



MEMORANDUM

To: Pat Tarpey, LWWA
From: Forrest Bell, FB Environmental
Subject: 2014 Lake Waukewan & Winona Shoreline Survey
Date: July 25, 2014
Enclosures: Shoreline Survey Photos, Maps, and Spreadsheet (on ftp)

Overview

The Lake Waukewan and Lake Winona Shoreline Survey was conducted on Wednesday, July 11, 2014 by FB Environmental Associates (FBE) and several local watershed association volunteers. Two boats were utilized for surveying Lake Waukewan and one boat was used for Lake Winona. Staff and volunteers documented conditions of the lake shorelines by parcel using a scoring system that FBE has used previously for several lakes in ME and NH that evaluated vegetated buffer condition, appearance of bare soil, areas of shoreline erosion, the distance of structures to the lake, and the slope of the shoreline. Overall scores were given to each site based on these criteria. Photos were taken of each parcel evaluated; these photos have been cataloged by lake and site number and are being delivered to LWWA and are being stored on file at FBE. These photos will provide the project stakeholders with a valuable tool for assessing the lake shoreline conditions over time. It is recommended that a shoreline survey be conducted every 5 to 10 years to evaluate changing conditions. Ideally a re-survey will be conducted in mid-summer.

Results

A total of 303 parcels were evaluated, of which 215 were located on Lake Waukewan and 88 on Lake Winona. Each parcel was given a score for different shoreline conditions that varied from one to five depending on the category (Buffer, Bare Soil, Shoreline Erosion, Distance, Slope; Table 1). Our experience is that higher scores (12 or more) indicate conditions that may be detrimental to lake water quality. Total scores could range from zero to eighteen (Figure 1, Figure 2). Shoreline conditions and overall scores were higher (slightly worse) on Lake Waukewan than Lake Winona (Table 1).



Figure 1. Lake Winona parcel receiving a final score of 7



Figure 2. Lake Waukewan parcel receiving a final score of 12

Table 1. Average shoreline disturbance scores for each category evaluated, and the total average score for each lake. Lower values indicate shoreline conditions that are effective at reducing erosion and keeping excess nutrients out of the lake.

Lake	# Parcels Evaluated	Average Scores Per Parcel					Total Shoreline Disturbance Score (0 - 18)
		Buffer (1 - 5)	Bare Soil (1 - 4)	Shoreline Erosion (1 - 3)	Distance (1 - 3)	Slope (1 - 3)	
Lake Waukewan	215	3.6	1.6	1.2	2.5	1.5	9.6
Lake Winona	88	2.2	1.2	1.1	2.5	1.8	8.6
Total	303	2.9	1.4	1.1	2.5	1.7	9.1

The overall average combined shoreline disturbance score of both lakes was 9.1. High scoring parcels on both lakes are those scoring a 10 or higher (Figure 3, Figure 4). These sites tended to have inadequate buffers, some evidence of bare soil, and structures within 75 feet of the shoreline. This trend tells us where the greatest improvements can be made around the lake shorelines, such as through planting stronger buffers and installing erosion controls. Although bare soil, shoreline erosion, and slope conditions tended to score lower they should still be monitored for future changes and, if necessary, improvement.

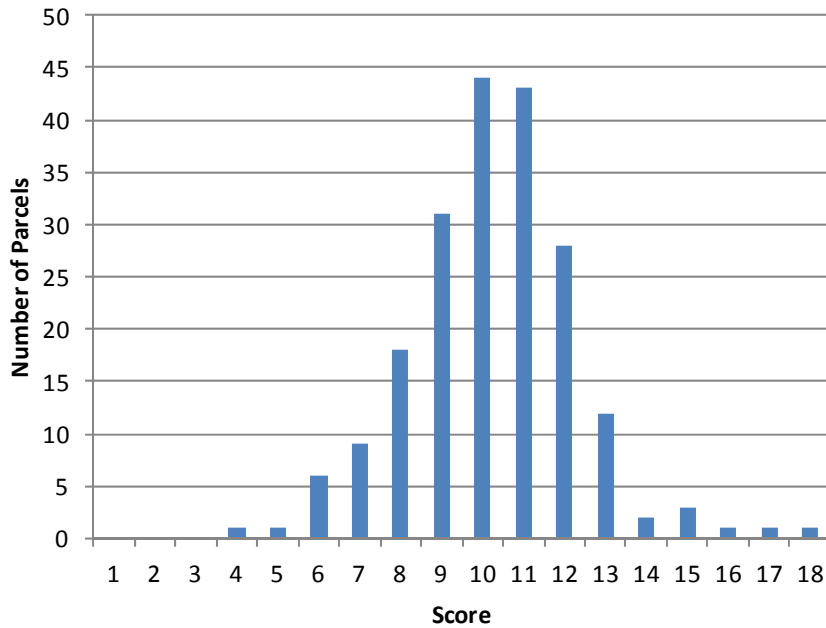


Figure 3. Lake Waukewan Parcel Scores

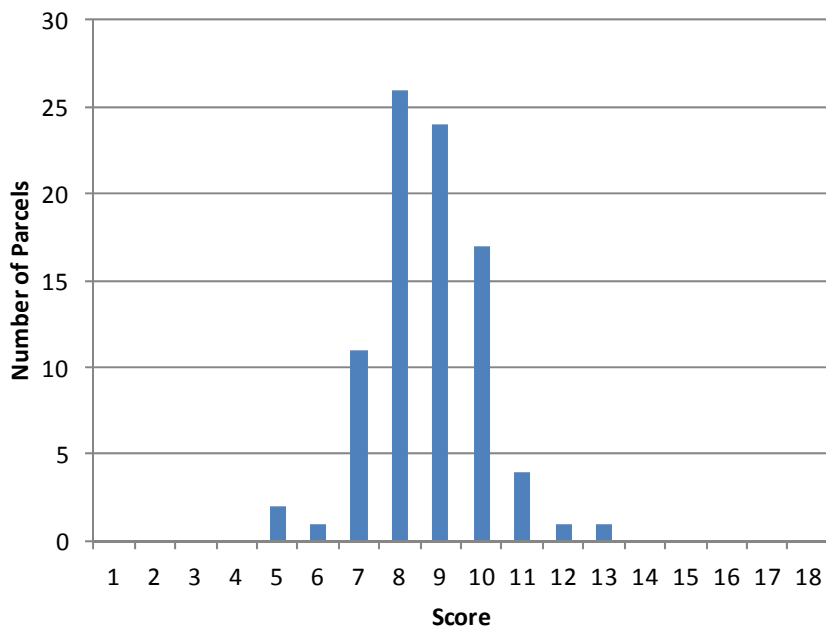


Figure 4. Lake Winona Parcel Scores



Next Steps

Data from the survey will be used to plan the next steps for improving the shoreline of these lakes by informing the watershed plan and septic loading model. This includes highlighting areas contributing to non-point source pollution, determining actions needed to reduce NPS pollution and maintain water quality goals, as well as prioritizing areas for shoreline restoration using stormwater Best Management Practices (BMPs).

Recommendations for LWWA and Associations

- Utilize this shoreline survey to target future implementation efforts on residential shoreline properties; locate willing volunteers to “demonstrate” what an ideal shoreline buffer looks like and how it functions.
- Obtain digitized parcel data before re-surveying and add 2014 photos (digitally) to the appropriate parcel
- Re-survey the lakes in 5-10 years when updating the watershed plan