with DNR, was needed on another case where several conservation practices were eventually installed. A final compliance determination is expected to occur in 2024.

The following table describes the activities installed in the Red Cedar Watershed using county/state cost-share funding. It also describes other farm related activities:

Conservation Practice	Quantity	Cost-share $
Nutrient Management Plans (new)	197 acres	$7,880
Manure Storage Closure	1	$3,803
Grade Stabilization Structure	0	$0
Critical Area Planting	0 acre	$0
Ordinance compliance reviews	7 farms	NA
Farmland Preservation compliance reviews	12 participant farms	NA
No Till Drill rental	390 acres (8 individuals)	NA

Surface Water Monitoring

The LWCD continued to partner with the Department of Natural Resources in establishing a systematic surface water monitoring program. This includes five (5) volunteers through the Water Action Volunteer (WAV) Program, the Red Cedar Conservation Farmers producer led watershed group and staff and students from UW-Stout. Nineteen (19) stream sites were monitored in 2023 by LWCD staff. Those streams were: Beaver Creek, Bronken Creek, Eddies Creek, Hay Creek, Popple Creek, Red Cedar River, Sand Creek, and Trout Creek. Funding for this monitoring was supported by Multi-Discharger Variance (MDV); Department of Natural Resources (DNR); and Red Cedar Conservation Farmers (RCCF).

Red Cedar Demonstration Farm

The Red Cedar Demonstration Farm hosted two public field days this year. These events highlighted the conservation practices implemented on the farm to improve soil health and the impacts to the return on investment of the farm. The Red Cedar Demo Farm is operated by the agronomy classes at Chippewa Valley Technical College (CVTC) with advisory roles from Dunn County LWCD, USDA-Natural Resources Conservation Service (NRCS) and UW-Extension.

Dunn County Transect Survey

The LWCD conducted its annual Soil/Crop Transect Survey in 2023. The Soil/Crop Transect Survey is an inventory of cropping data identified at pre-determined locations throughout the County. The follow data is specifically for the TMDL watershed, and is a small representation of the data available from the survey. Based on the 2023 Transect Survey the TMDL watershed within Dunn County consists of:

33% of cropland was in Corn;

37% of cropland was in Soybeans;

24% of cropland was in a form of forage such as alfalfa, grass, hay;

33% of the crops were planted using a no-till system;

The average tolerable soil loss value for the soils within the watershed is 3.9 Tons/acre/year; and the rotational average soil loss for the cropping years of 2020-2023 was 2.6 tons/acre/year. In general, based on the Transect Survey, farmers are implementing conservation practices that are meeting "T" or tolerable soil loss. Even though the rotational average soil loss is less than what is considered "tolerable" there are several instances of individual fields that exceed the tolerable level. Continued work by the LWCD and partners is needed to assist those responsible for those fields in meeting T.

Multi-Discharger Variance Program (MDV)

The LWCD participated in the Multi-Discharger Variance Program through the Department of Natural Resources in 2023. The goal of this program was to use funds generated from point source facilities to implement a local buffer program as well as the implementation of other eligible conservation practices in the watershed. MDV funds were used in 2022 to install 16 acres of buffers, totaling $3,300. Those buffers remained in place through 2023. MDV funds were also used to install a conservation cover and critical area stabilization project to prevent further soil erosion. As mentioned above some of the MDV funding was used for stream nutrient monitoring. Remaining funds were carried forward for implementation in 2024. As a result of those practices, the following are the estimated nutrient reductions:

MDV practice (acres)	P reduction (lbs)	N reduction (lbs)	Sediment reduction (tons)
16 buffers	14	24	21
Critical Area & Conservation Cover (1.1)	112.5	63	103

The Conservation Reserve Enhancement Program (CREP) continued to be an important conservation practice and program for the watershed. Two landowners enrolled new acres into the program, however, the practices will not be installed until 2024 therefore nutrient reductions will be calculated for the 2024 report.

Red Cedar Conservation Farmers

The Red Cedar Conservation Farmers (RCCF) is one of two farmer-led watershed councils within Dunn County. The watershed covered by this group falls in both Chippewa and Dunn Counties, but staff from Dunn County Land & Water Conservation Division worked as the county collaborator for RCCF. In 2023, a Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) grant was awarded to RCCF to fund conservation practice incentive payments to farmers. The practices installed in 2023 with these funds and donated match are shown below.

Practice	Amount	Pounds of Phosphorus Reduction	Pounds of Nitrogen Reduction	Tons of Sediment Reduction
Cover Crops	678 acres	54	27	68
No-till crops	2688 acres	1,485	807	1,344
Planting green	404 acres	22	12	20
Waterways	1,850 feet	458	250	416
Total	-	2,019 pounds	1,096 pounds	1,848 tons

The RCCF held several field days, workshops and public meetings to share information about their group and to provide an opportunity for outreach and education. Seven (7) different events were attended by 1,393 individuals.

The RCCF has provided funding for surface water sampling with funds from their DATCP grant since 2020. In 2023, surface water sampling was expanded with additional funding from DNR and Multi-Discharger Variance (MDV). Three new sites were added. Sampling prior to 2023 was limited to once per year. In 2023 samples were collected monthly, April through October. All surface water samples were collected by Dunn County LWCD. 133 samples were collected in 2023. The data collected from the samples was uploaded to the DNR Surface Water Integrated Monitoring System (SWIMS) database. With more regular sampling RCCF is hopeful that we will see a water quality improvement due to increased conservation practices in the smaller sub watersheds within the group's watershed boundary.

The RCCF also participated in the newly created Nitrogen Optimization Pilot Program (NOPP). This program was created through the Department of Ag, Trade and Consumer Protection to conduct research across the state on nitrogen use in cropping systems. The RCCF conducted NOPP research on two of their participating farms.

Lead Farmer, Aaron Dietsche and his family provided Wisconsin Governor Tony Evers with a farm tour. During his visit the group discussed the DATCP Producer-led Watershed and NOPP Grant programs.

Hay River Farmer-Led Watershed Council

In 2023, County staff continued to work as the county collaborator for the Hay River Farmer-Led Watershed Council (HRFLWC). A grant through the Department of Agriculture, Trade and Consumer Protection (DATCP) and the McKnight Foundation helped fund the group's conservation practice incentive payments to farmers. The following chart describes the practices implemented using both grant funds and what was donated by the participating farmers.

Practice	Amount	Pounds of Phosphorus Reduction	Pounds of Nitrogen Reduction	Tons of Sediment Reduction
Cover Crops	2,211 acres	94	47	117
Waterway	160 feet	40	22	36
Totals		134 pounds	69 pounds	153 tons

While installation of BMPs is a large part of what the HRFLWC does, there is also a large need for outreach and education to recruit and inform area farmers. The Council held several field days, workshops and public meetings to share information about their group and to provide an opportunity for outreach and education. Twelve (12) different events were attended by 227 individuals.

The LWCD is looking forward to 2024 to continue the implementation of conservation practices and programs. Several more projects are already being planned for the TMDL watershed including additional grant funds for conservation projects.

Barron County Soil and Water Conservation Department

In 2023, Barron County Soil and Water Conservation Department staff assisted with the implementation/installation of the following practices in the Red Cedar River watershed:

Practice	Acres	Number
Nutrient Management Plans (new for 2023)	128 (affected acres)	
Grass Waterways	6	
Cover Crops	800	
Manure Storage Closures		15
Manure Storage Construction and Transfer Systems		3
Well Decommissioning		1
Critical Area Stabilization	42	
Clean Water Diversion	2200 (ft)	

The Department also did inspections for Farmland Preservation, and also NR151 compliance. Of the 60 Farmland Preservation inspections, 48 were in compliance with standards. Of the 61 NR151 compliance inspections, 48 were in compliance. Regarding the NR151 inspections that did not meet standards, regional DNR nonpoint staff were contacted. None of the 13 who did not meet NR151 standards were brought into compliance in 2023.

The Department used news releases, on-site tours, field days, email list-serves, and private well-testing programs as tools for outreach and education on natural resource topics and issues.

The County also completed a 2-year groundwater study with the UW-Stevens Point Groundwater Center. A total of 723 wells were sampled. This information will be used for Public Health and Nutrient Management Planning outreach. Further analysis will be done in 2024 and the information will be used to guide several Department programs.

Rusk County Land and Water Conservation Department

A small portion of the entire western edge of Rusk County is part of the Red Cedar River watershed, and includes parts of seven HUC12-scale watersheds. One TRM grant project was awarded in the area for 2023 but has been slow to start. The County has been working with WDNR in hopes of beginning a dam-rebuild project on Betty Lake/Pigeon Creek dam. Staff also began looking at watershed boundaries and land use in cooperation with the Chetek Lakes Association regarding a couple of the streams in the area that eventually flow to the Chetek chain of lakes.

Chippewa County Land Conservation and Forest Management Department

Small portions of western and northwestern Chippewa County are part of the Red Cedar River watershed, including portions of seven HUC12-scale watersheds. In 2023, the following projects occurred in the watershed with the assistance of Chippewa County Land Conservation and Forest Management Department staff.

1) Cost-shared the installation of 496 acres of cover crops in the fall of 2023.
2) Provided assistance in nutrient management planning for 1,819 acres for the 2023 growing season.
3) Helped with two field trials with farmers to study corn nitrogen management and efficiency.
4) Worked with UW-Extension on small grain trials on one farm.
5) Worked with one dairy farm with a feed pad runoff issue pursuing a fix with state and local oversight.

Other Partners

In addition to the categories listed above, other entities and agencies are key members of the Red Cedar River Water Quality Partnership and play vital roles in the work they do with the Partnership and with their constituencies.

Wisconsin Department of Natural Resources

The WDNR's presence in the Partnership is crucial to implementation of the ten-year plan on many levels. They provide advice and counseling on various grant programs available to the partners for work toward improving water quality. They provide valuable science data regarding water quality monitoring and modeling. They have institutional knowledge of the history of waterways and waterbodies in the state. And WDNR staff are a valuable networking partner, having connections to their own divisions, and to other agencies, non-profits, and resources. In 2023 they provided valuable assistance in all the above areas, and the Partnership continues to rely on them as a vital connection to the state and its resources.

Nonpoint Source Pollution Program

Nonpoint source (NPS) pollution, or runoff, caused by rainfall or snowmelt picks up pollutants as it moves over land on its way to waterbodies and is a leading cause of water quality problems. The Nonpoint Source Coordinator representing the program in this partnership addresses NPS issues through administering the Runoff Grant Program and enforcing Wisconsin Administrative Code Chapter NR 151 Runoff Management.

Federal 319: Wisconsin submits a 5-year Nonpoint Source Program Management Plan (currently 2021-2025) that meets U.S. Environmental Protection Agency (EPA) Clean Water Act requirements and ensures Wisconsin's eligibility for Section 319 funding. Time spent developing/renewing/implementing 9 Key Element Plans/TMDL Implementation plans with groups such as the Red Cedar Water Quality Partnership is used as match for this federal NPS Program grant.

Grants: There are several categories within the Runoff Grants program. Targeted Runoff Management (TRM) and Notice of Discharge (NOD) grants are typically applied for by County Land and Water Conservation Divisions (i.e., Dunn and Barron Counties). Municipalities like the City of Menomonie (or Rain to Rivers through Regional Planning Commission) apply for the Urban Nonpoint Source & Storm Water (UNPS) Planning or Construction grants. There are other NPS funding sources like the Multi-

discharger Variance (MDV) which is more of a collaboration between point source and nonpoint source efforts.

Targeted Runoff Management (TRM)
Rusk County was awarded a small scale TRM grant for 2023 through 2024. The project includes nutrient management, barnyard runoff control systems, and clean water diversions for a small beef operation.

Notice of Discharge (NOD)
An NOD grant was awarded to Dunn County to replace a failing manure storage structure in 2023.

Multi-Discharger Variance (MDV)
The multi-discharger variance (MDV) for phosphorus extends the deadline for point sources of phosphorus to comply with lower phosphorus limits in their permits. This variance to the phosphorus limit can cover multiple point source permits, whereas an individual variance would only apply to a single facility. This provides for administrative streamlining while benefiting the watershed as a whole. While point sources are investing in gradual reductions of phosphorus at their facilities, they are also paying into a fund that is dispersed to counties to spend on nonpoint pollution reduction projects. MDV funds, totaling $56,006.24, were allocated among Barron, Dunn, and St. Croix Counites in 2023 to be spent in the Red Cedar Watershed. These funds were generated from 6 point sources: Village of Luck, Village of Almena, Downsville Sanitary District Wastewater Treatment Facility, Crystal Lake Sanitary District, Lakeland Sanitary District, and Jennie O Turkey Store Inc Barron Plant. Each county gets an amount proportional to the percent of area within it that is covered by the watershed.

Enforcement
Enforcement activities include responding to manure spills and complaints pertaining to small and medium (non-permitted) farms and conducting site inspections. For facilities in violation of NR 151 performance standards and prohibitions, Notice of Noncompliance (NON) and Notice of Discharge (NOD) letters are issued. If this is not enough to resolve the noncompliance, and it becomes necessary to escalate enforcement, Notice of Violation (NOV), Enforcement Conferences, and Department of Justice referrals, among other consequences, are then recommended by the NPS program to DNR's Environmental Enforcement staff. The following are some specific examples of enforcement activities in the Red Cedar Watershed during 2023.

A facility in Chippewa County was issued a notice of violation in the fall of 2023 for s. NR 151.055 Wisc. Admin. Code, Process wastewater handling performance standard.

A facility in Dunn County roughly 2 miles upstream on a tributary to Tainter Lake, was issued a notice of violation in the fall of 2023 for s. NR 243.11(3) Wisc. Admin. Code, WPDES permit coverage required.

An operation in Dunn County was issued two citations for s. 29.601(3)(a), Wisc. State Stats. Deleterious Substance, where cropland erosion led to sediment deposition into waters of the state.

Farmers of Barron County Watersheds

The producer-led watershed group in Barron County, known as the Farmers of Barron County Watersheds are members of the Partnership, and continue to work toward expanding innovation in regenerative agriculture on the land they manage. In 2023, the group consisted of 47 members, farming 9,594 acres.

In 2023 the group worked on some branding for marketing and education purposes, sought out and found help for administrative support, conducted field days and educational outreach, increased membership, and helped establish a demo plot with data collection. One major accomplishment was a Winter Agronomy Conference, held in December. Experienced presenters at the event included a research agronomist sharing demo plot data, County Land Conservation staff sharing programming information, and Francisco Arriaga from UW and consultant Matthew Oehmichen presenting on water and soil quality as well as cover and companion crops. Roughly 50 people from within the watershed group and surrounding communities as well as conservation professionals attended.

The table below shows the group's outreach and education activities in 2023.

Type of outreach	Number of events held	Number of participants	Titles/topics of an example event or events from this category you'd like to share:
Field Days	2	25	-Cover Crops -Demo Plot Tour -Water Infiltration -Grain Drill Calibration -Supporting programming at both ex Practical Farmers of Iowa -Incentive programs at cover crop mtg in July
Board Meetings	4	6-10 at each	
Workshops	1	50	Winter Agronomy Conference -Demo Plog Agronomy Summary -Farmer Cons Practice Programs -Connections Between Soil Health & Water Quality -Conservation Agronomics -Open Panel discussion

Additionally, members of the group participated in soil testing using the Haney Test, which provides a detailed profile of the health of soil. This testing across a number of participant farms provided first hand experience of a lab tool for measuring nitrogen values pre-sidedress. The main learning outcome was awareness of soil nitrogen levels prior to this application. Results across most farms showed much higher than expected soil nitrogen levels, with some participants choosing to reduce side dress application rates based on the test data provided.

City of Menomonie

In 2023, the City of Menomonie accomplished several projects and practices aimed at improving water quality. Water quality projects and practices in 2023 included:

- Wastewater Treatment Plant Upgrades: The City continued a construction project at the wastewater treatment plant focused on reducing the amount of phosphorus in the discharged effluent to meet upcoming DNR standards of 0.1 parts per million (ppm).
- Outfall Repair: The City contracted with a private contractor to substantially repair a failed outfall that discharges into Wilson Creek.
- Increased Street Sweeping: The City continued to implement targeted, increased street sweeping frequency in the fall, within 24 hours of curbside leaf pickup, in select residential neighborhoods with moderate tree canopy based on DNR technical guidance.
- Phosphorus Modeling: The City has identified a need for additional stormwater planning to quantify and account for all current practices providing water quality treatment and estimate municipal progress toward the TMDL/MS4 goals. The City Council approved a locally funded planning project to update the TMDL delineations and complete WinSLAMM modeling in September 2022. Work was completed and submitted to the Wisconsin Department of Natural Resources (DNR) in October 2023. The City estimates that it reduces 56.2% of total suspended solids (TSS) and 48.7% of total phosphorus (TP) as compared to implementing no stormwater management controls in the TMDL regulated area of the City. This equates to a load removal of 382,439 pounds of TSS and 695.9 pounds of phosphorus annually. This analysis does not include the city's street sweeping practices, curbside leaf pickup or any privately owned stormwater best management practices. City staff are currently working with the DNR to verify modeling results and receive concurrence on meeting our TMDL goals.
- The City is an active member in the regional water quality consortium, Rain to Rivers of Western Wisconsin. The City participates and helps promote stormwater education and outreach activities across the region and watershed.
- The City continues its annual efforts to improve water quality and maintain compliance with the requirements in the City's MS4 permit. Highlights of these efforts include:
    - 16 educational events with a focus on water quality
    - Inspected 143 stormwater outfalls
    - Conducted 56 erosion control inspections at construction sites with one or more acres of land disturbing construction activity
    - Inspected 31 municipally owned stormwater ponds
    - Inspected 11 privately owned stormwater ponds
    - Collected 1,329 tons of material during spring and fall street sweeping operations
    - Cleaned 28 catch basin sumps

- Collected bagged yard waste and leaves curbside on eight days (4 spring/4 fall)

Landmark Conservancy

Landmark Conservancy is a nationally accredited, non-profit land trust serving 20 counties in western and northwestern Wisconsin. They work primarily with private landowners who wish to conserve their land in perpetuity. They also work with local municipalities, state, and federal entities to create public preserves and trails for all to enjoy. Their primary tools for land protection are conservation easements and land acquisition.

Although Landmark Conservancy did not have any new projects in the Red Cedar River watershed in 2023, they continue to be a valuable member of the Partnership and will continue to work in western and northwestern Wisconsin to serve those looking to preserve natural lands in perpetuity.

3M

The 3M plant in Menomonie manages several hundred acres around the plant just east of Lake Menomin, and in the past has leased it for farming. However, a decision was made in 2022 that that would be the last year they would lease this land for farming. In 2023, this land underwent a change. A decision was made to plant low-maintenance ground cover on much of this land. In 2023 3M initiated these efforts by cutting the overgrowth and spraying the land in preparation for planting in 2024.

UW-Stout

Having UW-Stout located in Menomonie and in the Red Cedar River watershed is beneficial to the Partnership on many levels. The water quality issues in the watershed provide excellent opportunities for multi-disciplinary learning and teaching for faculty and students. Many programs sponsored by UW-Stout contribute valuable data for the Partnership regarding natural and social science elements that influence how water quality problems in the watershed are addressed. Additionally, UW-Stout hosts the annual Red Cedar River Conference. The following is a list of activities UW-Stout sponsors in which the Partnership participates or considers highly valuable in working toward its goals.

1. The LAKES REU hosted their second cohort of students under their current 3-year funding from the NSF in the summer of 2023. Nine students from around the country participated. All research posters and summaries can be found at the program's website. Projects covered a variety of topics including (only a partial list):
    - An aquatic plant survey of Lake Menomin with a focus on curly leaf pondweed
    - Toxin levels and dynamics in Lake Menomin and Lake Tainter
    - Public perceptions of drinking water quality and how partisanship plays a role
    - A survey of farmers and their trust in a variety of agricultural service providers, agencies, and experts
    - The potential benefits (both economic and environmental) of diversifying farm operations.

2. A major Universities of Wisconsin Innovation Grant (one of only three in the system) was awarded to Drs. Yuan Xing, Cheng Liu, Abhishek Verma, Tina Lee, and Bob Zheng (Dr. Zheng is from UW River Falls). The project (A Human-Centered Collaborative Approach to Designing an Energy-Efficient Wireless Sensor Network for Precision Agriculture) aims to gather input from smaller producers to help design on-farm technology to support better data gathering and sustainability. The hope is to design solutions that are cost-effective and more easily adoptable. Community partners (local farmers, agronomists, and Dunn County) are key to this project.
3. Several grants were received from the Freshwater Collaborative of Wisconsin. The grants were used to support water-related research and students projects in the watershed as well as the creation of curriculum to train students to work in this area after graduation:
    - A Freshwater Science Summer Field Experience for high school students during the summer of 2023
    - Continuation and Expansion of the Red Cedar Basin Monitoring Group (Dr. Nicole Hayes, Dr. Keith Gilland, Dr. Amanda Little, and Julia Chapman)
    - Data Collection and Parameter Estimation for a Dry Bean Yield Response to Irrigation Model (Dr. Keith Wojciechowski; project with Chippewa Valley Bean)
    - Development of a Cross-Campus Certificate in Freshwater Sciences (Dr. Keith Gilland and Dr. Amanda Little)
    - Development of an Advanced Freshwater Science Field Course (Dr. Keith Gilland)
4. Dr. Keith Gilland and Dr. Julia Chapman continued collaborations with the City of Menomonie and the Red Cedar Colfax Preserve and Recreation Area on a variety of restoration projects.
5. The Human Dimensions of Conservation concentration in the B.S. in Environmental Science program was launched. It will help to train students for work in conservation that needs social science and "people skills" to help to address the needs to engage communities and change behaviors to address complex environmental problems (including water quality).
6. Work continued on establishing a Center for Sustainable Communities (formerly known as the Center for Rural Opportunities, Prosperity, and Sustainability)
7. Under a USDA SARE Grant, work is continuing to establish and grow a Red Cedar Learning Hub, an effort led by John Strausser from Grassland 2.0. The group aims to promote more generative agriculture in the watershed using a process they term "Collaborative Landscape Design." One key project will be to launch a pilot project to bring producers of grassfed beef (raised in ways that support improved water quality) together with consumers (especially those who live on lakes) to build markets and supply chains.

UW-Madison Division of Extension

Staff from UW-Madison Division of Extension continue to provide assistance and resources to the Partnership.

Extension Agriculture Water Quality Program

A new Agriculture Water Quality Outreach Specialist for Northwest Wisconsin, Kelsey Hyland, was hired in 2023. She engaged with 13 producers and 35 fields in the Red Cedar River Basin to sample for the statewide 2023 Soil Test Phosphorus (STP) survey conducted by the Agriculture Water Quality Program. Research has shown phosphorus concentrated at the soil surface is a risk factor for phosphorus losses to

water bodies. Shallow soil sampling was offered on 3 fields per producer as a means to identify individual field's water quality risk. Individual and group outreach was conducted with the Red Cedar Conservation Farmers, the Hay River Farmer Led Watershed Group, the Farmers of Barron County Watersheds, and individuals not affiliated with farmer-led groups, but still farming in the Red Cedar River Basin (Figure 1).

This project aligns with one of the goals set out in the original water quality plan included in the Best Management Practice Table "Draw phosphorus levels down to 25ppm on ⅓ of cropland with the highest delivery rates (86,000 acres)," which is modeled to reduce approximately 31,500lbs. of phosphorus per year in the Red Cedar River Basin. The newest available data from Department of Agriculture, Trade, and Consumer Protection (DATCP) show median levels for STP within this watershed remain elevated above this 25ppm benchmark. Of the 28,898 0-6in. soil samples submitted to DATCP certified labs in Barron County, the median sits at 35ppm and of the 25,700 samples submitted in Dunn County, the median sits at 41ppm (Figure 2). Which means that more than half of the ~55,000 samples submitted between Barron & Dunn counties far exceed the 25ppm STP plan goal. Additionally, approximately 80% of 0-2in. samples in the 2023 Soil Test Phosphorus survey were in the excessively high category for loamy soils (>30ppm). Coupled together this data signifies a continued need for outreach and action in this topic area within the Red Cedar River Basin.

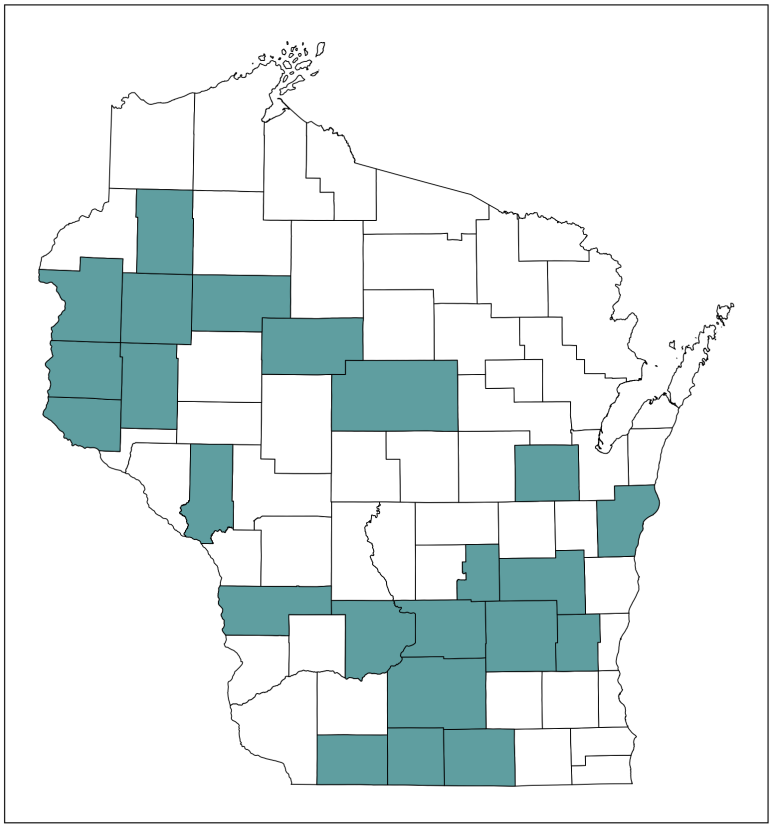


Figure 1. 2023 Soil Test Phosphorus (STP) Survey participation across the state .

This strategy also works to elevate awareness surrounding dissolved phosphorus losses. This is an important loss pathway that is estimated to make up approximately 50% of total phosphorus losses depending on conditions, yet it continues to be a pathway we struggle to control with other conservation practices present in the watershed like no-till and cover crops (Figure 3). Shallow soil sampling with new participants in the watershed, additional analysis, and outreach communicating the importance of phosphorous drawdown as a strategy to layer with other conservation practices to reduce phosphorous loss risk to water bodies will continue into 2024-2025.

Median County Soil Test Phosphorus (ppm)
DATCP Soil Survey (0-6 in), 2014-2019

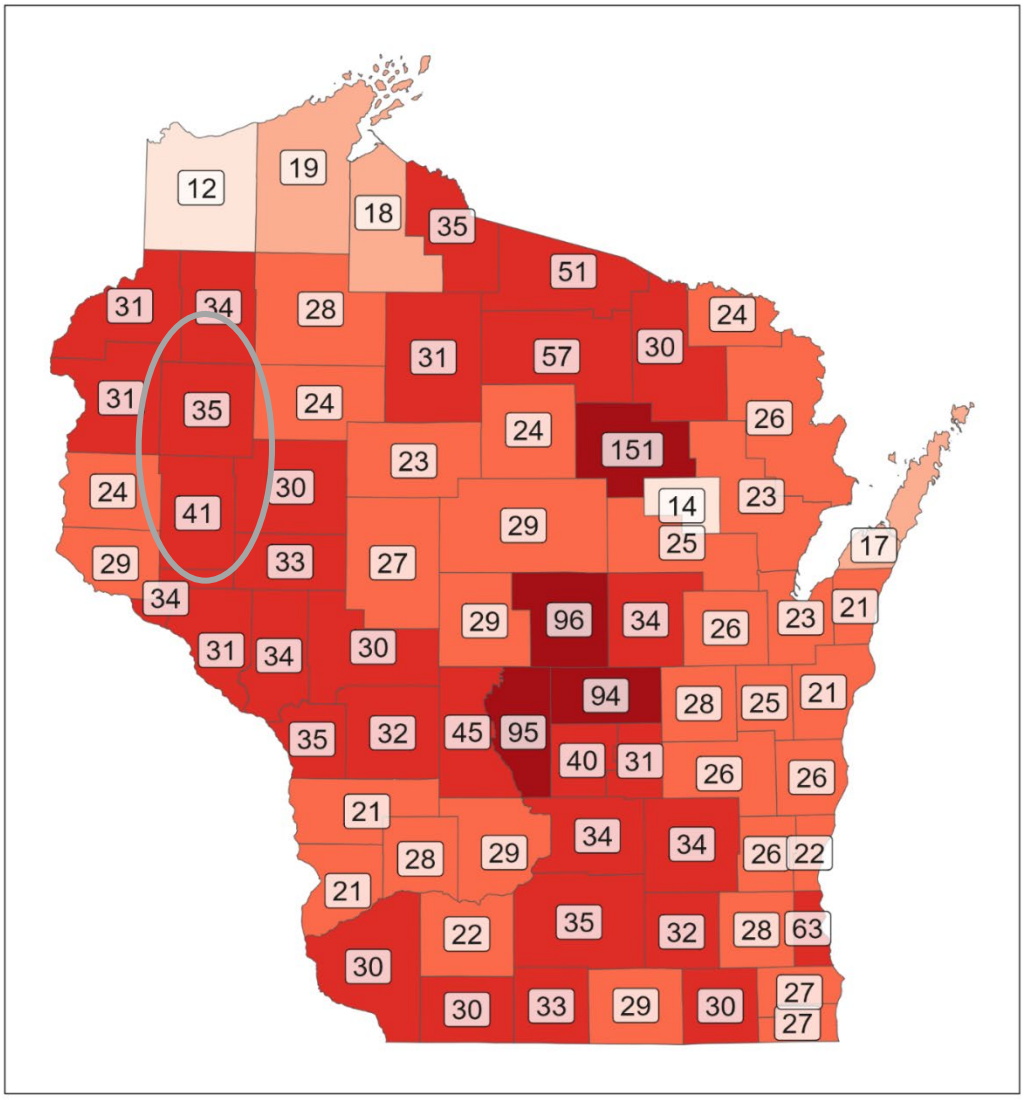


Figure 2. Median Soil Test Phosphorus (STP) values for 0-6in samples submitted to DATCP certified labs from 2014-2019. Counties with higher median STP are shown in darker shades. The green circle corresponds to approximate location of the Red Cedar River Basin.

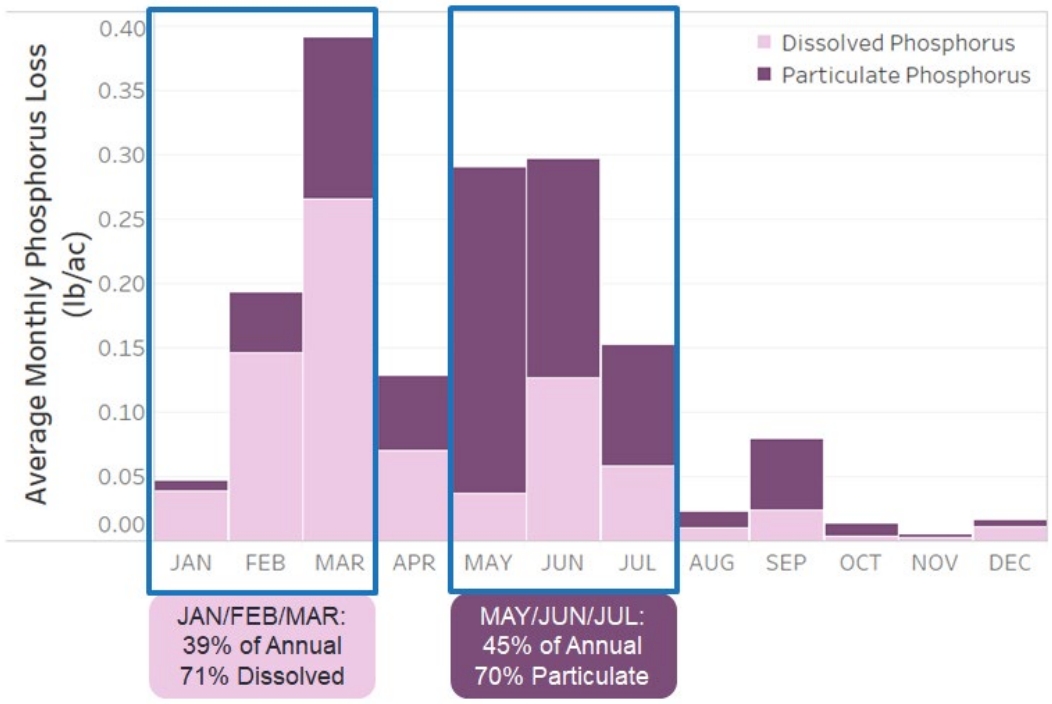


Figure 3. Phosphorus loss data by speciation from UW-Madison Extension Discovery Farms 20 years of edge-of-field monitoring. Approximately 50% of total phosphorus losses are in the dissolved form and occur during winter.

Extension Regional Natural Resources Education Program

UW-Madison Division of Extension Regional Natural Resources educator, Dan Zerr, continues to facilitate and lead the Red Cedar River Water Quality Partnership, and has been in that role since the group's inception in 2012. This involves coordinating meetings, agendas, and minutes, writing reports and press releases, representing the group in letters of support and at events, and presenting the Partnership's activities at various conferences and workshops.

Estimated Load Reductions from Best Management Practices

The ten-year watershed plan calls for reducing annual phosphorus loads to the watershed by a little less than 200,000 lbs. by year ten. As listed above, many of the various partners have been involved with the installation of best management practices that help reduce phosphorus loads to the watershed. Such reductions will help lead to fewer and less intense algae blooms in the lakes and rivers of the Red Cedar River watershed.

In addition to the practices listed previously, there are landowners participating in other cost-share programs through the federal Natural Resource Conservation Service (NRCS). It is hoped that as education and outreach efforts, field days, mentoring, and other activities occur in the watershed, more farmers would begin to adopt many of the best management practices listed in the ten-year plan as being effective methods to reduce nutrient loads to water bodies. It's virtually impossible to know what every landowner is doing toward the use of best management practices, as some farmers are installing

best management practices but not participating in cost-share programs, or not reporting what they're doing to any official agency; while others may have tried some practices in recent years and decided for whatever reason to discontinue such practices. However, in addition to what was captured above, we also have limited access to some of the NRCS cost-share activities in the watershed. Below is a summary of BMP data obtained for this report. Using modeling and calculations specific to individual projects, or using the calculation formulas contained in the ten-year plan to estimate load reduction projections from certain BMPs, an estimate of load reductions from the 2023 data collected is included, and shows that 6,874.5 lbs. of phosphorus was kept from the waters of the Red Cedar watershed through these various programs.

(Note: It is not easy to calculate load reduction projections for all BMPs, so any BMPs listed above or otherwise happening in the watershed where calculations of load reduction are not possible are not listed below. This would include practices such as grassed waterways, managed grazing, grade stabilization structures, and others. It IS possible to do load reduction calculations for some of these practices, but not without detailed information about each specific project.)

Practice (NRCS data)	**Acres**	**Pounds of Phosphorus Reduced**
Conservation Cover	79.3	68.4
Cover Crops	9565.9	1607.1
Critical Area Planting/Field Borders	70.3	60.6
No Till	3684.7	2641.2
Total NRCS		**4377.3**
Totals from Counties and Producer Led Watershed Group Activity		**2497.2**
Estimated Overall Annual Load Reduction for 2023		**6,874.5**

It's important to emphasize that these load reduction calculations are based on ONLY those practices for which some sort of cost-share or monitored program report can be referenced. Thus, we reiterate that this is not a comprehensive picture of practices in the watershed. It is very difficult to assess all acres, but we can offer an example of alternative estimation. If we were to refer to the item under Dunn County Land and Water Conservation's section previously listed in this report that discusses the County's transect survey, we could estimate that 33% of all cropland in Dunn County is planted in a no-till system. According to the USDA 2023 CROS estimate of cropland, there were 227,308 acres of cropland in Dunn County. If we estimate that 33% of that was in a no-till system (75,012 acres), and use the same formula for calculating load reductions for no-till as we used in the above table, this would give us a value of 53,768 lbs. of phosphorus reduced within Dunn County alone. However, we don't know for sure that the 33% in the transect area can truly translate county-wide, we don't know how many of these acres have been in no-till for years prior to 2023 (thus not "new" load reduction), and there are other variables for which we can't be confident. But all these numbers and estimates are valuable, and good for tracking load reductions year to year.

Point Sources

Phosphorus loads into the watershed from point sources, such as wastewater treatment plants, are monitored and managed through the WPDES permits those sources are mandated to have. However, it is beneficial for us to track those loads over the years to monitor changes.

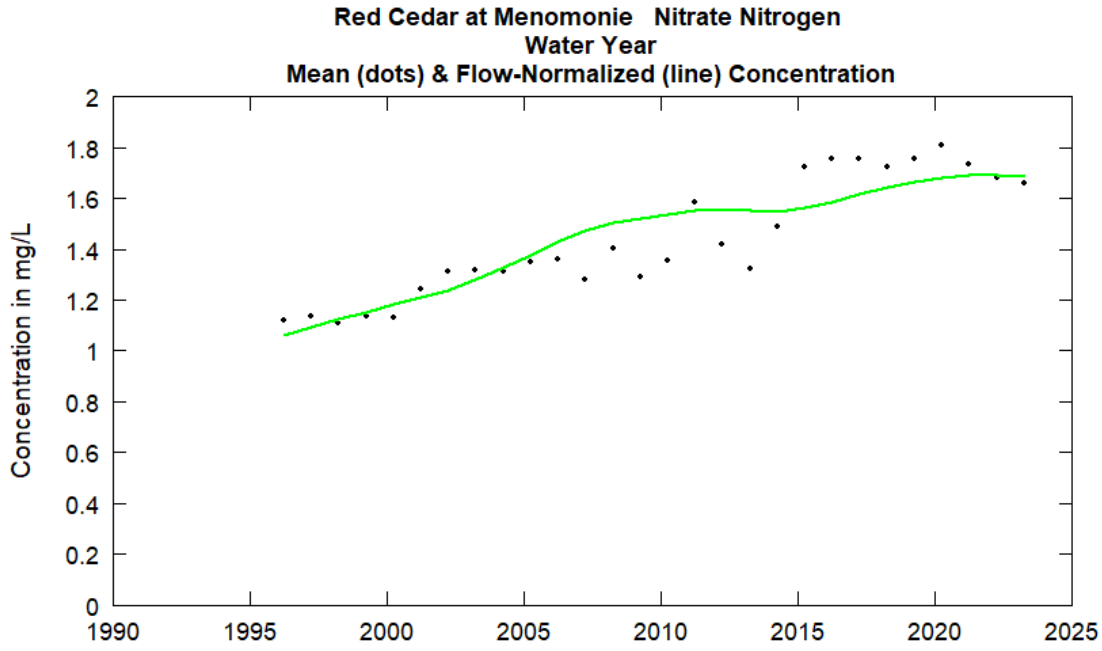
The TMDL for the Red Cedar River watershed calls for a phosphorus load goal from point sources, of 20,100 lbs. per year. In 2023, total point source loads from all permitted sources were recorded to be 7,684 lbs. (source: WDNR), considerably below the stated goal. However, it's important to note that from year to year, this load varies. In the past twelve years annual point source loads in the watershed have varied from a low of 6,354 lbs. in 2011 to a high of 17,258 lbs. in 2014 which was still below the TMDL goal of 20,100 lbs. This tells us that point sources of phosphorus are generally doing their part and meeting their goals for reduction.

Water Quality Monitoring in the Red Cedar Watershed

In addition to special monitoring projects DNR does regular monitoring of phosphorus and nitrate below the Lake Menomin dam on the Red Cedar River near the bottom of the watershed. This monitoring has been going on for several decades and is a good historical picture of nutrients in the Red Cedar River. In 2023 phosphorus levels continued at levels considerably lower than when measurements began over 30 years ago, with another slight drop in the normalized P concentration from 2022 to 2023 from 0.0995 mg/l to 0.0983 mg/l (see graph below). The Partnership sees this as progress toward goals and would like to be able to say it's because of our work. However, that's a difficult connection to make directly, with so many variables involved. Still, the trend of declining phosphorus levels is a positive trend and moves the Partnership toward goals laid out in the plan, and this will hopefully continue. However, nitrate levels in the river continue to be high though have leveled off slightly in recent years. Higher nitrate levels in surface water likely also means higher nitrate levels in ground water, and this presents a different set of problems than the phosphorus issues. This data will inform future discussions and actions within the Partnership.

In the graphs below provided by WDNR, the dots represent the annual mean total phosphorous or nitrates for each year, and the green line is the annual concentration normalized for the annual flow.

Nitrate levels below the dam in Menomonie (source: WDNR)



Total phosphorus levels below the dam in Menomonie (source: WDNR)