

Purpose and Benefits of Shoreland Mitigation



Introduction

All living creatures need food, clean water, clean air, and tolerable climates. Shorelands are the only place where all four needs can be found in one location. The abundance of riches found in the shoreland zone is why this accumulation of ecosystems needs protection, improvement, and understanding. Strength of the shoreland zone is built through the cumulative effect of sound ecosystems such as shoreland buffers, rain gardens, bioretention devices, and stewardship of those ecosystems. As a riparian landowner you are a part of this remarkable accumulation of ecosystems.

Shoreland zoning and mitigation is designed to aid in the protection, recovery, and understanding of these cumulative ecosystems and the positive attributes of shorelines which are so attractive to us all. Jay Settersten, SetterTech, LLC

Purpose

The primary purpose of shoreland mitigation is to begin the process of re-establishing riparian (shoreline) habitat throughout the County. Over the years much of the critical shoreline habitat found in Dane County has been lost. As this habitat is absolutely critical to the health and wellbeing of our wildlife, lakes, and fisheries it is very important to begin the process of re-establishing that habitat before our natural environment qualities degrade further. This habitat will be created through a number of different natural channels. Enhancement of the littoral zone (shallow water) habitat area will provide necessary functions for a broad range of vertebrate and invertebrate species by providing shade and cover with overhanging vegetation, and promoting natural recovery of emergent species. As shoreline mitigation practices mature they also provide a source of

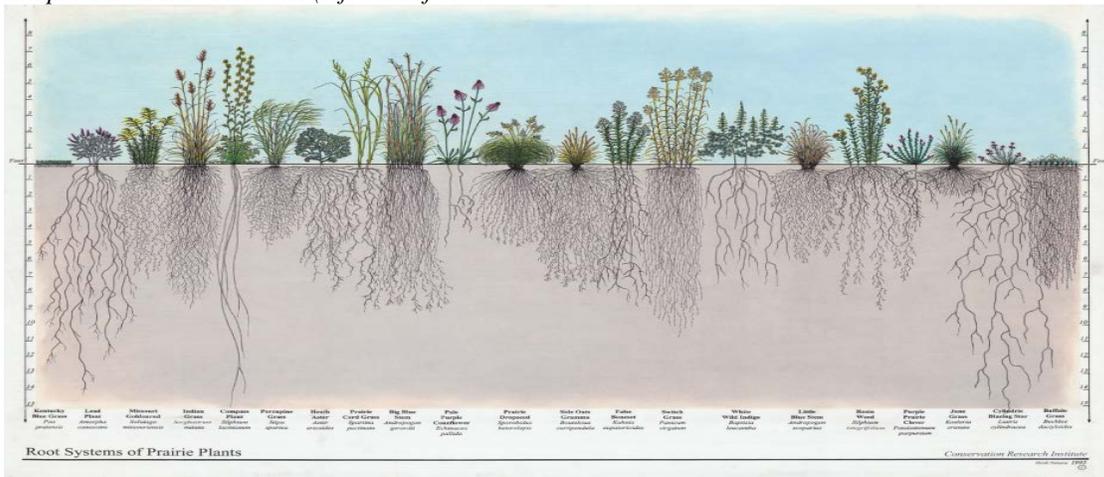
detritus (decomposing organic matter) and woody cover for aquatic organisms. The maturity of woody material and the subsequent falling of that material into the water will provide a tremendous amount of habitat for aquatic organisms which are critical for fisheries and insect populations. Tree and shrub layers eventually provide shade to the margins of the lakes and streams they are located upon. Shade lowers water temperatures and facilitates higher dissolved oxygen concentrations, which is very important to the health of aquatic organisms and decreases algae and bacterial populations.

Over time the continued development of shoreline buffers will create a shoreline corridor for aquatic and terrestrial plants animals and insects. This connectivity of habitat is a critical component of any ecosystem and such connectivity is no longer present on many of our lakes and streams. As this continuation of habitat continues to expand, human interaction with that ecosystem will see increased rewards as the populations of many wildlife species including birds, butterflies, and fish will increase and water quality will improve. Fish populations will improve as most fish species require interaction with natural shorelines at some point in their life cycle whether for reproduction, foraging or shelter this habitat is a critical component of their life cycle.

The natural beauty of our lakes has changed over the years to one of manipulated landscapes and that change has reduced the natural beauty of the lakeshore. The manipulated shoreline has also reduced the strength of the shoreline from a stability and water quality standpoint. As we improve the natural components of the shoreland zone the zone will become healthy and stable, and natural beauty will be returned to the lakeshore.

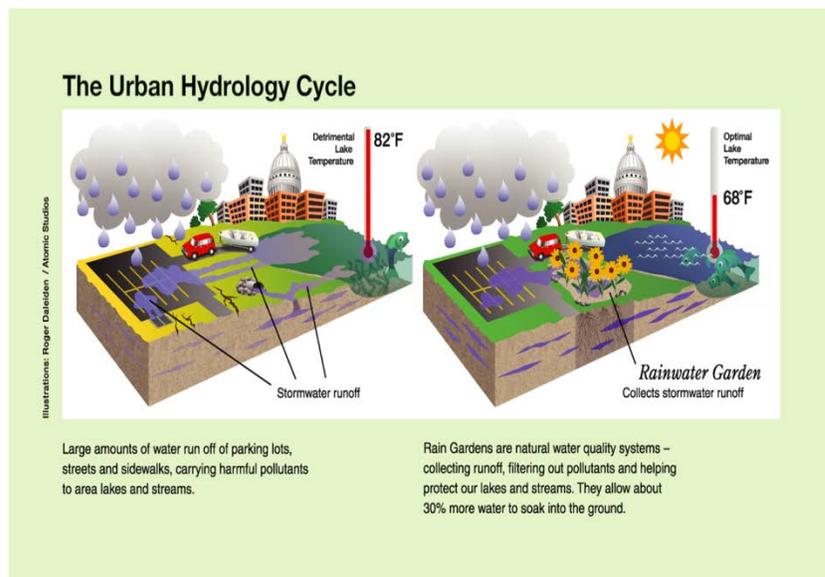
As native vegetation has decreased and impervious surfaces have increased in riparian areas we have seen an increase in nutrients and sediments reaching the lakes. Where natural buffers have been eliminated, the deep and fibrous rooting strengths of the native plants are no longer present. This natural infrastructure created by native species root systems and the stem density created by the vegetative portion of the plants does a tremendous job of holding our shoreline soils in place and filtering stormwater runoff as it flows overland. As many will note through the increase in algae blooms, beach closures, shoreline erosion and reduction in many aquatic species; reduction in natural shorelines and increased hard surface area is an issue. A 35' buffer will not fully restore water quality and habitat to a level that was once present in natural shoreline communities but it can provide a significant improvement. There are situations where additional stormwater management practices are necessary to reduce the amount and quality of stormwater flowing to our aquatic ecosystems. Raingardens and their engineered counterpart bioretention basins are the most common stormwater management practices used to achieve these goals in Shoreland Mitigation.

This diagram below shows the difference between the growth characteristics of native vegetation in comparison to mowed lawns (left side of chart)



How do Raingardens and Bioretention Basins Benefit Lakes

One of the most straight forward ways to illustrate how raingardens and bioretention systems benefit the water quality of our lakes and streams is to describe the hydrologic cycle (see below). In a natural environment there are many small depressions and deep rooted plants that increase the amount of water absorbed by our soils. This is one reason why wetlands are so important to our environment. As water soaks into and percolates through our soils it is filtered and cooled. Clean cool water contributes to healthy aquatic ecosystems. As mentioned above, cold water holds more dissolved oxygen and that oxygen is a very important component of wildlife and fishery health. In an urban environment, the natural depressions, wetlands and deep rooted native plants are either lost completely or greatly reduced. Now we have to begin reclaiming the process of utilizing nature's water quality improvement systems to aid in the improvement of our natural ecosystems.



Agricultural Impact Reduction

Although agriculture environments are often thought of as being quite different than urban environments, many of the problems and methods of improving riparian and aquatic environments are the same. As in urban situations there is a reduction in deep rooted native plants, increase in hard surface areas, increased nutrient flow into lakes and streams. Improvements to riparian shorelines, buffer strips, and the creation of runoff collection systems, rain gardens, and bioretention systems has the same effect on the improvement of aquatic and riparian ecosystems as are witnessed in the urban environment.

Conclusion

Nature has its own systems for maintaining healthy ecosystems. The development and progression of the human environment has had and will continue to have impacts upon nature's systems. Science has proven that human impacts upon these natural systems causes negative impacts upon the natural environment and therefore impacts the human environment. As stewards of the land, we now need to recognize our role in nature's systems and begin doing our part through the utilization of processes that allow us to progress and develop while holding the natural environment in high regard.