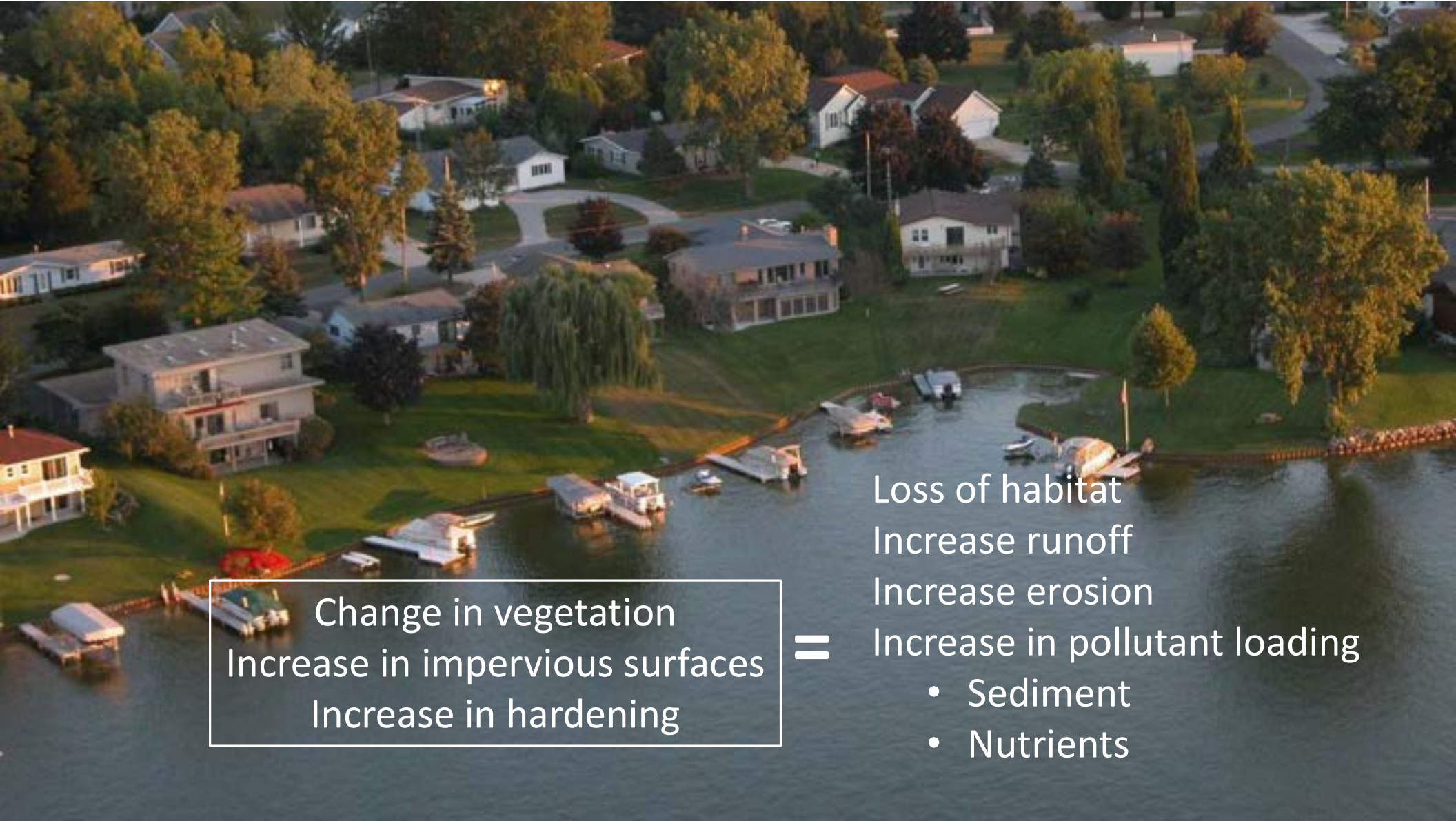




Michigan Case Studies in Nearshore Protection and Restoration

Erick Elgin, MSU Extension & Michigan Natural Shoreline Partnership



Change in vegetation
Increase in impervious surfaces
Increase in hardening

=

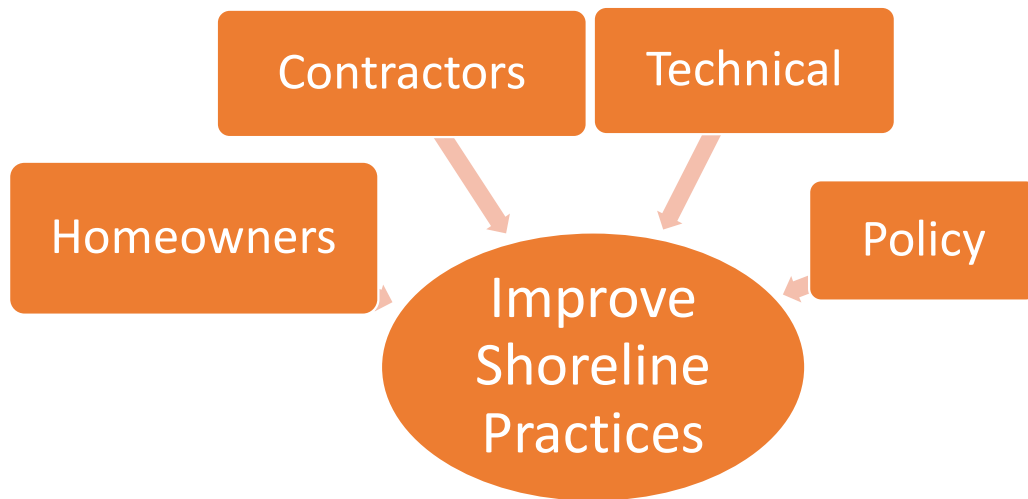
Loss of habitat
Increase runoff
Increase erosion
Increase in pollutant loading

- Sediment
- Nutrients



Michigan Natural Shoreline Partnership

Protecting Michigan lakes through conservation and restoration of natural shorelines

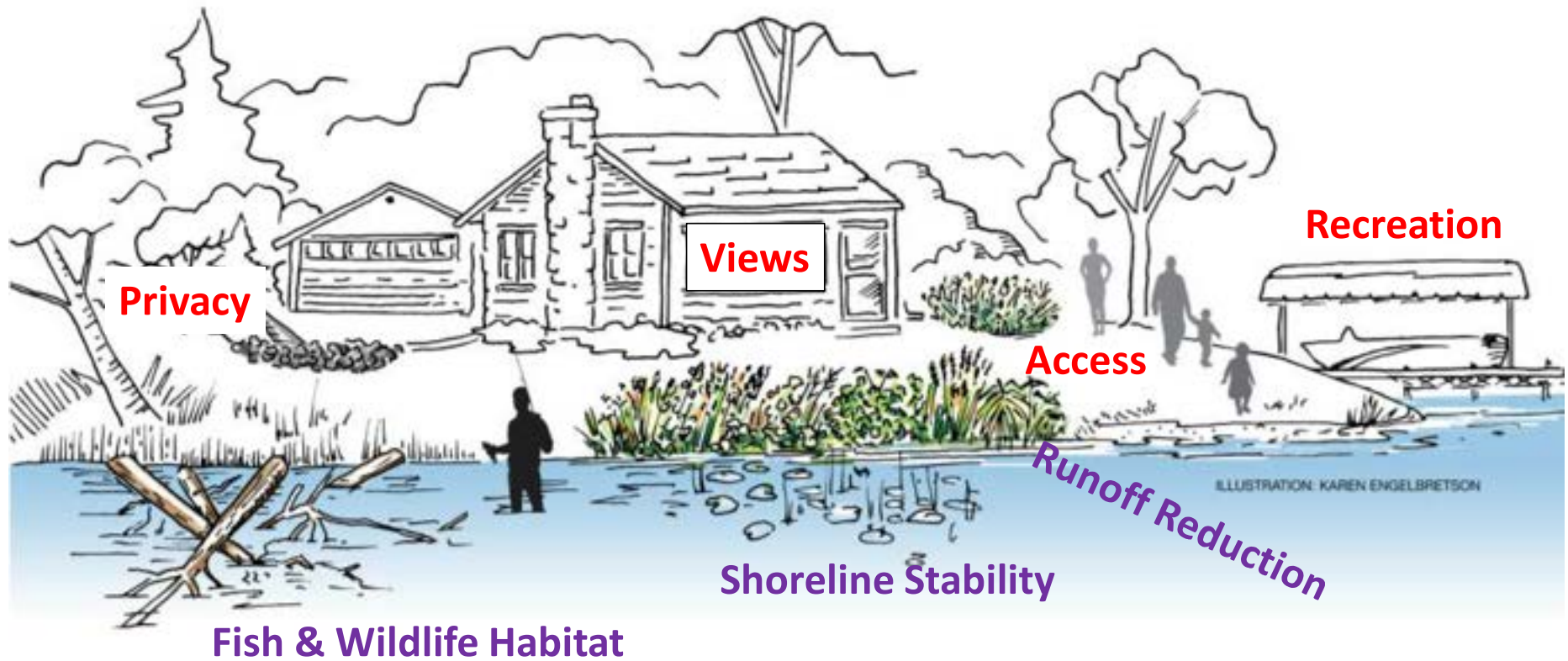


MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Restoration Challenge: Urban landscape

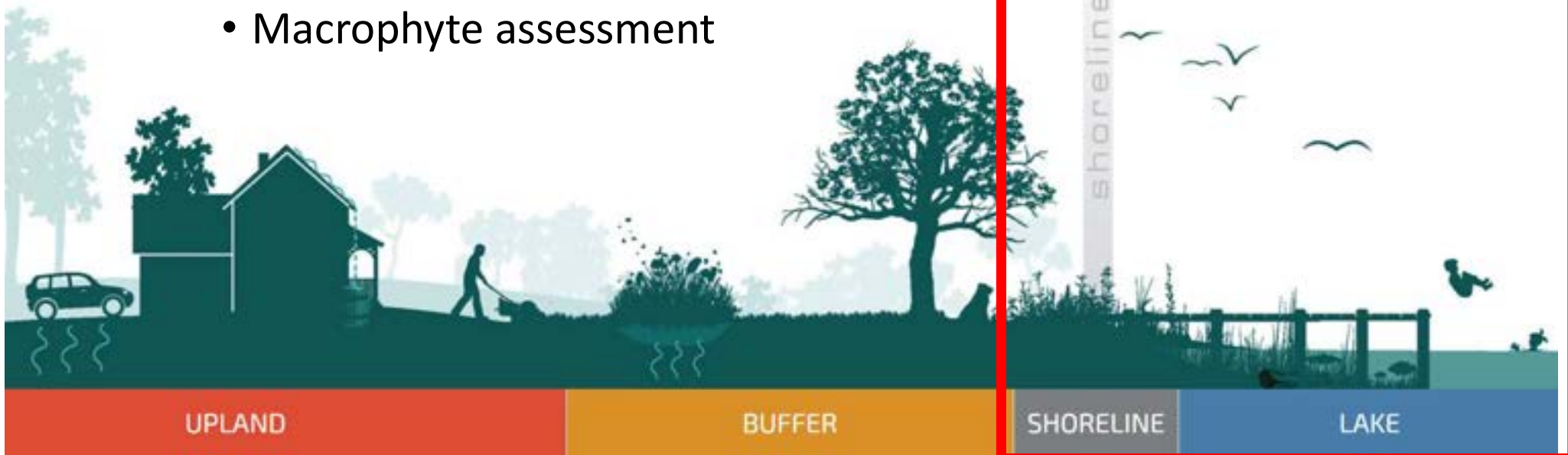


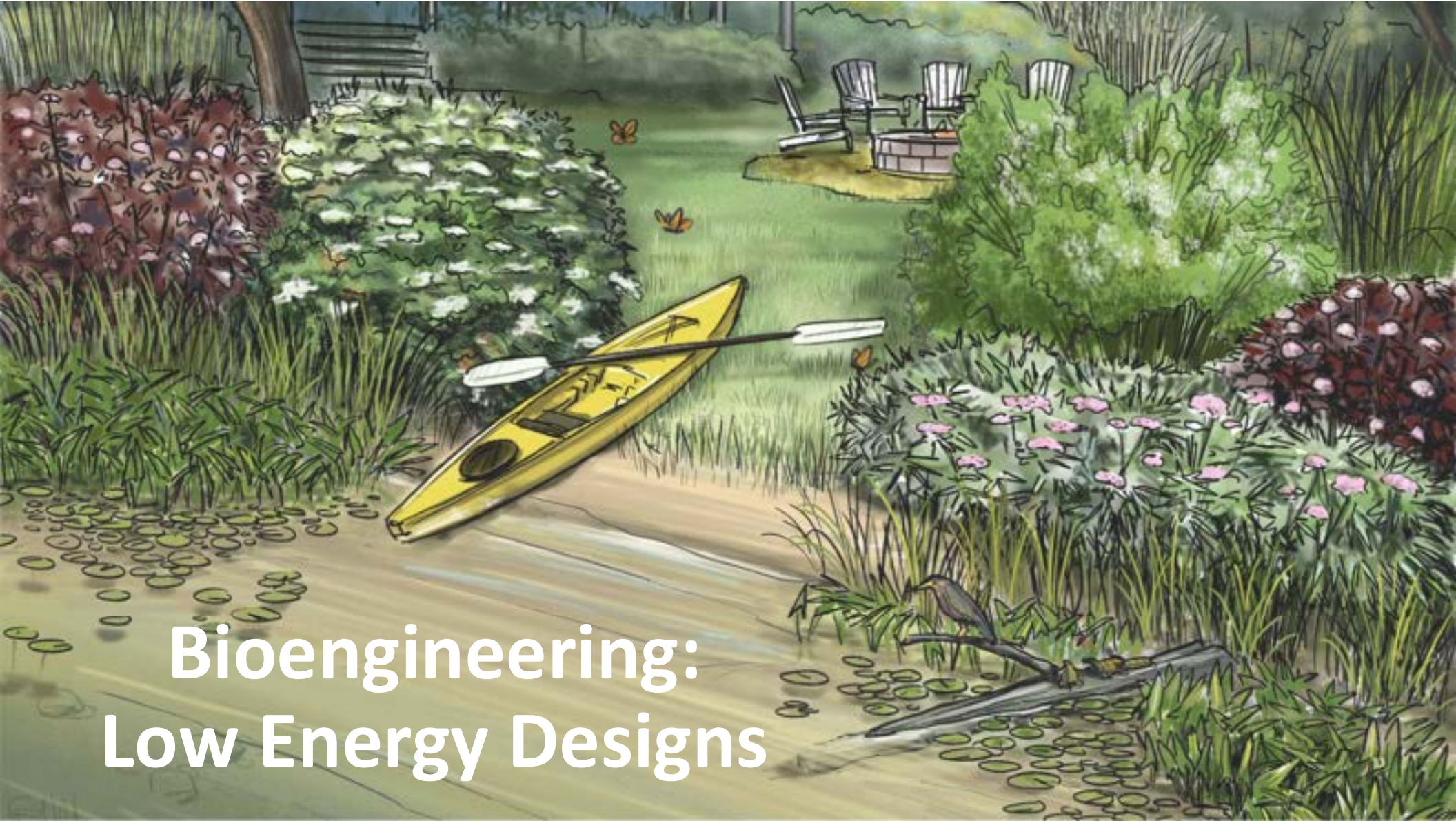
Balance homeowner needs with the protection of the waterbody



Outline

- Low Energy
- High Energy
- Wood addition
- Macrophyte planting
- Macrophyte assessment





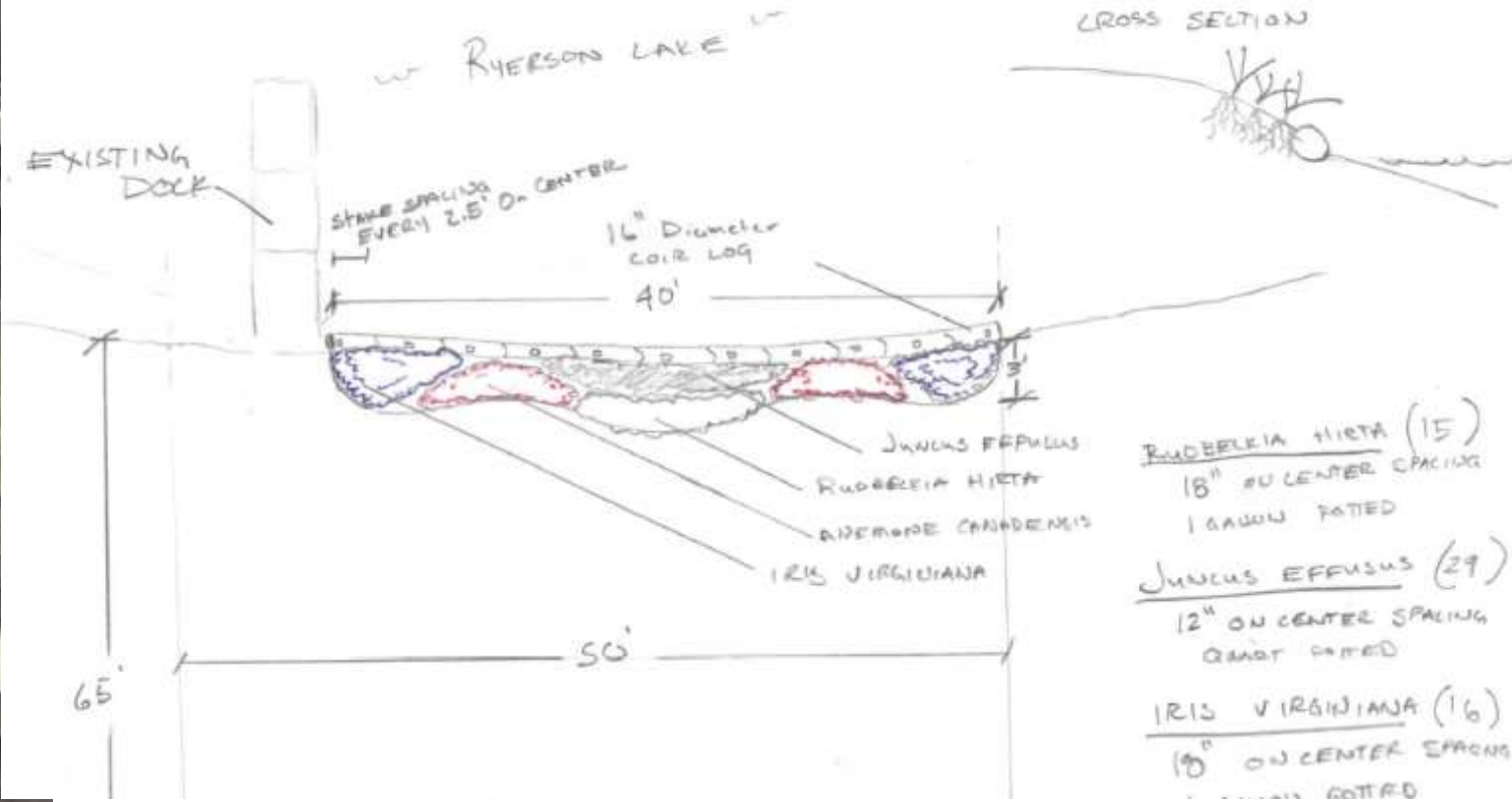
**Bioengineering:
Low Energy Designs**

Native Plant Buffer

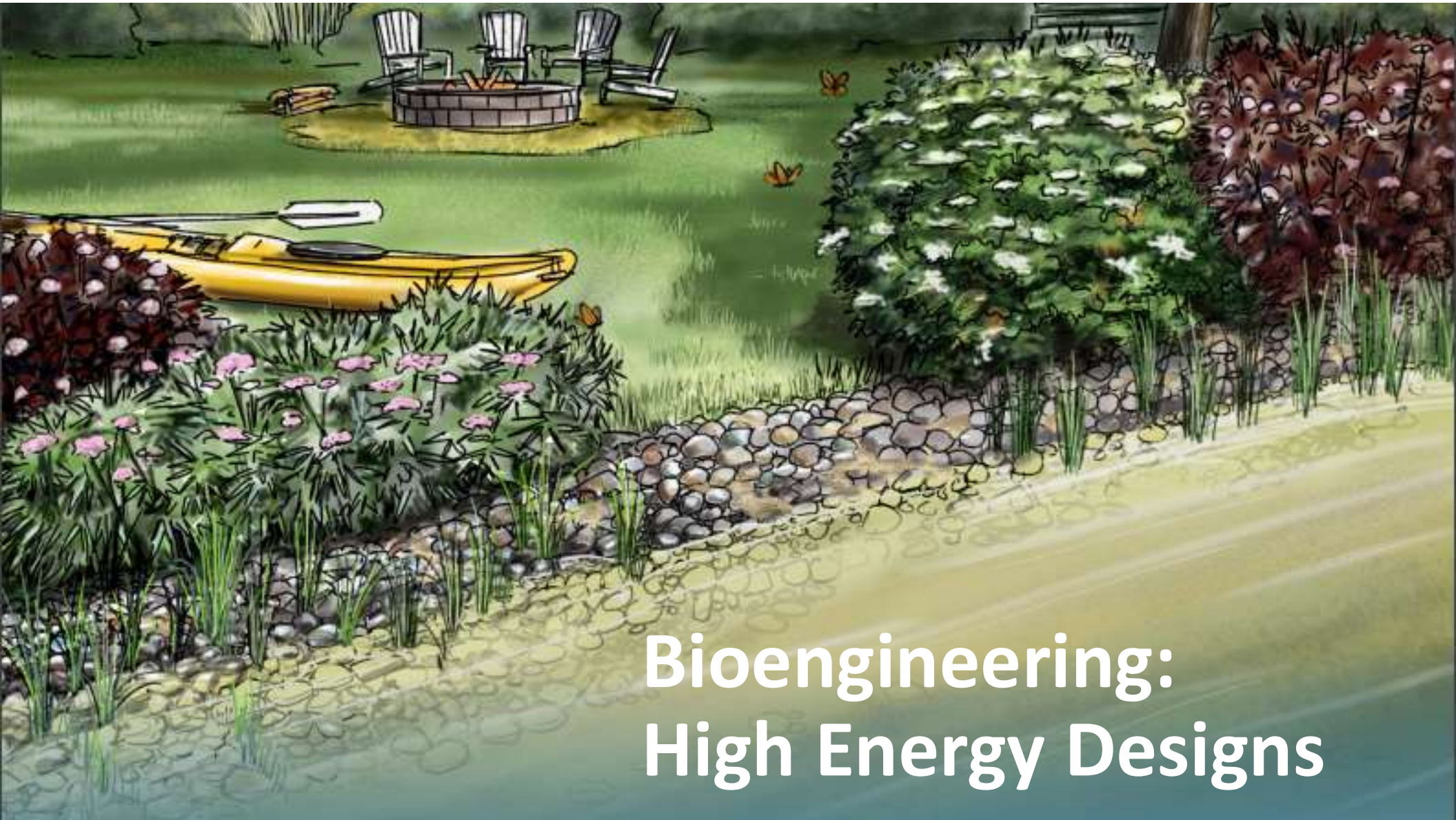
Coir Log



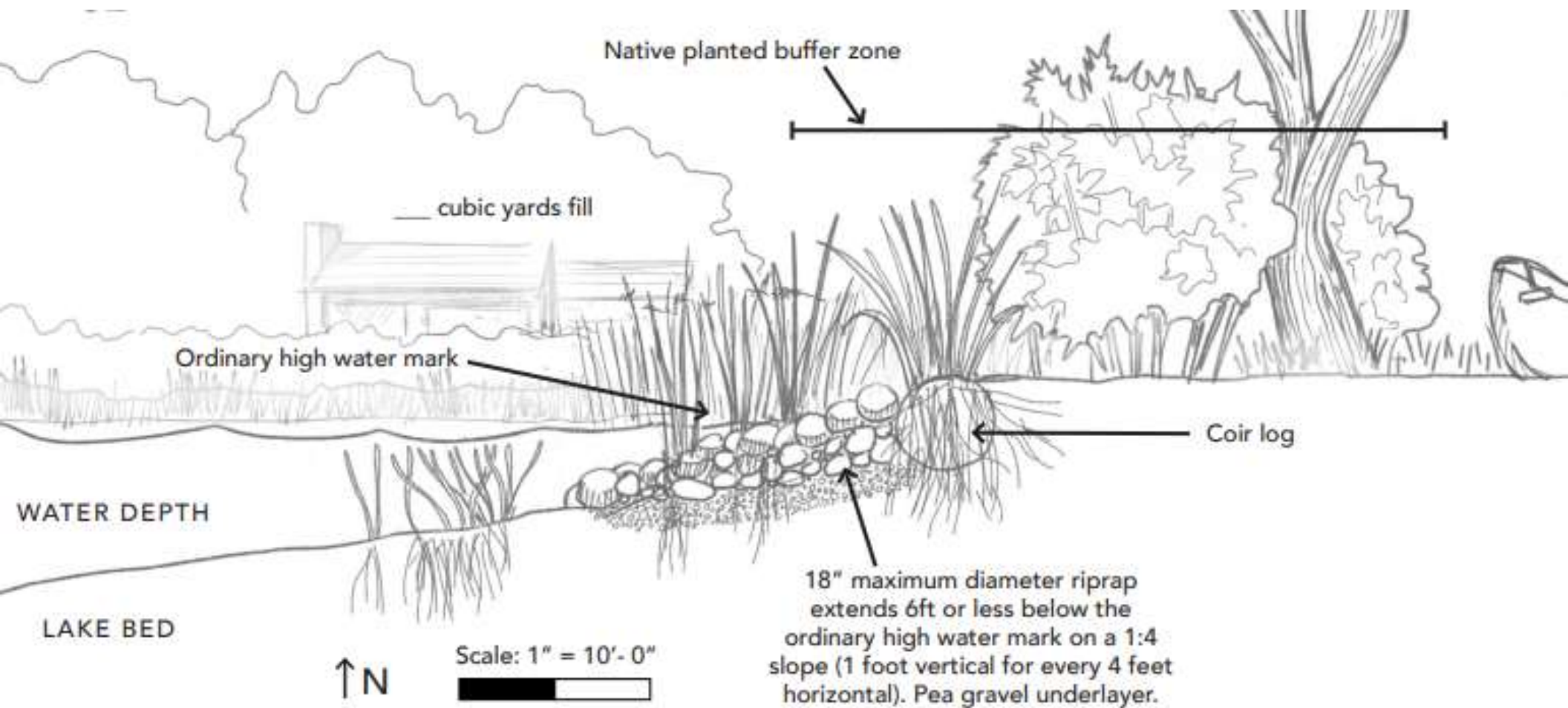
Ryerson Lake







Bioengineering: High Energy Designs



Intermediate Lake



Dekraker:
SHORELINE RESTORATION PROJECT

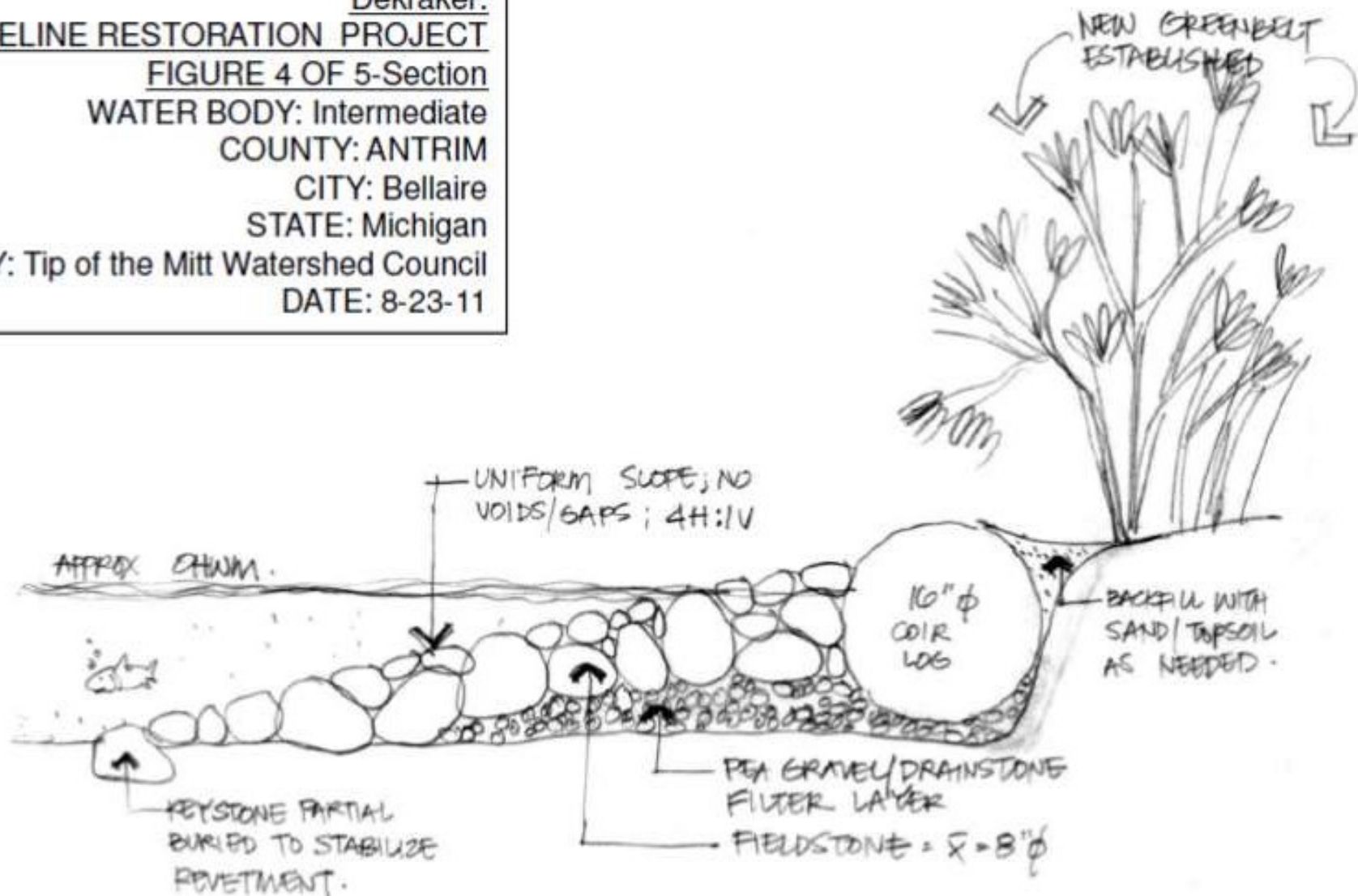
FIGURE 4 OF 5-Section
WATER BODY: Intermediate
COUNTY: ANTRIM

CITY: Bellaire

STATE: Michigan

APPLICATION BY: Tip of the Mitt Watershed Council

DATE: 8-23-11

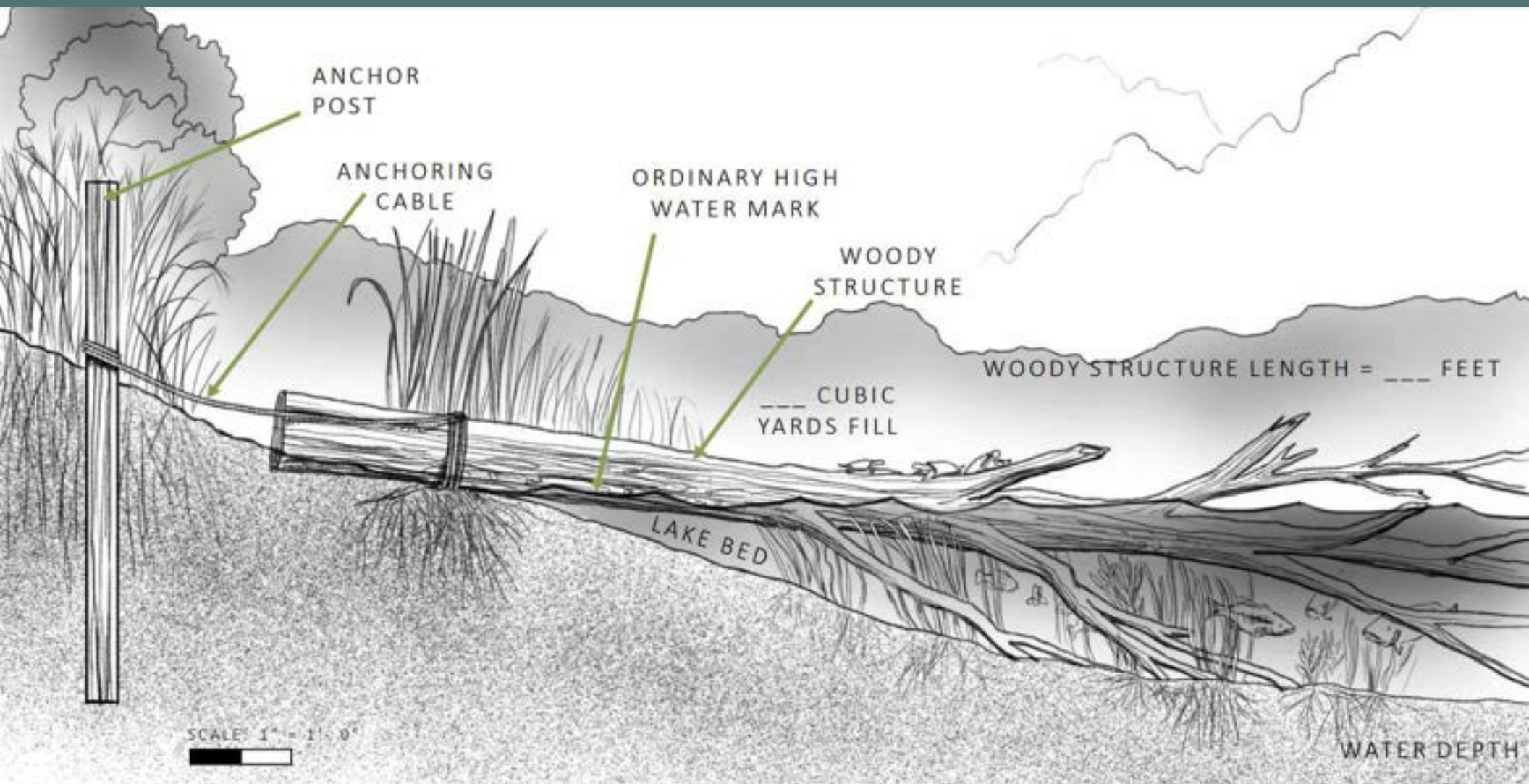








Fish sticks and Turtle logs



Portage Lake



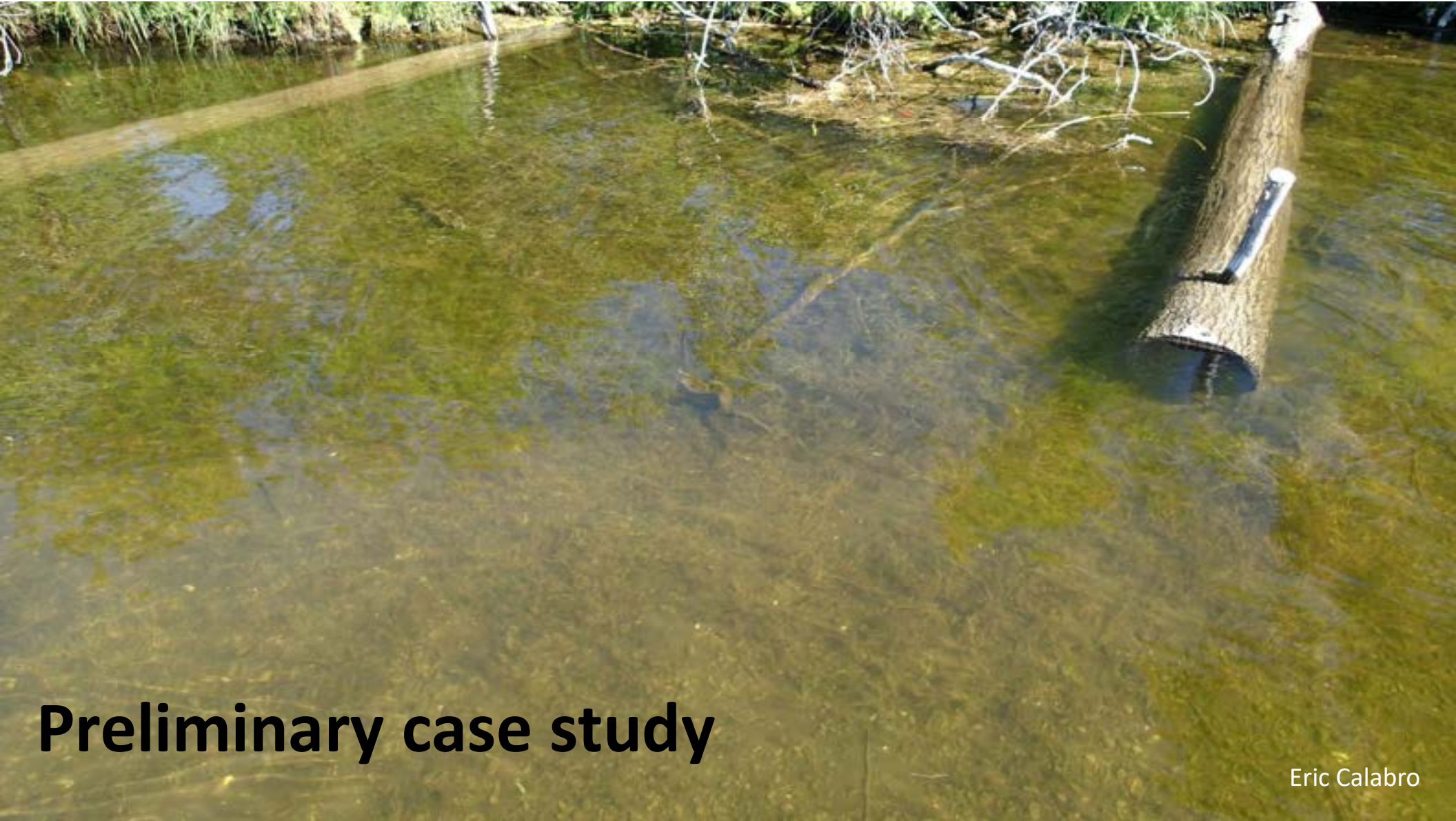










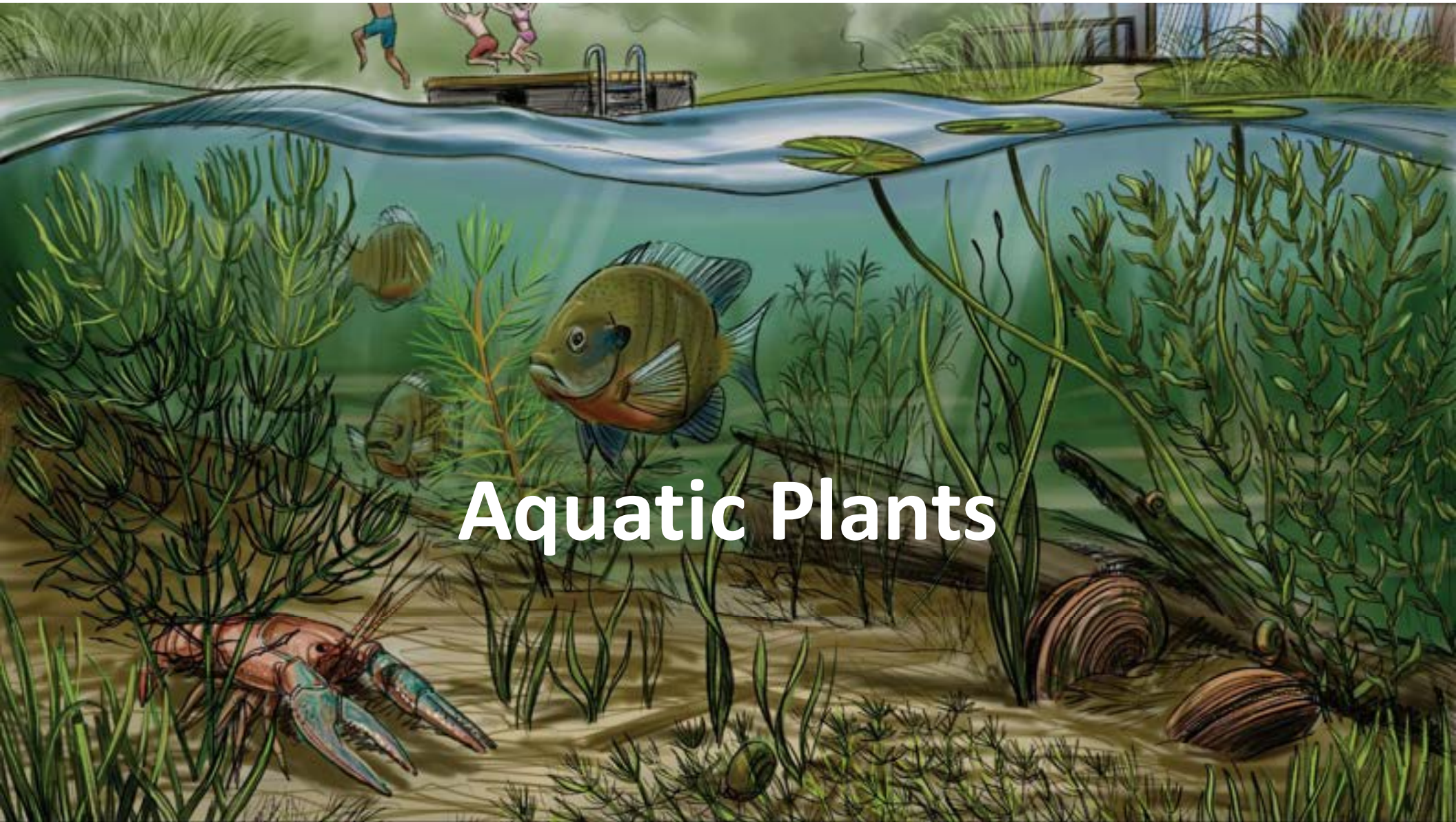


Preliminary case study

Eric Calabro

Preliminary case study

Eric Calabro



Aquatic Plants

Species and Planting Methods

Plant Species

- Sago pondweed
- Illinois pondweed
- Chara

Planting methods

- Push-in
- Staple
- Weighted burrito

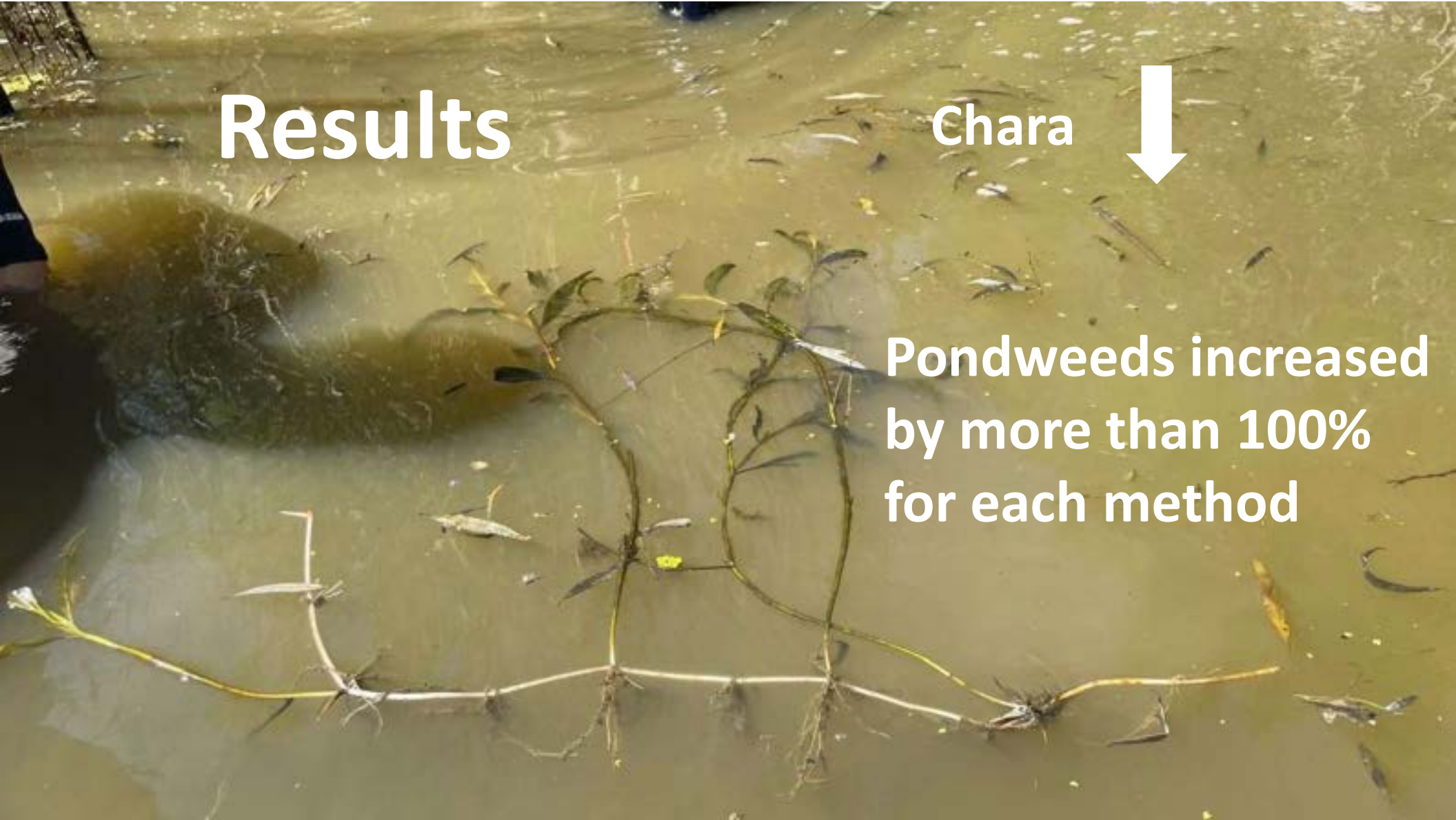


Results

Chara



**Pondweeds increased
by more than 100%
for each method**



Loss of aquatic plants

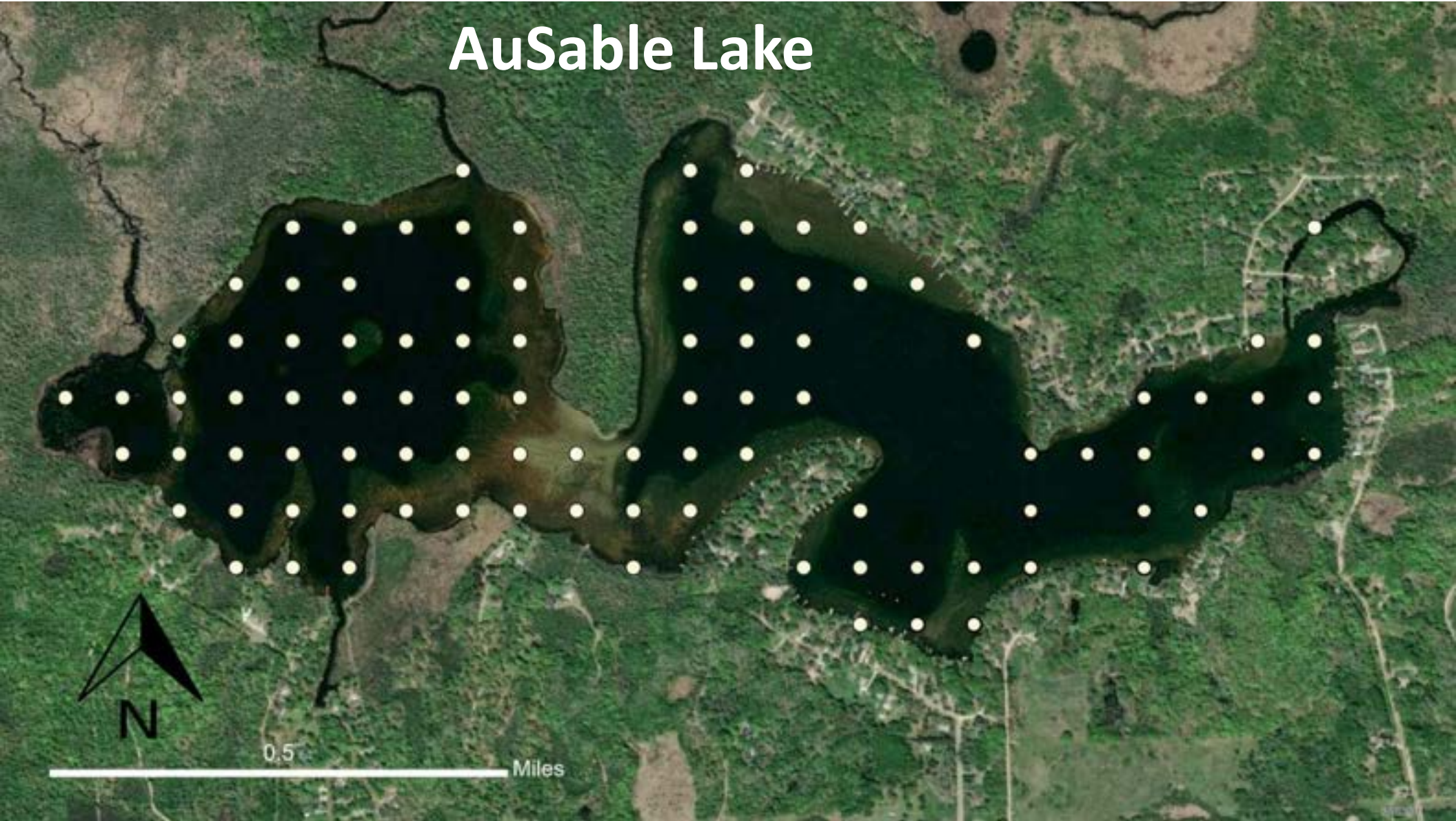
FEATURE:
FISHERIES SCIENCE

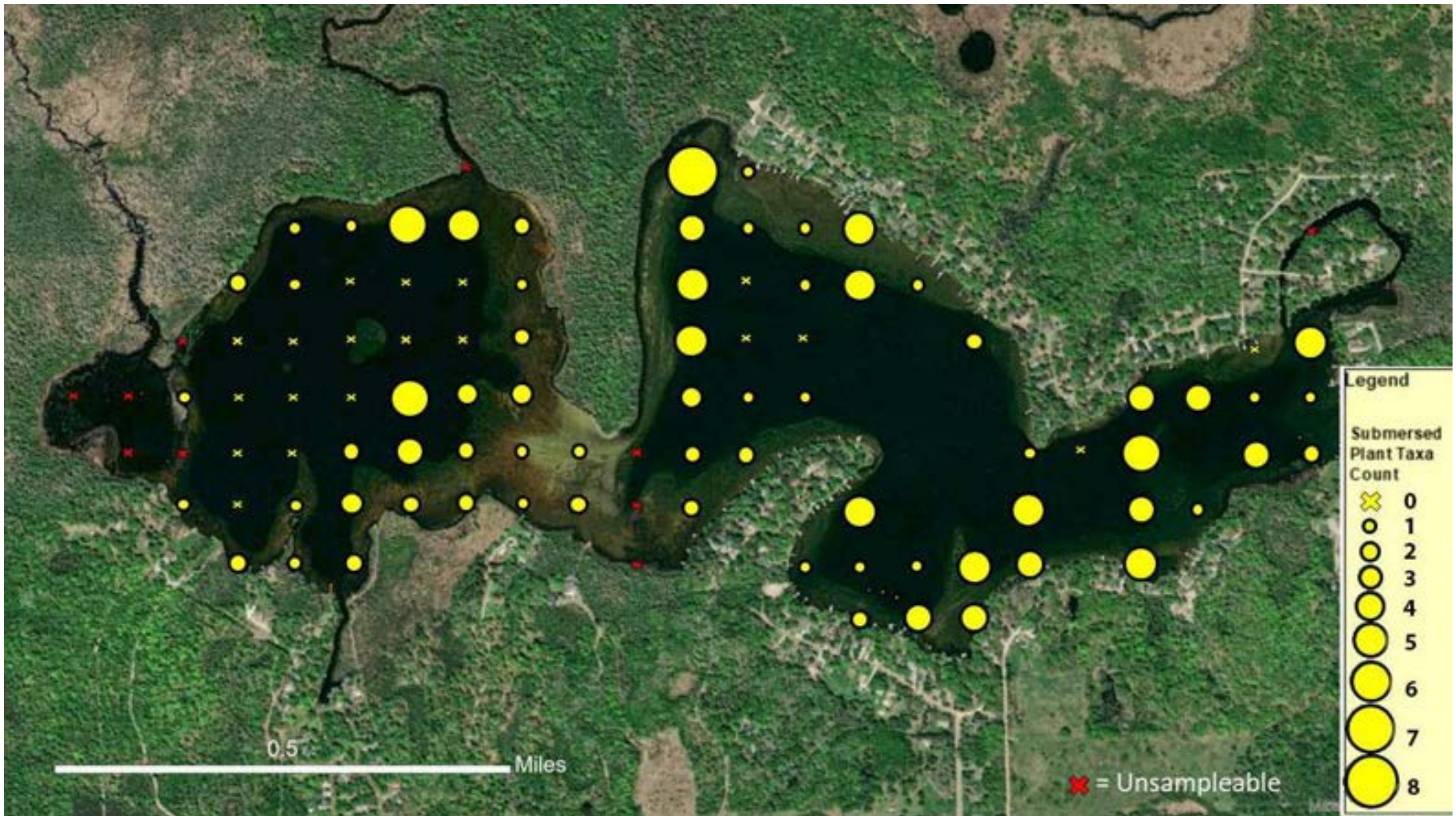
Potential Impacts of Docks on Littoral Habitats in Minnesota Lakes

Paul Radomski,
Lyn A. Bergquist,
Michael Duval, and
Andrew Williquett

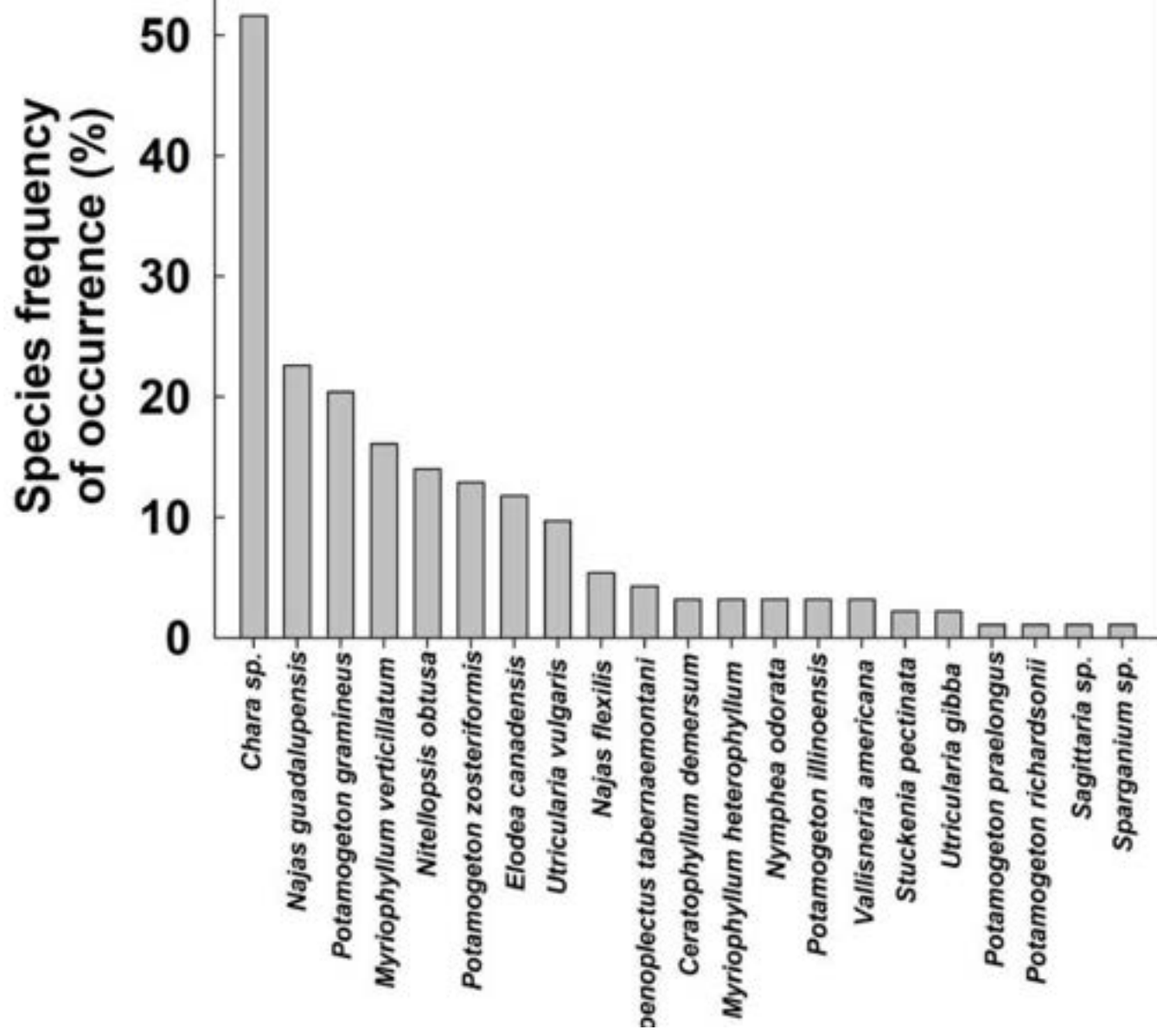
All of the authors work for the Minnesota Department of Natural Resources, St. Paul, Minnesota. Radomski is an aquatic biologist; Bergquist is a GIS coordinator; Duval is fisheries habitat coordinator; and Williquett is a research analyst. Radomski can be contacted at paul.radomski@state.mn.us.

AuSable Lake





Diversity: Frequency of Occurrence





Thank You!

Eric Calabro

Sarah LeSage

Craig Kivi

Joe Nohner

EGLE

DNR

GLRI

Tip of the Mitt Watershed Council

Questions

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