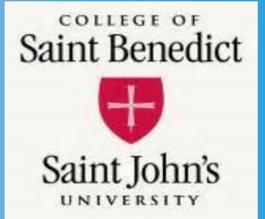


Natural Lawn Care Programs and Lakeshore Restoration: Strategies to Reduce the Effects of Lakeshore Lawns



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Introduction

Lakes play a large part in our lives in Minnesota due to the fact that there are just so many of them and that they are great locations for cabins and other recreational activities. This is why we have come to form such a value for the lakes of Minnesota, many people have a positive experience involving a lake throughout their lives. Water quality is a very important part of why many of these lakes are valued so highly and with increased lakeshore inhabitation and lakeshore disturbance the quality of water in these lakes may decrease. Although there are many ways that are used to protect water quality throughout the lakes in Minnesota, water quality is still negatively affected by human manipulation of the lakeshore. The main factors that effect water quality for lakes that I will investigate are nutrients loading and increased erosion from lakeshore disturbances. Are strategies such as natural lawn care programs and lakeshore restorations able to decrease the effects of lakeshore lawns on water quality? It is important to understand the importance of protecting the natural lakeshore habitat as well as preserving the water quality of Minnesota Lakes. By implementing programs such as natural lawn care programs and restoring of natural lakeshore buffers, the negative effects of lakeshore lawns can be decreased causing better water quality.



Figure 1. This image is an example of a poor lakeshore landscape. This landscape displays large quantities of grass that are not able to reduce the amount of runoff that is able to reach the lake.

Methods

I looked at case studies to help me further investigate the research questions that were stated above. The Lawn to Lake study looked at the benefits of a natural lawn care programs and how education about these programs can decrease erosion and nutrients loading. Another study that was used looked at the effects that different fertilizers had on the amount of nutrients that was able to runoff due to different factors. I looked at many project details for the implantation of lakeshore restorations in the form of buffer strips and natural landscaping. After looking at these case studies the information found was used to create a benefits table for each strategy studied.



Figure 2. This image is an example of a good lakeshore landscape. The natural grasses are able to act as a buffer between the lawn and the lake.

Table 1. Showing the three different strategies and the benefits of each.

Strategies	Benefits
Lakeshore Restoration/ Lakeshore Buffer	-Controls shoreline erosion with deep rooted plants -Protects water quality by filtering lawn runoff -Creates habitat for fish and wildlife -Increases infiltration of water -Creates an aesthetically pleasing lakeshore -Reduces the amount of turf near the lakeshore
No Phosphorus Fertilizer	-Reduces the amount of phosphorus that is able to be available for runoff -Allows for high quality lawn that is able to hold more water -No phosphorus lawn fertilizer lawns are able to take fertilizers with phosphorus off the shelves
Natural Lawn Care Programs	-Reduce inputs of lawn chemicals and fertilizers -Reduce the amount of input needed into a lawn -Reduce the amount of water that is wasted during irrigation by increasing the quality of the lawn -Higher mowing heights allow for the turf to build larger root systems

Conclusion

Lakeshore lawns although aesthetically pleasing are causing damage to the aquatic ecosystem that is valued so highly by the people of Minnesota. These three strategies are able to decrease the amount of excess nutrients that are available to be swept into the lake by runoff or other means. The Lawn to Lake study is able to educate the public about the benefits of natural lawn care programs on lakeshores which in turn is estimated to have a large reduction in amount of phosphorus. Each strategy can provide solutions to the runoff of excess nutrient problem in different situations. Although each of these strategies are able to reduce the amount of excess nutrients that are able to be taken into the lake a combination of these strategies would provide for the most successful prevention of increased nutrient concentration in the aquatic system as well as reduce runoff. Out of the three the most successful strategy is the implementing of a buffer strip or natural lakeshore habitat due to the fact that this strategy is able to counter runoff and thus reduces the total amount of nutrients that is placed into the aquatic system. Buffers strips between the lakeshore and lawns are able to reduce the amount of runoff that reaches the lake by 40%.

References

- Shock, C, and Kathy Pratt. "Phosphorus Effects on Surface Water Quality and Phosphorus Tmdl Development." Paper presented at the Western nutrient management conference, 2003.
- Vanderbosch, Dana A., and Susan M. Galatowitsch. "An Assessment of Urban Lakeshore Restorations in Minnesota." Ecological Restoration 28, no. 1 (2010): 71-80.