

# Lake Eau Claire Management Plan Update 2020



Lori Bechtel 2019

Lake Eau Claire Partnership  
Team 2020

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# **VISION STATEMENT:**

**To create and increase awareness and financial support of Lake Eau Claire and its water system quality by continuing our community's commitment to protect natural habitat and to preserve it as a recreational resource.**

## **Lake Eau Claire Partnership Team January 2020**

The Lake Eau Claire Partnership Team worked in collaboration to update the Lake Eau Claire management goals and activities which when implemented will protect and improve the lake as a beneficial community and regional ecological and recreational asset for all to enjoy. We the current members of the Lake Eau Claire Partnership Team commit to continue working together bringing our respective resources of our time, talents and finances to implement the lake management activities outlined in this plan.

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Lake Eau Claire Protection and Rehabilitation District – Chairman

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Lake Eau Claire Association – President

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Eau Claire County Board – District 1

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Eau Claire County – Land Conservation Division

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Eau Claire County – Parks and Forest Department

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Wisconsin Department of Natural Resources – West Central Region

## INTRODUCTION

The Lake Eau Claire Partnership Team (LECPT) completed updating the Lake Eau Claire Management Plan over a series of three meetings during October, November and December 2019. The LECPT reviewed and updated each of the lake management goals from the previous Lake Eau Claire Management Plan and its associated plan updates (2009, 2012, 2014 and 2016) <https://www.lakeeauclaire.org/>. The LECPT initiated each goal review by evaluating the successful lake management activities which have been completed for each lake management activity since the original lake management plan began implementation in 2009. The current and past successes of implementing the management activities defined in previous lake management plans can be attributed to the development of community capacity and lake management science by the outstanding leadership within the Lake Eau Claire community.

The LECPT convened Lake Eau Claire community members from the Lake Eau Claire Lake District leadership, Lake Eau Claire Association leadership, Eau Claire County Board, Eau Claire County Department of Planning and Development – Land Conservation Division, Eau Claire County Department of Parks and Forest and Wisconsin Department of Natural Resources – Lake Management, Fisheries Management and Surface Water Grants to complete the Lake Eau Claire Management Plan Update 2020. The LECPT updated and reviewed lake management activities and goals for Sediment Management, Habitat, Water Quality and Community Capacity. Lake Management actions and responsibilities were developed to achieve each lake management goal. The LECPT developed:

- (1) Which lake management activities need to be continued.
- (2) Which team member, or organization or institution leads the implementation for a given lake management activity and their associated responsibilities.
- (3) Who are the partners and their respective responsibilities to successfully implement the lake management activity?
- (4) What is the lake management activity implementation schedule?
- (5) What/who are the funding sources to complete the lake management activity.

Sustaining the recreational and ecosystem benefits that Lake Eau Claire provides to the greater Lake Eau Claire community will require the continued investments of time, talent and money.

## BACKGROUND

Lake Eau Claire is an approximately 897-acre (Wildlands School Map) impoundment on the Eau Claire River in eastern Eau Claire County north of Augusta, Wisconsin. Lake Eau Claire has a history of intense summer blue green algae blooms, large areas of sedimentation especially in the far east end of the lake and near the mouths of the tributary streams, and relatively low amount of woody and aquatic plant habitat for fisheries and aquatic life. Sedimentation in critical habitats for fisheries and aquatic life pose the most significant impacts to Lake Eau Claire.

## WATER QUALITY

Many studies have been conducted assessing environmental conditions in Lake Eau Claire and the 380,992-acre Eau Claire River Watershed which drains into the lake. Lake Eau Claire has 443 acres of watershed land drain to each acre of Lake Eau Claire. The 1998 Army Corps of Engineers found that the summer nutrient inputs that cause summer algae



blooms come about one-half from the watershed and about one-half from the lake sediments in the far western portion of the lake.

An Eau Claire River Phosphorus loading study conducted by the University of Wisconsin Stevens Point (2009) <https://www.uwsp.edu/cnr-ap/watershed/Documents/ecrw.pdf> found that the majority of phosphorus entering the lake from the watershed originates on agricultural lands in the watershed. This study used a sophisticated mathematical watershed model to estimate how better watershed management could improve water quality.

The Eau Claire River Watershed Coalition was formed in 2015 and completed a comprehensive strategy for reducing phosphorus and sediment inputs to the lake from the watershed which was approved by EPA July 2017. The strategy titled “Healthy Soils and Health Waters – A Community Strategy for the Eau Claire River Watershed” provides the guiding strategies and priorities to reduce nutrient and sediment inputs which when fully implemented will lead to a dramatic improvement in water quality, habitat and the recreational value in Lake Eau Claire <https://dnr.wi.gov/topic/Nonpoint/9keyElement/planMap.html>.

A summary of water quality data from 2012-2016 prepared by WDNR show that Lake Eau Claire continues to experience very high levels of phosphorus and modest levels of algae (Figure 1). Lake Eau Claire volunteers also have collected water quality data for the past eight years in the Wisconsin Citizen Lake Monitoring program. This data is available on the Citizen Lake Monitoring Website <https://dnr.wi.gov/lakes/CLMN/Station.aspx?id=10033495>.

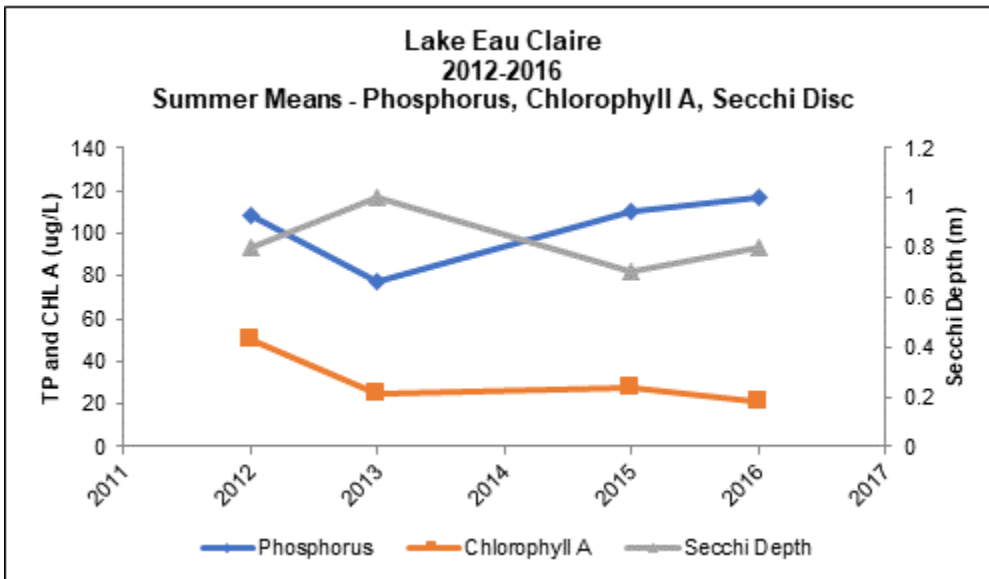


Figure 1. Lake Eau Claire Water Quality Data 2012-2016 WDNR.

The 2010 Lake Eau Claire Management developed lake management goals for water quality, fisheries, habitat, erosion and sedimentation, invasive species and recreation. Many of the lake management activities associated with the lake management goals in the 2010 have been implemented.

The summer aeration system which was installed in June 2015 in the west end of Lake Eau Claire provides lake water column mixing to provide oxygen in lake water at the surface of the bottom sediments to prevent phosphorus from being released into Lake Eau Claire.



## HABITAT

Prior to 2011, Lake Eau Claire had relatively low levels of in-lake habitat for fisheries and aquatic life. Healthy lake habitat conditions are provided by a significant amount of coarse woody habitat (fallen trees in the near shore areas) and submerged and emergent aquatic plants distributed throughout the shallow areas of lake. Lake Eau Claire had very little coarse woody habitat in the shallow areas and the aquatic plant are limited to the eastern 200 acres of the lake (Figure 2).

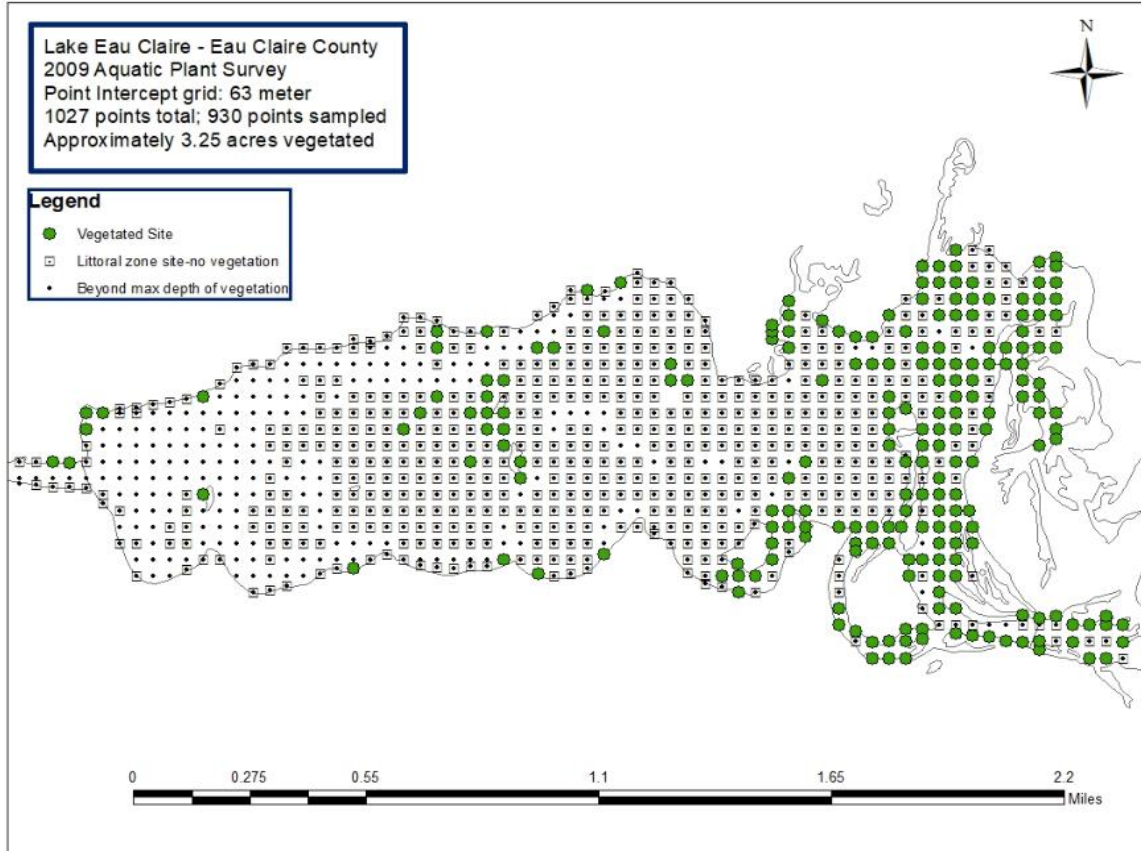


Figure 2. Aquatic Plant Survey 2009 WDNR.

To date over 300 half log fish cribs have been installed by the Lake Eau Claire Association with hundreds of hours of labor donated by Lake Association and community volunteers. WDNR and lake community volunteers have placed over 200 trees in Lake Eau Claire between 2014 and 2019.





Figure 3. Lake Eau Claire Association and Community Volunteers Half Log Cribs.

Lake Eau Claire is an 897-acre impoundment of the Eau Claire River that supports a healthy and diverse fishery. Lake Eau Claire is known for its quality panfish populations along with sizable gamefish populations. The yellow perch population is what drives the fishery. Yellow perch fyke net catch rates are near the highest in state and size structure is above average as well. Black crappie catch rates were average, but size structure was good which keeps anglers returning to Lake Eau Claire. There is a bluegill population present, but it is not a major component to the fishery. Walleye are the dominate gamefish in Lake Eau Claire and the population is supported entirely by natural reproduction. Lake Eau Claire consistently has some of the best natural reproduction in the state and the walleye population reflects that. Abundance estimates for the walleye population are above the

statewide average. There are many good 'eater' sized fish in the population from 15"-18". A fairly low-density northern pike population exists with good size structure. Smallmouth are the dominant bass species with low catch rates but good size structure. Musky are stocked in Lake Eau Claire on an alternate year basis to help diversify the fishery. "All in all, Lake Eau Claire has a well-balanced fishery that draws anglers in on a regular basis," Joseph Gerbyshak WDNR Fisheries Management 2020.

## SEDIMENT

The 2012 Lake Eau Claire Management Plan Update conducted a detailed analysis determining how much sediment had been deposited in the lake since it was flowed in 1937. This detailed analysis provided the information needed to provide the size and location of sediment traps which were installed in the Eau Claire River upstream of the lake. It is estimated that the Eau Claire River sediment load is 6,900 – 8,500 cubic yards of sediment per year. This sediment has been largely deposited in the far east portion of Lake Eau Claire since it was created in the late 1930's (Figure 4). The sedimentation in this portion of the lake has resulted in the loss of several hundred acres of fisheries and aquatic life habitat loss. The "Habitat Restoration and Reconnectivity of the East Meander Floodplain" report 2014 identifies areas of critical habitats lost by sedimentation and potential areas that could be reconnected to Lake Eau Claire. The reconnection of the floodplain areas could result in improved fisheries and aquatic life habitats and decrease flood flow velocities in the current mainstem of the Eau Claire River.



Figure 4. East Meander Floodplain of Lake Eau Claire (Google Earth).

Sediment traps were installed on the Eau Claire River upstream of Lake Eau Claire (Figure 5) to protect the main lake basin and the remaining habitat of the east meander floodplain of Lake Eau Claire. The continued partnership of the LECPT has maintained these sediment traps annually since their installation in 2013. **It will be absolutely critical to maintain the sediment traps on the Eau Claire River to protect in lake habitat and the lake basin. This is especially critical for the restoration of habitat in the East Meander Floodplain and the existing critical aquatic life habitat in the Rookery area.**

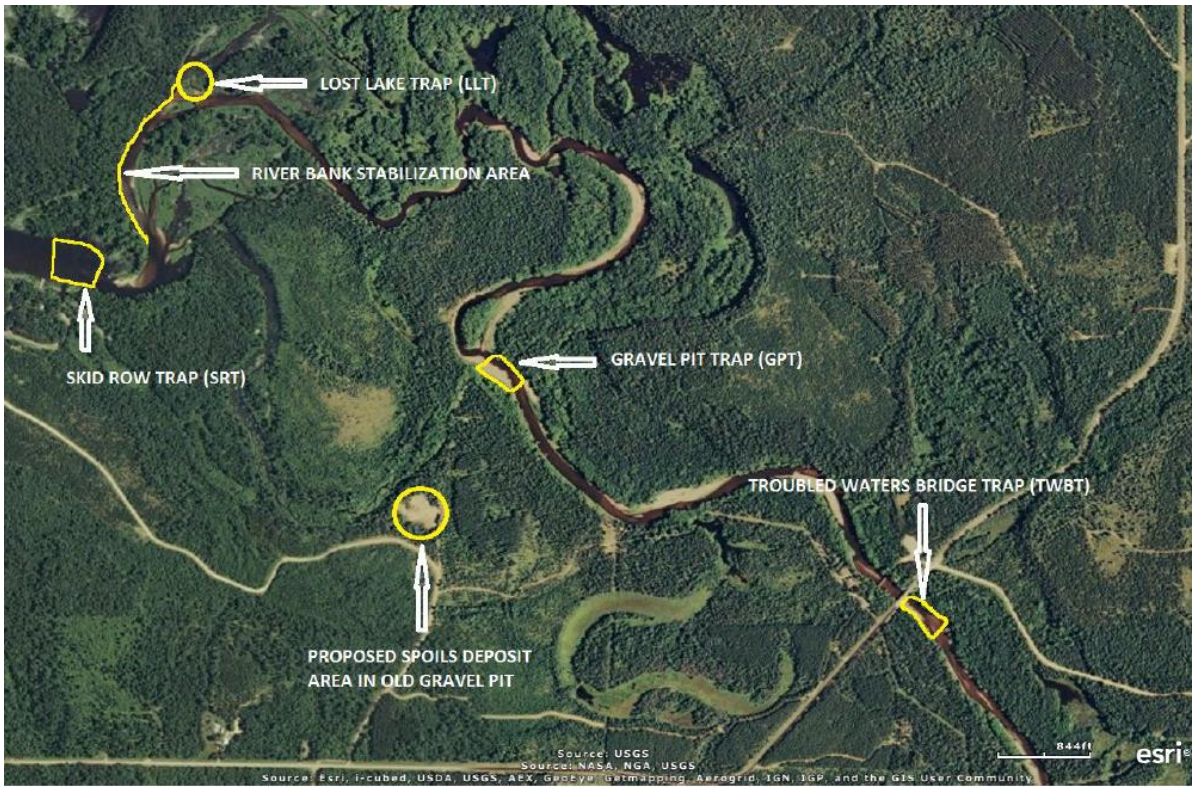


Figure 5. Lake Eau Claire Management Plan 2012.

Most of the planned sediment traps have been installed on the north shore tributaries (Figure 6) beginning in 2014 and are maintained annually provided funding is available. These sediment traps are protecting nearshore areas of the lake basin from filling in.

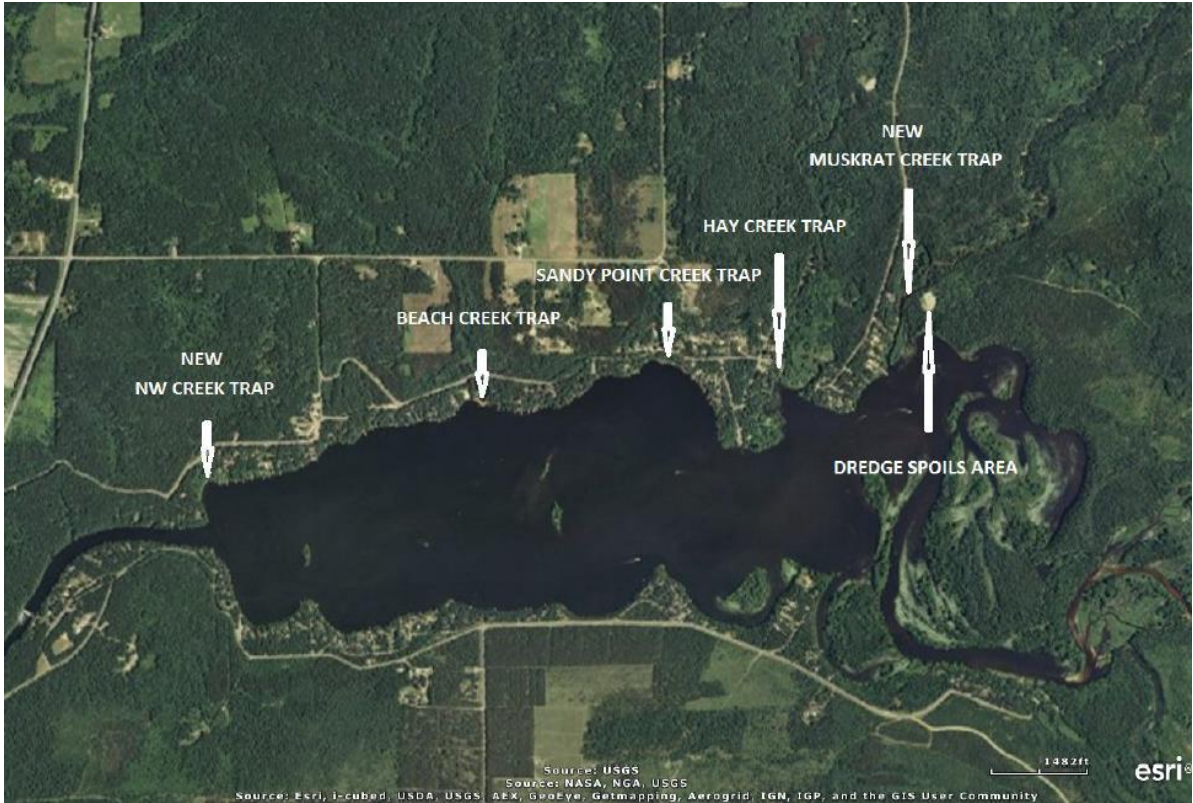


Figure 6. North Shore Tributary Sediment Trap Approximate Locations Lake Eau Claire Management Plan 2012.

## LAKE MANAGEMENT GOALS AND MANAGEMENT ACTIVITIES

### Sediment Management Goal:

Continue to reduce overall erosion and sedimentation occurring in Lake Eau Claire, restore areas within and above the lake that have been adversely affected by excess sedimentation and assess the amount of sedimentation coming into Lake Eau Claire from streambanks and watershed impacts.

Table 1. Sediment Management Implementation Activities.

Lake Management Activity	Activity Leader and Responsibilities	Activity Partners and Responsibilities	Implementation Schedule	Funding Sources
Annual Sediment Trap Maintenance and Evaluation of Sediment Traps for sediment infilling – Trouble Waters Bridge (TWB), Gravel Pit Trap (GPT), Skid Row Trap (SRT), Muskrat Creek Trap (MCT), Beach Creek Trap (BT), Bedpost Creek Trap (BPT), Hay Creek Trap (HCT)	<ul style="list-style-type: none"> <li>• Lake Eau Claire District and Lake Eau Claire Association</li> <li>• Assess Traps</li> <li>• Advocate within Lake District, Lake Association and Lake Eau Claire Community</li> <li>• Education Activities – Social Media, Newsletters, On-water tours, Maintain communication with County Board Members</li> <li>• Coordinate LAKE EAU CLAIRE Permitting activities and Project Management</li> </ul>	<ul style="list-style-type: none"> <li>• Eau Claire County – County Board – Annual Funding in County Budget</li> <li>• Land Conservation Division – Permitting and Technical Assistance</li> <li>• Forest and Parks Department – Spoils site locating, equipment and technical assistance</li> <li>• Lake Altoona Lake District- Coordinate and advocate for county funding</li> <li>• Purchasing Department – Bid process and construction Contracts</li> <li>• Highway Department- Equipment and Labor</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Lake District Annual Tax Levy</li> <li>• County Budget Annual Appropriation</li> <li>• Lake Association Fund Raising Events</li> <li>• WDNR every ten years Recreational Boating Facilities (RBF) Grant SRT boating Channels</li> </ul>

		<ul style="list-style-type: none"> <li>• ECRWC – Coordination and implementation of EC River Watershed Plan</li> </ul>		
Install a Skid Row Trap near the Eagles Nest and stabilize the streambanks along the channel flowing into Lost Lake	<ul style="list-style-type: none"> <li>• Lake Eau Claire District Coordinate technical planning and funding</li> </ul>	<ul style="list-style-type: none"> <li>• Lake Eau Claire Association Assist in developing funding sources</li> <li>• Eau Claire County Provide technical assistance and assist in developing funding</li> <li>• Wisconsin Department of Natural Resources Provide technical assistance and assist in developing funding</li> </ul>	2020	<ul style="list-style-type: none"> <li>• Lake Eau Claire District Annual Tax Levy</li> <li>• Lake Eau Claire Association Fund Raising</li> <li>• Eau Claire County Annual Budget Appropriation</li> <li>• WDNR Surface Water Grants</li> </ul>
Assessment of Streambank Erosion for all Lake Eau Claire tributaries using LIDAR and aerial photo data	<ul style="list-style-type: none"> <li>• Eau Claire County Land Conservation Division</li> </ul>	<ul style="list-style-type: none"> <li>• ECRWC and WDNR technical assistance as needed</li> </ul>	2021 LIDAR Flight	<ul style="list-style-type: none"> <li>• Eau Claire County</li> <li>• WDNR Surface Water Grants</li> </ul>
Sediment Impact Monitoring Skid Row and Rookery	<ul style="list-style-type: none"> <li>• Lake Eau Claire Lake District</li> <li>• Project Management</li> </ul>	<ul style="list-style-type: none"> <li>• WDNR – technical assistance and equipment</li> <li>• Eau Claire County – technical assistance and equipment</li> <li>• Lake Eau Claire Association – volunteer assistance</li> </ul>	2020 and subsequently every 3 years	<ul style="list-style-type: none"> <li>• Lake District Annual budget</li> <li>• Lake Eau Claire Association annual fund-raising events and volunteer labor as grant match</li> </ul>

				<ul style="list-style-type: none"> <li>• WDNR Surface Water Grants</li> </ul>
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### Annual Estimated Sediment Trap Maintenance Cost

Trouble Waters Bridge, Gravel Pit and Skid Row Traps approximately \$200,000 per year.

Muskrat and Hay Creeks Traps approximately \$40,000 per year.

Bedpost and Beach Creeks Traps approximately \$4,000 per year.

Cost estimates based on most recent actual costs.

Estimated total annual cost for sediment trap maintenance \$244,000.

### Lake District Permits

The Lake District is responsible for maintaining and renewing several permits related to dredging, spoils sites, and fish cribs. The various permits have renewal periods varying from 2-10 years. Several of the permits can be renewed easily and indefinitely by contacting the department requiring the permit, but the main dredging permit, which has a 10-year expiration date, can only be renewed once and then must be re-applied for. This permit is expiring from its one allowed renewal in 2023 and will need to be resubmitted. All permits, along with an index of expiration dates are kept on file in possession of the Lake District chairman, who is responsible for renewing the permits as needed.

### Eau County Budget Process

The Eau Claire County budgeting process begins annually in March and the final budget is approved at the November county board meeting. It will be critical for the LECPT to understand their role in this process and to participate at the critical points within the process.



Habitat Goal:

Continue to protect and improve in-lake and shoreline habitat to promote a healthy and diverse community of aquatic life in Lake Eau Claire including a self-sustaining fishery and diverse aquatic plant community.

Table 2. Habitat Management Implementation Activities.

Lake Management Activity	Activity Leader and Responsibilities	Activity Partners and Responsibilities	Implementation Schedule	Funding Sources
Install Modified Half Log Fish Structures – 15/year minimum	<ul style="list-style-type: none"> <li>• Lake Association- Project Coordination</li> </ul>	<ul style="list-style-type: none"> <li>• Lake District</li> <li>• WDNR- Permit Exemption 2017</li> <li>• ECRWC Volunteers – Labor and Equipment</li> </ul>	Annually	<ul style="list-style-type: none"> <li>• Lake Association Fund Raising Events</li> <li>• WDNR – Surface Water Grants</li> </ul>
Assess Longevity of Fish Half Log Structures	<ul style="list-style-type: none"> <li>• Lake District and Lake Association – Project Development and Implementation</li> </ul>	<ul style="list-style-type: none"> <li>• WDNR Fisheries – Study Design and Equipment</li> <li>• Wildlands School – research labor</li> </ul>	2020 and every subsequent 5 years	<ul style="list-style-type: none"> <li>• Lake Association Fund Raising Events</li> <li>• WDNR Surface Water Grants</li> </ul>
Tree Drops	<ul style="list-style-type: none"> <li>• WDNR Fisheries – Equipment and Labor</li> <li>• Lake District - Labor</li> </ul>	<ul style="list-style-type: none"> <li>• Eau Claire County – GIS Mapping</li> </ul>	Annually as trees become available	<ul style="list-style-type: none"> <li>• WDNR - Labor</li> <li>• Lake District - Labor</li> </ul>
Determine Feasibility of Installation of Deep-Water Fish Cribs	<ul style="list-style-type: none"> <li>• Lake District</li> <li>• WDNR Fisheries – Provide Rationale</li> </ul>		2020	<ul style="list-style-type: none"> <li>• WDNR In Kind</li> </ul>
East End Meander Floodplain Channel-Backwater Habitat Reconnectivity Assessment	<ul style="list-style-type: none"> <li>• Lake Eau Claire District – Initiate contact with ACOE – St. Paul Flood Plain Management Program</li> </ul>	<ul style="list-style-type: none"> <li>• Army Corps of Engineers St. Paul Flood Plain Management Program – Assess Feasibility of conducting flood plain channel and backwater reconnectivity project</li> </ul>	2020	<ul style="list-style-type: none"> <li>• Army Corps of Engineers Flood Plain Management Program</li> </ul>

**Water Quality:**

Continue to protect and restore water quality, reduce bacterial and phosphorus loading (from near shore, in-lake and watershed sources) Reducing the occurrence and intensity of blue-green algae blooms will ensure future recreational opportunities.

**Table 3. Water Quality Management Implementation Activities.**

<b>Lake Management Activity</b>	<b>Activity Leader and Responsibilities</b>	<b>Activity Partners and Responsibilities</b>	<b>Implementation Schedule</b>	<b>Funding Sources</b>
Aeration System Maintenance and Operation	<ul style="list-style-type: none"> <li>• Lake Eau Claire District</li> </ul>	<ul style="list-style-type: none"> <li>• Lake Eau Claire Association and Volunteers – Clean Diffusers</li> </ul>	Annually and Ongoing	<ul style="list-style-type: none"> <li>• Lake District Annual Budget</li> </ul>
Determine Eau Claire River Stage and Flow Threshold for Aeration System Operation	<ul style="list-style-type: none"> <li>• Lake Eau Claire District- Contract with limnological consultant</li> </ul>	<ul style="list-style-type: none"> <li>• WDNR – develop lake temp profiles and river flow</li> <li>• Eau Claire County – river stage data at County G</li> </ul>	2020-2021	<ul style="list-style-type: none"> <li>• WDNR Surface Water Grant</li> </ul>
Implement Eau Claire River Watershed 9 Key Element Plan	<ul style="list-style-type: none"> <li>• Eau Claire River Watershed Coalition (ECRWC) – Plan Implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Lake Eau Claire District and Lake Eau Claire Association – participate in plan implementation activity and advocate for plan implementation strategies</li> </ul>	Annually and ongoing	<ul style="list-style-type: none"> <li>• EPA</li> <li>• WDNR</li> <li>• Counties in Eau Claire River Watershed</li> <li>• USDA</li> </ul>

The estimated annual maintenance and operational cost of the aeration system is \$14,000.

Community Capacity:

The Lake Eau Claire Partnership Team will sustain the community capacity, organizational relationships and financial resources to achieve the goals which will protect and improve Lake Eau Claire.

Table 4. Community Capacity Development Implementation Activities.

Lake Management Activity	Activity Leader and Responsibilities	Activity Partners and Responsibilities	Implementation Schedule	Funding Sources
Build Community, Social, Cultural, Organizational and Institutional Support	<ul style="list-style-type: none"> <li>• Lake Eau Claire District and Lake Eau Claire Association</li> <li>• Encourage Leadership to participate with other community organizations and institutions sharing importance of Lake Eau Claire within the greater Lake Eau Claire community</li> <li>• Schedule biannual meetings with LECPT develop annual Lake Management Plan implementation activities, budgets and celebrate successes of Lake Eau Claire</li> </ul>	<ul style="list-style-type: none"> <li>• Eau Claire County Board – attend annual lake partnership tour on Lake Eau Claire</li> <li>• Eau Claire Land Conservation Department continue to represent community importance of Lake Eau Claire within Eau Claire County governmental institutions and agricultural organizations</li> <li>• EC Forest and Parks Dept. – advocate importance of Lake Eau Claire within EC County governmental institutions and local outdoor recreational organizations.</li> <li>• City of Augusta, Town of Bridge Creek, Town of Ludington, ECRWC, Lake Altoona District, Beaver Creek Reserve and Wildlands School and WDNR – all partners must understand</li> </ul>	Annually and Ongoing	<ul style="list-style-type: none"> <li>• All Partners</li> </ul>

		that Lake Eau Claire will need their continued support to sustain the outstanding recreational and environment benefits the lake provides to the greater Lake Eau Claire community		
Sustain the Capacity to Implement Lake Management Activities	<ul style="list-style-type: none"> <li>• Lake Eau Claire Partnership Team – be the leadership advocacy organization for protecting and improving Lake Eau Claire</li> </ul>	<ul style="list-style-type: none"> <li>• Greater Lake Eau Claire Community – develop the recognition and ownership of Lake Eau Claire as a recreational piece of infrastructure that is critical to sustaining our community and celebrate Lake Eau Claire as a community resource</li> </ul>	Annually and Ongoing	<ul style="list-style-type: none"> <li>• Leadership and Partner Organizations</li> </ul>
Community Leadership Development	<ul style="list-style-type: none"> <li>• Lake Eau Claire Partnership Team - have 2 members participate in the WI Lake Leaders Institute biannually</li> </ul>	<ul style="list-style-type: none"> <li>• WDNR and UWEX</li> <li>• Provide organizational support for leadership development</li> </ul>	Annually and biannually ongoing	<ul style="list-style-type: none"> <li>• Lake District</li> <li>• Lake Association</li> <li>• WDNR Surface Water Grants</li> <li>• UWEX – In kind</li> </ul>

It was a privilege to assist the Lake Eau Claire Partnership Team in developing the Lake Eau Claire Management Plan Update 2020. Buzz Sorge, Buzz Sorge Consulting, LLC.