

Rock Lake Shorelands and Shallows Survey

The Importance of Shorelands and Shallows

The land adjacent to our lakes and the shallow water next to the land are important areas for many reasons. These areas are where people use the waters for fishing, bird watching, swimming, getting their boats out on the water, or simply sitting and enjoying the view. The shoreland area is a vital place for many species that are dependent on native habitat during part of their life cycle. In fact as much as 90% of the living things in lakes are found in the shallow waters and shoreland areas.

How we manage our shoreland areas can impact our lakes positively or negatively. The 2007 National Lakes Assessment identified the loss of shoreland habitat as the number one stressor to our lakes in the nation and in Wisconsin. A shoreland area containing a native plant garden can prevent pollutants carried by rainwater from reaching our lakes and also prevent shoreline erosion. In fact, when comparing native shoreland habitat to lawns, areas with lawns contribute 7-9 times more phosphorus and 18 times more sediment to the water. These phosphorus and sediment inputs to the water can reduce water clarity and increase algae blooms which can cause a decrease in property values.

Development of our shorelands and shallow areas can negatively impact lake fish and wildlife. Shorelines that contain seawalls and rock riprap impede the movement of turtles and other animals that need to access the lake and the shoreland area. Increased development (lawns, impervious surfaces, bare ground, piers) has been linked to degraded aquatic plant habitat, decreases in green frog and uncommon bird populations, and a decline in fish species.

Many of the values lake front property owners appreciate and enjoy about their properties—natural scenic beauty, tranquility, privacy, relaxation—are enhanced and preserved with good shoreland management. And studies have shown that healthy lakes with good water quality translate into healthy lake front property values.

Shorelands and Shallows Survey Protocols

In 2015, the Jefferson County Land and Water Conservation Department (LWCD) obtained a Department of Natural Resources (DNR) lake planning grant in order to assess the current conditions in the shoreland and near-shore shallow areas of Rock Lake. The survey will serve as a baseline so that future changes (improvements or declines) in conditions can be measured.

The survey protocols were determined in consultation with the DNR as they were developing state-wide protocols during the beginning of the Rock Lake project. As a result, the survey was delayed to wait for the development of the protocol. The LWCD was one of the entities that tested the state protocols and provided feedback to improve them. There were also some additional information that the LWCD gathered that was not part of the state protocol.

The shoreland and shallows survey was performed on Rock Lake during the summers of 2015 and 2016. The data collected is listed below.

Riparian Zone Data Collected within 35 feet of the water

- Average width of a vegetated area adjacent to the water (if any)
- % cover of tree canopy
- Presence/absence of shrubs and herbaceous plants
- % cover of each item that totals 100%: maximum of shrub or herbaceous plants, impervious surfaces, manicured lawn, other (including mulch, sand, bare ground, etc.)
- Human structures on land: main residence, boathouse, outbuildings, commercial buildings, stairs/paths, fire pits, and other (retaining wall, patio, boats on land, boat launch, gravel)
- Hydrologic modifications: point source, channelized flow, stairs/paths that slope toward the lake, lawn sloping directly to lake, bare soil, and other
- Shoreline erosion control: seawalls, riprap, other erosion control, and beach
- Human structures in the water: piers, boat lifts, boats in the water, rafts, inflatables, boat houses over water, and other
- Aquatic plants: floating, emergent, submerged

An additional part of the survey was to determine the amount of wood in the water. Wood that is submersed in the water provides habitat for a variety of species that live in the lake including fish, aquatic insects, crayfish, and turtles. The wood survey was done to document the location and certain characteristics of wood that was at least 4 inches in diameter, at least 5 feet in the water, and in 2 feet or less of water. The characteristics noted were whether the wood crosses the high water level (so is connected to shore) and the amount of branches that the wood contained (no branches, some branches, or a full tree crown).

Shoreland Survey Results

The amount of shoreline assessed in the survey was 7.3 miles (38,520 feet) and included the Miljala channel, the Elm Point channel, and the mill pond. The survey did not include Marsh Lake. The survey covered 347 tax parcels.

Vegetation

The state and county standard is to have a vegetated area that consists of shrubs, trees, grasses, and flowers to a depth of 35 feet from the water. This area is called a vegetated buffer. A viewing and access corridor is allowed to be 35 feet wide parallel to shore for a parcel that is 100 feet. Ideally, every lot would contain a vegetated buffer to project the quality of the water.

Shorelands that were reported as having $\geq 65\%$ cover of shrubs and herbaceous plants are the parcels that meet or exceed the state and county standard. The survey revealed that out of 347

tax parcels, Rock Lake had 64 parcels that meet the state/county standard. Therefore only 18.4% of parcels meet the state standards for protecting the water quality of Rock Lake.

Another way to assess how Rock Lake is doing in terms of meeting the buffer standard is to look at the total length of shoreline that meets the standard. There are 2.07 miles of shoreline that have $\geq 65\%$ shrubs and/or herbaceous plants within 35 feet of the lake. Therefore, 28.3% of the shoreline meets the standard. Please see the map at the end of this document.

The percent cover of items found within 35 feet of the lake was estimated. This information on all of the parcels is summarized below. The “other” component included bare soil, sand, gravel, mulch, riprap, and retaining walls.

	Average % Cover	Minimum Cover	Maximum Cover
Shrubs and/or Herbaceous Plants	40%	0%	100%
Impervious Surfaces	17%	0%	95%
Lawn	39%	0%	100%
Other	4%	0%	70%

The presence of emergent and floating-leaf aquatic plants were noted in the survey.

	Number of Lots Containing Aquatic Plants	% of Lots Containing Aquatic Plants
Emergent plants	49	14.1%
Floating-leaf plants	79	22.8%

Structures

The number of structures within 35 feet of the water were counted as part of the survey. Structures in the “other” category included items such as paths, retaining walls, decks patios, boats on shore, fishing platforms and roads.

Structure	Number of Structures	Number of Parcels Containing Structures
Residences	18	18
Boathouses on land	84	82
Out buildings	25	24
Commercial buildings	2	2
Stairs	219	197
Fire Pits	15	15
Other	266	55

The number of structures in the littoral zone (in the water near shore) were counted. Structures included in the “other” category include boat launches, fishing platforms, dam, and deck over

water. Both watercraft in the water and boat lifts were counted to obtain an approximation of the number of watercraft (boats, sail boats, jet skis, etc.) kept on the lake. However, it should be noted that empty lifts were counted and some of the watercraft in the water could typically be “housed” on those empty lifts. In addition, some watercraft typically kept at the pier in the water (or on a lift) could have been in use on the lake and therefore would not have been counted as part of the survey. The approximate number of watercraft associated with lots is 682. This number does not include the number of boats found on shore.

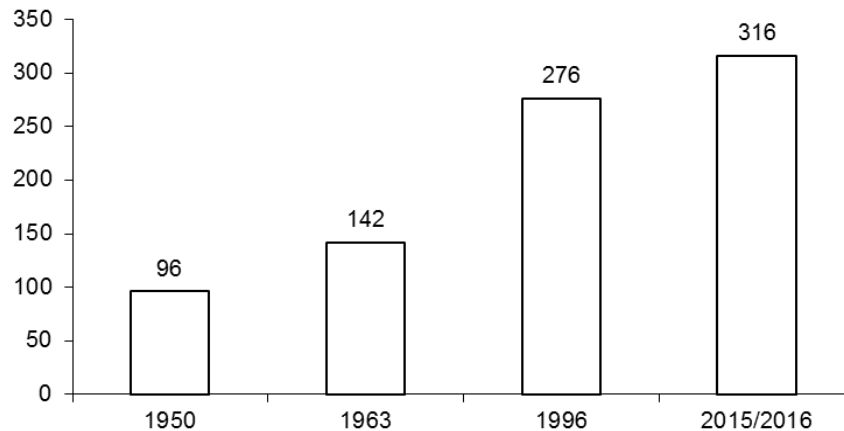
	Number of Structures	Number of Lots Containing Structures
Piers	332	285
Watercraft in the water	274	157
Boat lifts	408	157
Rafts	23	23
Boathouses over water	4	4
Buoy*	3	3
Marina	2	1
Bridge	7	3
Public beach	4	3
Other	11	10

It is thought that the buoys associated with the lots was undercounted because sometimes the survey boat was in between the land and the buoy, and the surveyors were looking at the land.

The items that were counted in the “other” category included 6 boat launches, a dam, 1 handicap accesses fishing platform, stairs to the water, a deck hanging over the water, and a wooden landing in the water.

Throughout the years, there have been surveys of piers on Rock Lake. This number is important because it gives an indication of the development of the near-shore water area. The information is contained in the chart below. The 1950 and 1963 data was generated by the Department of Natural Resources (DNR) via mid-summer aerial photos. The DNR also did a pier survey by boat in 1996. These 3 surveys didn’t include piers in the millpond, Marsh Lake, or the channel located along Elm Point Road. The number of piers displayed in the chart for 2015/2016 includes the piers counted on Rock Lake (not the Marsh, millpond, or Elm Point channel). The number of piers documented in 2015 and 2016 in the Elm Point channel was 3 and in the millpond was 13. Properties that don’t have piers in the Elm Point channel still have boats that are parked along their frontage. In 2015/2016, the total number of piers on Rock Lake, the millpond, and the Elm Point channel was 332.

Number of Piers on Rock Lake (not including Marsh Lake, millpond, or Elm Point channel)



Runoff Concerns

Areas that could increase runoff into the lake were also documented.

Runoff Concerns	Number Found
Point Sources	9
Channelized Flow	4
Stairs, paths, roads leading directly to top of bank	94
Lawn or soils that slopes to lake	37
Bare soil	49
Slumping banks (erosion)	3

The amount of shoreline erosion (slumping banks) was further documented with the amount of area that is eroding.

- One site in the Town of Lake Mills had approximately 10 feet of erosion that was more than 1 foot high.
- One site in the Town of Lake Mills had approximately 5 feet of erosion that was less than 1 foot high; and approximately 5 feet of erosion that was more than 1 foot high.
- One site (along the Glacial Drumlin Trail) had approximately 6 feet of bank erosion that was more than 1 foot high.

These areas were not placed on a map because it won't be shared outside of the LWCD office to protect the privacy of the private lot owners. However, these sites will be viewed again in 2017 to see if conditions have changed. If the erosion still exists, the landowners will be contacted to make an offer of technical assistance to address the erosion. In some cases, financial assistance may be available also.

Bank Modifications

Bank modifications were documented in the survey.

	Length (miles)	Number of Parcels
Seawall	1.3	60
Rock riprap	2.8	175
Other erosion control	0.1	12
Artificial beach	0.2	8

Wood in the Water

The wood in the lake that was at least 4 inches in diameter, at least 5 feet in the water, and within 2 feet of depth was 55. Of the 55, 39 were “connected” to shore in that they cross the high water mark of the lake. The level of branchiness of each wood found is noted below.

Level of Branchiness	Number
No branches	25
A few branches	21
Tree trunk has full crown	9

Aquatic Plants

Emergent and floating leaf aquatic plants were noted as present if they appeared in front of the lots. The presence of submerged aquatic plants were noted when they were seen. However, the conditions were not always conducive to seeing the submerged plants. The number of lots that had emergent or floating leaf aquatic plants in the water adjacent to the lots are shown in the table below.

	Number of Lots
Floating-leaf aquatic plants	79
Emergent aquatic plants	49

Originally, the plan was to also document areas with aquatic plant disturbance such as the removal of plants by various means next to shore. This was not done because the amount of other data needed to be documented didn’t allow enough time for the surveyors to fully assess the plant population.

Communications

The LWCD developed a fact sheet (attached) to inform people about the shoreland and shallows survey project. This fact sheet was shared with the public in a variety of ways:

- Shared at a Land and Water Conservation Committee meeting
- Shared at a Rock Lake Improvement Association meeting
- Shared at a Joint Rock Lake Committee meeting

The LWCD also shared information about the shoreland and shallows project through one-on-one conversations with citizens, at a June 21, 2016 presentation on Rock Lake sponsored by the Lake Mills Arts Alliance, and at various public meetings throughout the life of the project.

The LWCD contacted some landowners that have lots with good shoreland habitat. Some of these properties will be included on a garden tour sponsored by the Rock Lake Improvement Association. The tour will highlight the use of native plants in both shoreland restorations and rain gardens.

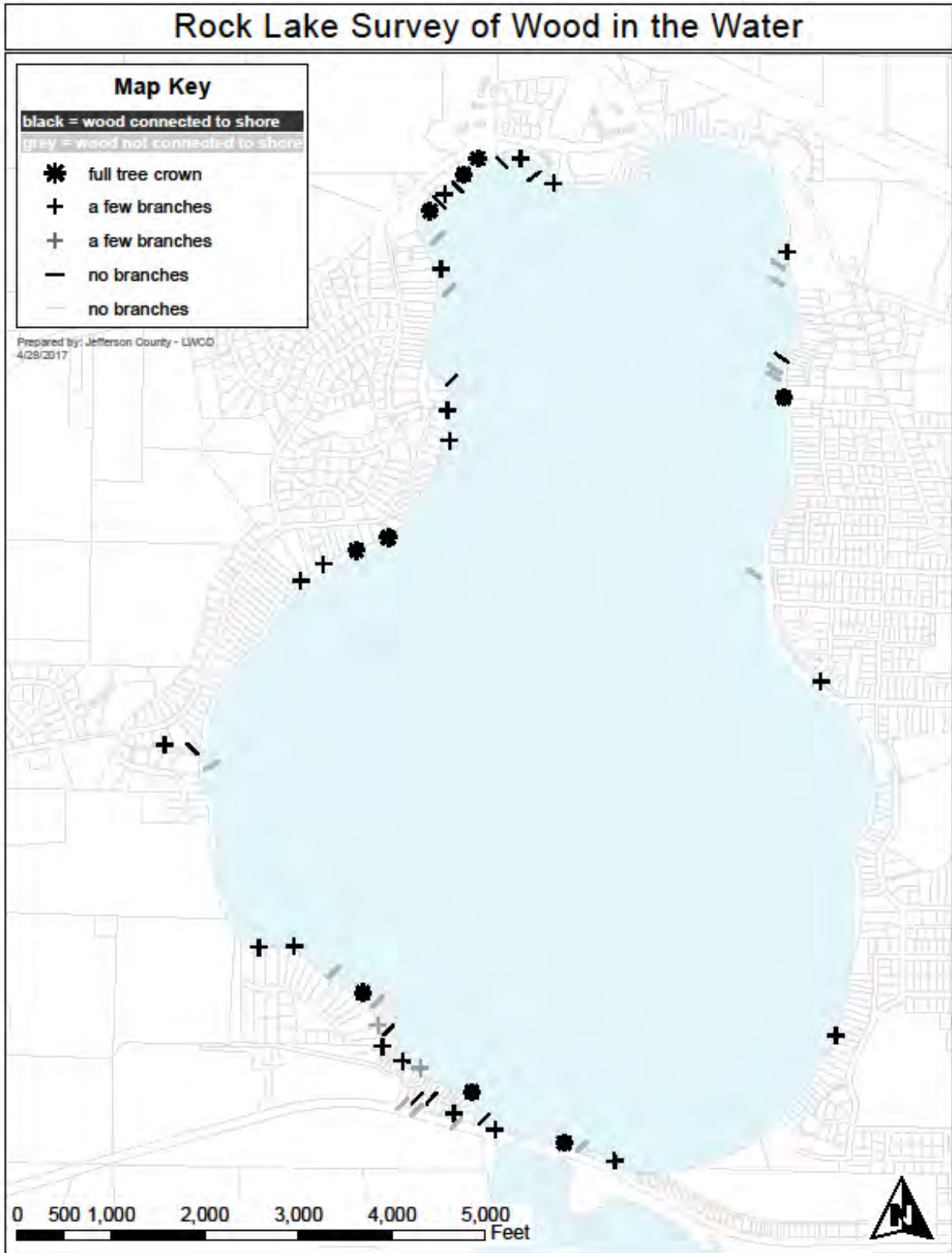
The LWCD contacted some landowners that have lots that would benefit from improvements in shoreland habitat. One of these landowners now has plans to install a rain garden in 2017 (via a Healthy Lakes grant), and a shoreland restoration (will be included in a future Healthy Lakes grant). There are 2 other landowners that have indicated that they are interested in either a shoreland planting or a rain garden.

Recommendations

It is recommended that the shoreland and shallows survey be repeated in approximately 5 years to track changes.

It is recommended that the amount of shoreland vegetation along the lake be increased in order to achieve more water quality protections and increase habitat. The DNR's Healthy Lakes grant should be used to help interested landowners with some of the costs. The LWCD should work in partnership with the RLIA to educate property owners about the benefits of installing native plants in the shoreland area.





Fact Sheet:

Rock Lake Shoreland and Shallows Survey - DNR Lake Planning Grant

Project Description:

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Development of our shoreland and shallow areas can negatively impact lake critters. Shorelines that contain seawalls and rock riprap impede the movement of turtles and other animals that need to access the lake and the shoreland area. Increased development (lawns, impervious surfaces, bare ground, piers) has been linked to degraded aquatic plant habitat, decreases in green frog and uncommon bird populations, and a decline in fish species.

The 2007 National Lakes Assessment highlighted the need to better protect and restore shoreland and shallow habitat. This project will take the first step toward this goal by assessing the conditions in the shoreland and near-shore shallow areas of the Rock Lake.

The results will be used to assess the overall quality of the shoreland and shallow water areas. This information has never been collected before on Rock Lake and will serve as a baseline for the future. The data will be summarized and shared with the community to highlight the importance of shoreland and shallow habitat to the quality of the lake. Best management practices can be highlighted as recommendations for making improvements to their property. The information can also be used to praise property owners who have done a good job.

The Rock Lake Improvement Association has indicated that they can use the results of this project to educate landowners and encourage them to take steps that will enhance their properties and at the same time protect the lake. Many of the values lake front property owners appreciate and enjoy about their properties—natural scenic beauty, tranquility, privacy, relaxation—are enhanced and preserved with good shoreland management. And studies have shown that healthy lakes with good water quality translate into healthy lake front property values.

Grant Information:

- \$3,000 State share + matching LWCD staff time