



## Environment and Natural Resources Trust Fund

### M.L. 2021 Approved Work Plan

#### General Information

**ID Number:** 2021-313

**Staff Lead:** Rory Anderson

**Date this document submitted to LCCMR:** July 21, 2021

**Project Title:** Stop Starry Invasion - Community Invasive Species Containment

**Project Budget:** \$1,000,000

#### Project Manager Information

**Name:** Jeff Forester

**Organization:** Minnesota Lakes and Rivers Advocates

**Office Telephone:** (952) 854-1317

**Email:** jeff@minnlakesandrivers.org

**Web Address:** <http://www.minnlakesandrivers.org/>

#### Project Reporting

**Date Work Plan Approved by LCCMR:** July 20, 2021

**Reporting Schedule:** December 1 / June 1 of each year.

**Project Completion:** July 31, 2024

**Final Report Due Date:** September 14, 2024

#### Legal Information

**Legal Citation:** M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 06g

**Appropriation Language:** \$1,000,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with Minnesota Lakes and Rivers Advocates to work with civic leaders to purchase, install, and operate waterless cleaning stations for watercraft; conduct aquatic invasive species education; and implement education upgrades at public accesses to prevent invasive starry stonewort spread beyond the 16 lakes already infested. This appropriation is available until June 30, 2025, by which time the project must be completed and final products delivered.

**Appropriation End Date:** June 30, 2025



## Narrative

**Project Summary:** Minnesota Lakes Rivers, MLR will contain starry stonewort (*Nitellopsis obtusa*) in the 16 lakes (31 accesses) where it currently exists using civic organizing, waterless boat cleaning stations, and social messaging.

**Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

Michigan discovered starry stonewort in 2005 and took no direct action to contain it. Today over 1,000 Michigan lakes are infested. Minnesota discovered starry stonewort in 2015 in Lake Koronis. Sixteen lakes (31 public accesses) are now infested. Each is a vector of spread. Starry stonewort is difficult and expensive to manage, prefers high quality waters, and significantly impacts fishing, boating, and swimming.

Since 2017 the Minnesota Aquatic Invasive Species Research Center and Extension Service has run a robust early detection program called “Starry Trek.” Over 200 volunteers survey hundreds of high risk MN lakes. The MN DNR, counties and lake associations also run organized early detection efforts for starry stonewort. There is hope that this highly destructive species is not widespread and that containment efforts should be pursued.

Starry stonewort is perhaps the most concerning AIS in Minnesota. It is expensive to manage and is very resilient.. But there is still time to contain it and prevent spread and save millions in ongoing management costs. Lake Koronis now spends over \$200,000 annually on starry stonewort mitigation to keep the public access usable. Without action now, spread of SSW to Minnesota’s premier lakes is imminent.

**What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.**

The Best Management Practice, BMP, is to completely clean, drain and dry all watercraft and water-related equipment when leaving a water body. Surveys consistently find lack of tools to be a major obstacle to BMP compliance. MLR will install waterless watercraft cleaning stations with wet/dry vacs, high pressure air, scrubbers, grabbing tools, undercarriage and overhead lights, and drain plug wrenches. Public use instructions can be included on equipment. The units can be internet-enabled to send detailed use data and alerts to managers.

This project will turbocharge clean, drain, dry BMPs by installing waterless boat cleaning stations at all thirty accesses. Hennepin County found that when waterless boat cleaning stations are combined with organized community engagement, signage, careful location, and pavement markings, AIS violation rates can be reduced by 70+%.

MLR will deploy these systems, with support from associations and local government, and use civic organizing strategies to elevate local awareness and support. Research shows lakes within 50 miles of an infestation are at higher risk.

This strategy has never been deployed to contain an emerging AIS. With only sixteen lakes infested, we hope to provide a protocol for containing future invasions by providing the tools boaters need.

**What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state’s natural resources?**

Our goal is to protect, conserve and preserve Minnesota's waters by preventing the further spread of starry stonewort. We will further evaluate the success of the program by collecting and correlating two key variables: education impressions and behavior changes. Thereby, we can evaluate the impacts of our educational/civic organizing efforts by correlating the adoption of BMPs to education/outreach over the lifecycle of the campaign. These efforts will result in long-term educational infrastructure that reduces risk of not only starry stonewort spread, but all other AIS, after the project is over.

## Project Location

**What is the best scale for describing where your work will take place?**

Statewide

**What is the best scale to describe the area impacted by your work?**

Statewide

**When will the work impact occur?**

During the Project and In the Future

## Activities and Milestones

### Activity 1: Tech/site advice Install, Manufacture and deliver 26 CD3 Stations, Provide and Supervise IoT services

**Activity Budget:** \$792,995

#### Activity Description:

The supplier of the waterless cleaning stations will be chosen through an RFP process, but so far only one, the CD3, has been identified. CD3s are built in Minnesota, in use across North America, are internet-connected to transmit use data and maintenance needs to managers of the equipment, and have all the tools required to meet current BMPs. CD3s have low maintenance costs and are designed to last at least ten years. Additionally, CD3s are an example of a success story of catalyzing innovation in invasive species management via the Lessard Outdoor Heritage Fund dollars via the Initiative Foundation grants. CD3s provide lights, wet/dry vacuum, air blower, hand tools for physical AIS removal, and a drain plug wrench so boaters can effectively Clean, Drain and Dry their water-related equipment. Because the selected boat cleaning station manufacturer has the knowledge and experience we will rely on their technicians to install the equipment. These systems will be free to boaters.

The project will cover the cost of the equipment, installation, IoT connectivity and platform design.

#### Activity Milestones:

Description	Completion Date
Build and enable IoT data systems	July 31, 2021
Deliver and Instal waterless cleaning systems	July 31, 2021
Site Selection on water accesses and signed leases with access owners.	July 31, 2021

### Activity 2: Admin, Build Local Partners, Travel, Selecting Sites, Supervise Instal, Enhancing Launches w/Behavioral Cues, Education, Manage Project

**Activity Budget:** \$207,005

#### Activity Description:

Minnesota Lakes and Rivers, MLR will identify key local civic leaders and work with them to choose the best sites to instal waterless cleaning stations, plan access upgrades, and design strategic local AIS education efforts.

Priority will be given to lakes ranked by two criteria:

1. Lakes ranked as highest risk for originating spread by Minnesota Aquatic Invasive Species Research Center using their risk assessment algorithm,
2. Support of local community partners.

These partners will design and implement education ranging from pavement striping, signage, video content, and stop bars. These water access site upgrades will guide traffic flow and educate users. Supporting education and creating a broad base of committed active citizens will catalyze the use of waterless cleaning stations.

We will evaluate the success of the program by collecting and correlating two key variables: education impressions and behavior. Thereby, we can evaluate the impacts of our educational efforts by correlating the adoption of BMPs to education/outreach over the lifecycle of the campaign. These efforts will result in long-term educational infrastructure that reduces risk of not only starry stonewort spread, but all other AIS, after the life of the project.

**Activity Milestones:**

Description	Completion Date
Negotiate w/Install owner - secure permissions	July 31, 2021
Identify local partners, create civic workgroup to carry local process for each of the installations.	July 31, 2021
Use year 1 data via IoT platform to adjust community based marketing/education strategies	December 31, 2021
Administration of Process	December 31, 2023
Write and disseminate final case study.	July 31, 2024

## Dissemination

**Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.**

MLR has partnered with MAISRC. County resource managers are also supporting this effort. Through these channels we will be able to reach hundreds of thousands of Minnesotans. We will also pursue print, radio and television stories on the effort. MLR will carry project information on their website. ENTRF logo and/or attribution language will be posted on the CD3 stations themselves, any special signage installed at the ramps, civic organizing materials and media releases.

## Long-Term Implementation and Funding

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?**

The results of the project will be written as a case study and distributed by MLR to partners, MAISRC, and the media. Our hope is that this strategy can be used to contain any new-to-state AIS. This project will cover the cost of equipment and civic organizing to build an active citizen engagement around AIS prevention.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Site Project manager		On site mgr for install and 3 years civic organizing, education, data collection, upkeep and contact.			0%	0.27		\$122,415
Project Manager of this grant		Administration and Management of this grant.			0%	0.54		\$43,200
							<b>Sub Total</b>	<b>\$165,615</b>
<b>Contracts and Services</b>								
							<b>Sub Total</b>	-
<b>Equipment, Tools, and Supplies</b>								
							<b>Sub Total</b>	-
<b>Capital Expenditures</b>								
		26 "Wayside Solar" (\$31,500 each) and 3 "Outpost" (\$13,500 each) CD3 Boat Cleaning Stations	To provide the tools, civic infrastructure and education at the place boaters need these tools and education so that they can effectively Clean, Drain and Dry watercraft and water related equipment before leaving the water access site.					\$792,995
							<b>Sub Total</b>	<b>\$792,995</b>
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								



	Miles/ Meals/ Lodging	Lodging, and Incidentals (Per "Commissioner's Plan" (\$71 M&IE +\$124 Lodging) - 5 days/nights	Lodging and incidentals to identify Civic Leaders, select and enhance sites, monthly meetings to build institutional partners and develop civic infrastructure with outreach and behavioral cues and ongoing support of local AIS efforts for 3 years.					\$7,215
	Miles/ Meals/ Lodging	Lodging and Incidentals (Per "Commissioner's Plan" (\$71 M&IE +\$124 Lodging) 1 day/night	Install, Service and Maintain Waterless Cleaning Stations at 31 Boat Ramps for 3 Years					\$2,275
							<b>Sub Total</b>	<b>\$9,490</b>
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Printing and Publication</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Other Expenses</b>								
		IoT capacity - 28 Units	Connect IoT to cell system to send real time use data and maintenance, ex. holding wet vacuum tank full. 1 years for 28 units.					\$24,700
		Software set up fees	Software set up fees for 6 counties - one time fee. (Wright County has already paid this fee.)					\$7,200
							<b>Sub Total</b>	<b>\$31,900</b>
							<b>Grand Total</b>	<b>\$1,000,000</b>

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
---------------	---------------------	-------------	--

## Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
<b>State</b>				
Cash	County AIS Prevention Aid, Pope County	General support of Stop Starry project to put waterless boat cleaning stations at all accesses on all starry stonewort infested lakes in Minnesota, and use civic organizing, education and social marketing to support use. Stations prioritized using MAISRC risk assessment algorithm and community capacity.	Secured	\$5,000
In-Kind	County AIS Prevention Aid, Hennepin County	Purchase, instal and management of waterless boat cleaning station at Medicine Lake, Three Rivers Park District, Plymouth for three years.	Secured	\$45,000
Cash	County AIS Prevention Aid, Cook County	General support of Stop Starry project to put waterless boat cleaning stations at all accesses on all starry stonewort infested lakes in Minnesota, and use civic organizing, education and social marketing to support use. Stations prioritized using MAISRC risk assessment algorithm and community capacity.	Secured	\$1,500
			<b>State Sub Total</b>	<b>\$51,500</b>
<b>Non-State</b>				
Cash	Island Lake Association	General support of Stop Starry project to put waterless boat cleaning stations at all accesses on all starry stonewort infested lakes in Minnesota, and use civic organizing, education and social marketing to support use. Stations prioritized using MAISRC risk assessment algorithm and community capacity.	Secured	\$150
			<b>Non State Sub Total</b>	<b>\$150</b>
			<b>Funds Total</b>	<b>\$51,650</b>

## Attachments

### Required Attachments

#### *Visual Component*

File: [a342566b-d68.pdf](#)

#### *Alternate Text for Visual Component*

The maps show site analysis for each of the 29 public water access sites where solar powered waterless boat cleaning stations will be located. Each site will be ranked by two criteria; 1) potential risk as a source of starry stonewort spread based on the MAISRC risk assessment tool, 2) local support for the project and potential partnerships. We will deploy waterless as funding becomes available....

#### *Financial Capacity*

File: [2c38f72a-af9.pdf](#)

#### *Board Resolution or Letter*

Title	File
MLR Board resolution in support	<a href="#">ccf74b20-3ab.pdf</a>
Background Check Certification	<a href="#">d61ec30b-1a9.pdf</a>

### Optional Attachments

#### *Support Letter or Other*

Title	File
Lake Koronis Assoc. Ltr of Support	<a href="#">42b768db-c07.pdf</a>
Cass SWCD Support Ltr.	<a href="#">e5bddd9b-fb9.pdf</a>
UofM NRRI Support Ltr	<a href="#">339cc057-e28.pdf</a>
Nat'l Pro. Anglers Support Ltr	<a href="#">8fcb125e-ccc.pdf</a>
Cass Co. Env. Services Ltr. Support	<a href="#">5cb711c3-e68.pdf</a>
Lake Sylvia Support Ltr	<a href="#">310e6eba-74a.pdf</a>
Pope County Support Ltr.	<a href="#">f9336240-b80.pdf</a>
Initiative Foundation Support Ltr.	<a href="#">d69c3b44-4f6.pdf</a>
Beltrami County Support Letter	<a href="#">80a17b7f-99a.pdf</a>
Stearns County Support Ltr.	<a href="#">15f0b7e3-bb7.pdf</a>

### Difference between Proposal and Work Plan

#### *Describe changes from Proposal to Work Plan Stage*

During the LCCMR process, the budget was reduced from \$1,676,000 to \$1,000,000. We were able to manage this by leaning on partners to pick up annual maintenance and connectivity costs - the original budget included these costs for all three years of the project. In addition we identified low risk/use access site that do not require a "Wayside Solar" station and substituted an "Outpost" station at these sites. This year Lake Cornelian was listed as Starry Stonewort infested, and was added to the list of lakes we will protect.

## Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

**Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?**

Yes

**Do you agree travel expenses must follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?**

Yes, I agree to the Commissioner's Plan.

**Does your project have potential for royalties, copyrights, patents, or sale of products and assets?**

No

**Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?**

N/A

**Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?**

N/A

**Does your project include original, hypothesis-driven research?**

No

**Does the organization have a fiscal agent for this project?**

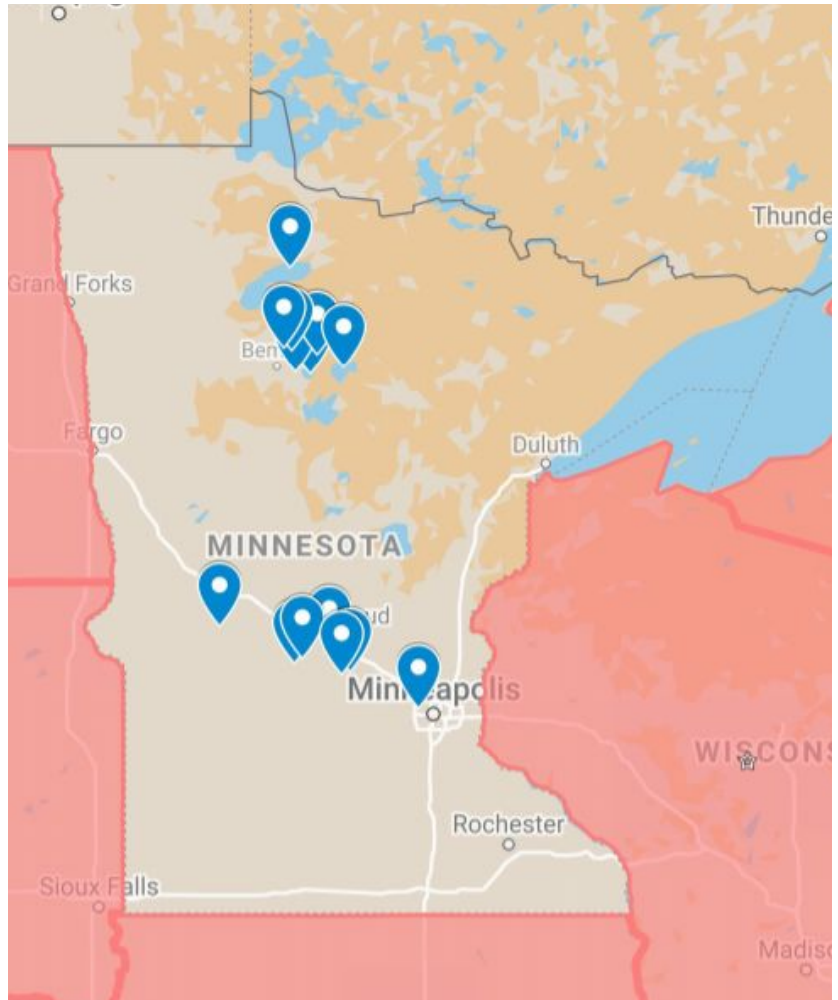
No

# Stop Starry Stonewort Project

## Site Analysis: State of Minnesota

As per MN DNR Data (April 2020)  
Lakes with Starry Stonewort are  
as follows:

1. Cass Lake
2. Lake Winnibigoshish
3. Lake Koronis
4. Medicine Lake
5. Lake Minnewaska
6. Rice Lake
7. Turtle Lake
8. Moose Lake
9. Pleasant Lake
10. Sylvia/Twin Lake
11. Big Wolf Lake
12. Grand Lake
13. Upper Red Lake
14. Beltrami Lake



Maps within have:

- **Water Access Name**
- **Administrator**
- **County**
- **Boat Cleaning System Location Considerations**

# Stop Starry Stonewort Project

## Site Analysis: Upper Red Lake (Tamarac River)



**Water Access Name:** Tamarac River  
(W) State Water Access Site

**Administrator:** DNR Division of Parks  
and Trails

**County:** Beltrami

### **Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow





# Stop Starry Stonewort Project

## Site Analysis: Beltrami Lake



**Water Access Name:** Beltrami Lake State Water Access Site

**Administrator:** DNR Division of Parks and Trails

**County:** Beltrami

### Boat Cleaning System Location Considerations:

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow





# Stop Starry Stonewort Project

## Site Analysis: Cass Lake



**Water Access Name:** Cass Lake, Knutson Dam State Water Access Site (Upper Left)

Cass Lake, Norway Beach (S) State Water Access Site (Right)

Cass Lake, Wanaki (SE) State Water Access Site (Lower Left)

**Administrator:** US Forest Service

**County:** Cass and Beltrami

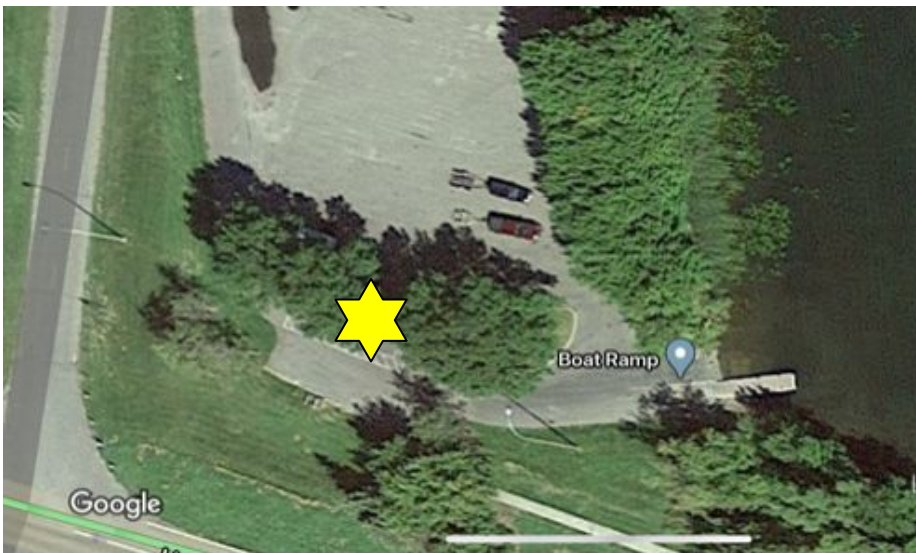
**Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Cass Lake



**Water Access Name:** Cass Lake (E) State Water Access Site

Cass Lake Hwy2 State Water Access Site

Cass Lake, Allens Bay (N) State Water Access Site

**Administrator:** US Forest Service, DNR Parks and Trails

**County:** Cass and Beltrami

**Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Grand Lake



**Water Access Name:** Grand Lake State Water Access Site

**Administrator:** DNR Division of Parks and Trails

**County:** Stearns

### **Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Lake Koronis



**Water Access Name:** Koronis Lake, Co Park State Water Access Site (bottom)  
Koronis Lake, Hwy55 State Water Access Site (Left), Koronis Lake, Lake Park State Water Access Site (Right)

**Administrator:** Stearns County, Parks Department, DNR Division of Parks and Trails, City of Paynesville

**County:** Stearns & Meeker

**Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow

# Stop Starry Stonewort Project

## Site Analysis: Lake Winnibigoshish



**Water Access Name:** Lake Winnibigoshish, Reese Landing State Water Access Site  
Lake Winnibigoshish, Richards Townsite State Water Access Site  
Lake Winnibigoshish, Tamarack Point State Water Access Site

**Administrator:** US Forest Service

**County:** Cass

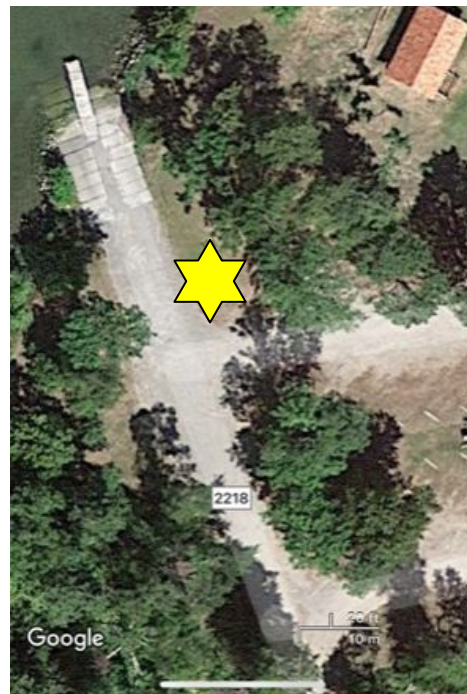
**Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Lake Winnibigoshish



**Water Access Name:** Lake Winnibigoshish, Third River Flowage Public Water Access Site (Left), Lake Winnibigoshish, Birches State Water Access Site, Lake Winnibigoshish, Plughat Pt Rd State Water Access Site (Right)

**Administrator:** US Forest Service

**County:** Cass and Itasca

**Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow

# Stop Starry Stonewort Project

## Site Analysis: Lake Minnewaska



**Water Access Name:** Minnewaska Lake (N) State Water Access Site (Right) , Minnewaska Lake (NE) State Water Access Site (Lower Left), Minnewaska Lake (NW) State Water Access Site (Upper Left)

**Administrator:** DNR Division of Parks and Trail (Right)s, City of Minnewaska (Lower Left) City of Starbuck (Upper Left)

**County:** Pope

### **Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Moose Lake



**Water Access Name:** Moose Lake State Water Access Site



**Administrator:** DNR Division of Parks and Trails

**County:** Beltrami

### **Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Pleasant Lake (N)



**Water Access Name:** Pleasant Lake (N) State Water Access Site

**Administrator:** Wright County, Parks Department

**County:** Wright

**Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Pleasant Lake (S)



**Water Access Name:** Pleasant Lake (S) State Water Access Site



**Administrator:** City of Annandale

**County:** Wright

### **Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow

# Stop Starry Stonewort Project

## Site Analysis: Rice Lake



**Water Access Name:** Rice Lake (N) State Water Access Site (Left), Rice Lake (S) State Water Access Site (Right)

**Administrator:** DNR Division of Parks and Trails

**County:** Stearns

### Boat Cleaning System Location Considerations:

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Turtle Lake



**Water Access Name:** Turtle Lake State Water Access Site

**Administrator:** DNR Division of Parks and Trails

**County:** Beltrami

**Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Twin Sylvia Lake



**Water Access Name:** Twin/Sylvia Lake State Water Access Site

**Administrator:** DNR Division of Parks and Trails

**County:** Wright

### **Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Twin Sylvia Lake



**Water Access Name:** Twin/Sylvia Lake  
State Water Access Site

**Administrator:** DNR Division of Parks  
and Trails

**County:** Wright

**Boat Cleaning System Location  
Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow



# Stop Starry Stonewort Project

## Site Analysis: Wolf Lake



**Water Access Name:** Wolf Lake State Water Access Site



**Administrator:** DNR Division of Parks and Trails

**County:** Beltrami

### **Boat Cleaning System Location Considerations:**

1. Locate as Clean In/ Out location.
2. Precast base can be placed on any level surface. Install bollards as needed.
3. Redo the signage & arrows and/or stop signs to promote traffic flow

