

***Beaver Dam Lake Aquatic Invasive Species
(AIS) Grant Application: Established EWM
Population Control Project***

***by
Beaver Dam Lake Management District and
Barr Engineering Company***

January 2014



***Aquatic Invasive Species (AIS) Control
Grant Application***

Notice: Use of this form is required by the DNR for any application filed pursuant to ch. NR 198, Wis. Adm. Code. Personal information collected on this form, including such data as your name, address, phone number, etc., will be used for management and enforcement of DNR programs, and is not intended to be used for any other purpose. Information may be made accessible to requesters under Wisconsin's Open Records laws (s. 19.32-19.39, Wis. Stats.) and requirements.

Section I: Application Type

Check one:

- Education, Prevention & Planning
 Early Detection & Response
 Established Infestation Control

Legislative District Numbers		To determine your legislative district, go to http://165.189.139.210/WAML/ Type in complete address, next screen shows information.
Senate	Assembly	
25	75	

Section II: Applicant Information

Applicant Beaver Dam Lake Management District			Type of Eligible Applicants		
Waterbody Name Beaver Dam Lake			<input type="checkbox"/> County	<input type="checkbox"/> Tribe	<input type="checkbox"/> Other Gov't Unit
Project County/Township/Section/Range T35/R13/S5,6,7,8/R14/S1,12/T36/R14/S26,27,34,35,36/T36			<input type="checkbox"/> City	<input type="checkbox"/> Sanitary Dist.	<input type="checkbox"/> Nonprofit Org.
Authorized Representative Named by Resolution Tom Schroeder			<input type="checkbox"/> Village	<input checked="" type="checkbox"/> Dist.	<input type="checkbox"/> College, School, etc.
Authorized Representative Title President			<input type="checkbox"/> Town	<input type="checkbox"/> Assoc.	<input type="checkbox"/> Federal
Address 1970 Hines Lakeview Drive			Project Contact Name Meg Rattei; Barr Engineering Company		
City Cumberland			Project Contact Title Senior Biologist		
State WI			Address 4700 West 77th Street		
ZIP Code 54829			City Minneapolis		
Daytime Phone (area code) (715) 822-2699			State MN		
Evening Phone (area code) (618) 521-7674			ZIP Code 55435		
E-mail Address tcschroeder@centurytel.net			Daytime Phone (area code) (952) 832-2810		
			Evening Phone (area code) (651) 295-6936		
			E-Mail Address mrattei@barr.com		

Mail Check to: (if different from applicant)

Name and Title Alan Carlson MD; Treasurer		Address 586 24th Ave	
Organization Beaver Dam Lake Management District		City Cumberland	State WI
		ZIP Code 54829	

For DNR Use Only

Application Type	Date Received	Date Reviewed (AIS/LC/RC)	AIS/Lake /River Coordinator Approval /Date
Waterbody ID#	Adequate Public Access <input type="checkbox"/> Yes <input type="checkbox"/> No		Environmental Grants Specialist Approval / Date
Eligible Project <input type="checkbox"/> Yes <input type="checkbox"/> No	Eligible Applicant <input type="checkbox"/> Yes <input type="checkbox"/> No	Project Priority Rank	Research / Demo Project <input type="checkbox"/> Yes <input type="checkbox"/> No
Prior Grant Award(s) <input type="checkbox"/> Yes <input type="checkbox"/> No	Fiscal Year(s)	Amount Received To Date \$	Project Awarded <input type="checkbox"/> Yes <input type="checkbox"/> No

Aquatic Invasive Species (AIS) Control Grant Application

Form 8700-307 (12/11)

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Section III: Project Information

Project Title 2014 Beaver Dam Lake EWM Management: Herbicide Treatment & Hand Harvesting	Proposed Ending Date 06/30/15
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Other Management Units	Letter of Support	Other Management Units	Letter of Support
1. Barron County Department of Land Services	<input checked="" type="checkbox"/>	4.	<input type="checkbox"/>
2. City of Cumberland	<input checked="" type="checkbox"/>	5.	<input type="checkbox"/>
3.	<input type="checkbox"/>	6.	<input type="checkbox"/>

Section IV: Public Access

Number of Public Vehicle Trailer Parking Spaces Available at Public Access Sites: 40

Number of Public Access Sites Including Boat Launches and Walk-ins: 6

Section V: Cost Estimate and Grant Request

Section V must be completed or application will be returned. Details in support of Section V are welcome.

Section V must be completed or application will be returned. Details in support of Section V are welcome.	Project Costs		
	Column 1 Cash Costs	Column 2 Donated Value	<i>DNR Use Only</i>
1. Salaries, wages and employee benefits		1,060.00	
2. Consulting services	6,500.00		
3. Purchased services--printing and mailing			
4. Other purchased services (specify):	82,255.00		
5. Plant material			
6. Supplies (specify)			
7. Depreciation on equipment			
8. Hourly equipment use charges			
9. State Lab of Hygiene (SLOH) Costs			
10. Non-SLOH Lab Costs			
11. Other (specify)			
12. Subtotals (sum each column)	88,755.00	1,060.00	
13. Total Project Cost Estimate (sum of column 1 plus sum of column 2)	89,815.00		
14. State Share Requested (up to 75% of total costs may be requested)	44,907.00		

Subject to the following maximum grant amounts:

- Education, Prevention and Planning Projects--up to \$150,000
- Early Detection and Response Projects--up to \$20,000
- Established Infestation Control Projects--up to \$200,000

Use of Federal funding as match: (check box below if applicable)

We are using or planning to apply for Federal funds to be used as match.

If known, indicate source of funding:

Section VI: Attachments (check all that are included)

A. For all applicants: (Refer to instructions for applicability.)

- 1. Authorizing resolution
- 2. Letters of support
- 3. Map of project location and boundaries
- 4. Lake map or river segment with public access sites identified (per Section IV of this application and page 20 of the guidelines)
- 5. Itemized breakdown of expenses
- 6. For projects that entail sending samples to the State Laboratory of Hygiene (SLOH) only: a completed SLOH Projected Cost Form
- 7. Project scope/description:
 - a. Description of project area
 - b. Description of problem to be addressed by project
 - c. Discussion of project goals and objectives
 - d. Description of methods and activities
 - e. Description of project products or deliverables
 - f. Description of data to be collected, if applicable
 - g. Description of existing and proposed partnerships
 - h. Discussion of role of project in planning and/or management of lake
 - i. Timetable for implementation of key activities
 - j. Plan for sharing project results
 - k. Other information in support of project not described above

B. For applicants that are Lake Management Organizations (LMOs), River Management Organizations (RMOs) or Qualified Non-profit Organizations:

- 1. For first time applicant LMOs/RMOs only: A completed Form 8700-226 (Lake Association Organizational Application) or 8700-287 (River Management Organization Application)
- 2. For first time applicant Qualified Nonprofit Organizations only: Copy of IRS 501(c)(3) determination letter and copies of your Articles of Incorporation and Bylaws
- 3. List of national and/or statewide organizations with which you are affiliated
- 4. List of board members' names, including municipality and county of residence. Designate officers
- 5. Documentation of current financial status
- 6. Brochures, newsletters, annual reports or other information about your organization

C. Education, Prevention and Planning Projects: (No additional attachments required.)

D. Early Detection and Response Projects:

- 1. APM Permit application

E. Established Infestation Control Projects:

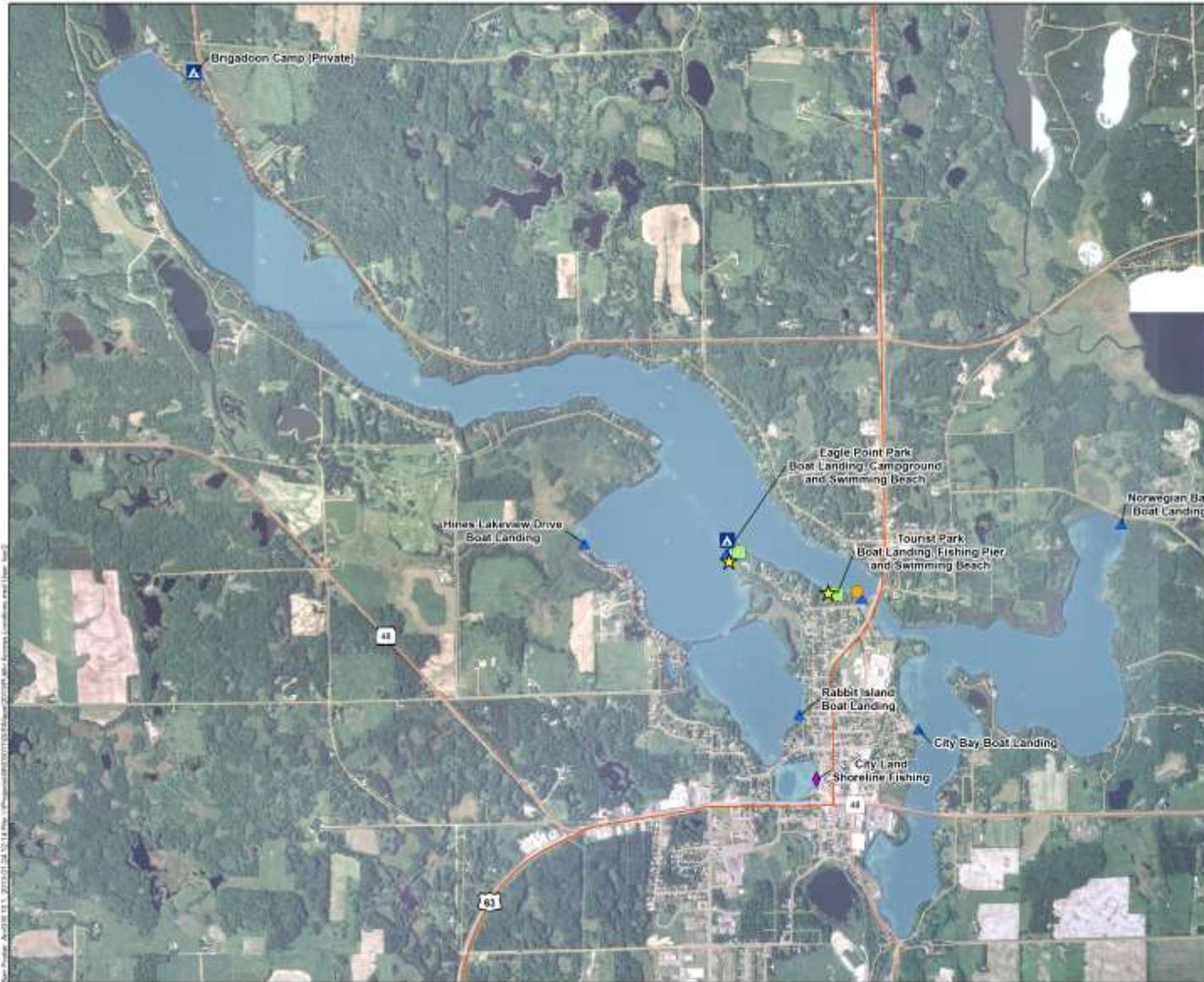
- 1. Management Plan
- 2. APM Permit application

Section VII: Certification

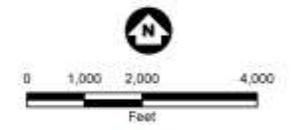
I certify that information in this application and all its attachments are true and correct and in conformity with applicable Wis. Statutes.

Print/Type Name of Authorized Representative Tom Schroeder	Title of Authorized Representative President
Signature of Authorized Representative <i>Tom Schroeder</i>	Date Signed 1/23/2014

***Map of Public Boat Access Sites
(From Section VI A.4 of this Application)***



- Boat Landing
- Campground
- Fishing Pier
- Park
- Shoreline Fishing
- Swimming Beach
- Beaver Dam Lake



PUBLIC ACCESS LOCATIONS
Beaver Dam Lake
Barron County, WI

***Project Scope/Description
(From Section VI A.7 of This Application)***

Section 6: Project Scope/Description: Beaver Dam Lake AIS-EPC Grant Application

1.0 Description of Project Area

Beaver Dam Lake in Barron County, Wisconsin is valued by lakeshore property owners, area residents, the City of Cumberland, Barron County, and the Wisconsin Department of Natural Resources (WDNR) for its fisheries (northern pike, walleye, largemouth bass, smallmouth bass, and panfish) and for recreational use. The lake has a surface area of 1,186 acres, a maximum depth of 106 feet, and a mean depth of 32 feet (See Figure 1). Beaver Dam Lake is the deepest lake in Barron County and the sixth deepest lake in Wisconsin. The lake has 20 miles of shoreline.

The lakeshore is developed with dwellings and several parks and boat landings present. Specifically, the lake has six boat landings, five swimming beaches of which two are public, one fishing pier, two campgrounds (Eagle Point Park and Camp Brigadoon) of which one (Eagle Point Park) is operated by the City of Cumberland, and a park located adjacent to the lake (Tourist Park). Four of the boat landings provide a paved boat ramp and a boarding dock. At least one of the landings has a portable restroom.

Collectively, the public boat landings provide a total of 40 car/trailer parking spaces, which satisfy the requirement of Wisconsin Administrative Code NR 1.91

Public boating access standards for WDNR decisions related to providing natural resource enhancement services.

The lake is heavily used by the public and the lake's 5 swimming beaches, fishing pier, and park provide significant other public access opportunities. The heavy use of the lake was documented by watercraft inspections, a creel survey, and permits for fishing tournaments.



Beaver Dam Lake's swimming beaches, including the public swimming area adjacent to Tourist Park pictured above, are heavily used by the public.



Figure 1
 BEAVER DAM LAKE SITE MAP
 Barron County, WI
 Job No. 49-03-011

Beaver Dam Lake is a popular fishing lake. Results of a creel survey indicate projected angling pressure for all fish species in 2006 through 2007 was 41.4 hours per acre.¹ The lake notes a moderate use for fishing tournaments and by fishing clubs. In 2009, there were 4 permitted fishing tournaments, in 2010 there were 3 permitted fishing tournaments², and in 2011 and 2012 there were 2 permitted fishing tournaments, a summer bass tournament and a winter ice fishing tournament³. Beaver Dam Lake is a popular bass “club” water. Bass “clubs” go to a new lake every week to fish one night per week as part of their club activities. Bass “clubs” fish Beaver Dam Lake regularly in their club rotation. Bass clubs usually have only 10 to 15 boats per event and, therefore, do not meet the criteria for needing a fishing tournament permit.⁴ Only tournaments with 20 or more boats or 100 or more participants require a tournament permit from the DNR. Hence, there were likely additional smaller tournaments that did not require a permit⁵



The northern pike, pictured above, was caught in Beaver Dam Lake. Photo Credit: www.lake-link.com/lakes/lake.cfm?LakeID=128

2.0 Description of Problem to Be Addressed By Project

Beaver Dam Lake has a diverse and high quality aquatic plant community. However, EWM poses a threat to the lake’s native community and prevents the lake from fully supporting recreational uses such as motor boating, swimming, and fishing. EWM was introduced to the lake in 1991 and was allowed to grow and spread without management during 1991 through 1999. From a 1999 plant survey, it was estimated that 73 percent of the lake’s littoral area was infested



EWM, pictured above, was introduced to Beaver Dam Lake in 1991 and rapidly spread throughout the lake. Photo Credit: Endangered Resource Services, LLC.

¹ Benike, Heath and Mason Disrude. 2008. Beaver Dam Lake Fisheries Survey Barron County, Wisconsin 2005-2007 MWBIC: (2081200). Wisconsin Department of Natural Resources, Northern Region-Barron.

² Benike, Heath. 2010. Email Communication Dated July 8, 2010.

³ Cole, Aaron. 2013. Email Communication Dated January 24, 2013.

with EWM. Herbicide treatment of EWM reduced the area of infestation to 47 percent of the lake's littoral area by 2005 and to 25 percent by 2013. During the past 5 years, EWM extent in Beaver Dam Lake has been reduced by about 50 acres, from 176 acres in 2008 to 122 acres in 2013⁴.

Despite the effectiveness of previous control efforts, continued EWM reduction efforts are necessary to attain the lake-wide goal of reducing EWM levels to 10 percent of the littoral zone. Additionally, treatment is necessary to curtail the rapid expansion of EWM in the lake. It is well documented that EWM in Beaver Dam Lake is a rapidly expanding population, curtailed only by annual herbicide treatments. Annual point intercept plant surveys during July and October have documented the rapid expansion of EWM between summer and fall. As shown in Tables 1 and 2, EWM lake-wide frequency of occurrence and extent more than tripled between summer and fall of 2013.



Pictured above, EWM in City Bay, one of the bays in the East Basin of Beaver Dam Lake, prevents the lake from fully supporting recreational activities.

Further reduction of EWM in Beaver Dam Lake will reduce the likelihood that Beaver

Dam Lake will continue to be a source of infestation to other waterbodies. The lake receives significant use by boaters and is the likely source of EWM infestation of several neighboring lakes that observed infestations of EWM following its introduction to Beaver Dam Lake (e.g., Sand Lake and Echo Lake). Continued efforts to reduce EWM infestation as well as watercraft inspections of boats leaving the lake will help protect neighboring waterbodies not yet infested with EWM (e.g., Kirby Lake, Dummy Lakes). The District's efforts to control EWM in Beaver Dam Lake and prevent its spread to neighboring lakes is detailed in the Beaver Dam Lake Aquatic Plant Management Plan found in Appendix B.

⁴ Barr Engineering Company. 2014. Beaver Dam Lake Aquatic Plant Management Plan.

Table 1 2009-2013 Beaver Dam Lake EWM Frequency of Occurrence Summary

Location	% of Sample Points up to 20-foot depth with Eurasian watermilfoil, Including Visuals									
	Jul-2009	Fall 2009	July 2010	Fall 2010	July 2011	Fall 2011	July 2012	Fall 2012	July 2013	Fall 2013
West Lake	16.72	15.22	11.68	15.46	7.99	11.22	9.72	15.60	7.43	20.49
Williams Bay	19.78	12.77	4.30	14.13	11.49	11.58	4.40	17.65	1.09	7.53
Rabbit Island Bay	19.64	21.50	13.51	28.30	11.01	18.18	1.77	12.50	0.88	3.88
Library Lake	5.07	1.59	0.75	6.40	0.00	0.00	3.01	1.96	0.00	1.03
East Lake	17.65	33.91	27.83	36.54	35.40	40.83	22.03	35.45	3.57	24.79
City Bay	32.78	62.87	21.55	55.93	55.00	68.11	48.07	58.90	21.79	48.54
Norwegian Bay	39.71	78.79	33.82	28.36	11.76	51.52	54.41	72.13	7.35	63.49
Cemetery Bay	0.00	6.82	0.00	10.23	3.37	47.73	0.00	18.39	0.00	2.27
West Basins	15.16	13.15	8.60	15.63	7.31	10.11	6.08	14.01	3.78	14.41
East Basins	23.46	46.33	20.75	37.84	33.33	54.68	32.89	46.32	10.71	35.08
Beaver Dam Lake - Whole Lake	18.61	26.90	13.69	24.63	18.29	28.68	17.59	28.56	6.65	22.07

Table 2 2006-2013 EWM Extent in Beaver Dam Lake

Treatment Area	Acreage of EWM (based on plant surveys)									
	July 2009	Fall 2009	July 2010	Fall 2010	July 2011	Fall 2011	July 2012	Fall 2012	July 2013	Fall 2013
West Lake	24.59	19.67	15.80	25.15	8.65	14.78	15.31	23.11	10.05	29.13
Williams Bay	9.48	4.80	1.15	6.68	4.57	4.65	1.68	6.92	0.33	2.46
Rabbit Island Bay	10.57	8.51	6.26	11.47	4.22	8.01	0.51	5.64	0.38	1.45
Library Lake	0.40	0.09	0.04	0.72	0.00	0.00	0.2	0.04	0.00	0.06
East Lake	8.14	19.37	14.13	17.48	17.18	23.93	11.33	19.98	1.18	15.72
City Bay	27.89	61.62	20.11	54.01	47.97	73.66	48.76	55.75	20.70	49.01
Norwegian Bay	8.65	28.23	12.09	9.61	1.99	19.67	21.21	26.91	2.19	23.37
Cemetery Bay	0.00	1.81	0.00	3.97	0.86	21.32	0	7.17	0.00	0.51
East Basins:	44.68	111.03	46.33	85.07	67.99	138.58	81.30	109.81	24.07	88.60
West Basins:	45.04	33.07	23.25	44.02	17.44	27.44	17.70	35.70	10.76	33.10
Beaver Dam Lake -Whole Lake	89.72	144.10	69.58	129.09	85.43	166.02	99.00	145.51	35.88	121.70

Problematic growths of EWM have prevented Beaver Dam Lake from fully supporting recreational activities. A survey of lake residents found that about 60 percent feel their activities are negatively affected by aquatic plants. Lake uses most negatively affected by aquatic plants are swimming, fishing and pontooning followed closely by motor boating and enjoying the view. When asked to rank the degree of impact that invasive species has on use or enjoyment of the lake, more than half of survey respondents selected high impact.⁴

Management of EWM is necessary to reduce the area of EWM infestation, support recreational use of the lake, and protect and, whenever possible, improve the native plant community in Beaver Dam Lake.

Plant surveys of Beaver Dam Lake have documented the very diverse and high quality native plant community in the lake. In 2013, the lake's FQI was 46.3 which is more than double the Ecoregion median FQI of 20.9. In addition, three NHI species of concern were observed in Beaver Dam Lake during 2009 through 2013: *Potamogeton vasey* (Vasey's pondweed), *Eleocharis robbinsii* (Robbin's spikerush), and *Utricularia purpurea* (purple bladderwort). Control of EWM is necessary to protect the high quality native plant community of Beaver Dam Lake, including the NHI species of concern that currently reside in the lake.⁴

Fishery surveys have documented the high quality fishery in the lake. Because EWM can aggressively displace native species that provide necessary habitat for the lake's fishery, control of EWM is necessary to protect the lake's high quality fishery.

This AIS grant project intends to control EWM in Beaver Dam Lake. Control of EWM in Beaver Dam Lake will protect the lake's native plant community and fisheries habitat, enable the lake to fully support recreational activities, and reduce the likelihood that Beaver Dam Lake will continue to be a major source of AIS spread to neighboring lakes.

3.0 Discussion of Project Goals and Objectives

The goals of this established EWM control project are four of the goals from the District's current aquatic plant management plan. These four goals and project objectives are:

Goal 1: Reduce Eurasian watermilfoil (EWM) levels to ten percent of the littoral zone while minimizing harm to native aquatic plants.

Objective 1: Protect the lake's ability to support recreational uses such as boating, fishing, swimming, and enjoying the view.

Objective 2: Protect fisheries habitat and the overall health of the lake.

Objective 3: Reduce the annual EWM management cost.

Goal 2: Maintain navigation channels that are not impaired by invasive plant growth

Objective 1: Protect the lake's ability to support recreational uses such as boating, pontooning, and fishing.

Objective 2: Provide riparian owners with the ability to access the lake with their boats and pontoons.

Goal 3: Prevent transfer of invasive plant species from Beaver Dam Lake

Objective 1: Containment of EWM to prevent the introduction of EWM to other lakes.

Goal 4: Improve the fishery resource through proper management of aquatic plants and stocking of extended growth walleyes to control rainbow smelt, an invasive species.

Objective 1: Improve fishery habitat through the reduction of EWM to 10 percent of the littoral area.

Objective 2: Protect fishery habitat by minimizing harm to the native plant community during the treatment of EWM.

Objective 3: Protect plants found in critical habitat areas of the lake because these plants are important to the lake's fishery.

Objective 4: Improve the fishery resource by controlling rainbow smelt, an invasive species, through the stocking of extended growth walleyes.

4.0 Description of Methods, Activities, Deliverables, and Plan for Sharing Project Results

This established EWM population control grant application is for the herbicide treatment of Beaver Dam Lake during the spring of 2014 and limited hand harvesting of EWM in the summer of 2014.

Complementary AIS management activities that will also occur in 2014 include:

- Stocking extended growth walleyes to control rainbow smelt
- Clean Boats, Clean Waters watercraft inspection

- AIS surveillance by CLMN volunteers

The 2014 Beaver Dam Lake EWM herbicide treatment program includes spring treatment of 277.91 acres (Figures 2 and 3 and Table 3). The four West Lake treatment areas total 95.93 acres and the four East Lake treatment areas total 181.98 acres. Liquid 2,4-D will be used in all treatment areas, but dose will vary between treatment areas:

- 4 parts per million (ppm) dose will be applied to spot treatment areas in West Lake, Williams Bay, Rabbit Island Bay, Library Lake, and East Lake
- 2 ppm dose will be applied to spot treatment areas in Cemetery Bay
- 0.6 ppm dose will be applied to Norwegian Bay and City Bay which are whole bay treatments

The doses shown in Table 3 and Figures 2 and 3 assume stratification will occur at the 20-foot depth for all treatment areas with depths greater than 20 feet. If stratification occurs at a deeper or shallower depth, doses may need to be adjusted accordingly to attain the desired whole lake concentration shown in Table 1 and on Figures 2 and 3. To determine when stratification occurs, temperature profiles will be measured in the Center of East Lake, Rabbit Island Bay, Williams Bay, and West Lake at the deepest locations. Measurements would begin shortly after ice-out and continue on a daily basis during the business week until the time of treatment. The stratification information will be used to determine when treatment should occur and whether dose adjustments are needed.

Table 3 2014 EWM Treatment Plan for Beaver Dam Lake

Treatment Area	Acres Treated	2,4-D Concentration Applied to Each Treatment Area (ppm)	Expected 2,4-D Whole Bay-Concentration (ppm)
West Lake Basins			
West Lake	65.12	4	0.3
Williams Bay	15.95	4	0.3
Rabbit Island Bay	12.97	4	0.3
Library Lake	1.89	4	0.3
East Lake Basins			
Norwegian Bay	37.90	0.6	0.6
East Lake	33.83	4	0.6
City Bay	102.17	0.6	0.6
Cemetery Bay	8.08	2	0.3

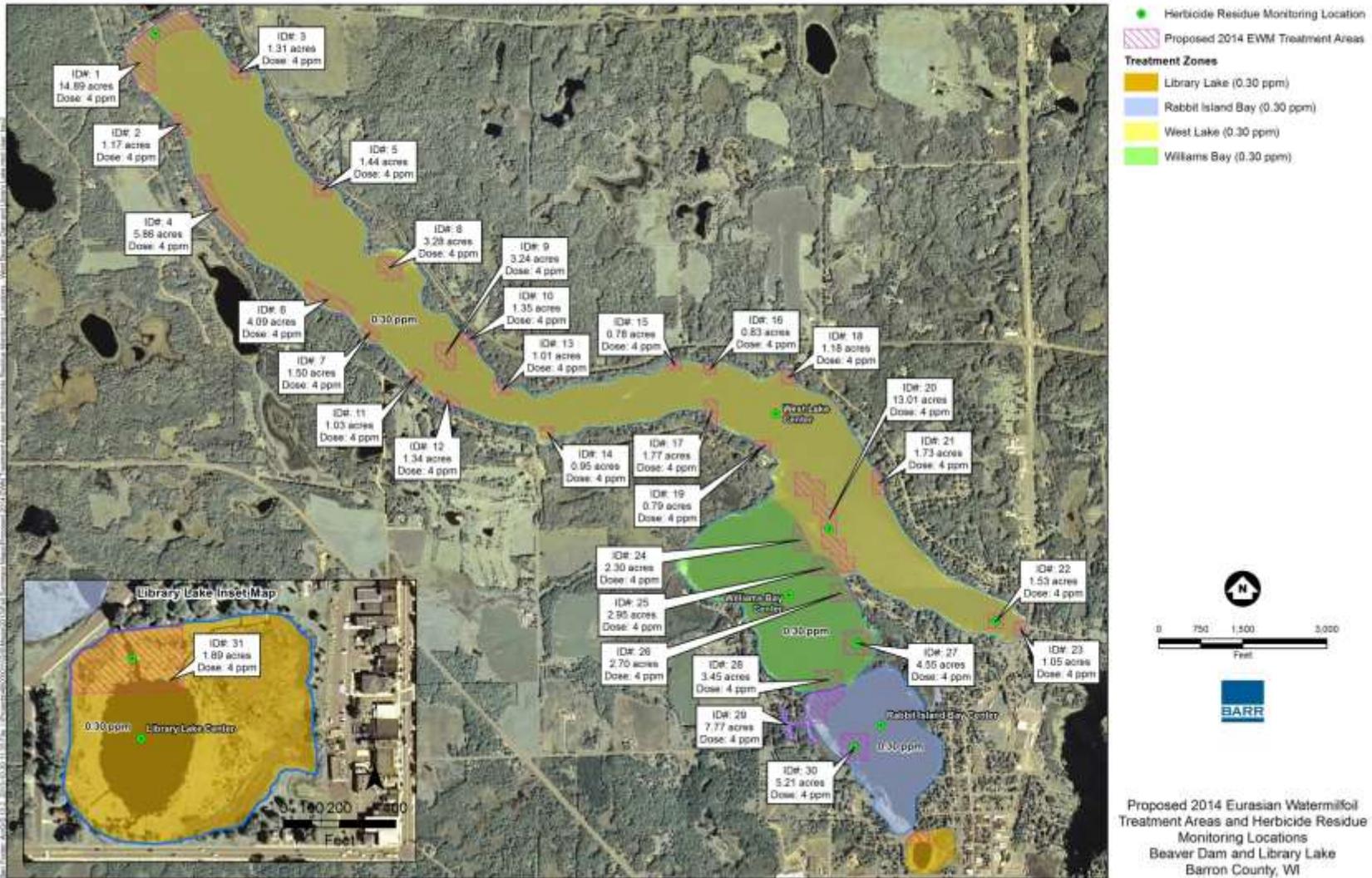


Figure 2 Proposed 2014 Treatment Plan for West Lake, Williams Bay, Rabbit Island Bay, and Library Lake

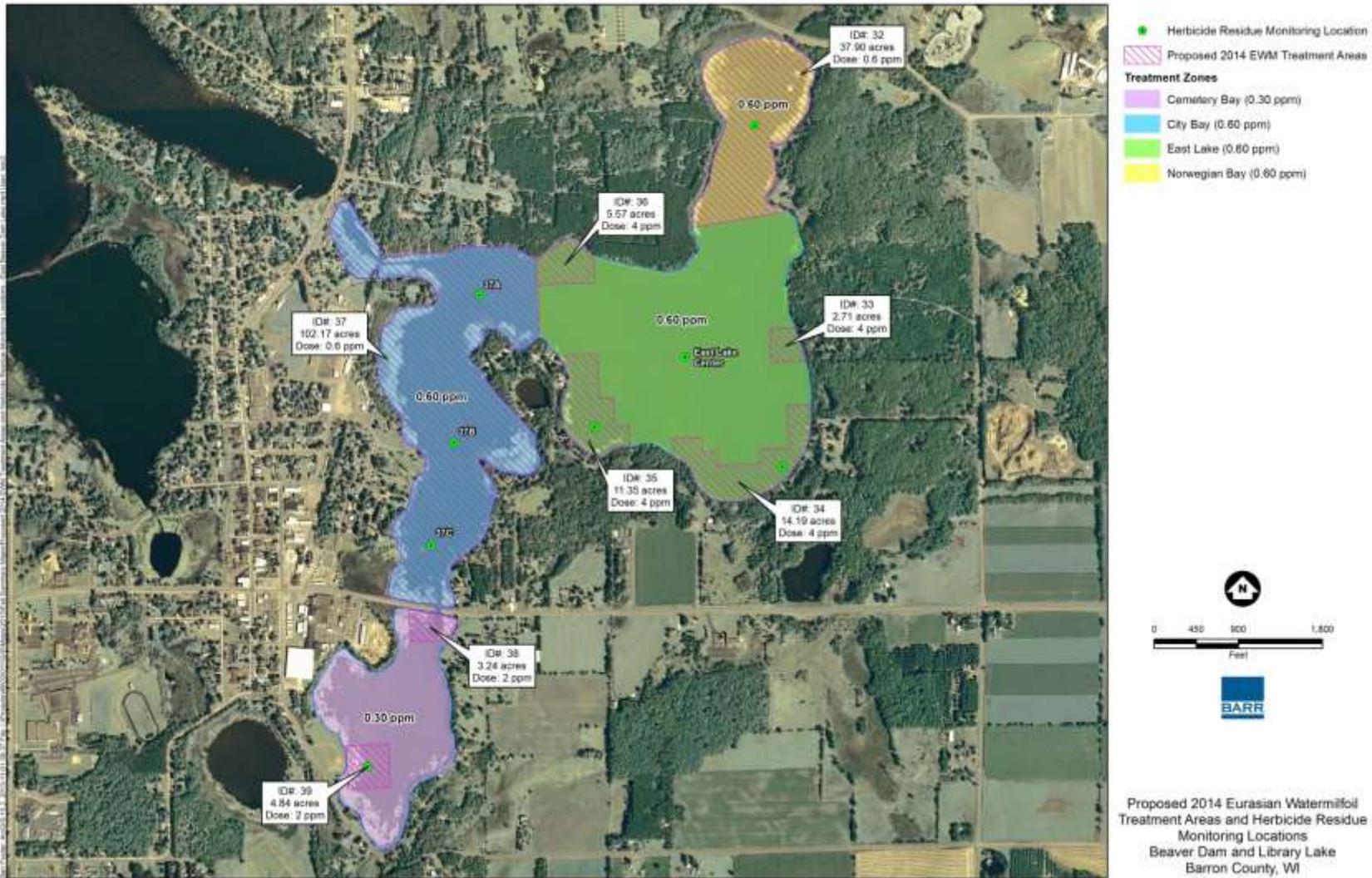


Figure 3 Proposed 2014 Treatment Plan for Norwegian Bay, East Lake, City Bay, and Cemetery Bay

4.1 West Lake

The West Lake treatment is a spot treatment with an expected bay wide 2,4-D concentration of up to 0.3 parts per million (ppm) (Figure 4).

The EWM in the West Lake sub basin grows at a range of depths, including very deep depths. EWM begins growing sooner in the shallow depths than deeper depths. The treatment approach in 2014 will be to wait until the EWM at the deeper depths reaches an ideal growth stage for treatment and then commence with treatment. To determine the ideal treatment stage, a team consisting of Lake Restoration, Inc. (applicator) and Endangered Resource Services, LLC (plant surveyor) will assess the EWM in the deeper areas. When the team concurs that the EWM is at an ideal growth stage for treatment, the herbicide treatment of West Lake will commence. It is anticipated that the treatment will occur around mid-June.

Because the timing of EWM growth and the rate of EWM growth can vary from year to year, it is possible that some deeper areas of West Lake near the sharp breaks to the deeper depths may not exhibit EWM growth when it is determined that treatment needs to commence in the rest of the lake to protect the native plant community. In the event that this scenario occurs in 2014, treatment will commence on areas exhibiting EWM growth considered ideal for treatment and areas that exhibit later EWM growth will be treated at a later time.

Although the goal of the treatment is to attain a whole bay 2,4-D concentration that is as close as possible to 0.3 ppm, there are many variables that can prevent attainment of that goal. As noted in the previous paragraph, it may not be possible to treat all of the EWM areas in the lake if deeper areas near the sharp breaks to the deeper depths begin growing so late that it becomes necessary to treat the rest of the lake in advance of these deeper areas. In that situation, the expected whole lake concentration would be expected to be below 0.3 ppm .

Due to the large size of the West Lake, it will take several days to apply the herbicide, even under ideal application conditions. Weather conditions have a great impact on West Lake and impact treatment conditions. In the event that poor weather conditions delay completion of treatment, the treatment of West Lake could be spread out over a longer time period. The whole lake concentration attained after treatment will depend upon how long it takes to complete the treatment. Increased application time may reduce the whole lake 2,4-D concentration attained after treatment. Nonetheless, the time period required for application is determined by uncontrollable factors such as weather conditions.

West Lake is not only large in size, but is a deep lake containing two bays around 100 feet deep. The treatment will be completed after stratification has occurred when it is anticipated that only the upper 20 feet or so of water will mix with the herbicide and impact whole lake 2,4-D concentrations attained after treatment. However, the depth variations in the lake and the mixing complexities that can occur in the lake create a lot of unknowns that can impact the whole lake 2,4-D concentration attained after treatment. These mixing unknowns create a lot of uncertainty regarding the whole lake 2,4-D concentration attained after treatment. It is important to recognize the uncertainties and their impacts to insure realistic expectations for treatment results.

4.2 Williams Bay, Rabbit Island Bay, Library Lake, and Cemetery Bay

Williams Bay, Rabbit Island Bay, Library Lake, and Cemetery Bay are spot treatments with an expected bay wide 2,4-D concentration of 0.3 ppm after treatment, assuming dissipation of the herbicide throughout the bay. The whole bay 2,4-D concentrations expected after the 2014 treatment are the same as the whole bay concentrations that were anticipated after the 2013 treatment. Sites within Williams Bay, Rabbit Island Bay, and Library Lake will be treated with a 2,4-D concentration of 4 ppm. Sites within Cemetery Bay will be treated with a 2,4-D concentration of 2 ppm.

4.3 East Lake

East Lake is a spot treatment with an expected bay wide 2,4-D concentration of 0.6 ppm after treatment, assuming dissipation of the herbicide throughout the bay. The whole bay 2,4-D concentration expected after the 2014 treatment is 0.1 ppm higher than the 2,4-D concentration anticipated after the 2013 treatment. The higher whole bay 2,4-D concentration is proposed to effectively destroy EWM root crowns, which were viable after the 2013 treatment per the July 2013 aquatic plant survey of East Lake. Sites within East Lake will be treated with a 2,4-D concentration of 4 ppm.

4.4 Norwegian Bay and City Bay

Norwegian Bay and City Bay are whole bay treatments with a 2,4-D concentration of 0.6 ppm. Hence, the expected whole bay 2,4-D concentrations after treatment are 0.6 ppm. The whole bay 2,4-D concentrations expected after the 2014 treatment are 0.1 ppm higher than the concentrations anticipated after the 2013 treatment. The higher whole bay 2,4-D concentrations are proposed to effectively destroy EWM root crowns, which were viable after the 2013 treatment per the July 2013 aquatic plant surveys of Norwegian Bay and City Bay.

4.5 Limited Hand Harvesting of EWM in Summer of 2014

In 2014, BDLMD will solicit volunteers to complete hand harvesting of EWM in a limited number of selected shallow water areas during late summer. Endangered Resource Services LLC will use the results of the July aquatic plant survey to select a limited number of appropriate areas for hand harvesting. Endangered Resource Services LLC will conduct a hand harvesting workshop and provide guidance to the volunteers who will complete EWM hand harvesting in the selected areas during late summer.

4.6 Project Deliverables

The deliverables for this project will be:

- (1) 2014 treatment tracks from the treatment areas
- (2) 2014 Treatment Results Memorandum
- (3) Updated Beaver Dam Lake Aquatic Plant Management Plan (APM Plan) completed by March of 2015. The APM Plan will include herbicide residue and aquatic plant data, including changes in EWM extent following treatment and the response of native plants.

The treatment tracks and treatment results memorandum will be submitted to WDNR. The updated Beaver Dam Lake Aquatic Plant Management Plan will be submitted to WDNR and posted on the District website.

4.7 2014 Monitoring Programs to Assess Success of Herbicide Treatment Program

Although monitoring program costs are not included in this AIS established control grant project, the 2014 monitoring programs to assess results of the 2014 herbicide treatment program are described because the programs are important to evaluate the success of the treatment program. A separate grant application is concurrently submitted to seek grant funding for monitoring programs, including the herbicide residue monitoring program to monitor 2,4-D concentrations following treatment as well as the summer aquatic plant monitoring program to assess treatment success and native plant response to the EWM treatment program. The monitoring programs are described in the following paragraphs.

4.7.1 2,4-D Herbicide Residue Monitoring Program

2,4-D herbicide residue monitoring will occur in 18 representative locations to determine whether the target dose was attained as well as the rate of herbicide decline due to dilution, mixing, and

natural degradation. Monitoring locations are shown in Figures 2 and 3. Samples will be collected at mid-depth from each location during a 26 day period (Table 4). Specific sample collection times for the treatment areas are shown in Table 4. 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; (2) if weather conditions make sample collection unsafe during any of the scheduled sample collection times, samples will not be collected.

Table 4 2014 Herbicide Residue Monitoring Plan

Treatment Area (Sample Site ID)	Sample Collection Time (Hours After Treatment)	Sample Collection Time (Days After Treatment)
West Lake Basins		
West Lake (ID 1, 20, 22, and West Lake Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Williams Bay (ID 27 and Williams Bay Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Rabbit Island Bay (ID 30 and Rabbit Island Bay Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Library Lake (ID 31 and Library Lake Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
East Lake Basins		
Norwegian Bay (ID 32)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
East Lake (ID 34, 35, and East Lake Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
City Bay (ID 37A, 37B, and 37C)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Cemetery Bay (ID 39)	1,4	1, 2, 3, 5, 7, 12, 19, and 26

4.7.2 Aquatic Plant Monitoring Programs

The 2014 aquatic plant monitoring programs will include a July survey of all plant species and an October survey of aquatic invasive species (EWM and CLP). Details of the aquatic plant monitoring programs follow.

4.7.2.1 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 (Appendix B of this grant application). 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. Chi squared analysis will compare 2014 data with 2013 data to identify significant changes in

frequency of occurrence of native species. The July monitoring program duplicates monitoring programs completed during 2009 through 2013.

4.7.2.2 Fall Aquatic Invasive Species Survey

During October, a fall point intercept survey of about 1,346 sample points will assess aquatic invasive species (EWM and CLP) coverage in Beaver Dam Lake. Maps showing the sample locations are found in Appendix E of the Beaver Dam Lake APM Plan (Appendix B of this grant application). The results of the EWM data collected during the fall aquatic invasive species survey will determine 2015 EWM treatment areas and will be used to design the 2015 herbicide treatment 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 2015 when CLP is at its peak growth stage. The fall aquatic invasive species monitoring program duplicates monitoring programs completed during 2006 through 2013.

4.8 Aquatic Plant Management Plan Update

The Beaver Dam Lake Aquatic Plant Management Plan (APM Plan) describes a framework for annual AIS control activities that include the required elements of an APM Plan. Those elements of an APM Plan that involve annual management activities are updated annually. Remaining elements that may remain relatively unchanged, such as watershed information, will be reviewed for new information when it becomes available or at least every five years. Herbicide treatment (and all attendant monitoring) is a critical element to be reviewed annually and will be used to plan and apply for each annual NR 107 permit. Updated as it is each year, the APM Plan fulfills the need of a long-term commitment to AIS management. Updated annually, it will include new technical developments for control of AIS. The annually amended APM Plan will be adopted at a public noticed Board meeting and then submitted to the WDNR. Table 5 compares the APM Plan elements with the elements that are updated annually.

The Beaver Dam Lake APM Plan will be updated during 2014. Included in this update will be incorporation of the results of the 2014 herbicide treatment program (i.e., herbicide residue monitoring data and aquatic plant survey data). As noted in Section 4.5 of this grant application, the updated APM Plan is a deliverable for this project.

Table 5 Comparison of Elements in an Aquatic Plant Management Plan with Elements Updated Annually

Aquatic Plant Management Plan Elements*	Updated Annually
Public Input	**
Water Quality Studies	**
Clean Boats/Clean Waters Boat Inspection Program	**
Invasive Species (Purple Loosestrife, CLP, and EWM)	X
Native Plant Community	X
Define Problem	X
Goals and Objectives	**
Aquatic Plant Management Plan	X
Lake and Watershed Information	**
Watershed Management	**
Shoreline, Fishery, and Wildlife Management	**

*Update required every five years

**Review for new information when it becomes available or at least every five years.

5.0 Timetable for Implementation of Project Activities

Table 6 Timetable for Implementation of 2014 Project Activities

Project Activity	Completion Period
Herbicide Treatment of Beaver Dam Lake	April-June, 2014
Submission of Treatment Tracks to WDNR	April-June, 2014
Limited Hand Harvesting of EWM	July – September, 2014
Submission of Herbicide Treatment Results Memorandum to WDNR	August, 2014
Submission of updated Beaver Dam Lake Aquatic Plant Management Plan	March, 2015
Complementary 2014 Management Activities	
Project Activity	Completion Period
Stocking Extended Growth Walleyes to Control Rainbow Smelt	October – November, 2014
Clean Boats Clean Waters Watercraft Inspection	May – September, 2014
AIS Surveillance by CLMN Volunteers	May – October, 2014

6.0 Cost

The estimated total project cost is \$89,005 and the 50 percent State share requested is \$44,502.

Table 7 provides an overall project cost summary and detailed project costs are shown in Tables 8 through 10.

Table 7 Project Cost Breakdown

Type of Project Activity	Cash Costs	Donated Value
2014 EWM Herbicide Application and Related Fees	\$82,255	
EWM Hand-Harvesting Efforts	\$500	\$1,060
Consulting Services	\$6,000	
Project Subtotals	\$88,755	\$1,060
Total Project	\$89,815	
State Share Requested (50%)	\$44,907	

Table 8 2014 EWM Herbicide Application and Related Fees

Treatment Area	Treatment Area (ac)	Treatment Volume (ac ft)	2,4-D Dose Applied to Treatment Area (ppm)	Treatment Cost/Acre	Cash Cost	Donated Value
Library Lake	1.89	5	4	\$252	\$477	
Rabbit Island Bay	12.97	70	4	\$299	\$3,874	
Williams Bay	15.95	182	4	\$332	\$5,290	
West Lake	65.12	712	4	\$567	\$36,923	
Norwegian Bay	37.90	174	0.6	\$143	\$5,425	
East Lake	33.83	343	4	\$379	\$12,812	
City Bay	102.17	523	0.6	\$143	\$14,628	
Cemetery Bay	8.08	31	2	\$193	\$1,556	
Total Herbicide Application Cost	277.91	2,040	-		\$80,985	
WDNR Permit Fees					\$1,270	
Herbicide Application and Related Fees Subtotal					\$82,255	

Table 9 EWM Hand-Harvesting Efforts

EWM Hand-Harvesting Efforts	Cash Cost	Donated Value
Solicitation of Volunteers (Newspaper, Web Site) and Coordination of Volunteers		\$100
Provide Hand-Harvesting Workshop and Guide Hand-Harvesting Efforts by Volunteers (Assume Endangered Resources, LLC - Half Day)	\$500	
Hand Harvesting by Volunteers – Assume 10 volunteers and 8 hours of hand harvesting per volunteer over the summer for a total of 80 volunteer hours (\$12/hr)		\$960
EWM Hand-Harvesting Efforts Subtotal	\$500	\$1,060

Table 10 Consulting Services

Consulting Services	Cash Cost	Donated Value
Dissolved Oxygen Data Analyses to Determine Stratification	\$1,500	
EWM Inspection to Determine Treatment Readiness	\$1,500	
Treatment Results Memorandum	\$3,000	
Consulting Services Subtotal	\$6,000	

7.0 Complementary Management Efforts

Complementary Beaver Dam Lake management efforts include:

- Clean Boats/Clean Waters boat inspections
- AIS surveillance by Citizen Lake Monitoring Network (CLMN) volunteers
- Shoreland restoration projects
- Management of nonpoint source pollution
- Walleye stocking to manage rainbow smelt

7.1 Clean Boats/Clean Waters

The Beaver Dam Lake Management District (BDLMD) and the City of Cumberland have worked in partnership with one another to implement the Clean Boats/Clean Waters inspection program on Beaver Dam Lake since 2007. The City of Cumberland obtained WDNR grant money to help fund a Clean Boats/Clean Waters inspection program during 2007 through 2009 and 2011 through 2013. The grant funded 75 percent of the cost and the BDLMD funded the remaining 25 percent of the cost. The City hired three boat monitors and the boat monitors inspected boats

entering the lake at three boat landings. All boats entering and leaving the lake during noon to 8 PM each Friday, Saturday, and Sunday from Memorial Day weekend through Labor Day weekend were inspected. In 2010, the City of Cumberland did not obtain grant monies to help fund the Clean Boats/Clean waters program. The BDLMD provided funding to hire two boat monitors who completed boat inspections at two of the landings. The numbers of boats inspected during 2007 through 2013 are shown in Table 11. In 2013, boat monitors spent 770 hours at the boat landings, contacted 2,603 people, and inspected 1,082 boats.

Table 11 Number of Boats Inspected during 2007-2013 Clean Boats/Clean Waters Boat Inspection Program

Year	# Boats Inspected
2007	1,387 ⁵
2008	1,724 ¹
2009	1,219 ¹
2010	Data Not Available
2011	813 ⁶
2012	1,373 ²
2013	1,082 ⁷



The City of Cumberland will complete Clean Boats/Clean Waters watercraft inspections in 2014. If the City of Cumberland obtains grant funding to fund 75 percent of the Clean Boats/Clean Waters program costs, the BDLMD will fund the remaining 25 percent of program costs. If the City of Cumberland does not obtain grant funding for the Clean Boats/Clean Waters program, the BDLMD will fund the program.

⁵ Frisinger, Arlene. 2010. Email communication dated June 28, 2010 of City of Cumberland Clean Boats/Clean Waters Data for 2007-2009.

⁶ Wisconsin Department of Natural Resources. 2013. Clean Boats/Clean Waters Data for 2011-2012 from DNR website on January 9, 2013.

⁷ Hardie, Keith. 2013. Email communication dated December 11, 2013. 2013. City of Cumberland Clean Boats/Clean Waters Data for 2013.

7.2 AIS Surveillance by Citizen Lake Monitoring Network (CLMN) Volunteers

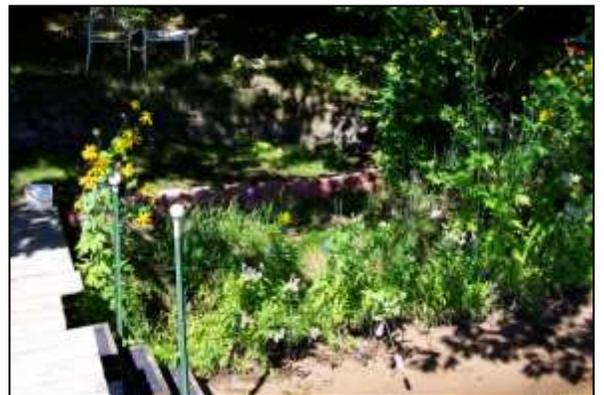
In 2014, the BDLMD, with training assistance from WDNR staff, will provide AIS surveillance of Beaver Dam Lake throughout the open water season. During the spring of 2014, the BDLMD will solicit volunteers and arrange for a CLMN surveillance training session by WDNR staff. Once trained, each volunteer will provide AIS surveillance of a particular stretch of Beaver Dam Lake shoreline (e.g., shoreline adjacent to volunteer's home) monthly during May through October. Volunteers will monitor for EWM during May through October, curly-leaf pondweed (CLP) during May through June, and purple loosestrife during July through August. In addition, volunteers will check for zebra mussels when taking their docks out of the lake for the winter. Volunteers will submit CLMN surveillance data to the Surface Water Integrated Monitoring System (SWIMS) database to document their 2014 monitoring activity.

7.3 Shoreland Assessment and Restoration Projects

The BDLMD fully funded and completed a shoreland restoration project in Tourist Park. A lake resident also funded and completed a shoreland restoration project. The projects are discussed in the Beaver Dam Lake APM Plan in Appendix B of this grant application and pictured below.

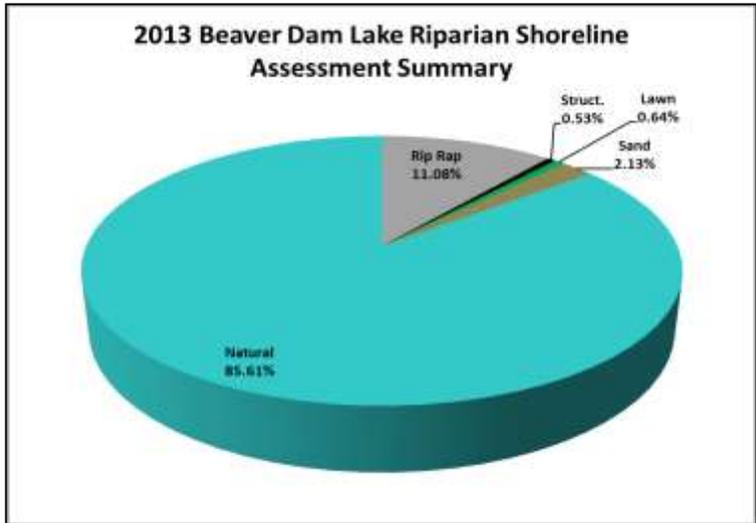


The Beaver Dam Lake Management District completed a shoreline restoration project at Tourist Park, pictured above

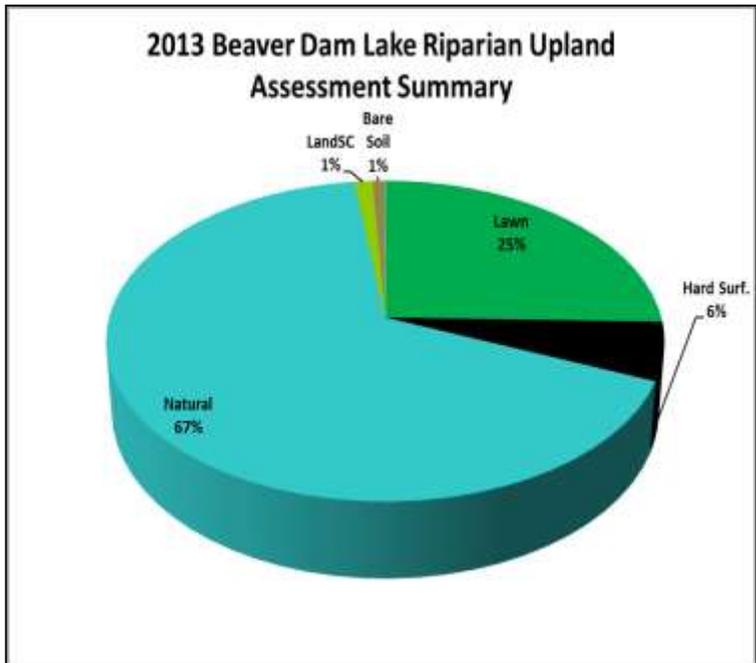


Pictured above, a shoreline restoration project completed by a resident.

The District conducted an assessment of Beaver Dam Lake riparian properties during 2012 through 2013.^{8 9}. A group of 12 volunteers assessed every parcel on the entire lake. Survey results indicate approximately 86 percent of the shoreline and 67 percent of the upland riparian area is natural. The results of the survey were shared with the City of Cumberland, Barron County and WDNR and will be used by BDLMD to educate and encourage riparian residents to voluntarily establish buffer areas.



To support the efforts of residents to voluntarily establish shoreline buffers, the District has helped fund workshops to train area landscapers to install rainwater gardens and complete shoreline stabilization projects. The workshops were held at the UW campus in Rice Lake, WI on March 27 and April 17, 2012. Workshop topics included shoreline buffers, runoff mitigation, and shoreline stabilization.



7.4 Management of Non-Point Source Pollution

Non-point source pollution management efforts include completion of stormwater management plans and projects to reduce nutrient and sediment loading to Beaver Dam Lake.

⁸ Evenson, Dave. 2012. President, Beaver Dam Lake Management District. Personal Communication.

⁹ Schroeder, Tom. 2013. President, Beaver Dam Lake Management District. Email Communication.

The BDLMD completed a non-point source pollution management plan for Library Lake, one of the lake's bay areas. The City of Cumberland completed a non-point source management plan of Beaver Dam Lake.

The BDLMD constructed a stormwater treatment pond to treat stormwater runoff to Library Lake. The pond is the first of several stormwater runoff ponds that will be constructed to treat stormwater runoff to Library Lake. The completed stormwater treatment pond is located at the northwest side of Grove Street.



Stormwater runoff is treated by a recently constructed stormwater treatment pond, pictured above, before entering Library Lake. Photo Credit: EOR, Inc.

Storm water from a 13-acre drainage area (from Eighth Avenue near the Burger King to Grove Street north of

Library Lake) is treated by the basin. To date, the goal of capturing and treating the first ½-inch of stormwater has been exceeded by the pond. An underground 60-inch diameter pretreatment chamber was installed to collect sediment, trash, debris, and chemicals before the overflow water goes to the stormwater pond. The basin cleans the stormwater flowing from the pretreatment chamber through an 18-inch layer of a clean mix of 70 percent sand and 30 percent aged organic leaf compost. Additional treatment is provided by deep rooted native vegetation including wild flowers and grasses. The design of the basin encourages groundwater recharge by allowing stormwater to soak into the ground. Besides the seeding of grass around the pond, over 2,500 wildflower and grass plants were planted. Information about the stormwater treatment pond is found on the District's website at <http://www.beaverdamlake.org/storm-water-ponds.html>.

During the July 2011 plant survey, cattle were observed on the shoreline of the channel that connects Duck Lake to Norwegian Bay, one of the lake's bays. The cattle had access to the channel, and there was a potential for runoff from the grazing pasture reaching the channel; both were a source of pollution to the lake. The BDLMD brought the matter to the attention of the Barron County Department of Land Services (Barron County). In 2013, Barron County successfully completed a fencing project to prevent the cattle from having access to the channel, thus removing this source of pollution.

7.5 Walleye Stocking to Manage Rainbow Smelt in Beaver Dam Lake

The Beaver Dam Lake fishery was surveyed by WDNR in 2005 through 2007. Survey results indicate the adult walleye population has decreased over time. The decrease roughly coincides with an illegal introduction of rainbow smelt, an aquatic invasive species (AIS) that was believed to have occurred at or near 1980. The WDNR has recommended walleye stocking to increase predation on rainbow smelt and improve walleye natural reproduction, stock recruitment and abundance¹⁰. In 2012, BDLMD stocked Beaver Dam Lake with 6,500 extended growth walleyes (6 to 8 inch). WDNR stocked Beaver Dam Lake with 16,000 extended growth walleyes in 2013. In 2014, the BDLMD will fully fund the stocking of extended growth walleyes in October or early November to control rainbow smelt, an AIS. Increased predation on rainbow smelt by the stocked walleyes is expected to protect and improve the walleye population of the lake.

8.0 Successful Completion of Previous Projects

The BDLMD successfully completed aquatic plant management plan (APMP) projects in 1999 through 2000, 2005 through 2006, and 2011 through 2013. The APMPs completed in 2000 and 2006 were funded by Lake Planning Grant monies. The APMP completed in 2013 received AIS-EPP funding for the aquatic plant survey. During 2013, the pre- and post-monitoring program was funded by AIS-EPP grant monies. In addition, the District received grant monies to fund a recently completed stormwater treatment basin (discussed in section 7.4 of this grant application). The District successfully completed all grant funded projects. The successful completion of these projects (project objectives achieved, projects completed on schedule and budget, and project reports completed) demonstrate that the BDLMD is capable of managing projects successfully.

In addition to completing a number of grant projects, (1) the BDLMD funded and completed monitoring programs during 2009 through 2010 and 2012 and (2) funded EWM control projects during 2000 through 2013 and a CLP control project in 2013.

9.0 Pre-Application Grant Scoping Consultation With DNR

On November 4, 2013, the District discussed obtaining grant funding for the 2014 treatment program with WDNR staff during a Web Ex Planning conference call. Details of the 2014 treatment plan were discussed and additional information was requested. The WDNR provided

¹⁰ Benike,

the requested information by email on November 19. On November 20, the District submitted a number of grant questions by email and WDNR promptly answered the questions by email. On December 17, the District submitted a draft grant application to WDNR and requested comments. On December 23, WDNR provided the requested comments and posed a question regarding whether extended growth walleyes would be used in the walleye stocking program. The District provided an answer to the walleye question on December 26. A second draft of the grant application was submitted to the WDNR for review and comment on December 26 and the WDNR responded with comments on December 30.

10.0 Role of Project in Planning and/or Management of Lake

The herbicide treatment of Beaver Dam Lake is integral to the attainment of the District goal of reducing EWM to 10 percent of the littoral zone of Beaver Dam Lake. In 2013, EWM extent was 25 percent of the littoral zone of Beaver Dam Lake.

11.0 Projected Grant Application Score

Tables 12 and 13 provide a useful summary of the information in this grant application relative to grant ranking criteria as well as a projected grant application score.

Table 12 Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
A. The degree to which the project includes a prevention and control strategy. (6 points possible): 4 /6 projected			
1) The water being controlled has, or the project includes, a Clean Boats, Clean Waters watercraft inspection program per the requirements of s. NR 198.22 (1)(d) or an approved Alternative Equivalent (see guidance).	2 points	2	Conducted 770 hours of watercraft inspection in 2013 on Beaver Dam Lake and will conduct Clean Boats, Clean Waters watercraft inspection in 2014.
2) The project will conduct other complimentary source containment activities that go above and beyond minimum level of inspection and signage (e.g. boat washing or cleaning stations, augmented enforcement).	2 points	0	
3) The water being controlled has, or the project will train, volunteers to identify AIS and conduct water body surveillance monitoring for early detection using accepted WDNR or citizen based monitoring (CLMN/Project RED, etc) protocols where data is being entered into SWIMS.	2 points	2	CLMN AIS surveillance by volunteers in 2014 per CLMN protocols, including submission of monitoring data to SWIMS.

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
B. The degree to which the project will prevent the spread of aquatic invasive species (7 points possible): 4/7 projected			
1a) The control activity will take place on a Statewide AIS Source Water listed on the following table. OR	5 points		
1b) The control activity will take place on a major AIS source water with high public use (lakes greater than 500 acres and all boat-able rivers that meet or exceed the minimum boating access criteria in NR 1.91(4) or wetlands greater than 500 acres in public ownership) or the project includes a Statewide AIS Source Water where less than 50% of the activities are directed. OR	4 points	4	Beaver Dam Lake has an area of 1,186 acres
1c) The control activity takes place on a significant AIS source water with high public use (lakes between 500 and 100 acres and all rivers that meet or exceed the minimum boating access criteria in NR 1.91(4); wadeable streams with public access or wetlands between 500 and 100 acres in public ownership). OR	3 points		

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
1d) The control activity takes place on a minor AIS source water (lakes less than 100 acres that meet or exceed the minimum boating access criteria in NR 1.91(4); any river or stream with public access or wetlands less than 100 acres in public ownership. AND	2 points		
2) The project will control a NR40 prohibited species; e.g. Hydrilla, yellow floating heart, spiny water flea, red swamp crayfish, etc.	2 points	0	Eurasian watermilfoil is "restricted", not "prohibited".
C. The degree to which the project protects or improves the aquatic ecosystem's diversity, ecological stability or recreational uses. (3 points possible): 3/3 projected			
1) Project plan implementation includes stocking or planting to reintroduce native community species or implements other actions or changes in management strategies that will provide <u>added</u> protection to native species beyond herbicide treatments alone.	2 points	2	Walleye stocking in 2014 to increase predation on rainbow smelt and improve walleye natural reproduction, stock recruitment and abundance

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
<p>2) Project area has a high degree of native biodiversity or is critical habitat, as expressed by:</p> <ul style="list-style-type: none"> • an above eco-region average aquatic or wetland FQI • the presence of a listed aquatic species (NHI endangered, threatened or watch) • is an ERW or ORW water • has a Sensitive Area or Critical Habitat designation • is within or adjacent to a State Natural Area, State Park, other publicly owned unique natural area or such an area owned/managed by a nonprofit conservation organization (e.g., Nature Conservancy). 	1 point	1	FQI of Beaver Dam Lake (46.3 in 2013) exceeds ecoregion median (20.9); Three NHI species of special concern found in Beaver Dam Lake during 2009-2013.
D. The stage of the infestation in the water body. (4 points possible): 2/4 projected			
1) The project addresses a pioneer population (as defined by s.198.12(8), or was a past early response project	2 points	0	Neither

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
2) The target species is low in density and still at a controllable level as determined by being found in 25%, or less of the colonizable area of the project water body(e.g., only the littoral zone of the lake can be colonized by EWM).	1 point	1	Per the fall 2013 plant survey, 25% of the Beaver Dam Lake littoral zone is colonized by Eurasian watermilfoil
3) It is well documented (PI surveys or GIS mapping, verified) that the target species is a rapidly expanding population (doubling annual increase in areal coverage or FOO). Population is still under 25% threshold above.	1 point	1	While annual herbicide treatments have prevented annual doubling of EWM , the annual rapid increase of EWM between summer and fall has been documented by summer and fall PI surveys during 2009 through 2013. In 2013, EWM FOO and areal coverage more than tripled between summer and fall. Hence, it is well documented that EWM is a rapidly expanding population, curtailed only by herbicide treatment.

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
E. The degree to which the project will be likely to result in successful long-term control (4 points possible: 3/4 projected)			
1) As also included in the approved management plan, the project employs multiple strategies (for the same species) to achieve and maintain control objectives. [e.g. hand pulling in combination with chemical treatment and biocontrol, draw downs, etc.]	2 points	2	In 2014, BDLMD will solicit volunteers to complete hand harvesting of EWM in a limited number of selected shallow water areas during late summer.
2) The sponsor has had a pre-application grant scoping consultation with the Department and the application is consistent with the results of those discussions.	1 point	1	Numerous correspondences
3) There is a low risk of reestablishment and spread after control activity occurs. All of the following apply: the project site is not impounded; is not tributary to or connected to any other AIS populated water and; the entire AIS population is being targeted for control.	1 point	0	Is impounded

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
F. The availability of public access to, and public use of, the water body. (2 points: 2/2 projected)			
1) Any lake of 100 surface acres or greater and any boatable river that has more than the minimum public boating access as defined in s. NR 1.91(4) or any wetland greater than 50 acres in public ownership	1 point	1	Has minimum public boat access
2) The water provides significant alternative public access and use opportunities that include <u>two</u> of the following at separate locations: public swimming beach, park or other public land with accessible frontage; public fishing pier or wildlife observation area; two or more private resorts, youth camps or sportsmen clubs; or where more than 50% of the lake or river shore in the project area is in public ownership.	1 point	1	Eagle Point Park, Camp Brigadoon, and Tourist Park which has a public swimming beach and fishing pier.
G. The degree to which the proposed project includes or is complemented by other management efforts including watershed pollution prevention and control, native vegetation protection and restoration and other activities that help control aquatic invasive species or resist future colonization. (2 points possible): 2/2 projected			
1) Applicant demonstrates that they have implemented, or been a significant participant in a shoreland restoration, habitat protection, sediment and nutrient control, water level management or other substantial lake stewardship activity (not including education or planning) that protects the lake ecosystem (Score 1 point per action, provide documentation).			

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
Activity 1	1 point	1	The BDLMD constructed a stormwater treatment pond to treat stormwater runoff to Library Lake.
Activity 2	1 point	1	The BDLMD fully funded and completed a shoreland restoration project in Tourist Park.
2) The sponsor is a Green Tier Community Charter Member (City of Middleton, Bayfield, Fitchburg, Appleton, Weston, Monona, Eau Claire, La Crosse, & the Village of Bayside)	1 point	0	
H. Community support and commitment, including past efforts to control aquatic invasive species. (5 points possible) 3/5 projected			
1) This is demonstrated by requesting less than the maximum state share cost (cash costs) for the total project costs. No more than 25% of the project match can be in-kind or donated labor. The sponsor is requesting:			
65% State Share	1 point		
OR			
50% State Share	2 points	2	50% state share requested
2) The project has financial support from additional management units, interest groups or organizations committing > 10% of the hard cash local match .	1 point	0	Does not apply

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
3) The sponsor conducted AIS control, consistent with their Department-approved plan, in the previous season <i>without</i> financial assistance from the State. They may have begun implementation without a grant or received grants in the past but not the past season.	1 point	1	Conducted treatment of 247 acres of Eurasian watermilfoil and 29 acres of curlyleaf pondweed in 2013 to implement the Beaver Dam Lake Aquatic Plant Management Plan (approved by DNR on March 8, 2013) without grant funds.
I. Whether the sponsor has previously received a grant for a similar project for the same water body. (2 points) 2/2 projected			
1) There has not been an AIS Established Population Control grant for the same species in the same waterbody in the last five years.	2 points	2	No prior AIS-EPC Grant
J. The degree to which the project will advance the knowledge and understanding of the prevention and control of aquatic invasive species. (1 point possible) 0/1 projected			

Table 12 (Continued) Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Aquatic Invasive Species Control Grants Established Population Control Ranking Questions (36 Maximum Points)	Ranking Points	Projected February 2014 Score	Comments
1) The project has an evaluation component that will be conducted by an objective outside entity to assess project outcomes or is a participant in a Department-sponsored research and demonstration project on the AIS research priority list.	1 point	0	Herbicide concentration monitoring will be conducted in association with the 2014 DNR/Corp research program if invited. Credit received in monitoring project. Ranking committee could also award a point for this project if deemed appropriate.
		25	

Table 13 Summary of Projected Grant Application Score for Beaver Dam Lake AIS-EPC: February 2014

Description of Overview Category	Overview Category	Points (Projected/Possible)	
The degree to which the project includes a prevention and control category.	A	4/6	
The degree to which the project will prevent the spread of aquatic invasive species.	B	4/7	
The degree to which the project protects or improves the aquatic ecosystem's diversity, ecological stability or recreational uses.	C	3/3	
The stage of the infestation in the water body.	D	2/4	
The degree to which the project will be likely to result in successful long-term control.	E	3/4	
The availability of public access to, and public use of, the water body.	F	2/2	
The degree to which the proposed project includes or is complemented by other management efforts including watershed pollution prevention and control, native vegetation protection and restoration and other actions that help control aquatic invasive species or resist future colonization.	G	2/2	
Community support and commitment, including past efforts to control aquatic invasive species.	H	3/5	
Whether the sponsor has previously received a grant for a similar project for the same water body.	I	2/2	
The degree to which the project will advance the knowledge and understanding of the prevention and control of aquatic invasive species.	J	0/1	
	Total	25/36	

***Authorizing Resolution
(From Section VI A.1 of this Application)***

Aquatic Invasive Species EWM Control Grant Resolution

Resolution # 2-2014

RESOLUTION OF Beaver Dam Lake Management District, County of Barron

WHEREAS, Beaver Dam Lake is an important resource used by the public for recreation and enjoyment of natural beauty; and

WHEREAS, public use and enjoyment of Beaver Dam Lake is best served by protection of Beaver Dam Lake from infestation of aquatic invasive species; and

WHEREAS, we recognize the need to provide information or education about aquatic invasive species; and

WHEREAS, we are qualified to carry out the responsibilities of an aquatic invasive species control project.

NOW, THEREFORE, BE IT RESOLVED THAT the Beaver Dam Lake Management District requests grant funding and assistance available from the Wisconsin Department of Natural Resources under the "Aquatic Invasive Species Control Grant Program" and hereby authorizes the President of the Beaver Dam Lake Management District to act on behalf of the Beaver Dam Lake Management District to:

- Submit an application to the State of Wisconsin for financial aid for aquatic invasive species control purposes;
- Sign documents
- Take necessary action to undertake, direct, and complete an approved aquatic invasive species control grant; and

Hereby authorizes the treasurer of the Beaver Dam Lake Management District to:

- Submit reimbursement claims along with necessary supporting documentation within six months of project completion date.

BE IT FURTHER RESOLVED THAT the Beaver Dam Lake Management District will meet the obligations of the aquatic invasive species control project including timely publication of the results and meet the financial obligations of an aquatic invasive species grant, including the prompt payment of our 25 percent commitment to aquatic invasive species control costs.

Adopted this day 4 of DEC., 2013

By a vote of: 4 in favor against abstain

BY:

Nancy Bentz

Secretary of Beaver Dam Lake Management District

Appendix A

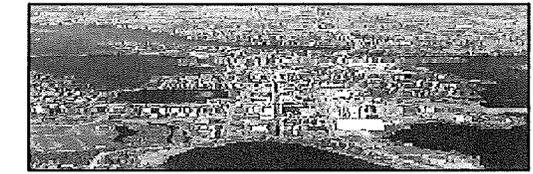
***Letters of Support
(From Section VI A.2 of this Application)***

THE ISLAND CITY
Clerk-Treas. Julie Kessler
cumberland@charter.net
Public Works Dir. Keith Hardie
publicworks@cityofcumberland.net
715.822.2752 / Fax 715.822.3799

Mayor Tom Mysicka
citymayor@charter.net



www.cityofcumberland.net



950 First Avenue Cumberland Wisconsin 54829

December 11, 2013

Tom Schroeder
President, Beaver Dam Lake Management District
1870 Hines Lakeview Drive
Cumberland, Wisconsin 54829

Mr. Schroeder:

The City of Cumberland is in support of the grant applications to control and monitor the spread of Eurasian watermilfoil and Curly-leaf pond weed. As the City of Cumberland is the "Island City", Beaver Dam lake is one of the most important assets. All efforts made to protect the lake are very important to the City and receive strong support from the City and its residents.

The City of Cumberland and the Beaver Dam Lake Management District have a very strong working relationship and are working closely to preserve and improve the quality of the lake. We encourage the Wisconsin Department of Natural Resources to fund the grants, which will benefit all the residents of the area and all who come to enjoy this beautiful lake.

Sincerely,

A handwritten signature in black ink, appearing to read "K. Hardie".

Keith Hardie
Public Works Director/Zoning Administer
City of Cumberland
950 First Avenue
Cumberland, Wisconsin 54868
715-822-2752 Fax 715-822-3799

BARRON COUNTY
DEPARTMENT OF LAND SERVICES

David Gifford, Director

LAND INFORMATION * SOIL & WATER CONSERVATION * ZONING

Barron County Government Center
335 East Monroe Avenue - Room 2104
Barron, WI 54812

Phone: 715-537-6375
Fax: 715-537-6847
www.barroncountywi.gov

December 23, 2013

Tom Schroeder,
President, Beaver Dam Lake Management District
1870 Hines Lakeview Drive,
Cumberland, WI 54829

Dear Tom,

This is a letter of support to continue implementation of the Beaver Dam Lake AIS Established Infestation Control Grant Plan and an Education, Prevention and Planning Grant for post treatment monitoring.

The Beaver Dam Lake District has done considerable work on efforts reducing the levels of Eurasian Water Milfoil. The treatment will go a long way in maintaining this work to improve the aquatic environment of Beaver Dam Lake. It appears that your plan has identified the areas of greatest concentration and will be targeting them. The monitoring component of the plan will aid in the evaluation of such efforts.

The herbicide residue monitoring component is interesting and I'm sure this information will be useful for lakes throughout the region.

I encourage the approval of a grant to continue the implementation of the Beaver Dam Lake Aquatic Plant Management Plan through an established infestation control grant plan and an Education, Prevention, and Planning AIS Grant.

Sincerely,



W. Tyler Gruetzmacher
Barron County Conservationist

Appendix B

***Aquatic Plant Management Plan
(From Section VI E.1 of this Application)***

(Separate Electronic File)

Appendix C

***Aquatic Plant Management Permit Application for Chemical
Treatment (From Section VI E.2 of this Application)***

State of Wisconsin DNR
 DNR Department of Natural Resources
 Water Permit Central Intake -- attn. APM
 PO Box 7185
 Madison, WI 53707-7185

Chemical Aquatic Plant Control Application and Permit Wisconsin Pollutant Discharge Elimination System (WPDES) Pesticide Pollutant Permit Application

Form 3200-004 (R 03/13)

Notice: Use of this form is required by the Department for any application filed pursuant to s. 281.17(2), Wis. Stats., and Chapters NR 107, 200 and 205, Wis. Adm. Code. This permit application is required to request coverage for pollutant discharge into waters of the state. Personally identifiable information on this form may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

DNR Use Only	
ID Number	Permit Expiration Date
Waterbody #	Fee Received

Section I – Applicant Information – Name of Permit Applicant. Also indicate names and addresses of all individuals, associations, communities or town sanitary districts sponsoring treatment. Attach additional sheets if necessary.

Home Address	Name Lake Restoration Inc.	Lake Address	Name
	Street Address 12425 Ironwood Circle		Street Address
	City Rogers		City
	State MN		State
	ZIP Code 55374		ZIP Code
Phone Number (include area code) Primary: 763-428-9777 Secondary:		Email Address lrmil@lakerestoration.com	

Section II – Aquatic Plant Control Location

Waterbody to be Treated (waterbody where treatment area is located) Beaver Dam				Lake Surface Area 1112 acres	Estimated Surface Area that is 10 Feet or Less in Depth 300 acres
County Barron	Section	Township 35, 36 W	Range 13, 14	<input type="checkbox"/> E <input checked="" type="checkbox"/> W	Name of Applicator or Firm Lake Restoration Inc.
Latitude:	Longitude:			Street or Route 12425 Ironwood Circle	
Is the waterbody a private pond?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	City Rogers		
Does the waterbody have public access?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	State MN	ZIP Code 55374	
Adjacent Riparian Property Owner Names (attach sheets if necessary)			County Hennepin	Phone Number (include area code) 763-428-9777	
1. We will be indentifying homeowners within 150 feet of			Email Address lrmil@lakerestoration.com		
2. treatment area by the Barron County Database and will be			Applicator Certification Number for Category 5 Aquatic Pesticide Application		
3. notifying them by mail			Business Location License Number (if applicable) 93-006836-006558		
4. _____			Restricted Use Pesticide License Number (if applicable) See Attachment A		
5. _____					
6. _____					
7. _____					
Name of Lake Property Owners' Association Representative or Lake District Representative (if none, please indicate)					

Area(s) Proposed for Control: (Note details in permit cover letter for final permitted sizes of treatment areas.)

Treatment Length	Treatment Width	Estimated Acreage	Average Depth	Total Estimated Acres
A. _____ ft. X _____ ft.	+ 43,560 ft. ² =	See Attachment	_____ ft.	
B. _____ ft. X _____ ft.	+ 43,560 ft. ² =	B	_____ ft.	Total from lines A - E _____
C. _____ ft. X _____ ft.	+ 43,560 ft. ² =	_____	_____ ft.	Total from Attached Sheets _____
D. _____ ft. X _____ ft.	+ 43,560 ft. ² =	_____	_____ ft.	
E. _____ ft. X _____ ft.	+ 43,560 ft. ² =	_____	_____ ft.	Grand Total Attachment B

If the estimated acreage is greater than 10 acres, or is greater than 10 percent of the estimated area 10 feet or less in depth in Section II, complete and attach Form 3200-004A, Large-Scale Treatment Worksheet. Private pond treatments are exempted from this requirement.

Is this area within or adjacent to a sensitive area designated by the Department of Natural Resources? <input type="checkbox"/> Yes <input type="checkbox"/> No	DNR Use: NHI Review? <input type="checkbox"/> Yes <input type="checkbox"/> No Describe:
--	--

Chemical Aquatic Plant Control Application and Permit WPDES Pesticide Pollutant Permit Application

Form 3200-004 (R 03/13)

Page 2 of 4

Section III – Fees

1. s. NR 107.11(1), Wis. Adm. Code, lists the conditions under which the permit fee is limited to the \$20 minimum charge.
2. s. NR 107.11(4), Wis. Adm. Code, lists the uses that are exempt from permit requirements.
3. s. NR 107.04(2), Wis. Adm. Code, provides for a refund of acreage fees if the permit is denied or if no treatment occurs.
4. Fee calculations:

Basic Permit Fee (non-refundable) \$ 20.00

If proposed treatment is over 0.25 acre, calculate acreage fee:
(round up to nearest whole acre, to maximum of 50 acres.)

 Max acres X \$25 per acre = \$ 1250

If proposed treatment is ≤ 0.25 acre, acreage fee is \$0.

Enter Acreage Fee (from above) 1250

Total Fee Enclosed \$ 1270

Site Map: Attach a sketch or a printed map of lake indicating area and dimensions of each individual area where plant control is desired and flow of surface water outside treatment area. Also show location of property owners riparian to and adjacent to the treatment area. Attach a separate list of owners and corresponding treatment dimensions coded to the lake map, if necessary.

Section IV – Reasons for Aquatic Plant Control

Is this permit being requested in accordance with an approved Aquatic Plant Management Plan? Yes No

Treatment Type: Lake Pond Wetland Marina Other

Goal of Aquatic Plant Control:

Reduce nuisance algae accumulation

Maintain navigational channel for common use

Maintain private access for boating

Maintain private access for fishing

Improve swimming

Control of purple loosestrife

Control of invasive exotics

Other: Please see Beaver Dam Lake Report

Nuisance Caused By:

Algae

Emergent water plants (majority of leaves and stems growing above water surface, e.g. cattails, bulrushes)

Floating water plants (majority of leaves floating on water surface, e.g., waterlilies, duckweed)

Submerged water plants (leaves and stems below water surface, flowering parts may be exposed, e.g., milfoil, coontail)

Other: _____

List Target Plants

Eurasian Watermilfoil

Note: Different plants require different chemicals for effective treatment. Do not purchase chemical before identifying plants.

Section V – Chemical Control

Alternatives to Chemical Control:	Feasible?		If No, Why Not?
1. Mechanical harvesting	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Please see the Beaver Dam Lake Report _____ _____ _____ _____ _____ _____ _____
2. Hand pulling	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
3. Hand raking	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
4. Hand cutting	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
5. Sediment screens/covers	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
6. Dredging	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
7. Lake drawdown	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
8. Nutrient controls in watershed	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
9. Other: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Note: If proposed treatment involves multiple properties, consider feasibility of EACH alternative for EACH property owner.

If you checked yes to any of the alternatives listed above, please explain your decision to use chemical controls:

Chemical Aquatic Plant Control Application and Permit
WPDES Pesticide Pollutant Permit Application

Form 3200-004 (R 03/13)

Page 3 of 4

Section V – Chemical Control (continued)

Trade Name of Proposed Chemical(s)

2, 4-D

Method of Application: Underwater Injection

Will surface water outflow and/or overflow be controlled to prevent chemical loss? Yes No

Have the proposed chemicals been permitted in a prior year on the proposed site? All Some None

What were the results of the treatment?

Please refer to the Beaver Dam Lake Report

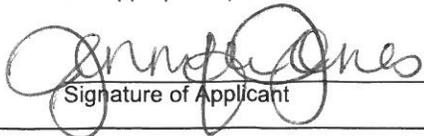
Note: Chemical fact sheets for aquatic pesticides used in Wisconsin are available from the Department of Natural Resources upon request.

Section VI – Applicant Responsibilities and Certification

1. The applicant has prepared a detailed map which shows the length, width and average depth of each area proposed for the control of rooted vegetation and the surface area in acres or square feet for each proposed algae treatment.
2. The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management project involving chemicals. Under s. NR 107.07, Wis. Adm. Code, supervision may include inspection of the proposed treatment area, chemicals and application equipment before, during or after treatment. The applicant is required to notify the regional office 4 working days in advance of each anticipated treatment with the date, time, location and size of treatment unless the Department waives this requirement. Do you request the Department to waive the advance notification requirement? Yes No
3. The applicant agrees to comply with all terms or conditions of this permit, if issued, as well as all provisions of Chapter NR 107, Wis. Adm. Code. The required application fee is attached.
4. The applicant has provided a copy of the current application to any affected property owners' association, inland lake district and, in the case of chemical applications for rooted aquatic plants, to all owners of property riparian or adjacent to the treatment area. The applicant has also provided a copy of the current chemical fact sheet for the chemicals proposed for use to any affected property owner's association or inland lake district.

Check if you are signing as Agent for Applicant.

I hereby certify that the above information is true and correct and that copies of this application have been provided to the appropriate parties named in Section II and that the conditions of the permit and pesticide use will be adhered to.


Signature of Applicant

01-08-14
Date Signed

All portions of this permit, map and accompanying cover letter must be in possession of the chemical applicator at time of treatment. During treatment all provisions of Chapter NR 107, specifically ss. NR 107.07 and NR 107.08, Wis. Adm. Code, must be complied with, as well as the specific conditions contained in the permit cover letter.

Chemical Aquatic Plant Control Application and Permit WPDES Pesticide Pollutant Permit Application

Form 3200-004 (R 03/13)

Page 4 of 4

Section VII – WPDES Permit Request

Is WPDES coverage being requested? Refer to <http://dnr.wi.gov/topic/wastewater/aquaticpesticides.html> for more information.

- No: Already have WPDES coverage until Sept. 2016 Yes – complete section VII with signature
 WPDES coverage not needed

- Select which permit you are requesting:
- WI-0064556-1 Aquatic Plants, Algae & Bacteria
 - WI-0064564-1 Aquatic Animals
 - WI-0064581-1 Mosquitoes & other Flying Insects

Indicate WPDES permittee responsible for the pollutant discharge: Applicator Sponsor

Do you expect the pest control activity will result in a detectable pollutant discharge to waters of the state beyond the treatment area boundary or a pollutant residual in waters of the state after the treatment project is completed? Yes No

If yes, identify the pollutant(s): _____

Are you planning to incorporate integrated pest management principles, as specified in the WPDES permit, into your pest control activity to minimize any pollutant residual or pollutant discharge beyond the treatment area? Yes No

Type of WPDES coverage being requested: One Treatment Site Statewide Coverage

For informational purposes, select areas of WI for most of your aquatic treatments: NW NE SW SE

Is WPDES coverage being requested for more than 1 year?

- Yes No If yes, the permittee will remain in "active" WPDES status until a Notice of Termination is submitted.

I hereby certify that I am the authorized representative (as specified in Ch. NR 205.07(1)(g), Wis. Adm. Code) of the pest treatment activity which is the subject of this permit application. I certify that the information contained in this form and attachments is, to the best of my knowledge, true, accurate and complete.

 Signature of Authorized Representative Printed Name Date Signed

Section VIII – Permit to Carry Out Chemical Treatment (Leave Blank – DNR Use Only)

The foregoing application is approved. Permission is hereby granted to the applicant to chemically treat the waters described in the application during the season of 20____.

Application fee received?

- Yes No

State of Wisconsin
Department of Natural Resources
For the Secretary

Advance notification of treatment required?

- Yes No

By _____
Regional Director or Designee

_____ _____
Date Signed Date Mailed

Please Note:

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to s. 227.48(2), Wis. Stats.

To request a contested case hearing pursuant to s. 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.

Attachment A

Applicator Name	Wisconsin License Number
James Bartlett	143379-CA
Chad Hadler	223167-RA
Michael Norton	273550-RA
James Stewart	144408-CA
Steve Symalla	185609-RA

Attachment B

2014 Ewm Treatment Areas Acres

West Lake Basins

Library Lake	1.89
Rabbit Island Bay	12.97
West Lake	65.12
Williams Bay	15.95

East Lake Basins

Cemetery Bay	8.08
City Bay	102.17
East Lake	33.83
Norwegian Bay	37.9

277.91	Total Acres to be treated
--------	----------------------------------

Memorandum

To: Beaver Dam Lake Management District (Board of Commissioners)
From: Barr Engineering Company (Meg Rattei)
Subject: Proposed 2014 Beaver Dam Lake Herbicide Treatment Plan
Date: November 22, 2013
Project: 49030011.12

The purpose of this memorandum is to present:

1. Results of the fall plant survey,
2. Proposed 2014 herbicide treatment plan,
3. Proposed 2014 monitoring programs.

As detailed in the Beaver Dam Lake Aquatic Plant Management Plan (APM Plan), Beaver Dam Lake is divided into two separate basins, East Lake located east of US 63 and West Lake located west of US 63. Each basin is further divided into 4 sub basins or bays. The herbicide treatment plan for the lake is comprised of a treatment plan for each of the eight sub basins or bays within the lake (Figure 1). Hence, monitoring results are presented for each sub basin or bay.

1.0 2013 Fall Plant Survey Results

2013 fall plant survey results indicate the 2013 herbicide treatment reduced EWM frequency in the littoral area of Beaver Dam Lake by about 7 percent. The littoral area is defined as the area of the lake up to the 20 foot depth. As shown in Table 1 and Figure 2, EWM frequency of occurrence during fall of 2013 was 22 percent, an improvement from the 29 percent frequency of occurrence observed during fall of 2012.

The EWM extent data shown in Table 2 indicate the 2013 treatment reduced the percent of the littoral area infested with EWM by about 5 percent. The littoral area of Beaver Dam Lake, estimated from depth measurements made during the fall 2013 plant survey, is the 482 acre area of the lake with a depth of 20 feet or less. To determine percent of littoral area infested with EWM, the EWM extent shown in Table 2 was divided by 482, the littoral area of Beaver Dam Lake, and then multiplied by 100 to convert to percent. As shown in Figure 3, the percent of the littoral area infested with EWM in the fall of 2013 was 25 percent, an improvement from the 30 percent observed during fall of 2012.

To: Beaver Dam Lake Management District (Board of Commissioners)
 From: Barr Engineering Company (Meg Rattiel)
 Subject: Proposed 2014 Beaver Dam Lake Herbicide Treatment Plan
 Date: November 22, 2013
 Project: 49030011.12
 Page 2

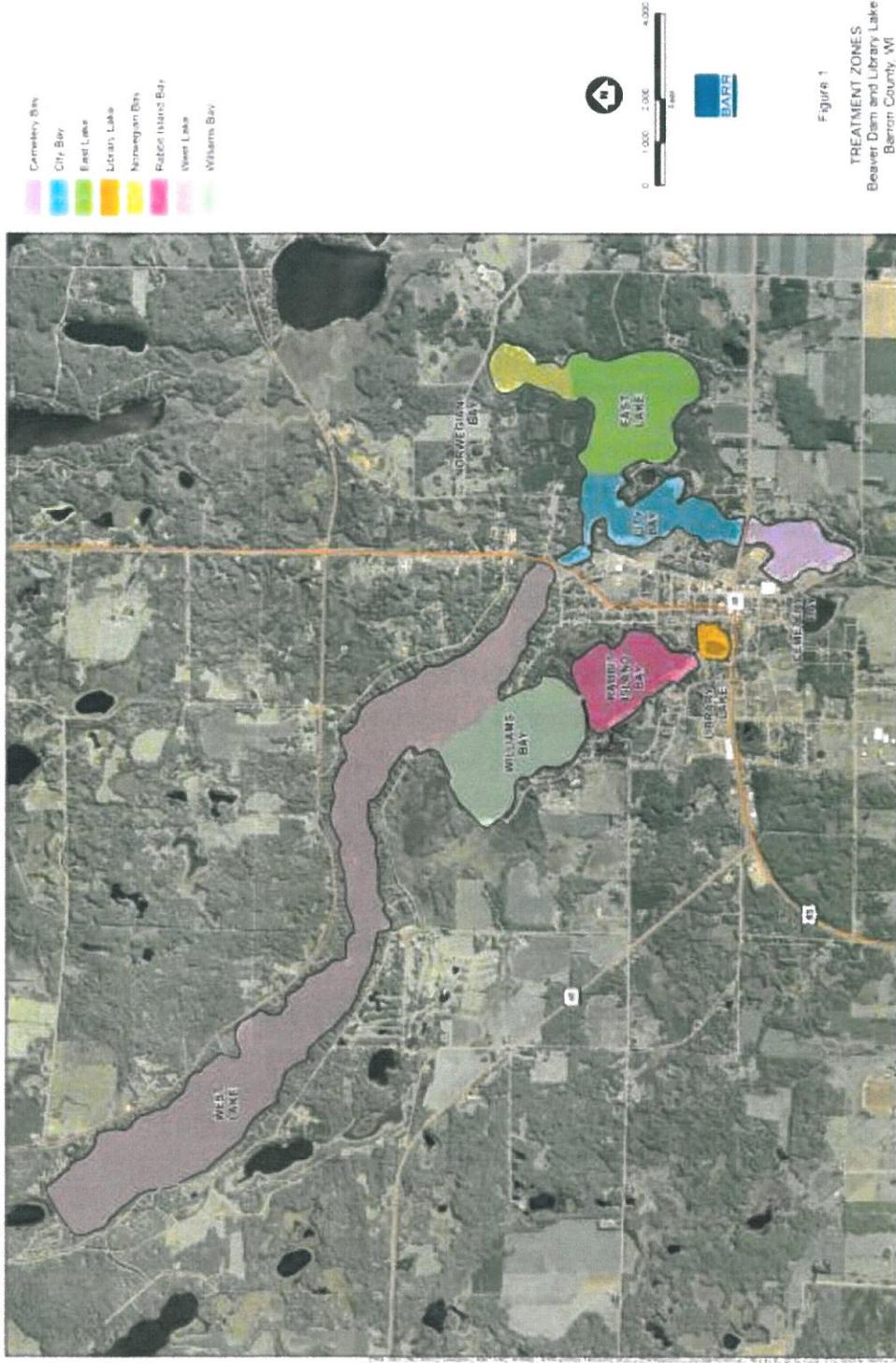


Figure 1 Beaver Dam Lake Treatment Zones

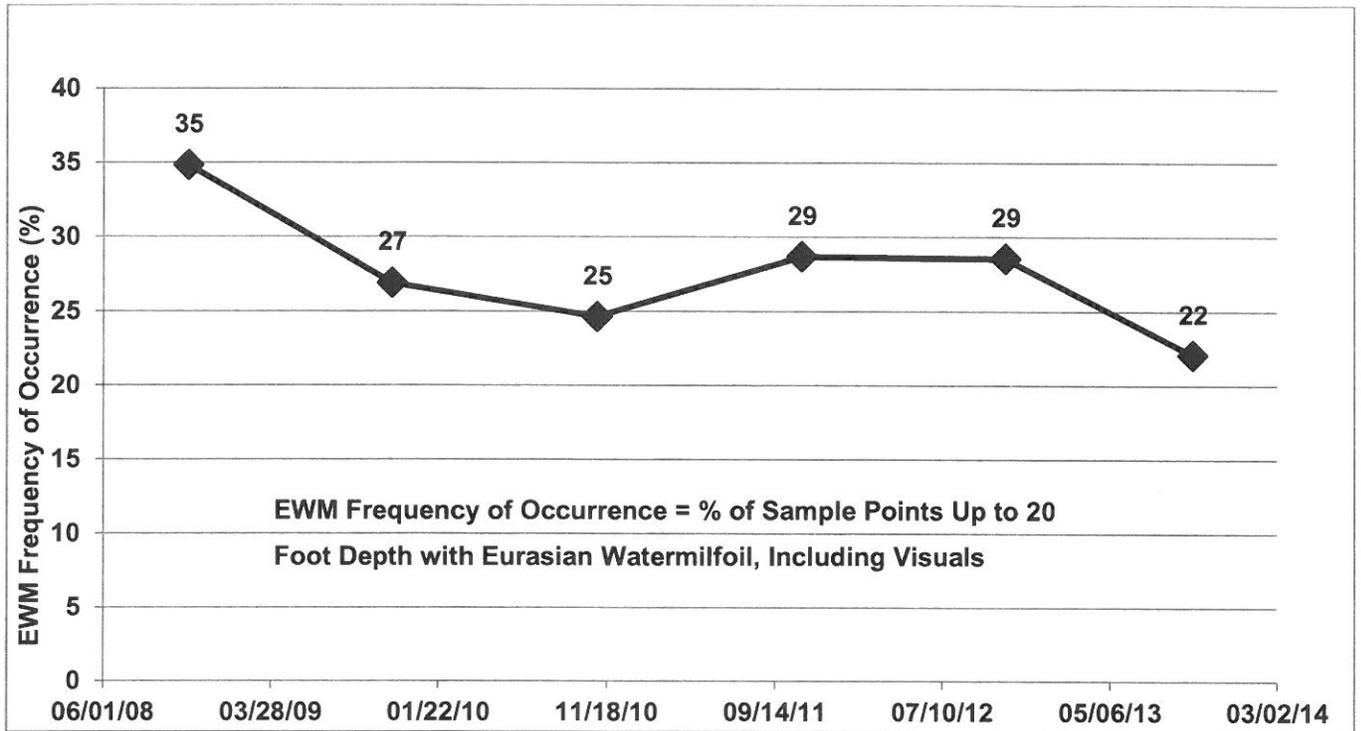


Figure 2 2008-2013 Beaver Dam Lake Eurasian Watermilfoil Frequency of Occurrence during Fall

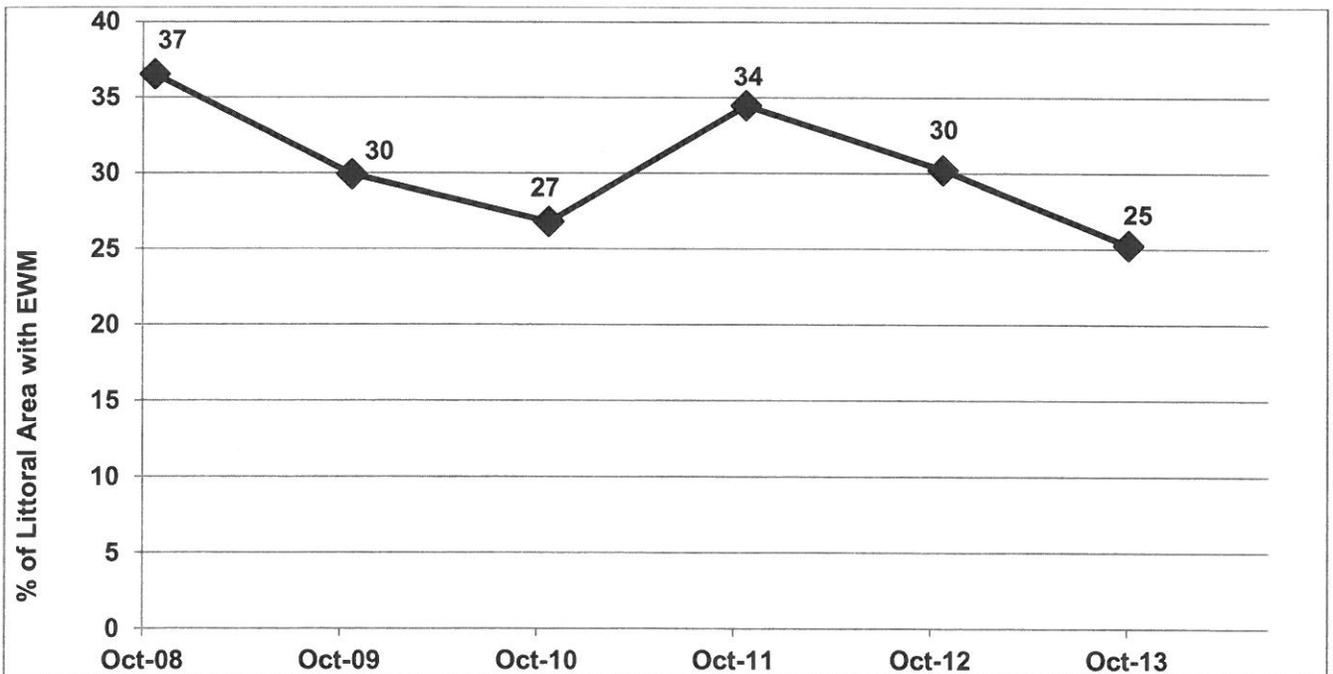


Figure 3 2008-2013 Beaver Dam Lake Percent of Littoral Area with EWM during Fall

n Lake EWM Summary

n Lake EWM Summary															
% of Sample Points up to 20-foot depth with Eurasian watermilfoil, Including Visuals															
Fall 2006	Fall 2007	Fall 2008	Jul-2009	Fall 2009	July 2010	Fall 2010	July 2011	Fall 2011	June 2012	July 2012	Fall 2012	May 2013	June 2013	July 2013	Fall 2013
9.21	11.74	24.24	16.72	15.22	11.68	15.46	7.99	11.22	N/A	9.72	15.60	N/A	16.33	7.43	20.49
5.38	29.87	26.88	19.78	12.77	4.30	14.13	11.49	11.58	N/A	4.40	17.65	N/A	4.35	1.09	7.53
9.80	30.34	31.63	19.64	21.50	13.51	28.30	11.01	18.18	0.00	1.77	12.50	0.00	0.00	0.88	3.88
3.33	21.36	25.93	5.07	1.59	0.75	6.40	0.00	0.00	N/A	3.01	1.96	N/A	N/A	0.00	1.03
6.06	0.00	15.20	17.65	33.91	27.83	36.54	35.40	40.83	N/A	22.03	35.45	N/A	N/A	3.57	24.79
3.71	7.34	73.75	32.78	62.87	21.55	55.93	55.00	68.11	8.89	48.07	58.90	46.93	0.00	21.79	48.54
6.67	16.13	49.23	39.71	78.79	33.82	28.36	11.76	51.52	13.24	54.41	72.13	39.71	0.00	7.35	63.49
9.47	0.00	38.64	0.00	6.82	0.00	10.23	3.37	47.73	N/A	0.00	18.39	N/A	3.37	0.00	2.27
9.66	19.87	26.27	15.16	13.15	8.60	15.63	7.31	10.11	N/A	6.08	14.01	N/A	N/A	3.78	14.41
5.61	5.32	46.35	23.46	46.33	20.75	37.84	33.33	54.68	N/A	32.89	46.32	N/A	N/A	10.71	35.08
4.58	14.16	34.82	18.61	26.90	13.69	24.63	18.29	28.68	N/A	17.59	28.56	N/A	N/A	6.65	22.07

whole lake/bay area. Survey included Rabbit Island Bay channels and a small area near the Eagle Point boat landing.

it in Beaver Dam Lake

it in Beaver Dam Lake															
Acreage of EWM (based on plant surveys)															
all	Fall 2007	Fall 2008	July 2009	Fall 2009	July 2010	Fall 2010	July 2011	Fall 2011	June 2012	July 2012	Fall 2012	May 2013	June 2013	July 2013	Fall 2013
106	11.36	33.19	24.59	19.67	15.80	25.15	8.65	14.78	N/A	15.31	23.11	N/A	3.15	10.05	29.13
5.27	10.23	12.64	9.48	4.80	1.15	6.68	4.57	4.65	N/A	1.68	6.92	N/A	0.26	0.33	2.46
3.63	12.36	13.21	10.57	8.51	6.26	11.47	4.22	8.01	0	0.51	5.64	0	0	0.38	1.45
0.66	0.59	3.62	0.40	0.09	0.04	0.72	0.00	0.00	N/A	0.2	0.04	N/A	N/A	0.00	0.06
0.00	0.00	9.34	8.14	19.37	14.13	17.48	17.18	23.93	N/A	11.33	19.98	N/A	N/A	1.18	15.72
0.25	3.94	68.06	27.89	61.62	20.11	54.01	47.97	73.66	7.65	48.76	55.75	50.85	N/A	20.70	49.01
3.64	4.75	18.12	8.65	28.23	12.09	9.61	1.99	19.67	3.36	21.21	26.91	15.16	N/A	2.19	23.37
0.90	0.00	17.80	0.00	1.81	0.00	3.97	0.86	21.32	N/A	0	7.17	N/A	0.75	0.00	0.51
4.79	8.69	113.32	44.68	111.03	46.33	85.07	67.99	138.58	N/A	81.30	109.81	N/A	N/A	24.07	88.60
5.36	34.54	62.66	45.04	33.07	23.25	44.02	17.44	27.44	N/A	17.70	35.70	N/A	N/A	10.76	33.10
0.15	43.23	175.98	89.72	144.10	69.58	129.09	85.43	166.02	N/A	99.00	145.51	N/A	N/A	35.88	121.70

whole lake/bay area. Survey included Rabbit Island Bay channels and a small area near the Eagle Point boat landing.

On a lake-wide basis, EWM extent was reduced from 146 acres in fall of 2012 to 122 acres in fall of 2013. All four East Lake treatment areas observed a reduction in EWM extent in 2013. The overall change in East Lake areas was a decline in EWM extent from 110 acres in fall of 2012 to 89 acres in fall of 2013. In West Lake treatment areas, Rabbit Island Bay and Williams Bay observed a reduction in EWM extent, West Lake observed an increase in EWM extent, and EWM extent remained about the same in Library Lake. The overall change in West Lake areas was a small decline in EWM extent from 36 acres in fall of 2012 to 33 acres in fall of 2013 (Table 2).

The cause of the 2013 increase in West Lake EWM extent is likely the spread of EWM fragments by boat traffic. During navigation channel inspections during June through August, shredding and spreading of EWM fragments by boat traffic was observed at the far end of West Lake. Since the lake's flow pattern is from the west end of the lake eastward toward East Lake, EWM fragments from the far West end of the lake spread eastward populating West Lake with EWM. During fall of 2013, 72 percent of West Lake sample points with EWM were located outside of 2013 treatment areas. The data provide verification that most of the EWM in West Lake during fall resulted from the spread of EWM fragments by boat traffic. This spread increased EWM extent in West Lake from 23 acres during the fall of 2012 to 29 acres during the fall of 2013.



Boat traffic through canopied beds of EWM at the far West end of West Lake, shown above, caused the spread of EWM fragments to other parts of West Lake.

In Library Lake, EWM was found at one sample location during the fall of 2012 and 2013. Hence, EWM extent remained about the same. Because EWM was not observed in Library Lake during July, the presence of EWM in fall is likely due the spread of EWM fragments from other parts of the lake by boats conveying the fragments to Library Lake.

2013 EWM extent in Williams Bay and Rabbit Island Bay was the lowest observed during the 2006 through 2013 monitoring period. EWM extent in Williams Bay decreased from 7 acres during the fall of 2012 to 2 acres during the fall of 2013. EWM extent in Rabbit Island Bay decreased from 6 acres during the fall of 2012 to 1 acre during the fall of 2013.

In Norwegian Bay and East Lake, EWM extent was reduced more than an order of magnitude between the fall of 2012 and July of 2013. However, EWM extent increased by an order of magnitude between July and October of 2013. In City Bay, EWM extent was reduced by more than half between the fall of 2012 and July of 2013. However, EWM extent more than doubled between July and October of 2013. While no EWM was observed in Cemetery Bay during July of 2013, about half an acre of EWM was observed in October.

During the July plant survey, all EWM plants observed in Norwegian Bay, East Lake, and City Bay were new growth from old root crowns. This observation suggests the 2013 herbicide



concentrations applied to these areas were not high enough to destroy the EWM root crowns. Consequently, the viable root crowns populated these areas with EWM.

Additionally, observations made during the July plant survey and summer navigation channel inspections indicated boats were shredding and spreading EWM fragments as they proceeded through a EWM bed located east of the City Bay boat landing. EWM fragments were observed everywhere along the north shore of East Lake and the wind was funneling them towards

Norwegian Bay. The combination of EWM growing from old root crowns and boats spreading EWM fragments increased EWM extent in the four East Lake areas from a total of 24 acres in July to 89 acres in October. The data verify the importance of applying a

All EWM observed in Norwegian Bay, East Lake, and City Bay during July was new growth from old root crowns, shown above.

herbicide dose that is high enough to kill the EWM root crowns. Viable root crowns not only populate the lake with EWM, but boats traveling through the resultant EWM beds then shred and spread EWM fragments which further populate the lake with EWM. Despite the increase in EWM extent between summer and fall, the 2013 fall EWM extent in the four East Lake treatment areas was 21 acres lower than the 2012 fall EWM extent. Hence, the 2013 herbicide treatment resulted in an overall reduction of EWM in East Lake sub basins and bays.

2.0 Proposed 2014 EWM Treatment Plan

As detailed in the Beaver Dam Lake APM Plan, the lake-wide goal of EWM treatment is to reduce EWM to 10 percent of the littoral area. Since the lake-wide goal of 10 percent has not yet been attained, herbicide treatment in 2014 is proposed.

The 2014 Beaver Dam Lake EWM treatment program includes spring treatment of 277.91 acres (Figures 4 and 5). The four West Lake treatment areas total 95.93 acres and the four East Lake treatment areas total 181.98 acres. Liquid 2,4-D will be used in all treatment areas, but dose will vary between treatment areas:

- 4 parts per million (ppm) dose will be applied to spot treatment areas in West Lake, Williams Bay, Rabbit Island Bay, Library Lake, and East Lake
- 2 ppm dose will be applied to spot treatment areas in Cemetery Bay
- 0.6 ppm dose will be applied to Norwegian Bay and City Bay which are whole bay treatments

The 2014 treatment plan is discussed in Sections 2.1 through 2.4 and shown in Table 3 and Figures 4 and 5.

Table 3 2014 EWM Treatment Plan for Beaver Dam Lake

Treatment Area	Acres Treated	2,4-D Concentration Applied to Each Treatment Area (ppm)	Expected 2,4-D Whole Bay-Concentration (ppm)
West Lake Basins			
West Lake	65.12	4	0.3*
Williams Bay	15.95	4	0.3
Rabbit Island Bay	12.97	4	0.3
Library Lake	1.89	4	0.3
East Lake Basins			
Norwegian Bay	37.90	0.6	0.6
East Lake	33.83	4	0.6
City Bay	102.17	0.6	0.6
Cemetery Bay	8.08	2	0.3

*As detailed in Section 2.1, the West Lake post-treatment whole lake concentration is expected to be less than 0.3 ppm because a longer (e.g., 2 week) application period is required in West Lake to effectively treat EWM.

The doses shown in Table 3 and Figures 4 and 5 assume stratification will occur at the 20-foot depth for all treatment areas with depths greater than 20 feet. If stratification occurs at a deeper or shallower depth, doses may need to be adjusted accordingly to attain the desired whole lake concentration shown in Table 3 and on Figures 4 and 5. To determine when stratification occurs, temperature profiles will be measured in the Center of East Lake, Rabbit Island Bay, Williams Bay, and West Lake at the deepest locations. Measurements would begin shortly after ice-out and continue on a daily basis during the business week until the time of treatment. The stratification information will be used to determine when treatment should occur and whether dose adjustments are needed.

To: Beaver Dam Lake Management District (Board of Commissioners)
 From: Barr Engineering Company (Meg Raffel)
 Subject: Proposed 2014 Beaver Dam Lake Herbicide Treatment Plan
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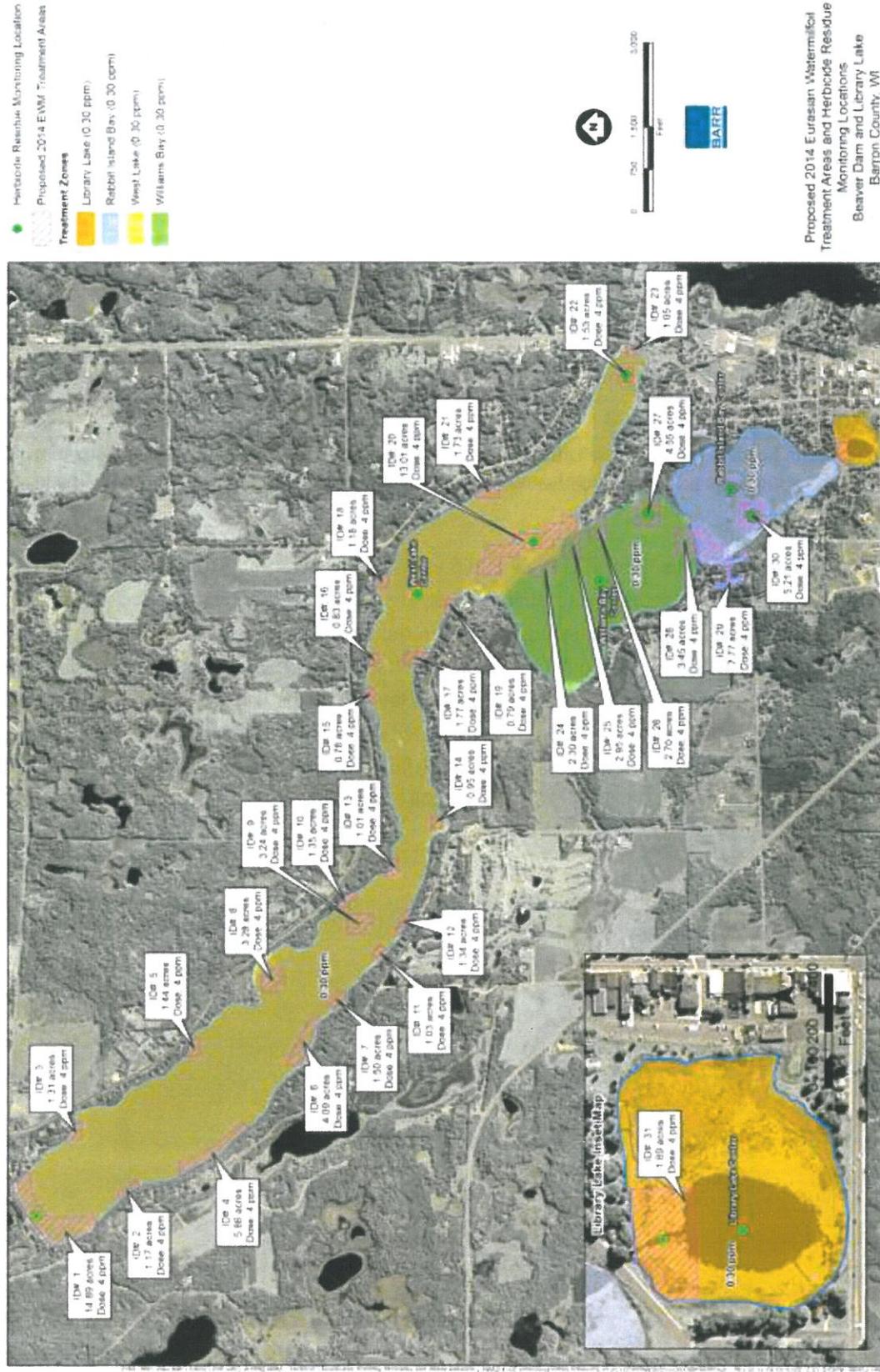


Figure 4 Proposed 2014 Treatment Plan for West Lake, Williams Bay, Rabbit Island Bay, and Library Lake

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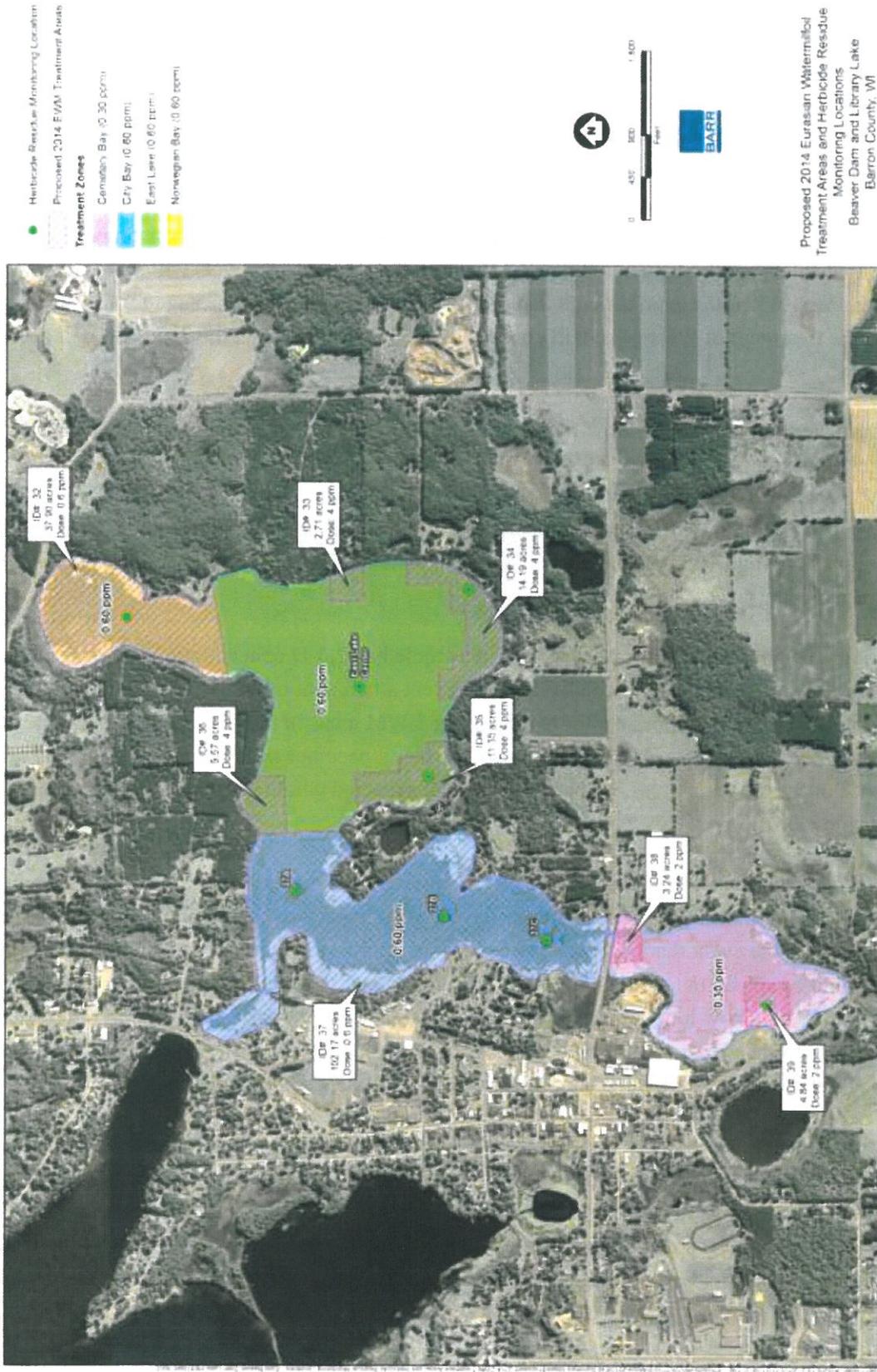


Figure 5 Proposed 2014 Treatment Plan for Norwegian Bay, East Lake, City Bay, and Cemetery Bay

2.1 West Lake

The West Lake treatment is a spot treatment with an expected bay wide 2,4-D concentration of up to 0.3 parts per million (ppm) (Figure 4).

The EWM in the West Lake sub basin grows at a range of depths, including very deep depths. EWM begins growing sooner in the shallow depths than deeper depths. The treatment approach in 2014 will be to wait until the EWM at the deeper depths reaches an ideal growth stage for treatment and then commence with treatment. To determine the ideal treatment stage, a team consisting of Lake Restoration, Inc. (applicator) and Endangered Resource Services, LLC (plant surveyor) will assess the EWM in the deeper areas. When the team concurs that the EWM is at an ideal growth stage for treatment, the herbicide treatment of West Lake will commence. It is anticipated that the treatment will occur around mid-June.

Because the timing of EWM growth and the rate of EWM growth can vary from year to year, it is possible that some deeper areas of West Lake near the sharp breaks to the deeper depths may not exhibit EWM growth when it is determined that treatment needs to commence in the rest of the lake to protect the native plant community. In the event that this scenario occurs in 2014, treatment will commence on areas exhibiting EWM growth considered ideal for treatment and areas that exhibit later EWM growth will be treated at a later time.

Although the goal of the treatment is to attain a whole bay 2,4-D concentration that is as close as possible to 0.3 ppm, there are many variables that can prevent attainment of that goal. As noted in the previous paragraph, it may not be possible to treat all of the EWM areas in the lake if deeper areas near the sharp breaks to the deeper depths begin growing so late that it becomes necessary to treat the rest of the lake in advance of these deeper areas. In that situation, the expected whole lake concentration would be expected to be below 0.3 ppm .

Due to the large size of the West Lake, it will take several days to apply the herbicide, even under ideal application conditions. Weather conditions have a great impact on West Lake and impact treatment conditions. In the event that poor weather conditions delay completion of treatment, the treatment of West Lake could be spread out over a longer time period. The whole lake concentration attained after treatment will depend upon how long it takes to complete the treatment. Increased application time may reduce the whole lake 2,4-D concentration attained after treatment. Nonetheless, the time period required for application is determined by uncontrollable factors such as weather conditions.

West Lake is not only large in size, but is a deep lake containing two bays around 100 feet deep. The treatment will be completed after stratification has occurred when it is anticipated that only the upper 20 feet or so of water will mix with the herbicide and impact whole lake 2,4-D concentrations attained after treatment. However, the depth variations in the lake and the mixing complexities that can occur in the lake create a lot of unknowns that can impact the whole lake 2,4-D concentration attained after treatment.

These mixing unknowns create a lot of uncertainty regarding the whole lake 2,4-D concentration attained after treatment. It is important to recognize the uncertainties and their impacts to insure realistic expectations for treatment results.

2.2 Williams Bay, Rabbit Island Bay, Library Lake, and Cemetery Bay

Williams Bay, Rabbit Island Bay, Library Lake, and Cemetery Bay are spot treatments with an expected bay wide 2,4-D concentration of 0.3 ppm after treatment, assuming dissipation of the herbicide throughout the bay. The whole bay 2,4-D concentrations expected after the 2014 treatment are the same as the whole bay concentrations that were anticipated after the 2013 treatment. Sites within Williams Bay, Rabbit Island Bay, and Library Lake will be treated with a 2,4-D concentration of 4 ppm. Sites within Cemetery Bay will be treated with a 2,4-D concentration of 2 ppm.

2.3 East Lake

East Lake is a spot treatment with an expected bay wide 2,4-D concentration of 0.6 ppm after treatment, assuming dissipation of the herbicide throughout the bay. The whole bay 2,4-D concentration expected after the 2014 treatment is 0.1 ppm higher than the 2,4-D concentration anticipated after the 2013 treatment. The higher whole bay 2,4-D concentration is proposed to effectively destroy EWM root crowns, which were viable after the 2013 treatment per the July 2013 aquatic plant survey of East Lake. Sites within East Lake will be treated with a 2,4-D concentration of 4 ppm.

2.4 Norwegian Bay and City Bay

Norwegian Bay and City Bay are whole bay treatments with a 2,4-D concentration of 0.6 ppm. Hence, the expected whole bay 2,4-D concentrations after treatment are 0.6 ppm. The whole bay 2,4-D concentrations expected after the 2014 treatment are 0.1 ppm higher than the concentrations anticipated after the 2013 treatment. The higher whole bay 2,4-D concentrations are proposed to effectively destroy EWM root crowns, which were viable after the 2013 treatment per the July 2013 aquatic plant surveys of Norwegian Bay and City Bay.

3.0 Proposed 2014 Monitoring Programs

The 2014 monitoring programs to assess results of the 2014 herbicide treatment program will consist of herbicide residue monitoring programs to monitor 2,4-D concentrations following treatment as well as aquatic plant monitoring programs to: (1) assess treatment success; (2) determine native plant response to treatment; and (3) design the 2015 EWM treatment plan.

3.1 2,4-D Herbicide Residue Monitoring Program

2,4-D herbicide residue monitoring will occur in 18 representative locations to determine whether the target dose was attained as well as the rate of herbicide decline due to dilution, mixing, and natural degradation. Monitoring locations are shown in Figures 4 and 5. Samples will be collected at mid-depth from each location during a 26 day period (Table 4). Specific sample collection times for the treatment areas are shown in Table 4. 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; (2) if weather conditions make sample collection unsafe during any of the scheduled sample collection times, samples will not be collected.

Table 4 2014 Herbicide Residue Monitoring Plan

Treatment Area (Sample Site ID)	Sample Collection Time (Hours After Treatment)	Sample Collection Time (Days After Treatment)
West Lake Basins		
West Lake (ID 1, 20, 22, and West Lake Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Williams Bay (ID 27 and Williams Bay Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Rabbit Island Bay (ID 30 and Rabbit Island Bay Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Library Lake (ID 31 and Library Lake Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
East Lake Basins		
Norwegian Bay (ID 32)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
East Lake (ID 34, 35, and East Lake Center)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
City Bay (ID 37A, 37B, and 37C)	1,4	1, 2, 3, 5, 7, 12, 19, and 26
Cemetery Bay (ID 39)	1,4	1, 2, 3, 5, 7, 12, 19, and 26

3.2 Aquatic Plant Monitoring Programs

The 2014 aquatic plant monitoring programs will include a July survey of all plant species and an October survey of aquatic invasive species (EWM and CLP). Details of the aquatic plant monitoring programs follow.

3.2.1 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. 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. Chi squared analysis will compare 2013 data with 2012 data to identify significant changes in frequency of occurrence of native species. The July monitoring program duplicates monitoring programs completed during 2009 through 2013.

3.2.2 Fall Aquatic Invasive Species Survey

During October, a fall point intercept survey of about 1,346 sample points will assess aquatic invasive species (EWM and CLP) coverage in Beaver Dam Lake. Maps showing the sample locations are found in Appendix E of the Beaver Dam Lake APM Plan. The results of the EWM data collected during the fall aquatic invasive species survey will determine 2015 EWM treatment areas and will be used to design the 2015 herbicide treatment 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 2015 when CLP is at its peak growth stage. The fall aquatic invasive species monitoring program duplicates monitoring programs completed during 2006 through 2013.