WISCONSIN DEPARTMENT OF NATURAL RESOURCES
AQUATIC INVASIVE SPECIES GRANT PROGRAM
EARLY DETECTION & RESPONSE

Application Materials

Manitowish Chain of Lakes AIS-EDR Project *Phase III*

Prepared for the

North Lakeland Discover Center

February, 2014

Onterra LLC
Lake Management Planning

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INTRODUCTION & PROBLEM IDENTIFICATION

The Manitowish Chain of Lakes consists of 10+ lakes located just east of the Town of Manitowish Waters in Vilas County (Map 1). The Manitowish Waters Lake Association (MWLA) and the North Lakeland Discover Center (NLDC) have contracted with Onterra to create individualized management plans for each chain lake including connected downstream lakes below the Rest Lake Dam as well as a chain-wide management plan. This phased project was implemented in August 2011 and is planned for completion in 2016.

Curly-leaf pondweed (CLP) was first documented on the Manitowish Waters Chain on June 18, 2010 by a volunteer who had attended a North Lakeland Discover Center (NLDC) training session the previous day. Later that month, NLDC staff and volunteers confirmed the presence of a small CLP colony near an island in the north-western corner of Island Lake. Subsequent monitoring of Island Lake increased and in early-July 2010, a small amount of CLP was identified in Rice Creek. Because it was mid-summer and the CLP had already begun to senesce (die back), the full extent of the population was not realized.

On June 18, 2011 NLDC staff (Anne Kretschmann) and Rest Lake Captain/Manitowish Waters Lake Association (MWLA) representative Tom Joseph visited Rice Creek to quantify the CLP infestation. They found it to be much larger than expected and subsequently solicited assistance from Ted Ritter (Vilas County Invasive Species Coordinator). On June 24, 2011 Ted Ritter and Anne Kretschmann mapped the infestation using GPS while Karen Dixon (Stone Lake Captain/MWLA President) and Tom Joseph conducted meander surveys of Island Lake and the mouth of the Manitowish River at Island Lake.

On June 21, 2012 NLDC staff (Anne Kretschmann and Scott Blado) and Karen Dixon (Stone Lake Captain/ MWLA President) found a small area of CLP during a meander survey of Stone Lake. NLDC (with MWLA/ volunteer assistance) conducted meander surveys on all waters in the Manitowish Waters Chain of Lakes (including lakes downstream of the Rest Lake Dam, associated river sections between the lakes, several river-miles surrounding the chain in all rivers/streams coming into or out of the system, and unconnected lakes in the vicinity e.g. the Stepping Stones, Circle Lily, Statehouse, Jag, and Dog Lakes) with no additional new findings in 2012.

During the fall/winter of 2012, the MWLA and NLDC contracted with Onterra, LLC of De Pere, WI to initiate a phased project aimed to create individualized management plans for each chain lake, as well as a chain-wide management plan. At that same time, Onterra was also contracted to develop and implement a CLP control and monitoring strategy on the Manitowish Chain of Lakes. Using the results of the 2011 surveys, a preliminary treatment strategy targeting 26.6 acres was initially proposed for treatment in the spring of 2012.

In February of 2012, the NLDC received a Wisconsin Department of Natural Resources (WDNR) Aquatic Invasive Species (AIS) Early Detection and Response (EDR) Grant to initiate the first phase of a CLP control program on the newly identified locations of CLP within the Rice Creek, Island Lake, Spider Lake, and the Spider-Island Channel.

Following the submission of the conditional treatment permit in early April 2012 and subsequent multi-agency review by the WDNR and Great Lakes Indian Fish and Wildlife

Commission (GLIFWC), the treatment of proposed treatment site A-12 was suspended due to concerns regarding the proximity of the treatment area to northern wild rice (*Zizania palustris*) populations. Based on laboratory and outdoor growth chamber research, wild rice has been shown to be vulnerable to early-season herbicide treatments (Nelson et al. 2003; Madsen et al. 2008). Northern wild rice is an emergent aquatic grass that grows in shallow water of lakes and slow-moving rivers, and possesses great cultural significance to the Chippewa Tribal Communities. In addition, northern wild rice provides a number of valuable ecological services which include food and habitat sources for wildlife, soil stabilization, and nutrient uptake.

On April 12, 2012, Onterra ecologists made their first visit to the Manitowish Chain, making visits to Spider Lake, Island Lake, and Rice Creek to conduct a pre-treatment survey aimed at verifying the extents of the curly-leaf pondweed colonies and refining them where necessary. The curly-leaf pondweed was readily visible from the surface, but a submersible video camera was used to verify the colony extents in deeper water. This pre-treatment survey revealed that curly-leaf pondweed extended between and around the proposed treatment sites B-12 and C-12, and thus these proposed sites were merged into a single, expanded treatment site. Proposed treatment site D-12 was also adjusted and expanded based upon data collected during the pre-treatment survey.

Herbicide treatments rely on a combination of herbicide concentration and exposure time to be effective (Netherland 2009). For control of curly-leaf pondweed, liquid endothall is typically applied at 1.5 ppm active ingredient (ai) with an understanding that exposure times are going to be relatively short (hours). Onterra's typical policy, which is supported by the WDNR, is to start with a conservative herbicide treatment strategy and get more aggressive if the preceding treatment did not satisfy expectations. This approach results in utilizing the minimal amount of herbicide required to effectively control the target plant. This approach also limits the unintended effects on the native plant community that can accompany overuse of herbicides. Because D-12 was quite small and studies have consistently shown that small treatment sites are extremely difficult to treat effectively, a slightly higher application dose (2.0 ppm ai) was recommended. Expecting a moderate level of water flow within the channel between Island and Spider Lakes, treatment site B-12 was also recommended to be treated at this slightly higher dose. The 2012 final treatment areas were treated on May 2, 2012.

On May 29-30, 2012, Onterra ecologists completed post-treatment evaluation surveys of the 2012 treatment sites on Spider Lake and Island Lake. In addition, a full meander-based survey was completed on Rest Lake to locate any potential occurrences of curly-leaf pondweed and any other non-native species. Overall, it appeared that the 2012 herbicide treatments on Spider and Island Lakes were not effective at causing curly-leaf pondweed mortality. The Spider/Island Lake channel still contained large colonies of *dominant* and *highly dominant* curly-leaf pondweed, and *scattered* curly-leaf pondweed was located within treatment site D-12 in Island Lake. This lack of success was likely due to an approximate 8-12 inch increase in water levels prior to the herbicide application, which likely slightly diluted the herbicide concentration. In addition, although the herbicide concentration was increased within the Spider/Island Lake channel to account for higher rates of water flow, it is suspected that this increased dose was not sufficient to overcome the dilution effects of flow.

Photo 1. Onterra ecologist Eddie Heath with surface-matted curly-leaf pondweed in Rice Creek. Photo taken during late-May 2012 curly-leaf pondweed survey.

No curly-leaf pondweed was located in Rest Lake in 2012, but it was located in a few areas in Spider Lake, Island Lake, and Rice Creek, some outside of 2012 treatment areas. In total, approximately 39 acres of colonized curly-leaf pondweed were observed in 2012. Twenty-seven acres (69%) of the 39 acres of curly-leaf pondweed located in 2012 were located in Rice Creek. The curly-leaf pondweed in Rice Creek was also the densest that Onterra ecologists encountered during the 2012 surveys, much of which was non-navigable and matted at the surface (Photo 1).

Because the 2012 curly-leaf pondweed treatments were largely ineffective, a more aggressive strategy was developed for 2013. Working with the NLDC and MWLA, it was decided that all colonized areas of curly-leaf pondweed within Island Lake and Spider Lake would be treated with a higher dose of liquid endothall in 2013. The endothall dose was increased to 3.0 ppm ai for treatment sites C-13, E-13, and F-13. The smaller treatment area D-13 was treated with an endothall dose of 4.0 ppm ai to try and counteract the rapid dilution that current research indicates accompanies these small treatment sites. Areas of curly-leaf pondweed within Rice Creek were again proposed to be treated in 2013; however, these treatment areas again went untreated in 2013 due to concerns regarding their proximity to wild rice. In February 2013, the NLDC received a second phase WDNR AIS Early Detection and Response Grant to aid in funding the 2013 treatments and associated monitoring.

On June 20 and 25-27, 2013, Onterra ecologists completed the post-treatment evaluation surveys of the 2013 curly-leaf pondweed treatments. Qualitatively, the 2013 treatments appeared to be successful as no curly-leaf pondweed could be seen from the surface within any of the herbicide application areas (Map 2). For a more detailed description of the 2013 treatment results, please see the 2013 Manitowish Chain of Lakes Treatment Report (anticipated distribution early February 2014).

In addition to assessing the 2013 treatment areas, whole-lake early-season AIS surveys were completed on Island Lake, Rice Creek, Spider Lake, the project Phase II lakes (Clear Lake and Fawn Lake), Manitowish Lake, and the Manitowish River between Stone Lake and Rest Lake. Early-season AIS surveys were not scheduled to occur on Manitowish Lake and Stone Lake until 2015 and 2016, respectively, but members of the NLDC discovered areas of curly-leaf pondweed in these lakes during their 2011 and 2012 monitoring.

No curly-leaf pondweed was located in Clear Lake or Fawn Lake in 2013 (Map 2). A small, *dominant* colony of curly-leaf pondweed was located in the Manitowish River, approximately midway between Stone Lake and Rest Lake, along with a number of single plants, clumps of plants, and small plant colonies. A few single plants/clumps of plants were located in Stone Lake and Spider Lake, while only one single curly-leaf pondweed plant could be located in Manitowish Lake. Colonized curly-leaf pondweed was located in the southeastern portion of

Island Lake along with some single plants/clumps of plants. The large, colonized area of curly-leaf pondweed was still present in Rice Creek, though at somewhat lesser density on the westernmost end; the eastern portion was still dominated by *highly dominant* and *surface matting* curly-leaf pondweed. The upstream-most colonized area of curly-leaf pondweed observed in Rice Creek in 2012 was nearly three times larger in 2013. A small plant colony of curly-leaf pondweed was also discovered further upstream in Rice Creek than what had been located in 2012.

In total, 30.6 acres of colonized curly-leaf pondweed were located in the Manitowish Chain in 2013, representing an eight-acre decrease in colonial acreage from 2012 (Figure 1). Most of the acreage lost was within treatment areas in Spider and Island Lakes. Like in 2012, the majority of the curly-leaf pondweed in 2013 was located in Rice Creek.

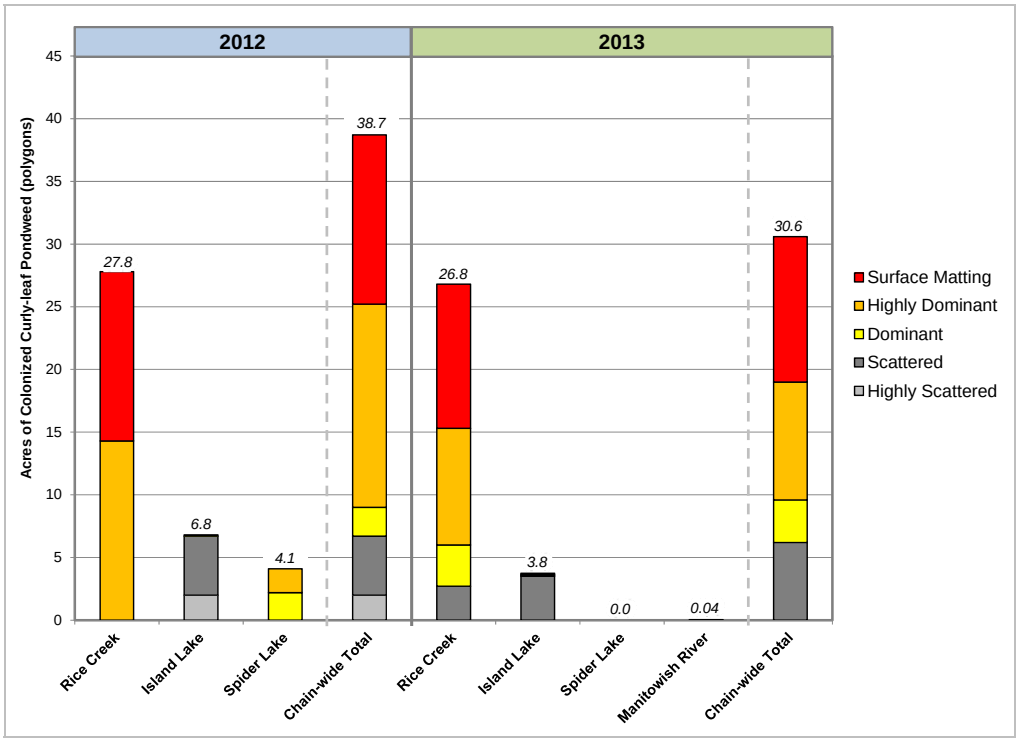


Figure 1. Manitowish Chain of Lakes acreage of curly-leaf pondweed. Created using data from 2012 and 2013 early-season AIS surveys.

PROJECT SCOPE AND TIMELINE

The proposed project continues active management of the CLP population within the Manitowish Chain through herbicide applications and professional hand-removal (Map 2).

The chief goal of this management project is to minimize the negative impact that AIS can have on the ecology of the Manitowish Chain of Lakes. These impacts can range from reduced habitat value for fish and wildlife to alterations in lake water quality, including swings in pH and localized-anoxia.

The objective of this management action is not to eradicate CLP from the Manitowish Chain of Lakes, as that would be impossible. The objective is to bring CLP down to more easily controlled levels or levels that have minimal effect on the lake ecosystem.

Table 1 provides an approximate timeline for completion of the tasks as well as displays how the proposed project dovetails with previous and ongoing projects. The schedule needs to be flexible to accommodate for weather, scheduling conflicts, etc., but it provides a general indication of the dates for completing the proposed components.

Table 1. Approximate Project Schedule

	2012				2013				2014				
Task	**W**	**Sp**	**Su**	**F**	**W**	**Sp**	**Su**	**F**	**W**	**Sp**	**Su**	**F**	**W**
Spring Pretreatment Confirmation & Refinement Survey													
Quantitative Monitoring (Sub-sample PI Survey)													
CLP Peak-biomass Survey & Map Creation													
Herbicide Treatment													
Professional Hand-Harvesting													
Wild Rice Survey & Map Creation													
Annual Treatment Report & Strategy Development													

Cost Coverage from WDNR AIS-EDR Phase I Grant Award (February 2012)

Cost Coverage from WDNR AIS-EDR Phase II Grant Award (February 2013)

Cost Coverage from WDNR AIS-EDR Phase III Grant Application (February 2014)

Cost Coverage from WDNR AIS-EPP Grant Projects

Monitoring Strategy

The MWLA and NLDC understand the ecological and cultural importance of wild rice within the Manitowish Chain of Lakes. They are also concerned with the threat that CLP poses to the native plants, including wild rice, within the chain. A detailed herbicide treatment monitoring strategy has been devised that would evaluate the efficacy and selectivity of the control strategy.

Efficacy: In association with the proposed 2014 herbicide treatment, qualitative evaluation methodologies would be conducted in which pre- and post treatment CLP surveys are compared to one another. In addition to continuing to evaluate the success of the control program using qualitative methods, the 2014 treatment monitoring strategy will also implement quantitative methods using a modified point-intercept methodology consistent with the Appendix D of the WDNR Guidance Document, *Aquatic Plant Management in Wisconsin* (WDNR 2010). In general, a sub-sample point-intercept grid will be placed over the large treatment area within the Spider-Island Channel to yield approximately 4 points per acre.

Quantitative sampling would be conducted the spring just previous to the treatment (pretreatment) and the spring following the treatment (post treatment). Because of the early senescence of CLP, a post treatment survey a few weeks following the treatment would not differentiate if a reduction in occurrence could be attributed to the herbicide application or the natural die-off of the species. The frequency of CLP each spring will be a direct result of the turions that sprouted the previous fall. If the control strategy is effectively killing CLP before it produces turions, a reduction in CLP sprouting from those turions should be apparent after a

few years of treatment. It must be noted that only looking at this data within the confines of a single pre- and post treatment timeframe is problematic as it is suspected that the populations of CLP within some areas will be maintained for years from a large turion base that has built up over time. These data were also collected in association with the 2013 herbicide treatment of this area, allowing for a multi-year examination to be made.

Selectivity: Unfortunately, the quantitative methodology described above will not allow an understanding of how non-target native plants were impacted by the treatment strategy. To that end, the same sub-sample locations will be sampled each late-June and compared annually. It is anticipated that the majority of native plants should be actively growing during this time of year and annual comparisons will allow an understanding of changes in occurrence.

Wild Rice Mapping: A major limitation of the point-intercept method is the inability to use this technique to evaluate emergent and/or adjacent wetland areas due to the inability to navigate in these areas. As an emergent plant, it is impossible for the point-intercept method to evaluate the treatment impacts on the adjacent areas of wild rice. Similar to the qualitative methodologies used to map and compare CLP colonies and densities, a methodology has been developed to monitor changes in wild rice populations over time. Wild rice colonies have been delineated and assigned a two-tiered density rating (dense or sparse). While it is understood that wild rice populations fluctuate from year to year, a multi-year dataset may provide insight to whether the herbicide application is directly affecting its population.

Herbicide Concentration Monitoring: In conjunction with the WDNR and US Army Corps of Engineers (USACE), citizen-based herbicide concentration monitoring at strategic locations throughout the system would take place to understand the concentration/exposure time of the herbicide at different time periods and locations following the treatment. This information would indicate whether or not the amount of herbicide applied was sufficient to cause CLP mortality and if any adjustments in treatment strategy need to be made.

NLDC staff and volunteers were trained during the spring of 2013 to collect herbicide concentrations samples surrounding the 2013 treatment on the system following protocols developed by the USACE. If invited to participate again, water samples would be collected at various locations and time-periods following the 2014 treatment. Properly preserved samples would be sent to the USACE for laboratory analysis.

Spring Pretreatment Confirmation & Refinement Surveys

A qualitative assessment would be completed prior to the herbicide applications to verify treatment area extents and to inspect the condition of the CLP colonies targeted for treatment. Depending on weather and lake conditions, proposed treatment extents would be verified through the use of a combination of surface surveys, rake tows, and submersible video monitoring. Upon completion of the inspections, Onterra would electronically provide an update to the NLDC, MWLA, and WDNR describing the results of the assessment and any recommended changes to that year's treatment strategy. If changes are suggested, Onterra would provide the updated treatment areas to the applicator once the updated strategy is approved by the WDNR, MWLA, and NLDC.

Chemical Applications

It would be the responsibility of the NLDC to contract with a commercial aquatic pesticide applicator, certified with the Wisconsin Department of Agriculture and Consumer Protection and licensed by the WDNR to perform the *early season* treatments of curly-leaf pondweed. The treatments would occur roughly each year before June 1 when water temperatures are between 50-60°F. Onterra would create the treatment area maps in the form of polygons within Geographic Information System (GIS) and then transmit them to the applicator in native shapefile format or similar format recognized by the applicator's GPS technology. The applicator would be responsible for completing the necessary permit applications.

Due to the fact that Rice Creek was not treated in previous years, there is a small surplus to treatment-related costs within the Phase II AIS-EDR grant ($3,963.40). The proposed 2014 treatment contains cost coverage through a combination of using the remainder of funds from the Phase II Grant as well as additional costs within the proposed Phase III grant.

Professional Hand-Harvesting

The NLDC has conducted volunteer-based hand harvesting in prior years, but acknowledges the level of volunteerism to lead a successful control effort needs to be augmented by professionals. The proposed project initiates professional hand-harvesting efforts throughout the course of this project. For budgeting purposes, the proposed project includes $3,300 worth of hand-harvesting each year. The amount of hand-harvesting effort will be dependent on the firm hired, the equipment used, and the number of divers in the water at a time.

PROJECT DELIVERABLES

T2014 Treatment Report

During the winter following the 2014 early-season herbicide control strategy, a treatment report would be provided that would include maps detailing the survey findings and guidance for the following spring's treatment of CLP within the Manitowish Chain of Lakes. A map depicting the survey results and recommended control strategy would also be included within this report. All annual reports would be presented in electronic format only. Adobe's Portable Document Format (PDF) would be utilized as the report format for delivery via email.

Stakeholder Participation

Unless specifically indicated otherwise, the NLDC would be responsible for providing the necessary deliverables for those components listed within Volunteer Efforts Subcategory on cost breakdown table. The deliverables for these activities may include entering the appropriate information within the WDNR's Surface Water Integrated Monitoring System (SWIMS) or providing a brief narrative of the activities to the WDNR.

PROJECT COST BREAKDOWN

Please note that within the cost breakdown table, "T" preceding a year indicates that the task is associated with that year's treatment. For example, "T2014 Letter Report" indicates that this report will discuss the results of the treatment conducted in early-spring of 2014.

Manitowish Chain AIS Early Detection & Response Grant - Phase III	**Cash Costs**	**Donated Value**
Monitoring and Reporting		
Project Administration & Communications	$435.00	
2014 CLP Monitoring (Year 1)		
T2014 Spring Pretreatment Confirmation & Refinement Survey - Spring 2014	$610.00	
Point-intercept Sub-sampling Survey - Spring 2014	$525.00	
Hand-removal Coordination & GPS Basemap Creation	$230.00	
Point-intercept Sub-sampling Survey - Late-Spring 2014	$525.00	
2014 Wild Rice Survey of Island Lake & Rice Creek - Summer 2014	$1,675.00	
T2014 Report and T2015 Planning - Winter 2014/2015	$665.00	
Travel - Mileage (0.58/mile) & Incidentals	$700.00	
Monitoring & Reporting Subtotal	*$5,365.00*	*$0.00*
Professional Hand-Harvesting		
2014 Professional Hand-Harvesing (110 diver-hours)	$3,300.00	
Professional Hand-Harvesting Subtotal	*$3,300.00*	*$0.00*
Herbicide Application and Related Fees		
2014 Herbicide Treatment Costs (11 Acres @ 3.5 ppm ai) ($3,963.40 paid from Phase II)	$12,436.60	
2014 WDNR Permit Fees (11 acres)	$295.00	
Miscellaneous Costs Subtotal	*$12,731.60*	*$0.00*
Volunteer Efforts		
2014 AIS Surveillance Monitoring		
Volunteers (40 hrs)		$480.00
Volunteer Watercraft Use (4 days/yr @ $70/day)		$280.00
Canoes & Kayaks Useage During AIS Monitoring (4 days/yr @ $20/day)		$80.00
2014 Project Administration & Communications		
Volunteers (40 hrs/yr @ $12/hr)		$480.00
MWLA Volunteer Donation Funded Efforts		
Skiing Skeeters- AIS/ Boating Safety Announcements (MWLA donated cash)		$800.00
Lakeland Students AIS and Water Environmental Education (MWLA donated cash)		$840.00
Stakeholder Survey		
Mailing prep (Move from Plan Phase IIIb, 20 hrs)		$240.00
Purple Loosestrife Bio-control Program		
PL Flower Head Cutting		$96.00
Beetle Release		$48.00
Discovery Center		
AIS Pontoon Boat Useage		$750.00
AIS Fishing Boat Useage		$300.00
Discovery Center Van Useage		$250.00
Canoes & Kayaks Useage		$400.00
Supplies		
GPS (use donated by Town)		$210.00
Volunteer Efforts Subtotal	*$0.00*	*$5,254.00*
Project Subtotals	**$21,396.60**	**$5,254.00**
Total Project	**$26,650.60**	
State Share Requested (75%)	**$19,987.95**	

State of Wisconsin
Department of Natural Resources

Aquatic Invasive Species (AIS) Control Grant Application

Form 8700-307 (12/11)

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 will 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	
Senate	Assembly
12	34

To determine your legislative district, go to http://165.189.139.210/WAML// Type in complete address, next screen shows information

Section II: Applicant Information

Applicant: North Lakeland Discovery Center

Waterbody Name: Island Lake, Spider Lake, Rice Creek

Project County/Township/Section/Range: Vilas/T42N/R05E/S14&13; T42N/R06E/S8, 9, 17-20

Type of Eligible Lake or River Applicants

☐ County ☐ Tribe ☐ Other Gov't Unit ☐ Federal
☐ City ☐ Sanitary Dist. ☒ Nonprofit Org. ☐ State
☐ Village ☐ Dist. ☐ College, School, etc. ☐ Other _____
☐ Town ☐ Assoc.

Authorized Representative Named by Resolution	Project Contact Name
Sarah Johnson	Tim Hoyman
Authorized Representative Title	**Project Contact Title**
Director - NLDC	Aquatic Ecologist, Onterra, LLC
Address	**Address**
P.O. Box 237	815 Prosper Road
City / State / ZIP Code	**City / State / ZIP Code**
Manitowish Waters / WI / 54545	De Pere / WI / 54115
Daytime Phone (area code)	**Daytime Phone (area code)**
715-543-2085	920.338.8860
Evening Phone (area code)	**Evening Phone (area code)**
715-543-2085	
E-Mail Address	**E-Mail Address**
sarah@discoverycenter.net	thoyman@onterra-eco.com

Mail Check to: (if different from applicant)

Name and Title	Address
Organization	**City / State / ZIP Code**

For DNR Use Only

Application Type	Date Received	Date Reviewed (AIS/LC/RC)	AIS/Lake/River Coordinator Approval/Date

Waterbody ID #	Adequate Public Access ☐ Yes ☐ No	Environmental Grants Specialist Approval / Date	
Eligible Project ☐ Yes ☐ No	**Eligible Applicant** ☐ Yes ☐ No	**Project Priority Rank**	**Research / Demo Project** ☐ Yes ☐ No
Prior Grant Award(s) ☐ Yes ☐ No	**Fiscal Year(s)**	**Amount Received to Date** $	**Project Awarded** ☐ Yes ☐ No

Aquatic Invasive Species (AIS) Control Grant Application

Section III: Project Information

Project Title	Proposed Ending Date
Manitowish Chain of Lakes EDR Project – Phase III	June 30, 2015

Other Management Units	Letter of Support	Other Management Units	Letter of Support
1. Vilas County Invasive Species Coordinator	☐	4.	☐
2.	☐	5.	☐
3.	☐	6.	☐

Section IV: Public Access

Number of Public Vehicle Trailer Parking Spaces Available at Public Access Sites:	55+
Number of Public Access Sites Including Boat Launches and Walk-ins:	7

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.

	Project Costs		
	Column 1 Cash Costs	**Column 2 Donated Value**	***DNR Use Only***
1. Salaries, wages and employee benefits (Professional Hand-harvesting)	$3,300.00		
2. Consulting services	$5,365.00		
3. Purchased services (Herbicide Applications)	$12,436.60		
4. Other purchased services (specify) WDNR Permit Fees	$295.00		
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) (Volunteer In-kind Labor)		$5,254.00	
12. **Subtotals** (Sum each column)	*$21,396.60*	*$5,254.00*	
13. **Total Project Cost Estimate** (sum of **column 1** plus sum of **column 2)**	**$26,650.60**		
14. **State Share Requested (up to 75% of total costs may be requested)**	**$19,987.95**		

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:

Aquatic Invasive Species (AIS) Control Grant Application

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 with public access sites identified (per Section VI 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 goal 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 no 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

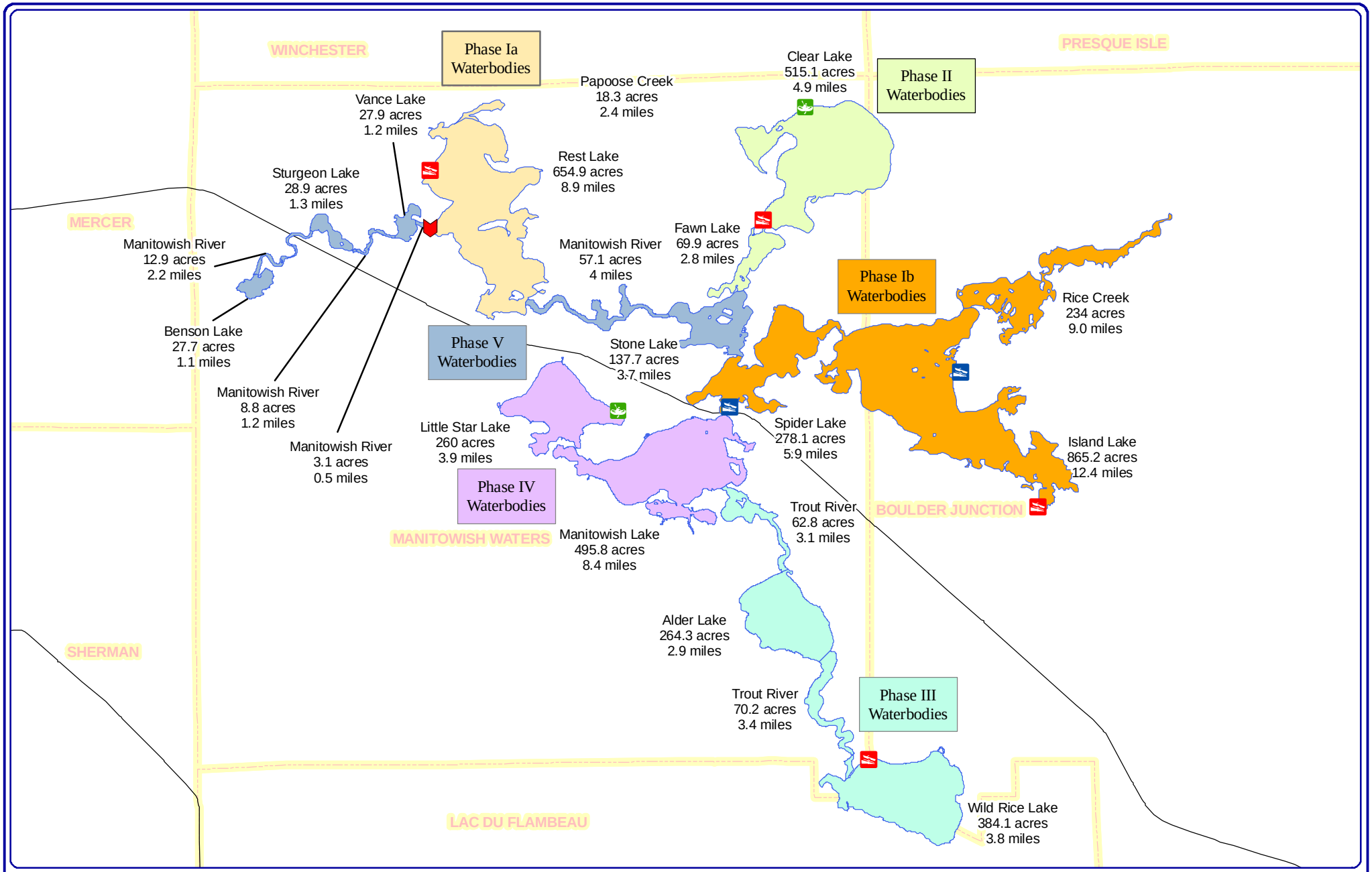
E. Established Infestation Control Projects:

- ☐ 1. Management Plan
- ☐ 2. APM Permit

Section VII: Certification

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

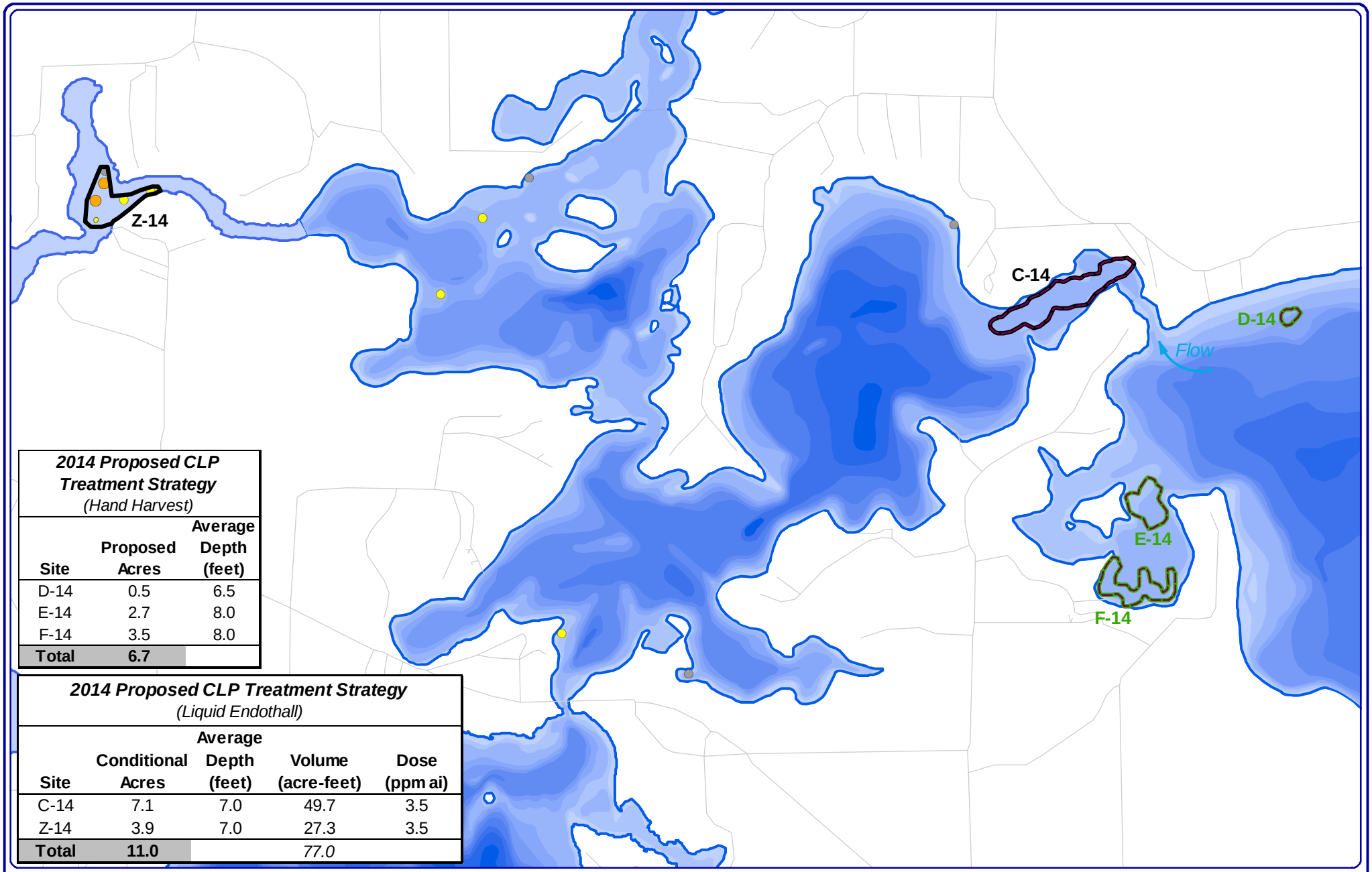
Print/Type Name of Authorized Representative	Title of Authorized Representative
Sarah Johnson	Director - NLDC
Signature of Authorized Representative	Date Signed



Onterra LLC
Lake Management Planning
815 Prosper
De Pere, WI 54115
920.338.8860
www.onterra-eco.com

Sources:
Data: Roads and Hydro: WDNR
Map Date: July 9, 2013
Filename: *ManitowishChainVilas_LocationPhasing.mxd*

Map 1
Manitowish Waters Chain of Lakes
Vilas County, Wisconsin
Proposed Phased Management Planning Approach



2014 Proposed CLP Treatment Strategy (Hand Harvest)		
Site	Proposed Acres	Average Depth (feet)
D-14	0.5	6.5
E-14	2.7	8.0
F-14	3.5	8.0
Total	**6.7**	

2014 Proposed CLP Treatment Strategy (Liquid Endothall)				
Site	Conditional Acres	Average Depth (feet)	Volume (acre-feet)	Dose (ppm ai)
C-14	7.1	7.0	49.7	3.5
Z-14	3.9	7.0	27.3	3.5
Total	**11.0**		*77.0*	

N W E S

1,250

Feet

Onterra LLC
Lake Management Planning
815 Prosper Road
De Pere, WI 54115
920.338.8860
www.onterra-eco.com

Sources:
Roads and Hyrdo: WDNR
Bathymetry: WDNR, digitized by Onterra
Aquatic Plants: Onterra, 2013
Map Date: January 31, 2014
Filename: Manitowish_CLP_T2014Cond1.mxd

Project Location in Wisconsin

Legend

CLP Survey (June 2013)

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

2014 Preliminary Control Strategy

- Hand Harvest Area
- Liquid Endothall Treatment Area
- 2013 Final Treatment Strategy

Map 2

Manitowish Chain

Vilas County, Wisconsin

Preliminary 2014 CLP Treatment Strategy v1