Summary of Accomplishments of the Red Cedar River Water Quality Partnership for the End of Year Five (2020) of the Ten-Year Plan

Authored by the Partnership in April 2021

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 five years. This report is a brief summary of some of the activities of the Partnership in 2020.

The year 2020 was not a typical one for many reasons, as the pandemic and shut down of many normal functions of governments and organizations took its toll on the Partnership, as it did on many aspects of society. However, the Partnership continued to meet in 2020, albeit virtually, and many of the partners continued their work as best they could to try to effect change in the watershed toward better water quality in the lakes and rivers of the Red Cedar River Basin. While this report touches on some of the projects, accomplishments and events that took place in 2020, it is by no means comprehensive. Many people throughout the watershed continue to change land management practices, install things like catchment basins, 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 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.

Red Cedar Basin Assessment for Water Quality Improvement Project

One major accomplishment in the Basin in 2020 was the completion of the Red Cedar Basin Assessment for Water Quality Improvement. This three-year project was a focused effort to increase the base of science knowledge about the watershed, increase outreach and education efforts, and also better understanding of some of the socio-economic aspects of the watershed. Partners in this project included the US Army Corps of Engineers (COE), Wisconsin Department of Natural Resources (DNR), UW-Stout, Tainter/Menomin Lake Improvement Association (TMLIA), Dunn County Land and Water Conservation, Barron County Land Conservation, UW-Madison Division of Extension, and West Central Wisconsin Regional Planning Commission (WCWRPC). Rather than repeat a summary here, you can find a project summary, as well as detailed reports from some of the individual partners regarding their work, on WCWRPC's website here.

Some highlights of the project include Agricultural Conservation Planning Framework (ACPF) maps for two subwatersheds in the basin, results from detailed water quality monitoring from 2014-2018, an

updated water quality model for lakes Tainter and Menomin, and researched estimates on the economic impact that better water quality could have on local economies.

Lake Associations

Many of the lake associations in the Partnership continued their work in 2020, with various projects designed to focus on the individual issues in their lakes.

Red Cedar Lake Association

Following a Spring pre-survey study, RCLA treated six acres of Curly Leaf Pondweed (CLP) in early June as part of a 3-year DNR Aquatic Invasive Species Control grant. This is significantly less than the 46 acres treated in 2019. A post CLP Survey confirmed that the treatment effectively controlled CLP, while allowing for emergence of abundant and healthy native plant growth. In addition, several high-volume areas of Purple Loosestrife were effectively treated by volunteers. Ongoing monitoring of lakes and streams has shown no evidence of new AIS.

A DNR Water Quality Planning grant allowed volunteers to test and measure phosphorous, dissolved oxygen, flow volume and precipitation in the three lakes and incoming streams, with the objective of updating the water quality management plan in 2022. Although phosphorous readings were slightly higher than normal in 2020 due to heavy rains this summer, overall phosphorous readings have been trending downward over the past 10 years due to active management of the lakes through implementation of DNR Best Management Practices.

A DNR Clean Boats Clean Waters grant allowed for over 400 hours of monitoring on the highest volume boat landings this year. In addition to normal monitoring, volunteers conducted surveys and handed out literature to boat owners.

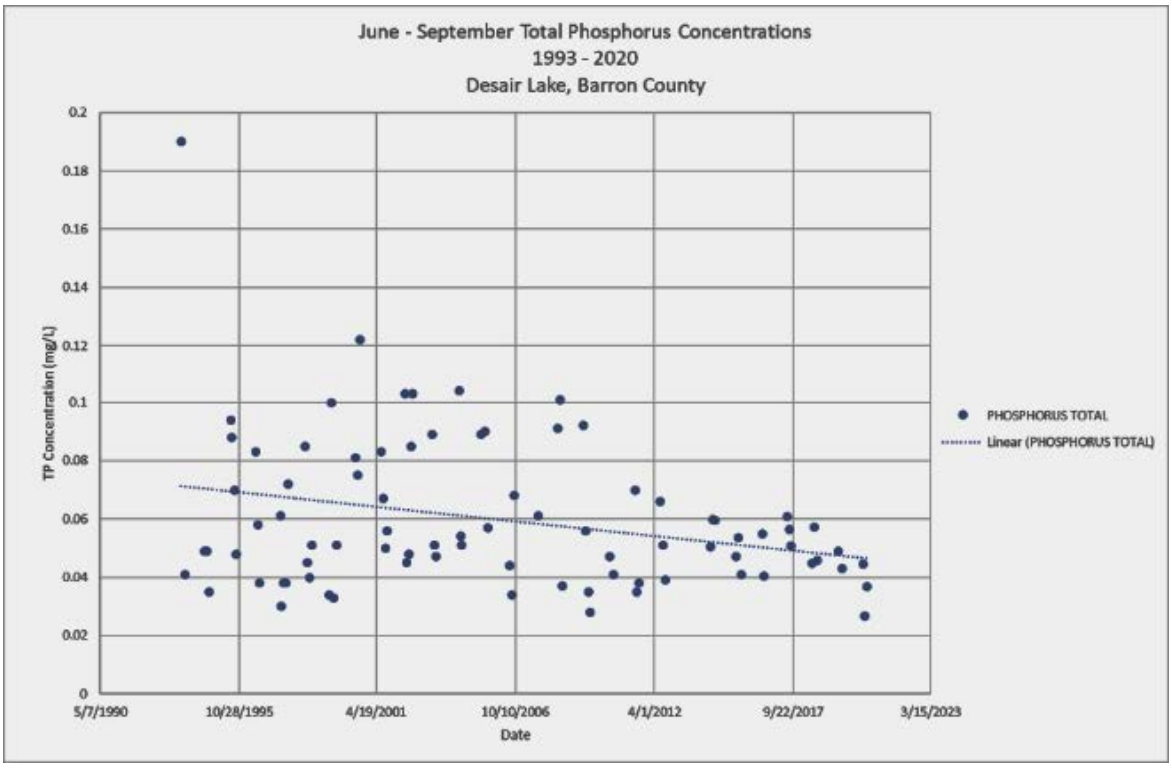
A Shoreline Habitat Study was conducted on Red Cedar and Balsam Lakes, providing valuable insight for management of impaired shorelines to help reduce phosphorous loading and improve water quality.

The above Study was the basis for submission of nine Healthy Lakes grants to the DNR in November of 2020, for implementation in 2021.

Five fish stick projects were installed at five different locations along the shorelines of Balsam Lake this past summer.

Desair Lake Restoration

Phosphorus levels in Desair Lake have been declining for several years and that trend continued in 2020. Desair Lake Restoration (DLR) has been involved in many projects designed to decrease phosphorus levels, and from the phosphorus monitoring data, it appears work is paying off (see graph below).



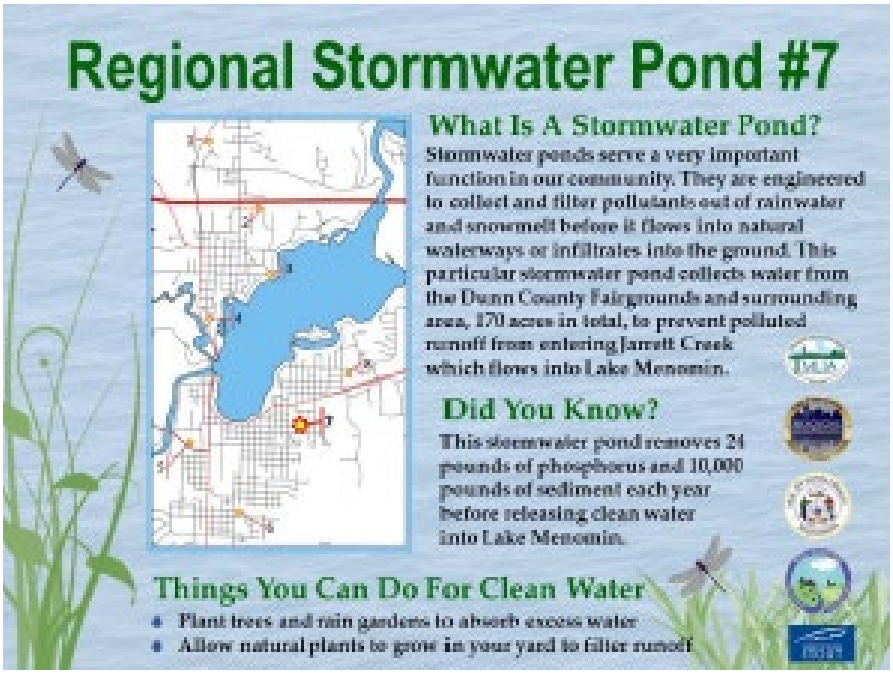
A DNR Lakes Protection grant was awarded to DLR in 2020. An amount of $28,718 to build 22 catchment basins in dry runs coming into Desair Lake was awarded. These tiny dam structures will slow flood waters, prevent erosion, and capture sediment. Seven landowners agreed to allow the DLR to place these structures in gullies on their land. The volunteer work by DLR members will compensate for the 25% of the DLR's matching share of the grant. During August and September, fourteen small catchment basins were installed in a steep ravine to slow water flow and erosion in that area.

Tainter Menomin Lake Improvement Association

Tainter Menomin Lake Improvement Association (TMLIA) found many ways to continue their work during the pandemic. Among the highlights, TMLIA again hosted the Red Cedar River Conference in March of 2020. This event was held in person and was one of the last in-person events allowed in 2020 before things shut down. Approximately 200 people were in attendance.

Shortly after the Lakeside Park rain garden was constructed in Menomonie in 2016, students in a UW Stout graphic design course were asked to come up with sign concepts. A winning design was selected. After much work to get the plans in usable form and line up all the contracting work needed, a sign was installed at the park in 2020 (see below).

Another project TMLIA worked on with UW-Stout students was signage for the City of Menomonie's stormwater ponds. The Environmental Science & Sustainability Capstone course was provided the idea and the content and the students came up with a concept which was used to create the design below, modified for each individual pond. The stormwater ponds help control stormwater runoff pollution affecting the lake and the signs bring attention to the effort.



Chetek Lakes Protection Association

During 2020 the Chetek Lakes Association had 27 active Healthy Lakes shoreline improvement projects funded through DNR on properties around the lakes. Additionally, 11 "fish sticks" (tree drops) were

installed, and they did updates to educational materials including a new informational brochure and interpretive signage around the boat docks and landings. In 2020 membership in the Association grew to 350 people throughout the lakes.

The algae skimmer continued to work on the chain of lakes during 2020. The graph below shows the number of loads harvested showing a steady decline (although 2020 data is not complete).

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 majority of the work done within the Red Cedar River Watershed by Dunn County Land & Water Conservation Division (LWCD) is in the form of work done by the nutrient management specialist, Travis Drier. Within the Red Cedar River Watershed within Dunn County, 58 people participate in the Farmland Preservation Program, and approximately 90 nutrient management plan updates are submitted on a yearly basis. In 2020, Dunn County provided funding to assist one landowner who did not previously have a nutrient management plan.

Beyond nutrient management planning and Farmland Preservation, several LWCD projects were done in the Red Cedar River Watershed in 2020. A small education event was done for elementary level summer school students in Boyceville in August. Several practices were installed using county funds. One abandoned well was properly closed, a grade stabilization structure was constructed to reduce runoff from approximately four acres of cropland, and a wetland restoration of roughly 0.75 acre was installed in the fall. Dunn County also owns a no-till drill that was rented out by some farmers in the Red Cedar Watershed to see if their operations could viably make the switch to no-till farming.

Red Cedar Conservation Farmers

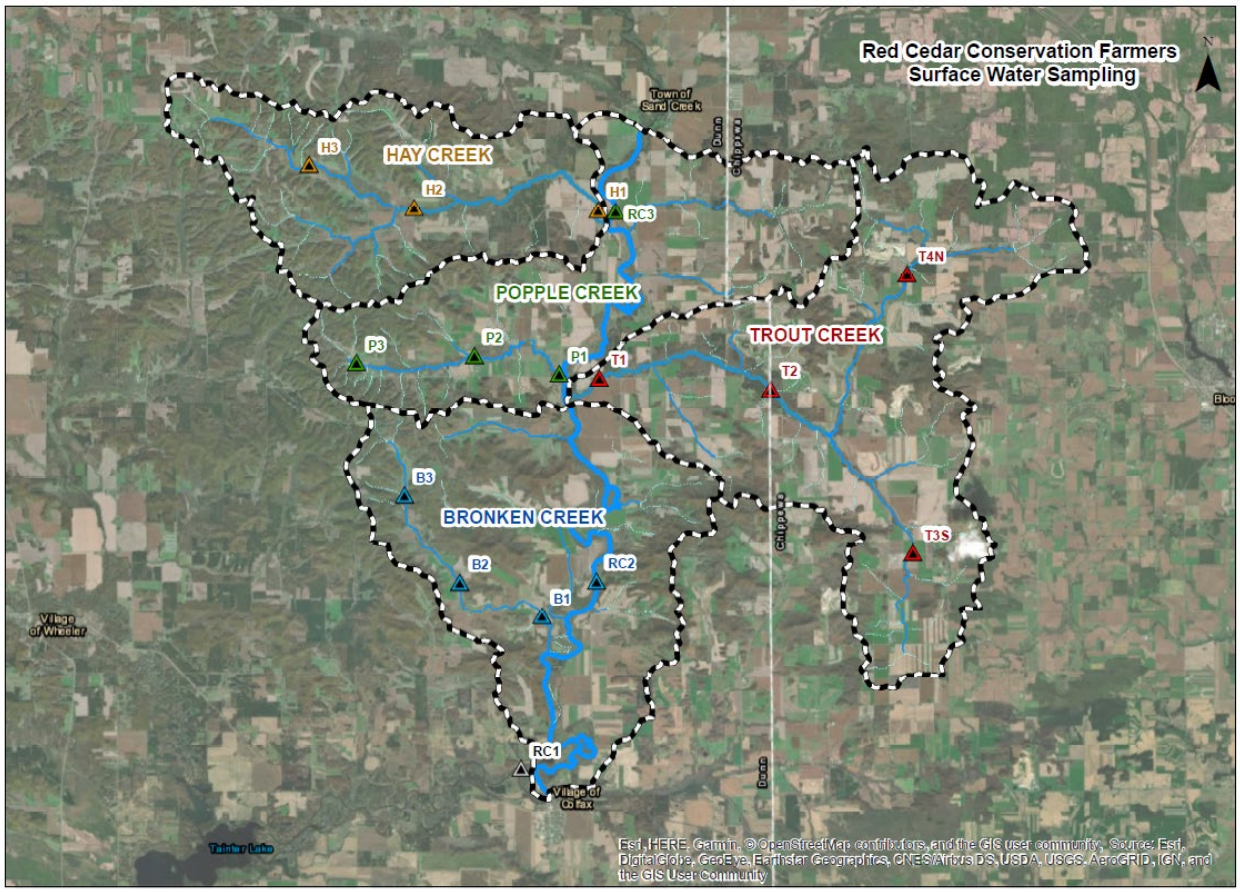
The Red Cedar Conservation Farmers (RCCF) is one of two farmer-led watershed councils within Dunn County. The watershed covered by this group falls in both Chippewa and Dunn Counties, but Steve Olson from Dunn County Land & Water Conservation Division works as the county collaborator for RCCF. In 2020, 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**
Cover Crops	1,533.78 Acres
No-till Crops	3,321.49 Acres
Soil Samples	123 Samples Collected
Grassed Waterway	1,282 linear feet

Several farmers within RCCF also installed different demonstration areas within the watershed. 3.2 acres were put into a full season cover crop, 21 acres were used to compare no-till to strip-tillage, and two different nitrogen use efficiency plots were installed. Using the information learned from these, a field day was held on a member's farm in the summer.

In addition to the practices funded by the DATCP grant and member match, one farmer worked with RCCF to install a stream buffer along one of their fields without any form of cost-share or incentive payment. This buffer strip was 2,400 feet long by 35 feet wide, and covered 1.93 acres. Five farmers, connected with Steve Olson through RCCF, retired a total of 30.01 acres of land from production and entered into Conservation Reserve Enhancement Program contracts.

Also included in the DATCP grant was funding to pay for surface water and private well water sampling. In September, twelve private wells were sampled throughout the RCCF watershed. Of these samples, three contained nitrate concentrations above the 10 mg/L known to have health impacts on vulnerable populations. In August, sixteen samples were collected from tributaries to the Red Cedar River and its main stem, shown below.



Hay River Farmer-Led Watershed Council

In 2020, Amanda Hanson from Dunn County Land & Water Conservation Division continued to work as the county collaborator for the Hay River Farmer-Led Watershed Council (HRFLWC). A grant was awarded by the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) to help fund the group's BMP incentive payments to farmers trying new-to-them practices. Below is a chart breaking down the Producer-Led Watershed Protection Grant funds.

DATCP Grant Funded Incentives			
Incentive Practice	**Amount**	**Rate**	**Value**
Cover Crops	485.5 Acres	$10/ Acre	$4,855
Vegetated Buffers	3 buffers	$50/ buffer	$150
Waterways	3,700 linear feet	$1.35/ linear foot	$4,995
Grand Total Value			$10,000

In addition to the practices funded by the 2020 grant, the HRFLWC secured funding through the McKnight foundation and had several interested farmers install practices with their own funds. Below is a breakdown of the practices installed through the HRFLWC.

2020 Best Management Practices Installed in HRFLWC				
Practice	**DATCP Grant**	**McKnight Foundation**	**Donated Practices**	**Total Amount**
Cover Crops (acres)	485.5	389.45	834.05	1,709
Soil Tests (acres)	0	1,429.5	146.5	1576
Vegetated Buffers (count)	3	1	24	28
Waterways (linear Feet)	3,700	250	834.05	4,784.05
Total Cost	$10,000	$10,000	$11,252.47	$31,252.47

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 three in-person meetings. In early 2020, the HRFLWC had a booth at the Red Cedar Watershed Conference and had a representative attend the annual Producer-Led Watershed Protection Grant meeting. Like many things in 2020, 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 sponsored the Cover Crops Champions webinar and one of their members was featured in that webinar as a Cover Crop Champion. Jeff Lake, a member of the HRFLWC presented “Increasing profitability with precision agriculture” for the DATCP Producer-Led Webinar Series.

Barron County Soil and Water Conservation Department

Barron County has some of its own cost-share programs to help farmers with the costs of certain best management practices (BMPs) that are effective at controlling runoff and pollutant loads from reaching water bodies. In addition to BMPs installed by the Farmers of Barron County Watersheds (see farther below), here is a list of practices Barron County Soil and Water Conservation staff assisted with or provided cost share for in 2020.

Practice	Number of practices	Acres of practice
Manure storage closure	9	
Grassed waterways	6	4 (4300 ft total length)
Grade stabilization structure	1	
Shoreline infiltration trench	1	(300 ft)
Barnyard runoff system	1	
Nutrient management plans		870 (new acres)
Cover crops		800

Rusk County Land and Water Conservation Department

The entire western edge of Rusk County is part of the Red Cedar River Watershed. This includes a lot of forested land, but also some agricultural land. The Rusk County Land and Water Conservation Department, working under a Targeted Runoff Management (TRM) grant from DNR, helped a landowner in the watershed install a barnyard and buffer system to keep manure runoff from reaching Moose Ear Creek. The project is estimated to keep 12.5 lbs. of phosphorus out of the creek annually.

Additionally, there appears to be a growing interest in Rusk County among livestock owners to do managed grazing. This practice is good for soil health and for water quality, as cows grazing in well-managed fields rather than near water bodies or in overgrazed areas, are less likely to introduce manure into surface water bodies, and healthy vegetation present in well-managed grazing areas keeps manure in place, allowing it to act as a slow-release fertilizer rather than running off with rainfall.

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 2020, 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

The Farmers of Barron County Watersheds (FBCW) is a farmer-led group within the Red Cedar River watershed, which in 2020 featured 5 demonstration plots totaling 300 acres. Many farmers participated in cost-share practices through the FBCW involving several thousand acres of land.

Practice	Acres	No. of Participating Farmers
Cover Crops	1790	85
Low-disturbance Manure Injection	2500	4
Strip Tillage	3000	3

Some of the highlights of the year's other activities:

1. A winter meeting featured Jason Cavadini from the University of Wisconsin Marshfield Station, Jeff and Jake Lake, the 2019 Wisconsin Leopold Conservation Award winners, and Logan Dwyer reporting on his 60" row test plot and grazing beef on cover crops. CEU credits were also granted for this meeting to those who needed them,

2. Purchase of an inter-seeding machine and did a test plot on 250 acres inter-seeding into standing corn. And a test plot of 60" corn rows.

3. Held a summer field day featuring the 60" corn row and inter-seeding plots.

4. Offered the use of our inter-seeding machine for local farmers to try this practice on their own farms.

5. Harvested a cover crop for forage after planting soybeans into the cover crop.

The Covid pandemic did limit some activities, but as shown above, FBCW was still active and effective in promoting better land management for natural resource protection (see photos below).

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 (see signage above) and other BMPs, the City has now captured 371 pounds of phosphorus.

The City is excited to announce that with the formal creation of a street sweeping program in 2021 and the construction of the third regional stormwater pond (grant recently approved by WIS DNR) in 2022, they expect to remove an additional 140 pounds of phosphorus. This will bring the City to a total of 511 pounds of phosphorus captured and well ahead of the requirement of capturing 488 pounds of phosphorus. As an active member of Rain to Rivers of Western Wisconsin, the City of Menomonie continues to push stormwater education and outreach activities in the region thus helping the entire Red Cedar watershed. (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.)

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.

Landmark Conservancy completed two conservation projects in the Red Cedar River watershed in 2020. Landmark purchased 145 acres from Dunn County and transferred the ownership to the Town of Colfax. The property is now called the Colfax Red Cedar Preserve & Recreation Area. It is open to the public and contains Knowles-Nelson grant restrictions that prevents development. Landmark also encumbered 396 acres in Barron County with a Private Conservation Easement.

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 2020 corn was no-tilled into alfalfa, with several cuttings of alfalfa occurring. After corn harvest, oats were planted into those fields as a cover crop.

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.

A good portion of the work done for the Red Cedar River Basin Assessment project completed in 2020 was work done by faculty, staff and students at UW-Stout, the results of which can be seen in the reports referenced earlier in this document.

UW-Stout was again the host for the annual Red Cedar River Conference which was held in March just before most in-person events were cancelled or moved online. Approximately 200 people were in attendance at the 2020 conference.

UW-Madison Division of Extension

Staff from UW-Madison Division of Extension continue to provide assistance and resources to the Partnership. Katie Wantoch, ag educator in Dunn County, continues to assist with operations and research being done on the Red Cedar Demonstration Farm just east of Menomonie. And 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 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 land owner is doing toward the use of best management practices, but 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 2020 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. Also, the data from Dunn County above for the Hay River Farmer Led Watershed Council may overlap with some of the NRCS cost share data obtained, so to avoid double counting, that data is not included below.)

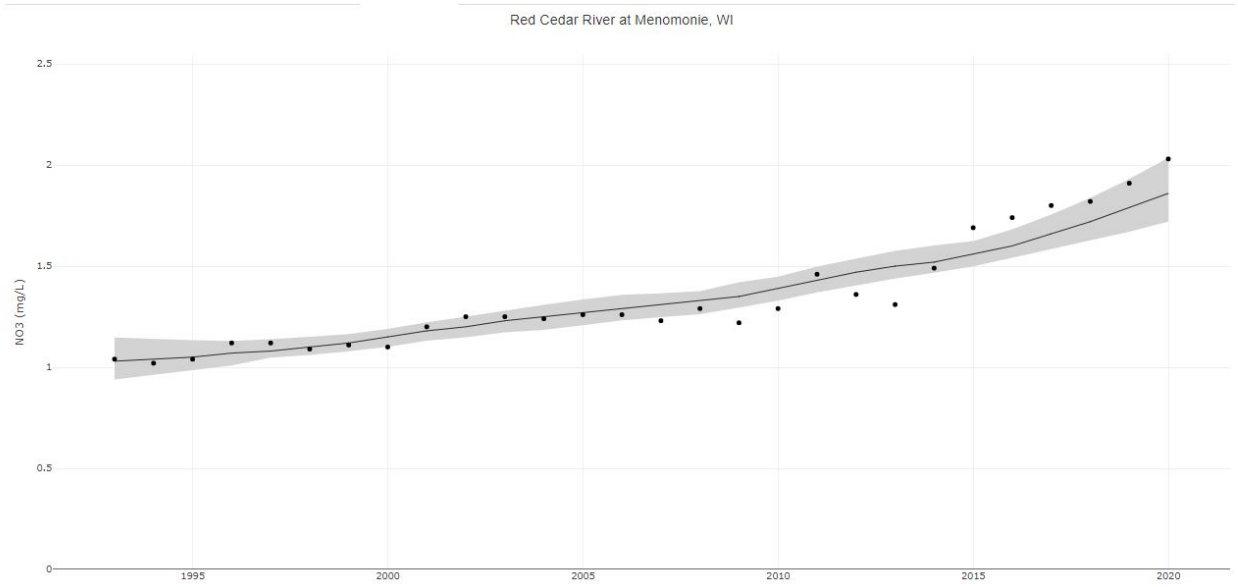
Practice (NRCS data)	**Acres**	**Pounds of Phosphorus Reduced**
Conservation Cover	51.3	44.2
Cover Crops	4854.9	815.6
Critical Area Planting/Field Borders	22.3	19.2
No Till	1169.5	838.3
Total NRCS		**1,717.3**
Totals from Counties and Farmer Led Council Activity		**3,241.8**
Estimated Overall Annual Load Reduction for 2020		**4959.1**

Water Quality Monitoring in the Red Cedar Watershed

In addition to the focused water quality monitoring that was part of the Red Cedar Basin Assessment Project (see above), DNR does regular monitoring of phosphorus and nitrogen below the Lake Menomin dam on the Red Cedar River…basically 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 2020, phosphorus levels continued to decline. The Partnership sees this as progress toward goals and would like to be able to say it's because of our work. But…that's a difficult connection to make directly. Still, the trend of declining phosphorus levels is a positive trend, and it will hopefully continue. However, nitrate levels in the River continue to rise. This will inform future discussions and actions in the Partnership. Higher nitrate levels in surface water, while not a good trend, likely also means higher nitrate levels in ground water, and this presents a different set of problems than the phosphorus issues.

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