

Resources:

East Goose Neighborhood Conversation: December 1st, 2020

- [PowerPoint](#)
- [Webinar recording link](#)

White Bear Lake City Council visitors presentation: May 11th, 2021

- [PowerPoint](#)
- Supplementary articles: [Eagan, MN Bald Eagle Lake, MN](#)
- [City Council recording](#) (1:40)

Other:

+ East Goose Lake Water Quality Data



The screenshot shows a YouTube video player interface. The video title is "Adaptive Lake Management". The video content includes a list of bullet points: "• ALM and associated benefits", "• Steps to implement ALM approach", and "• Possible Management projects". The video player has a play button in the center and a "Watch on YouTube" button at the bottom. The browser address bar shows the URL "East Goose Lake Neighborhood Convers...".

Dear East Goose lakeshore resident:

As part of the East Goose Adaptive Lake Management (ALM) Program, the City of White Bear Lake and VLAWMO invited Barr Engineering limnologist Joe Bischoff to provide 2 visitor presentations to the White Bear Lake City Council. One presentation took place on May 11th and is available online. The other is happening on May 25th at 7:00 pm. The presentations focus on the science of shallow lakes and vegetation management.

We invite you to view the May 11th presentation online. The recording and PowerPoint for the May 11th presentation are posted on the East Goose Lake Web Hub.

www.vlawmo.org/EastGooseALM

We also invite you to consider attending the City Council meeting on May 25th to view the presentation on vegetation management in shallow lakes. Comments are limited to input from City Council members for visitor presentations. Materials from the May 25th presentation will be posted on the web hub following the meeting. Additional venues for public questions and input will be provided this summer.

Shallow Lake
Vegetation Management:
City Council Visitor
Presentation

May 25th
7:00 pm

www.whitebearlake.org/meetings



Shallow Lake Vegetation Management

White Bear Lake City Council Meeting
5/25/2021



Objectives

- Shallow lake ecology and management
- Why the plant dominated state?
- Aquatic plant response following an alum treatment
- Shallow lake vegetation/recreation balancing act
- Long term management

Turbid and Clearwater States

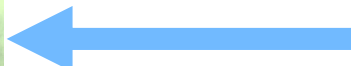
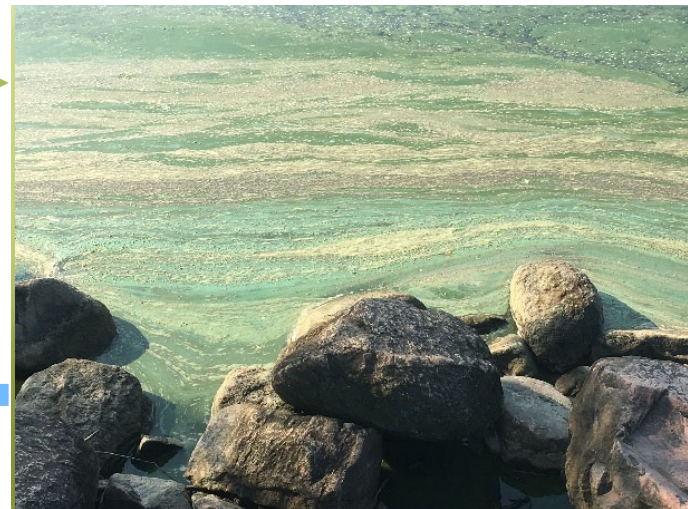
Competing Equilibria in Shallow Lakes

Clearwater State

- Large aquatic plant community
- Low algal productivity
- Large grazer population

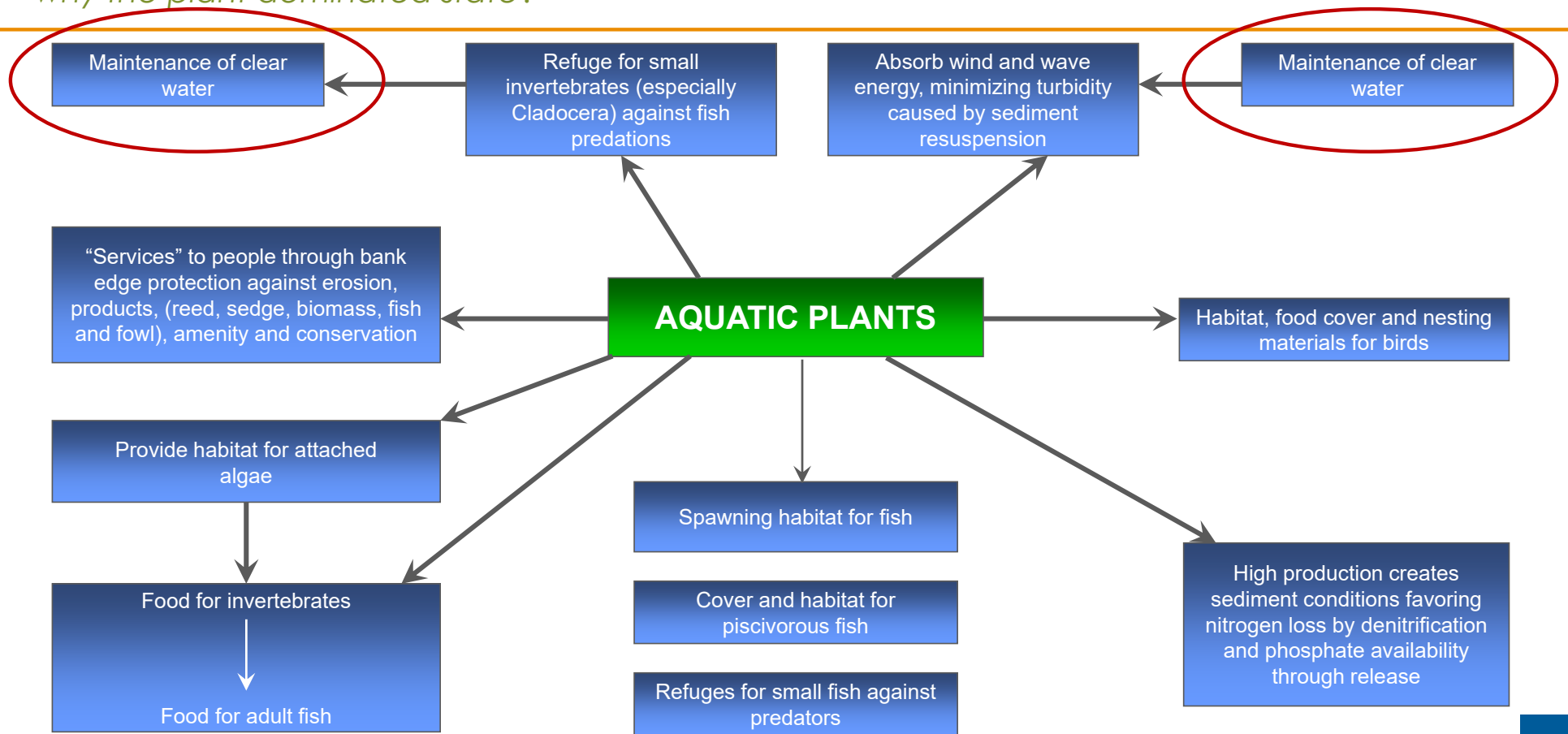
Turbid State

- High algal productivity
- Low aquatic plant productivity
- Low grazer (zooplankton) productivity



Role of Aquatic Vegetation in Shallow Lakes

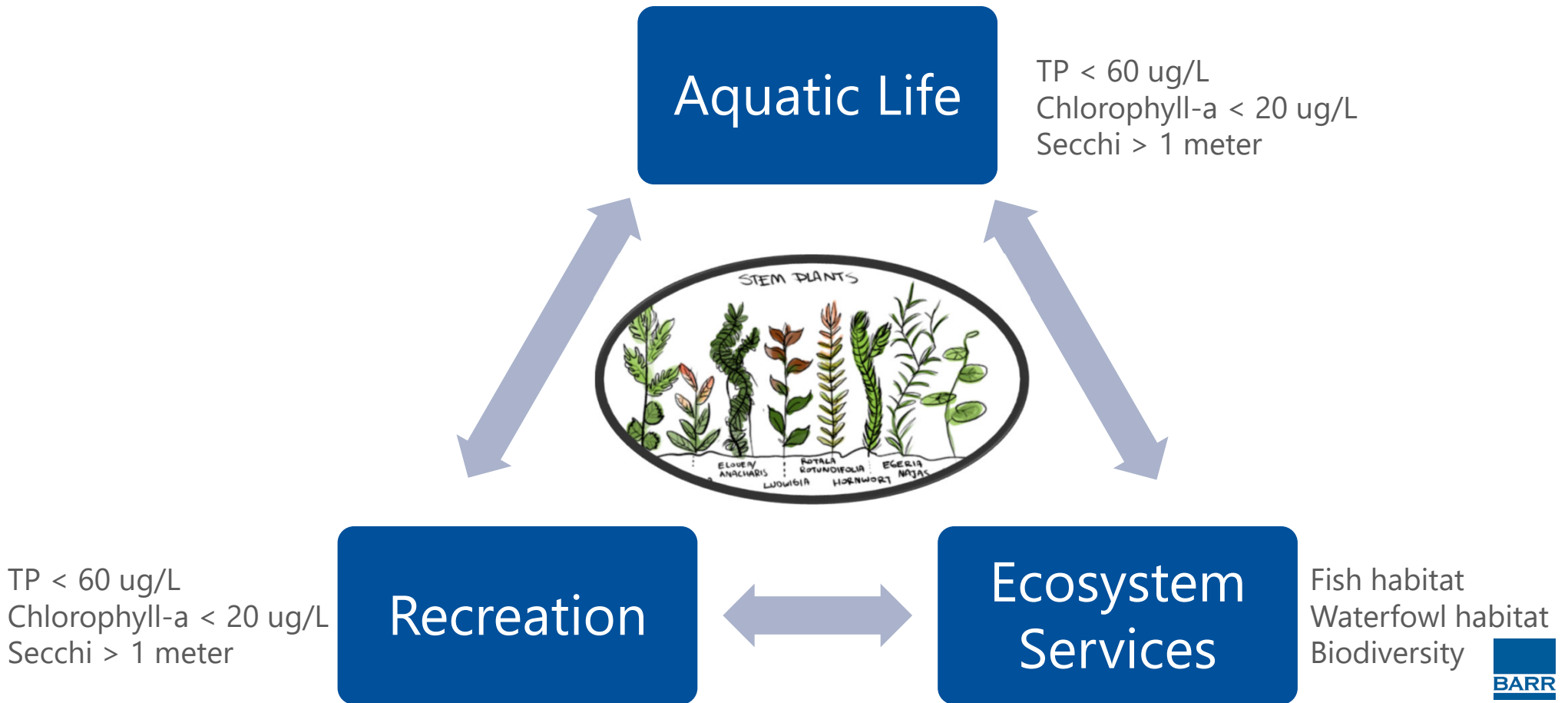
why the plant dominated state?



Moss et al. 1996

Balancing Aquatic Vegetation and Recreation in Shallow Lakes

why the plant dominated state?



Strategy for Restoring Shallow Eutrophic Lakes



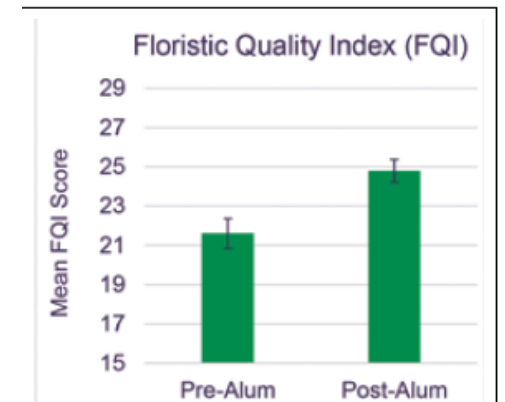
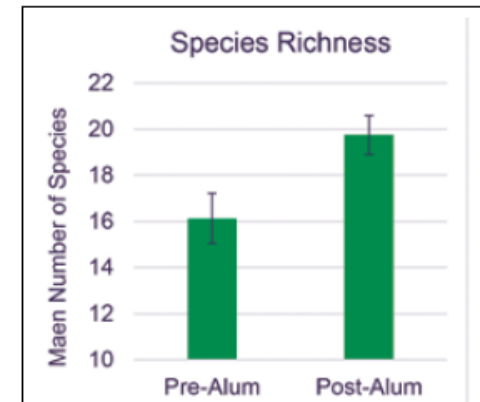
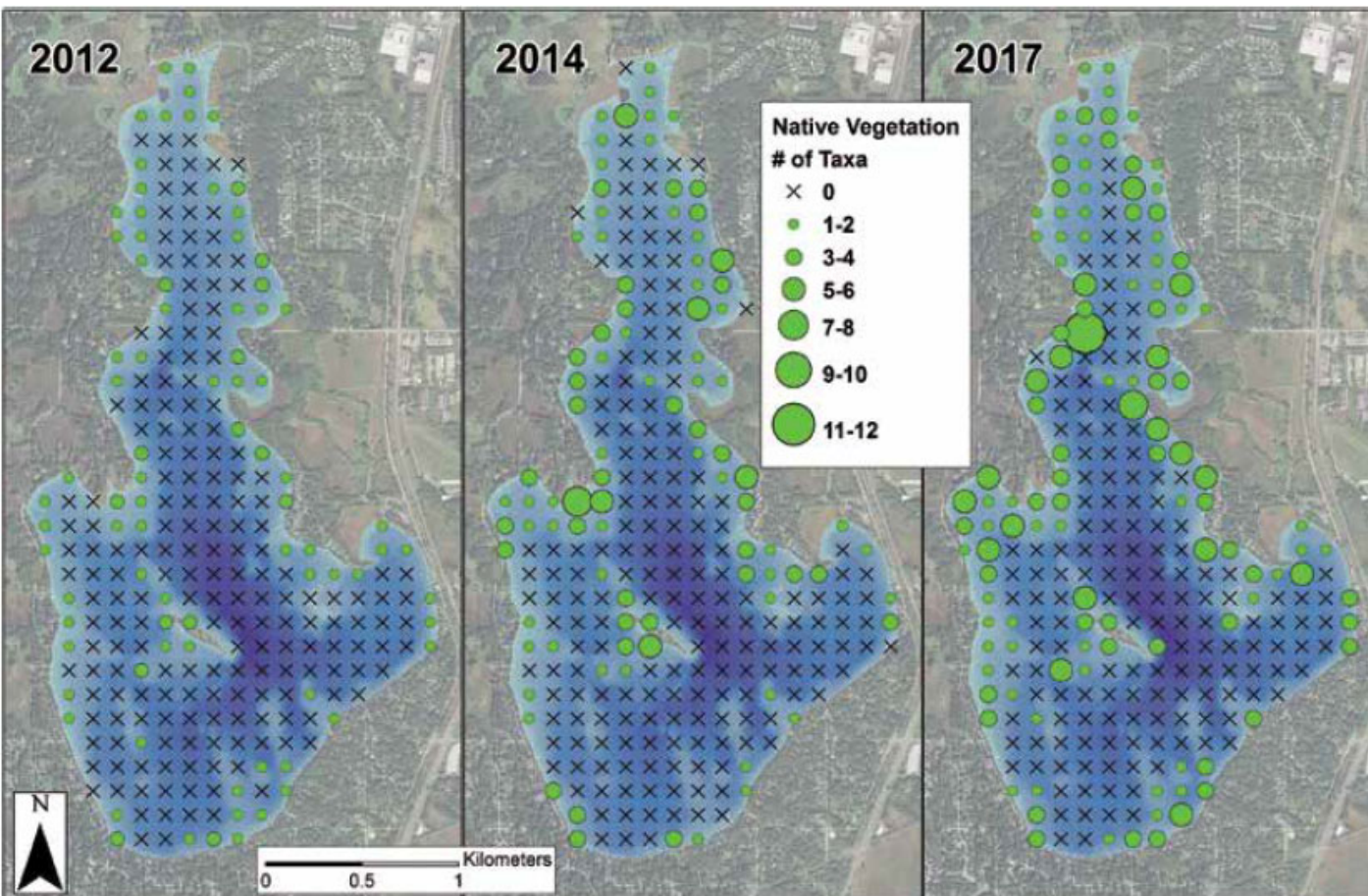
- Driver detection and removal
- External and internal nutrient control
- Biomanipulation
- Plant establishment
- Stabilizing and managing restored system



Sediment P Inactivation - Aluminum Sulfate

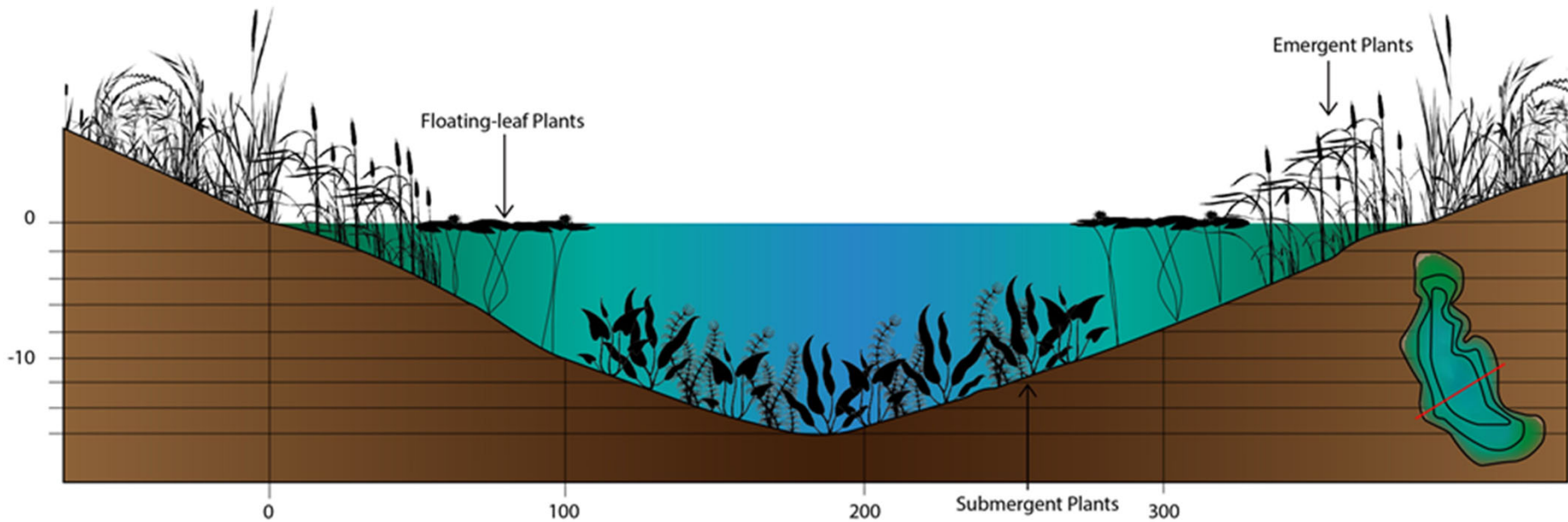
- 88% of P load to East Goose Lake is from the sediments
- Aluminum Sulfate (liquid)
 - Dissolves in water to form aluminum hydroxide and sulfate
 - Permanently binds phosphorus in the sediments
- Results in clear water in a few days
 - Sunlight reaching the sediment to invigorate aquatic plant community

Bald Eagle Lake Aquatic Vegetation Response to Alum



Aquatic Vegetation Management – Gardening Your Lake

Como Lake Example



Diverse, native, moderately abundant plant community



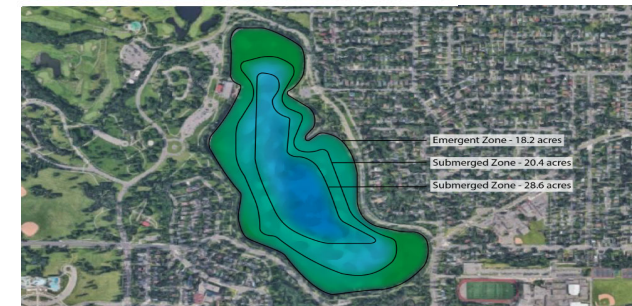
Native, monotypic SAV community



Monotypic SAV Dominated by Invasive species

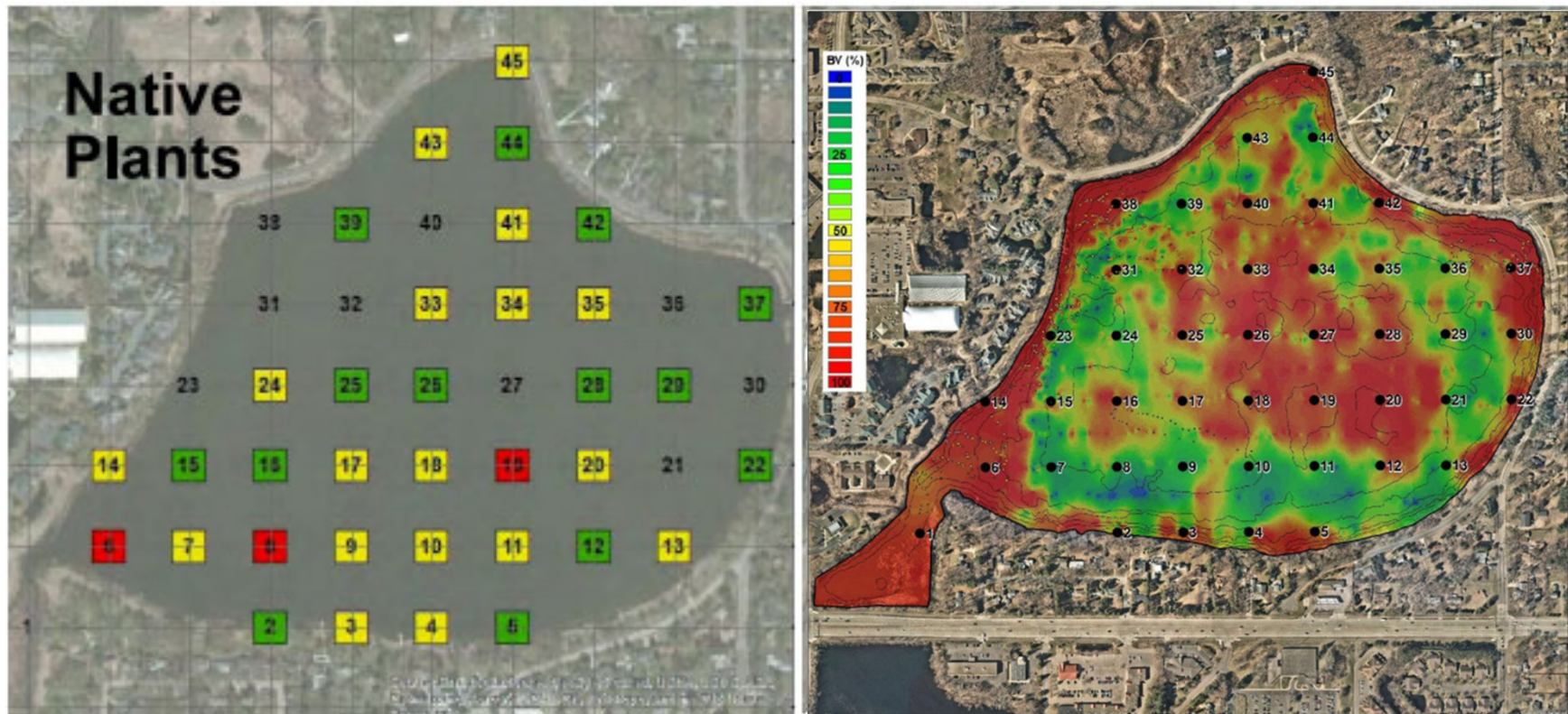


No Vegetation



Como Lake Aquatic Vegetation Management Plan (CRWD 2020)

Birch Lake Plant Community – 2013 and 2019



Fern pondweed (*P. Robbinsi*), Water celery (*Vallisneria americana*), and Chara (*chara sp.*) dominated

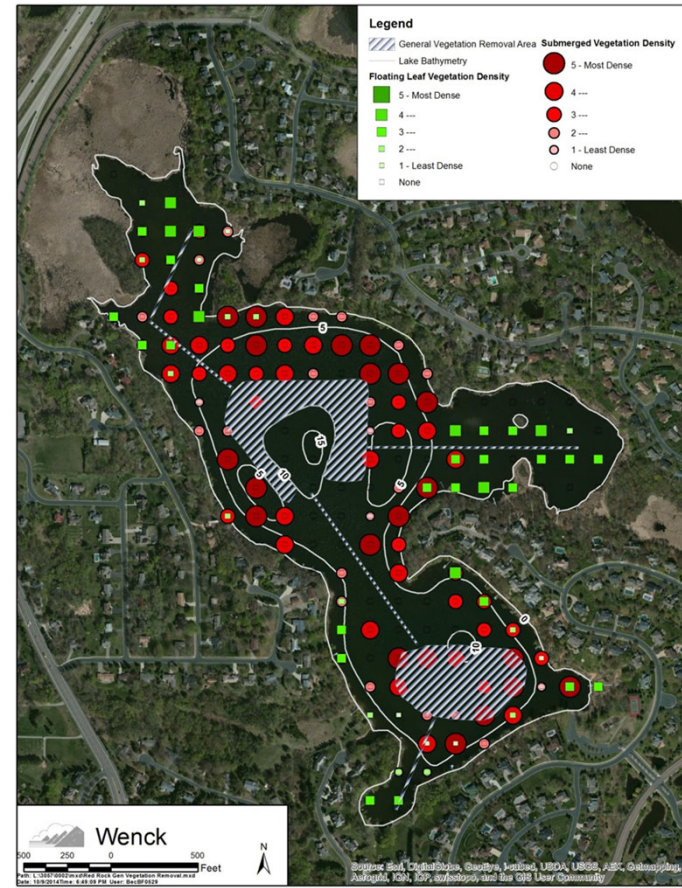
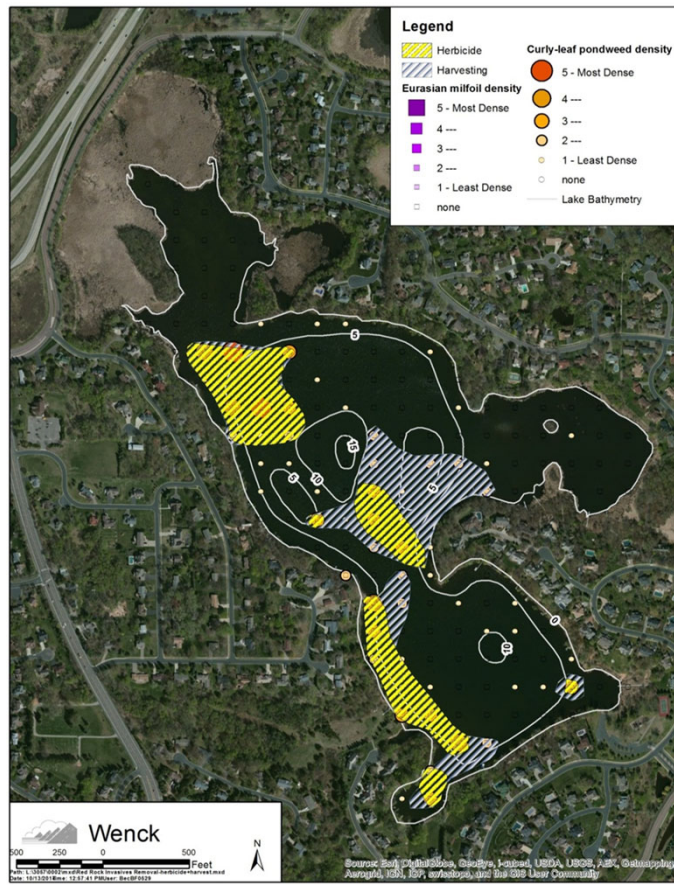
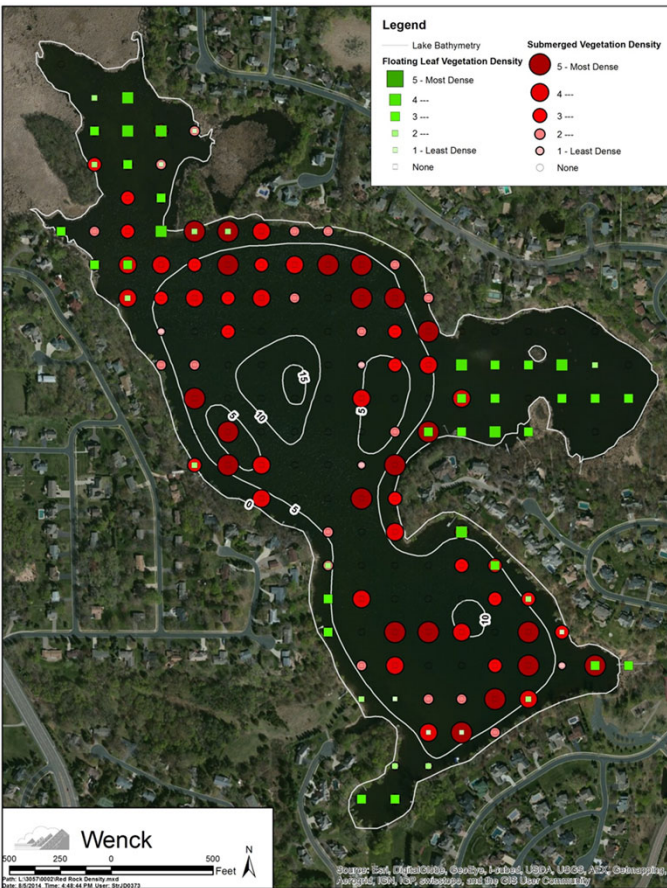
Adaptive Management in Aquatic Plant Management

- Aquatic vegetation management is challenging
 - Shallow depth increases challenge
 - Species specific response to management actions
 - Manage multiple goals (habitat, sediment stabilization, biodiversity)
- Management Objectives
 - Immediate: Harvesting, herbicide, physical controls
 - Long term: community structure, sediment, hydrology



Red Rock Lake Aquatic Plant Management

Riley Purgatory Bluff Creek Watershed District and City of Eden Prairie Partnership



Aquatic Vegetation Management – Heavy Lift

Whole Lake Drawdown



Dredging



Conclusions



Clear lake state is the most ecologically healthy state for shallow lakes

Required by State water quality rules

Low probability of HABs

Provides multiple ecosystem services (fish and waterfowl habitat)

Safe for aquatic recreation



Aquatic vegetation management requires an adaptive approach

Balance recreational uses and ecological health

Curate species that balance recreation and ecosystem services

Requires active management

- harvesting, herbicides and planting
- May require drastic measures such drawdown or dredging



Questions?
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