

PROTECTING AND RESTORING AQUATIC PLANTS IN THE NEARSHORE

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MICHIGAN STATE
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Paul Sundberg

AQUATIC PLANTS ANCHOR THE SHORELINE ECOSYSTEM

Tree Canopy

Shrub understory

UPLAND ZONE

Herbaceous Plants

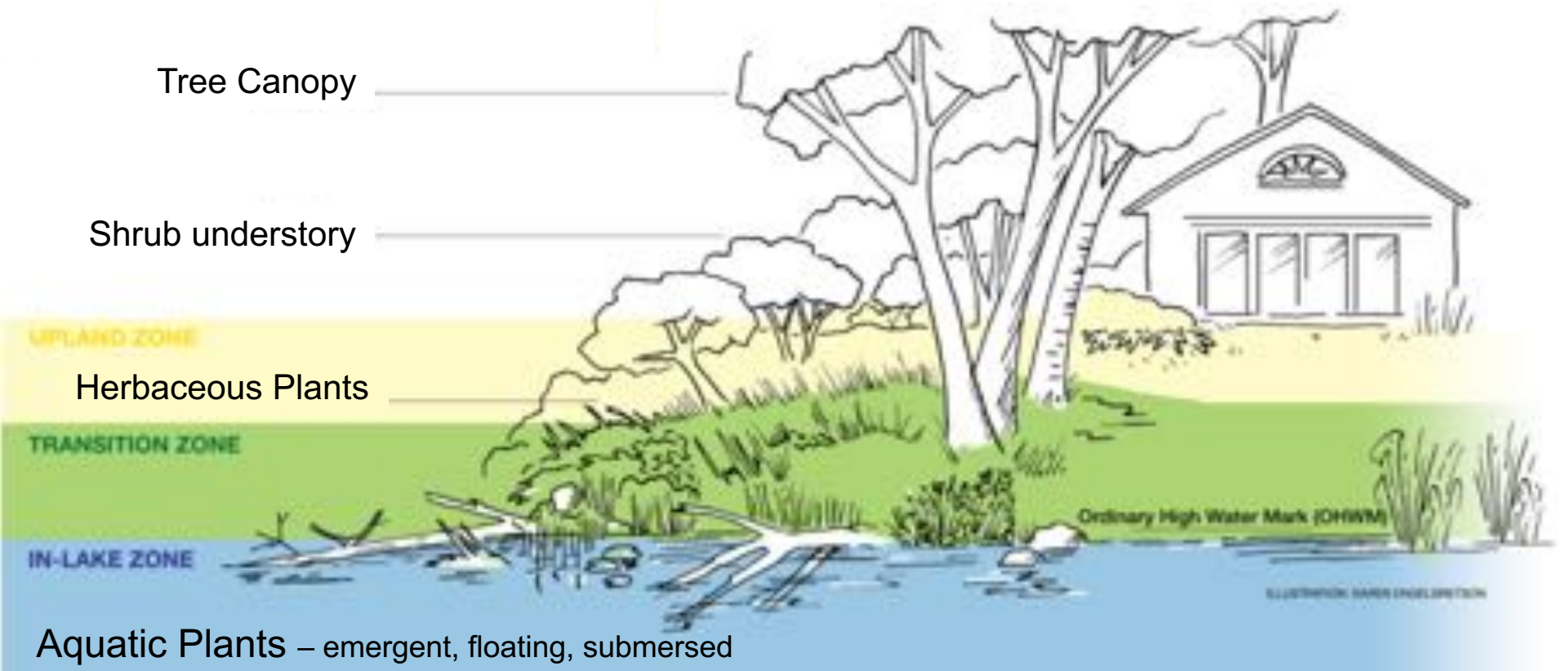
TRANSITION ZONE

IN-LAKE ZONE

Ordinary High Water Mark (OHWM)

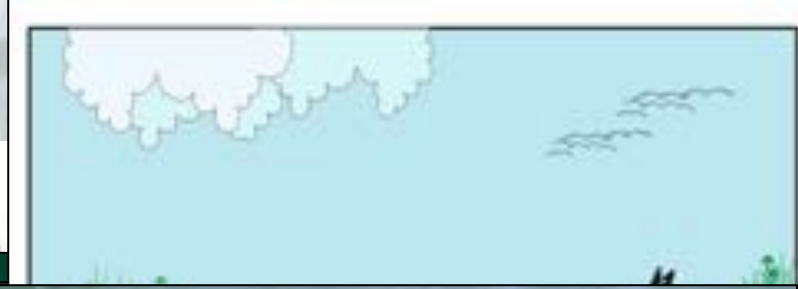
ILLUSTRATION: DAVID ENGLBRETT

Aquatic Plants – emergent, floating, submersed



BENEFITS OF AQUATIC PLANTS

- Shoreline & Sediment



- E

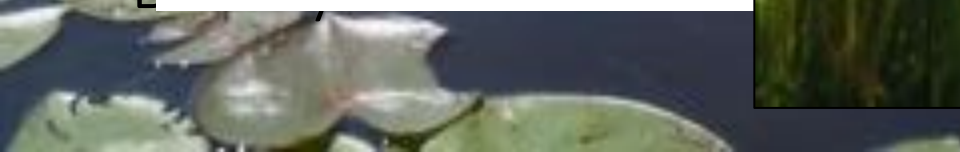
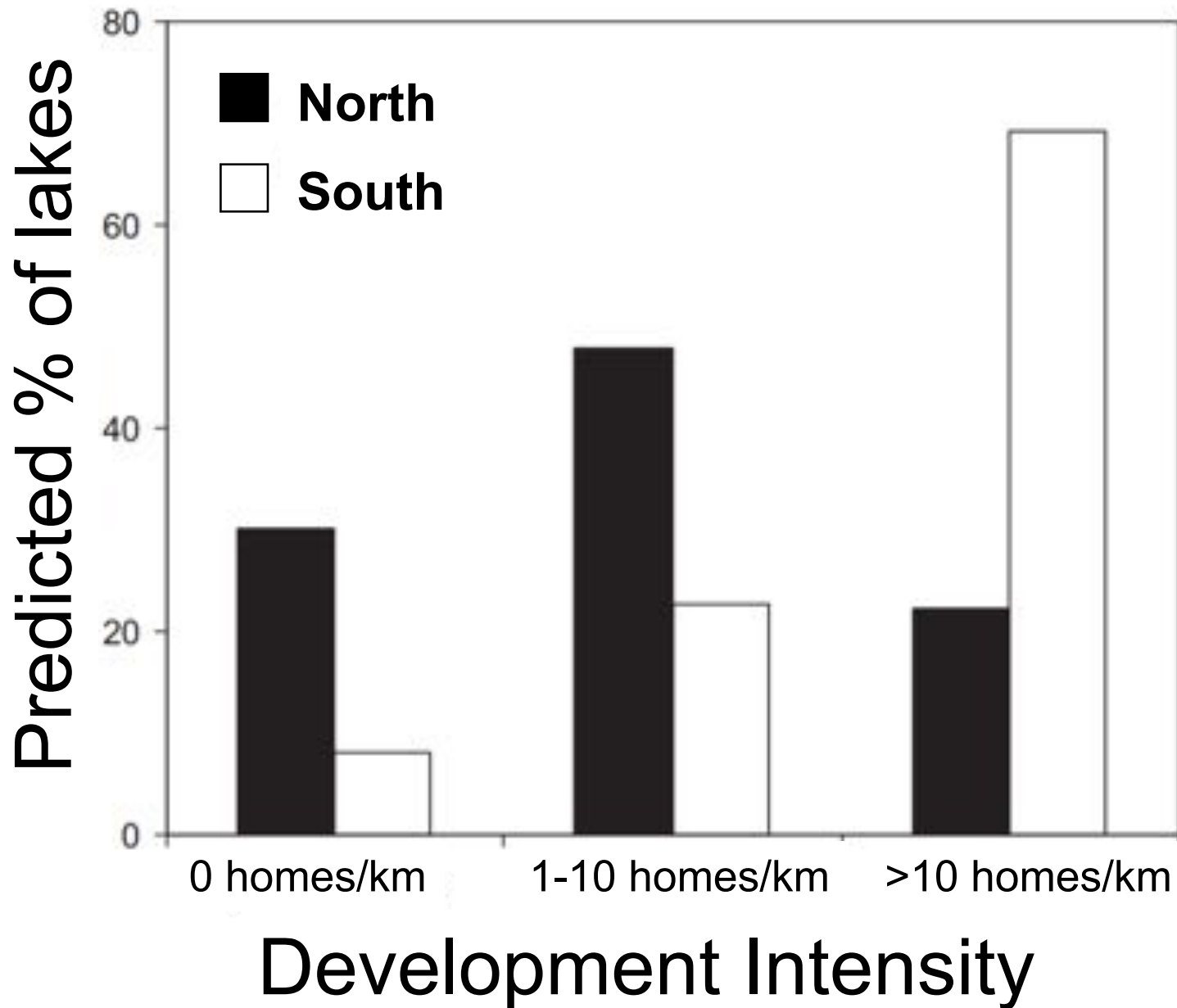




Photo: Scott Brown

DEVELOPED LAKES IN MICHIGAN



NEARSHORE DISTURBANCE PRACTICES

An aerial photograph of a lake shoreline. The image shows several wooden docks extending into the water. There are various structures, including what appears to be a small building or shed on the shore. The water is dark, and the shoreline is covered with trees and vegetation. The overall scene depicts a typical nearshore area in a lake.

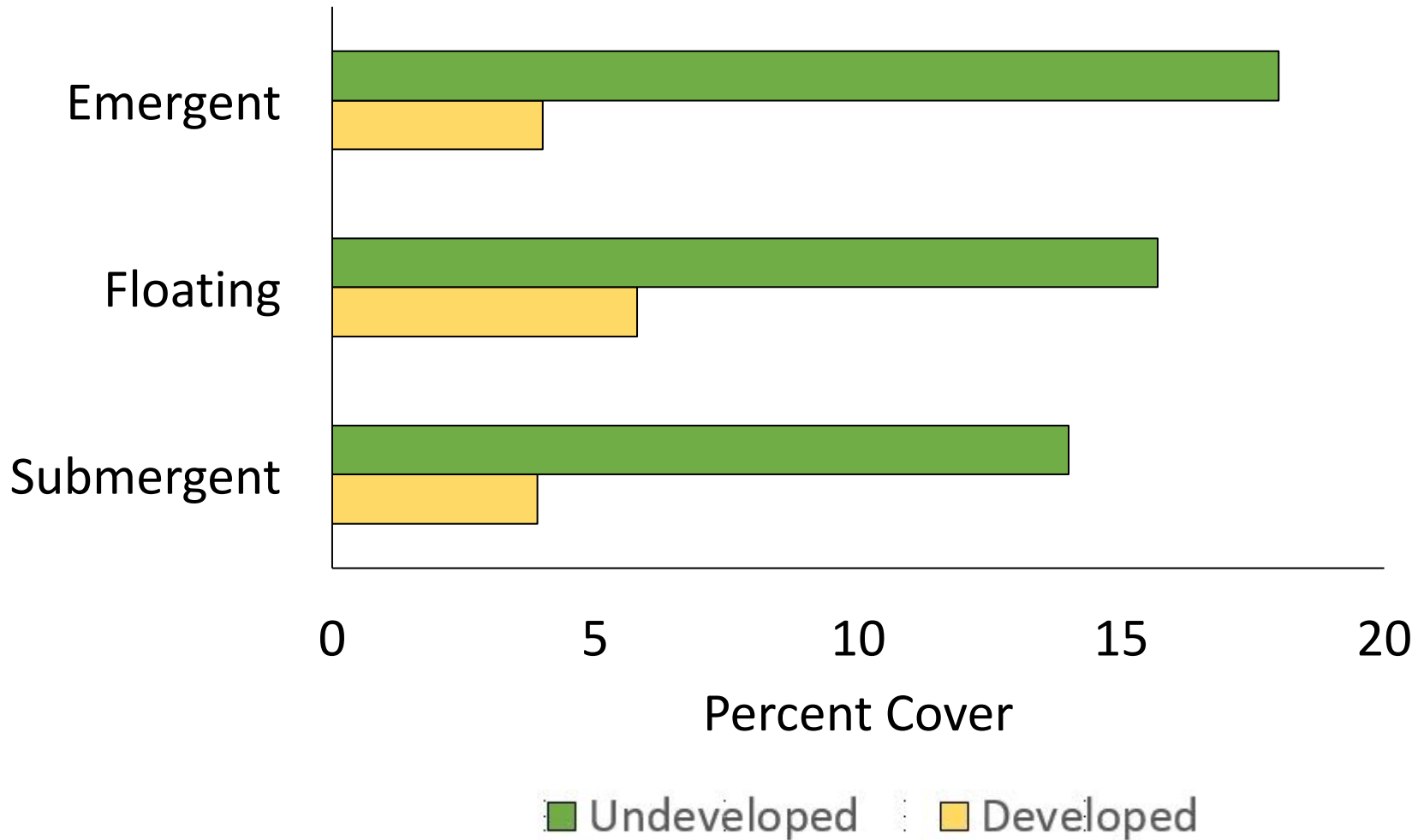
FEATURE:
FISHERIES SCIENCE

Potential Impacts of Docks on Littoral Habitats in Minnesota Lakes

Paul Radomski
Lyn A. Bergquist
Michael Duval
Andrew Williquett

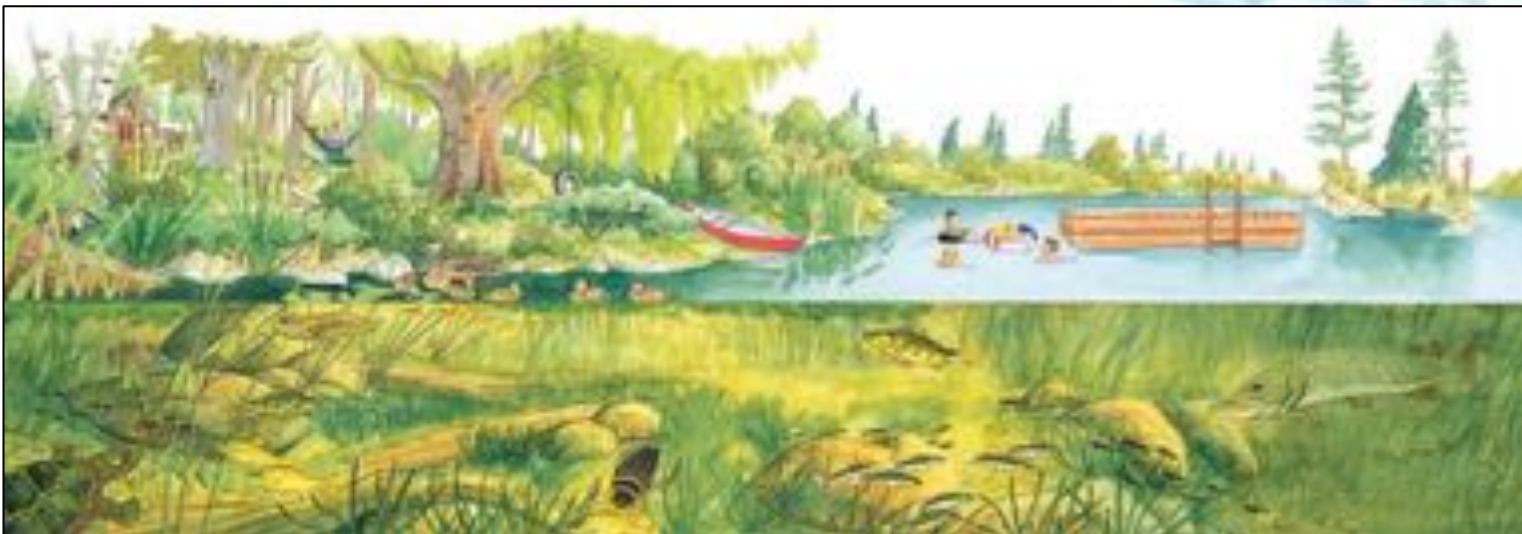
All of the authors work for the Minnesota Department of Natural Resources, St. Paul, Minnesota. Radomski is an aquatic biologist; Bergquist is a GIS coordinator; Duval is fisheries habitat coordinator; and Williquett is a research analyst. Radomski can be contacted at paul.radomski@state.mn.us.

WHAT HAS HAPPENED TO AQUATIC PLANTS?



NEARSHORE MANAGEMENT

1. Protect what we have:
 - Reduce disturbance
 - Avoid seawalls
 - Remove invasive species
2. Restore what has been lost



RE-ESTABLISHING NATIVE PLANTS IN SHALLOW WATER



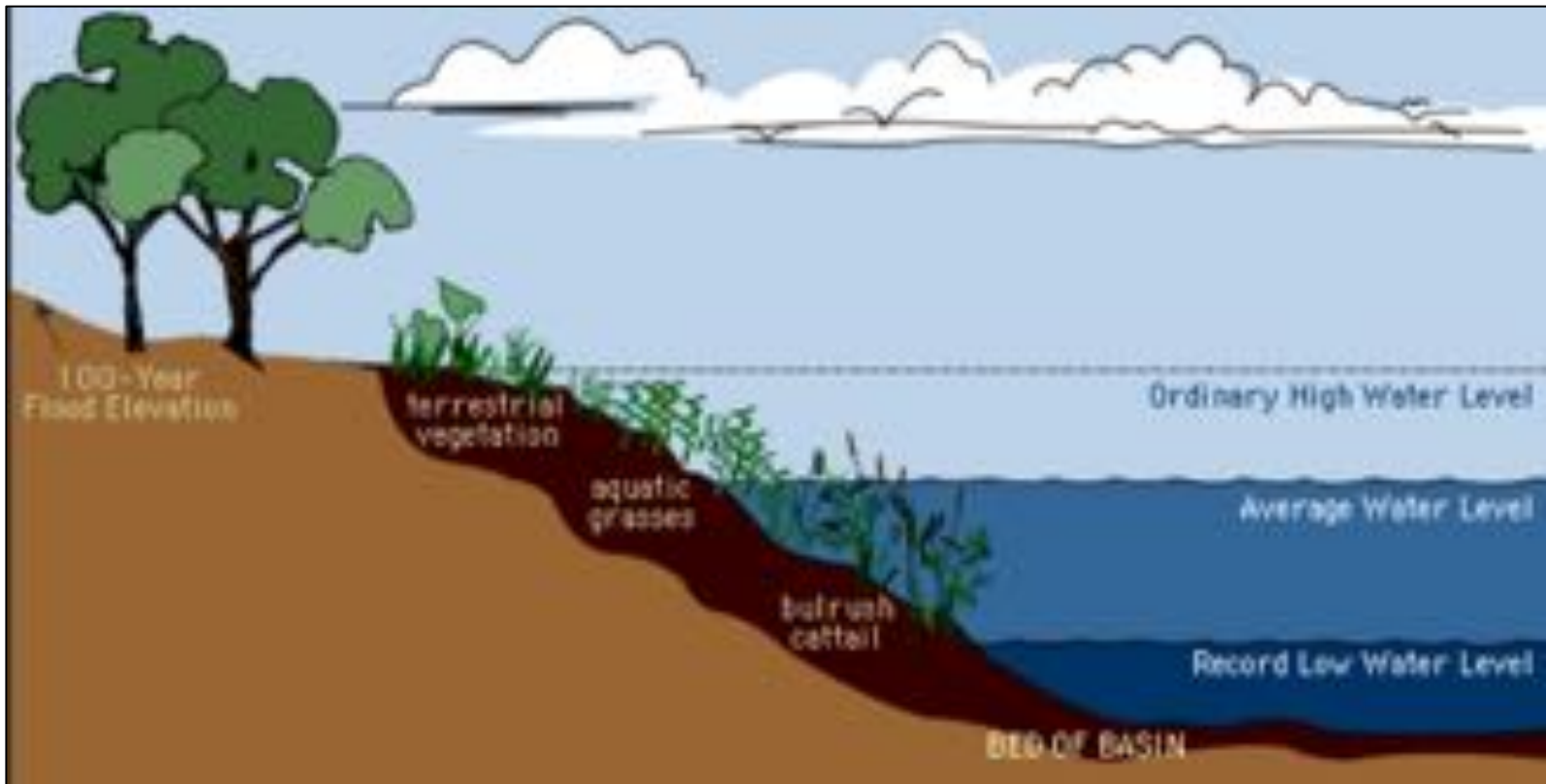
PROMOTING ESTABLISHMENT SUCCESS

- Assess environment and determine if conditions are right
 - Water level fluctuations
 - Water clarity
- Plant at the proper time and depth
- Prevent herbivory
- Protect against wave energy



PLANTING RECOMMENDATIONS

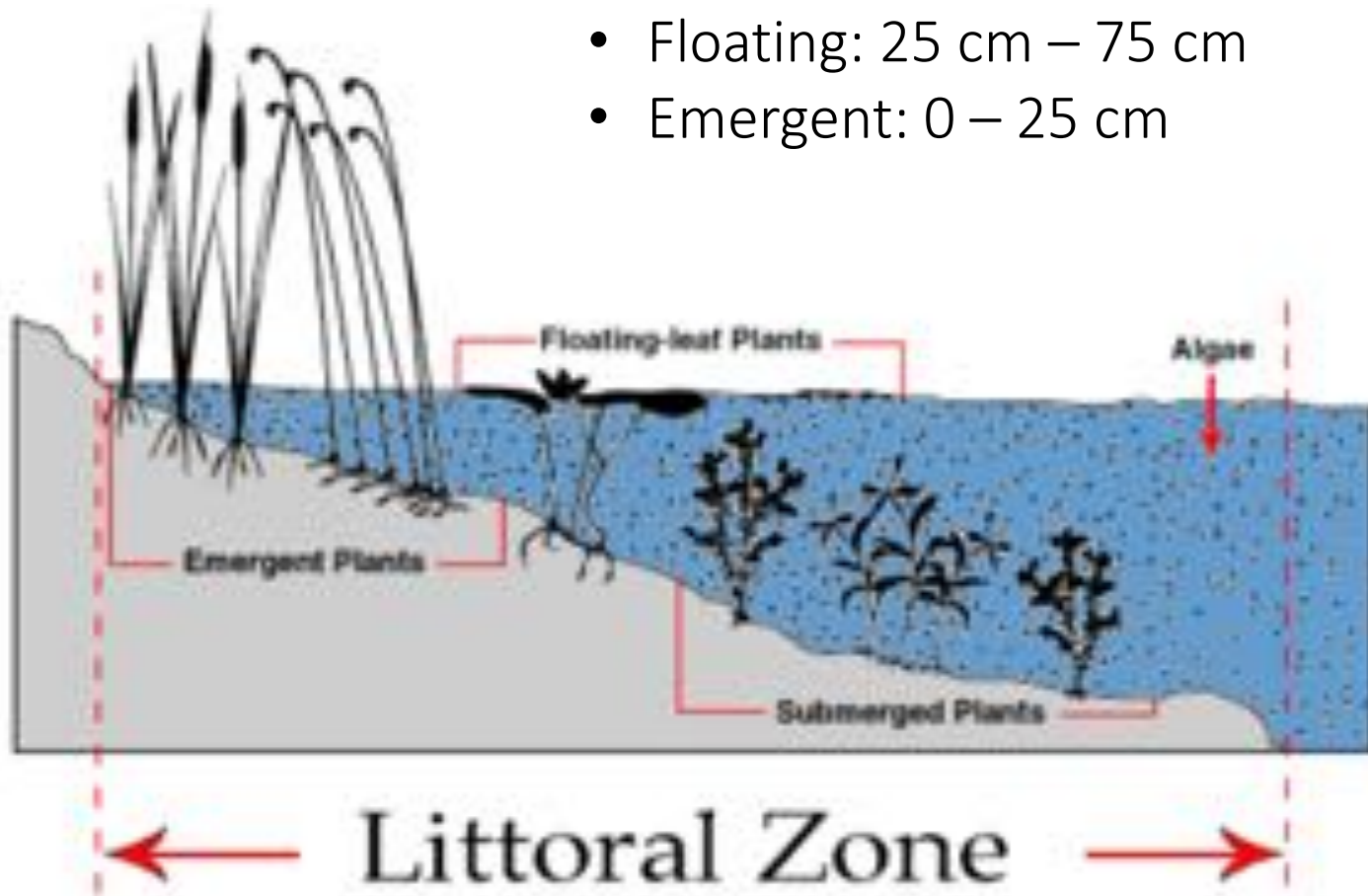
Water level fluctuations: 0.2 – 0.4 meters



PLANTING RECOMMENDATIONS

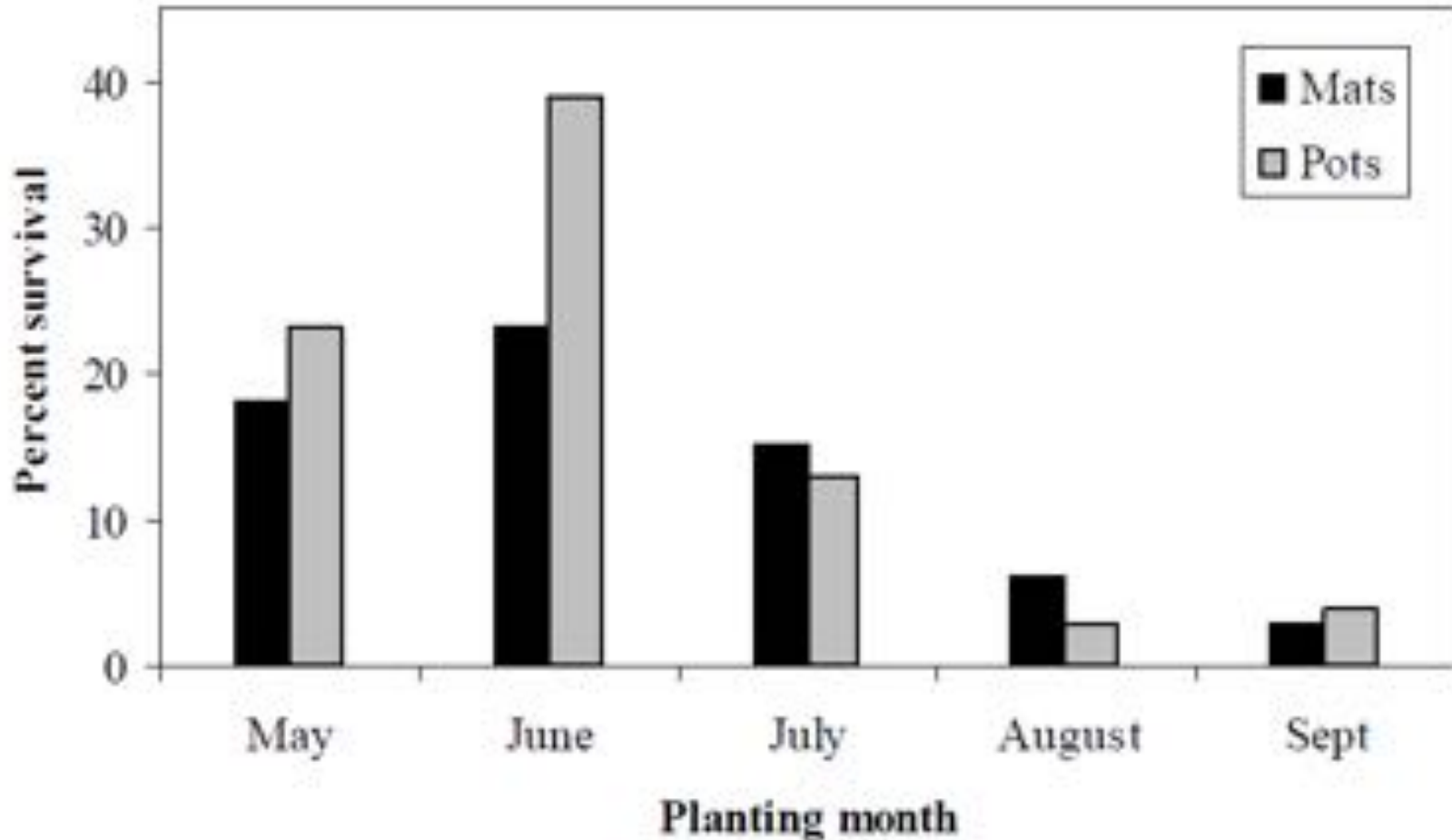
Planting Depth:

- Submersed: 0.5 – 1 m
- Floating: 25 cm – 75 cm
- Emergent: 0 – 25 cm



PLANTING RECOMMENDATIONS

Planting Time: Late Spring

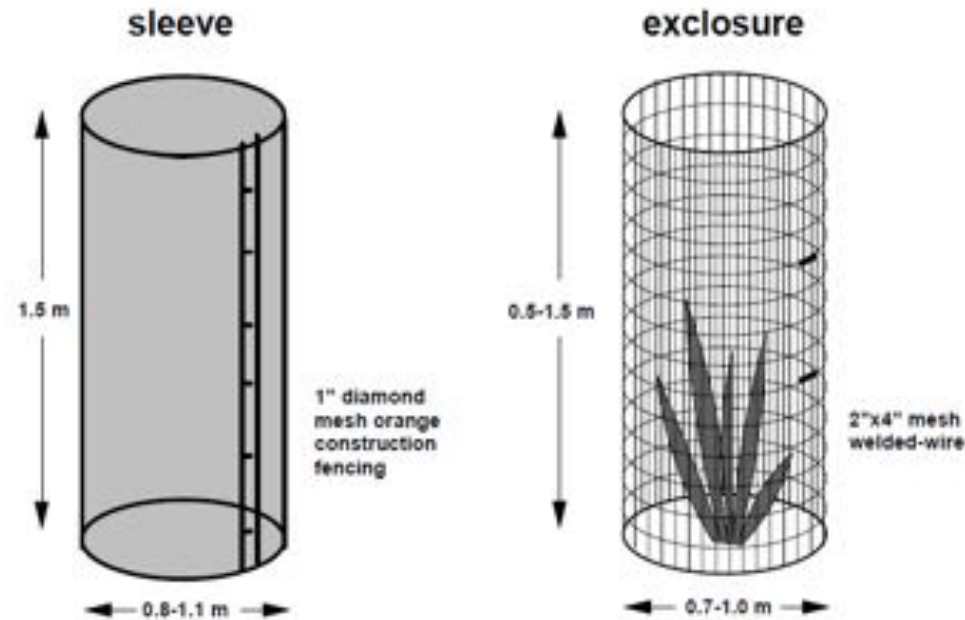


HERBIVORY AND THE NEED FOR FENCING



INDIVIDUAL PLANT PROTECTION

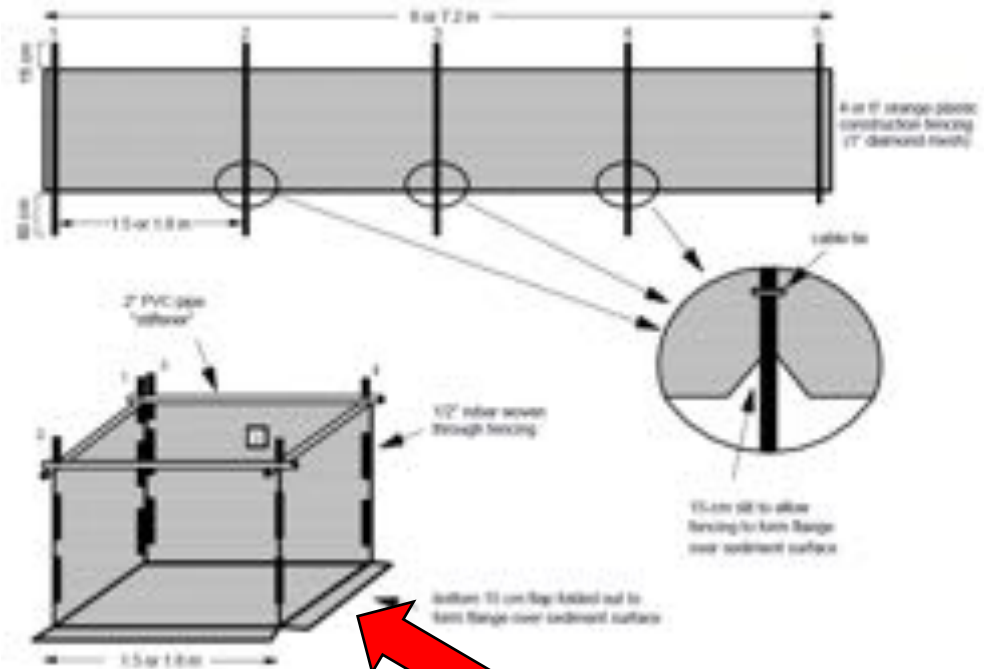
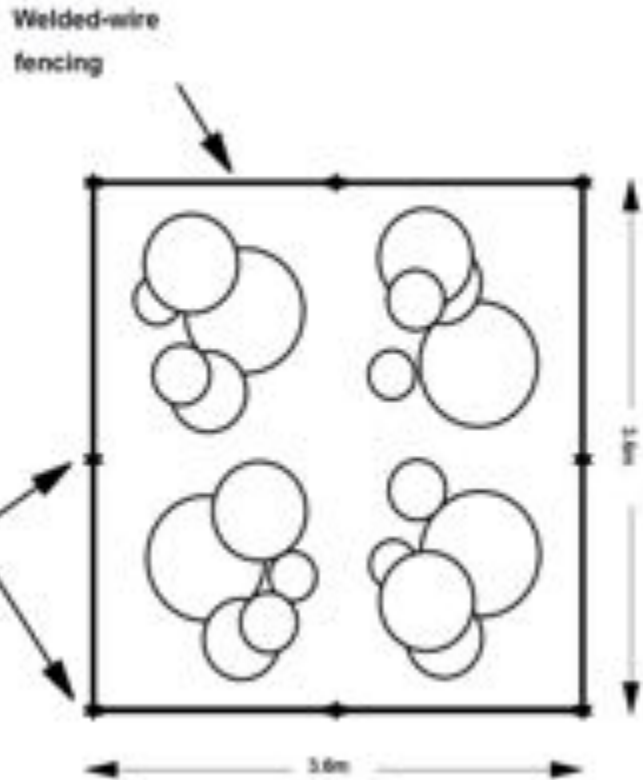
- 1.5 – 3 ft in diameter by 3 - 4 ft high
- 2 x 4 in. mesh welded-wire fencing
- Rebar is woven through the mesh and driven into the sediment
- Can close top to prevent entry of other herbivores
- If protection from crayfish is necessary use finer mesh



MULTIPLE PLANT PROTECTION

Fenced Plots

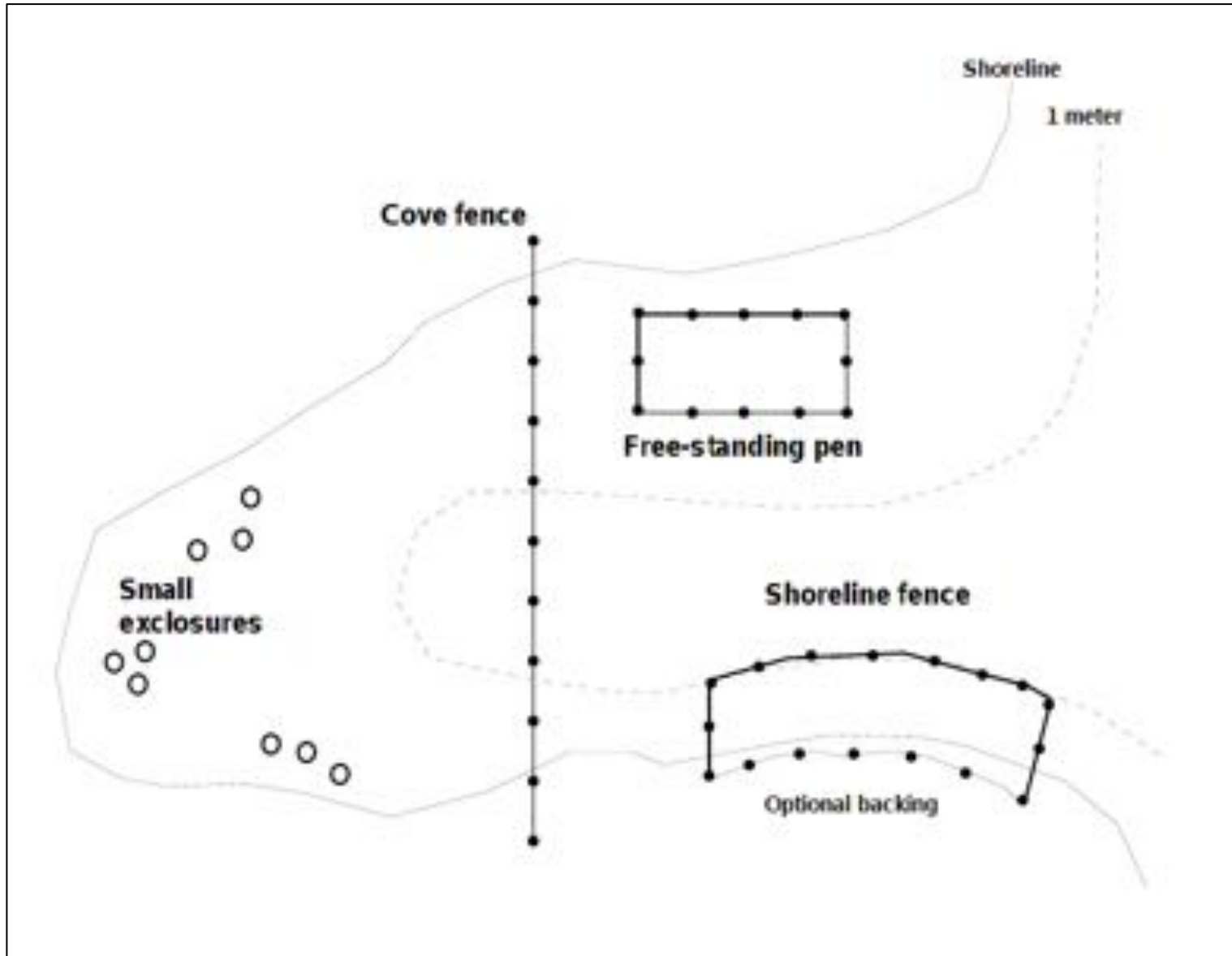
- 4 – 6 ft high, 2 x 4" mesh welded wire fencing



Square Cages

- 5 - 6 ft on a side
- 4 – 6 ft high
- 1.5" mesh orange plastic construction fencing
- Note the flange on the bottom

FENCING STRATEGIES

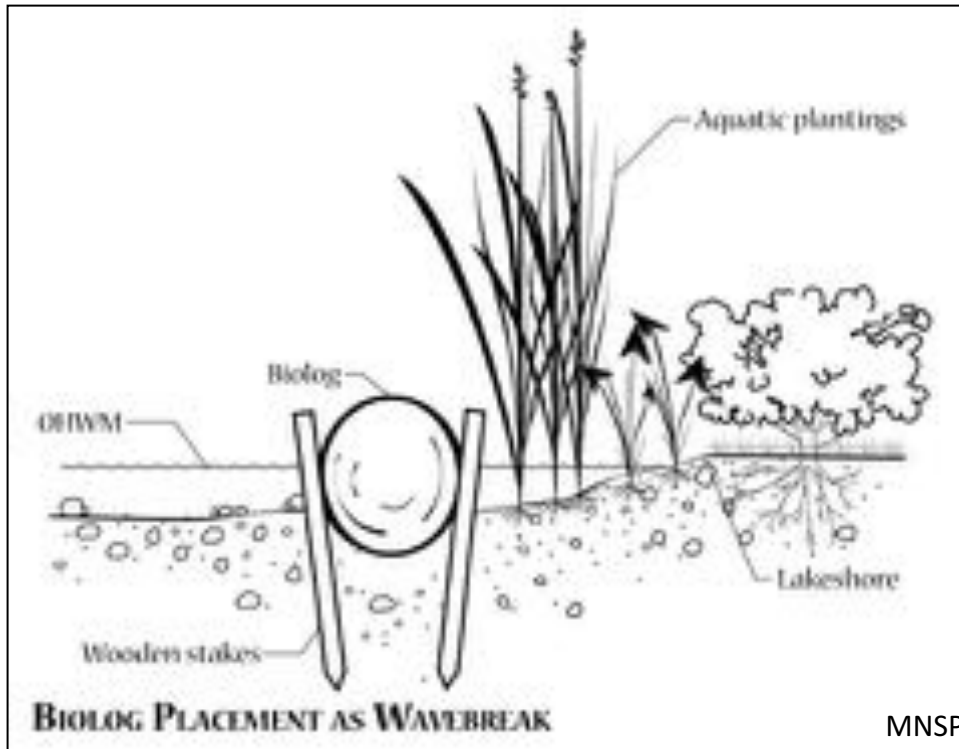


WAVE ENERGY

- Revegetation efforts often fail without wave protection
- Emergent transplants exposed to modest wave energy develop slowly



WAVE BREAK DESIGN



- Protects newly planted vegetation
- Collects and deposits sediment

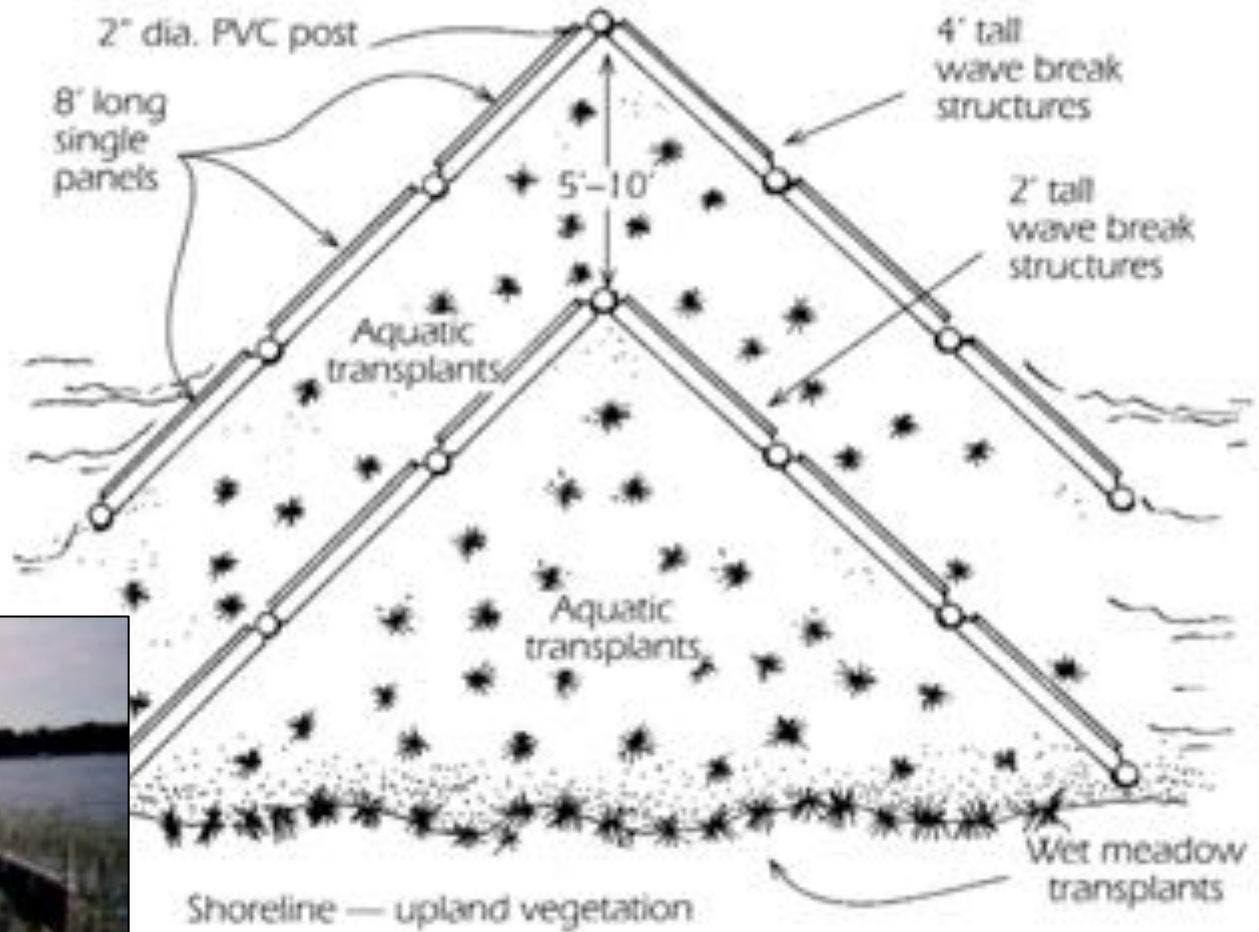
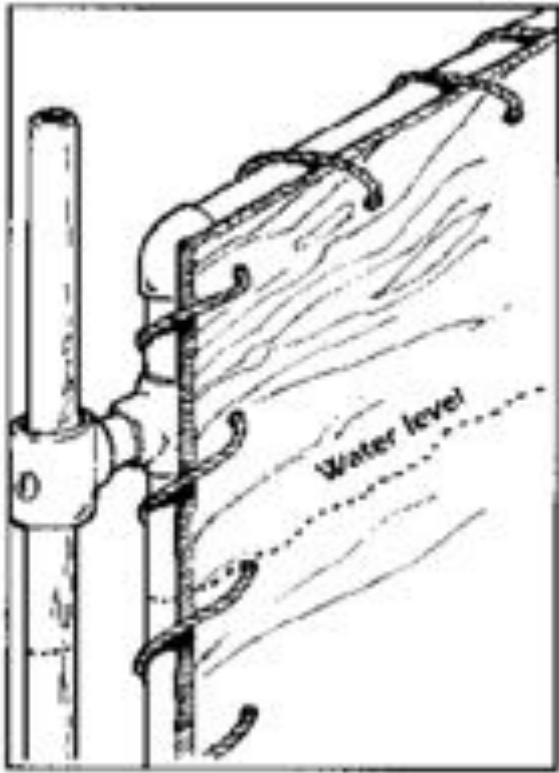
WAVE BREAKS – COIR LOGS



WAVE BREAKS - BRUSH BUNDLES



WAVE BREAKS - PANELS



PROTECTIVE STRUCTURE CONSIDERATIONS

Fencing

- Fencing material may deteriorate – PVC coated welded wire is best; plastic photo degrades, galvanized wire rusts
- Remove before winter?

Wave Breaks

- Remove panels before winter
- Remove brush bundles before winter?



Kevin Griffith

NEARSHORE OUTCOMES



A photograph of a river scene. In the foreground, a diver is partially submerged in the water, wearing a black wetsuit and a bright yellow snorkel. In the middle ground, a brown cow is wading through the water. The background features a grassy bank with various industrial structures, including a large cylindrical tank, a crane, and other buildings under a clear blue sky.

THANK YOU