



Exploring the water's edge: shoreland habitat, biodiversity, and restoration opportunities

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6.0 defining lakeshore habitat restoration

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The Wisconsin Lakes Partnership



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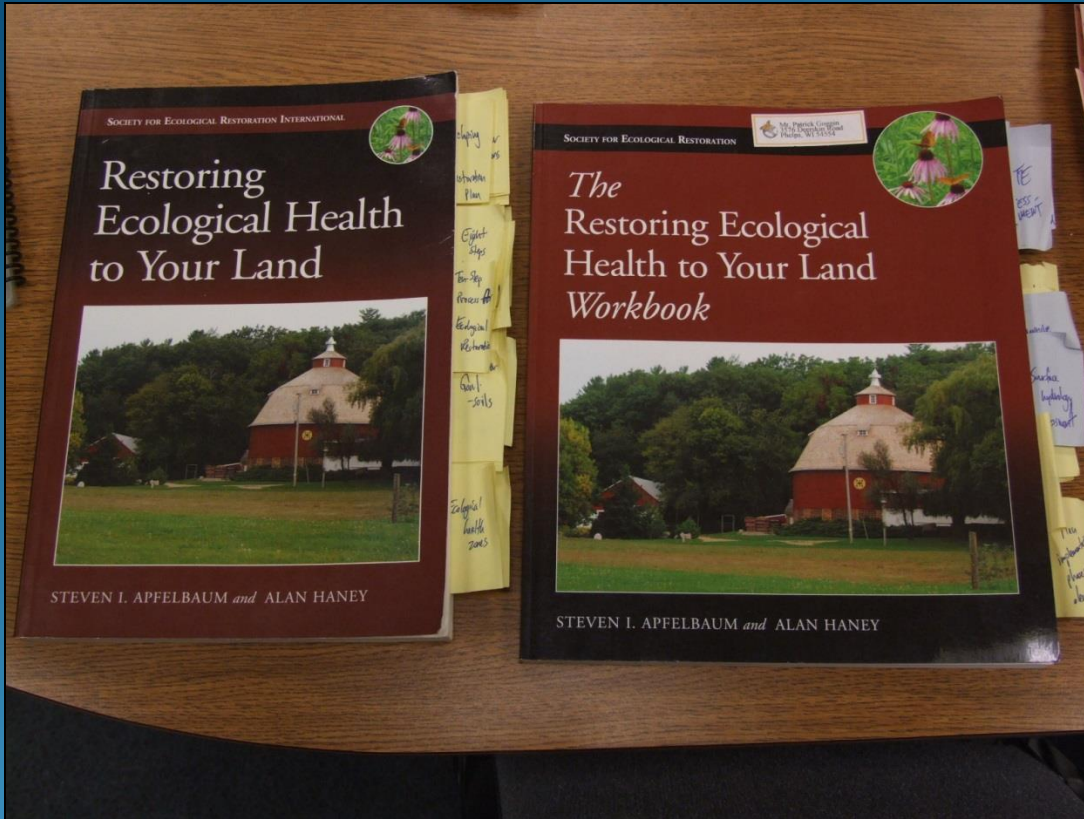


College
of Natural Resources



5.4 restoration ecology basics and getting to solutions

Restoration ecology:



Restoration - the return of a degraded ecosystem to a close approximation of its remaining natural potential

- First practical guidebook to give restorationists and would-be restorationists with little or no scientific training or background the “how to” information and knowledge they need to plan and implement ecological restoration activities
- The book sets forth a step-by-step process for developing, implementing, monitoring, and refining on-the-ground restoration projects that is applicable to a wide range of landscapes and ecosystems

Ecological restoration:

- Is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It is an intentional activity that initiates or accelerates ecosystem recovery with respect to its health (functional processes), integrity (species composition and community structure), and sustainability (resistance to disturbance and resilience).
- Restoration ensures abiotic support from the physical environment, suitable flows and exchanges of organisms and materials with the surrounding landscape, and the reestablishment of cultural interactions upon which the integrity of some ecosystems depends.
- Restoration attempts to return an ecosystem to its historic trajectory, i.e., to a state that resembles a known prior state or to another state that could be expected to develop naturally within the bounds of the historic trajectory. (e.g. pre-settlement)
- The restored ecosystem may not necessarily recover its former state, since contemporary constraints and conditions can cause it to develop along an altered trajectory.

Society for Ecological Restoration International - Guidelines for Developing and Managing Ecological - Restoration Projects, 2nd Edition / Guidelines for Developing and Managing Ecological Restoration Projects, 2 Edition. Andre Clewell¹, John Rieger², and John Munro³. December 2005. www.ser.org and Tucson: Society for Ecological Restoration International.

What is successful restoration?

Restoring natural landscapes is challenging; ecologists use several benchmarks to judge the success of a restoration:

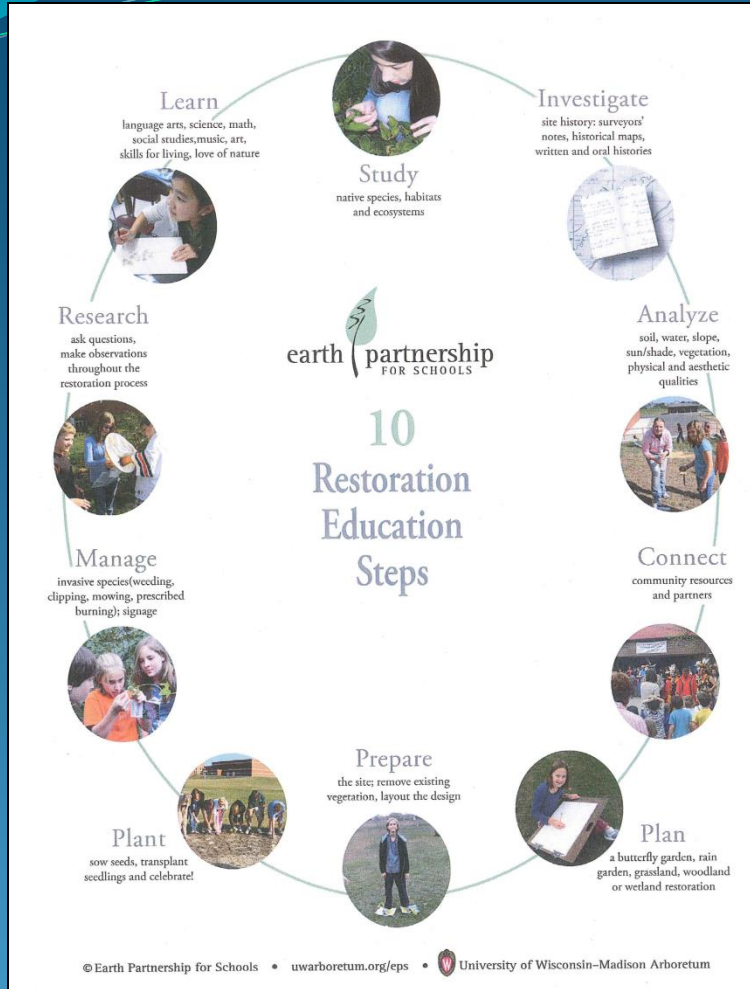
- Sustainability: Is the reconstructed community capable of perpetuating itself, or, like a corn field or a golf course, can it be sustained only if continuously managed by people?
- Resistance to invasion: Does the reconstruction yield a community that resists invasions by new species? Intact, natural communities are, in general, less easily invaded than ones that have been damaged or ones that lack one or more of their key species.
- Productivity: A restored community should be as productive as the original community.
- Nutrient retention / recycling: A reconstructed community should lose lesser amounts of nutrients than the original.
- Biotic interactions / biodiversity: The reassembly of formerly associated plant populations often leads to reconstruction of the entire biotic community. Because of their mobility and ubiquity, animals and microbes usually colonize spontaneously.
- Water recharge / hydrologic connectivity: Humans have ditched, tiled, and interrupted surface water flow patterns all over the landscape; restoration tries to reestablish these broken linkages to allow for more water infiltration and recharge.
- Scenic beauty: the aesthetics of our natural landscapes get beat up over time by unsound development. Restoration can reestablish the natural beauty of our ecological systems as well, an important component to why humans love the natural world, especially lakeshores!

Adapted from:

John J. Ewel – “Restoration is the ultimate test of ecological theory” in: Restoration Ecology, A Synthetic Approach to Ecological Research, 1987

5.4 restoration ecology basics and getting to solutions

Restoration ecology



Restoration guiding principles:

- Preserve and protect aquatic resources
- Restore ecological integrity
- Restore natural structure
- Restore natural function
- Work within the watershed/landscape context
- Understand the potential of the watershed
- Address ongoing causes of degradation
- Develop clear, achievable and measurable goals
 - Focus on feasibility
 - Use reference sites
 - Anticipate future changes
- Involve a multi-disciplinary team
- Design for self-sustainability
- Use passive restoration, when appropriate
- Restore native species, avoid non-native species
- Use natural fixes and bioengineering
- Monitor and adapt where changes are necessary

EPA Handout

USEPA, 2000. *Principles for the Ecological Restoration of Aquatic Resources*. EPA841-F-00-003. Office of Water (4501F), United States Environmental Protection Agency, Washington, DC. 4 pp. To order single, free copies, call 1-800-490-9198 and request document number EPA841-F-00-003. The document is also on the OWOW Restoration Website at:

< <http://www.epa.gov/owow/wetlands/restore/> >

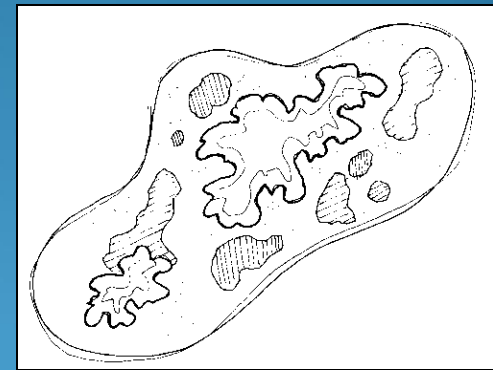
Defining lakeshore habitat restoration

Practice that uses native trees, shrubs, and groundcover, along with natural and biodegradable materials (biologs, delta-lock bags, sediment logs, soil lifts, woody material, etc.), to reduce lakeshore erosion and improve aquatic and wildlife habitat quality.



Lakeshore habitat restoration restorations can be considered a successful management practice if they:

- Reduce surface water and nutrient run-off
- Reduce lakeshore bank erosion
- Increase native plant abundance and diversity
- Improve wildlife habitat quality
- Increase wildlife abundance and diversity
- Create habitat heterogeneity: in other words, design patches of habitat that will benefit a variety of wildlife species. Patchiness is the pattern of nature which allows the highest degree of biodiversity possible.



Types of revegetation

1. Protection of intact buffers

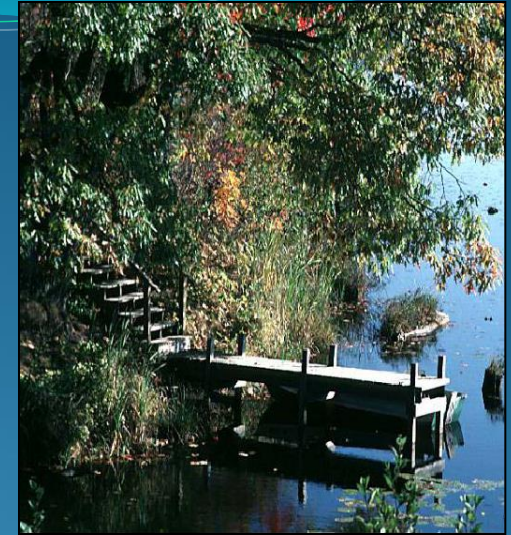
- No serious erosion problem
- Native vegetation present
- Diversity of structure
- Shoreland buffer requirement met

2. 'No mow' > natural colonization / recovery

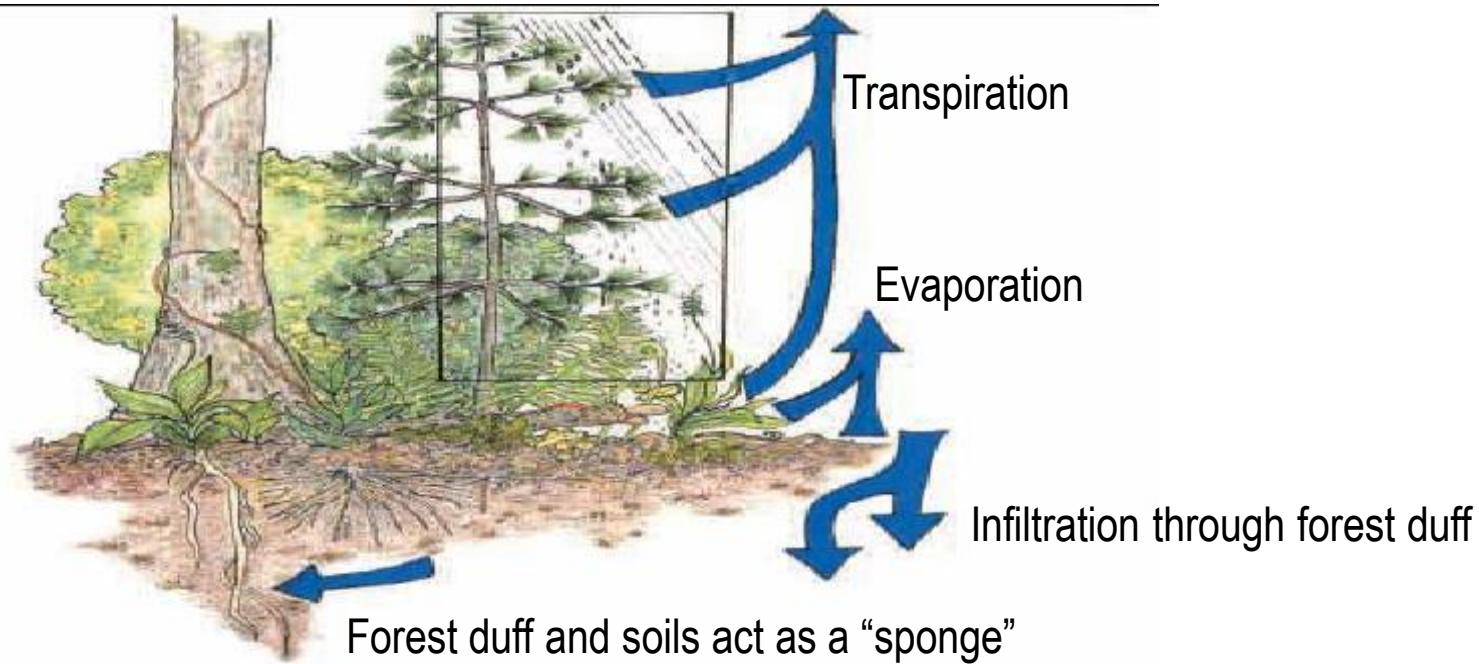
- Native elements present including seed bank
- Turf grasses not well established
- Areas screened from view
- Discourage trampling
- Look for opportunities to see results and promote

3. Accelerated Recovery

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



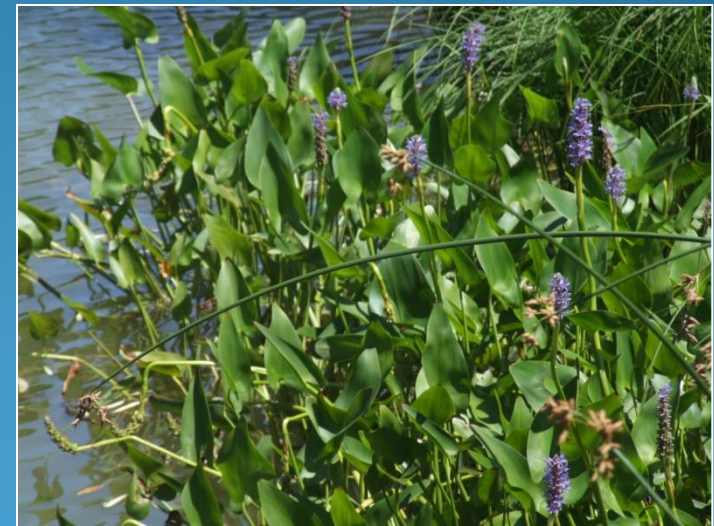
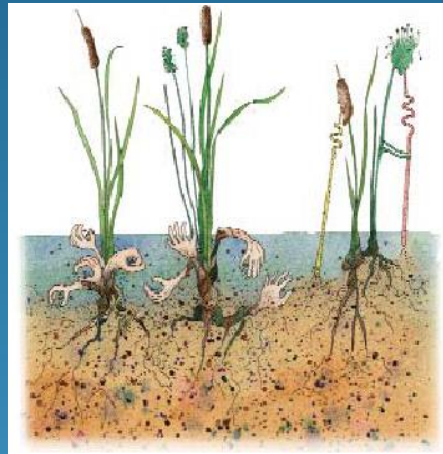
Importance of layered vegetation



Roots stabilize soils preventing erosion and allow plants to pump up water back into the atmosphere (transpiration)

Vegetation—the roots to 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.





Identify and discuss the goals and objectives for the site

- View corridor (30 ft. viewshed), recreational uses, wildlife support
- 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 vs. accelerated recovery
- Aesthetics: natural, wild (“untidy”) look versus a more landscaped feel (“tidy”)
- What the neighbors will think? Talk w/ them @ the project
- Exotic species control
- Attaining proper WDNR / county zoning permits



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
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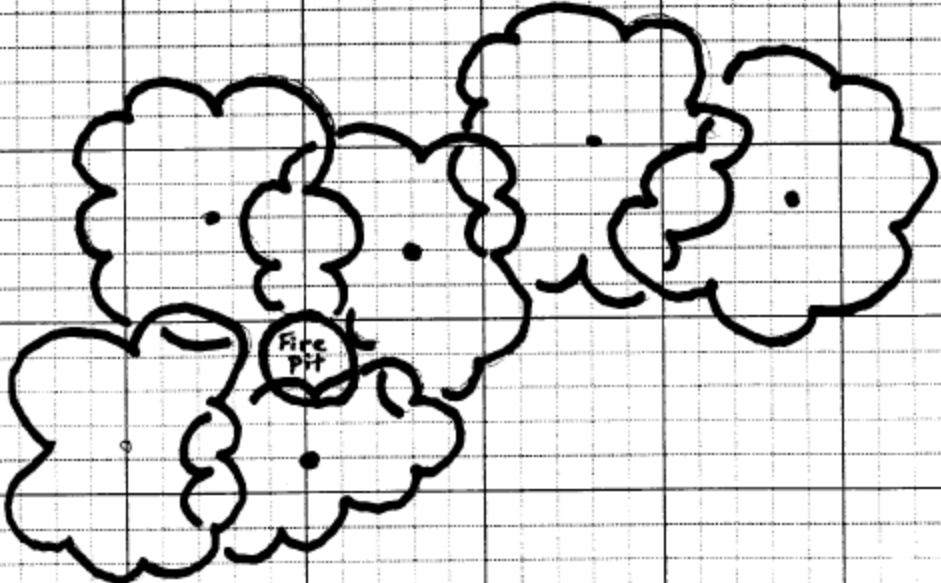
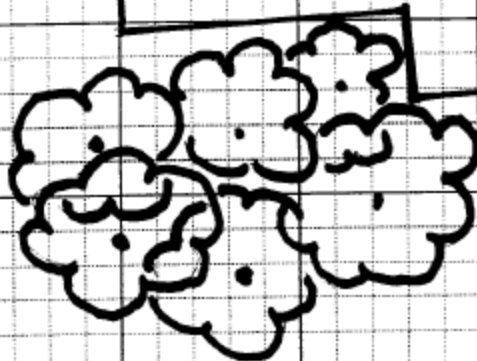
Typical questions to ask:

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



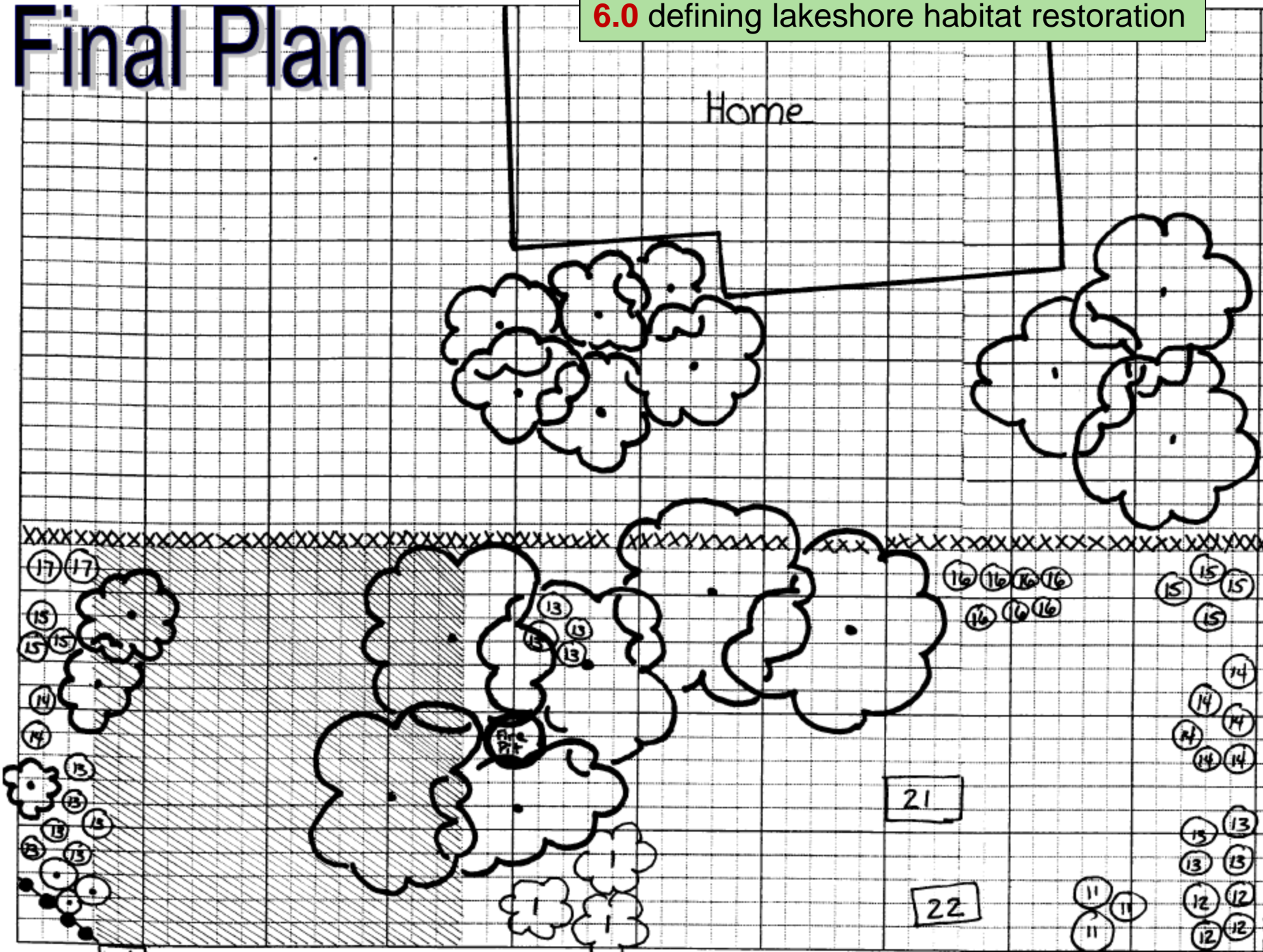
Initial Plan

Home



Final Plan

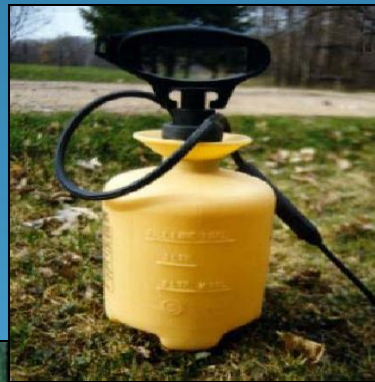
6.0 defining lakeshore habitat restoration



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



6.0 defining lakeshore habitat restoration

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



Plant choices > work horse species

What are they? Typically these plants have traits we admire for lakeshore habitats:

- Penetrating, deep roots.
- Prolific seeders that pioneer into disturbed ground before weeds and invasive species arrive.
- Many also have rhizomatous, fibrous, and/or clump forming root systems that minimize erosion.
- Most have wildlife habitat benefits of one sort or another too, such as providing nesting material, food, and cover.
- They are tolerant of variability in site conditions for moisture, water depth, soil type, and light.
- They can also be propagated efficiently and in a cost effective manner by nurseries specializing in native plant material production.



Shoreland restoration & other videos:

< <http://www.extension.umn.edu/Shoreland/videos/index.html> >



Shoreland Restoration: A Growing Solution

Outlines why natural shorelines help protect water quality and wildlife habitat, and introduces how shoreland property owners can restore natural functions to their shorelines. (15:30)

Keeping Our Shores: Shoreland Best Management Practices

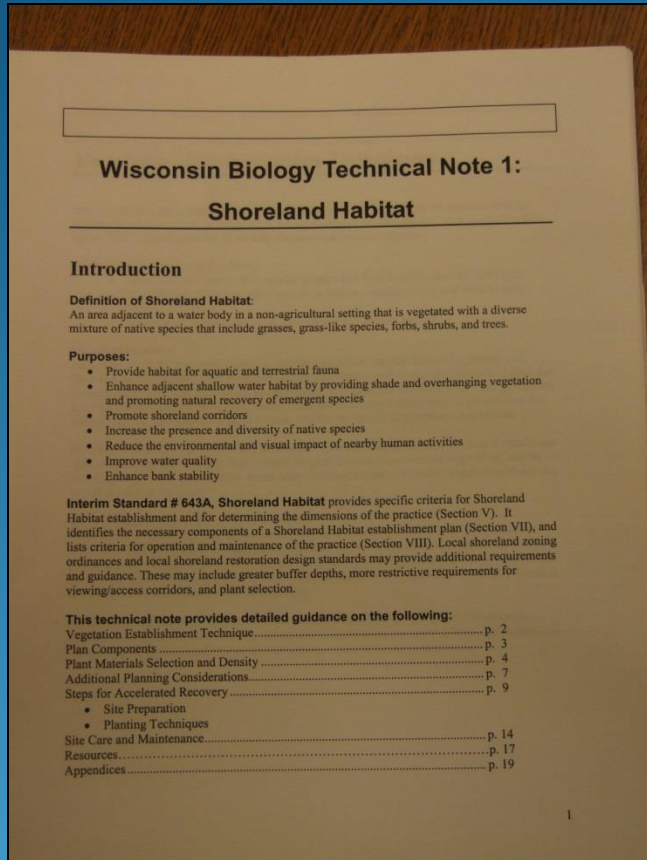
Introduces best management practices that shoreland owners can use to protect the water quality in a lake or river, including shoreline filter strips, proper septic maintenance, and appropriate lawn care practices. (15:20)



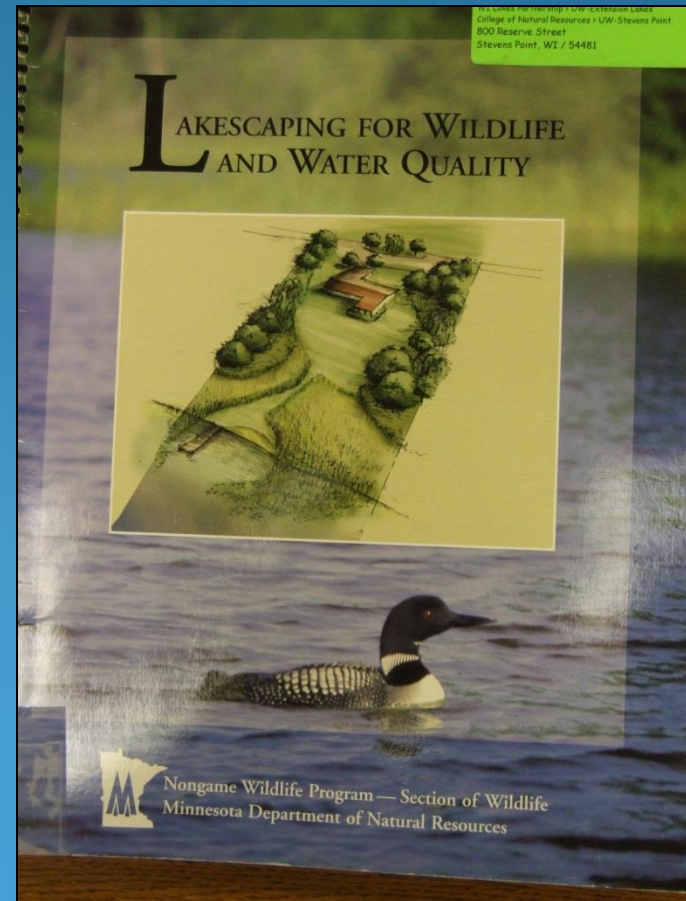
Wisconsin biology technical note 1: shoreland habitat / MN guide

6.2 state standards and biology technical note review

- Two most popular tools for project development [along w/ standards]



Most of what this biology note covers is the native planting timing and planting plan development



Streambank and shoreline protection code 580 conservation standard

Definition:

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

Purpose:

- Limiting the loss of land and its potential impacts to utilities, roads, buildings, other facilities or cultural resources adjacent to streambanks or lake shorelines;
- 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.

Conditions where practice applies:

This practice applies to the toe and bank zones of streambanks of natural or constructed channels and shorelines of lakes, reservoirs, or estuaries where they are susceptible to erosion (see Figure 1). This standard applies to controlling erosion using structural treatments¹ often in combination with re-vegetation, soil bioengineering, or upland erosion control practices (see NRCS National Engineering Handbook (NEH), Part 650, Engineering Field Handbook (EFH), Chapter 16, Companion Document 580-1).

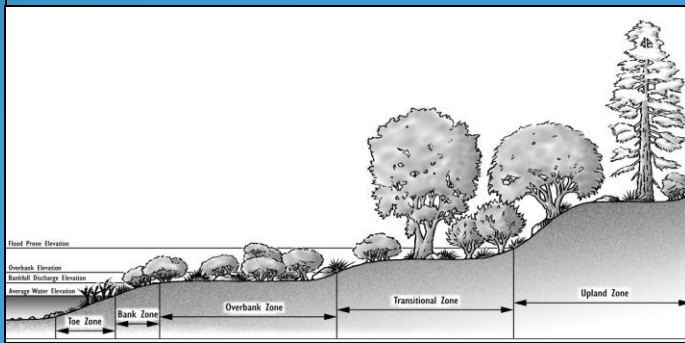


Figure 1: Location of hydrologic zones along a streambank or shoreline

Shoreland habitat code 643A conservation standard

Definition:

Area adjacent to a waterbody or watercourse in a non-agricultural setting that is vegetated with a diverse¹ mixture of native species that can include grasses, grass-like species, forbs, shrubs, and trees.

Purpose:

- A. Provide habitat (food, shelter, nesting sites, overwinter cover) for aquatic and terrestrial fauna.
- B. Enhance littoral zone (shallow water) habitat function for a broad range of vertebrate and invertebrate species by providing shade and cover with overhanging vegetation, and promoting natural recovery of emergent species.
- C. Provide a source of detritus (decomposing organic matter) and large woody cover for aquatic organisms.
- D. Provide shade to lower water temperatures and facilitate higher dissolved oxygen concentrations to improve habitat for aquatic organisms.
- E. Promote shoreland corridors for aquatic and terrestrial flora and fauna.
- F. Increase the presence and diversity of native plant and animal species in shoreland areas.
- G. Reduce the environmental and visual impact of human activities in the near-shore area.
- H. Improve water quality by reducing the amount of sediment and other pollutants, such as pesticides and nutrients in surface runoff.
 - I. Enhance bank stability by limiting intensive use, and reducing wave impact.

Conditions where practice applies:

- This practice applies, but is not limited to, areas of shoreland development where it is desired to enhance or restore native mixed vegetation for the improvement of fish and wildlife habitat, water quality and bank stability.
 - Where the primary purpose is to control sediment to environmentally sensitive areas, refer to the Natural Resources Conservation Service (NRCS) Field Office Technical Guide Section IV (FOTG), Standard 393, Filter Strip.
 - Where the primary purpose is to control bank erosion, refer to NRCS FOTG Standard 580, Streambank and Shoreline Protection to be used in conjunction with this standard.

6.2 state standards and biology technical note review

Riparian forest buffer code 391 conservation standard

Definition:

An area predominantly of trees and shrubs that functions as a vegetated ecotone¹ and is located adjacent to and up-gradient of water bodies and water courses.

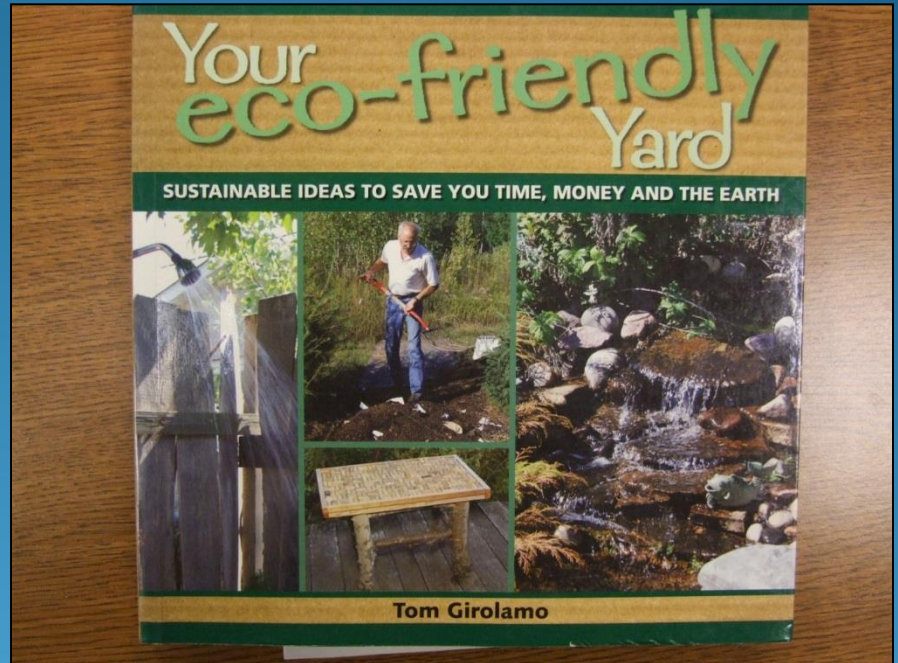
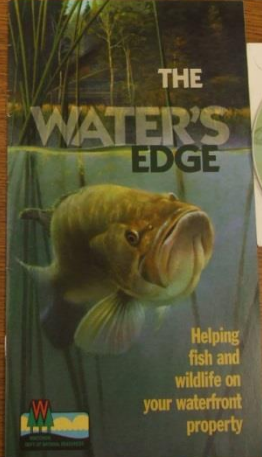
Purpose:

- Provide shade to lower water temperatures and facilitate higher stream dissolved oxygen concentrations to improve habitat for aquatic organisms.
 - Provide a source of detritus and large woody cover for aquatic organisms.
- Improve water quality by establishing permanent tree and herbaceous cover in floodplain areas subject to out-of-bank flow and/or scour erosion.
 - Provide habitat and corridors for aquatic and terrestrial flora and fauna.
- Increase transpiration and infiltration, resulting in slower groundwater discharge to streams and reduced flood flows and to mitigate flood damage.
 - Restore riparian plant communities.
- Improve water quality by reducing amounts of sediment, organic matter, nutrients, pesticides, and other pollutants in surface runoff and reducing the amounts of nutrients and other chemicals in shallow groundwater.
 - Reduce pesticide drift entering the water body.
 - Increase carbon storage in plant biomass and soils.

Conditions where practice applies:

- This practice applies to areas adjacent to permanent or intermittent streams, drainage ditches, wetlands, and lakes where it is desired to have woody vegetation for the improvement of water quality and riparian stability, and to improve fish and wildlife habitat.
 - This practice does not apply to the treatment of conditions where high levels of pollutants can be anticipated such as animal feed lots, feed storage areas, and milking center waste areas. For these types of situations refer to Wisconsin NRCS Field Office Technical Guide, Section IV (WI FOTG), Conservation Practice Standard 635, Wastewater Treatment Strip. This practice does not apply where soil loss is above "T" within 300 feet of the riparian forest buffer.
- Where the primary purpose is to protect environmentally sensitive areas such as sinkholes, crevices, or springs, refer to WI FOTG Standards 393, Filter Strip; 342, Critical Area Planting; or other applicable technical standards.

7.0 discussion of landowner backgrounds and how to work effectively with your customers



Tom Girolamo

7.0 discussion of landowner backgrounds and how to work effectively with your customers

Landowner types

Prime prospects: are landowners who have a conservation mindset but are not engaged in managing their lakeshore property as yet (e.g., they haven't yet developed management plans or consulted with natural resource professionals, and they don't participate in programs such as cost-shares and easements). Understanding what proportion of landowners in your region fall into this category will help you see how many people you can expect to influence.

Model owners: have a conservation mindset and they have already been taking many of the actions that natural resource professionals recommend for lakeshore conservation and management. Many love nature and animals and appreciate ecological benefits of lakeshore settings. Appeal to their sense of responsibility and stewardship.

Opportunists: are doing some lakeshore management activities but not really out of a conservation orientation--they may find these actions to be financially beneficial or otherwise convenient. Help them understand the ecological significance of their lakeshore property.

Uninvolved or write-offs: are people who are not managing their land sustainably and don't demonstrate a conservation mindset toward their lakeshore property; they may come to lakeshore habitat restoration projects through mitigation requirements, for example. Main interests may include reducing taxes and land management hassles to the extent possible. Conservation messages should identify direct financial benefits, preferably without too much effort on their part. Give them information but don't tell them what to do--accept their independence and cautiousness.

Lakeshore retreat owners (often retired couples): own their lakeshore property primarily for its beauty and recreational value; likely interested in wildlife viewing, participating in assorted water recreation activities, and enjoying the scenic beauty of their surroundings. The home is likely their largest investment. Give them specific, easy, low-cost actions to achieve their objectives (e.g. attracting wildlife).

Summer lake house folks (can be multi-generational and even multi-families): a team of folks are involved with the property; likely interested in ways to minimize land maintenance and management costs. Often interested in maintaining the long term health and value of the land; estate planning and land transfer can be important items to this group.

Working the land folks / supplemental income: tend to be pragmatic; value aesthetic and recreational benefits of their lakeshore property but also see it as a financial asset. May be involved with forestry activities and management. Usually interested in how to maintain the long term health and value of the land. Emphasize ways to enhance financial gains or maintain land value for future generations. Affirm their outdoorsy lifestyle and simple, traditional values.

Municipalities / town and county parks / state and federal land managers / Native American community partners: different public land managers tasked with oversight of parks, woodlands, forests, open space, and other greenways. Great locations for demonstration sites. Often require a phased approach due to financial resources and the need to work with oversight committees and existing planning strategies for these properties.

Ten Common Themes of Effective Shoreland Restorations

1. Partnerships Get it Done
2. Funding Can Take Many Forms
3. Plans Matter
4. Use Ecological Design Principles
5. Landowner Values are Met
6. Maintenance is Required
7. Address Erosion Control Concerns
8. Communication
9. Involve the Lake Community
10. Take an Adaptive Approach





LEAVING A LEGACY

Thanks for all you do toward
leaving a legacy of healthy lakes!



Questions?

Thanks for all you do toward leaving
a legacy of healthy lakes!



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The Wisconsin Lakes Partnership



“our tools... do not suffice for the oldest task in human history – to live on a piece of land (water) without spoiling it” Aldo Leopold