



Exhibit R

2023 EWM Management Plan



Memorandum

To: Beaver Dam Lake Management District (Board of Commissioners)
From: Barr Engineering Co. (Meg Rattei)
Subject: 2023 Eurasian Watermilfoil (EWM) Management Program, Monitoring Programs, and Survey of Navigation Channels
Date: March 17, 2023
Project: 49030011.23
c: Austin Dehn (WDNR), Tyler Mesalk (WDNR), Alex Smith (WDNR), Jim Bartlett (Lake Restoration, Inc.), Andrew McFerrin (Aquatic Plant Management), and Nick Johnson (Aquatic Plant Management)

The purpose of this memorandum is to present:

1. 2023 EWM Management Program
2. 2023 Monitoring Programs
3. 2023 Survey of Navigation Channels

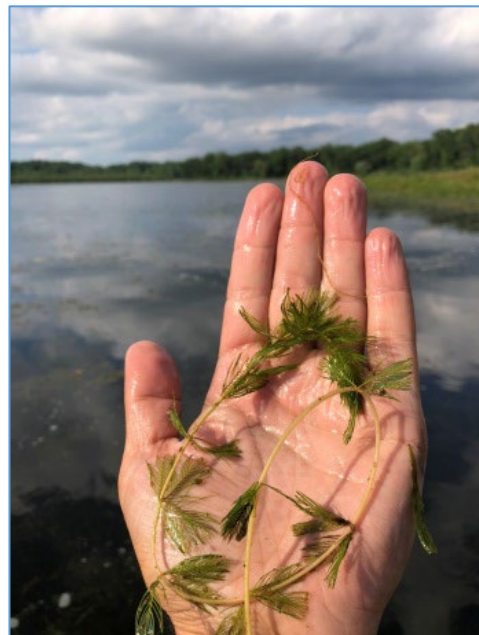
1.0 2023 EWM Management Program

The proposed 2023 EWM management program will treat EWM within Beaver Dam Lake with herbicide. The treated areas total 165.92 acres, which is about 31 percent of the lake's 530-acre littoral area.

The recommended treatment program includes treatment with ProcellaCOR and 2,4-D, contingent upon the Wisconsin Department of Natural Resources (WDNR) permitting the treatment since a WDNR permit is required for herbicide treatment.

The 2023 herbicide treatment areas are based upon the results of the 2022 fall plant survey. The 2023 EWM management program includes:

- ProcellaCOR treatment of:
 - Small areas in West Lake totaling 17.86 acres,
 - A 3.12 acre area in Williams Bay,
 - Small areas in Library Lake totaling 1.89 acres,
 - Small areas in Norwegian Bay totaling 4.33 acres,
 - Small areas in East Lake totaling 11.70 acres, and



EWM, pictured above, will be managed by herbicide treatment in 2023

- A 1.65 acre area in City Bay;
- 2,4-D treatment of:
 - the entire Rabbit Island Bay littoral area (61.8 acres).
 - 33.28 acres in City Bay and
 - 30.29 acres in Cemetery Bay.

Table 1, Figure 1 and Figure 2 show the 2023 Beaver Dam Lake EWM Management Program.

Table 1 2023 Beaver Dam Lake EWM Management Program

Location	EWM Extent (ac)	EWM Management Method	EWM Management Area (ac)	Name of Herbicide	Herbicide Dose Applied to Treatment Area	Estimated Whole Bay/Basin Concentration
West lake	4.73	Herbicide	17.86	ProcellaCOR	4 PDU	--
Williams Bay	0.43	Herbicide	3.12	ProcellaCOR	4 PDU	--
Rabbit Island Bay	15.06	Herbicide	61.8	2,4-D	1.37 ppm	0.4 ppm
Library Lake	0.61	Herbicide	1.89	ProcellaCOR	6 PDU	--
Norwegian Bay	0.89	Herbicide	4.33	ProcellaCOR	4 PDU	--
East Lake	2.54	Herbicide	11.70	ProcellaCOR	4 PDU	--
City Bay	11.95	Herbicide	1.65	ProcellaCOR	4 PDU	--
			33.28	2,4-D	2.5 ppm	0.8 ppm
Cemetery Bay	18.69	Herbicide	30.29	2,4-D	0.75 ppm	0.4 ppm

The herbicide treatments are expected to suppress the EWM infestation in the treated areas to very low levels, but some EWM may survive. Removal of surviving EWM in subsequent years will keep EWM suppressed to very low levels. EWM spreads explosively in Beaver Dam Lake and a handful of plants becomes hundreds of plants in just a few months.

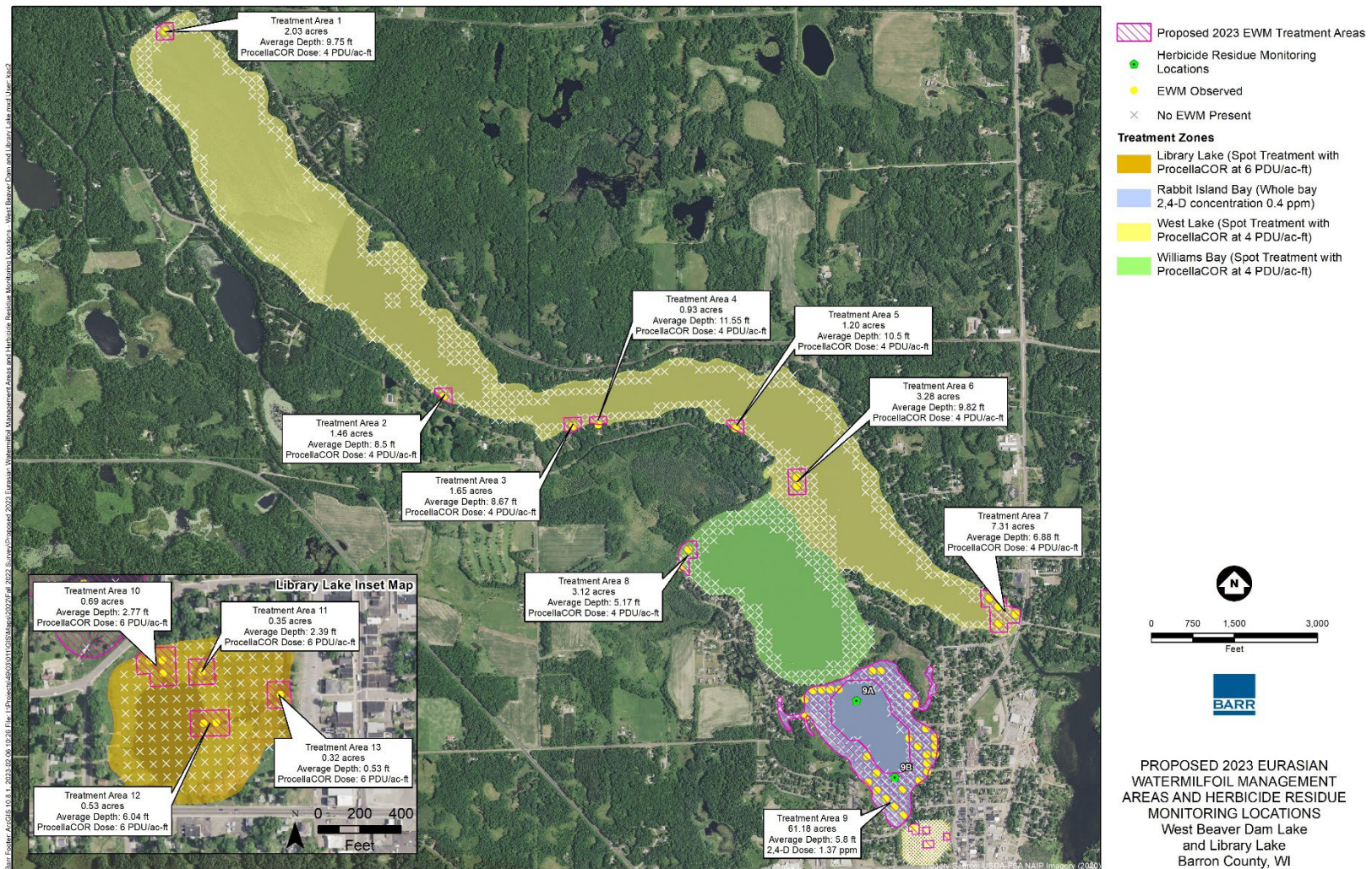


Figure 1 2023 Eurasian Watermilfoil Management Plan and Herbicide Residue Monitoring Locations: West Beaver Dam Lake and Library Lake

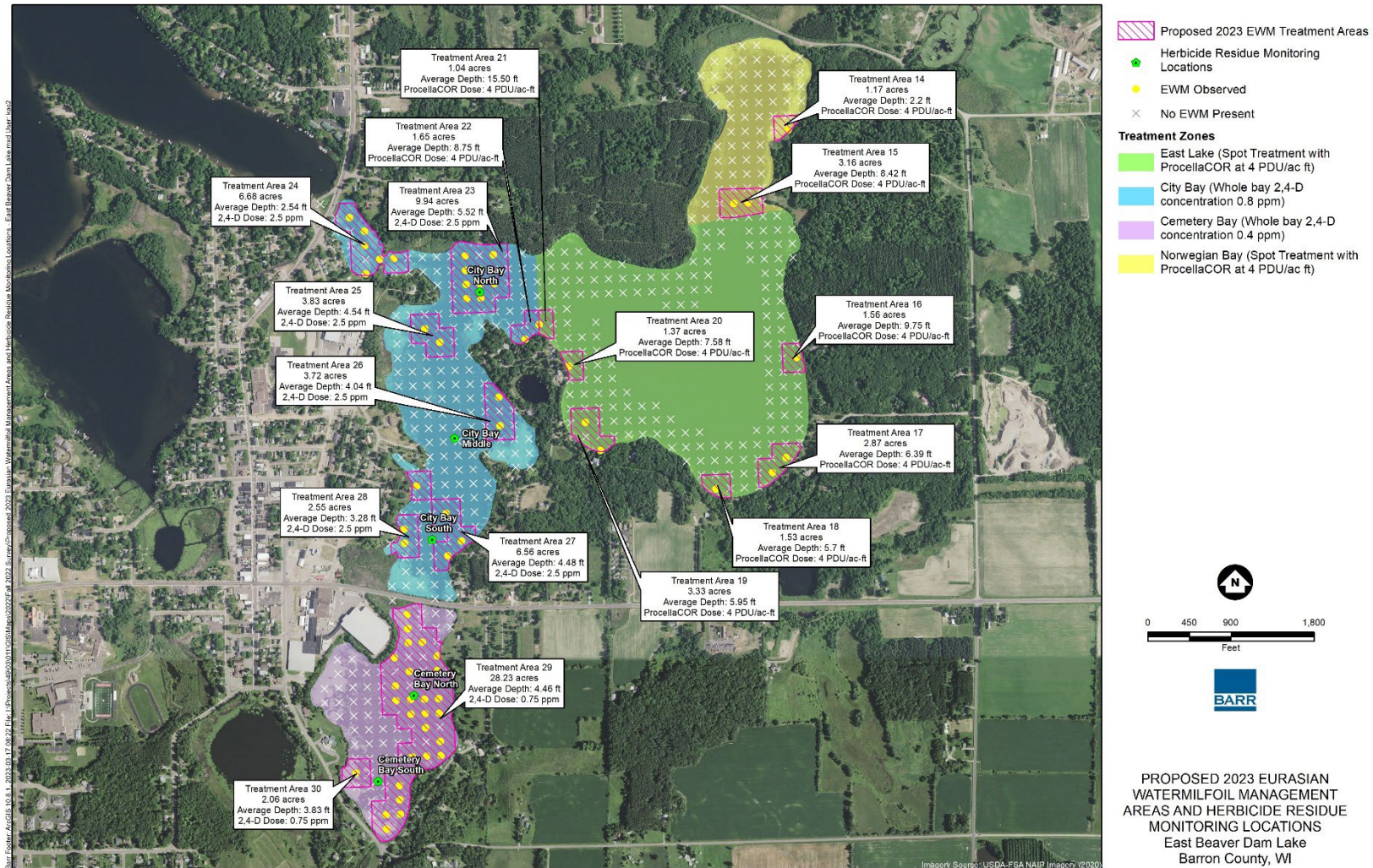


Figure 2 2023 Eurasian Watermilfoil Management Plan and Herbicide Residue Monitoring Locations: East Beaver Dam Lake

2.0 2023 EWM Management in Individual Bays and Basins

2.1.1 West Lake

In 2023, seven West Lake areas ranging from 0.93 acres to 7.31 acres will be treated in spring. The seven areas, totaling 17.86 acres, comprise 12 percent of the West Lake littoral area. The herbicide for the treatment is ProcellaCOR at a dose of 4 PDU/acre foot (Treatment Areas 1 through 7, Figure 1).



In 2023, EWM management in West Lake, pictured above, will consist of ProcellaCOR treatment of 17.86 acres (12 percent of littoral area).

2.1.2 Williams Bay

In 2023, EWM management in Williams Bay will be spring treatment of a 3.12 acre area that comprises 7 percent of the Williams Bay littoral area. The herbicide for the treatment is ProcellaCOR at a dose of 4 PDU/acre foot (Treatment Area 8, Figure 1).

2.1.3 Rabbit Island Bay

In 2023, EWM management in Rabbit Island Bay will be treatment of the entire 61.18-acre littoral area (Treatment Area 9, Figure 1). The herbicide for the treatment is 2,4-D at a dose of 1.37 ppm to attain a whole bay concentration of 0.4 ppm. The 2,4-D treatment would be completed in a single day. Herbicide treatment is intended to occur when the average water column temperature is 60 degrees Fahrenheit or less. It is expected that the average water column temperature would be at least 55 degrees Fahrenheit at the time of herbicide treatment. To determine the thermocline depth and to guide treatment timing, surface water temperature measurements in Rabbit Island Bay would be taken by the treatment contractor after the tribe has finished its annual fish spearing in the lake. The treatment contractor would take temperature measurements on Mondays, Wednesdays, and Fridays up to and including the day of treatment. The treatment contractor would measure temperatures at 1-meter intervals from the surface to bottom of Rabbit Island Bay at the location shown in Figure 3.

2.1.4 Library Lake

In 2023, four Library Lake areas ranging from 0.32 to 0.69 acres will be treated in spring. The four areas, totaling 1.89 acres, comprise 14 percent of the Library Lake littoral area. The herbicide for the treatment is ProcellaCOR at a dose of 6 PDU/acre foot (Treatment Areas 10 through 13, Figure 1).

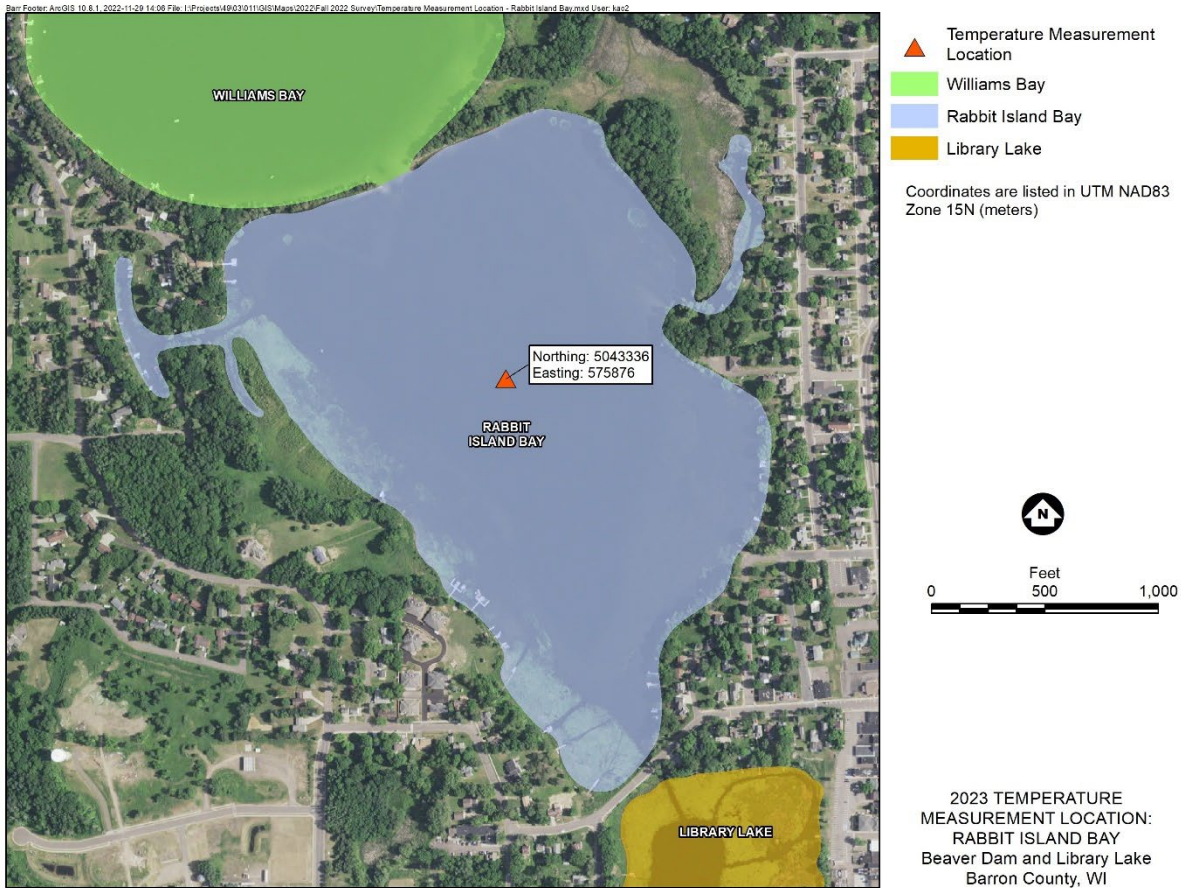


Figure 3 2023 Temperature Measurement Location Rabbit Island Bay

2.1.5 Norwegian Bay

In 2023, two Norwegian Bay areas ranging from 1.17 to 3.16 acres will be treated in spring. The two areas, totaling 4.33 acres, comprise 11 percent of the Norwegian Bay littoral area. The herbicide for the treatment is ProcellaCOR at a dose of 4 PDU/acre foot (Treatment Areas 14 and 15, Figure 2).

2.1.6 East Lake

In 2023, six East Lake areas ranging from 1.04 to 3.33 acres will be treated in spring. The six areas, totaling 11.70 acres, comprise 18 percent of the East Lake littoral area. The herbicide for the treatment is ProcellaCOR at a dose of 4 PDU/acre foot (Treatment Areas 16 through 21, Figure 2).

2.1.7 City Bay

In 2023, the EWM management area in City Bay totals 34.93 acres and comprises 34.46 percent of the littoral area. One small 1.65-acre area of EWM in City Bay (Treatment Area 22, Figure 2) is an extension of

East Lake Treatment Area 21 (Figure 2) and will be treated in spring with ProcellaCOR, a herbicide that is appropriate for a small scale treatment. The other 6 areas of EWM in City Bay total 33.28 acres and will be treated with 2,4-D, a herbicide that is appropriate for a large scale treatment. Treatment Area 22 (Figure 2) will be treated with a different herbicide than the other areas because of concerns that dilution from East Lake at this border treatment area could compromise the effectiveness of the treatment if it were included with the large scale 2,4-D treatment. ProcellaCOR is faster acting and better suited for small areas subject to dilution such as Treatment Area 22 (Figure 2). The small scale and large scale treatments are discussed separately in the paragraphs that follow.

2.1.7.1 Small Scale Treatment of Treatment Area 22 in City Bay with ProcellaCOR

The herbicide for treatment of Treatment Area 22, Figure 2 is ProcellaCOR at a dose of 4 PDU/acre foot. This 1.65 acre treatment area comprises 2 percent of the City Bay littoral area.

2.1.7.2 Large Scale Treatment of Treatment Areas 23 Through 28 in City Bay with 2,4-D

In 2023, six City Bay areas ranging from 2.55 to 9.94 acres will be treated in spring with 2,4-D, a herbicide appropriate for a large scale treatment. The six areas, totaling 33.28 acres, comprise 33 percent of City Bay. 2,4-D will be applied at a dose of 2.5 ppm to attain a whole bay concentration of 0.8 ppm (Treatment Areas 23 through 28, Figure 2). The 2,4-D treatment would be completed in a single day.

2.1.8 Cemetery Bay

In 2023, two Cemetery Bay areas ranging from 2.06 acres to 28.23 acres will be treated in spring. The two areas, totaling 30.29 acres, comprise 56 percent of Cemetery Bay. The herbicide for the treatment is 2,4-D at a dose of 0.75 ppm to attain a whole bay concentration of 0.4 ppm. The 2,4-D treatment would be completed in a single day.

3.0 Monitoring Herbicide Residue

Herbicide residue monitoring will be required for large scale treatment of Rabbit Island Bay, City Bay, and Cemetery Bay. In 2023, 2,4-D herbicide residue monitoring would occur in two representative locations in Rabbit Island Bay (Figure 1 and Figure 4), three representative locations in City Bay (Figure 2 and Figure 5), two representative locations in Cemetery Bay (Figure 2 and Figure 6) to determine whether the target dose was attained as well as the rate of herbicide decline due to dilution, mixing, and natural degradation. Samples would be collected at mid-depth from all locations during the monitoring period. Specific sample collection times for the treatment areas are shown in Table 2. It should be noted that (1) if the sample collection time for 1 and 4 hours after treatment occurs after dark, the sample will not be collected; and (2) if weather conditions make sample collection unsafe during any of the scheduled sample collection times, samples will not be collected.

Table 2 2023 2,4-D Residue Monitoring Plan for Rabbit Island Bay, City Bay, and Cemetery Bay

Treatment Area	Sample Site ID	Sample Collection Time (Hours After Treatment)	Sample Collection Time (Days After Treatment)
Rabbit Island Bay	9A and 9B	1 and 4	1, 2, 3, 5, 7, 12, 19, and 26
City Bay	City Bay North, City Bay Middle, and City Bay South	1 and 4	1, 2, 3, 5, 7, 12, 19, and 26
Cemetery Bay	Cemetery Bay North and Cemetery Bay South	1 and 4	1, 2, 3, 5, 7, 12, 19, and 26

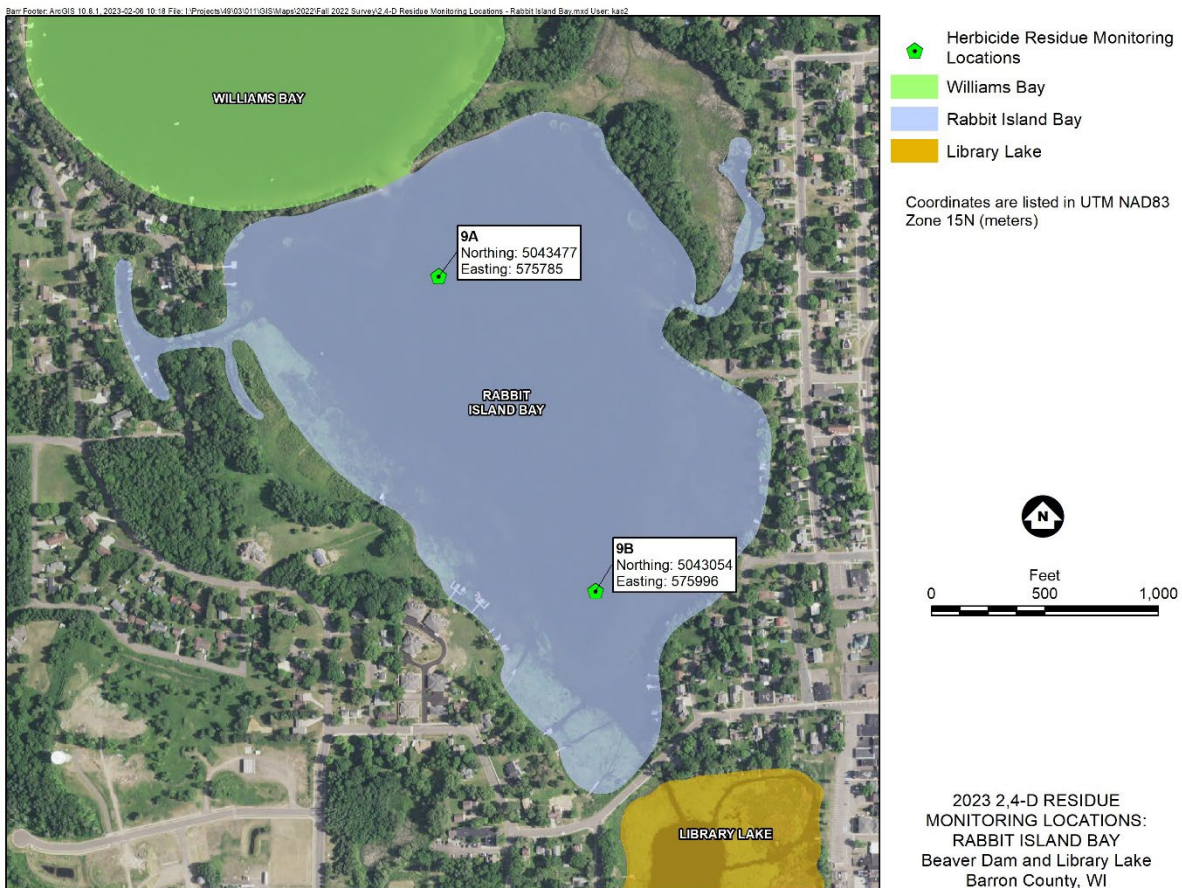


Figure 4 2023 2,4-D Residue Monitoring Locations: Rabbit Island Bay

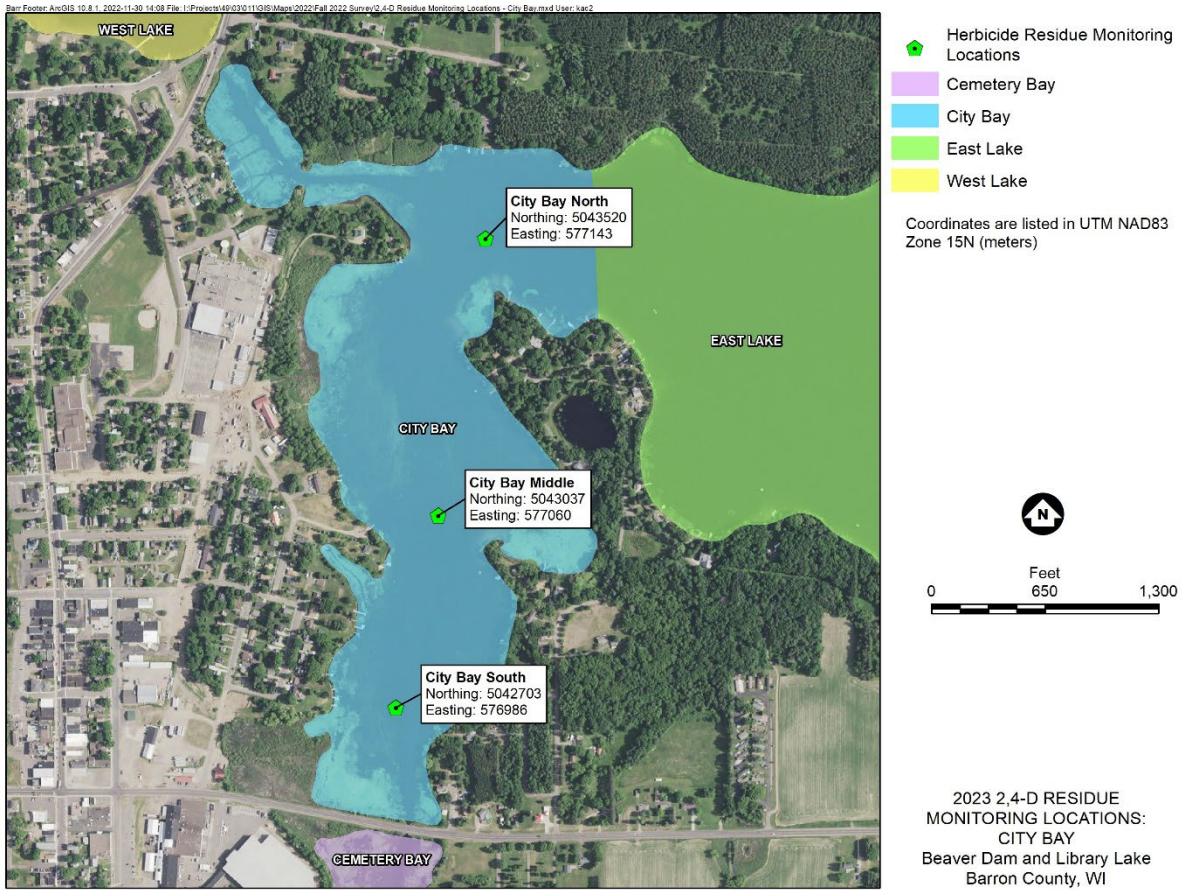


Figure 5 2023 2,4-D Residue Monitoring Locations: City Bay

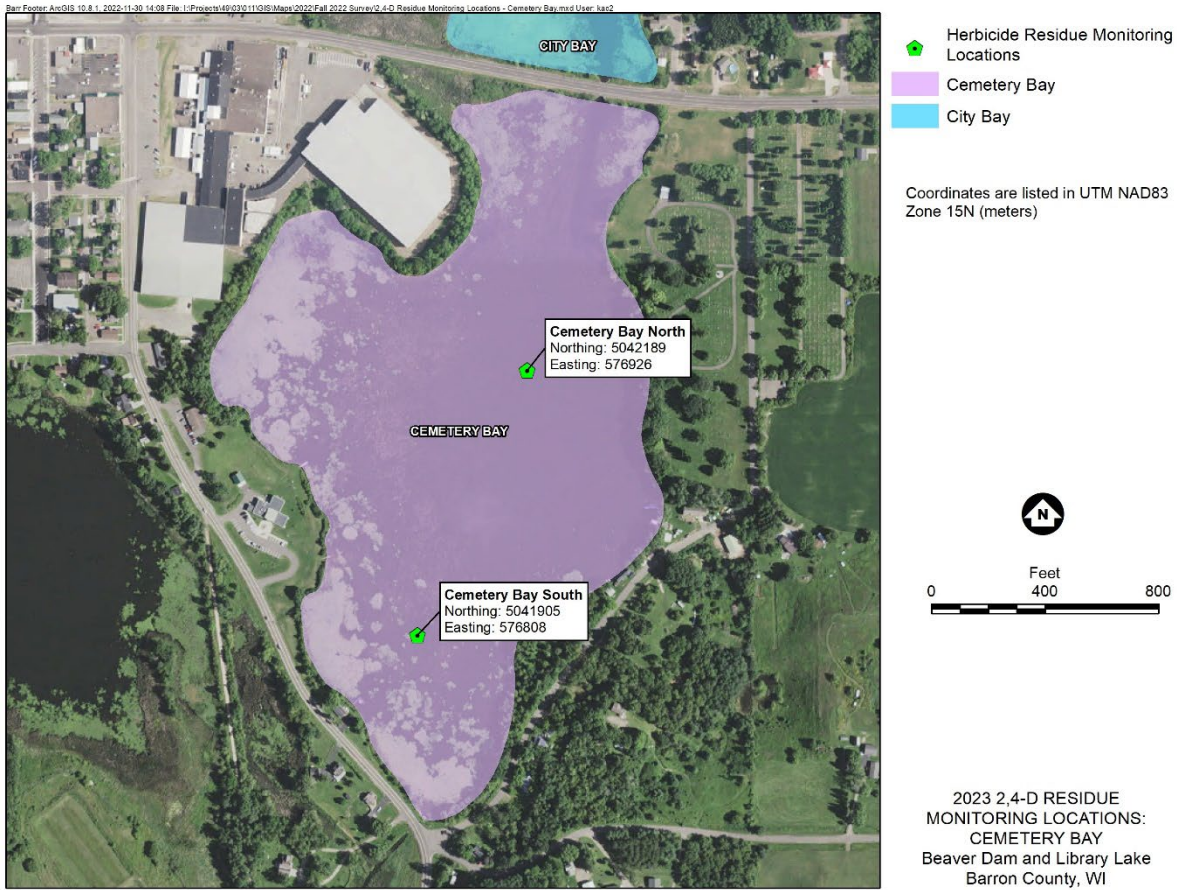


Figure 6 2023 2,4-D Monitoring Locations: Cemetery Bay

4.0 2023 Aquatic Plant Monitoring Programs

The 2023 aquatic plant monitoring programs will include a July survey of all plant species in Beaver Dam Lake and an October survey of aquatic invasive species in Beaver Dam Lake. Details of the aquatic plant monitoring programs follow.

4.1 Beaver Dam Lake July Aquatic Plant Survey – All Species

During July, a point intercept survey of about 1,346 sample points will assess the entire plant community in Beaver Dam Lake. Maps showing the sample locations are found in Appendix E of the Beaver Dam Lake APM Plan (<http://www.beaverdamlake.org/apmp>). Data will be summarized in tabular format using the WDNR pre-treatment/post-treatment spreadsheet. Maps will be prepared showing location and density of each species identified in the July plant survey. Maps will also be prepared that show bottom substrate, lake depth, littoral zone, native species richness, and total rake fullness. Chi squared analysis will compare 2023 data with 2022 data to identify significant changes in frequency of occurrence of native species. The July monitoring program duplicates monitoring programs completed during 2009 through 2022.

4.2 Beaver Dam Lake Fall Aquatic Plant Survey – Aquatic Invasive Species (EWM and CLP)

During October, a fall point intercept survey of about 1,346 sample points will assess aquatic invasive species (EWM and CLP) extent in Beaver Dam Lake. Maps showing the sample locations are found in Appendix E of the Beaver Dam Lake APM Plan (<http://www.beaverdamlake.org/apmp>). The results of the EWM data collected during the fall aquatic invasive species survey will determine 2024 EWM management areas and will be used to design the 2024 EWM management program. The results of the CLP data collected during the fall aquatic invasive species survey will be evaluated to determine whether any areas would need additional CLP monitoring during June of 2024 when CLP is at its peak growth stage. The fall aquatic invasive species monitoring program duplicates monitoring programs completed during 2006 through 2022.

5.0 2023 Survey of Navigation Channels

In 2023, the Beaver Dam Lake Management District contractor will survey the Beaver Dam Lake navigation channels during the July aquatic plant survey and determine whether remediation is necessary. If remediation is necessary, the Beaver Dam Lake Management District contact the WDNR. If the WDNR would permit EWM removal, the District will take appropriate action. Navigation channels include the channels between Rabbit Island Bay and Library Lake and the Grove Street Bridge, the channel east of the Highway 63 box culvert, and the area on both sides of the Highway 48 bridge.