

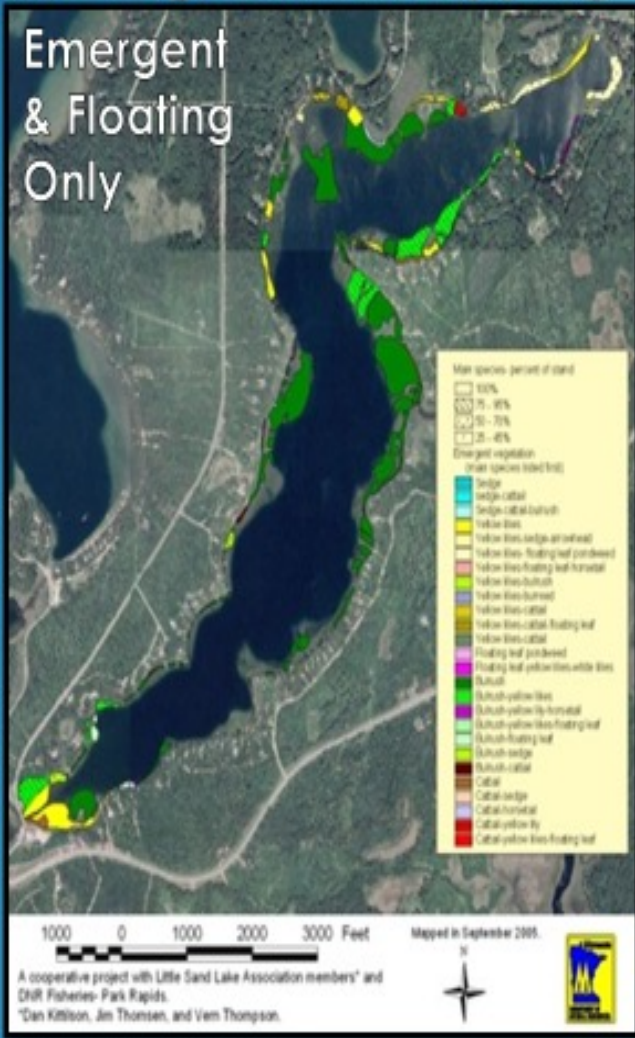
# 2022 Aquatic Vegetation Survey: Project and Results

<b>Total Cost:</b>	<b>\$2,333</b>
<b>COLA Grant:</b>	<b>\$1,166</b>
<b>LSLAA Cost:</b>	<b>\$1,166</b>

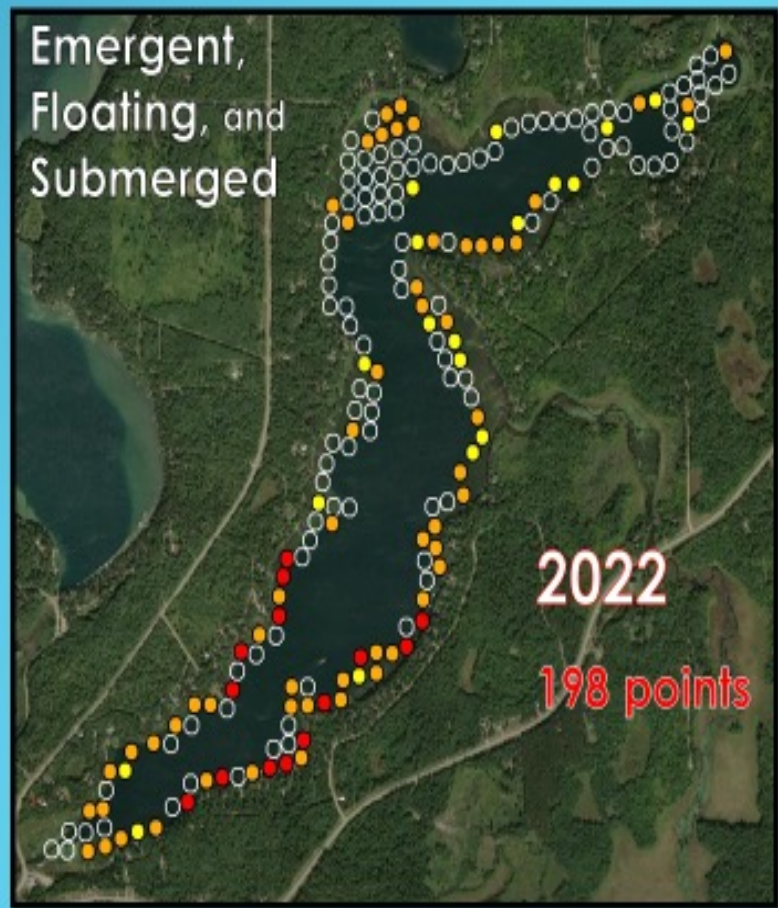
Full report from [RMB Environmental Laboratories](#) is available.

# Little Sand Lake

## Aquatic Vegetation Mapping and Monitoring – *an ongoing project*



Near Right:  
2005 –  
2008  
180 points



# Little Sand Lake

## Aquatic Vegetation Mapping and Monitoring –

*an ongoing project*

### **WHY MONITOR AQUATIC PLANTS?**

- Awareness of the Importance of Aquatic Plants
- Encourage Lakeshore Owners to Preserve Shoreline in a Natural State
- Provide Benchmark for Ongoing Monitoring of the Health of the Lake
- Detect Exotic Species (AIS)
- Detect Excessive Plant Removal

# Little Sand Lake

Aquatic Vegetation Mapping and Monitoring –  
*an ongoing project*



## **PURPOSE**

- Creates an AIS baseline
- Identifies sensitive areas
- Provides a historical record
- Service to other environmental monitoring agencies such as UofM and DNR:
  - Minnesota Aquatic Invasive Species Research Center (MAISRC), University of Minnesota
  - DNR Fisheries

# Little Sand Lake

Aquatic Vegetation Mapping and Monitoring –

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## **PROPERTY VALUES**

Property values are impacted by Water quality / Water clarity

Having a healthy variety and quantity of vegetation contributes to higher water quality

*Charles Parson, geography professor at BSU, and Patrick Welle, a BSU professor of economics and environmental studies, co-authored a study titled "Lakeshore Property Values and Water Quality" and released the findings in June 2011. Their conclusion: The better the water clarity in a lake, the higher the value of the land around that lake.*

# Little Sand Lake

## Aquatic Vegetation Mapping and Monitoring – *an ongoing project*

### **HISTORY and BACKGROUND**

**2004:** LSL leaders attend “visioning” session.

**2005 & 2006:** LSL leaders create a “Lake Management Plan,” and volunteers conduct initial aquatic plant inventory.

**2006:** HC COLA creates a plan to conduct aquatic plant mapping on selected lakes to determine a more in-depth analysis of each lake’s ecosystem.

Little Sand, Bottle, Big Sand, and Potato participate.

**2008:** Vegetation mapping conducted (180 points) and plans for ongoing monitoring developed.

**2015:** “Lake Management Plan” (2005) is updated to create the “Little Sand Lake Stewardship Action Planning Guide.”

**2022:** As follow-up to 2006 & 2008 mappings, LSLAA contracts with RMB Labs to conduct an updated Vegetation Survey (198 points).

**Ongoing:** LSL volunteers monitor lake for aquatic vegetation & AIS.

# Aquatic Vegetation Mapping and Monitoring – *an ongoing project*

## **METHOD**

2005

(From Dan Kittilson's presentation)

- **“Circling the Bulrushes & Lily Pads”**
- **Three Old Codgers (Gone High Tech)**
  - Jim Thomsen, Vern Thompson & Dan Kittilson
- **Throwing Rakes and Arguing about Plant ID While Sampling Submerged Vegetation**
- **Joint Partnership with DNR in 2005-06**
- **Joint Partnership with HC COLA & Other Area Lakes**
- **Utilizing GPS/GIS, Edie Evarts develops color-coded maps showing Emergent & Floating Leaf Vegetation**



Note high-tech device used in 2005

# Aquatic Vegetation Mapping and Monitoring – an ongoing project

## 2022 – RMB Labs **METHOD**

- Followed RMBEL and DNR Standard Operating Procedures for Point Intercept Surveys.
- Points surveyed previously were projected in the boat's GPS system.
- Double-headed, weighted garden rake attached to a rope was used to survey vegetation.
- Observations also made visually and with sonar.
- Vegetation found under the surface by use of the rake was categorized as follows:
  - 0 = absent,
  - 1 = rare ( $\leq 1/3$  of the rake head covered),
  - 2 = scattered ( $>1/3$  but  $\leq 2/3$  of the rake head covered),
  - 3 = common ( $>2/3$  of the rake head covered), and
  - 4 = abundant (plants over top of rake head).
- Plant identification followed Blickenderfer (2007)



*Same high-tech device as used in 2008.*

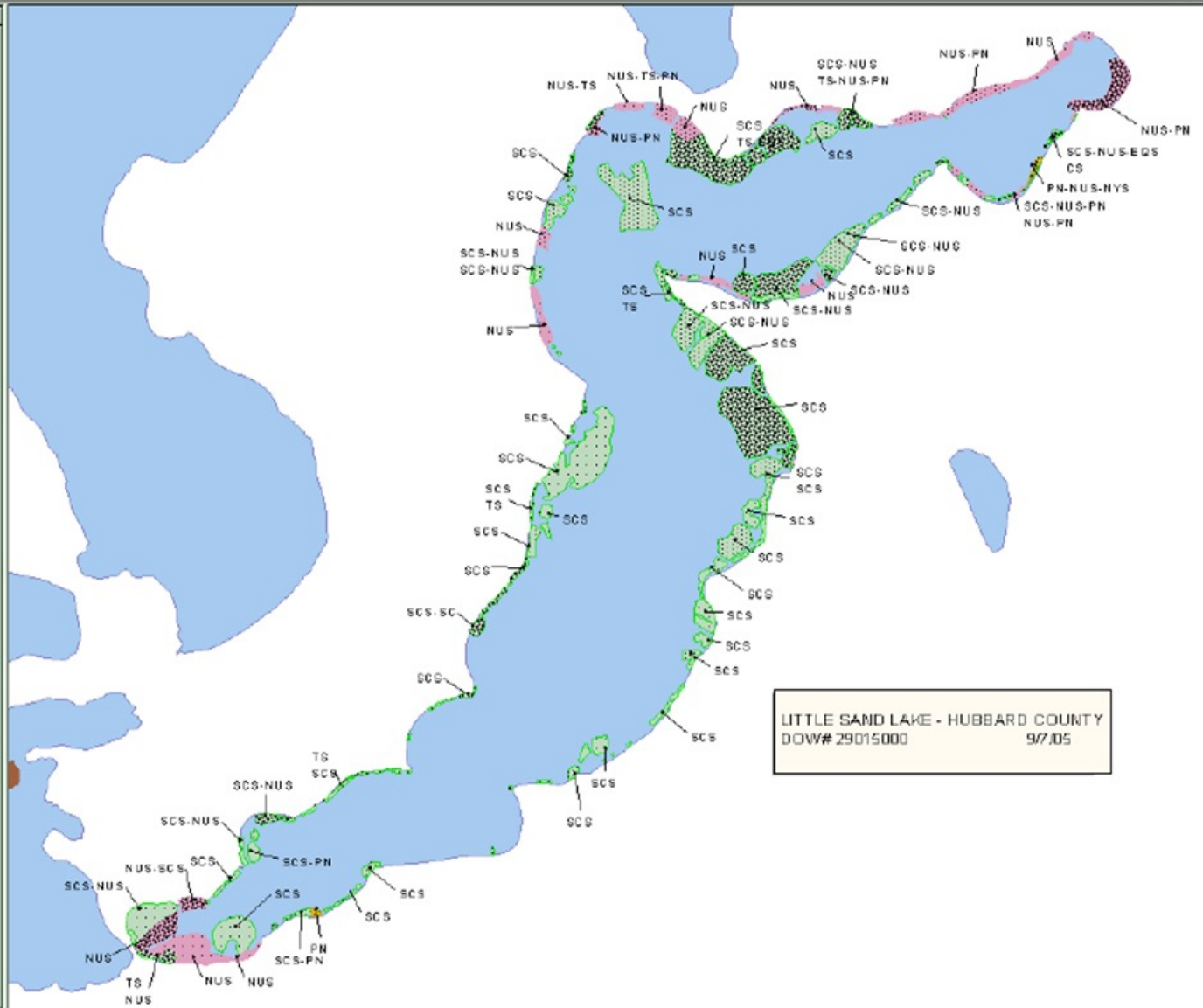


# RESULTS/OBSERVATIONS – 2005-06

- With 409 acres, 74 are covered by emergent or floating leaf vegetation (18%)
- 79% of vegetation mapped was emergent and 21% was floating leaf types
- **Bulrush was most common** (79% was Bulrush)
- **Yellow water lilies** is next most common (21% of acreage)
- 70% of Little Sand's shoreline is vegetated with high quality vegetation that provides critical shoreline habitat for fish and wildlife.
- Bulrush, cattail, and water lilies dampen wave energy and help protect shorelines from erosion.
- Little Sand has 198 littoral acres from 0 to 20 ft. (where emergent vegetation or submerged vegetation can grow)

LITTLE SAND LAKE - HUBBARD COUNTY

- Counter in Minnesota
- Stand Density
  - Dense
  - Moderate
  - Sparse
  - Variable
- Dominant Species Type
  - Emergent
  - Submergent
  - Floating Leaf
  - Free-floating
- DNR 100K Lakes and Rivers



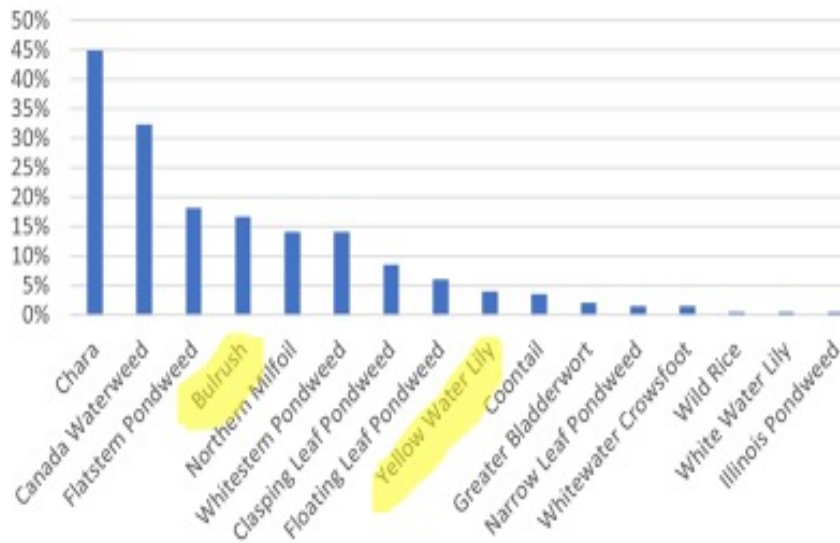
LITTLE SAND LAKE - HUBBARD COUNTY  
DOV# 29015000 9/7/05

# RESULTS – 2022

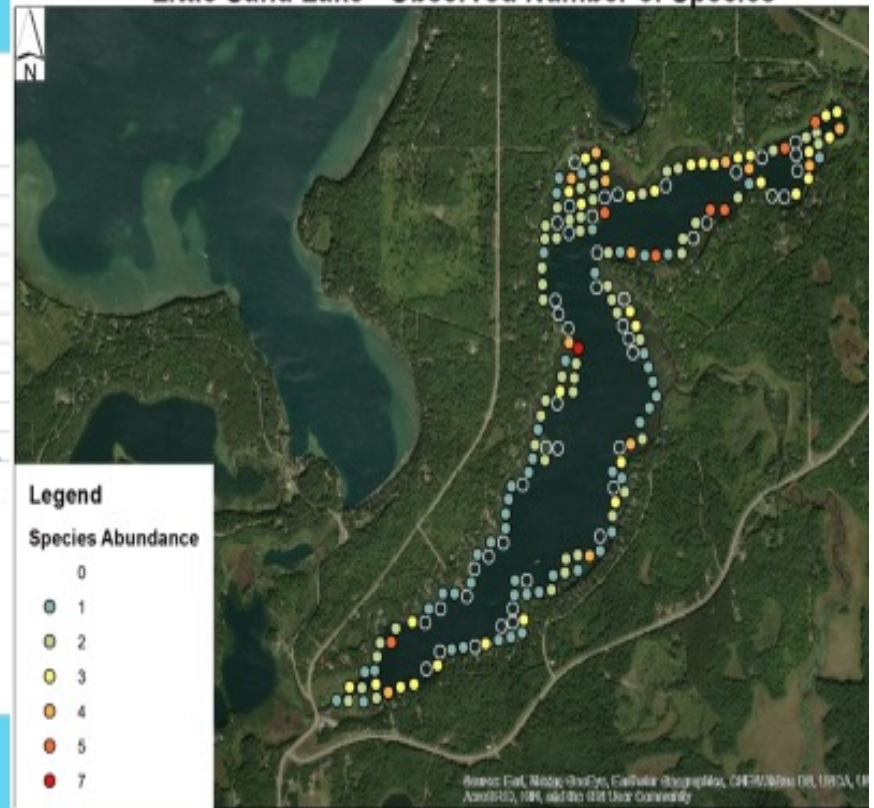
## Species Abundance

Emergent, Floating, and Submerged

Species Abundance - Little Sand Lake



Little Sand Lake - Observed Number of Species



# RESULTS – 2022

## Species Abundance – Submerged, Floating, Emergent

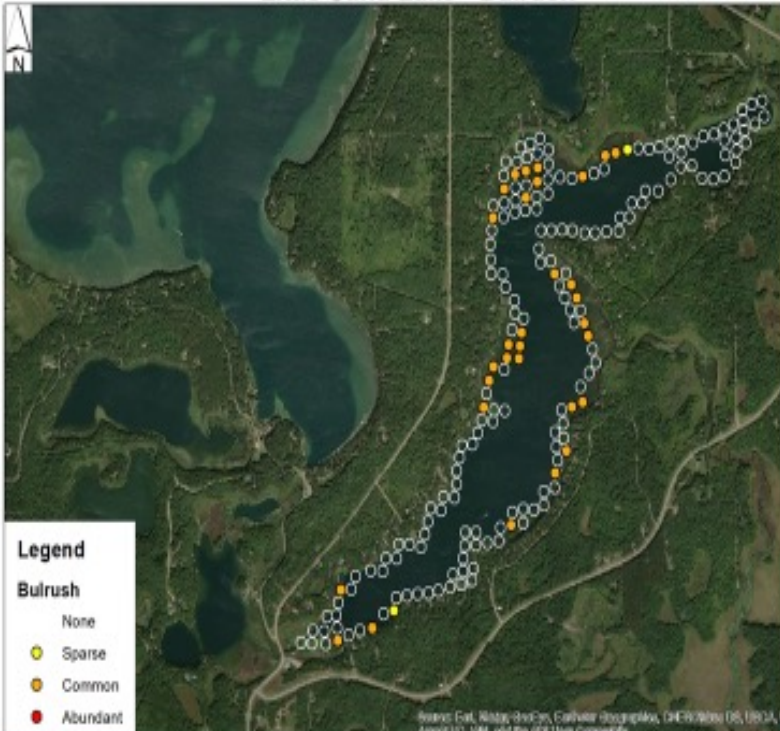
Table 2. Aquatic plants surveyed in Little Sand Lake, Hubbard County, MN

Life Form	Common Name	Count	Frequency
<b>SUBMERGED – ANCHORED</b> – These plants grow primarily under the water surface. Upper leaves may float near the surface and flowers may extend above the surface. Plants are often rooted or anchored to the lake bottom.	Chara	89	45%
	Canada Waterweed	64	32%
	Flatstem Pondweed	36	18%
	Northern Milfoil	28	14%
	Whitestem Pondweed	28	14%
	Clasping Leaf Pondweed	17	9%
	Coontail	7	4%
	Greater Bladderwort	4	2%
	Narrow Leaf Pondweed	3	2%
	Whitewater Crowsfoot	3	2%
Illinois Pondweed	1	1%	
<b>FLOATING – LEAF</b> – These plant leaves float on water and are anchored to the bottom of the lake.	Floating Leaf Pondweed	12	6%
<b>EMERGENT</b> – These plants extend above the water surface and are found in shallow water.	Bulrush	33	17%
	Yellow Water Lily	8	4%
	White Water Lily	1	1%
	Wild Rice	1	1%
Total number of plants (species diversity for the lake)		16	
Total number of plant occurrences		355	
Total number of sites		198	

# RESULTS – 2022: Abundance by Species

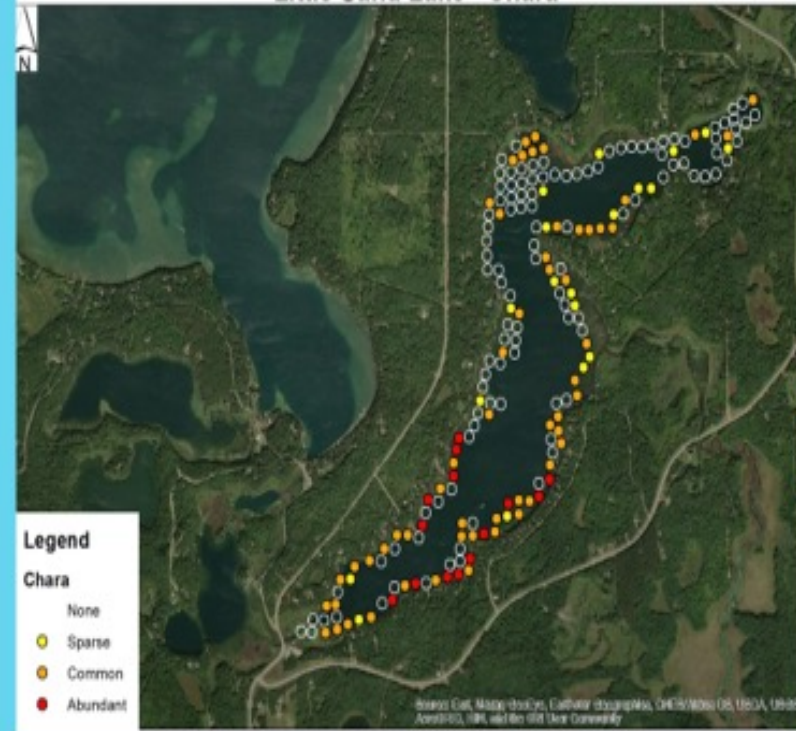
Received maps by species that showed the density of the species at each point.  
A few examples:

Little Sand Lake - Bulrush



Bulrush is an emergent species

Little Sand Lake - Chara



Chara is a submerged—or anchored—species

# RESULTS – 2022: Abundance by Species

Received maps by species that showed the density of the species at each point.  
A few examples:



# SUMMARY – 2022



- The presence of plants and the depth at which one finds them is related to the water clarity.
- The Minnesota DNR lists the littoral area of Little Sand Lake to be approximately 36% of the total surface area, and the findings of this plant survey support these findings.
- In general, the littoral area is approximated as the area of the lake that is 15 feet deep or less; in this plant survey, no plants were found deeper than 16 feet.
- While sampling was focused in the littoral area, actual depths encountered ranged up to 20 feet.

**FULL REPORT FROM RMB LABS WILL BE POSTED ON OUR WEBSITE.**

Go there for more detail.

# Little Sand Lake

## Aquatic Vegetation Mapping and Monitoring –

*an ongoing project*

### **GOING FORWARD**

1. Continue vegetation and AIS monitoring of six sites on Little Sand that Marshall Howe and his team do each year. This team has a focus on monitoring for AIS. Marshall plans to do that 4X in 2023 and usually does it 3X each year.
2. Develop a Volunteer Shoreline Monitoring Program to detect AIS as early as possible. Plan to monitor aquatic vegetation around the lake two times per year. Little Sand will model this program after Belle Taine's program to the extent possible.
3. Contract to have a professional Aquatic Vegetation Survey done in 2033.



Same high-tech device used by LSL team to check for AIS vegetation.



# Little Sand Lake

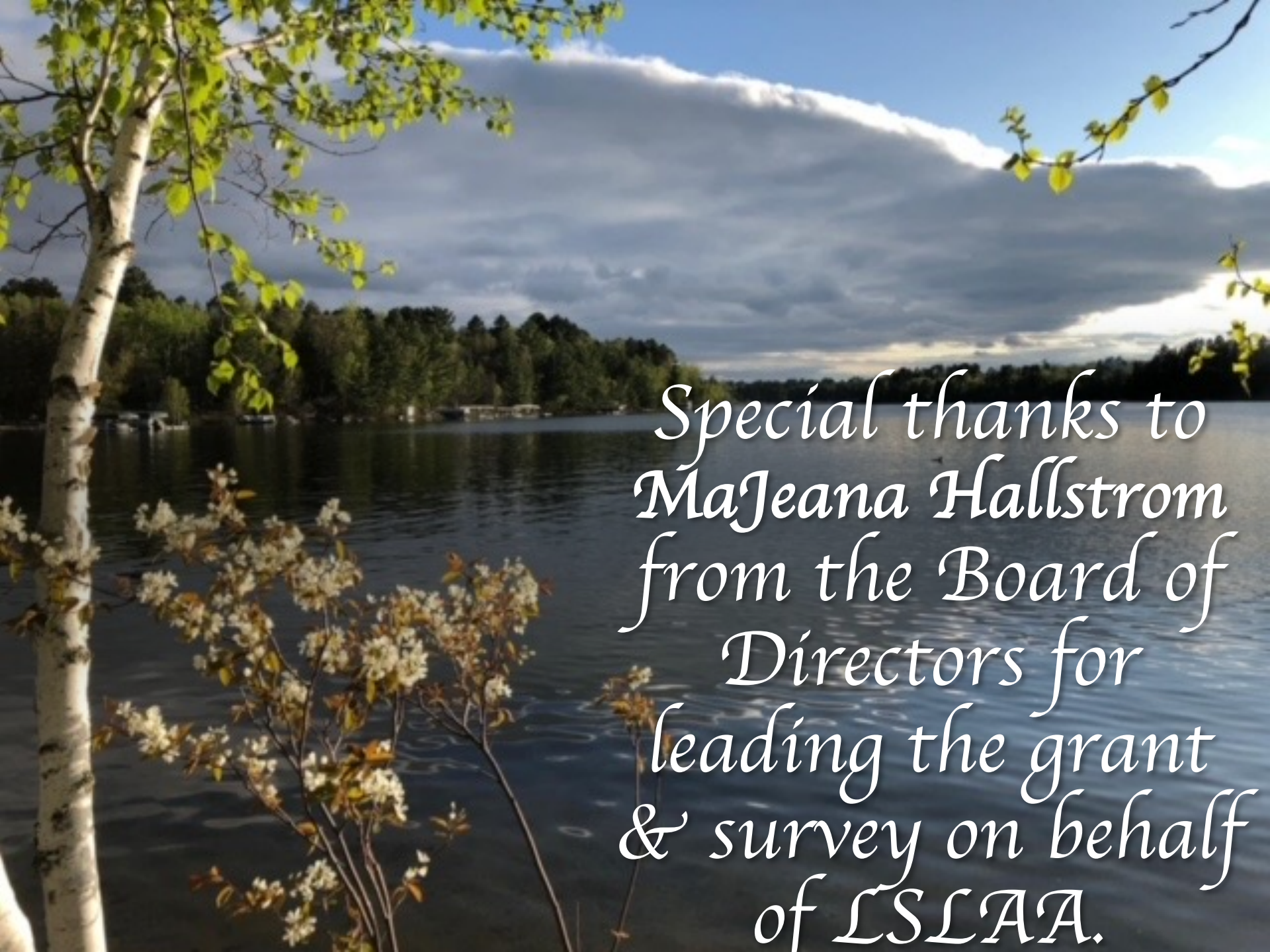
## Aquatic Vegetation Mapping and Monitoring –

*an ongoing project*

### **ACKNOWLEDGEMENTS**

#### *Thank you to...*

- Our dedicated lake volunteers—Dan Kittilson, Jim Thomsen, Vern Thompson—who initiated vegetation mapping starting in 2005 and worked with the DNR and HC COLA through 2008 to refine the process.
- Hubbard County COLA for providing a grant that helped support Little Sand Lake's contract with RMB Labs to conduct a professional aquatic vegetation survey in June 2022.
- Marshall Howe for years of leading Little Sand Lake's healthy lake initiatives, especially those pertaining to monitoring lake vegetation for AIS.
- Sharon Natzel, HC COLA President, and Marshall Howe for providing suggestions and guidance regarding ongoing monitoring of Little Sand Lake's aquatic vegetation.



*Special thanks to  
MaJeana Hallstrom  
from the Board of  
Directors for  
leading the grant  
& survey on behalf  
of LSLAA.*