



2023 Shoreline Inventory

Bone – Comfort - Forest

Aidan Read





Introduction

2023 inventories included Forest, Comfort, and Bone Lakes.

Inventories used a modified Score The Shore method.

Results show shoreline area meeting District goals is steady or declining.

Data gathered during the inventory will be used for prioritization and targeting.





District Goals

Goal 5: Promote natural, deep rooted, native vegetation buffers to ensure at least 75% of lakeshore parcels have at least 75% natural shoreline condition. For example, in its last shoreline survey 55% of parcels on Bone Lake were covered in at least 75% natural shoreline vegetation; the goal is to ensure 75% of parcels are vegetated thusly. See **Table 3-2, P.62.**

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
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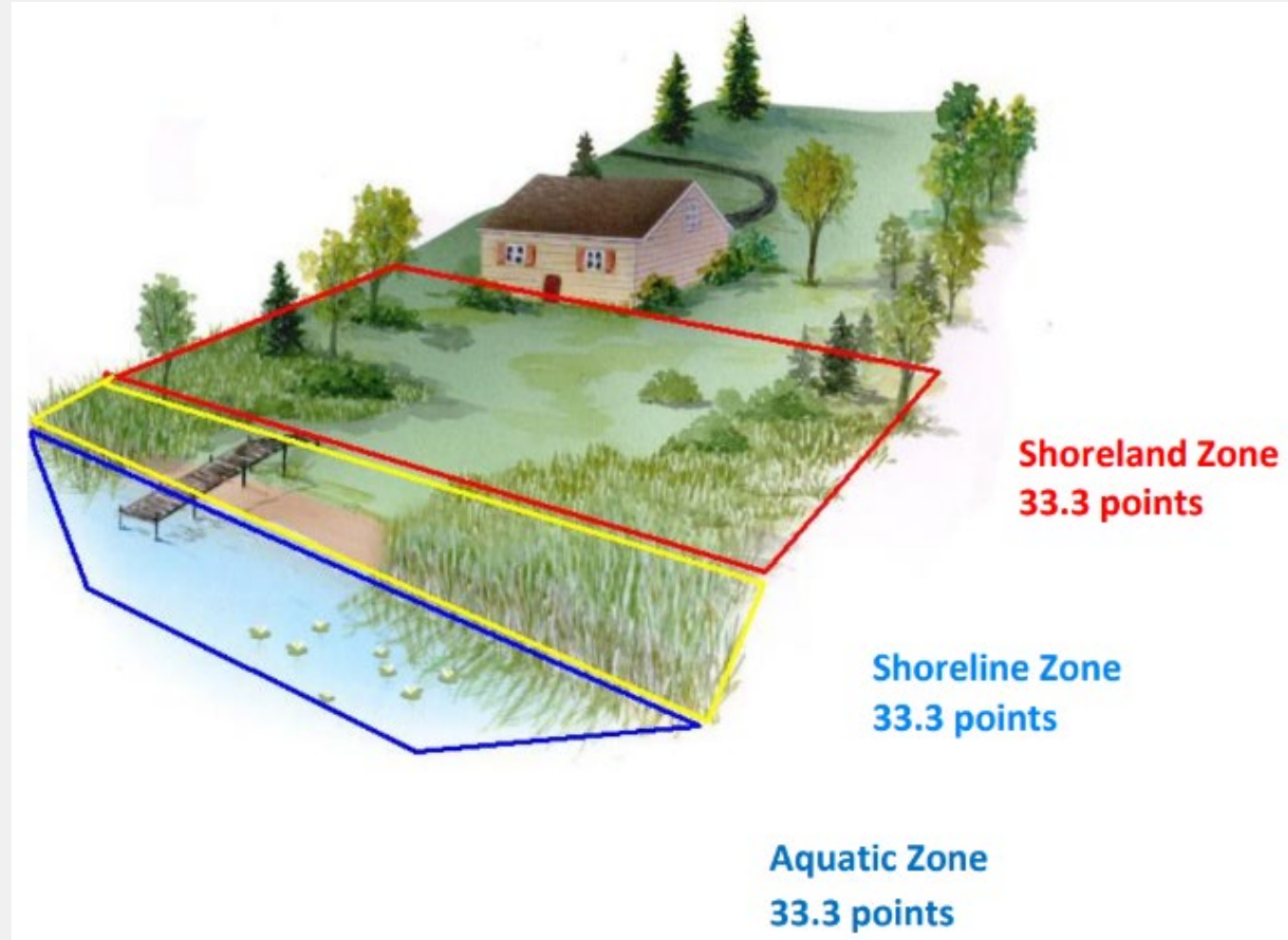


About Score The Shore

Developed by the DNR for rapid assessments of lake shore habitat

Adapted for our shoreline inventories

Provides a standard metric of shoreline health for comparison between waterbodies





About Score The Shore

Each zone is scored,
maximum total score of 100.

For major watersheds
statewide:

Mean - 67

Max - 82

Min - 37

Table 3-3 Interpretation of Score The Shore survey data

Mean Lakewide Score	Mean Shoreland Score	Mean Shoreline Score	Mean Aquatic Score	Rating
85 -100	28 -33.3	28 -33.3	28 -33.3	High
66-84	22-27	22-27	22-27	Moderate
50-65	17-21.5	17-21.5	17-21.5	Low
<50	<17	<17	<17	Very Low



STS vs District Goals?

STS

- Numeric score, qualified from very low to high
- Standard metric used throughout MN
- More detailed data on the entire near-shore area

District Goals

- “Natural shoreline condition”
- Defined in 2022-2031 Watershed Management Plan
- One component of STS, and is included in the score



Defining Natural Cover

Lake Keewahtin Example:
100% natural shoreline cover
100% shoreline trees or shrubs

*And yes, there's a house there
(with canoe access)*





Defining Natural Cover

Bone Lake Example:

75-100% natural shoreline cover

75-100% shoreline trees or shrubs

Note the overhanging woody habitat





Defining Natural Cover

Bone Lake Example:
50-74% natural shoreline
cover
1-24% shoreline trees or
shrubs





Defining Natural Cover

Bone Lake Example:
25-49% natural shoreline
cover
25-49% shoreline trees,
shrubs, or wetland





Defining Natural Cover

Bone Lake Example:

0% natural shoreline cover

1-24% shoreline trees, shrubs,
or wetland



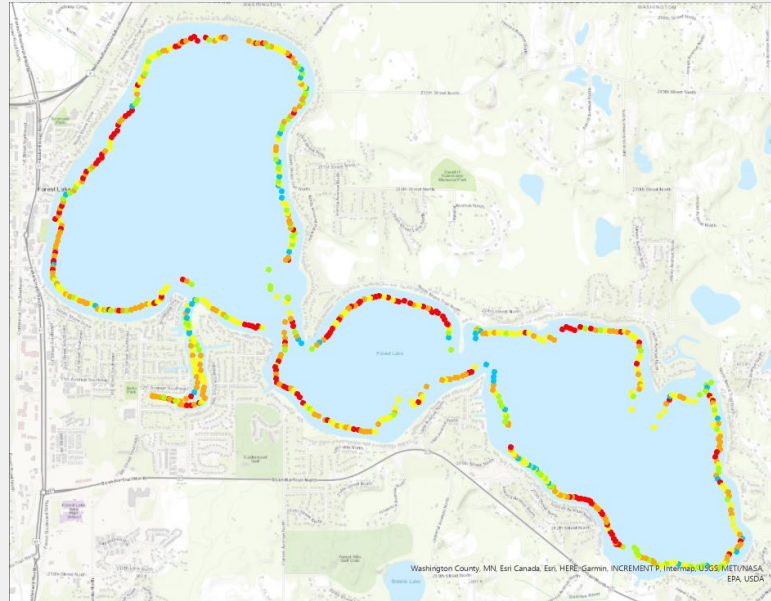


Lakewide Scores



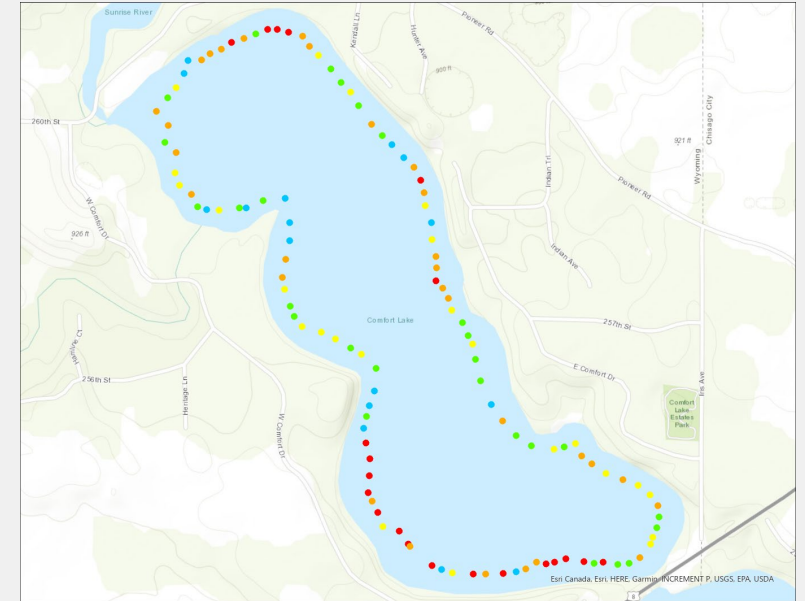
Bone - Low

- Aquatic – 19.53
- Shoreland – 20.98
- Shoreline – 23.29
- **Total – 63.80**



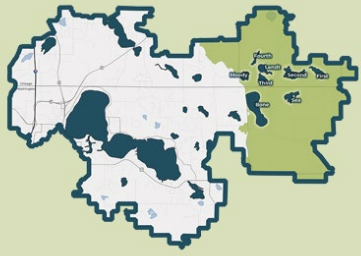
Forest – Very Low

- Aquatic – 17.52
- Shoreland - 13.87
- Shoreline – 10.57
- **Total – 41.96**



Comfort - Low

- Aquatic – 15.45
- Shoreland – 21.74
- Shoreline – 19.15
- **Total – 56.34**



Bone Lake Management District

Lake Area: 221.5 acres

Shoreline: 3.01 miles

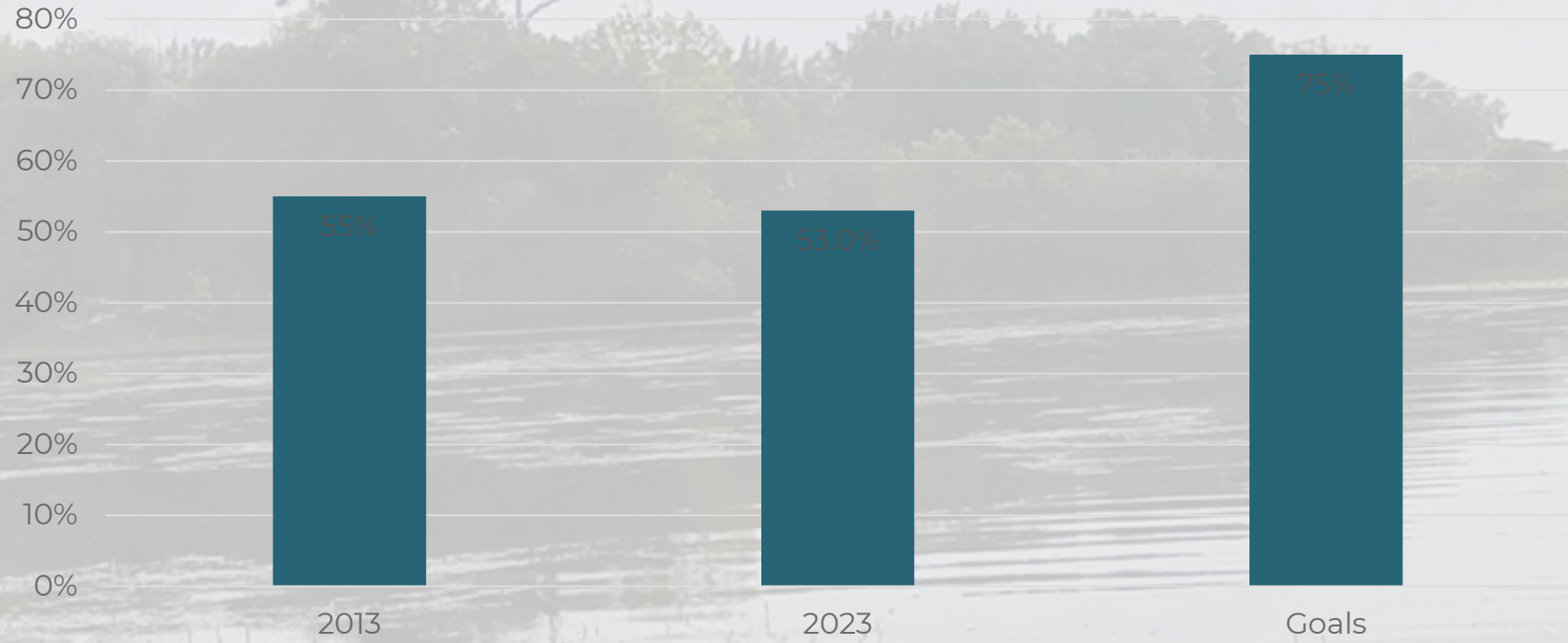
Lake Habitat Score: LOW

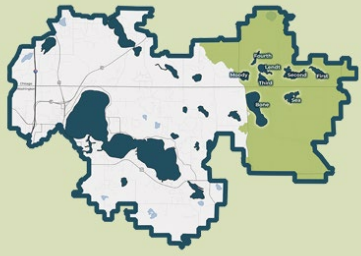
Natural Shoreline Cover: 53%

Bone Lake Shoreline

Shoreland	Shoreline	Aquatic	Total STS Score
20.98	23.29	19.53	63.80
Low	Moderate	Low	Low

Bone Lake Shoreline With >75% Natural Cover

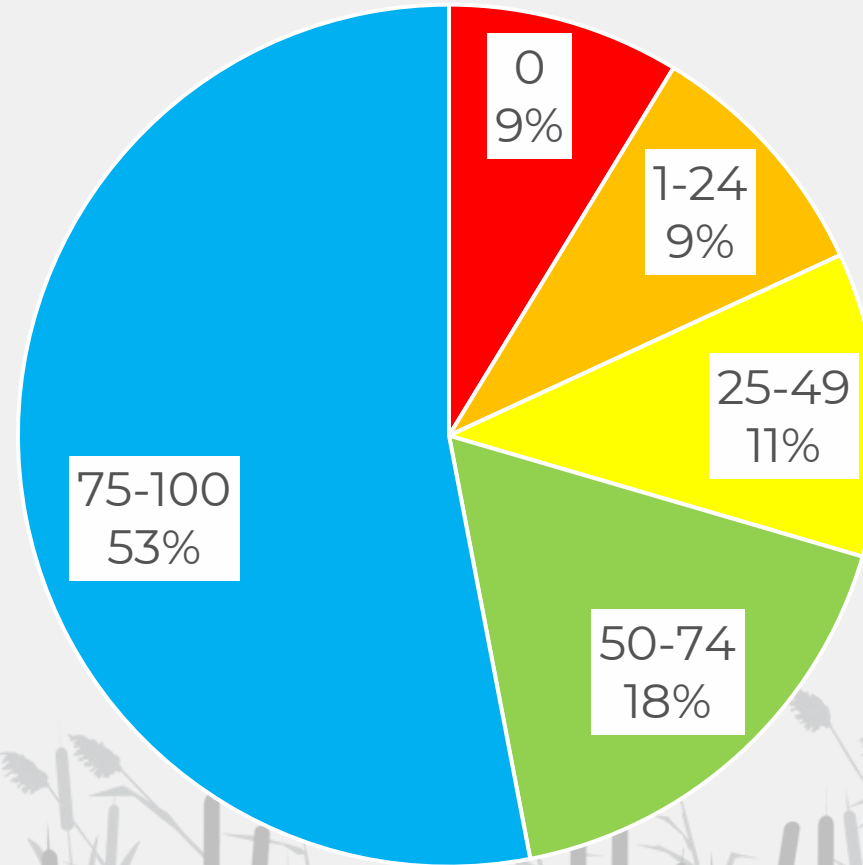




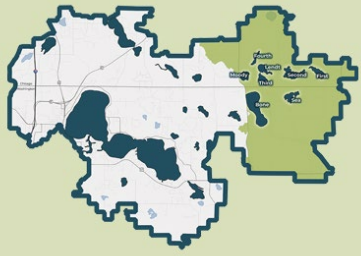
**Bone Lake
Management District**

Bone Lake – Shoreline Natural Vegetation

Bone Lake has 53% of shoreline meeting our goals, with a goal of 75%.

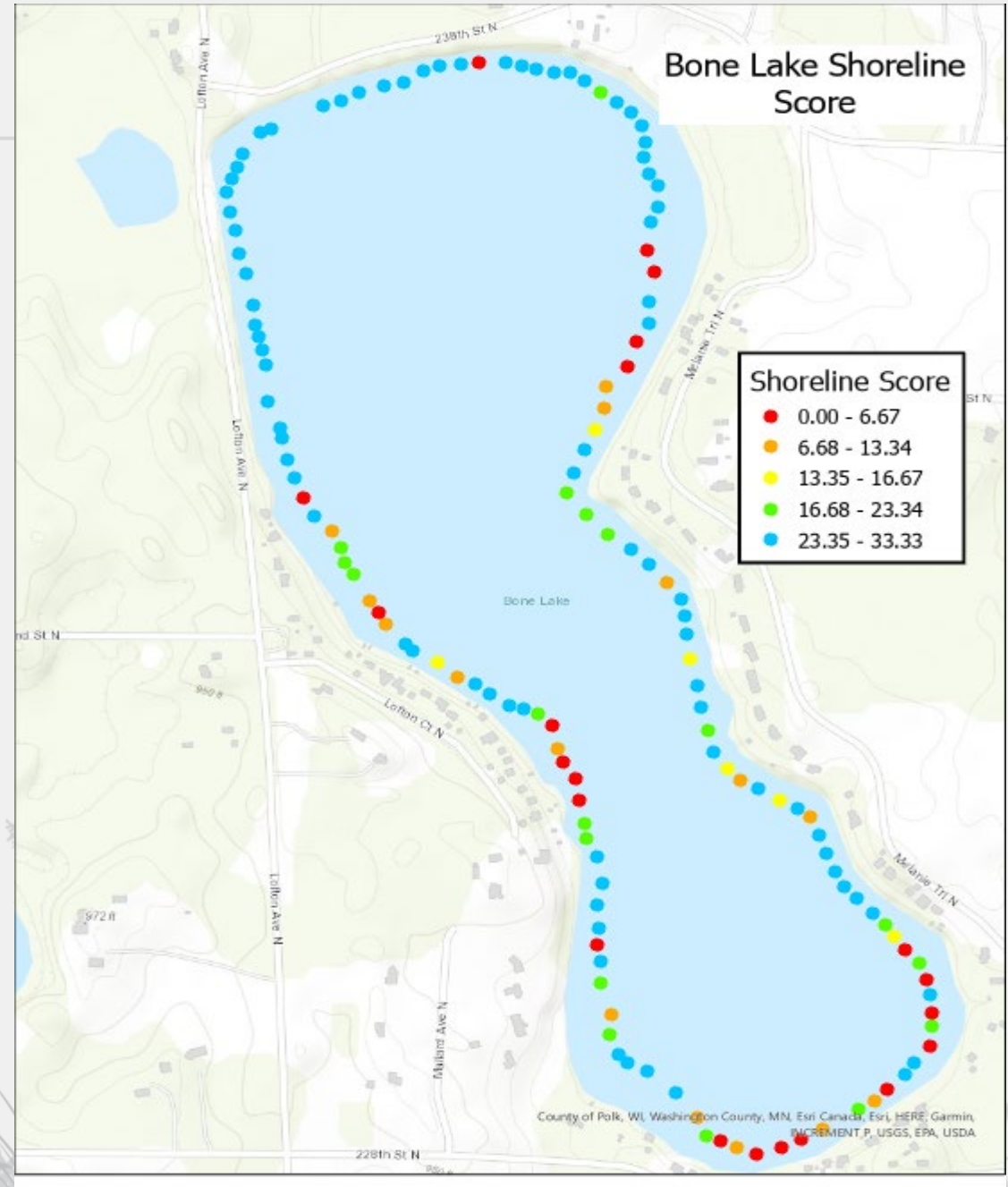
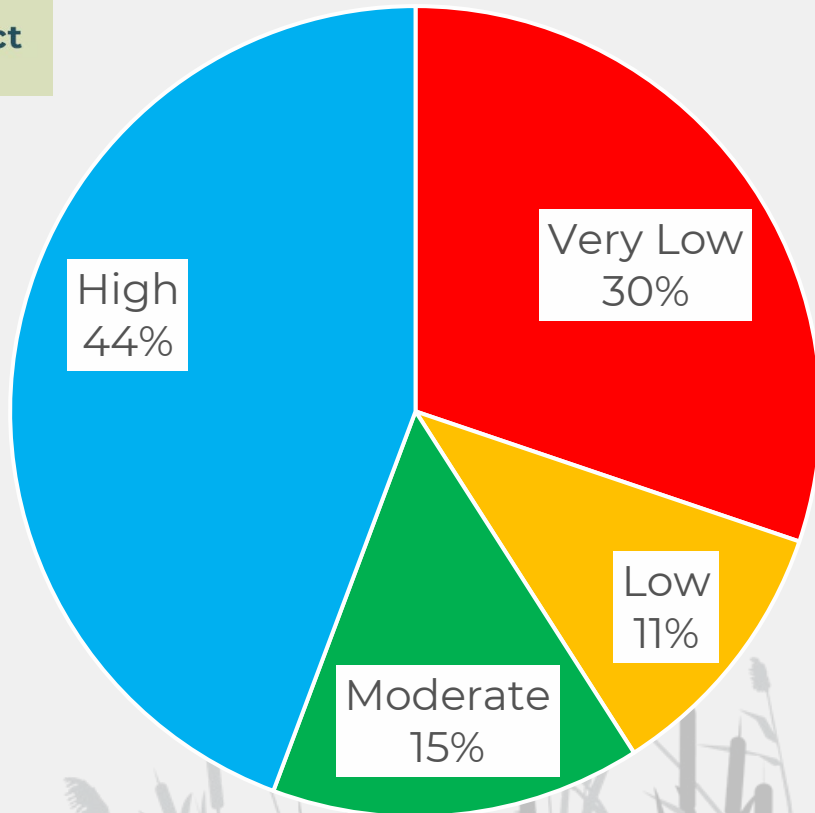


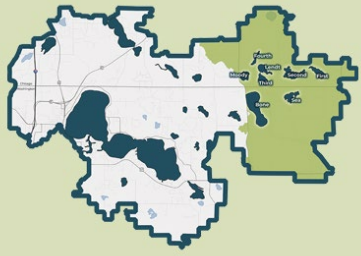
A focus of improvement is the 39% of shoreline with less than 50% natural cover.



Bone Lake Management District

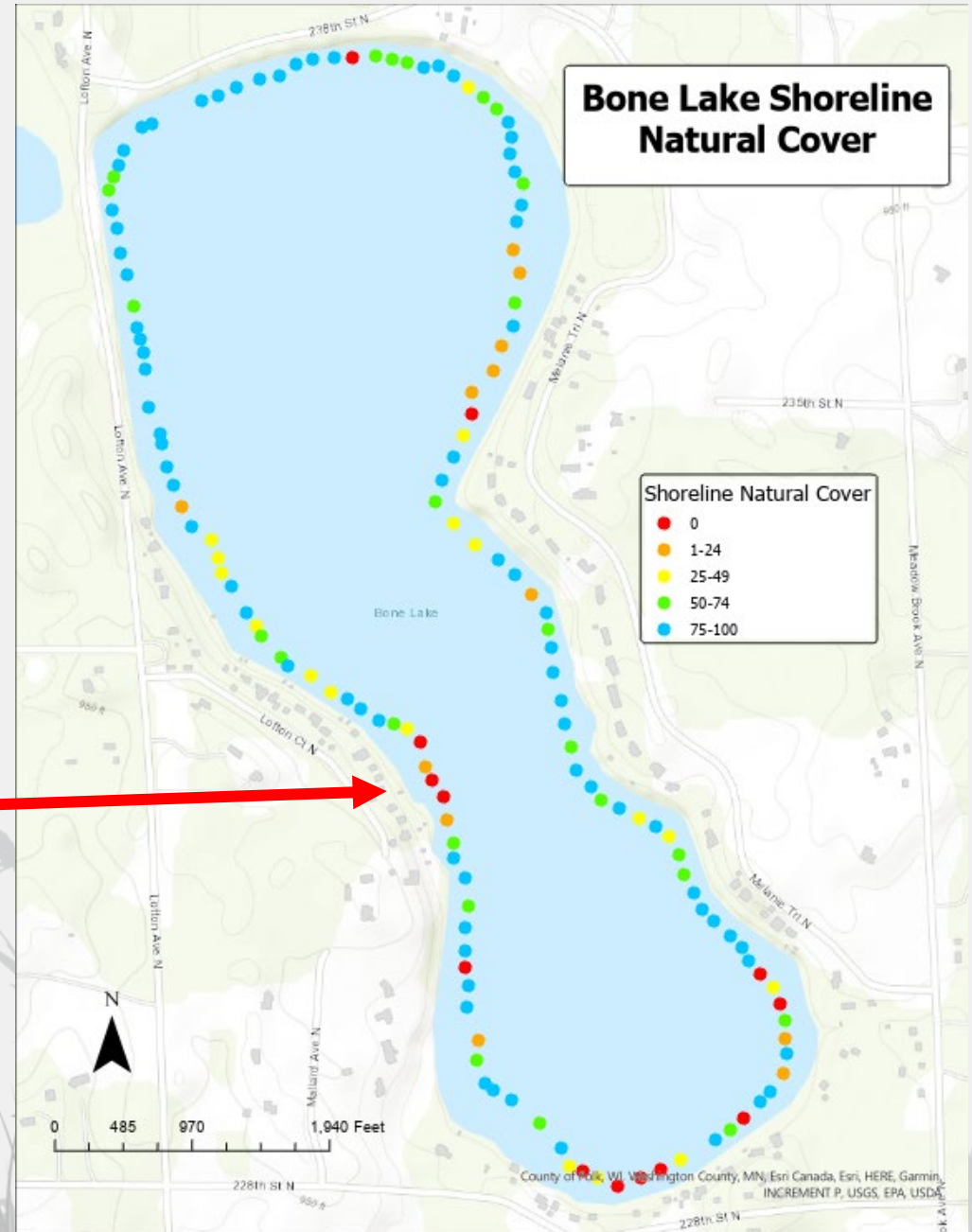
Bone Lake Shoreline Scores

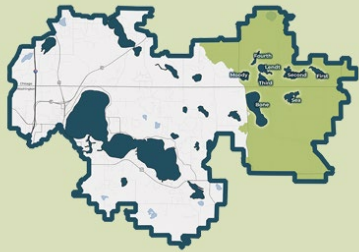




Bone Lake Management District

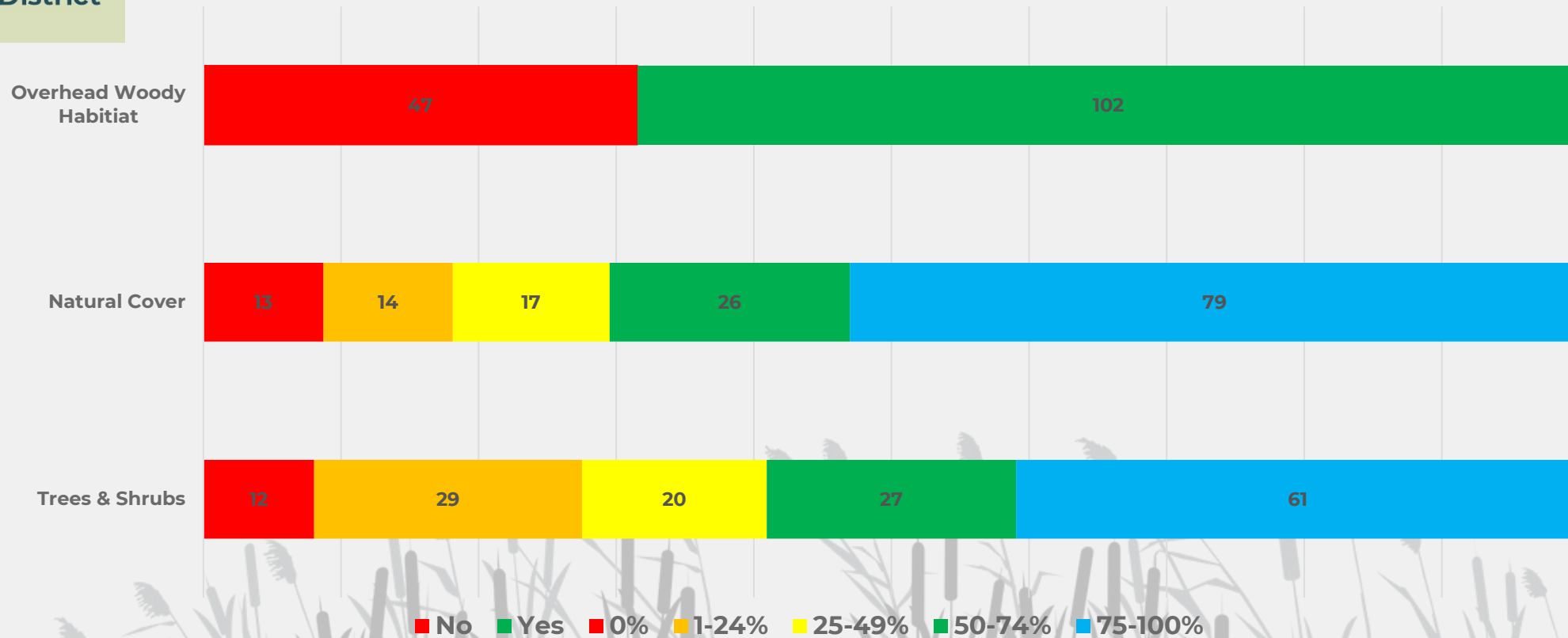
Examining the shoreline vegetation data, we can identify priority shoreline areas that largely lack any natural cover.

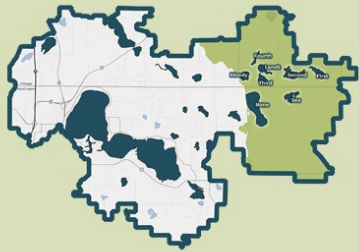




**Bone Lake
Management District**

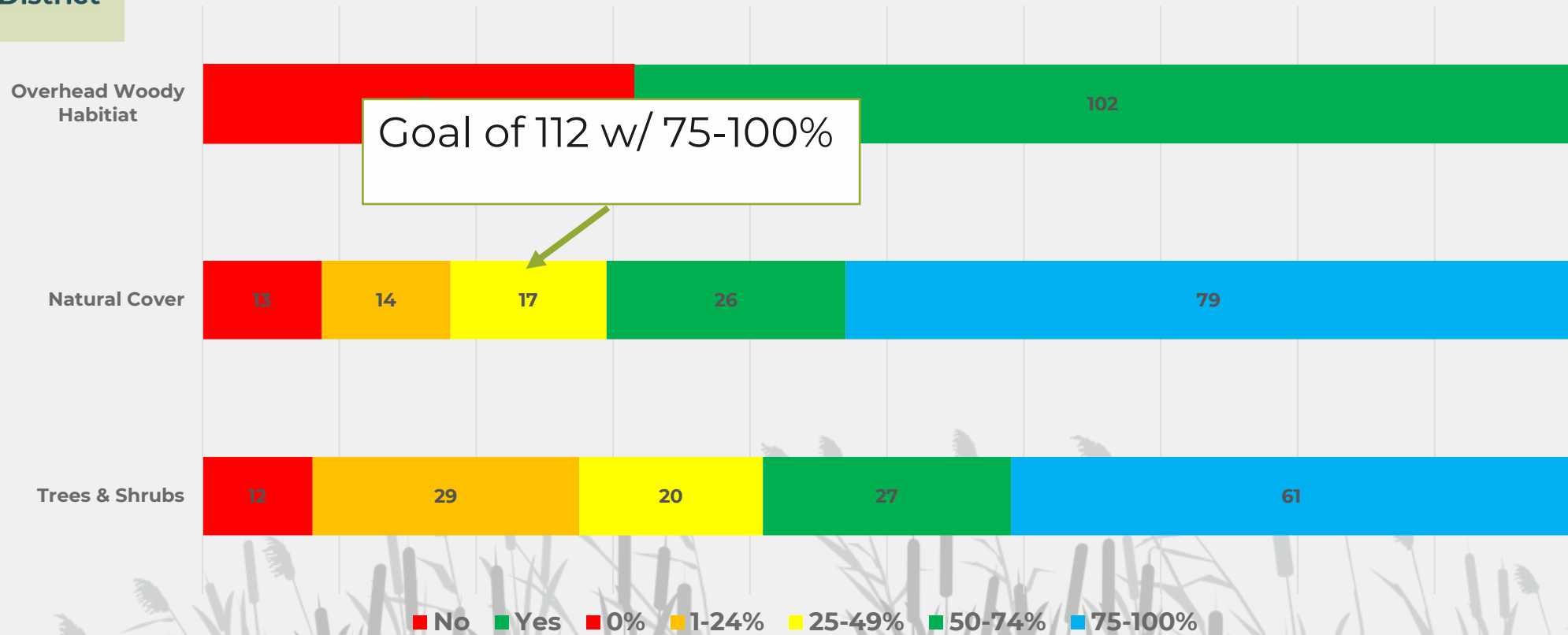
Bone Lake Shoreline Characteristics

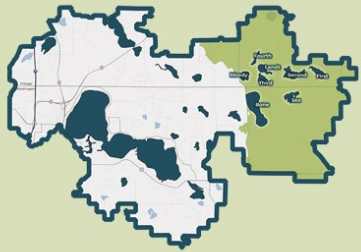




Bone Lake Management District

Bone Lake Shoreline Characteristics





Bone Lake Management District

Bone Lake Shoreline Characteristics

Overhead Woody Habitat



Goal of 112 w/ 75-100%

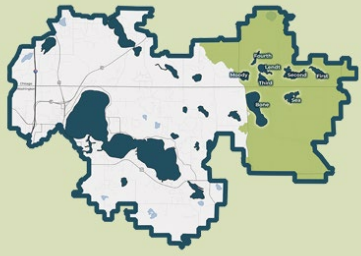
Natural Cover



3,300' of shoreline needed to meet goals



■ No ■ Yes ■ 0% ■ 1-24% ■ 25-49% ■ 50-74% ■ 75-100%



Bone Lake Management District

Bone Lake Shoreline Characteristics

Overhead Woody Habitat



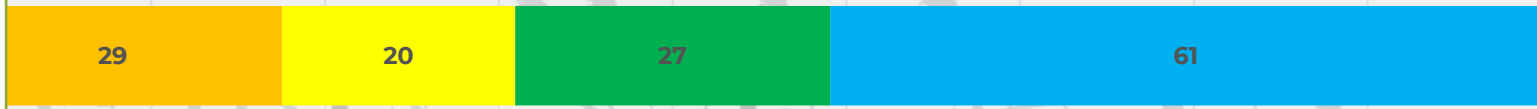
Goal of 112 w/ 75-100%

Natural Cover

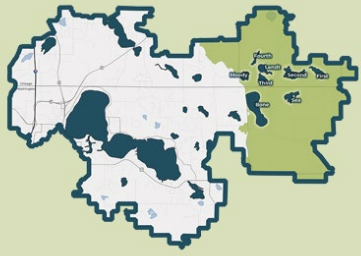


5 restorations (500') / year to meet 2031 goal

3,300' of shoreline needed to meet goals

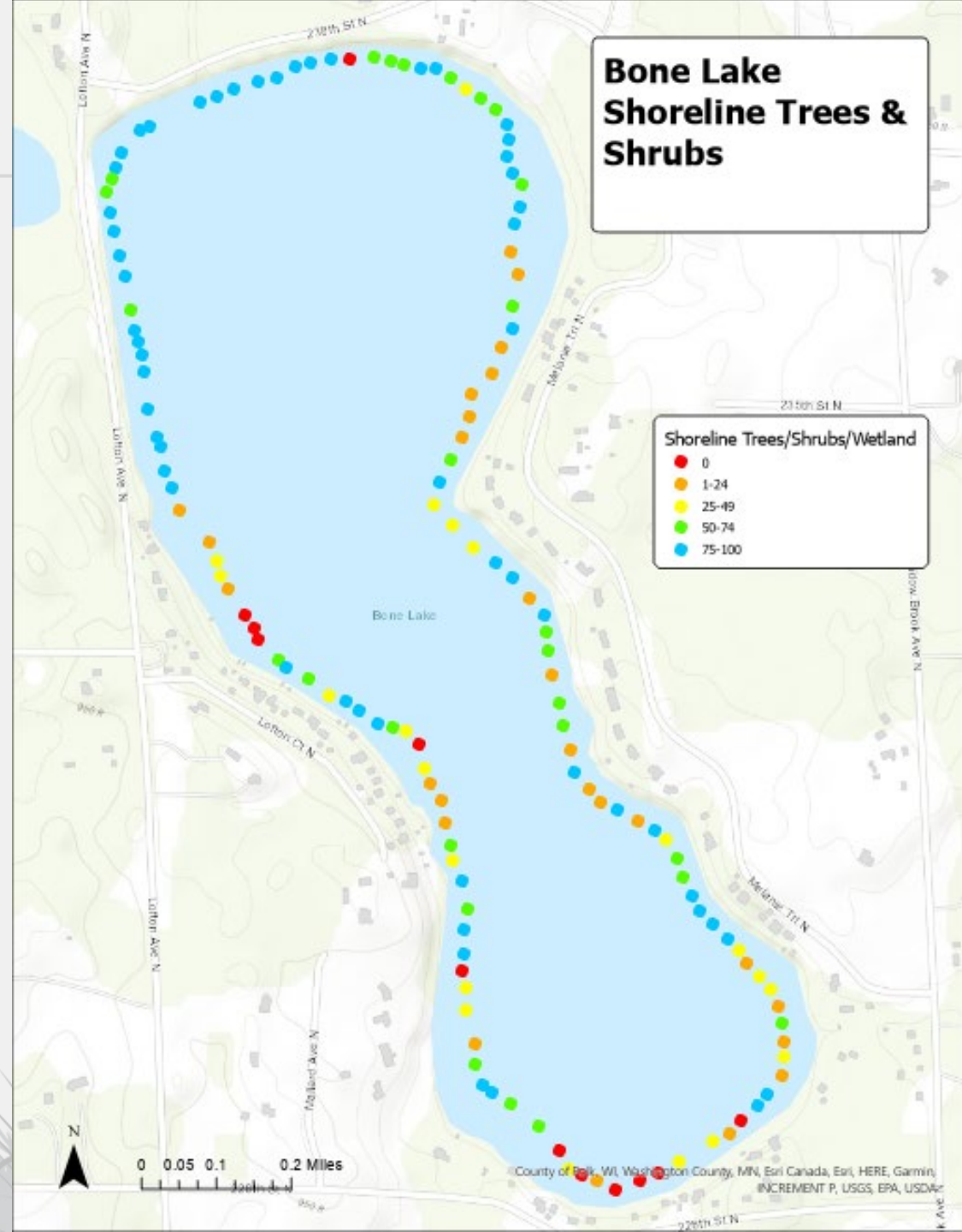


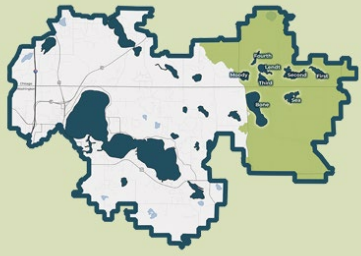
■ No
 ■ Yes
 ■ 0%
 ■ 1-24%
 ■ 25-49%
 ■ 50-74%
 ■ 75-100%



Bone Lake Management District

While not part of our shoreline goals, tree and shrub cover is an essential part of shoreline habitat.

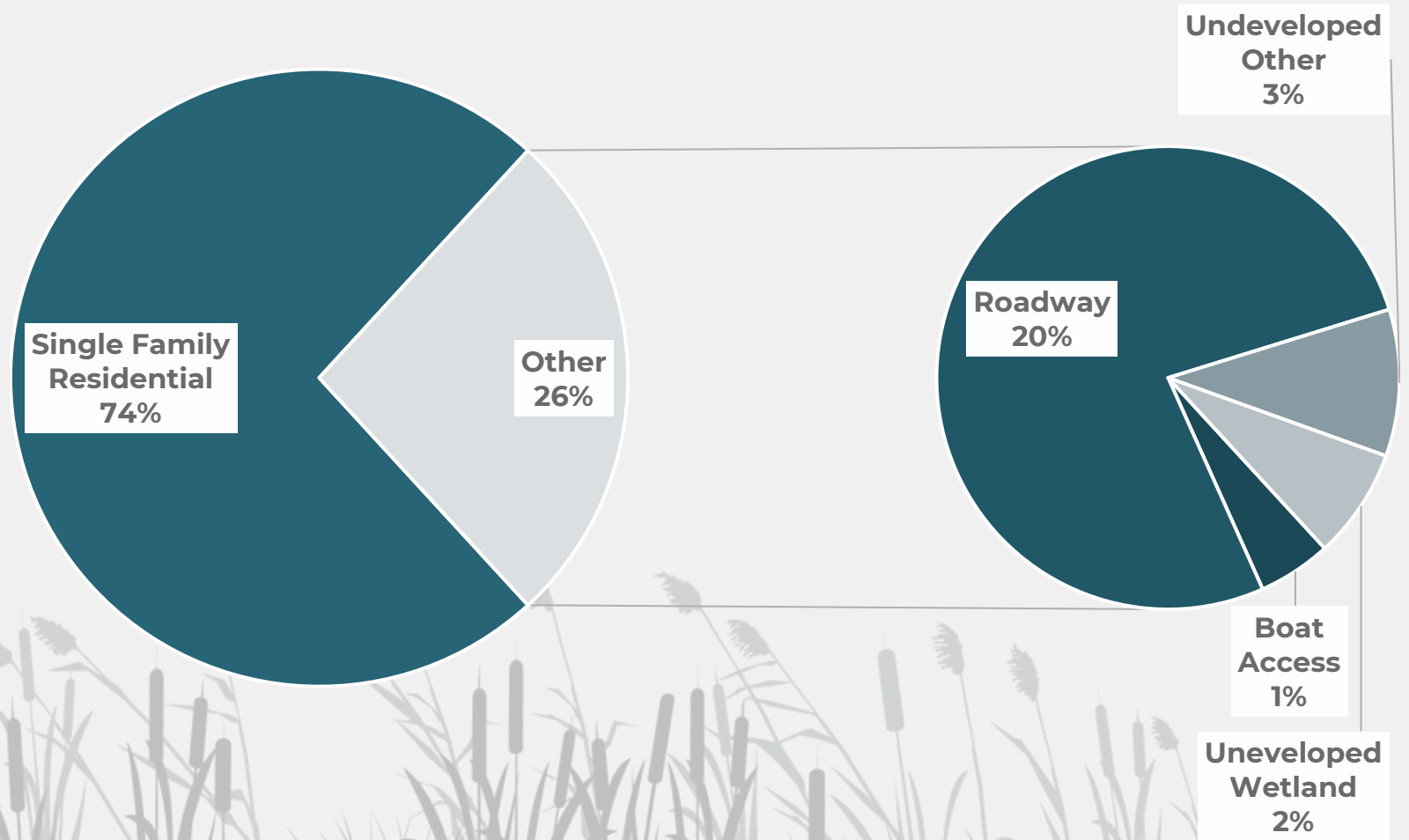


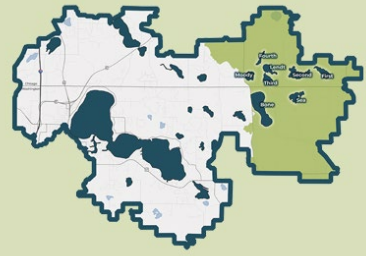


**Bone Lake
Management District**

Bone Lake - Land Use

Bone Lake has the most undeveloped shoreline of the three major lakes, with 5%.



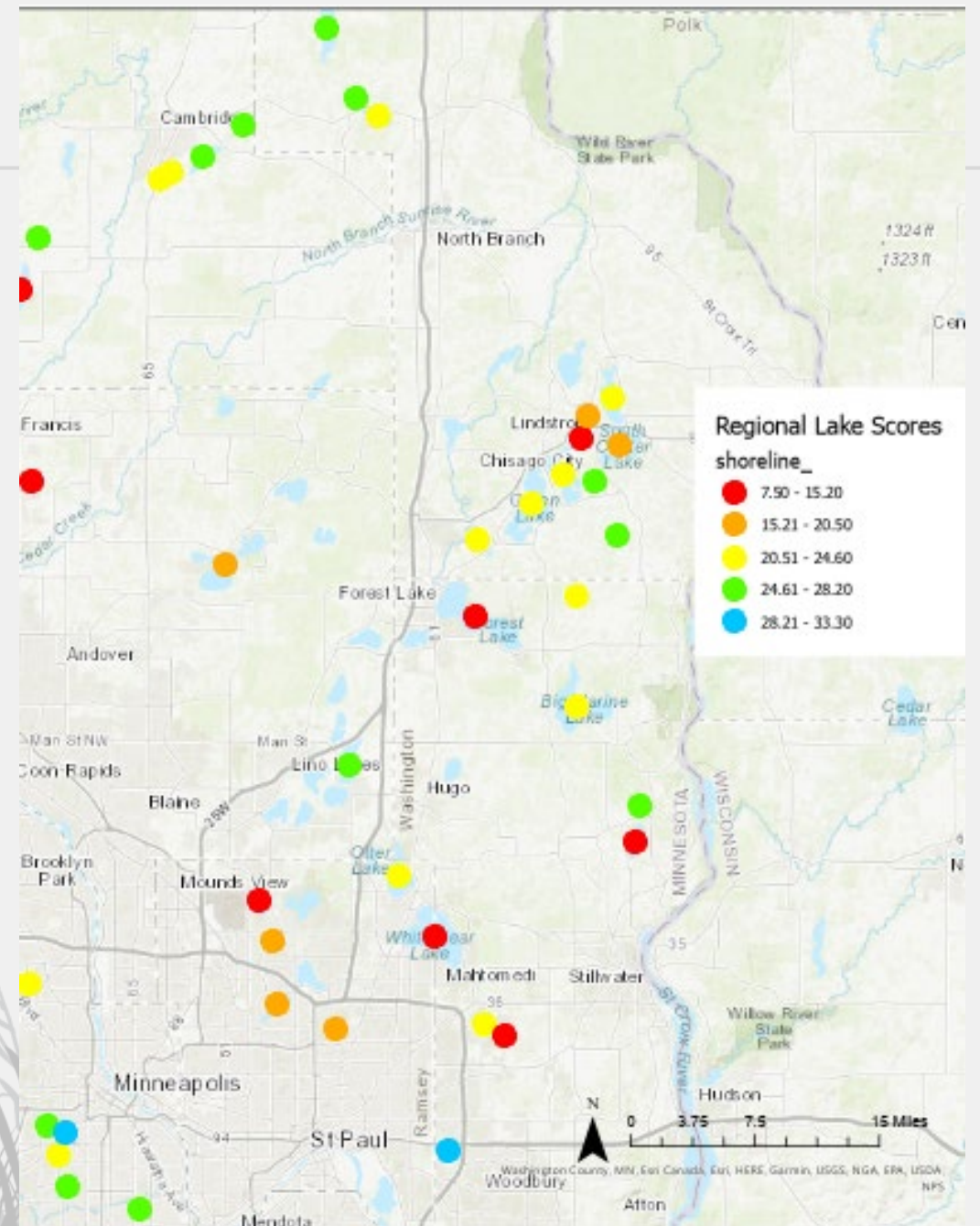


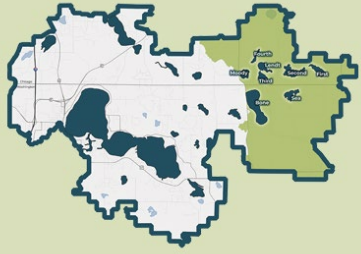
Bone Lake Management District

Bone Lake - How do we compare?

Compared to regional lakes, Bone Lake ranks moderately.

Of the 824 lakes surveyed by the DNR for shoreline habitat, Comfort Lake ranks 463rd, placing it in the lower 45th percentile.

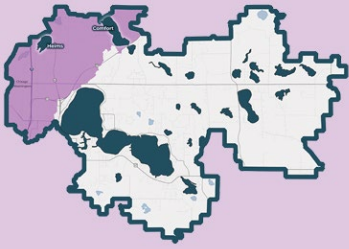




Bone Lake
Management District

Areas to focus

- Plant a tree! - 12 points without shoreline trees or shrubs
- Don't go there? Don't mow there! – 27 points with less than 25% natural vegetation
- If a tree falls in the lake... leave it! – 47 points without overhanging woody habitat



**Comfort Lake
Management District**

Comfort Lake Shoreline

Shoreland	Shoreline	Aquatic	Total STS Score
21.74	19.15	15.45	56.34
Moderate	Low	Very Low	Low

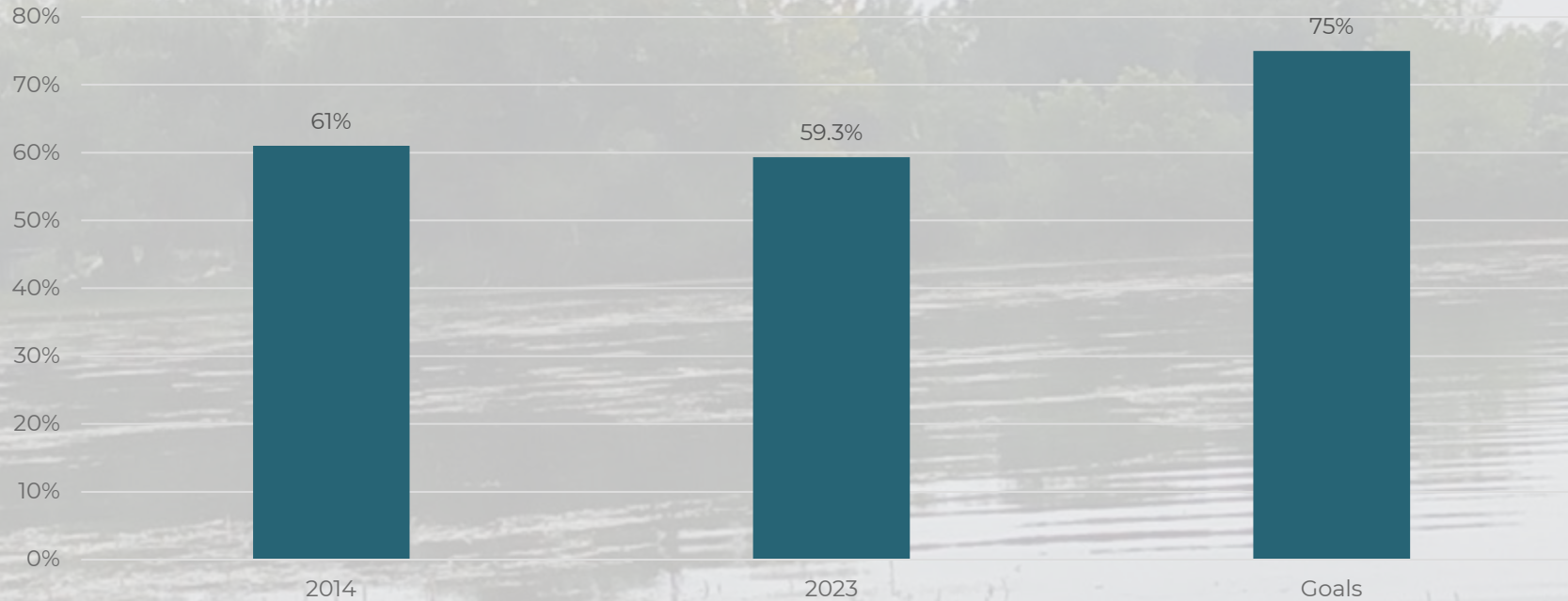
Lake Area: 217.8 acres

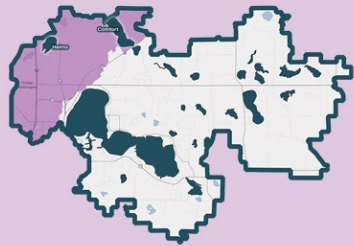
Shoreline: 3.24 miles

Lake Habitat Score: LOW

Natural Shoreline Cover: 59%

Comfort Lake Shoreline With >75% Natural Cover

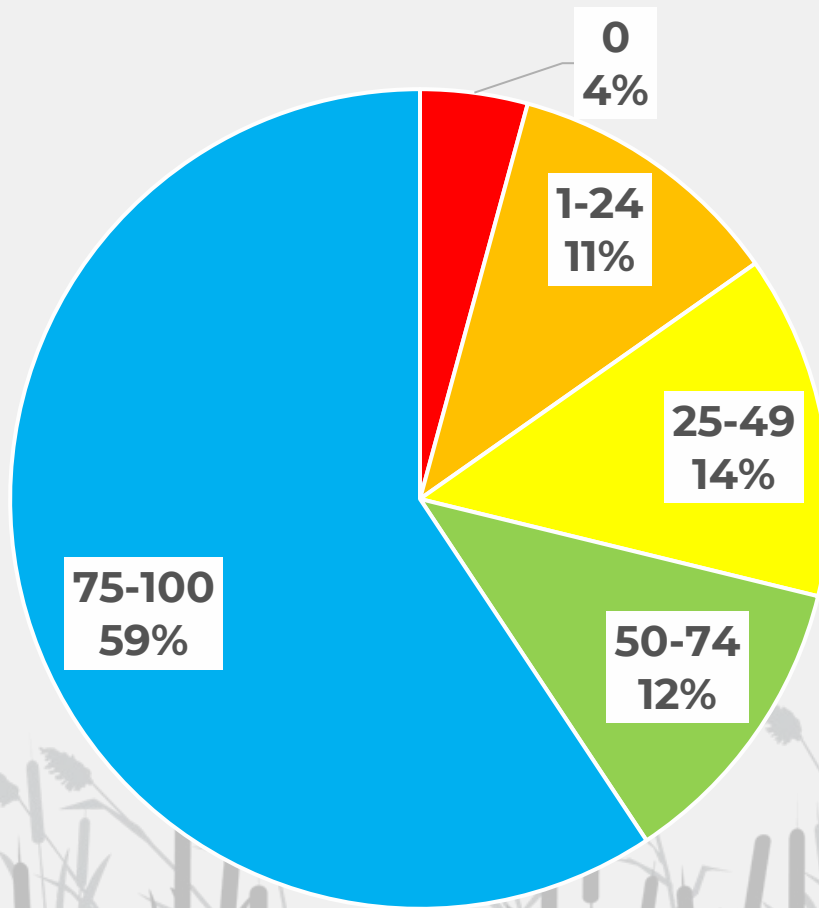




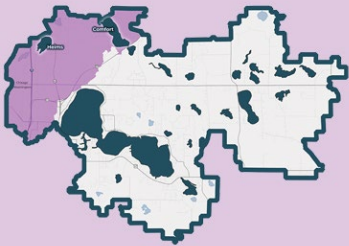
**Comfort Lake
Management District**

Comfort Lake – Shoreline Natural Vegetation

Comfort Lake has 59% of shoreline meeting our goals, with a goal of 75%.

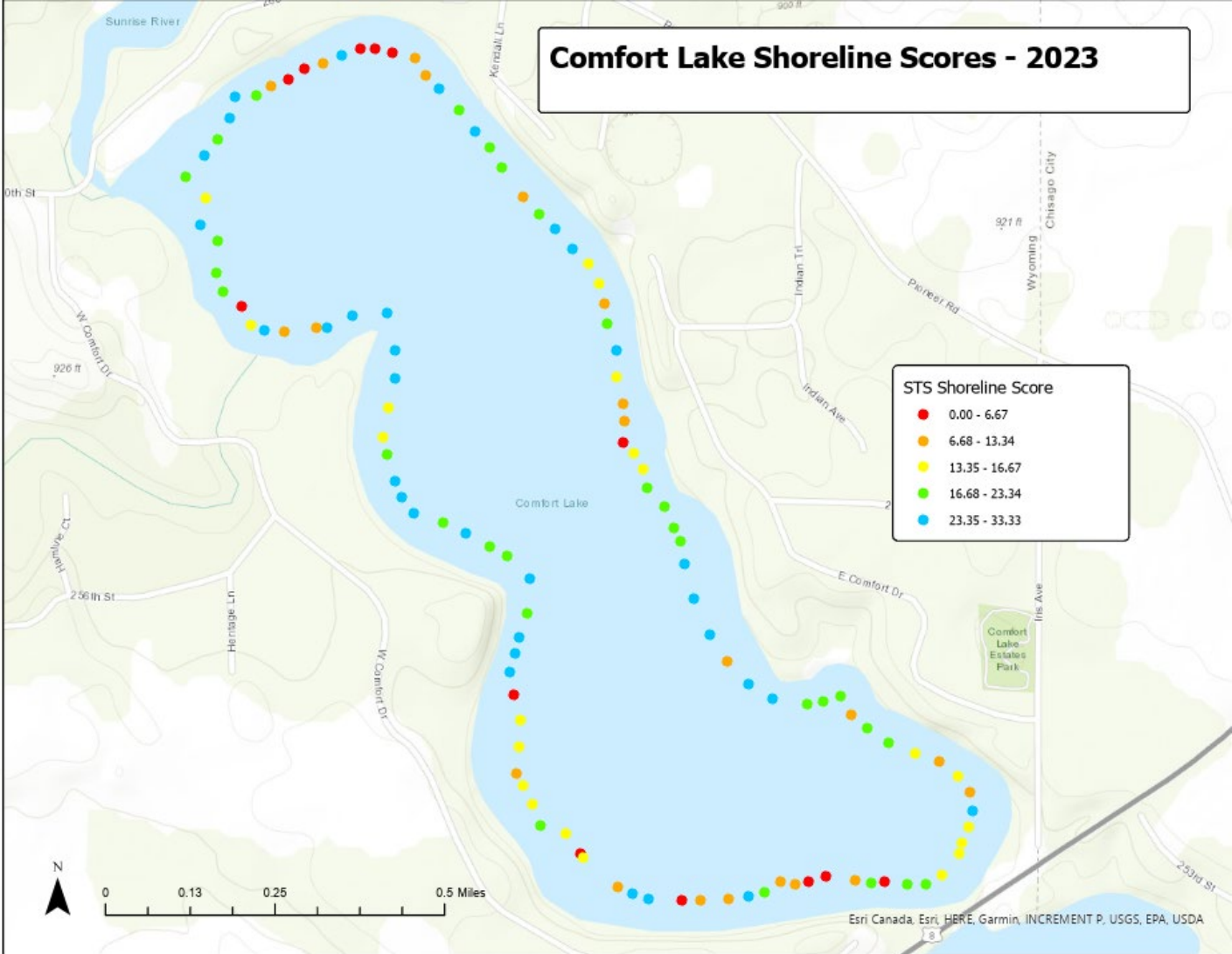
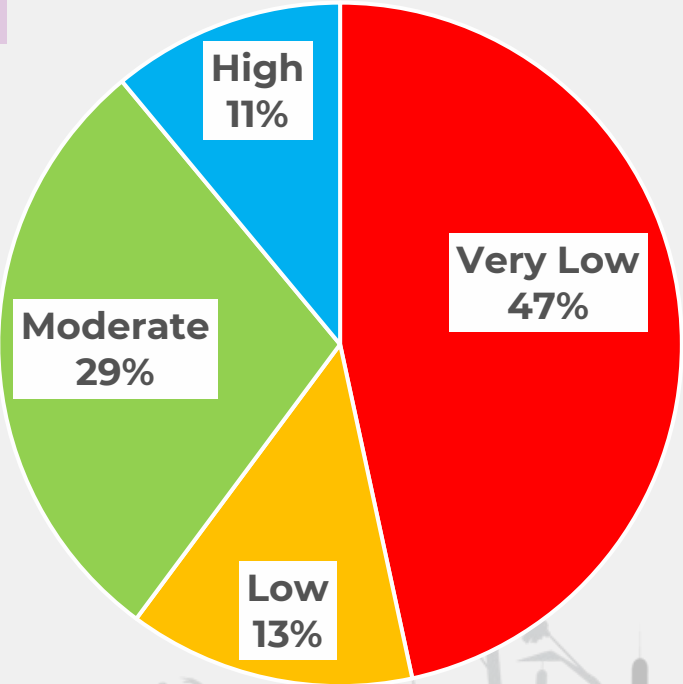


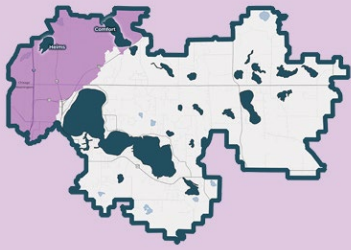
A focus of improvement is the 29% of shoreline with less than 50% natural cover.



Comfort Lake Management District

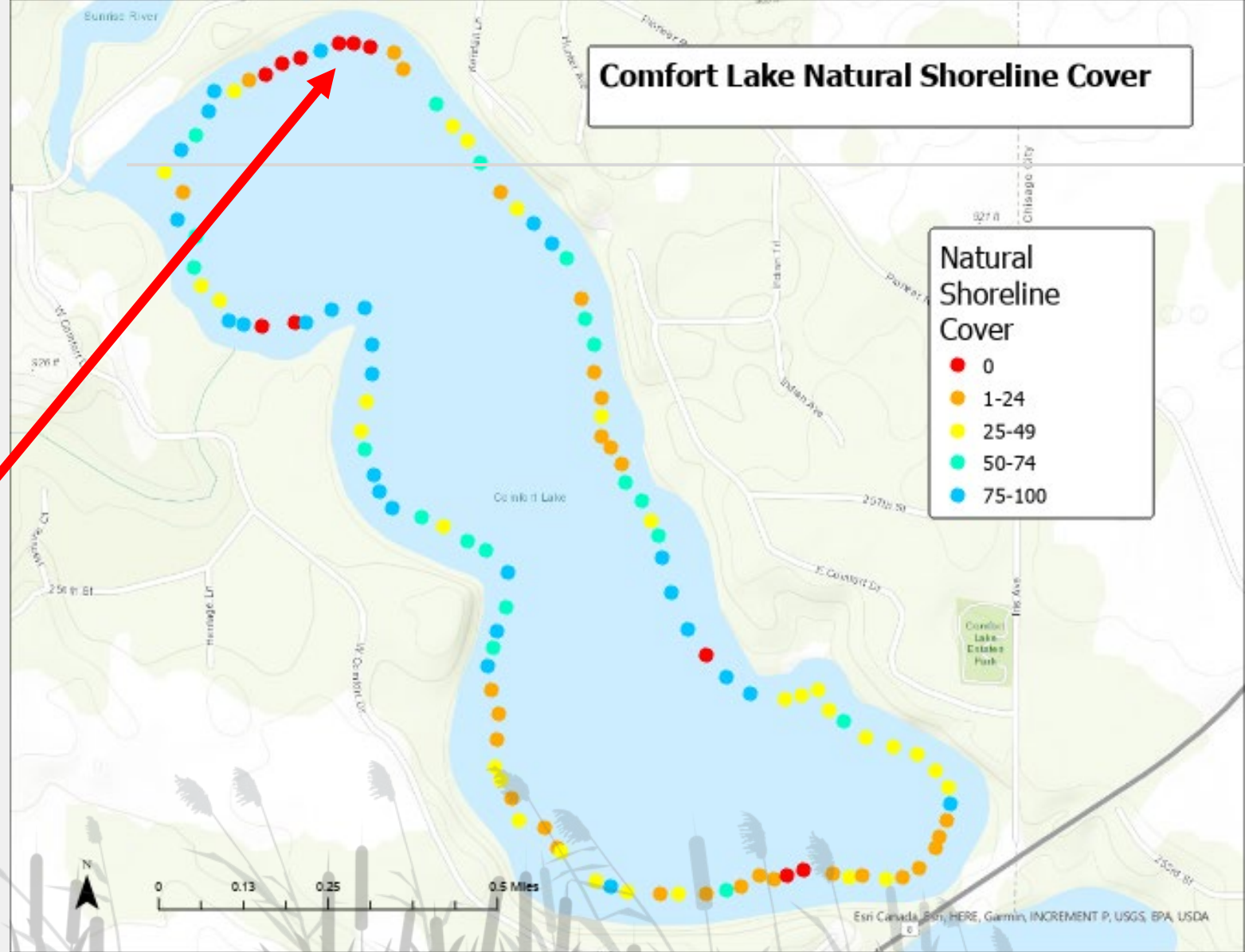
Comfort Lake Shoreline Scores

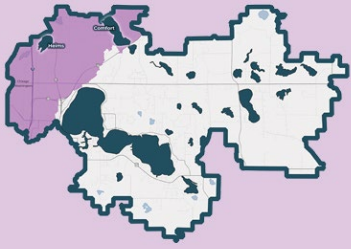




Comfort Lake Management District

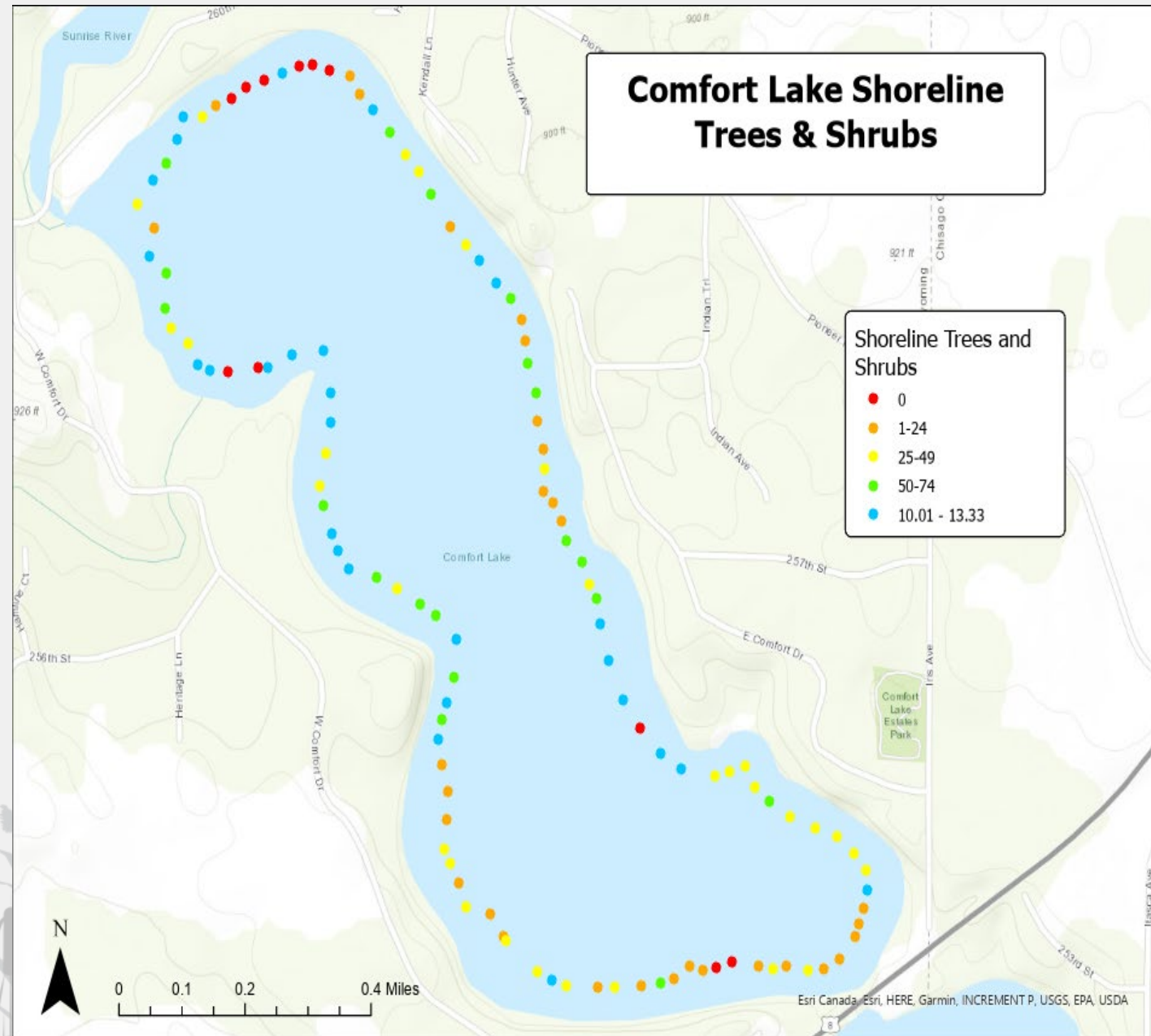
Examining the shoreline vegetation data, we can identify priority shoreline areas that largely lack natural cover.

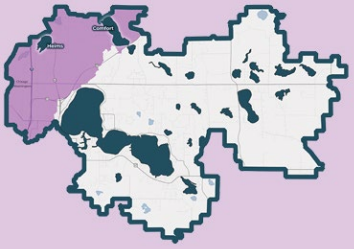




Comfort Lake Management District

The lake shore has pockets of deforestation with about 9% having zero trees or shrubs.





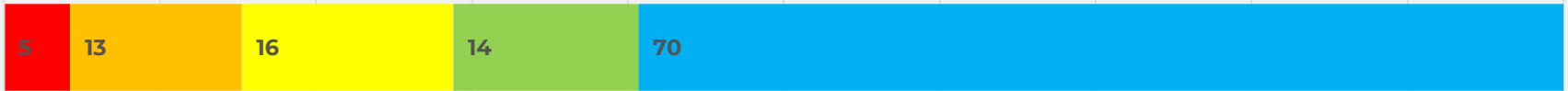
**Comfort Lake
Management District**

Comfort Lake – Shoreline Characteristics

Overhead Woody Habitat



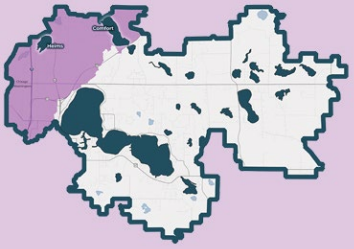
Natural Cover



Trees & Shrubs



■ 0% ■ 1-24% ■ 25-49% ■ 50-74% ■ 75-100% ■ No ■ Yes



Comfort Lake
Management District

Comfort Lake – Shoreline Characteristics

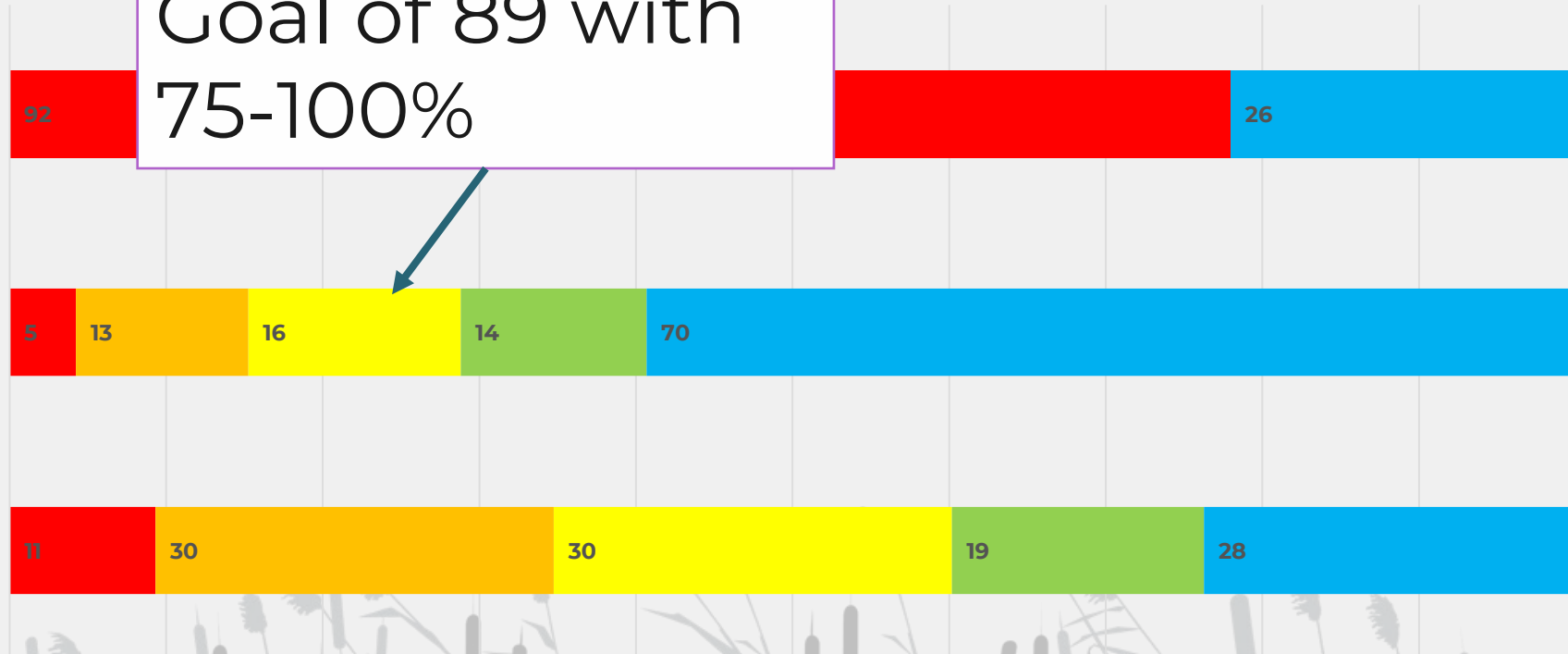
Overhead Woody Habitat

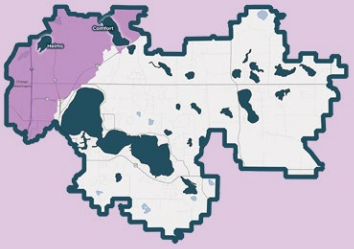
Goal of 89 with
75-100%

Natural Cover

Trees & Shrubs

■ 0% ■ 1-24% ■ 25-49% ■ 50-74% ■ 75-100% ■ No ■ Yes





Comfort Lake Management District

Comfort Lake – Shoreline Characteristics

Goal of 89 with 75-100%

Overhead Woody Habitat



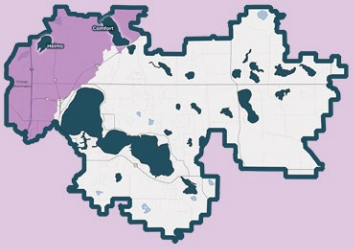
Natural Cover



1900' of shoreline needed to meet goals



0% 1-24% 25-49% 50-74% 75-100% No Yes



Comfort Lake Management District

Comfort Lake – Shoreline Characteristics

Overhead Woody Habitat



Goal of 89 with 75-100%

Natural Cover

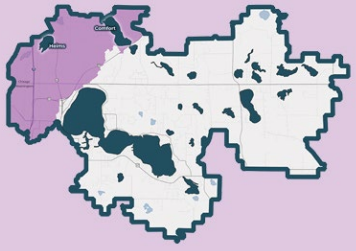


3 restorations (300') / year to meet 2031 goal

1900' of shoreline needed to meet goals



■ 0% ■ 1-24% ■ 25-49% ■ 50-74% ■ 75-100% ■ No ■ Yes

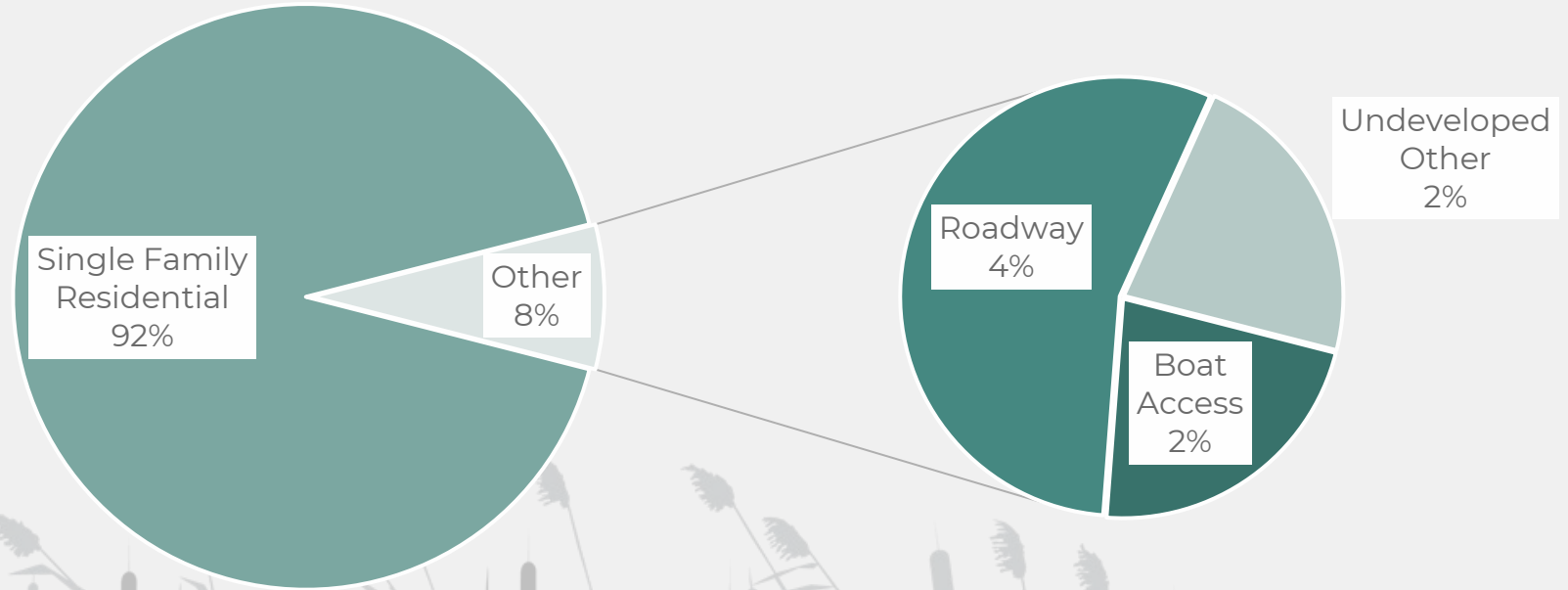


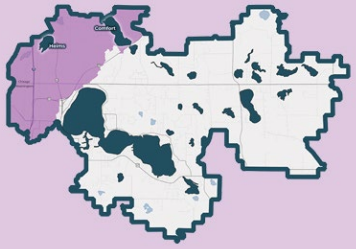
**Comfort Lake
Management District**

Comfort Lake - Land Use

Comfort Lake has a high rate of development.

Increasing development poses a challenge for improving shoreline habitat and water quality.



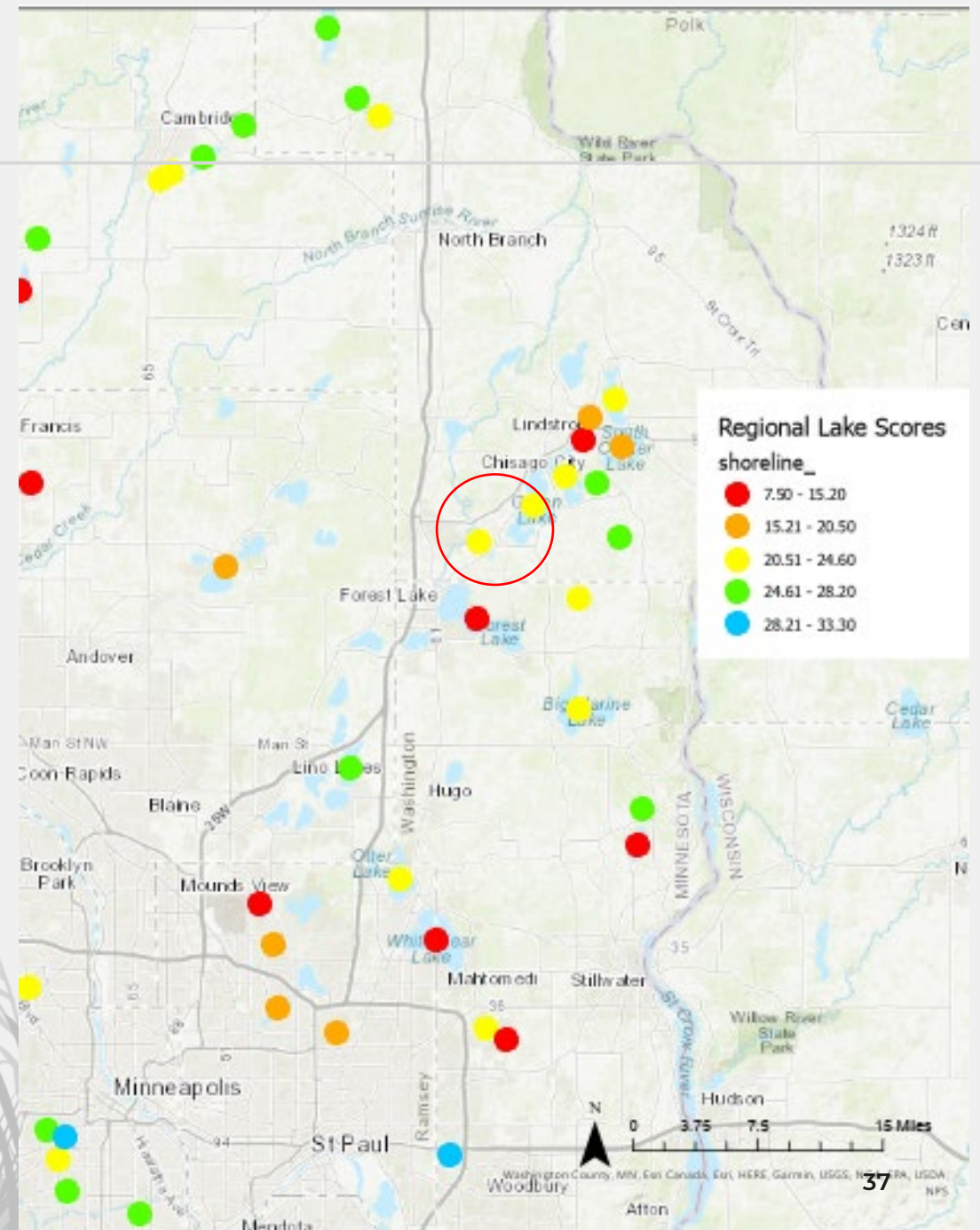


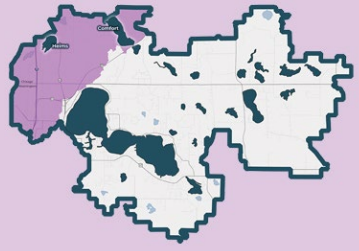
Comfort Lake Management District

Comfort Lake - How do we compare?

Compared to regional lakes, Comfort Lake ranks poor.

Of the 824 lakes surveyed by the DNR for shoreline habitat, Comfort Lake ranks 663rd, placing it in the lower 20th percentile.





Comfort Lake
Management District

Areas to focus

- Plant a tree! - 11 points without shoreline trees or shrubs
- Don't go there? Don't mow there! – 18 points with less than 25% natural vegetation
- If a tree falls in the lake... leave it! – 92 points without overhanging woody habitat



Forest Lake Shoreline

Shoreland	Shoreline	Aquatic	Total STS Score
13.87	10.57	17.52	41.96
Very Low	Very Low	Low	Very Low

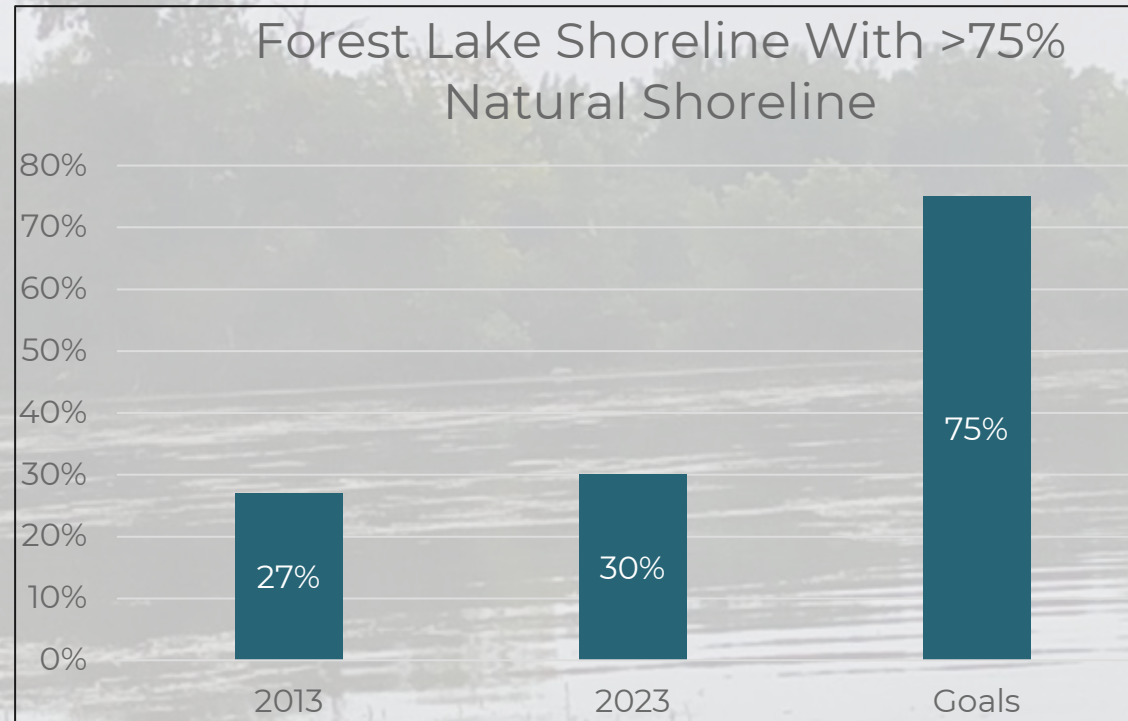
Forest Lake Management District

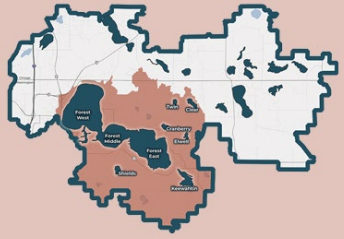
Lake Area: 2,271 ac

Shoreline: 15.7 miles

Lake Habitat Score: VERY LOW

Natural Shoreline Cover: 30%



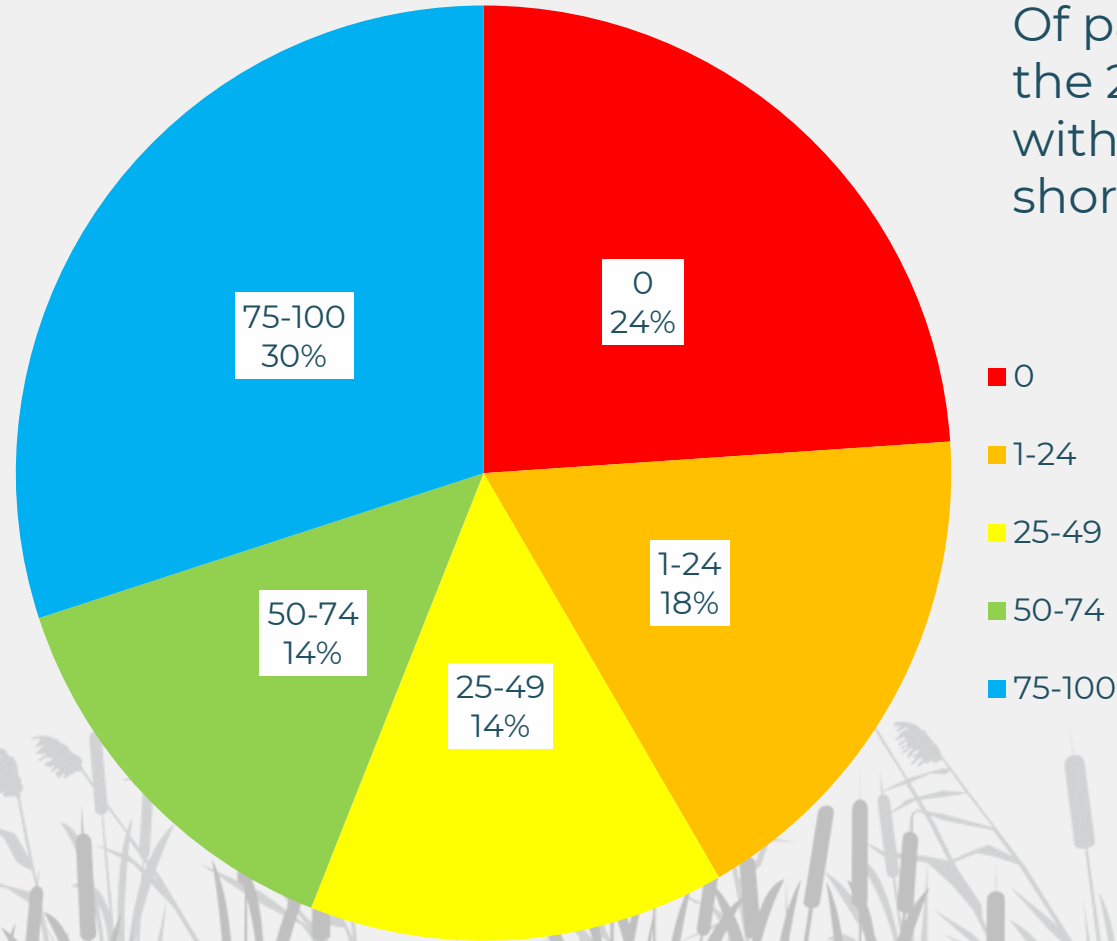


Forest Lake – Shoreline Natural Vegetation

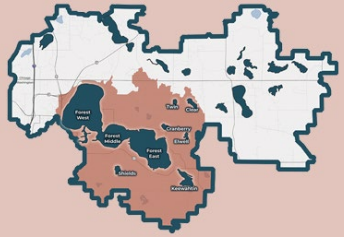
Forest Lake
Management District

WMP Goal: 75% of the shore with 75-100% natural vegetation

Forest Lake has 30% of shoreline meeting our goal

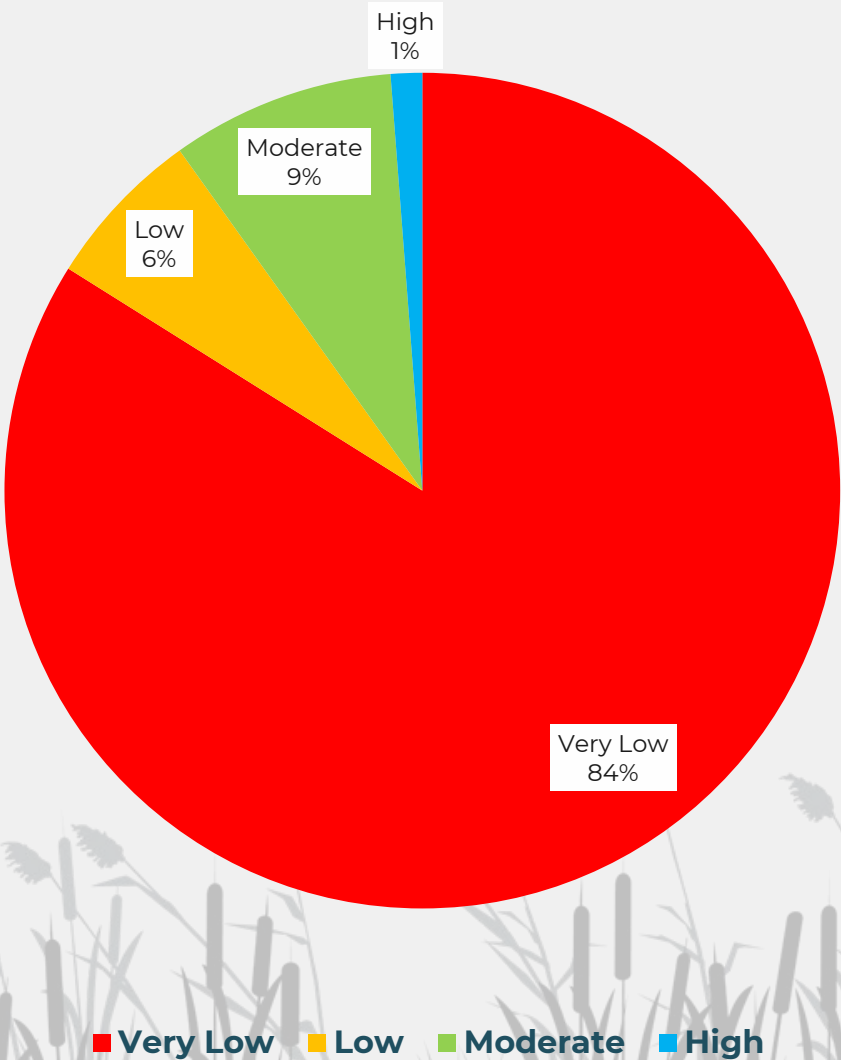


Of particular concern is the 24% of shoreline with no natural shoreline.



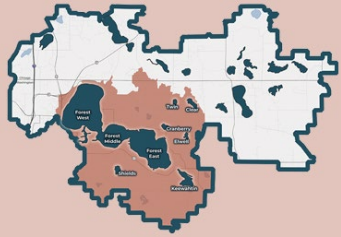
**Forest Lake
Management District**

Forest Lake Shoreline Scores



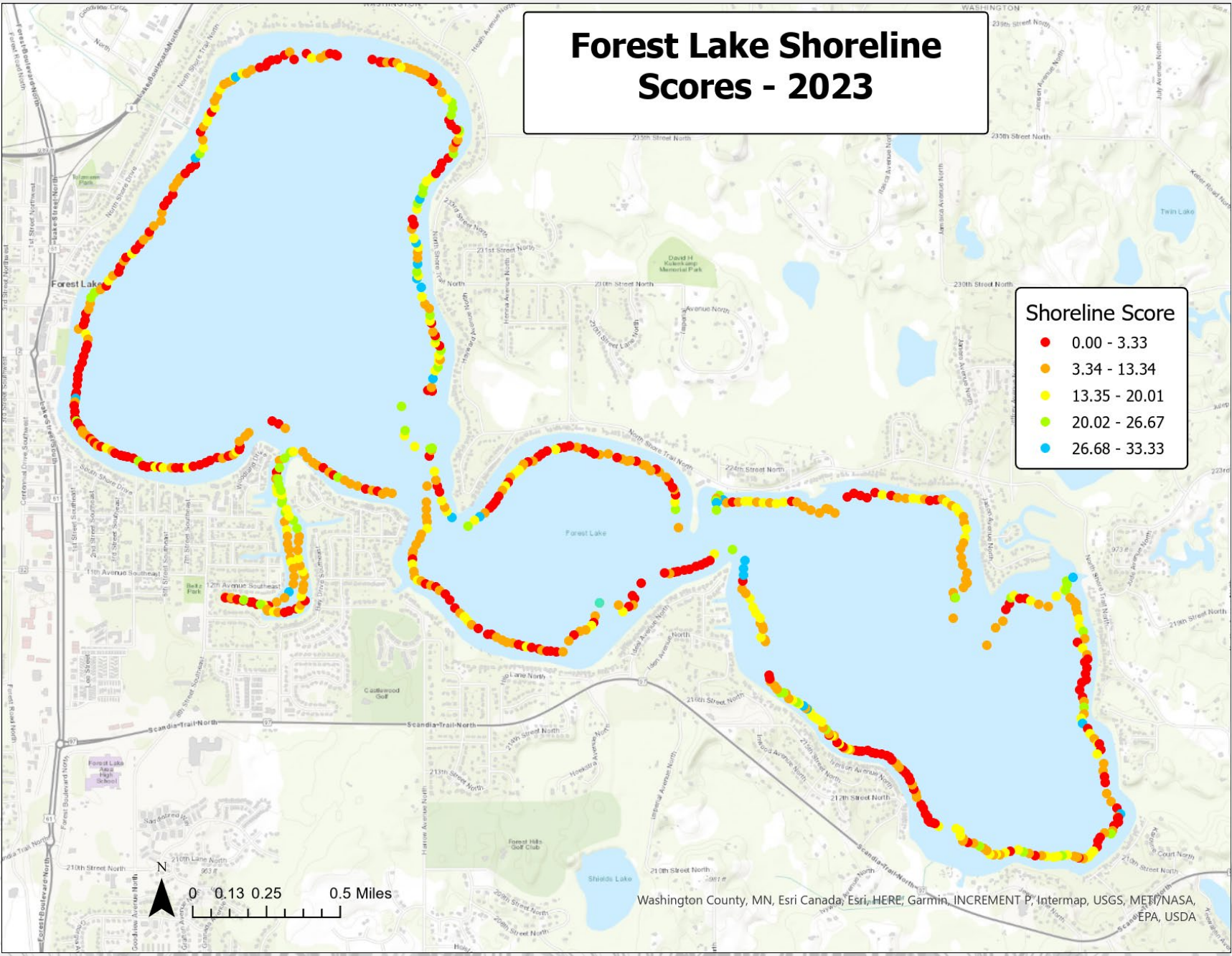
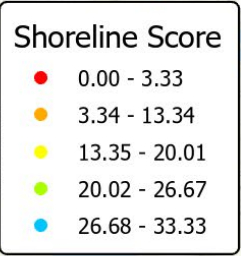
Only 1% (8 data points) had a High shoreline score

Looking at the shoreline score, which includes shoreline natural cover, the results are more negative.

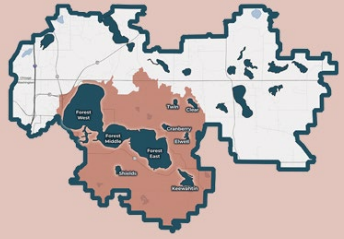


Forest Lake Management District

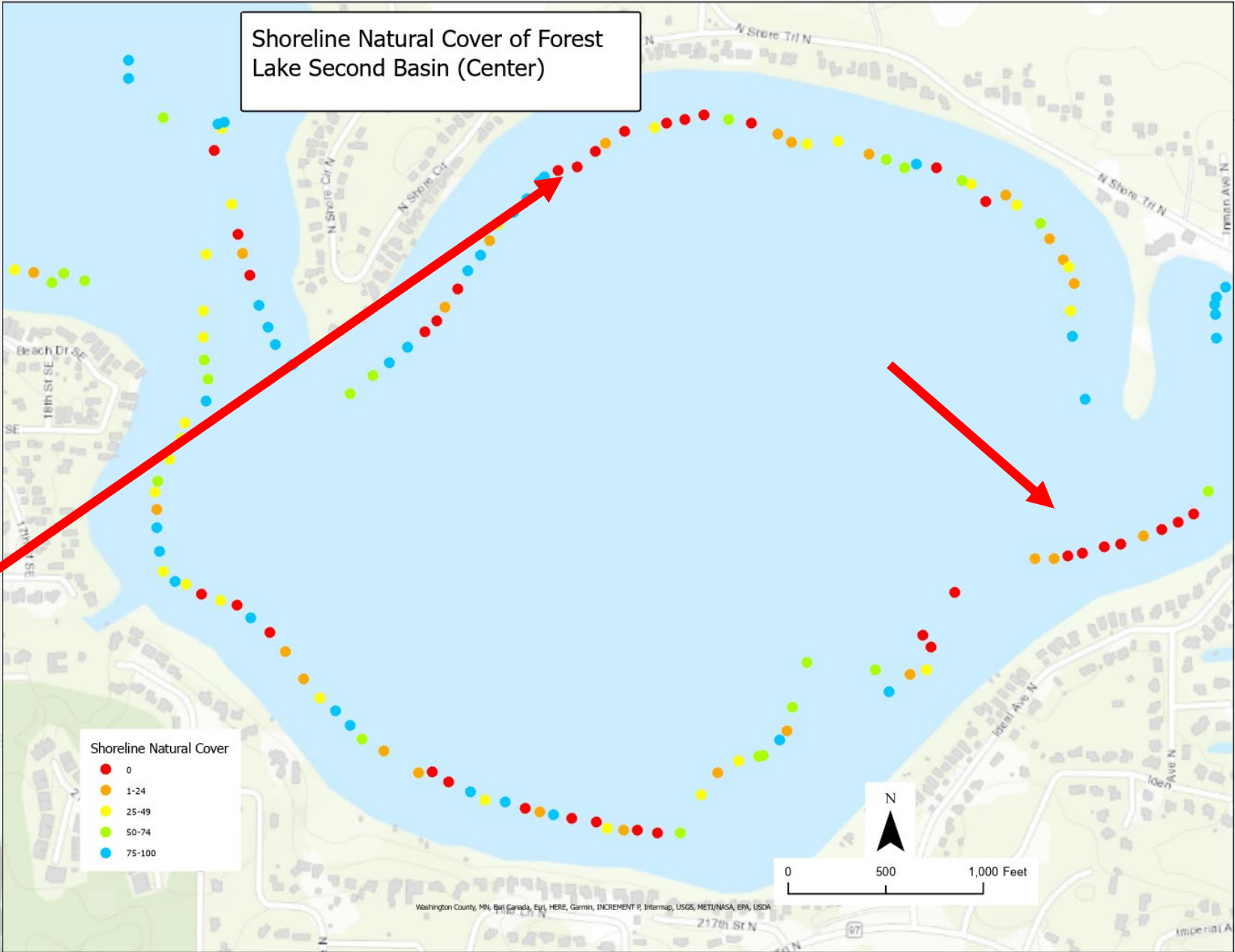
Forest Lake Shoreline Scores - 2023

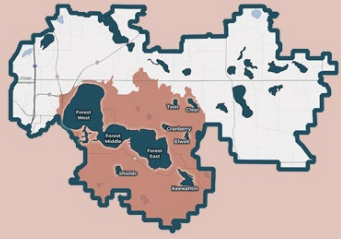


Washington County, MN, Esri Canada, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA

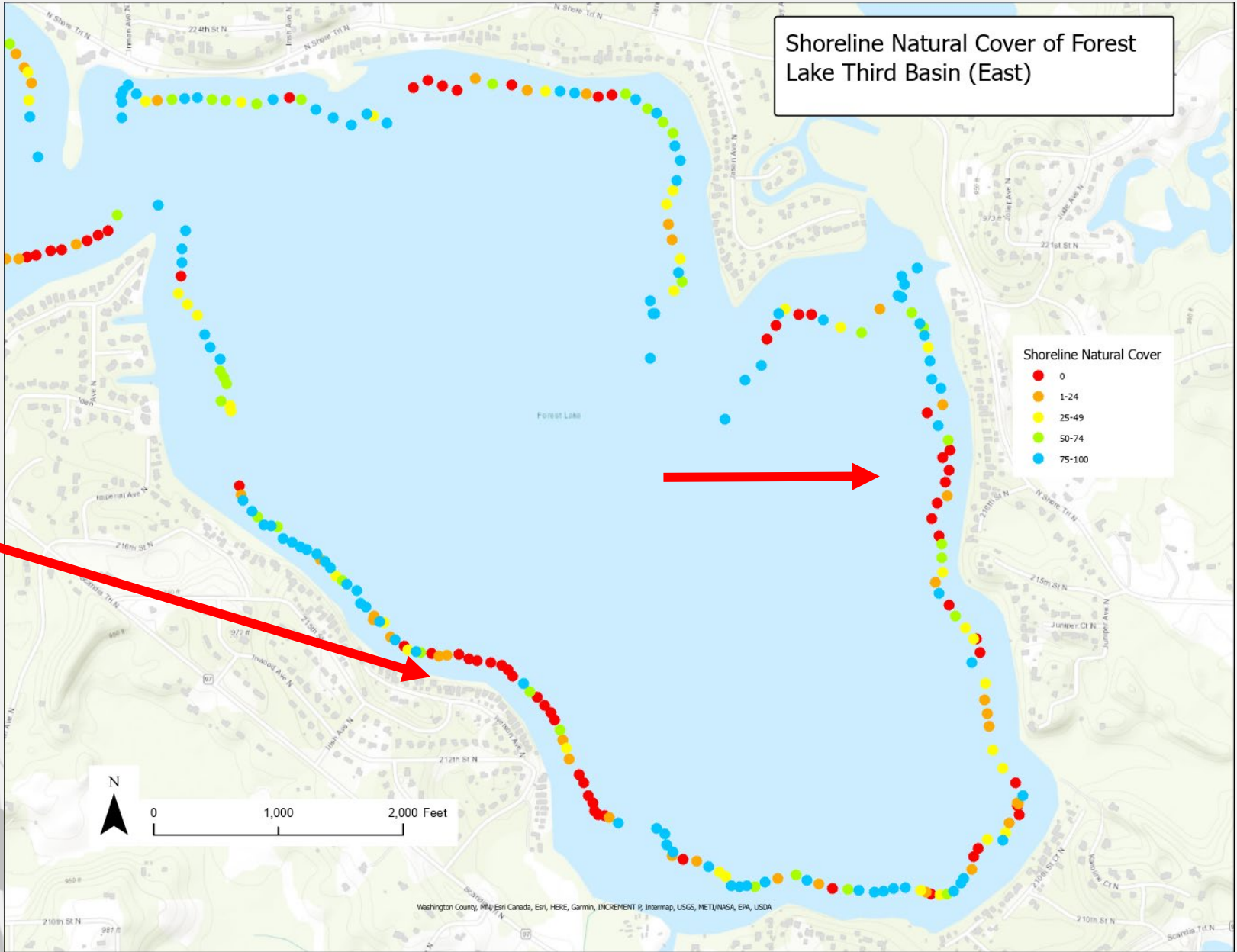


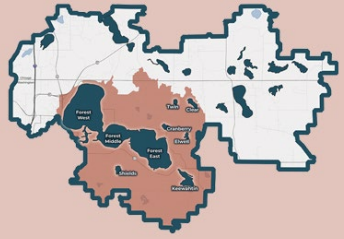
Forest Lake Management District





Forest Lake Management District





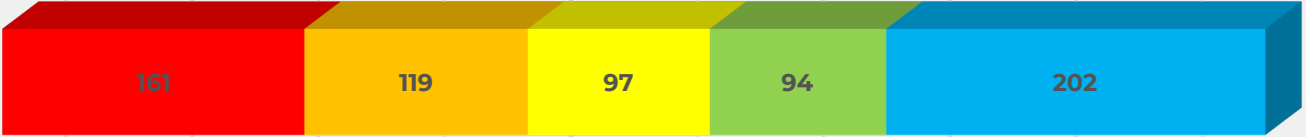
Forest Lake Management District

Forest Lake Shoreline Characteristics

Overhead Woody Habitat



Shoreline Natural Cover



Shoreline Trees/Shrubs/Wetland



0% 1-24% 25-49% 50-74% 75-100% No Yes



**Forest Lake
Management District**

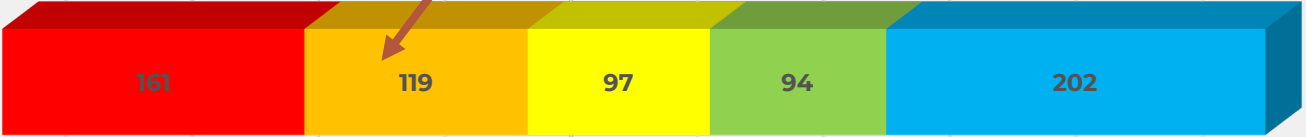
Forest Lake Shoreline Characteristics

Overhead Woody Habitat



Goal of 505 with
75-100%

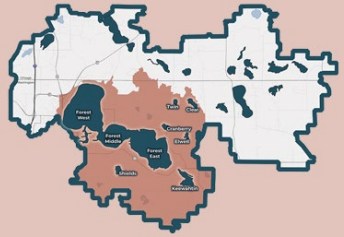
Shoreline Natural Cover



Shoreline Trees/Shrubs/Wetland



■ 0%
 ■ 1-24%
 ■ 25-49%
 ■ 50-74%
 ■ 75-100%
 ■ No
 ■ Yes



**Forest Lake
Management District**

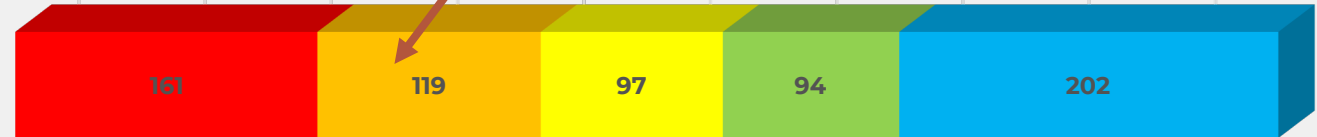
Forest Lake Shoreline Characteristics

Overhead Woody Habitat



Goal of 505 with
75-100%

Shoreline Natural Cover

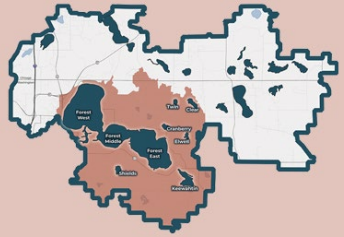


30,300' of shoreline
needed to meet goals

Shoreline Trees/Shrubs/Wetland



■ 0%
 ■ 1-24%
 ■ 25-49%
 ■ 50-74%
 ■ 75-100%
 ■ No
 ■ Yes



**Forest Lake
Management District**

Forest Lake Shoreline Characteristics

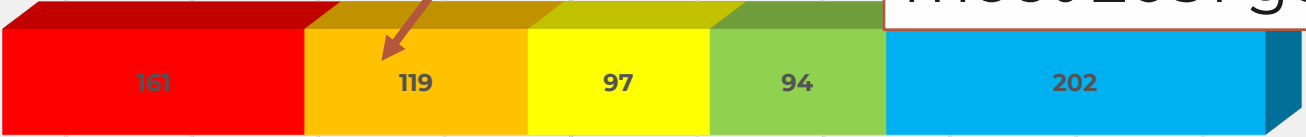
Overhead Woody Habitat



Goal of 505 with
75-100%

59 restorations
(4,400') / year to
meet 2031 goal

Shoreline Natural Cover

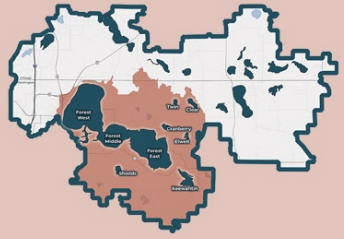


30,300' of shoreline
needed to meet goals

Shoreline Trees/Shrubs/Wetland

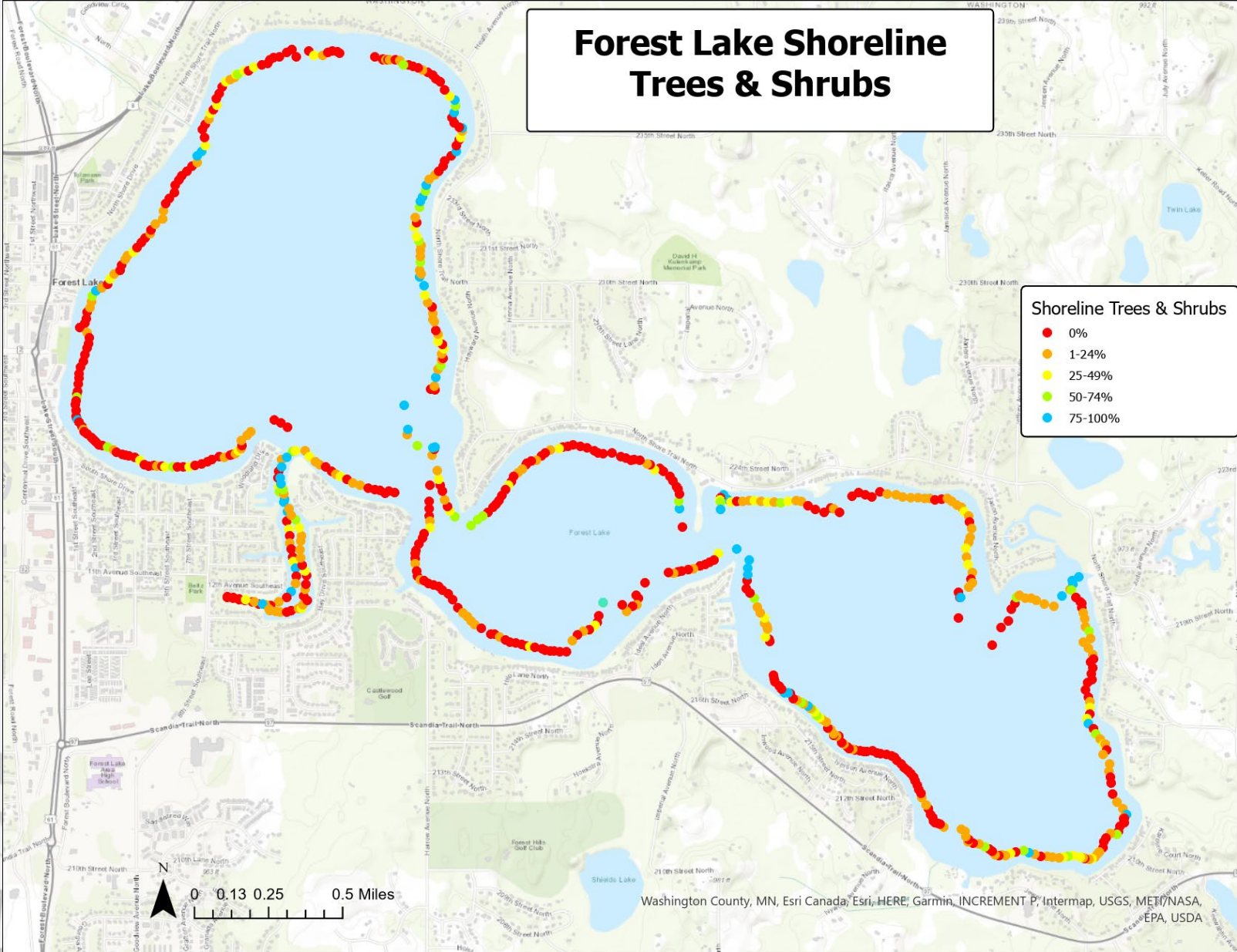


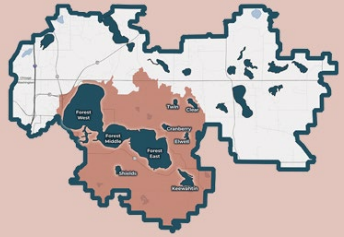
■ 0%
 ■ 1-24%
 ■ 25-49%
 ■ 50-74%
 ■ 75-100%
 ■ No
 ■ Yes



Forest Lake Management District

The lake shore has been largely deforested with more than half of the survey points having zero trees or shrubs.



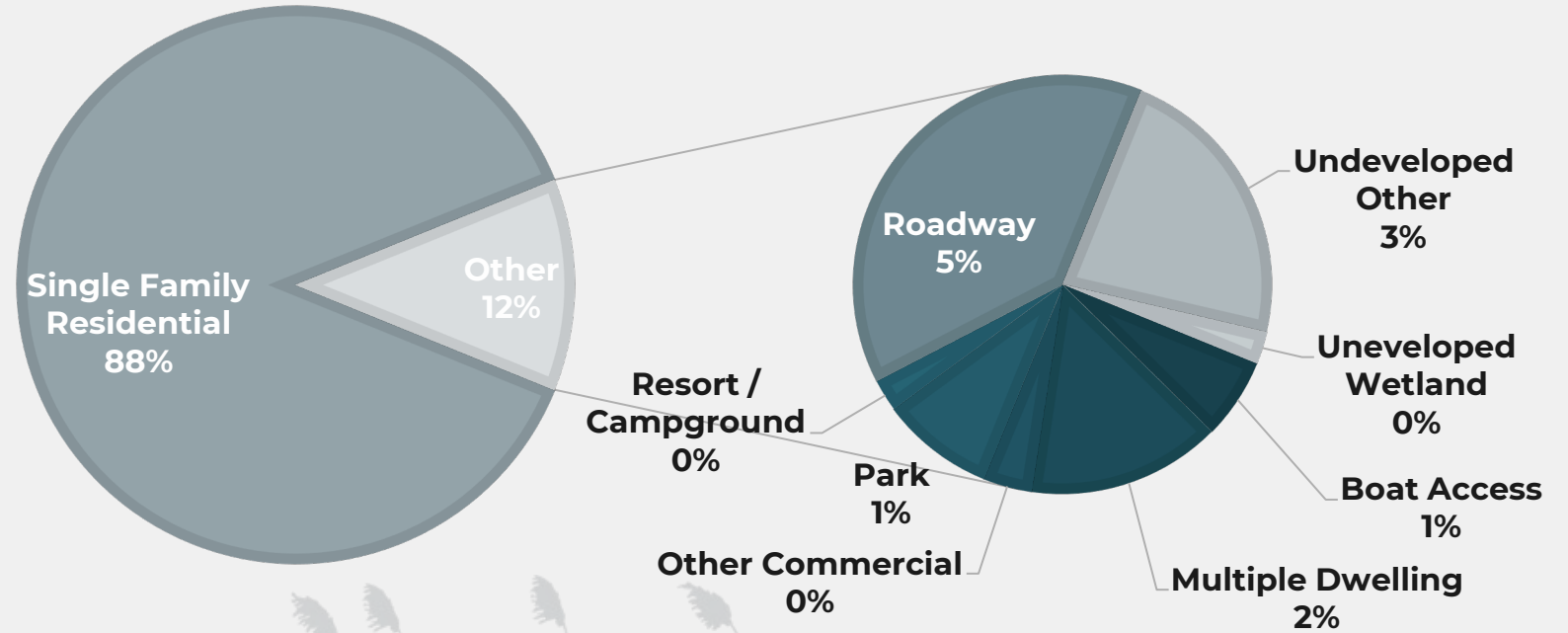


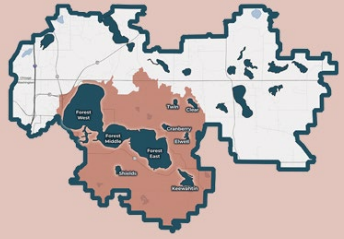
Forest Lake - Land Use

Forest Lake
Management District

Forest Lake has a high development density.

As such, it faces significant challenges in meeting our shoreline goals.



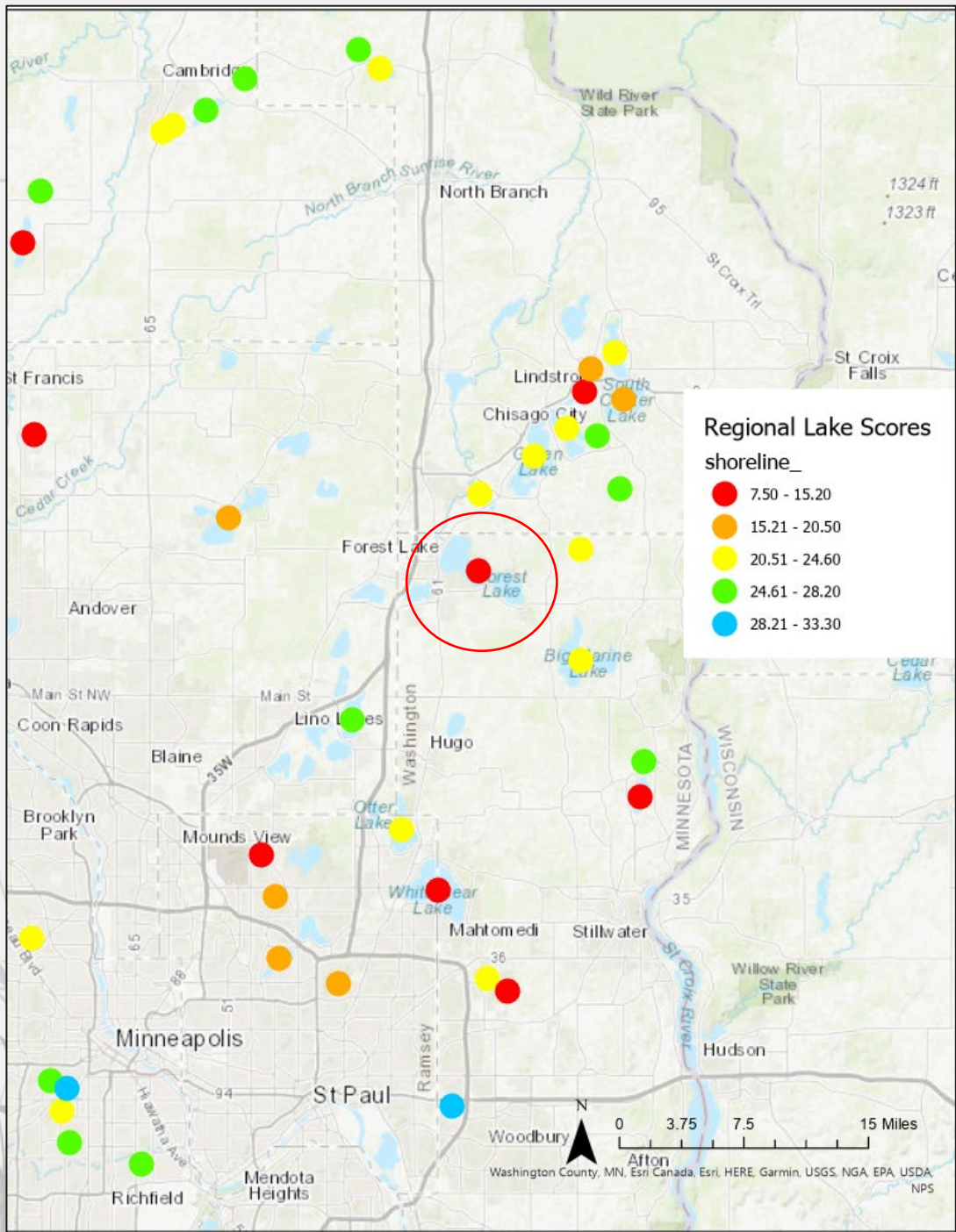


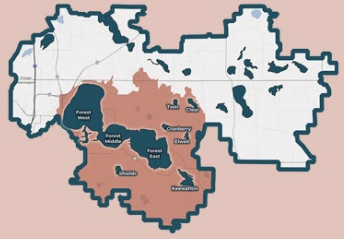
Forest Lake Management District

Forest Lake - How do we compare?

Compared to regional lakes, Forest Lake ranks poorly.

Of the 824 lakes surveyed by the DNR for shoreline habitat, Forest Lake ranks 817th placing it in the bottom 1 percentile.





Forest Lake
Management District

Areas to focus

- Plant a tree! - 345 points without shoreline trees or shrubs
- Don't go there? Don't mow there! – 161 points without any natural vegetation
- If a tree falls in the lake... leave it! – 609 points without overhanging woody habitat



What's Next

Small changes can make a big difference!

Contact CLFLWD today to see how you can improve your shore.

Shoreland Vegetation

- erosion-control
- water quality
- wildlife habitat
- high plant diversity = high wildlife diversity

Emergent Vegetation

- water quality
- erosion-control
- wildlife habitat)



Drifted-in Logs & Snags

- wildlife habitat
- erosion control
- water quality

Tree Stumps

- wildlife habitat
- water quality