

Shoreland buffers and erosion control



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UW Extension Lakes/WI Lakes Partnership



The Wisconsin Lakes Partnership

- **Google** UWEX lakes
- <http://www.uwsp.edu/cnr/uwexplakes/>
- <http://www.wisconsinlakes.org/>
- <http://www.dnr.state.wi.us/>

- **Lake Tides... The Lake Connection**
- **Lake List**
- **CBCW**
- **CLMN**



Talk outline



Shoreline buffers

Definition

Why are shoreland buffers important to our lakes?

Lake shore erosion

Slumped banks

Root wads exposed

Receding shorelines

Erosion control

Definition

Standards

Permits

Techniques

Shoreline revegetation

Site characteristics-[fetch; DNR web site]

Types of revegetation

Developing a plan

Site preparation

Using native plants

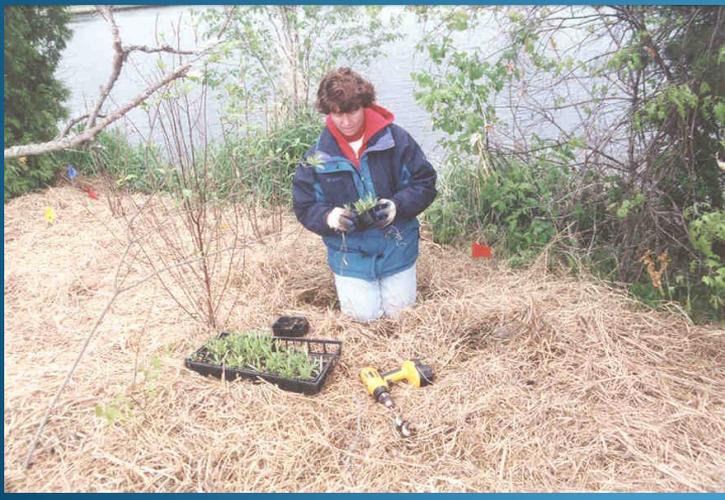
Layers of vegetation

Maintenance

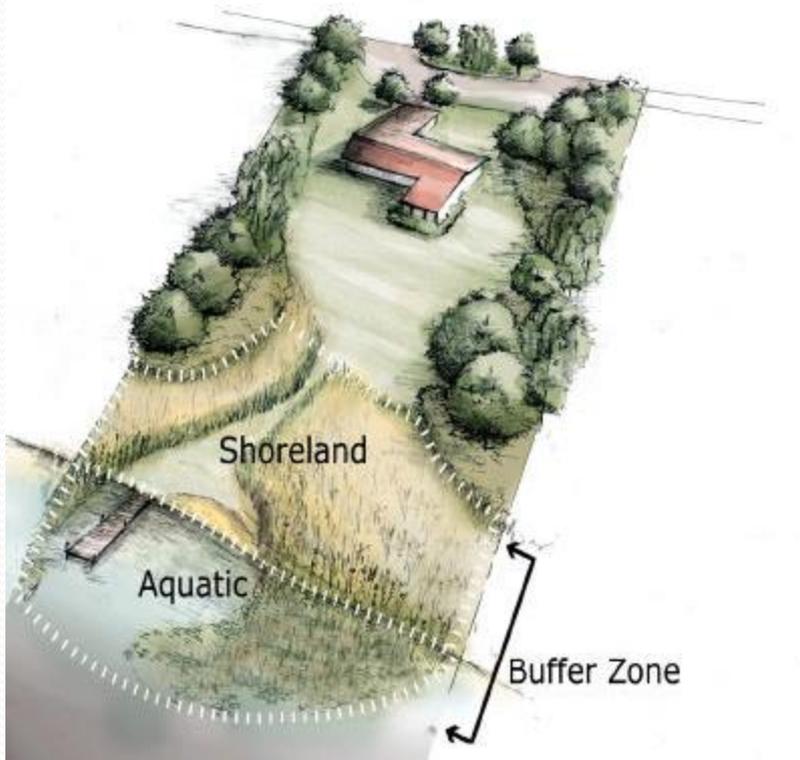
Before/after photos

Resources/handouts

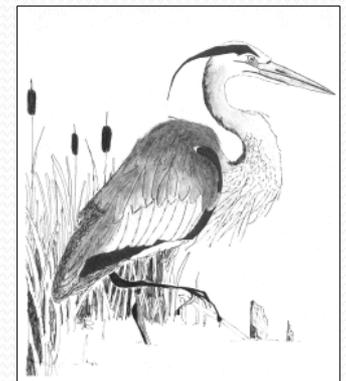
Q & A



What is a shoreland buffer?



- Interface between land and water --area adjacent to lakes/streams.
- Links together the world of water with the terrestrial uplands.
- Essential habitat plants and animals—corridor between uplands and lowlands as well as between habitats along the shore.
- Important for water quality protection and other functions.



Natural vegetation on land as well as in the water provides these functions:

- Stabilizing shorelines and upland slopes protects your waterfront property investment.
- Providing fish and wildlife habitat.
- Preserving natural shoreline beauty by screening development from view.
- Preserving the privacy of your home by screening it from public waters and neighbors.
- Filtering nutrients and sediments from runoff protecting water quality



Importance/functions of a buffer zone



- Help clarity by holding sediment in place.
- Take up nutrients that would be used by algae.
- Shelter for wildlife.
- Wildlife food and nesting areas.
- Can help reduce erosion and runoff.
- Spawning beds in sedges /emergent plants for fish.



90% of all lake life is born, raised and fed in the area where land and water meet.

Link between healthy shorelines and our quality of life

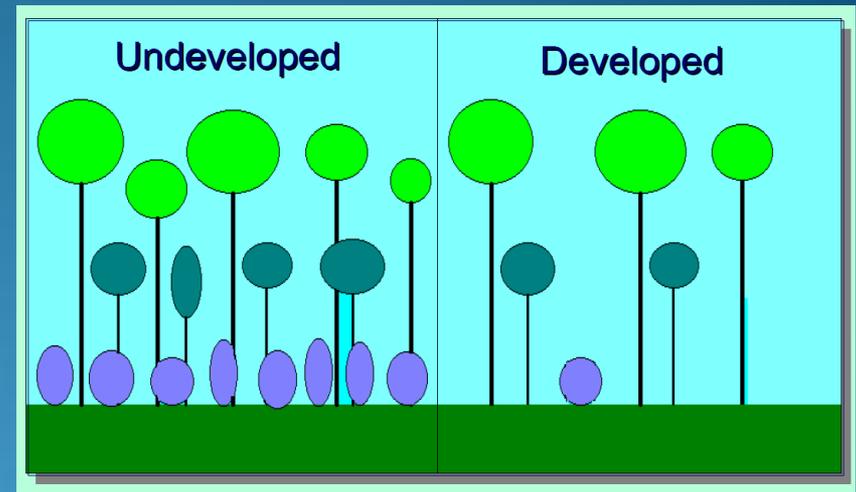
- Helps to support our tourism industry
- Provides recreation users [water sports, fisherman, boaters, etc.] with a good experience
- Gives a pleasing environment/aesthetics
 - Provides wildlife habitat
 - Enhances water quality



Development pressures have changed our lakes

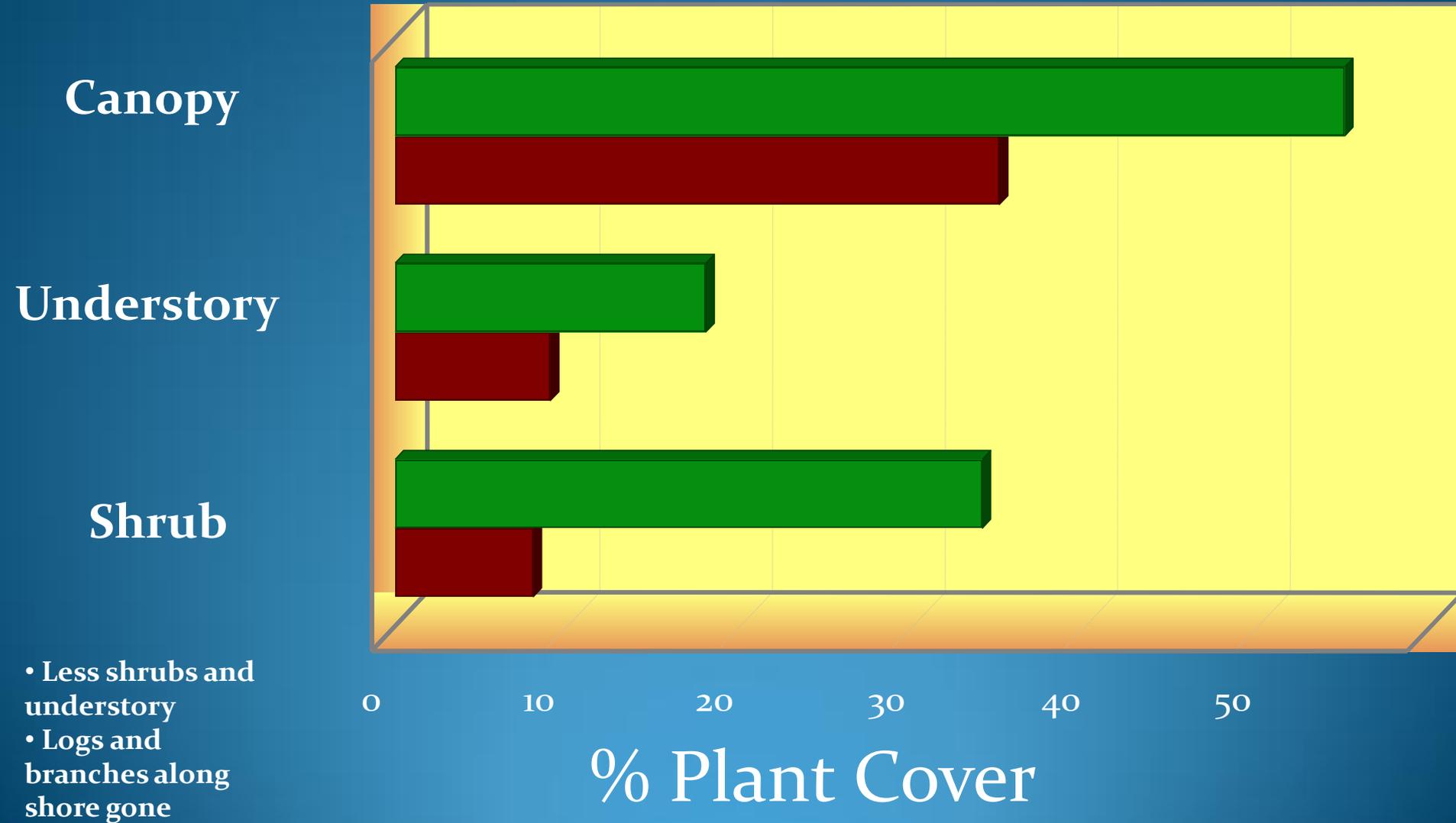
Impacts include:

- wildlife diversity decline;
- water quality degradation;
- less vegetation—especially less shrub and ground layers; woody habitat along shore;
- more lake users on the water;
- ‘*death by a thousand cuts*’ w/ population growth and housing density rise



Development trends

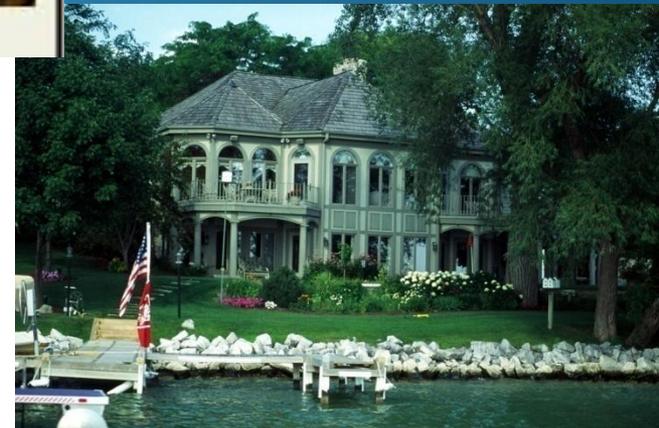
What's happened to shoreline plants?



Development trends

- Green frogs act as ecosystem indicators for lakes
- Male green frogs establish & defend breeding territories 2 feet from shore
- Numbers along developed lakes way down

Shoreland green frog trends



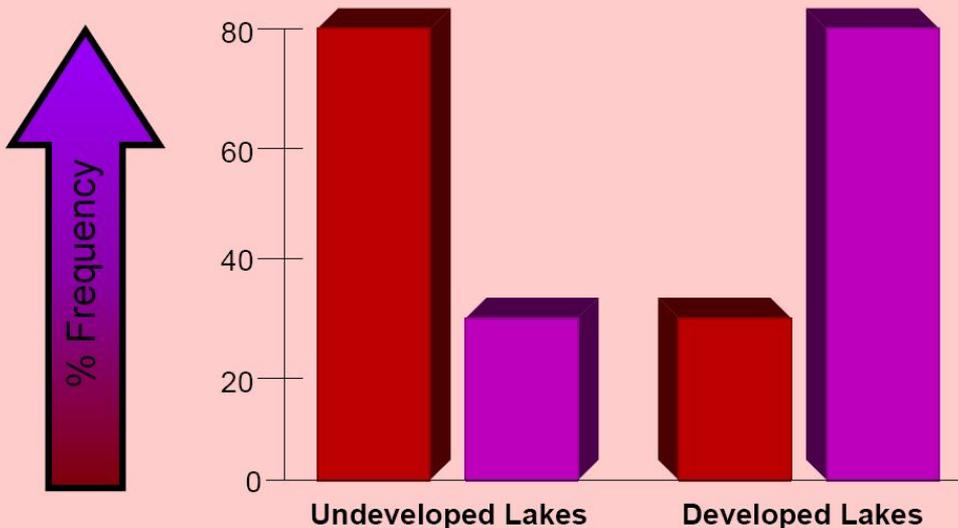
Development trends



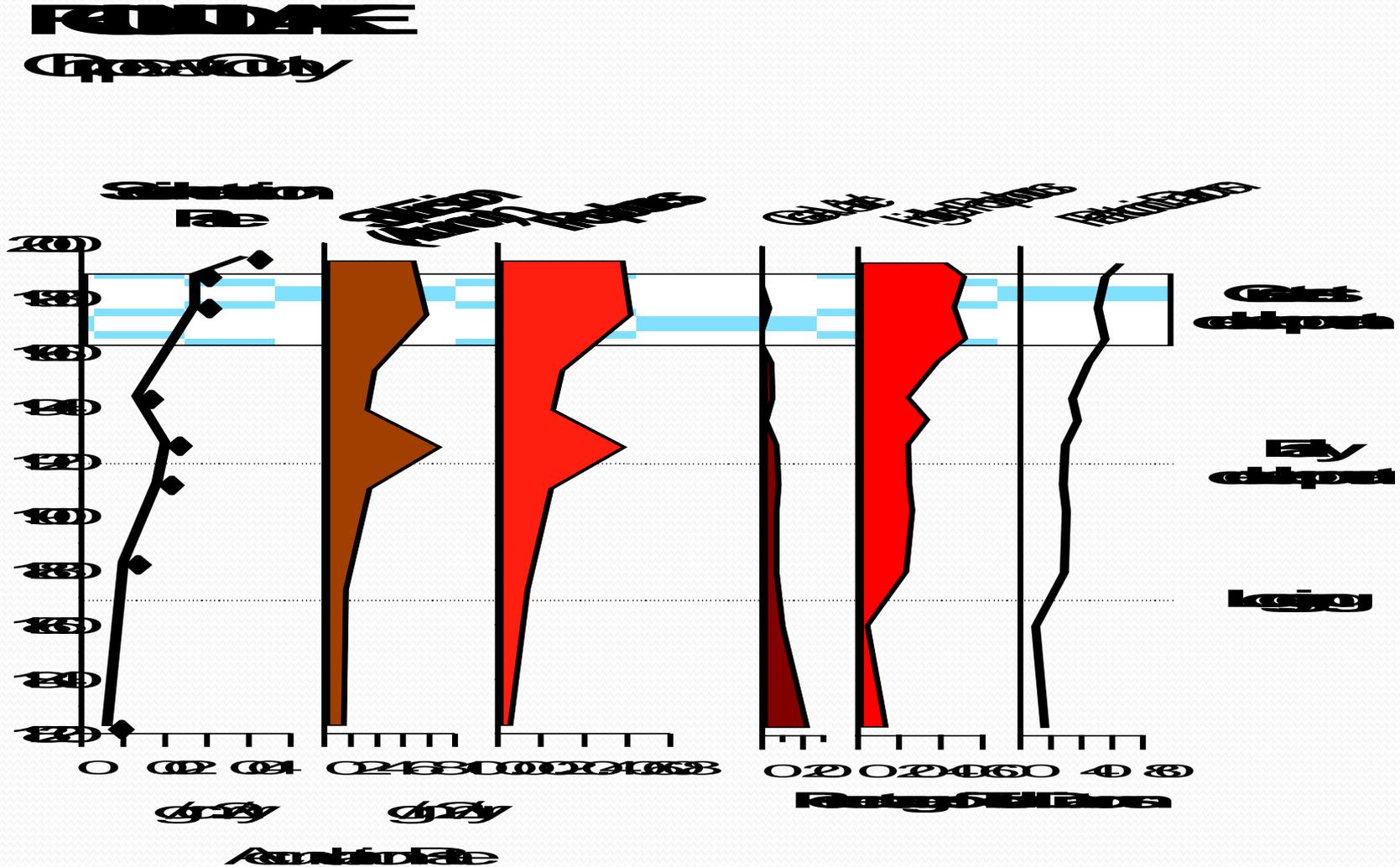
What's Happened to Songbirds?



- Uncommon birds (*Warblers, Thrushes, Vireos, Oven Bird*)
- Common birds (*Grackle, Catbird, Chickadee, Bluejay, Goldfinch*)

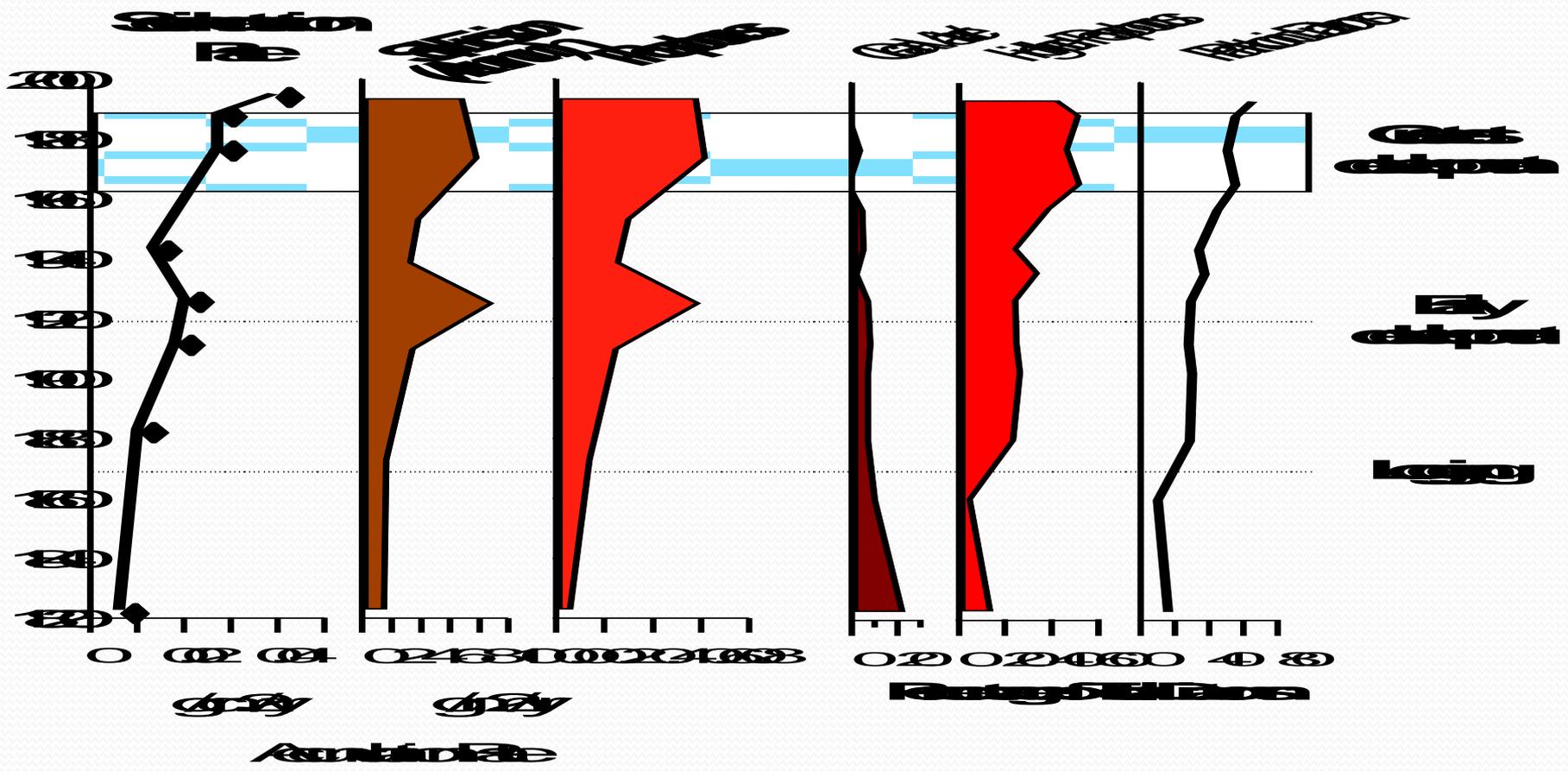


Development trends



Development trends

FUNDING
Grossly



Lake shore erosion indicators

- Slumped banks
- Root wads exposed
- Rilling
- Receding shoreline



Erosion control

Treatment(s) used to stabilize and protect banks of streams or constructed channels, lakes, reservoirs, or estuaries.



Erosion control

Wisconsin state standards—oversight by conservation partners:

1. Streambank and shoreline protection 58o
2. Shoreline habitat 643a

Permits required by DNR/Army Corps of Engineers:

Web site to help landowners through the process

Step 1

Learn about erosion control methods for shoreline protection.

Step 2

Determine if your project qualifies for a General Permit. Depending on your site location and features, general permits are available for biostabilization projects using vegetation and biological materials, and for Integrated Bank Treatment using a combination of rock, vegetation and biological materials.

Step 3

Apply for a General Permit.

WDNR shoreline erosion control – lakes web page

<http://www.dnr.state.wi.us/org/water/fhp/waterway/erosioncontrol.html>

Shoreline Erosion Control - Waterway and Wetlands Permits - WDNR - Windows Internet Explorer

http://www.dnr.state.wi.us/org/water/fhp/waterway/erosioncontrol.html

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Shoreline Erosion Control - Lakes

Question: I am concerned about erosion along my lake or borage shoreline. What should I do to protect the shoreline? Do I need to obtain a permit?

Answer: Natural shoreline features provide erosion control in various ways.

Every shoreline is exposed to different natural events and human activities that can cause erosion. A small amount of soil erosion may not be a cause for any concern, but intervention may be needed on some shorelines.

If your property is on an inland lake or borage, follow the steps below to assess your property, determine the extent of erosion, and get advice on the best range of methods for treating the shoreline. Permits will generally be required to place shoreline structures such as fiber logs, rock riprap or any type of seawall.

If your project is on a river or stream, see [Streambank Erosion Control](#).

All projects on the Great Lakes require an Individual Permit. If yours is such a project, go directly to [Step 1](#).

Because of their potential for harming fish and wildlife habitats and other public rights, the construction of seawalls along a shoreline is rarely permitted. Vegetative erosion control is recommended for low to moderate energy sites; for high energy sites, other structural methods such as rock riprap may be appropriate. For more information on erosion control methods, please see [Lakeshore and Streambank Erosion Control Information](#).



Follow the steps below before starting your project.

1. [Calculate the energy along your shoreline.](#)
2. [Choose an appropriate Shoreline Erosion Control method for your shoreline's energy.](#)
3. [Determine if your waterway has a special designation that might affect the exemption or permit requirements.](#)
4. [Determine if your project is exempt.](#)
5. [Determine if your project qualifies for a General Permit.](#)
6. [Apply for a General Permit.](#)
7. [Apply for an Individual Permit.](#)

Step 1

Calculate the energy along your shoreline. Engineers have determined that, of the factors that cause bank erosion, wind-driven waves are the predominant factor in determining the severity of erosion. This determination uses the longest fetch (distance)



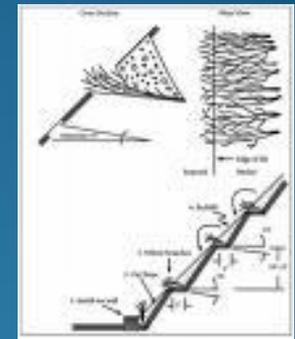
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Biological Erosion Control Methods

1. Use vegetative and natural materials for stabilization and protection.
2. Rely on plant materials as the main structural elements in a shoreline protection system.
3. Comprised of living and/or organic materials, such as native grasses, sedges and forbs; live stakes and posts; jute netting; and coir fiber rolls and mats.
4. Biodegradable.

Brush Mattress

Procedure in which uses live cut branches along the slope of an eroding shoreline.



Live Stakes

Requires the use of live, rootable vegetative cuttings, often willow (*Salix* sp.), dogwoods (*Corylus* sp.), or other species, to revegetate eroding shorelines.



Brush Layering

Uses alternating layers of live cuttings and compacted backfill along the slope of an eroding shoreline.



Fiber Rolls

Cylindrical tubes composed of coconut husk or excelsior fibers bound together with coconut or jute twine, or plastic netting.

Biodegradable or Temporary Breakwaters

Installed offshore of the shoreland to provide an area of quiescent water, usually when new erosion protection designs and shoreland plant installations are becoming established.



Vegetated Armoring Erosion Control Methods

- Used for controlling waterward erosion is to combine the structural integrity of technical shore protection with the positive biological aspects associated with biological shore protection.
- Integrate biological and technical methods, providing woody cover and vegetation that is key in preserving and/or establishing critical habitat for shoreline inhabitants.
- Mimic the natural environments through the use of woody and vegetative elements in the biotechnical techniques.
- Uses dead materials that substitute for woody cover such as trees and other woody material that provides food and cover for a wide variety of animals.
- Promotes faster, and often better establishment of natural vegetative cover.
- Sometimes it incorporates inert materials (typically rock) increasing the substrate size and interstitial habitats for invertebrates and fishes.
- In comparison to biological techniques, the tradeoff is slower and possibly less recovery or establishment of near-shore vegetation along the waters edge.

Integrated Toe Protection

Biotechnical integrated toe protection designs have toes made of inert materials including rock and armor units.

Vegetated Riprap

These are techniques that incorporate vegetation into the joints of placed rock into stone riprap.

Vegetation - The Roots of the Solution

The riparian areas of shorelines are glued together by a diversity of plants with strong, deep root systems, especially those of woody plants.



Types of revegetation

1. Protection

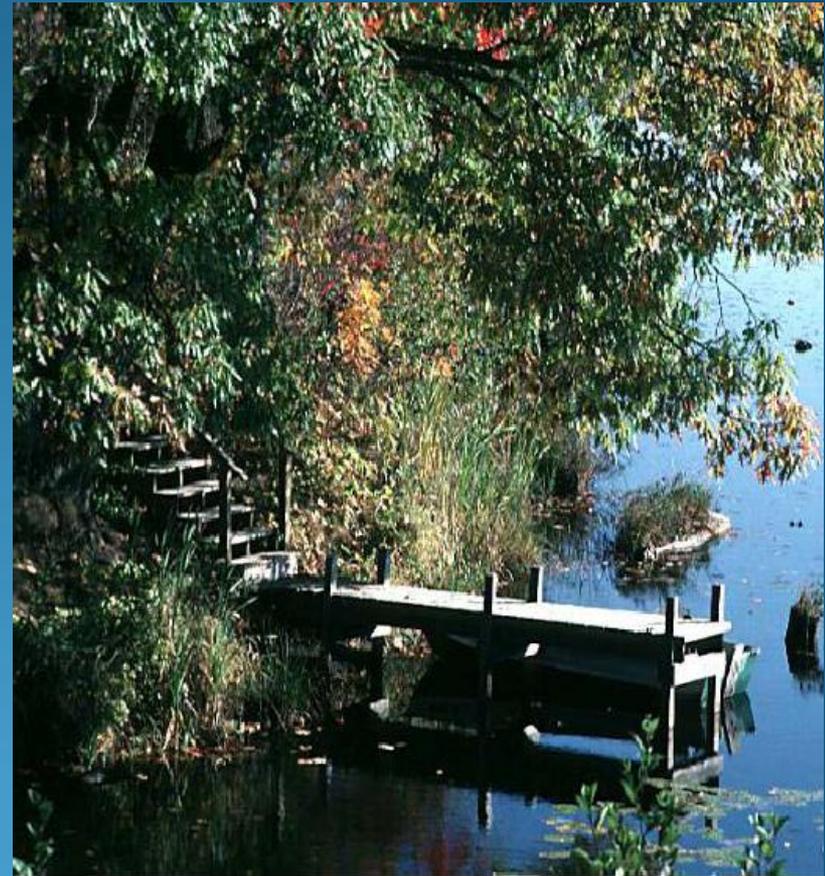
- No serious erosion problem
- Native vegetation present
- Diversity of structure
- Shoreland buffer requirement met

2. Natural Recovery/'No mow'

- Native elements present
- Turf grasses not well established
- Areas screened from view
- Discourage trampling
- Look for opportunities to see results and promote

3. Accelerated Recovery

- Turf grass well established
- No natives present
- Exposed soil
- Lots of traffic
- Sand beach maintained
- Quick results wanted



Steps in site plan design

The first step in designing a site plan is to inventory and map existing:

- Trees and shrubs
- Areas of native forbs, sedges and grasses
- Structures
- Relevant landscape features



Work to address landowner concerns

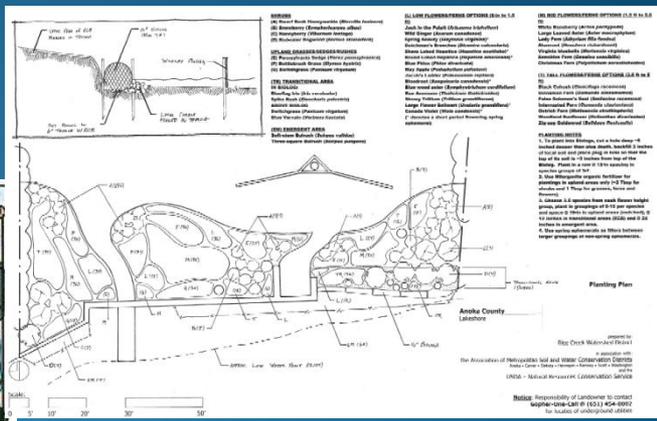
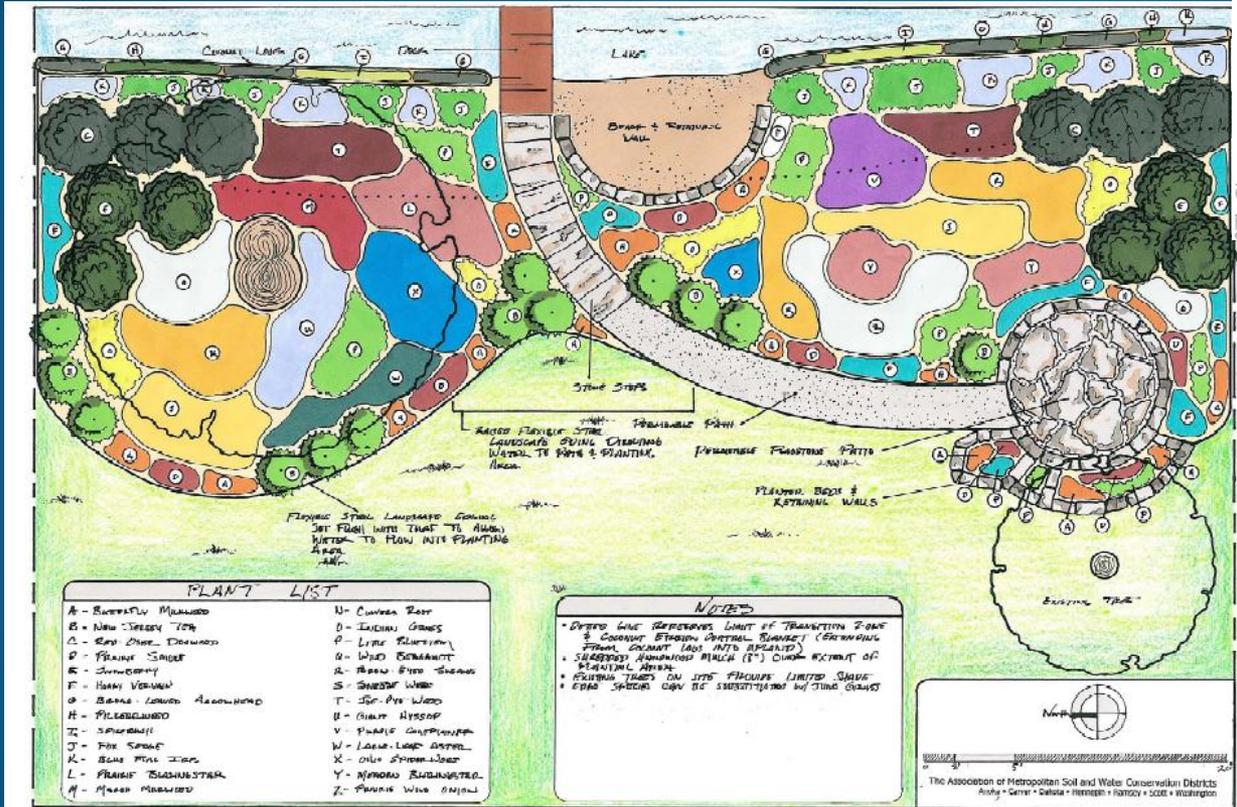
- View corridor (30 ft. viewshed)
- Access points along shoreline including docks, walkways, beach area, storage, etc.
- Wildlife impacts (muskrats; deer; etc.)
- Enhance existing native plants at the site / no mow areas
- Aesthetics
- What the neighbors will think? Talk w/ them @ the project
- Exotic species control
- Attaining proper WDNR / county zoning permits

Typical questions to ask:

1. What end product does each family member envision for the shoreline?
2. What is the property's drainage pattern?
3. Where are the areas of heaviest use?
4. Recreation (types; # of people) etc.
5. Pet and children areas?
6. Where is the viewing corridor?
7. Structures near the water?
- 8.

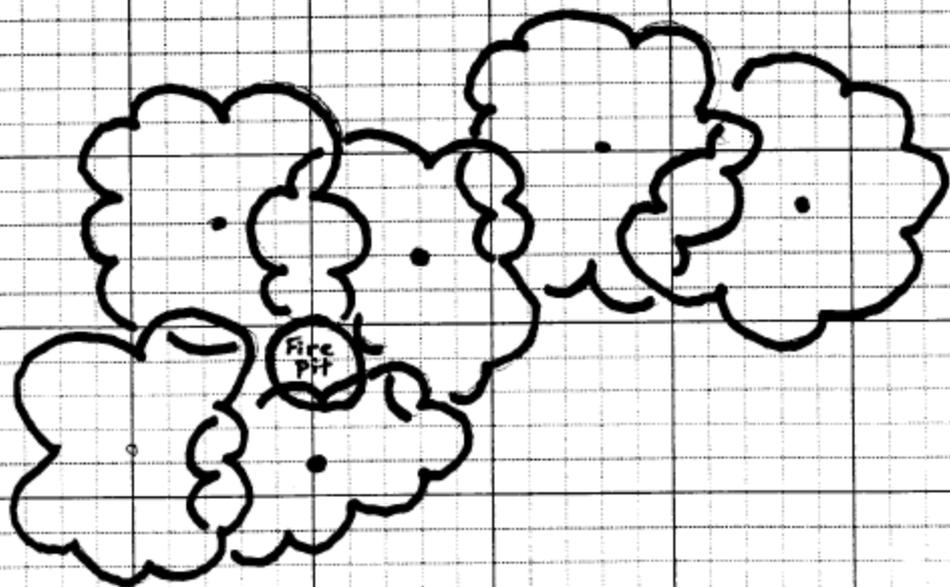
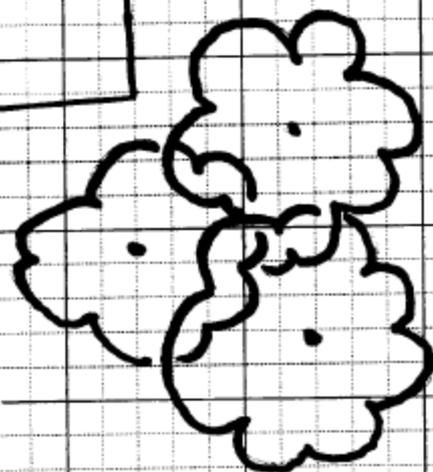
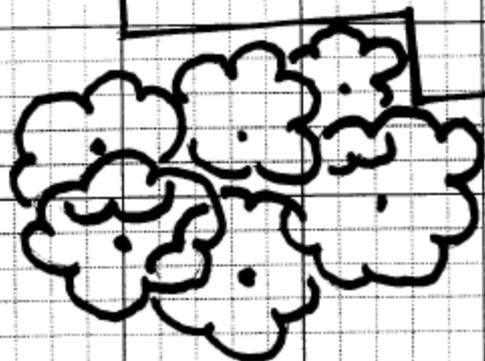


Plan



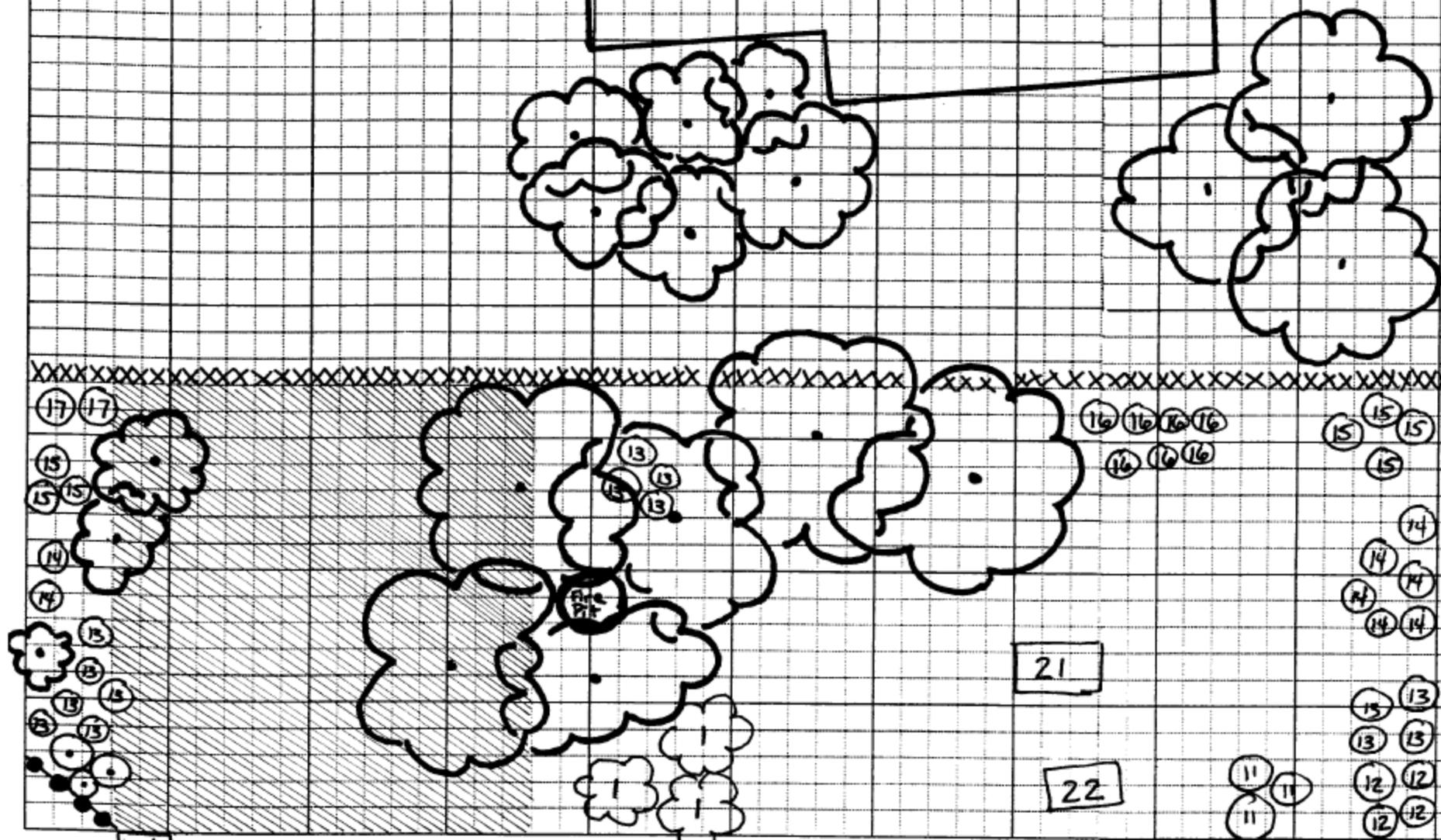
Initial Plan

Home



Final Plan

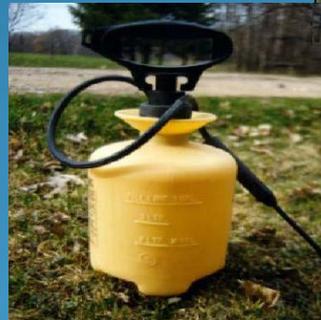
Home



Site preparation



- Black Plastic
- Soil tilling
- Herbicides



Reference sites

Find an undisturbed area of your lake similar to your soil, moisture and light conditions and investigate it:

- What kinds of native trees, shrubs, wildflowers are there?
- What densities are these plants found in at the site?
- Look to mimic what you see there in your revegetation efforts

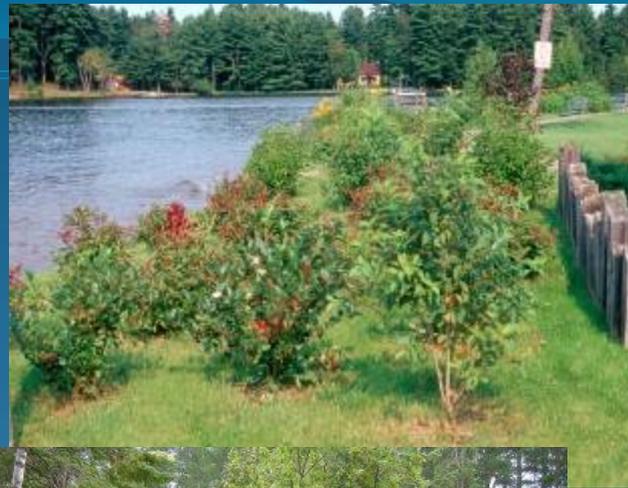
Implementing a plan

Revegetation:

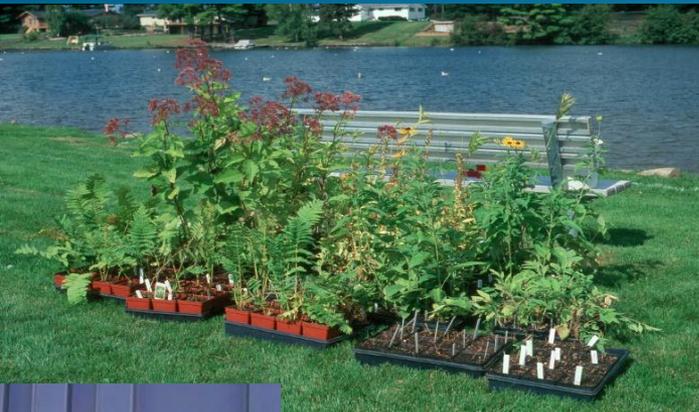
Three tiers of vegetation: trees, shrubs, and groundlayer—wildflowers, sedges, grasses, ferns



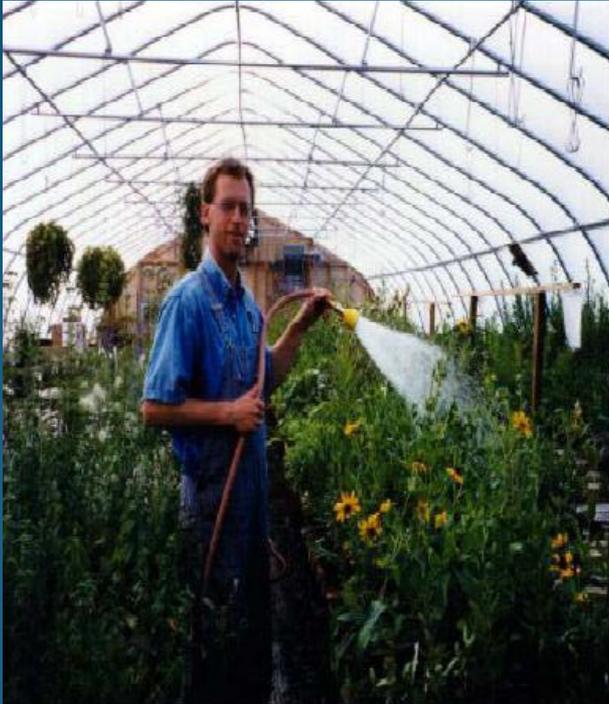
Plantings



Plant material types



Plants from a nursery



- Special orders – plan well in advance
- Determine origin / propagation method
- DO NOT use imported plants

Native plants

- Conservation of local genetic diversity
- Ability to provide food and shelter for native wildlife
- Improved health and vigor—climatically at home
- Increased survival rates for your plantings—save \$
- Reduced maintenance costs



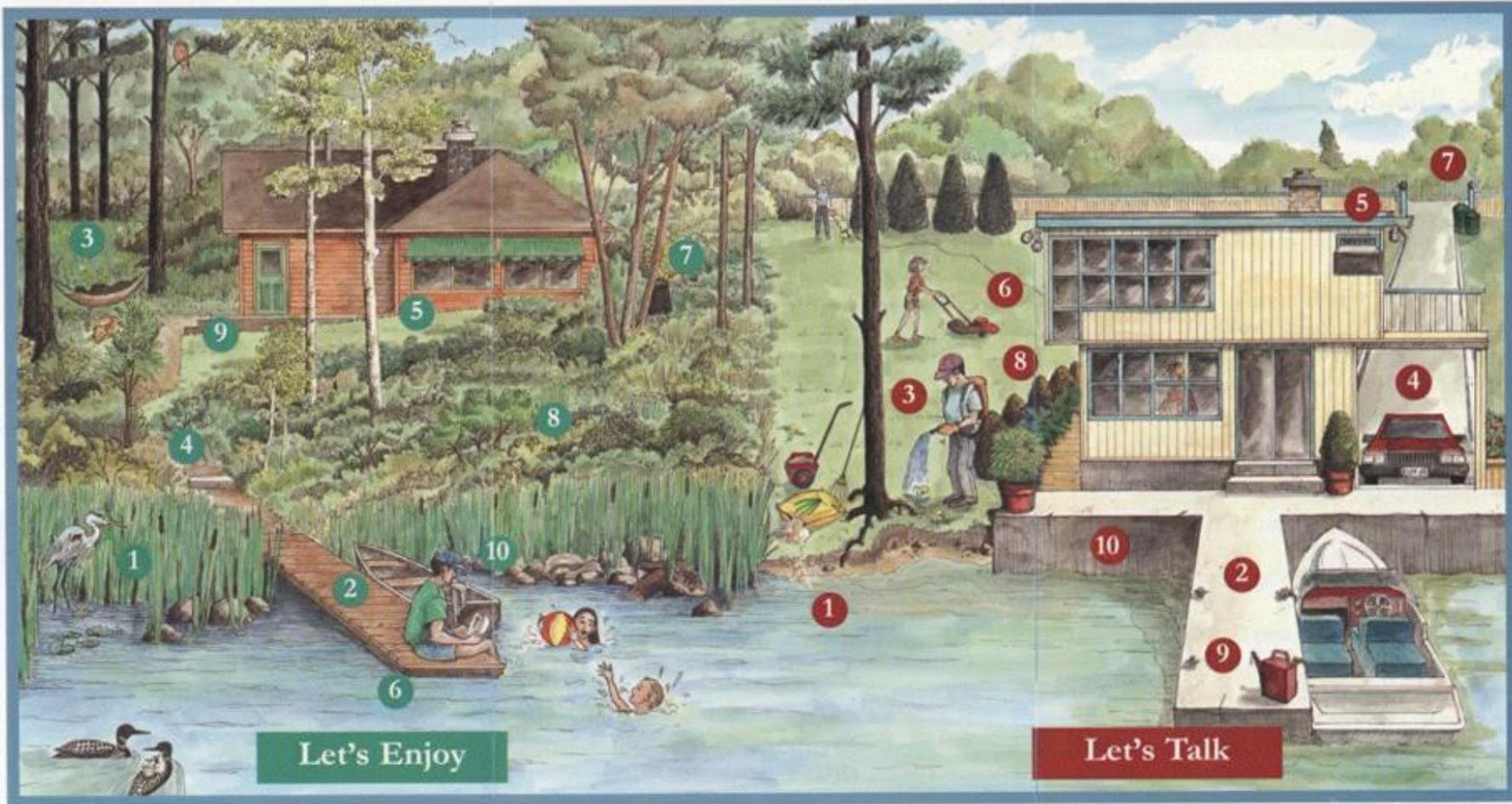
Watering-dah

Need to water plantings initially >
4-6 weeks; 1-2 " per week



Deer/rabbit protection





Let's Enjoy

1. Natural shoreline — great wildlife habitat.
2. Small floating dock — low impact on "ribbon of life."
3. Septic system far from the shore — reduces water pollution.
4. Narrow, gravelled footpath — less chance of erosion.
5. Trimmed trees and adjustable awnings — natural air conditioning with view maintained.
6. You work less — relax more!
7. Kitchen compost — improves your soil's quality.
8. Low-maintenance native plants — provide shoreline buffer.
9. Building — set back from shore and in character with setting.
10. Well-maintained motor — electric, or modern 4-stroke outboard, operated with low wake near shore.

Let's Talk

1. Bare shoreline — subject to erosion.
2. Solid dock — destroys wildlife habitat, alters currents, causes erosion elsewhere.
3. Fertilizer spills and chemical run-off from lawn — damage water quality.
4. Paved lane — pollution-laden runoff flows to water.
5. No shade trees — overworked air conditioner adds to electric bill.
6. Removal of natural vegetation — more work for you and more runoff.
7. Collecting lawn clippings — deprives soil of nutrients.
8. Ornamental shrubs — require chemicals and extra work.
9. Poor fuel management — spills are deadly.
10. Hardened shoreline — eliminates "natural filter," degrades water quality, and blocks wildlife access.

Before/after



Before/after



Before/after



Before/after



Questions?



Questions?
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