Summary of Accomplishments of the Red Cedar River Water Quality Partnership for the End of Year Six (2021) of the Ten-Year Plan

Authored by the Partnership in 2022

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 six years. This report is a brief summary of some of the activities of the Partnership in 2021.

The year 2021 again offered challenges with many implementation activities due to the ongoing Covid pandemic. However, the Partnership continued to meet, activities were held when they could be done safely, and many practices and management changes were implemented on the ground by groups and individuals within the watershed. While this report touches on some of the projects, accomplishments and events that took place in 2021, 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, detention ponds, and rain gardens, analyze their soil, and generally find ways to decrease surface runoff and increase infiltration of precipitation where it lands…and 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

Many of the lake associations in the Partnership continued their work in 2021, with various projects designed to focus on the individual issues in their lakes.

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

Following a spring pre-treatment survey, RCLA treated just 2.5 acres of Curly Leaf pondweed (CLP) in early June as part of a DNR Aquatic Invasive Species (AIS) Control Grant. This compares to 27.9 acres in 2019 and 16.7 acres in 2020. A CLP bed mapping survey in July confirmed a significant reduction of CLP in the lakes. Also, a fall CLP Turion Study (turions are the CLP seeds that fall off mature plants into the lake and form the basis for future plant growth) showed a measurable reduction in turion density in Red Cedar Lake between 2012 and 2021. There was a smaller reduction in turion density in Balsam and Hemlock Lakes during the same time frame, which is not surprising given that Red Cedar has had several more years of herbicide treatment than the other lakes. Relative to Purple Loosestrife management, the

team removed and chemically treated this AIS plant in a few areas in the lake that reestablished itself in 2021. Ongoing volunteer monitoring of the lakes and streams has shown no evidence of any new AIS in 2021.

A DNR Water Quality Grant wrapped up this year with volunteers testing and measuring phosphorous, dissolved oxygen, flow volume and precipitation in the three lakes and incoming tributaries. Phosphorous readings were slightly higher in 2021, driven by fairly significant loading increases from Big Chetac and Birch Lakes.

A DNR Clean Boats Clean Waters Grant allowed for over 400 hours of monitoring on the highest volume boat landing. In addition to monitoring, volunteers conducted surveys and handed out literature to boat owners. Also, decontaminations sites have been installed on all three lake's highest volume landings.

Shoreline habitat and woody debris studies were completed on Hemlock and Bass Lakes, providing valuable insight for management of impaired shorelines and opportunities for phosphorous loading reduction programs.

Two Healthy Lakes Grants aimed at reducing shoreline erosion were completed in conjunction with RCLA volunteers and property owners. Several more are scheduled in 2022.

RCLA successfully conducted its first tree drop project on Balsam Lake as part of the Fish Habitat program.

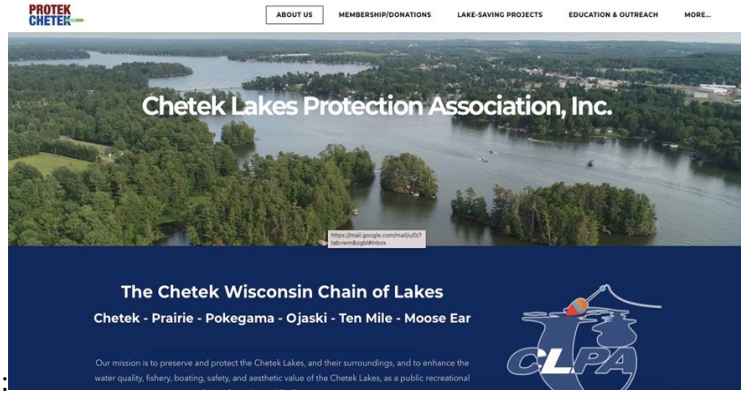
A concerted program aimed at educating boat owners on the negative impact of large wakes and corresponding shoreline erosion and phosphorous loading was implemented with educational posters on all boat landing kiosks.

Chetek Lakes Protection Association

During the 2021 year, the Chetek Lakes Protection Association (CLPA) continued a focus on public/visitor education, shoreline protection, algae mat management, and starting a process for updating the aquatic plant management and comprehensive lake management plans.

Public/Visitor Education
To improve boater knowledge and awareness, 9 of 16 landing signs have been replaced or repaired, and all content standardized and updated as per the picture below:

In addition, communication focus on digital platforms was increased with now weekly lake education updates to Facebook and the CLPA website, and a newly updated visitor brochure was released to improve lake education of the 30,000-40,000 visitors to the Chetek Chain of Lakes each year. We seek to improve use and care of the lake with better-informed visitors that may not have learned about lake health from any other source.



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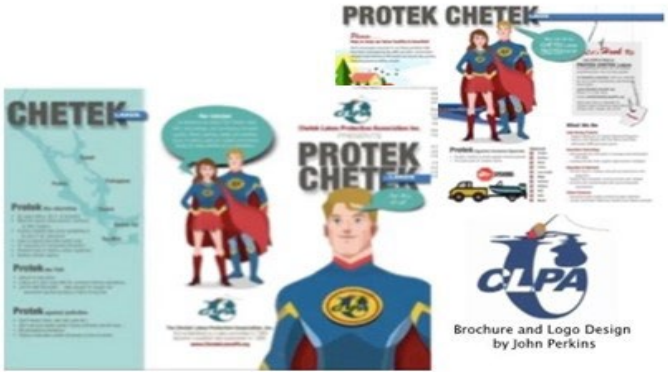
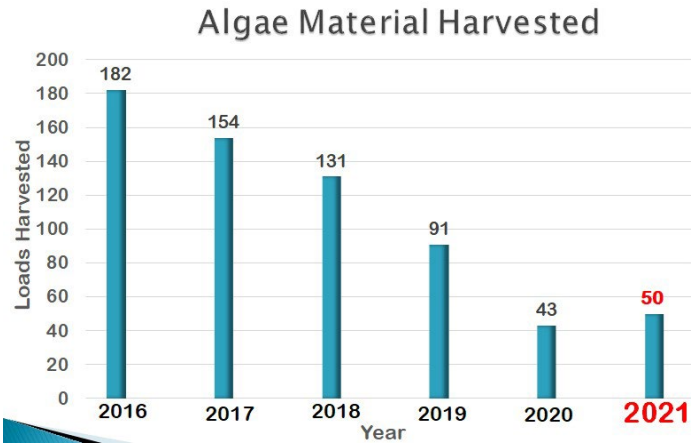


Shoreline Protection

Through the Healthy Lakes program, 12 fish sticks have been installed over the 2020/2021 year, and 8 property shorelines were upgraded with native plantings, rock gardens, and storm water run-off diversions.

Algae Mat Management

2021 also saw an increase in algae mats throughout the chain of lakes due to the early spring thaw and longer growing season adding approximately 4 weeks to the algae skimmer schedule. As measured and reported in the graph below, 2021 marked the first year that algae material removed from the lake surface increased in the past 5 years. Also noted by operators of the skimmer was a higher amount of duck weed than in past years.



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. Survey plans were developed and funding to complete the plan is being sought through WDNR Surface Water Grant Program, and through fund-raising, donations, and volunteer assistance.

Tainter Menomin Lake Improvement Association

Sadly, the Tainter Menomin Lake Improvement Association ended their existence in 2021. Terms for Board Officers expired, and no one stepped forward to fill those roles. The TMLIA has been an integral partner in the Red Cedar River Water Quality Partnership since the Partnership's beginning in 2012. Their contributions are greatly appreciated, and their participation in the Partnership will be sorely missed. It is hoped that there will be some sort of collaborative effort from lake residents that will again be part of the Partnership in the future. One item of note is that talks and exploration have been occuring in Dunn County to perhaps form a lake district around Tainter Lake. This has the potential to introduce another crucial partner into the existing Partnership.

Although acting during 2021 in a "past president" status, Liz Usborne did oversee some activities that took place toward the goals of the Watershed Plan. The 2021 Red Cedar River Conference took place virtually in March as part of "Wisconsin Water Week". It was well attended and offered many great sessions online. Also volunteers stepped up to offer maintenance at the rain garden in Lakeside Park in Menomonie since the TMLIA will no longer be overseeing the continued maintenance of that storm water control structure.

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. Travis Drier, Conservation Planner-Nutrient Management Specialist, worked with 62 people participating in the Farmland Preservation Program covering 16,351 acres. This includes two new participants in Otter Creek Township. We cost-shared 565.2 new acres of nutrient management planning, totaling $22,608.

Tina Barone, Conservation Planner, worked with several landowners within the watershed, including two grade stabilization projects and one other erosion control project, however due to a number of circumstances those projects were delayed until 2022. Tina did assist in the proper decommissioning of three abandoned wells.

Heather Wood, Conservation Planner-Water Quality Specialist, worked with four volunteers to collect total phosphorus samples on 15 stream sites through the Water Action Volunteer Program. Those streams were: Annis Creek, Little Beaver Creek, Big Beaver Creek, Clack Creek, Quarter Creek, Rush Creek, Vance Creek, Little Vance Creek, and Wilson Creek. A new Well Water Viewer has been created for Dunn County and will be released in early 2022 along with supporting groundwater education content. This information will continue to improve by including surface water information in the future.

The LWCD also hosted a small education event that was done for elementary level summer school students in Boyceville in August. Our no-till drill was rented out by 6 different individuals within the Red Cedar Watershed for a total of 175 acres.

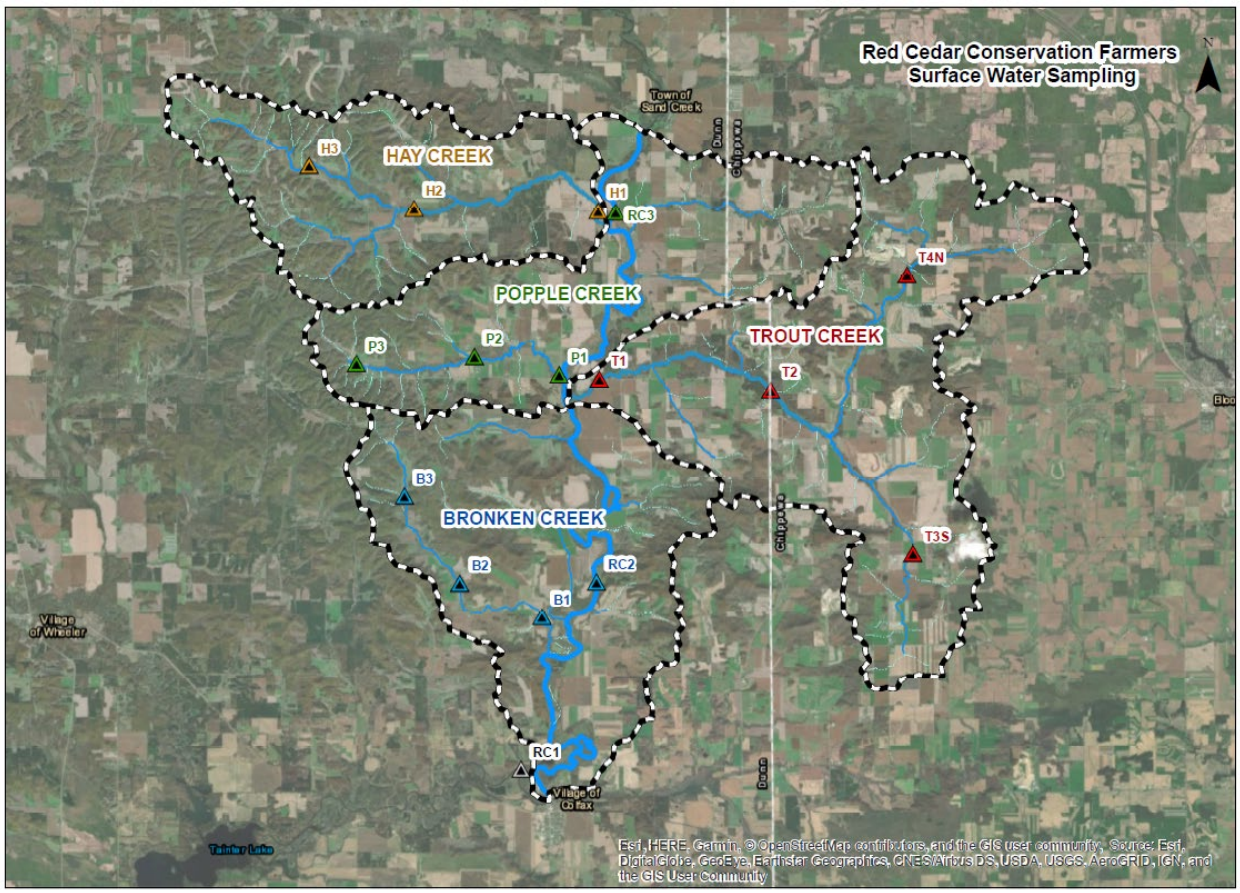
Red Cedar Conservation Farmers

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 Steve Olson from Dunn County Land & Water Conservation Division works as the county collaborator for RCCF. In 2021, a Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) grant was awarded to RCCF to fund BMP incentive payments to farmers. The practices installed 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	1395 acres	112 pounds	56 pounds	140 tons
No-till crops	3839 acres	2112 pounds	1152 pounds	1920 tons
Planting green	724 acres	40 pounds	22 pounds	36 tons
Soil samples	300	-	-	-
Grassed Waterway	2446 feet	605 pounds	330 pounds	550 tons
CREP	42.92 acres	117 pounds	64 pounds	57 tons
Total	-	2986 pounds	1624 pounds	2703 tons

Several farmers within RCCF also installed different demonstration plots within the watershed. The plots consisted of: 25 acres used to compare no-till to strip-tillage, one nitrogen use efficiency (NUE) plot, 8 acres using a roller crimper and soil health assessment samples on 22 fields.

Also included in the DATCP grant was funding to pay for surface water and private well water sampling. Ten (10) private wells were sampled throughout the RCCF watershed. Of these samples, one sample contained nitrate concentrations above the 10 mg/L known to have health impacts on vulnerable populations. The group continued to collect sixteen (16) surface water samples from tributaries to the Red Cedar River and its main stem, shown below.



Hay River Farmer-Led Watershed Council

In 2021, Amanda Hanson, Conservation Planner, continued to work as the county collaborator for the Hay River Farmer-Led Watershed Council (HRFLWC). A grant through the McKnight Foundation helped fund the group's BMP incentive payments to farmers trying new-to-them practices. The following chart describes the practices implemented using both grant funds and what was donated by the participating farmers.

McKnight Grant-Funded & Donated Incentives (HRFLWC)	
Incentive Practice	**Amount**
Cover Crops	840 Acres
Vegetated Buffers	3 buffers
Waterways	500 linear feet
Soil Tests	450 acres

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 was able to hold several in-person meetings. Like many things in 2021, outreach efforts were made significantly more difficult due to the pandemic. In spite of this, the HRFLWC was able to adapt and participate in several education and outreach efforts. Many of these efforts were virtual. The group also coordinated a field day with the RCCF on the Jeff Lake Farm where over 30 attendees were present.

Barron County Soil and Water Conservation Department

In 2021, Barron County Soil and Water Conservation Department staff assisted with the implementation/installation of the following practices:

Grassed Waterways - 12 7900' length – All in the Red Cedar Basin. Annual soil savings - 390 tons - These were constructed using our DATCP SWRM funds. We have been covering the newly constructed channels with erosion control blankets. This has increased the cost, but we feel it is necessary for establishment without further erosion.

Barron County was a leader in the construction of manure storage facilities starting in the 1970's. The science of liners was not advancing as fast as the urge to construct them. With the changing dairy economy leading towards fewer and larger farms, there are many earthen facilities that are no longer in use and there is potential for groundwater leaching. This year Barron County assisted in the closing of 10 earthen manure storage facilities, 9 of which were in the Red Cedar basin. Total of 4.5 acres of storage. To date, we have closed 130 with a total area of 50 acres.

Cover Crops - 12,600 acres reported in an email survey sent to Barron County farmers. The survey did not specify the watershed, but over 90% of the cropland is in the Red Cedar basin.

Barron County cost shared roughly 800 acres of cover crop with County funds. We had a great fall season for cover crops this fall, and it was apparent driving around the landscape that this great soil health tool is becoming the standard practice, especially after snap beans and corn silage.

Nutrient Management Planning – By Justin Everson Barron County Conservation Planner

64,000 acres of plans reported to us for participation in the Farmland Preservation Program. Of this, 39 plans for a total of 11,839 acres were assisted by Justin Everson, Barron County Conservation Planner.

Non-Metallic mining reclamation - 129 acres. This is related to NR 135 which regulates non-metallic mining in Wisconsin. These sites were a combination of sand & gravel mines and frac sand mines. In nearly all cases the mine was an internally drained operation. Reclamation usually consists of shaping the land with material that was moved to obtain the sand or gravel that was mined, and then topsoil. The areas are typically seeded with a mix of grasses and legumes to stabilize the site and begin the natural processes of soil health.

Rusk County Land and Water Conservation Department

While the Rusk County Land and Water Conservation Department continues to be an active partner in the Red Cedar Water Quality Partnership, only a small portion of the county along its western edge is in the watershed. In 2021, there were no substantial projects in this region of the watershed.

Other Partners

In addition to the categories listed above, other entities and agencies are key members of the Red Cedar River Watershed 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 2021, though limited in some of the work they could do, they still 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.

Farmers of Barron County Watersheds

This Barron County Producer Led Watershed Group continues to see the evidence of the leadership and examples put forward by those adopting cover-crops and no-till. Especially in the southern half of the county where the topography is more rolling it is very apparent that these practices are becoming more and more widely adopted.

There are also dairymen who now regularly use low disturbance manure application equipment to get the liquid manure below the surface and even have begun to apply manure after the corn is emerged and up to 6 inches tall. Top dress manure was done at more than one of the county dairy operations.

We are actively promoting cover crops following corn silage, small grain, vegetable crop harvests and have been encouraging the adoption of more small grains like winter wheat into the rotation. Some producers have initiated adoption of multi species cover crop mixes that allow them to pasture livestock well into the late fall and early spring as a way to bring value to the livestock in addition to the soil quality benefits. We see this as a very good way to enhance returns among the beef producers. The fact remains that most small beef producers are clueless when it comes to the negative soil and water quality effects of overstocking/overgrazing pastures.

Our relationship with the area canning companies is one we see as win-win. We are continuing to see more producers using covers before and after sweet corn and snap beans. The calendar for these crops provides a great timeframe to do some really good things but there is much work to do to increase these activities.

City of Menomonie

Through analysis and modeling the City of Menomonie has determined they contribute 1,245 pounds of phosphorus annually to Lake Menomin through five separate reachsheds. The City's TMDL goal/requirement is to reduce the contribution by 39.2%, or in other words they need to capture 488 pounds of phosphorus annually. With the recent construction of two regional stormwater ponds and other BMPs, the City has now captured 371 pounds of phosphorus. The City formally implemented a street sweeping plan based on DNR technical guidance that is expected to remove 35 pounds of phosphorus annually. The City plans to expand the areas included in the formal street sweeping plan which would be estimated to remove an additional 35 pounds of phosphorus annually. Construction will begin in 2022 on a regional stormwater pond in North Menomonie along 22nd Ave. This pond is estimated to capture 57 pounds of phosphorus annually. This would bring the City's estimated total annual phosphorus removal to 498 lbs., meeting our TMDL requirement. (Note: the phosphorus reduced by the City is not included in the calculated total phosphorus load reductions at the end of this report because the City's requirement is part of the City's storm water permit, and is excluded from the plan's separate load reduction goals.)

As an active member of Rain to Rivers of Western Wisconsin, the City of Menomonie continues to promote stormwater education and outreach activities in the region thus helping the entire Red Cedar watershed. Highlights in 2021 included a stormwater education booth and Plinko board at National Night Out, presentations to community organizations and hosting a winter maintenance open house for area plow operators on salt best management practices.

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 2021, 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 farmable acres around the plant, renting it out for farming. Again this year Five Star Dairy leased the land from 3M for farming. The contract for this lease features language that requires certain soil health practices be applied by Five Star Dairy. In addition to the regular rental contract, in 2021 3M initiated some prairie restoration efforts on about 2 acres of prairie on the northwest side of the property.

UW-Stout

Although the LAKES REU program at UW-Stout has a National Science Foundation grant to bring more students to campus to do work in the watershed, due to the Covid pandemic the program will wait until 2022 to recruit students for summer work.

UW-Stout usually plays host to the annual Red Cedar River Water Quality Conference, but the Conference was held virtually in 2021 due to the Covid pandemic.

UW-Madison Division of Extension

Staff from UW-Madison Division of Extension continue to provide assistance and resources to the Partnership. Dan Zerr, regional natural resources educator, continues to act as facilitator/coordinator for the Partnership.

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 2021 data collected is also included.

(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 project.

Practice (NRCS data)	**Acres**	**Pounds of Phosphorus Reduced**
Conservation Cover	66.3	57.2
Cover Crops	10,467.6	1,758.6
Critical Area Planting/Field Borders	34.5	29.8
No Till	7,676.7	5,502.7
Total NRCS		**7,348.3**
Totals from Counties and Farmer Led Council Activity		**4,700.9**
Estimated Overall Annual Load Reduction for 2021		**12,049.2**

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.

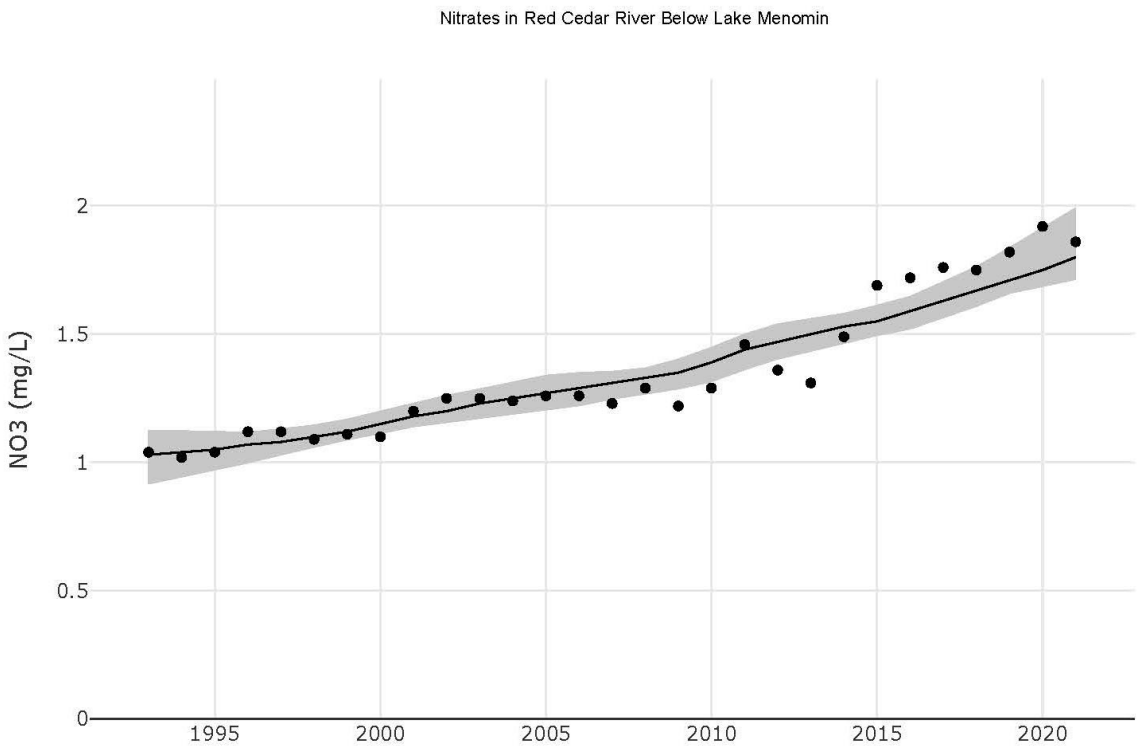
The TMDL for the Red Cedar River watershed calls for a phosphorus load goal from point sources, of 20,100 lbs. per year. The most recent year for which we have complete data from the watershed is 2020. In that year, total point source loads from all permitted sources were recorded to be 10,966 lbs., considerably below the stated goal. However, it's important to note that from year to year, this load varies. In the past ten 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.

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 2021 phosphorus levels continued to decline, with the annual mean level for 2021 the lowest it has been since the beginning of these measurements (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 at work. Still, the trend of declining phosphorus levels is a positive trend, and hopefully will continue. However, nitrate levels in the River continue to rise. 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 DNR, the dots represent the annual mean total phosphorous or nitrates for each year, the solid line is the annual concentration normalized for the annual flow, and the gray shaded area is the upper and lower confidence limits of the flow normalized line.

Nitrate levels below the dam in Menomonie



Total phosphorus levels below the dam in Menomonie