

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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Staff Memorandum

SCOPE OF WORK TO BE PERFORMED BY SEWRPC FOR PHASE ONE OF A COMPREHENSIVE LAKE MANAGEMENT PLAN FOR CRAVATH AND TRIPP LAKES, WALWORTH COUNTY, WISCONSIN

April 23, 2024

As requested during a March 4, 2024, meeting of the City of Whitewater lake committee ("City"), the Southeastern Wisconsin Regional Planning Commission ("Commission") has prepared this scope of work examining a variety of management issues that the City believes are important to the continued health and vitality of Cravath and Tripp Lakes ("Lakes"). This scope of work provides most of the technical, schedule, and budget information regarding fieldwork and data collection efforts as the first phase of a two phase process in preparing a comprehensive lake management plan for the lakes. A subsequent phase and scope of work will cover data analysis, plan writing, and management plan activities; the City may elect to apply for a grant through the Wisconsin Department of Natural Resources ("WDNR") Surface Water Grant program to help fund some of this subsequent phase.

BACKGROUND INFORMATION

Cravath and Tripp Lakes are 68-acre and 113-acre, respectively, impounded lakes within the City of Whitewater in Walworth County. Tripp Lake is an impoundment of Whitewater Creek while Cravath Lake is an impoundment of Spring Brook. Outflow from Tripp lake flows into Cravath Lake while outflow from Cravath lake flows as Whitewater Creek downstream to the Bark River, then to the Rock River, then to the Mississippi River, and ultimately discharges into the Gulf of Mexico. Both lakes are impounded by dams owned and operated by the City of Whitewater. According to the WDNR Presto-Lite model, the lakes receive runoff from 42.2 square mile watershed that drains northwestern Walworth and northeastern Rock Counties.¹ The eastern portion of the watershed draining into Tripp Lake contains substantial natural resource areas, including Whitewater Lake, Rice Lake, several WDNR State Natural Areas, and parts of the Kettle Moraine State Forest. The western portion of the watershed draining into Cravath Lake is predominantly in agricultural and wetland uses.

The Commission produced Memorandum *Report No. 191, A Lake Protection Plan for Cravath and Tripp Lakes, Walworth County, Wisconsin*, in April 2011. Since that time, the City completed a lake drawdown and dredging project to address excessive sediment accumulation in the lakes. Following those efforts, the City would like to update the lake management plan to study several issues related to the lakes' ability to maintain desirable ecological conditions and provide quality recreational opportunities to lake users.

¹ For more information on the WDNR Presto-Lite model, see the following webpage: <https://dnr.wisconsin.gov/topic/SurfaceWater/PRESTO.html>.

Representatives from the City are also in preliminary discussions to form a lake district that would have jurisdiction over Cravath and Tripp lakes. This forthcoming management plan would help guide and be guided by the lake district as it forms during the plan development.

The City would like to include an updated aquatic plant management plan as part of the overall lake comprehensive plan update. The City and private owners manage aquatic plant growth on Cravath and Tripp lakes to enhance navigation and recreational opportunities using mechanical harvesting and chemical treatments. Aquatic plant management is regulated by the WDNR and requires a permit. Use of chemical treatments requires permit applications annually while mechanical harvesting requires a permit application with an accompanying management plan every five years. This plan needs to consider the present status of the aquatic plant community, must identify plant community changes that may have occurred, must examine the potential success or lack of success of the current aquatic plant management strategies, must consider current trends and issues that pertain to aquatic plant management issues and techniques, and must describe the methods and procedures associated with proposed continuation of aquatic plant management in the Lakes. The City has requested the assistance of the Commission in conducting an aquatic plant inventory during 2024 and using this information to prepare the aquatic plant management plan.

At a March 4th meeting, Commission staff discussed with City representatives a list of lake management goals and activities that the City had prepared. Some of these activities were discussed as candidates for 2024 WDNR Surface Water Grant program funding while others were discussed as occurring prior to grant applications. In email correspondence from March 6th, Commission staff categorized these activities into activities that should occur outside the lake plan development, plan activities that could be completed in summer 2024 without grant funding, and plan activities that could be included in a fall WDNR grant application. This scope of work is intended to cover summer 2024 fieldwork efforts, including an aquatic plant survey, as well as preparation of an updated aquatic plant management plan for the Lakes; these efforts are expected to be entirely funded entirely by the City. A subsequent scope of work tailored toward gathering additional information for the comprehensive plan, data analysis, and comprehensive plan development; elements from this subsequent scope of work could be included in a fall 2024 WDNR grant application.

PROPOSED SCOPE OF WORK

The proposed study is designed to collect aquatic plant data, prepare an updated aquatic plant management plan using this data, and collect ecological information that will inform a comprehensive lake management plan for the lakes. The major factors proposed to be examined as part of the study are listed below.

- Aquatic plant community and management
- Publish aquatic plant management plan
- Lakes water quality
- Shoreline condition
- Recreational use

Some of these elements require active cooperation and participation by City volunteers, Walworth County and WDNR staff, and University of Wisconsin – Whitewater (“UW-W”) faculty and undergraduate students. Highlights of each element are summarized below.

Aquatic Plant Survey

Activity: Commission staff will conduct an aquatic plant point-intercept survey of both lakes that will inform the updated aquatic plant management plan. This survey is a requirement for completing WDNR-approved aquatic plant management plans and obtaining an updated mechanical harvesting permit.

Methods and Data Collected: The aquatic plant community of the Lake will be sampled on a set grid pattern of 233 points for Cravath and 305 points for Tripp (provided by WDNR staff) using the standard WDNR point-intercept survey method.² In this method, sampling sites are based on predetermined global positioning system (GPS) location points that are arranged in a grid pattern across the entire surface of a lake. This method allows the types and abundance of aquatic plants to be directly contrasted to prior point-intercept surveys.

Deliverables: Commission staff will provide standard WDNR digital spreadsheets with the survey results for each lake to the City and to WDNR biologists. The findings and significance of this aquatic plant data will be discussed in the aquatic plant management plan.

Publish Aquatic Plant Management Plan

Activity: Commission staff will compile aquatic plant information for the lakes into an updated aquatic plant management plan and recommend aquatic plant management techniques and locations within the lakes. This plan is a requirement for obtaining an updated mechanical harvesting permit from the WDNR.

Methods and Data Collected: Maps, figures, and tables will be prepared summarizing the newly collected aquatic plant data and contrasting them to earlier aquatic plant surveys. Digital versions of spreadsheet tables will be supplied to the WDNR for their use. At the minimum, the plan update will:

- Examine changes in species richness between 2017 and 2024
- Contrast invasive species abundance between 2017 and 2024
- Evaluate changes in sensitive species abundance and richness between 2017 and 2024
- Map the distribution and density of each species documented as part of the 2017 survey
- Update records of chemical treatment application
- Evaluate effect of control actions, including herbicide use, on invasive species populations

Lake user needs and desires, aquatic plant information, and the health of the Lake will be jointly considered in updating the aquatic plant management plan. Commission staff will work with the City, Lake users, and the WDNR to identify problem areas along with the current management techniques and potentially revise the plant management strategy to reflect current aquatic plant community health and Lake-user desires. Logistical considerations will also be addressed in this study, including cost-benefits of chemical treatments, DASH, and mechanical harvesting. Offloading, transport, and on-land disposal of cut plants will be examined in greater detail to help ensure that these activities comply with State and local regulations and guidelines. As the water levels in both lakes are controlled via outlet dams, use of

²J. Hauxwell, S. Knight, K. Wagner, A. Mikulyuk, M. Nault, M. Porzky, and S. Chase, Recommended Baseline Monitoring of Aquatic Plants in Wisconsin: Sampling Design, Field and Laboratory Procedures, Data Entry and Analysis, and Applications, Wisconsin Department of Natural Resources, Bureau of Science Services, Publication No. PUB-SS-1068 201, March 2010.

water level manipulation to manage aquatic plants may feature in the recommended management strategy.

Deliverables: A memorandum report will be prepared that summarizes the data, conclusions, and recommendations generated as part of this study. The memorandum will convey the key findings and recommendations in a format useful to the City, WDNR, and the average lake user. The Commission will provide the City and WDNR biologists with the opportunity to review and comment on a draft version of the memorandum and will incorporate mutually agreed revisions into the final document. The Commission will provide the City and the WDNR with digital and print copies of the final memorandum. If the City desires, Commission staff will also present the findings at a public meeting arranged by the City.³

Water Quality and Levels

Activity: Commission staff will coordinate with the City and with UW-W faculty and undergraduate students to monitor water quality and water levels in the Lakes as well as major tributaries and Whitewater Creek downstream of the lakes. This data can be used to develop nutrient and water budget analyses that would be included in phase two of the comprehensive plan development.

Method or Data Collected: The methods and data collected vary between the lakes and their tributaries and outlets.

Within the lakes, Commission staff recommend that the City engage with the WDNR's Citizen Lake Monitoring Network ("CLMN") and/or UW-W faculty and students to begin conducting baseline water quality information at the deep holes of both lakes. At a minimum, this data collection should include:

- Profile of water temperature with depth
- Profile of dissolved oxygen with depth
- Water clarity as measured via Secchi disc
- Total phosphorus concentrations
- Chlorophyll-*a* concentrations
- Chloride concentrations

These parameters should be collected at least monthly. Additional parameters of interest may include orthophosphate, nitrogen compounds (e.g., total nitrogen, nitrate, ammonia), specific conductance, total suspended solids, pH, total hardness, *E. coli*, and fecal coliform.

Within the streams, Commission staff recommend that the City and/or UW-W faculty and students collect baseline water quality information and, if feasible, streamflow measurements at four monitoring locations: in Spring Brook upstream of Cravath Lake, in Whitewater Creek upstream of Tripp Lake, in Bluff Creek upstream of its confluence with Whitewater Creek, and in Whitewater Creek downstream of Cravath Lake. At a minimum, water quality parameters should include:

- Water temperature
- Dissolved oxygen
- Water clarity as measured via transparency tube
- Total phosphorus concentrations

³The City would be responsible for informing interested parties of the public meeting, arranging meeting space, and hosting the meeting. Commission staff would use visual aids to convey the highlights of the report and answer salient questions. Such presentations commonly require a half hour and are followed by at least a half hour of questions or general discussion. The City should record the questions and input provided by meeting attendees for consideration in future management actions.

- Total suspended solid concentrations
- Chloride concentrations

Additional parameters of interest may include orthophosphate, nitrogen compounds (e.g., total nitrogen, nitrate, ammonia), and specific conductance. These discrete water quality measurements should be made at least monthly between May and September 2024. If feasible, UW-W faculty and students should strive to collect discrete streamflow measurements at the same monitoring locations and during the same sampling events. In addition, Commission staff recommend that “storm chaser” water quality and streamflow measurements be conducted during high streamflow following heavy rainfall as streams transport a lot of nutrients and sediment during these events.

The Commission can install continuous water temperature and water level loggers in six locations: within each lake and at the same four monitoring locations described in the stream water quality and streamflow measurements. These loggers can collect data hourly for at least one year. This water level information could be combined with water quality and discrete streamflow data collected in the lakes and streams to inform nutrient or water budget analyses.⁴

Deliverables: Commission staff will provide advice regarding water quality and water level monitoring logistics, including monitoring locations, parameters, and timing of sample collection. The Commission will also provide up to six continuous water temperature and water level logging devices and install these devices in the lakes, their tributaries, and at a downstream location on Whitewater Creek. Commission staff can also review and provide technical assistance on analyses or studies conducted by UW-W faculty and students as it relates to the water quality data collected and the comprehensive plan.

Shoreline Condition

Activity: Commission staff will complete an on-the-water shoreline condition inventory around the perimeter of the open-water portion of the lakes. The inventory will examine the type and quality of terrestrial and emergent vegetation present, the presence or absence of active erosion, the type and condition of artificial shoreline protection, the presence of buffer areas in the nearby uplands, and possibly other features such as springs, tributaries, and/or stormwater outfalls.

Method or Data Collected: With the assistance of a City volunteer, Commission staff will take notes and photographs of the shoreline and record locations of erosion, shoreline protection, and other features. Commission staff will inventory shoreline condition utilizing the standard WDNR protocol.⁵

Deliverable: The Commission will map shoreline conditions as well as recommend how to enhance shoreline and near-shore habitat and protect against erosion. Commission staff will discuss opportunities to fund shoreline restoration and/or protection projects through the WDNR Surface Water Grant program, the WDNR Healthy Lakes & Rivers program, and potentially other programs.

Recreational Use

Activity: Commission staff will qualitatively survey recreational use on and around the lakes during other fieldwork visits to the lakes, e.g. for the aquatic plant and shoreline surveys. The Commission can also provide advice regarding interactive signage designed to survey lake users.

⁴ If enough discrete streamflow information is collected, Commission staff can assist UW-W faculty and students in constructing rating curves for the stream monitoring locations to convert the continuous water level data into continuous estimated streamflow. This estimated streamflow could be combined with discrete water quality sampling to determine, for example, total phosphorus loads to and leaving the lakes.

⁵ Hein et al., Lake Shoreland and Shallows Habitat Monitoring Field Protocol, Wisconsin Department of Natural Resources EGAD # 3400-2020-19, July 2020.

Methods and Data Collected: Commission staff will tally the number of lake users and their general activities, such as fishing, kayaking, or bird-watching, as feasible during visits to the lakes.

Deliverables: The number and activities of lake users will be recorded, and this data may inform additional data collection for phase two of the comprehensive lake management plan. This information may also be useful to inform areas and/or techniques for aquatic plant management in the lakes.

PROBABLE SCHEDULE

The Commission will initiate work on this project as soon as City authorizes work to proceed.⁶ The fieldwork components would occur between May and September while the aquatic plant management plan is expected to be completed by early 2025. The aquatic plant surveys of each lake would occur during July or August 2024 while the shoreline survey would likely occur in either May or September 2024. As described earlier in this scope, the discrete water quality and streamflow monitoring should occur between May and September 2024. The continuous water level loggers would be installed soon after the authorization to proceed with the project and would collect data in the lakes and streams for at least one year.⁷

Fieldwork results and findings will be shared with the City, WDNR, and UW-W faculty. The aquatic plant management will need to be reviewed by the WDNR and the City, and time needs to be allowed for discussion, revision, and public comments. Draft copies of the report may be provided to the WDNR and the City as early as winter 2024. Assuming prompt review, the final aquatic plant management plan would normally be available for public distribution in early 2025.

PROPOSED PROJECT BUDGET

Category	Activity	Cash Outlays (Commission Services)	
		Labor (Hours)	Probable Cost (\$)
Aquatic Plant Survey	Conduct aquatic plant survey on both lakes using WDNR point-intercept protocol and grids.	54	\$2,640
Publish Aquatic Management Plan	Prepare comprehensive report, develop management recommendations, and publish report.	104	\$5,550
Water Quality	Coordinate with UW-Whitewater and City to monitor water quality and water levels in lakes, lake tributaries, and lake outflow. Provide and deploy continuous water temperature and level logging devices. If feasible, assist with developing water and nutrient mass budget for lakes.	24	\$1,550
Shoreline Condition	Conduct a field inventory of the lakes' shorelines. Enter data into WDNR database and provide basic analysis to inform lake comprehensive management plan.	20	\$1,000
Recreational Use	Monitor recreational use while completing other surveys. Provide advice to City regarding interactive signs to collect information on lake use.	6	\$260
Communication	Attend select meetings, provide updates on plan progress, and give presentation on aquatic plant management plan.	6	\$500
Total		214	\$11,500

⁶A short letter agreement, with a copy of this scope of work attached, is what is used to retain the Commission's services for this type of project. The Commission issues this letter and the City would also sign the letter to initiate work.

⁷ These loggers can be removed and re-installed to download the data collected thus far as required to inform any nutrient or water budget analyses.

As noted in the scope section of this document, this budget assumes that the City will acquire and make available certain pieces of equipment, will provide volunteer labor, and will be responsible for contractor fees (e.g., analytical laboratories) as necessary to conduct these tasks.

Following City review and acceptance of this scope of work, an agreement would be executed between the City and the Commission. Under that agreement, the City would be responsible for the entire \$11,500 project cost.

#272511 - CRAVATH AND TRIPP 2024 COMP PLAN SCOPE OF WORK PHASE ONE
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JPP/TMS/nkk
03/18/2024