

Green Lake County LCD Shoreland Restoration

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What is
aesthetically
pleasing?

Welcome to Wisconsin!

What do you
picture when
you hear
'Wisconsin
Lakes'?

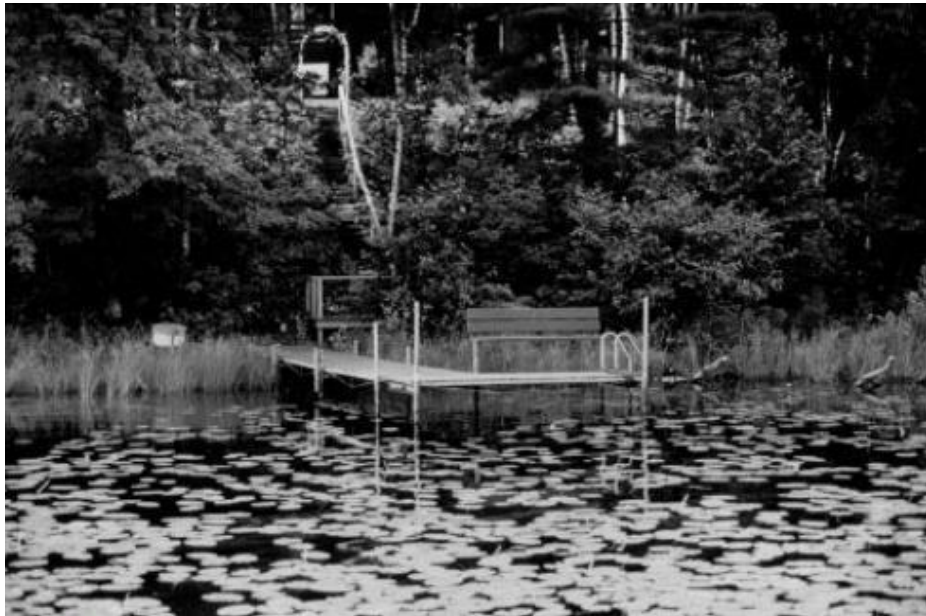
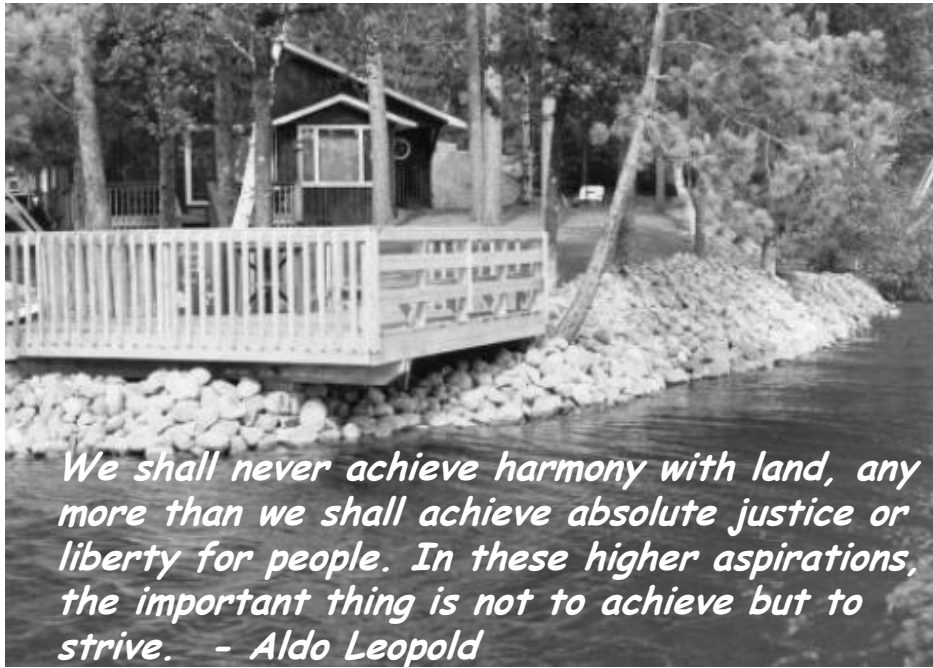




What do we
value?

Welcome
to
Wisconsin!





County LCDs

- **Protect and Improve Water Quality**
 - **Reduce Soil Erosion**
 - **Protect Soil Productivity**

County LCDs

- **Educational Programming**
- Design/Technical Assistance
- Permitting Assistance
- Cost-Share
- Management Planning
- Grant Writing



Youth Education Programming



County LCDs

- Educational Programming
- **Cost-Share/Grant Writing**
- Design/Technical Assistance
- Permitting Assistance
- Management Planning

County Land & Water Plans

- Sets County Priorities for action and funding
- Green Lake County – 10% of DATCP funds received are allocated for Shoreland Restoration. 90% are allocated for agricultural runoff practices. (Applies only to DATCP SWRM Funds).
- C/S rate vary, up to 50%, 10 yr contract
- Offset cash costs with in-kind donations.
- Limited funds available.

- Designs installed according to NRCS 580 (and other applicable practice standards)
- Follow Bio Tech Note 1
- Maintain for 10 years
- Maintenance Agreement
- Not Deed Recorded (unless over \$10k)
- Competitive Ranking Process

County LCDs

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- Cost-Share/Grant Writing
- **Permitting Assistance**
- Design/Technical Assistance
- Management Planning

County LCDs

- **Permitting Assistance**
 - **WDNR**
 - **USCOE**
 - **County Mitigation Compliance**
 - **Shoreland Zoning Compliance**
 - **Also, Neighbor SWM disputes**



Failing Seawalls






When Permits go Bad



Mass slope failure due to saturated soil conditions, and incorrect retaining wall design.



Required slope engineering
with soil stability analysis.



Native plants & shrubs to stabilize slope.

County LCDs

- Educational Programming
- Cost-Share/Grant Writing
- Permitting Assistance
- **Design/Technical Assistance**
- Management Planning

Design/Technical Assistance

- County LCD may provide technical engineering and design assistance for projects.
- Integrated, Full Site Assessment
- County LCD may approve engineering plans based on NRCS Standards (i.e. 580).
- County LCD may assist with DNR/USCOE Permits
- County LCD may assist with bid letting.

580 - Purpose

- Limiting the loss of land and its potential impacts.....
- Maintaining or restoring channel dimensions (width, depth), meander (sinuosity and meander geometry) and profile (slope, pools, riffles) allowing the channel to transport sediment and runoff without aggrading or degrading;
- Reducing sediment loads that cause degradation of habitat and water quality; and
- Improving or protecting recreation, fish and wildlife habitat, native biodiversity, and natural scenic beauty.

- **2. Waterway designation** (area of special natural resource interest, ORW, ERW) and size and type of water body (seepage lake, groundwater drainage lake, drainage lake, impoundment).
- **3. Water level fluctuation**, *ordinary high water mark (OHWM)*, water depth at 20 feet and 100 feet from shore.
- **4. Shore orientation** and geometry.
- **5. Bank recession rate.**
- **6. Average fetch** – Measured by the average of a central radial line, perpendicular to the shoreline, and two radials measured at 45 degree angles from the central radial.

- **Drainage** paths, flow patterns, runoff controls, roof gutters, impervious areas.
- 8. Bank and bed **composition and stability** – Soil type, composition, Unified Soil Classification System (USCS) profile log, bank height, bank angle, percent of bank protected by vegetation, rooting depth and density, presence of existing erosion control practices.
- 9. **Tiers of vegetation** – Aquatic, littoral, bank, and upland. Presence of invasive species.
- 10. Identification of the size and location of areas or **habitats requiring avoidance** (e.g., wetlands, riparian and upland areas, near shore habitat).

- 11. **Aquatic/terrestrial habitat** and movement corridors for wildlife in a watershed context.
- 12. Length of treatment area and **accessibility for equipment**.
- 13. Location and size of **access corridor**.
- 14. Number and orientation of **existing or proposed** decks, steps, piers, access points to water body, utilities, etc.
- 15. Documentation of **cultural and historical resources**.



Much like a boxer, who can take a punch without stumbling in round one, may be knocked out by the same punch in a later round, Lakes too, can only take so many hits before the effects begin to be seen.



Resistance:

Site's ability to tolerate use without disturbance.



Resilience:

Site's ability to recover from a disturbance.



Choosing your techniques:

Physical Influences

Erosion Source

Potential Threat to Structures/Roads

Wind-Wave Energy

Generated Wave Energy (Boats)

Water Fluctuations – Duration and Extent

Water Hydraulics

Human Influences

Costs

Permits

Use

Aesthetics

Is the protection needed short-term or long-term?

Short Term: Coir Log, Erosion Control Blanket, etc.

Add temporary protection until vegetation is established

6 months – 5 years

Long Term: Turf Reinforcement Mat, Interlocking Block, etc.

Add long-term reinforcement to support vegetation

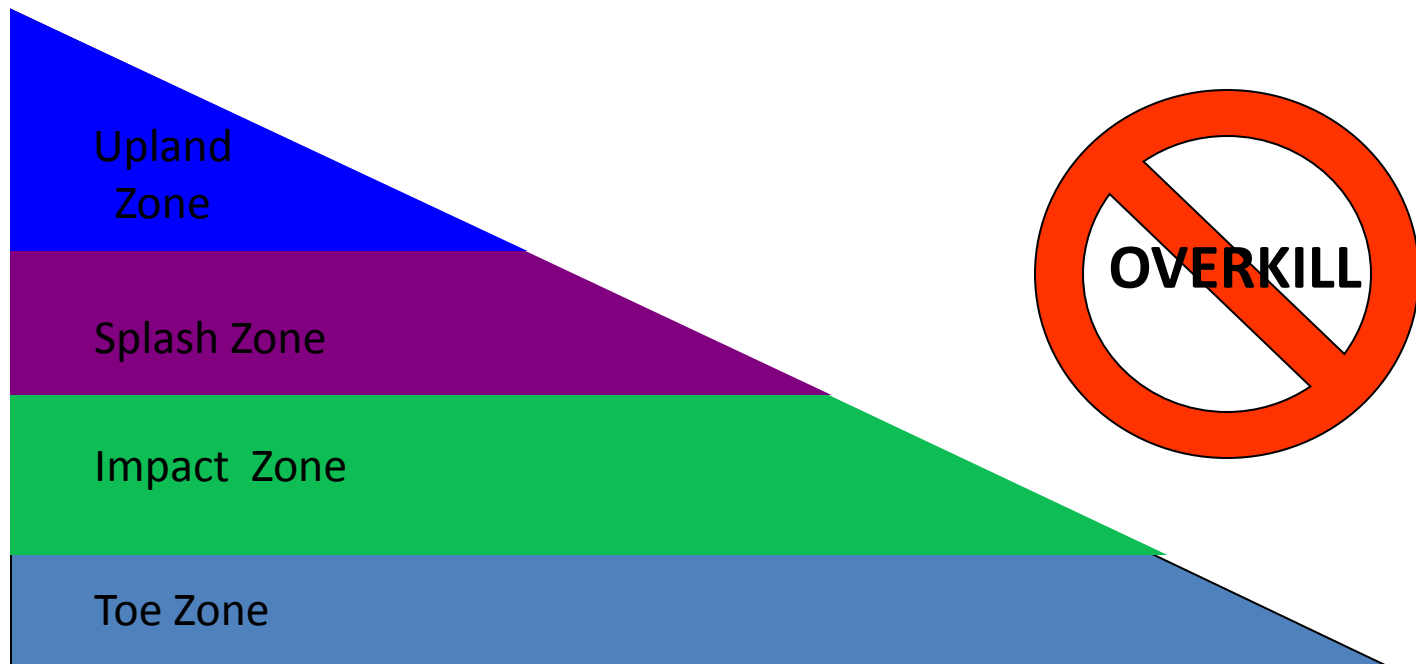
5 years +



Concept #1

Integrate Methods

Mix Methods Horizontally and Vertically as needed.



Every Design is Unique (no one-size fits all)

Design based on site-specific conditions

#1 Determine the Cause of the Erosion

- Current Deflection
 - Toe Erosion
 - Boat Wakes
 - Water Fluctuations
 - Saturated Soils
 - Ice action (sliding or plowing)
-
- Observe stable shorelines.



Address the cause where possible, not the symptom

*Example: Toe Erosion caused by lack of vegetation,
caused by fluctuating water levels*

In this case:

*Vegetation with temporary erosion control may not be
appropriate, due to fluctuating water levels drowning
shoreland plantings (common on reservoir systems)*

Getting out of the Stone Age...



Stone has it's place, but use in limited quantities.

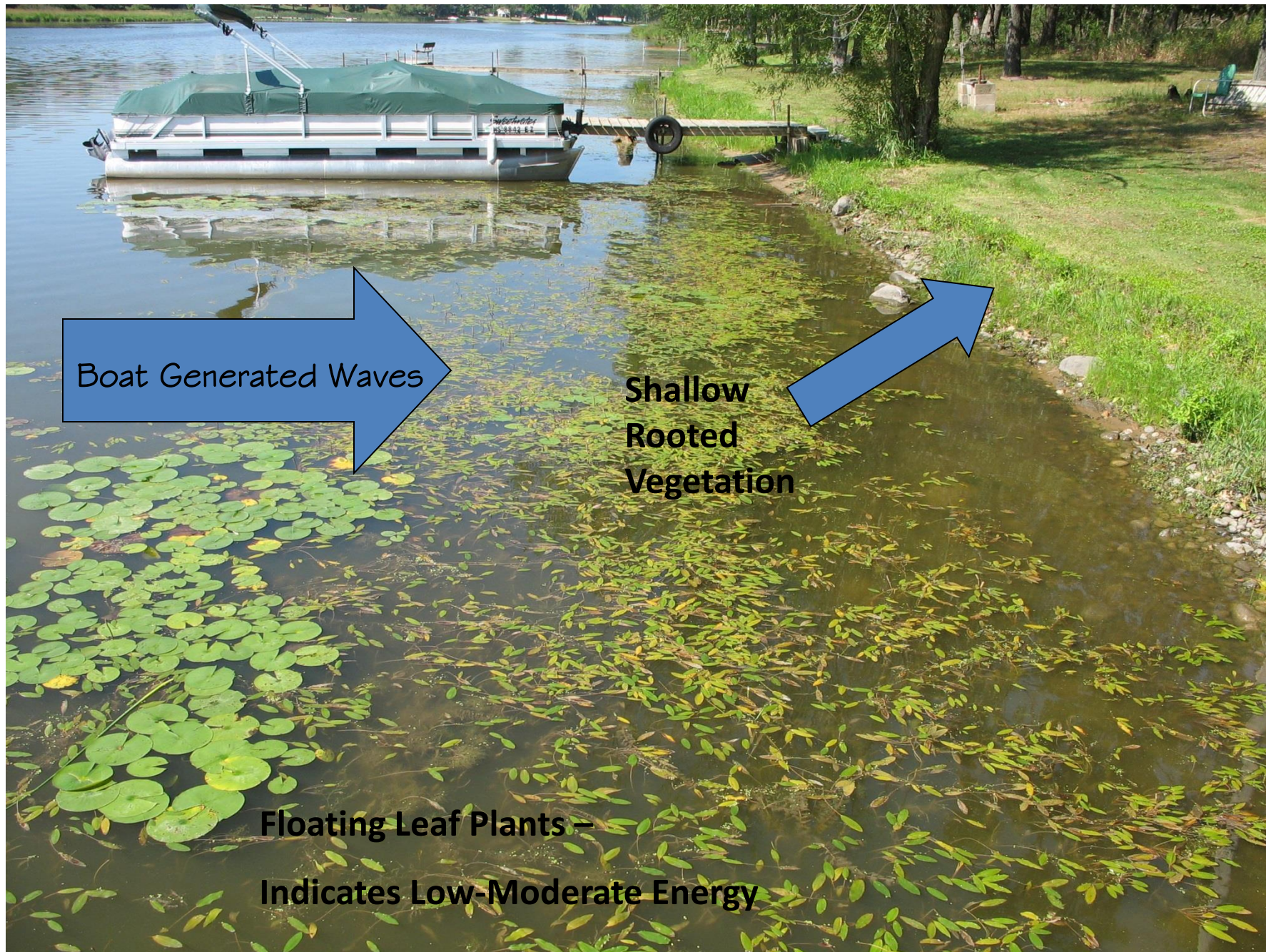


Reservoirs with water fluctuations in high energy areas may be a place to implement hard armor, but try to integrate woody plants and native forbs to strengthen shoreline and enhance fish/wildlife benefits.

RipRap Failure due to
improper design and
installation

No filter to prevent
piping thru stone and
installed at 1h:1v





Boat Generated Waves

**Shallow
Rooted
Vegetation**

**Floating Leaf Plants –
Indicates Low-Moderate Energy**

















Sturgeon Spawning Project / Erosion Control/ Buffer

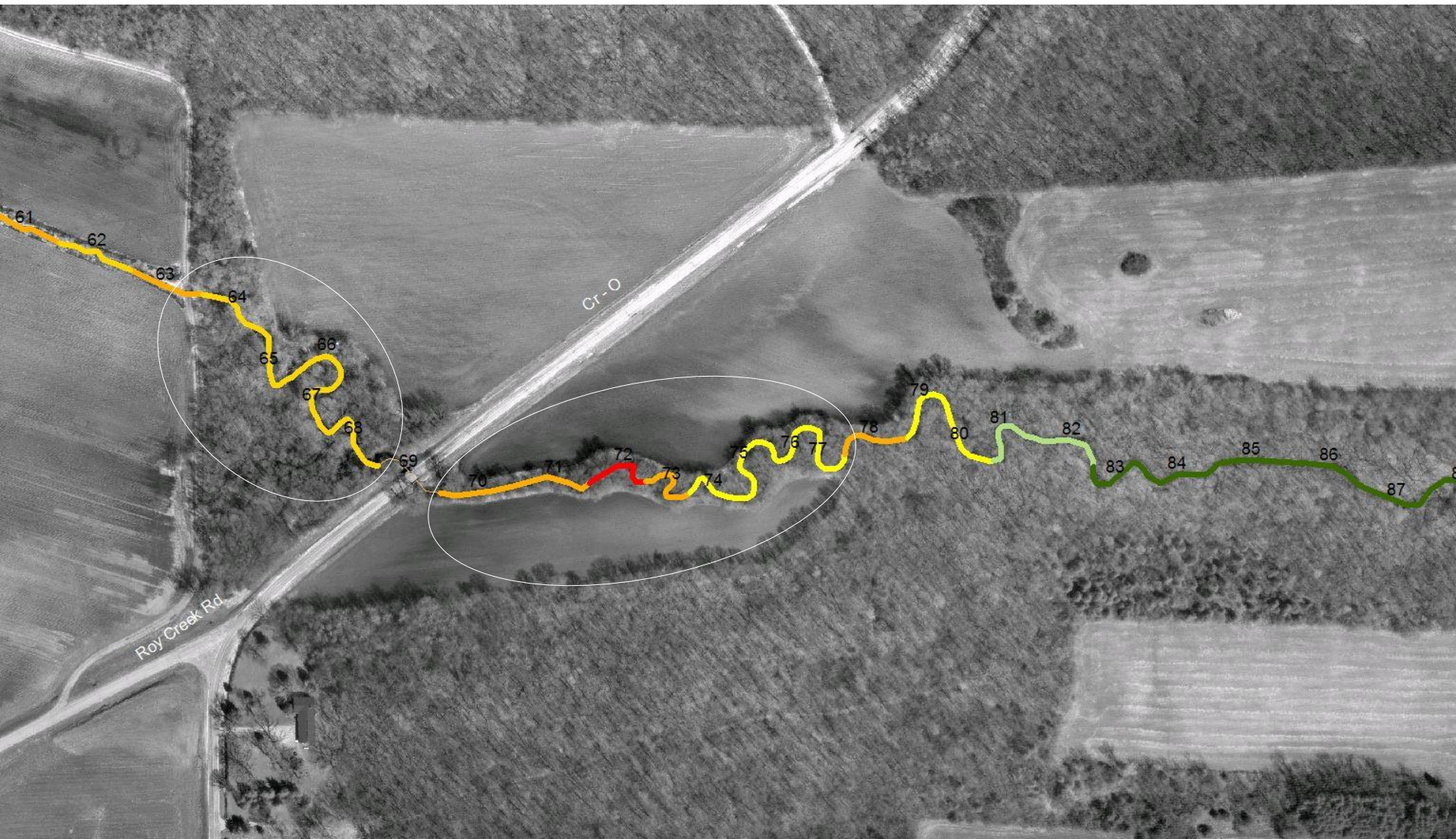


Fluctuating Water Levels





Restoration Areas





Poor Quality Vegetation











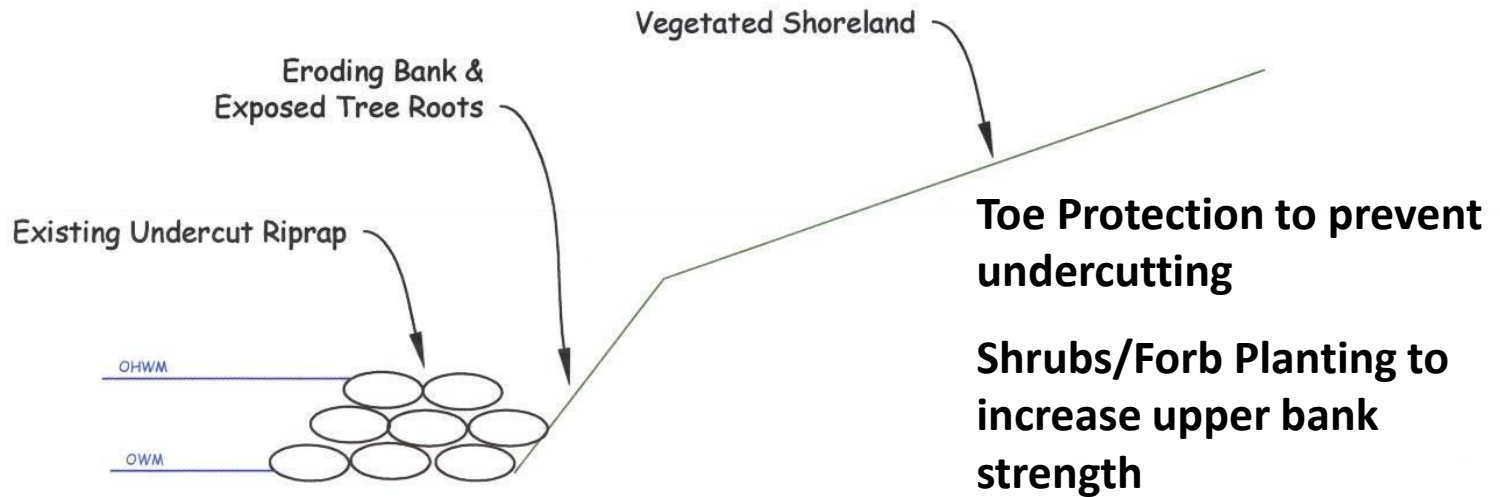




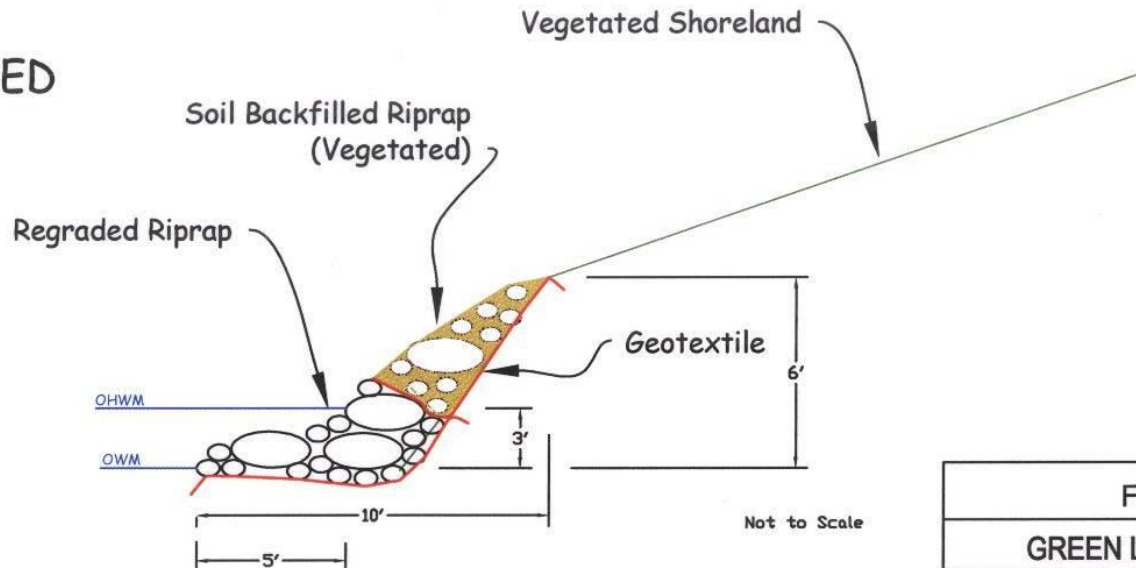




EXISTING



PROPOSED



Enhanced Riprap

Designer: Derek R Kavanaugh

Landowner Approval
(Initial and Date)

10/04/05

Ferge, Dave

GREEN LAKE COUNTY LCD

CHECKED BY:

DATE:

APPROVED BY:

DATE:

SHEET 4 OF 4



Fluctuating Water +/- 5 feet

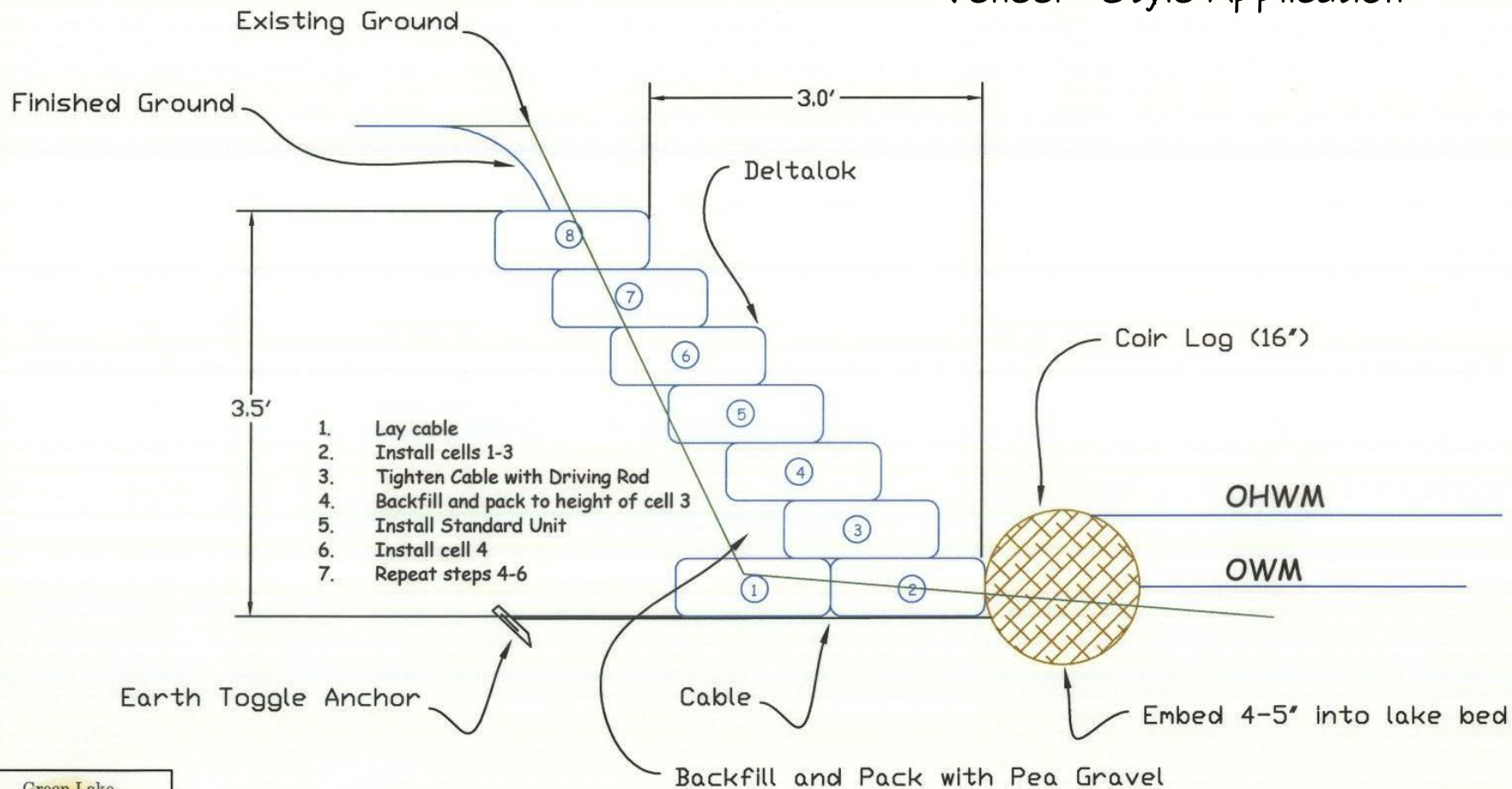






Toe Erosion causing Bank Slumping
Vertical Bank held by Tree Roots

"Veneer" Style Application



Biotechnical Shoreland Protection

Landowner Approval
(Initial and Date)

Designer: Derek R Kavanaugh

08/05/05

Mitchell, Edward & Audrey

GREEN LAKE COUNTY LCD

CHECKED BY:

APPROVED BY:

DATE:

DATE:

SHEET 4 OF 4











What's the cause of the erosion?



What's the cause of the erosion?



What's the cause of the erosion?

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What's the cause of the erosion?





County LCDs

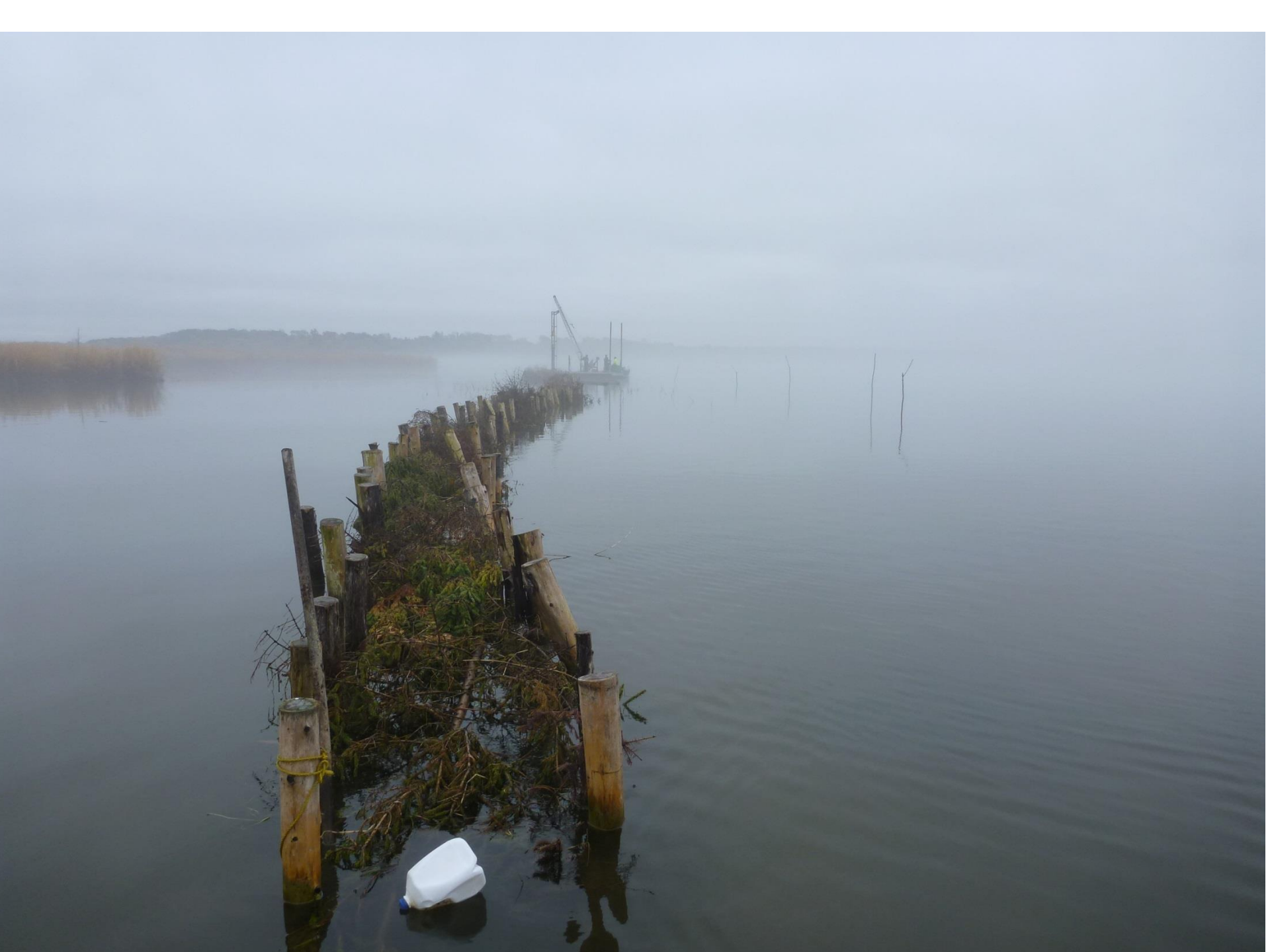
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Lack of Vegetation







Do it for the frogs.



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