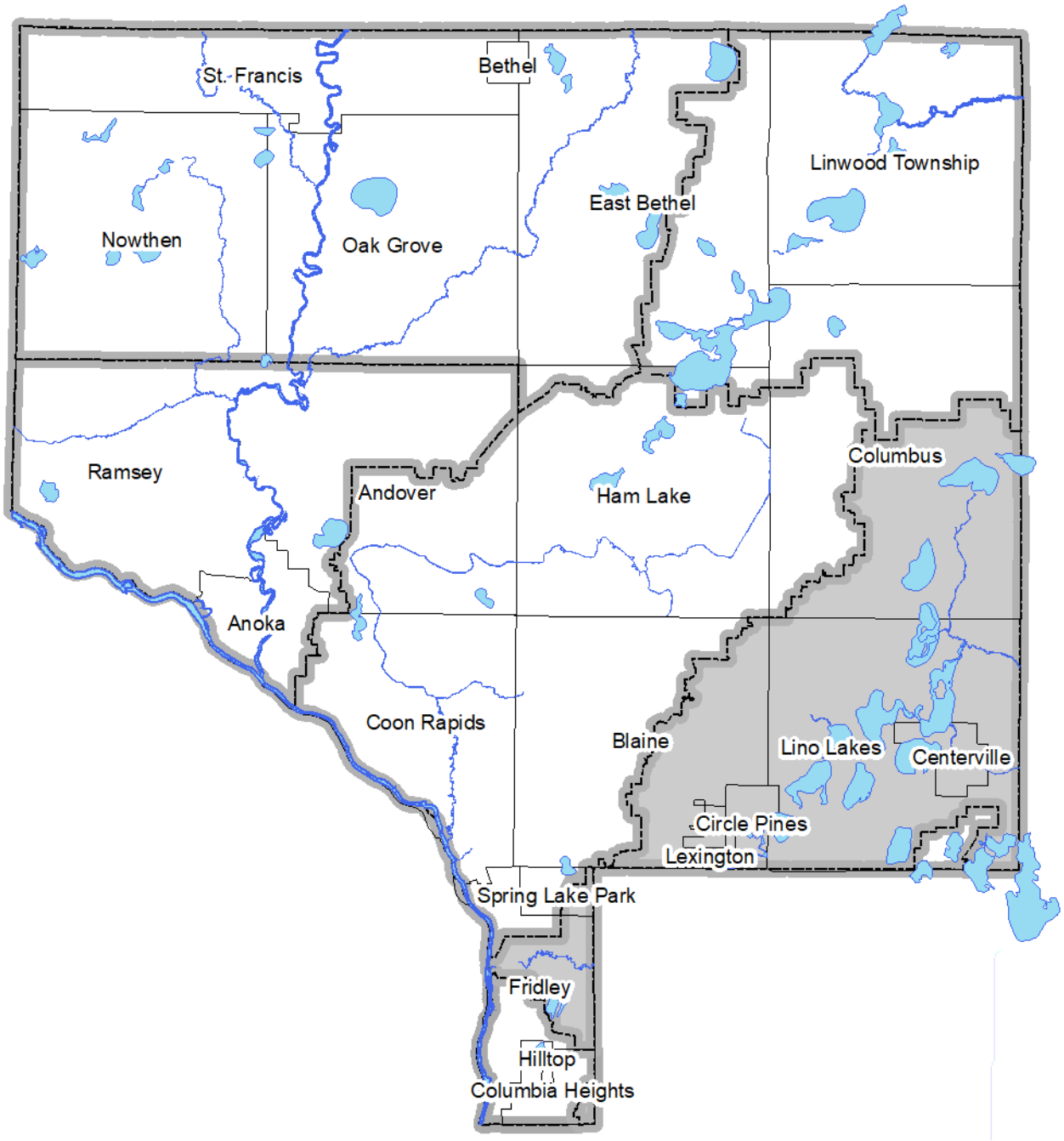
Excerpt from the 2021 Water Almanac

Chapter 5: Rice Creek Watershed



Prepared by the Anoka Conservation District

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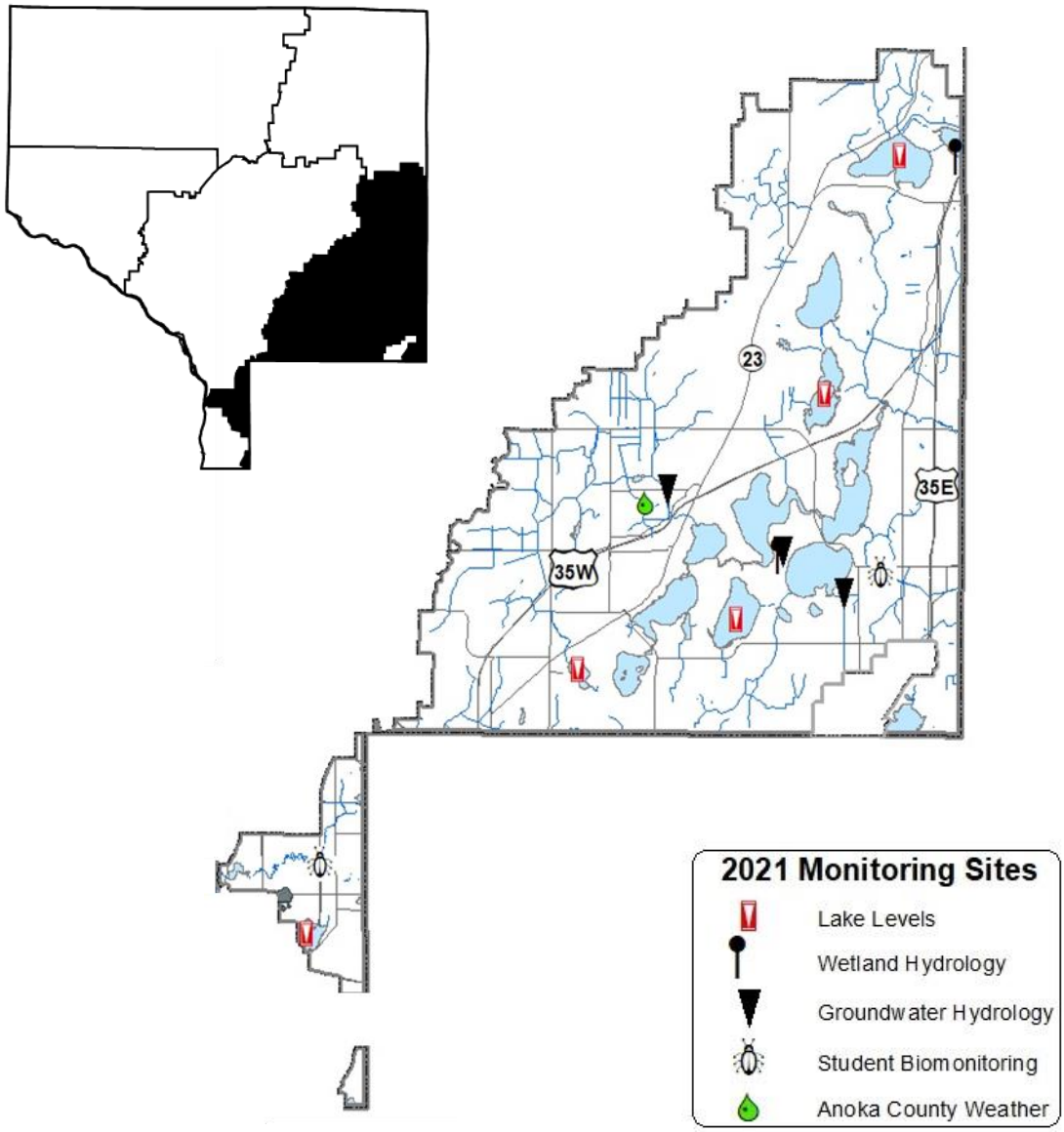
Recommendations

- **Continue to install cost effective projects** identified in preciously completed Subwatershed Retrofit Analyses. Projects identified in these studies would be ideal candidates for targeted outreach about available cost share funds. In many cases, projects are already sited, and the water quality benefits of potential projects have already been modelled.
- **Continue the biomonitoring program** with area schools at Rice Creek and Clearwater Creek. This program provides dual benefits in contributing to a long-term bio-indicator dataset as well as educating local youth.
- **Continue work to improve the ecological health of Clearwater, Hardwood, and Rice Creeks.** Clearwater Creek is designated as impaired for aquatic life based on fish and invertebrate IBIs. Hardwood Creek is impaired based on invertebrate data and low dissolved oxygen. Rice Creek is impaired for both fish and invertebrate IBIs downstream of Baldwin Lake in Anoka County. The invertebrate data for Anoka County RCWD streams continues to indicate depleted invertebrate community.
- **Continue efforts to reduce road salt use.** Chlorides are pervasive throughout shallow aquifers and the streams that feed them.

Map: 2021 Water Monitoring sites – Rice Creek Watershed District



Lake Level Monitoring

Partners: RCWD, ACD, Volunteers

Description: Weekly water level monitoring in lakes using gages placed in each lake. The past five and twenty five years of data for each lake are illustrated below, and all historical data are available on the Minnesota DNR website using the "LakeFinder" feature (https://www.dnr.state.mn.us/lakefind/index.html).

Purpose: To understand lake hydrology, including the impact of climate or other water budget changes. These data are useful for regulatory, building/development, and lake management decisions.

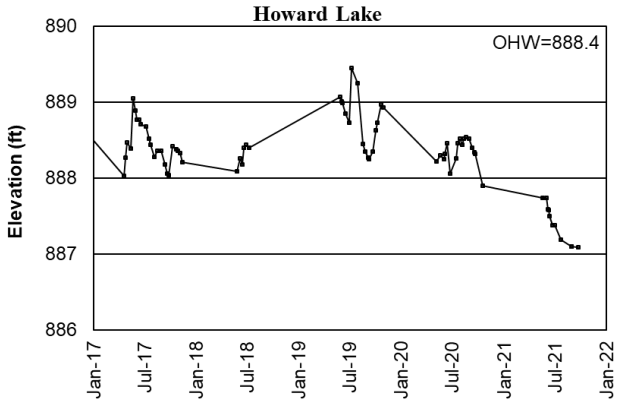
Locations: Howard Lake, Moore Lake, Reshanau Lake, Rondeau Lake, and Golden Lake

Results: Lake gages were installed by the Anoka Conservation District and surveyed by the MN DNR. In 2021, lake levels started near average and declined throughout the season. The rebound often seen in the fall was not observed in most lakes. This is due to Anoka County being in a state of drought from June through the fall, with most of the growing season spent in a severe drought condition.

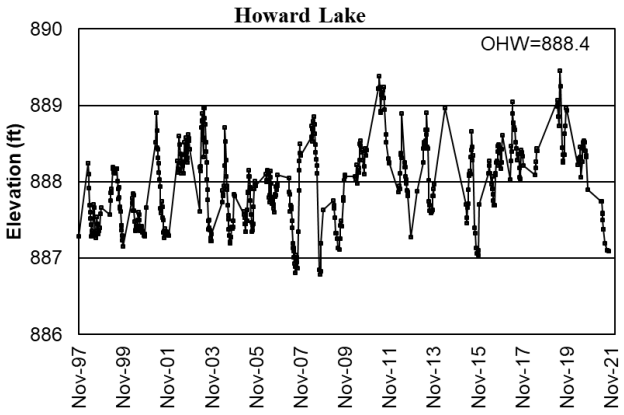
All lakes recorded lower water levels on average than in 2020. Howard Lake reached its lowest level since 2015, Reshanau its lowest since 2013, and Moore and Rondeau Lakes had their lowest water level ever recorded. Golden Lake water levels were the second lowest ever recorded, behind 1989.

All lake level data can be downloaded from the MN DNR website's LakeFinder feature (https://www.dnr.state.mn.us/lakefind/index.html). Ordinary High Water Level (OHW), the elevation below which a DNR permit is needed to perform work, is listed for each lake on the corresponding graphs below.

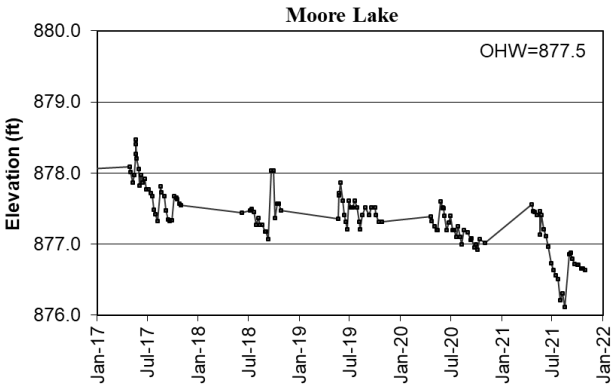
Howard Lake Levels – last 5 years



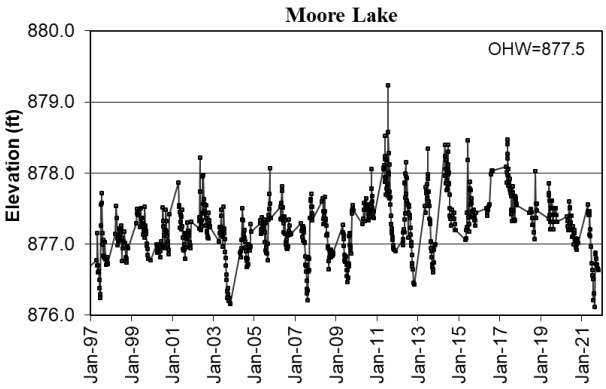
Howard Lake Levels – last 25 years



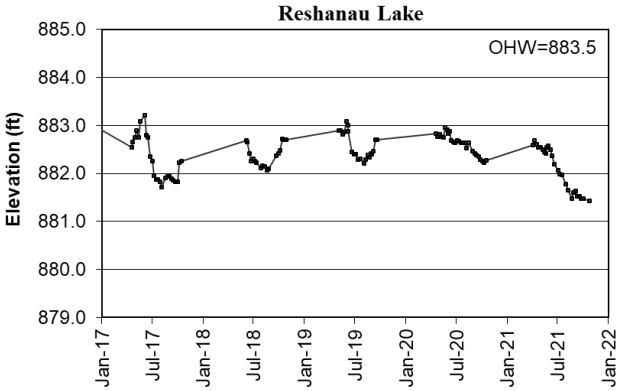
Moore Lake Levels – last 5 years



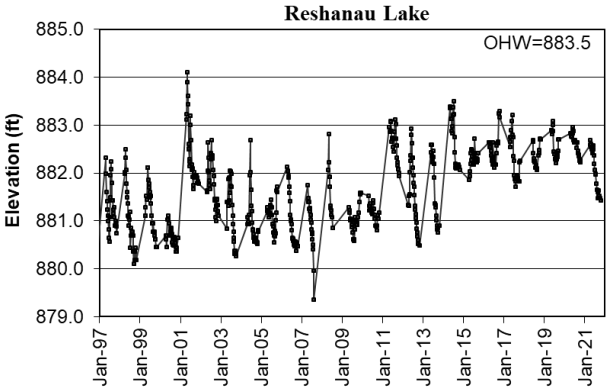
Moore Lake Levels – last 25 years



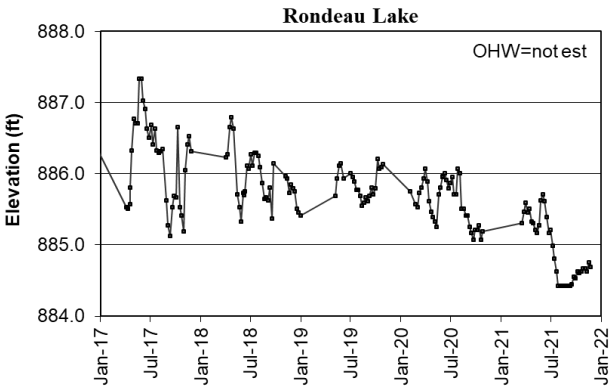
Reshanau Lake Levels – last 5 years



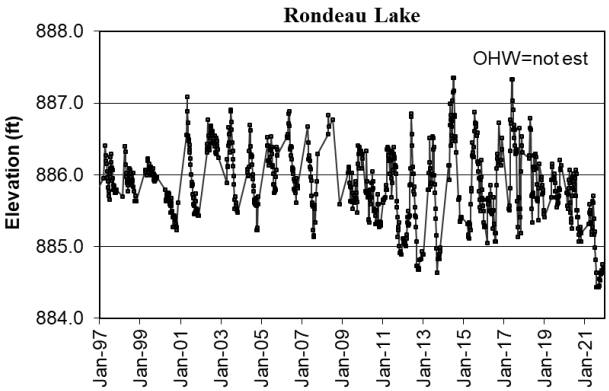
Reshanau Lake Levels – last 25 years



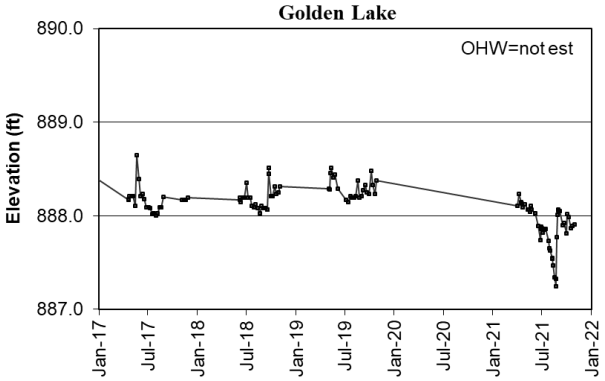
Rondeau Lake Levels – last 5 years



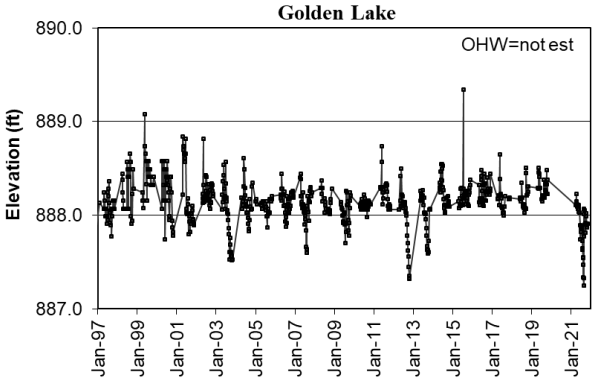
Rondeau Lake Levels – last 25 years



Golden Lake Levels – last 5 years



Golden Lake Levels – last 25 years



Lake	Year	Average	Min	Max
Howard	2017	888.43	888.03	889.05
	2018	888.30	888.09	888.44
	2019	888.77	888.25	889.45
	2020	888.34	887.90	888.54
	2021	887.40	887.09	887.74

Lake	Year	Average	Min	Max
Moore	2017	877.77	877.32	878.47
	2018	877.44	877.07	878.03
	2019	877.47	877.21	877.86
	2020	877.22	876.92	877.60
	2021	876.88	876.11	877.56

Lake	Year	Average	Min	Max
Reshanau	2017	882.28	881.71	883.21
	2018	882.38	882.06	882.72
	2019	882.58	882.20	883.08
	2020	882.61	882.23	882.95
	2021	882.08	881.42	882.69

Lake	Year	Average	Min	Max
Rondeau	2017	886.19	885.13	887.33
	2018	885.92	885.33	886.79
	2019	885.86	885.55	886.21
	2020	885.61	885.07	886.07
	2021	884.94	884.43	885.71

Lake	Year	Average	Min	Max
Golden	2017	888.17	888.00	888.65
	2018	888.20	888.03	888.51
	2019	888.30	888.15	888.51
	2020	Incomplete Data		
	2021	887.88	887.25	888.23

Wetland Hydrology

Partners: RCWD, ACD

Description: Continuous groundwater level monitoring at a wetland boundary, to a depth of 40 inches. Countywide, the Anoka Conservation District maintains a network of 23 wetland hydrology monitoring stations.

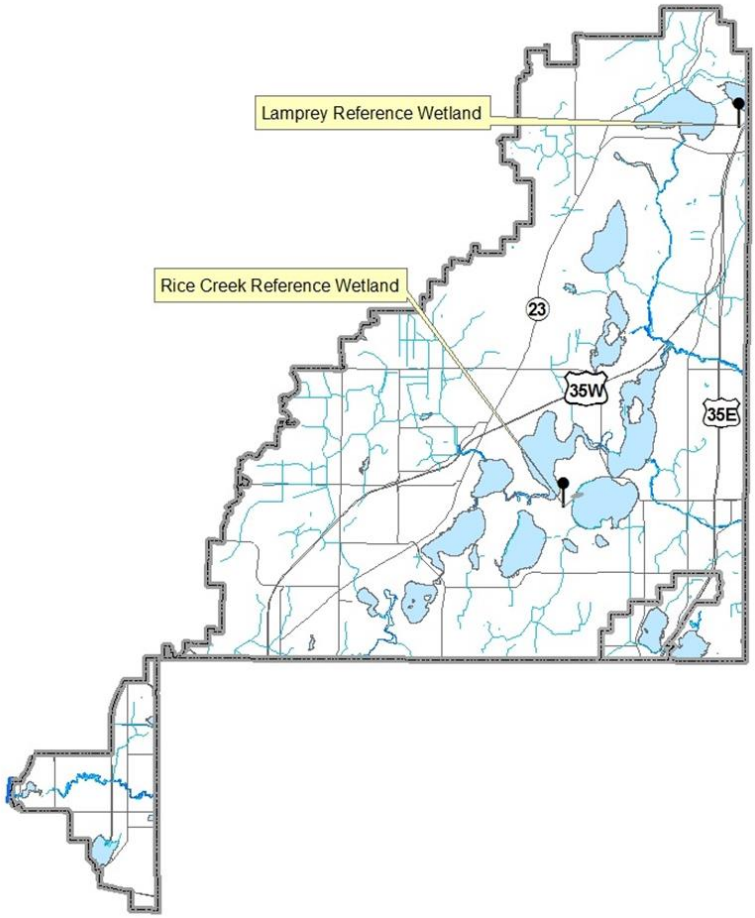
Purpose: To provide an understanding of wetland hydrology, including the impact of climate and land use change. These data aid in delineation of nearby wetlands by documenting hydrologic trends including the timing, frequency, and duration of saturation.

Locations: Lamprey Reference Wetland, Lamprey Pass Wildlife Management Area, Columbus

Rice Creek Reference Wetland, Rice Creek Chain of Lakes Regional Park Reserve, Lino Lakes.

Results: See the following pages.

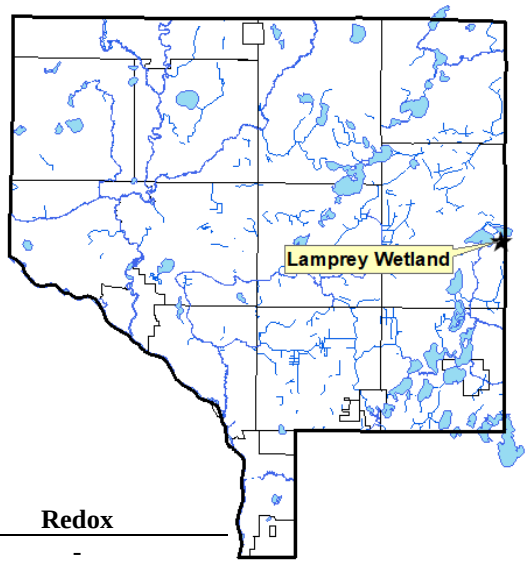
Rice Creek Watershed Wetland Hydrology Monitoring Sites



LAMPREY REFERENCE WETLAND

Lamprey Pass Wildlife Management Area, Columbus

Site Information



Monitored Since: 1999

Wetland Type: 4

Wetland Size: ~0.5 acres

Isolated Basin: Yes

Connected to a Ditch: No

Surrounding Soils: Braham loamy fine sand

Soils at Well Location:

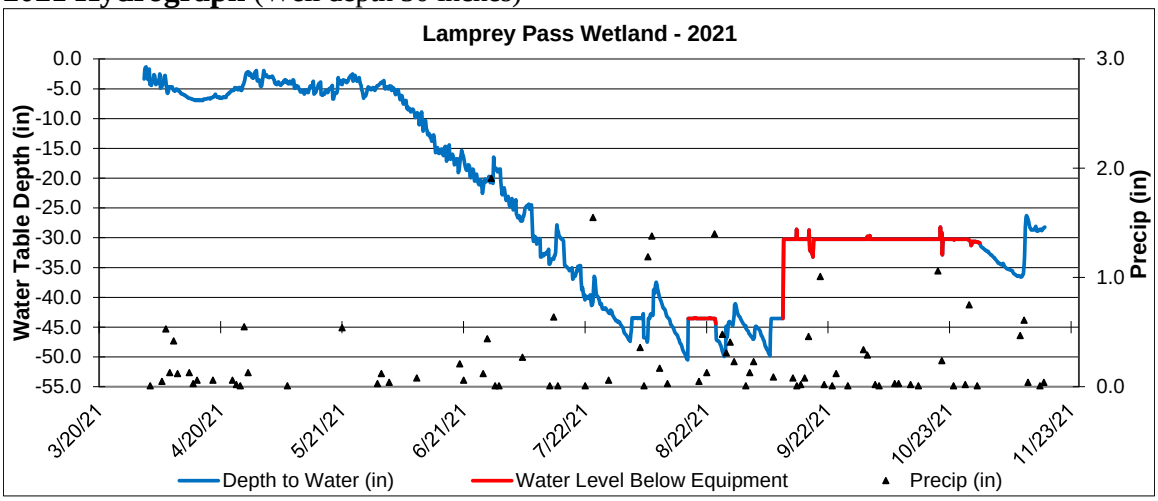
Horizon	Depth	Color	Texture	Redox
A	0-9	10yr 2/1	Fine Sandy Loam	-
AB	9-19	10yr 2/1	Fine Sandy Loam	2% 10yr 5/6
Bw	19-35	10ry 3/1	Loam	2% 10ty 5/4
2C1	35-42	5y 5/2	Clay Laom	5y 3/1 Organic Streaking
2C2	42-48	2.5y 5/1	Sandy Loam	2.5y 5/6

Vegetation at Well Location:

Scientific	Common	% Coverage
Carex pennsylvanica	Pennsylvania Sedge	50
Cornus stolonifera (S)	Red-osier Dogwood	20
Fraxinus pennslyvanicum (T)	Green Ash	40
Xanthoxylum americanum	Pricly Ash	20
Bare Ground		20

Other Notes: Wetland is west of Interstate 35, within a state wildlife management area. Well is located at the wetland boundary. In 2021, water levels intermittently were too low to detect.

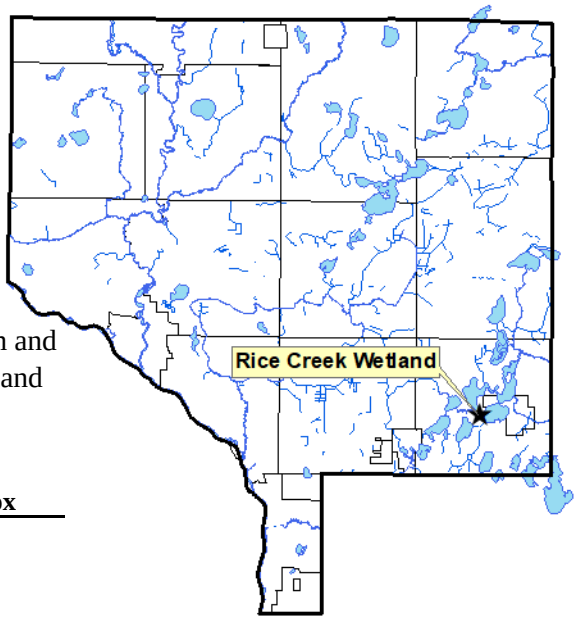
2021 Hydrograph (Well depth 50 inches)



RICE CREEK REFERENCE WETLAND

Rice Creek Chain of Lakes Regional Park, Lino Lakes

Site Information



Monitored Since: 1996

Wetland Type: 7

Wetland Size: ~0.5 acres

Isolated Basin: Yes

Connected to a Ditch: No

Surrounding Soils: Nessel fine sandy loam and Blomford loamy fine sand

Soils at Well Location:

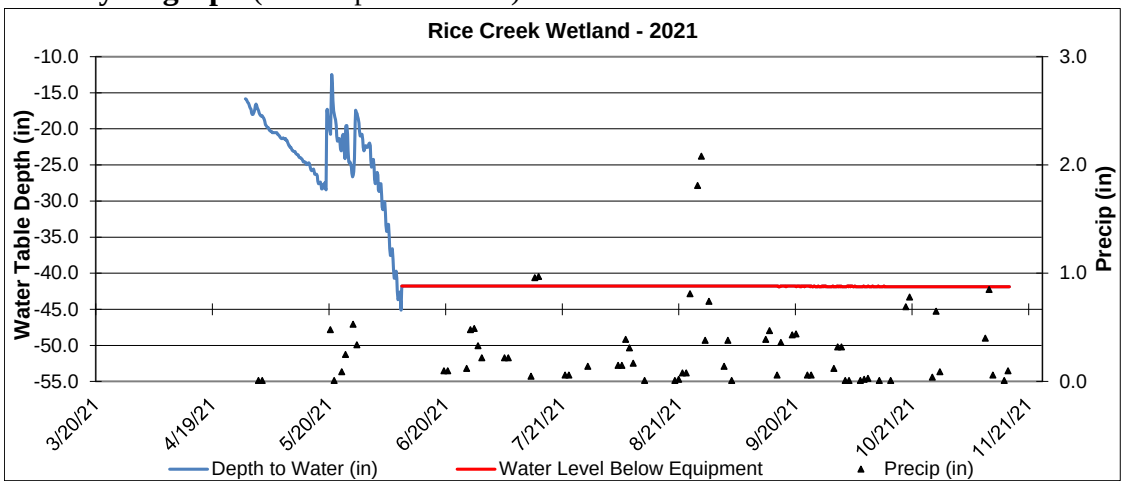
Horizon	Depth	Color	Texture	Redox
A	0-12	10yr 3/1	Sandy Loam	-
Ab	12-16	10yr 2/1	Sandy Loam	-
Bg1	16-21	10yr4/1	Sandy Loam	-
Bg2	21-35	10yr5/2	Sandy Loam	5% 10yr 5/6
2Cg	35-42	2.5y 5/2	Silt Loam	5% 10yr 5/6

Vegetation at Well Location:

Scientific	Common	% Coverage
Rubus strigosus	Raspberry	30
Onoclea sensibilis	Sensitive Fern	20
Fraxinus pennsylvanica	Green Ash	40
Amphicarpa bracteata	Hog Peanut	20

Other Notes: This is an intermittent, forested wetland within the regional park. Well is at a wetland boundary near George Watch Lake and Centerville Lake. In 2021, Anoka County was in a drought starting in June, and water levels became too low for the equipment to detect.

2021 Hydrograph (Well depth 45 inches)



Stream Water Quality – Biological Monitoring

Partners: ACD, Totino Grace High School, Forest Lake ALC

Description: This program combines environmental education and stream monitoring. Under the supervision of the ACD staff, high school science classes collect aquatic macroinvertebrates from a stream, identify their collections to the family level, and use the resulting numbers to gauge water and habitat quality. These methods are based upon the knowledge that different families of macroinvertebrates have different water and habitat quality requirements. The families collectively known as EPT (Ephemeroptera, or mayflies; Plecoptera, or stoneflies; and Trichoptera, or caddisflies) are generally pollution intolerant. Other families can thrive in low quality water. Therefore, a census of stream macroinvertebrates yields information about stream health.

Purpose: To assess stream quality through biological monitoring while providing an environmental service to the community.

Location: Clearwater Creek at Centerville City Hall
Rice Creek at Locke Park, upstream of Highway 65

Data Interpretation

Consider all biological indices of water quality together rather than look at each alone, because each gives only a partial picture of stream condition. Compare the numbers to county-wide averages. This gives some sense of what might be expected for streams in a similar landscape, but does not necessarily reflect what might be expected of a minimally impacted stream. Some key numbers to look for include:

<u># Families</u> Number of Invertebrate families. Higher values indicate better quality.

<u>EPT</u> Number of families of the generally pollution-intolerant orders. Ephemeroptera, Plecopter, Trichoptera. Higher numbers indicate better stream quality.

<u>Family Biotic Index (FBI)</u> An Index that utilizes known pollution tolerances for each family. Lower numbers indicate better stream quality.

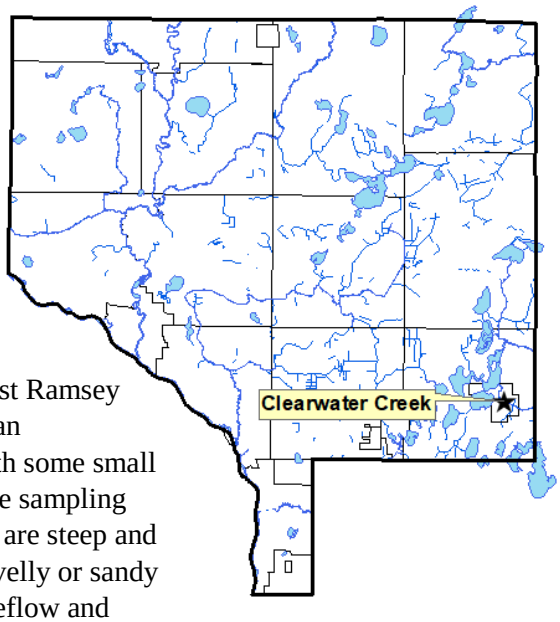
FBI	Stream Quality Evaluation
0.00-3.75	Excellent
3.76-4.25	Very Good
4.26-5.00	Good
5.01-5.75	Fair
5.76-6.50	Fairly Poor
6.51-7.25	Poor
7.26-10.00	Very Poor

<u>Population Attributes Metrics</u> **% EPT** compares the number of organisms in the EPT orders (Ephemeroptera, Plecoptera, Trichoptera) to the total number of organisms in the sample. A high percent of EPT is good.

% Dominant Family measures the percentage of individuals in the sample that are in the sample's most abundant family. A high percentage is usually bad because it indicates low evenness (one of a few families dominate, and all others are rare).

CLEARWATER CREEK

At Centerville City Hall, Centerville



Last Monitored

By ACD in fall of 2021

Monitored Since

1999

Student Involvement

8 Students in 2021, approximately 660 students since 1999

Background

Clearwater Creek originates in Bald Eagle Lake in northwest Ramsey County and flows northwest into Peltier Lake. Land use is an approximately equal mix of residential and agricultural, with some small commercial sites. The land use immediately surrounding the sampling site is entirely residential and developed. The stream banks are steep and eroding in spots. The streambed at the sampling site is gravelly or sandy with larger boulders. The stream is 6-12 inches deep at baseflow and approximately 10-15 feet wide.

Results

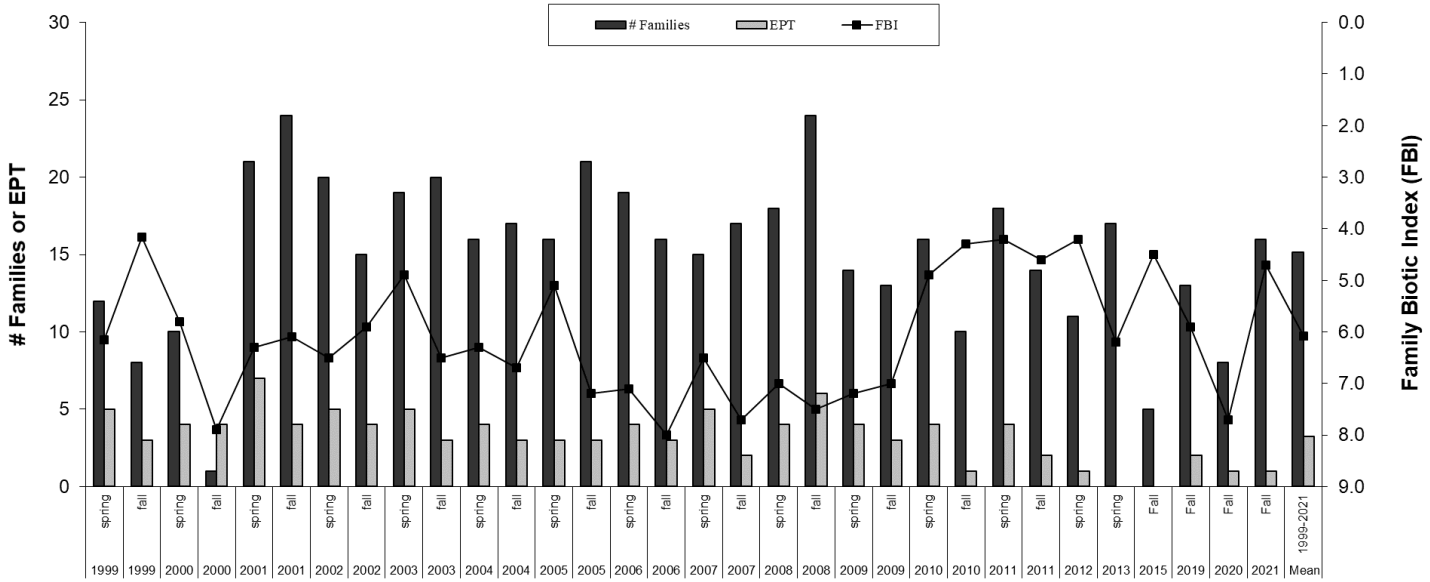
Centennial High School classes monitored Clearwater Creek through 2012. In 2013, ACD monitored the creek, and in 2015 a 4-H group monitored it. A Forest Lake Area Learning Center class picked monitoring back up at this site in 2019-2021. Overall, this stream has average at or slightly below average based on the invertebrate data. Since 2010, the FBI score has been lower than in most previous years. The lower FBI value suggests an increase in pollution tolerant species. This change may be driven by the increased dominance of the invertebrate community by the amphipod families Gammaridae and Hyallelidae, which have moderate tolerance values. These families had not been dominant before 2009, and EPT taxa were much more prevalent before that time, averaging about four unique EPT families present each year. Since 2010, less than 2 EPT families are present on average and amphipods have dominated. Invertebrate data in 2021 showed only a small percentage from the order Trichoptera and the dominant family by large being Gammaridae.

Discussion

This creek's biological community is probably limited by a combination of habitat, hydrology, and water chemistry factors. This creek has been highly modified and primarily turned into a straightened ditch throughout much of its length. Clearwater Creek is listed as impaired for dissolved oxygen as well as both fish and invertebrate biota. Bald Eagle Lake, which is impaired for nutrients and serves as the Creek's headwaters, may be contributing to the low oxygen concentrations. However it is worth noting that Bald Eagle Lake had an alum treatment in 2014 and 2016 to reduce phosphorus levels, which may reduce oxygen demand in Clearwater Creek.

Due to COVID-19, 2021 sampling of Clearwater Creek was completed by ACD staff. The teacher used the educational video of sampling produced in 2020 to teach the students about the sampling process. The students then identified the collected samples in the lab.

Summarized Biomonitoring Results for Clearwater Creek in Centerville



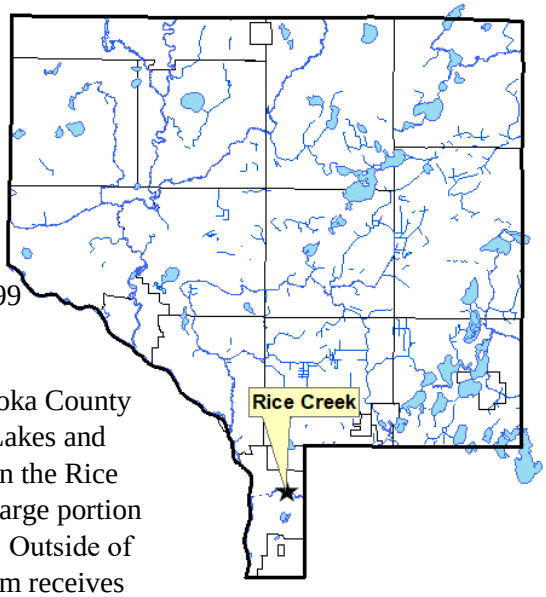
Biomonitoring Data for Clearwater Creek in Centerville

Data presented from the most recent monitored five years. Contact the ACD to request archived data.

Year	2013	2015	2019	2020	2021	Mean
Season	spring	Fall	Fall	Fall	Fall	1999-2021
FBI	6.2	4.5	5.9	7.7	4.7	6.1
# Families	17	5	13	8	16	15.1
EPT	0	0	2	1	1	3.3
Date	28-May	31-Aug	10-Oct	7-Oct	25-Oct	
Sampled By	CHS	Anoka 4-H	FLALC	ACD	ACD	
Sampling Method	MH	MH	MH	MH	MH	
Mean # Individuals/Rep.	228	152	133	255	191	
# Replicates	1	1	1	1	1	
Dominant Family	Hyalellidae	Gammaridae	Hyalellidae	Hyalellidae	Gammaridae	
% Dominant Family	34.2	65.7	36.1	90.2	74.3	
% Ephemeroptera	0	0	1.5	0.0	0	
% Trichoptera	0.0	0.0	26.3	0.4	1.6	
% Plecoptera	0.0	0.0	0.0	0.0	0.0	

RICE CREEK

At Highway 65, Rice Creek West Regional Trail Corridor, Fridley



Last Monitored

By Totino Grace High School fall of 2021

Monitored Since

1999

Student Involvement

40 Students in 2021, approximately 1,365 students since 1999

Background

Rice Creek originates from Howard Lake in east-central Anoka County and flows south and west through the Rice Creek Chain of Lakes and eventually to the Mississippi River. Sampling is conducted in the Rice Creek West Regional Trail Corridor, which encompasses a large portion of the stream's riparian zone in Fridley. This site is forested. Outside of this forested buffer, the watershed is urbanized and the stream receives runoff from a variety of urban sources. The stream has a rocky bottom with pools and riffles.

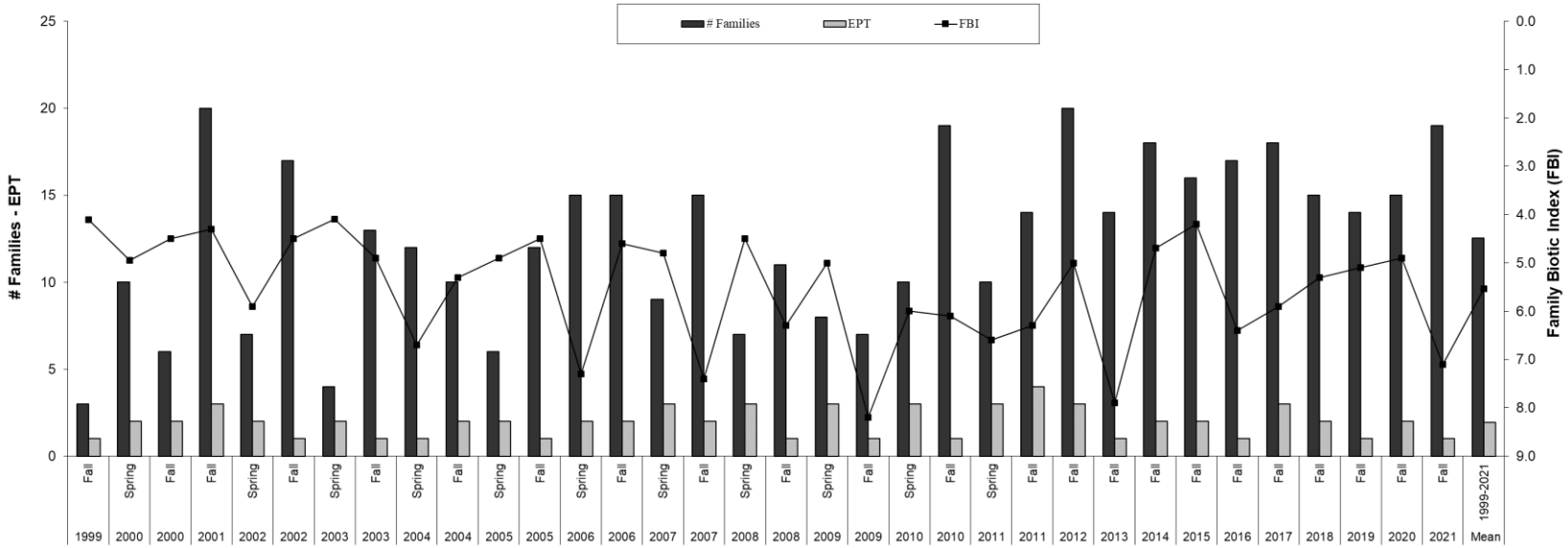
Results

Totino Grace High School monitored this stream in the fall of 2021, facilitated by the Anoka Conservation District. At this site, Rice Creek has a macroinvertebrate community indicative of poor stream health. While the number of families present has been similar to, or above the long-term average for Anoka County streams, most of these are generalist species that can tolerate polluted conditions. The most dominant family found seven of the past eight years is Hydropshychidae, a generalist family. The number of EPT families present has been below the county average in all years. EPT are generally pollution-sensitive, but the caddisfly family Hydropsychidae, is an exception to that rule. It thrives in relatively poor environmental conditions. Hydropsychidae was the only EPT taxa collected in 2021, and was seen in lower numbers than average.

Discussion

The poor macroinvertebrate community in this creek is likely due to poor water quality and flashy flows during storms, not poor habitat. Habitat at the sampling site and nearby is good, in part because of past stream habitat improvement projects. The stream has riffles, pools, and runs with a variety of snags and rocks. The area immediately surrounding the stream is predominately a buckthorn forest, with walking trails. However, outside of this wooded corridor around the stream, the watershed is urbanized and storm water inputs are likely the cause of degraded water quality. During storms, water levels in the creek can rise sharply. This portion of Rice Creek is impaired for both fish and invertebrate biota.

Summarized Biomonitoring Results for Rice Creek at Hwy 65, Fridley



Biomonitoring Data for Rice Creek at Hwy 65

Data presented from the most recent monitored five years. Contact the ACD to request archive

Year	2017	2018	2019	2020	2021	Mean
Season	Fall	Fall	Fall	Fall	Fall	1999-2021
FBI	5.9	5.3	5.1	4.9	7.1	5.5
# Families	18	15	14	15	19	12.5
EPT	3	2	1	2	1	1.9
Date	17-Oct-17	15-Oct-18	15-Oct-19	12-Oct-20	12-Oct-21	
Sampled By	TGHS	TGHS	TGHS	TGHS	TGHS	
Sampling Method	MH	MH	MH	MH	MH	
# Individuals	545	509	322	240	326	
# Replicates	1	1	1	1	1	
Dominant Family	Simuliidae	Hydropsychidae	Hydropsychidae	Hydropsychidae	Hydropsychidae	
% Dominant Family	65.2	24.6	48.4	63.8	32.2	
% Ephemeroptera	2.0	14.5	0	4.6	0	
% Trichoptera	12.3	24.6	48.4	63.8	5.8	
% Plecoptera	0.0	0	0	0	0	
% EPT	14.3	39.1	48.4	68.4	5.8	

Water Quality Grant Administration

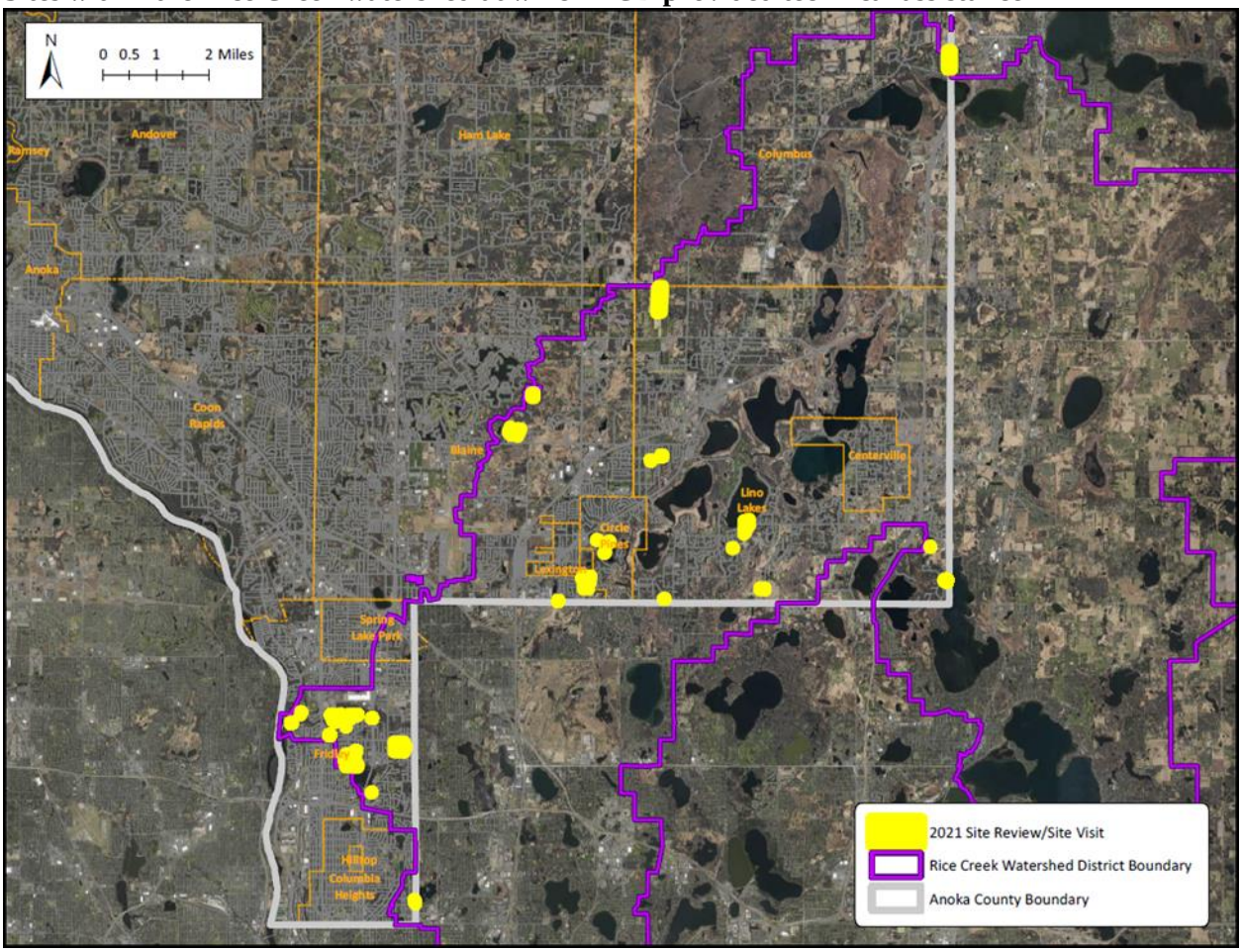
Description: RCWD contracted ACD to provide technical assistance for the RCWD Water Quality Grant Program. Tasks include landowner outreach and education, site reviews, site visits, project evaluations, Best Management Practices (BMP) design, cost-share application assistance, contractor selection assistance, construction oversight, long-term project monitoring, and other services as needed.

Purpose: To assist property owners within the Rice Creek watershed with the design and installation of water quality improvement BMPs.

Results: Formal property reviews/site visits were conducted at 39 sites throughout the Rice Creek watershed in Anoka County (see overview map below for specific locations). Project types included; 11 rain gardens, 11 lakeshore stabilizations, 4 streambank stabilizations, 11 backyard habitat projects, and 2 agricultural best management practices. Below is a summary of technical assistance provided in 2021.

2021 Summary

Sites within the Rice Creek watershed at which ACD provided technical assistance



Anoka County Water Resource Outreach Collaborative

Partners: ACD, Anoka County, WMO's, watershed districts, cities and townships

Description: The Anoka County Water Resources Outreach Collaborative (AWROC) is a partnership formed in 2018 to implement a comprehensive water outreach and engagement program. Its purposes are to reduce duplication while improving the cost effectiveness of public outreach about water resources.

Purpose: To inform community residents, businesses, staff, and decision-makers about issues affecting local waterbodies and groundwater resources. To achieve behavioral changes that improve water quality and recruit people to install water quality projects.

Location: Countywide

Results: Thirty-four events were attended or facilitated by the Anoka Conservation District's outreach specialist throughout the county in 2021. These events included staffing a booth at community events and facilitating workshops.

2021 Anoka County Water Resources Outreach Collaborative Results for RCWD