Appendix 4
Curly-leaf Pondweed in Lake Alice

Appendix 4

Curly-leaf pondweed in Lake Alice, Lincoln County, Wisconsin

The presence of Curly-leaf Pondweed (*Potamogeton crispus*) in Lake Alice was confirmed by a 2010 point-intercept aquatic plant survey by White Water Associates (consultant to the Lake Alice Association) and the identification was verified by the University of Wisconsin-Stevens Point Herbarium. Some Lake Alice anglers were aware of this species' presence for several years, although the official documentation occurred in 2010. In the 2010 aquatic plant survey, a single winter bud (turion) was observed and collected. Lake Alice has an active lake association and is guided by an adaptive lake management plan and aquatic plant management plan (prepared by White Water Associates). The LAA applied for and received an Early Detection-Rapid Response Grant from the WDNR in order to determine the extent and density of the curly-leaf pondweed population.

Curly-leaf pondweed is an aquatic invasive species (AIS) originally native to Eurasia. It has been in North America for over a century and is now present in nearly every state in the U.S. and almost every county in Wisconsin. In some lakes, curly-leaf pondweed coexists with native plants without causing big problems. It provides shelter for small fish and invertebrates that are important as fish food. Curly-leaf pondweed can, however, become the dominant plant in a lake and cause problems with early summer recreation because of dense plant beds. It dies back by mid-summer resulting in release of phosphorus. Algal blooms can develop from this available nutrient. Like any AIS, the presence of Curly-leaf pondweed in Lake Alice is a cause for concern and vigilance. It is not just a concern for Lake Alice, but for other water bodies in the region that might become infested by the plant through inadvertent transport on a boat trailer or other conveyance.

The purpose of the early detection and response project is to determine the extent and density of curly-leaf pondweed in Lake Alice. Field work for this investigation took place the spring of 2011, 2012, and 2013. Meander surveys covered the entire lake searching likely habitat and documenting presence of curly-leaf pondweed colonies or beds with latitude/longitude coordinates using a hand-held GPS (global positioning system). When curly-leaf pondweed beds were encountered, a density ranking (sparse, moderate, or high) was designated (see Table 1 for detail on rankings). The findings for each of the three years were mapped and analyzed.

Table 1. Density rankings for curly-leaf pondweed in Lake Alice.	
Density Rank	Description
Sparse	• Sparse spacing of individual plants (5-10 feet apart) • Individual colonies are comprised of 1-10 plants
Moderate	• Spacing of individual plants is 1-4 feet apart • Moderately dense patches • No dense surface matting
High	• Dense individual plant spacing (0-1 feet apart) • Surface matting

The 2011 field survey component of this project was completed by a team comprised of Chris Hamerla (AIS Coordinator for Lincoln, Langlade, and Forest Counties) and White Water Associates biologist (Barb Gajewski). They conducted a two-day field survey on Lake Alice in June 2011. GPS data and observations on population extent and density were recorded. In the 2012 and 2013 the meander surveys were continued by Gajewski with some additional focus on delineating beds and densities in the east end of Lake Alice where the curly-leaf pondweed occurred. In 2011, Gajewski investigated possible sources of curly-leaf pondweed at several road crossings (CR-H, Kummer Road, and CR-D) on Big Pine Creek that flows into Lake Alice near the area of largest curly-leaf pondweed population.

The curly-leaf pondweed population exists in the eastern part of the lake. Figure 1 shows this area and Figures 2, 3, and 4 detail the curly-leaf pondweed distribution and density in 2011, 2012, and 2013, respectively. In 2011, a single curly-leaf pondweed plant was observed in the Golf Course bay, but otherwise the population is located in the east part of the lake. No curly-leaf pondweed was documented in Big Pine Creek upstream of Lake Alice.

Table 2 presents the overall acreages of curly-leaf pondweed in Lake Alice and an acreage breakdown by each of the three density categories. The overall acreage of curly-leaf pondweed changed very little over the three years. Likewise, the acreage of curly-leaf pondweed in the "sparse" density category showed little change from year to year. In 2012, we noted a decrease in the area of coverage in the "moderate" density rank and a concomitant increase in the acreage of "high" density rank. There was virtually no change in areal coverage or density between 2012 and 2013.

Table 2. Lake Alice curly-leaf pondweed acreages and densities in 2011, 2012, and 2013.			
Density Rank	**2011 CLP Acres**	**2012 CLP Acres**	**2013 CLP Acres**
Sparse	97.9	99.2	100.5
Moderate	47.9	5.8	5.8
High	13.1	65.4	65.2
Total of All Densities	158.9	170.4	171.5

Figure 1. Lake Alice, Lincoln County, Wisconsin, Showing Detail Area and Features

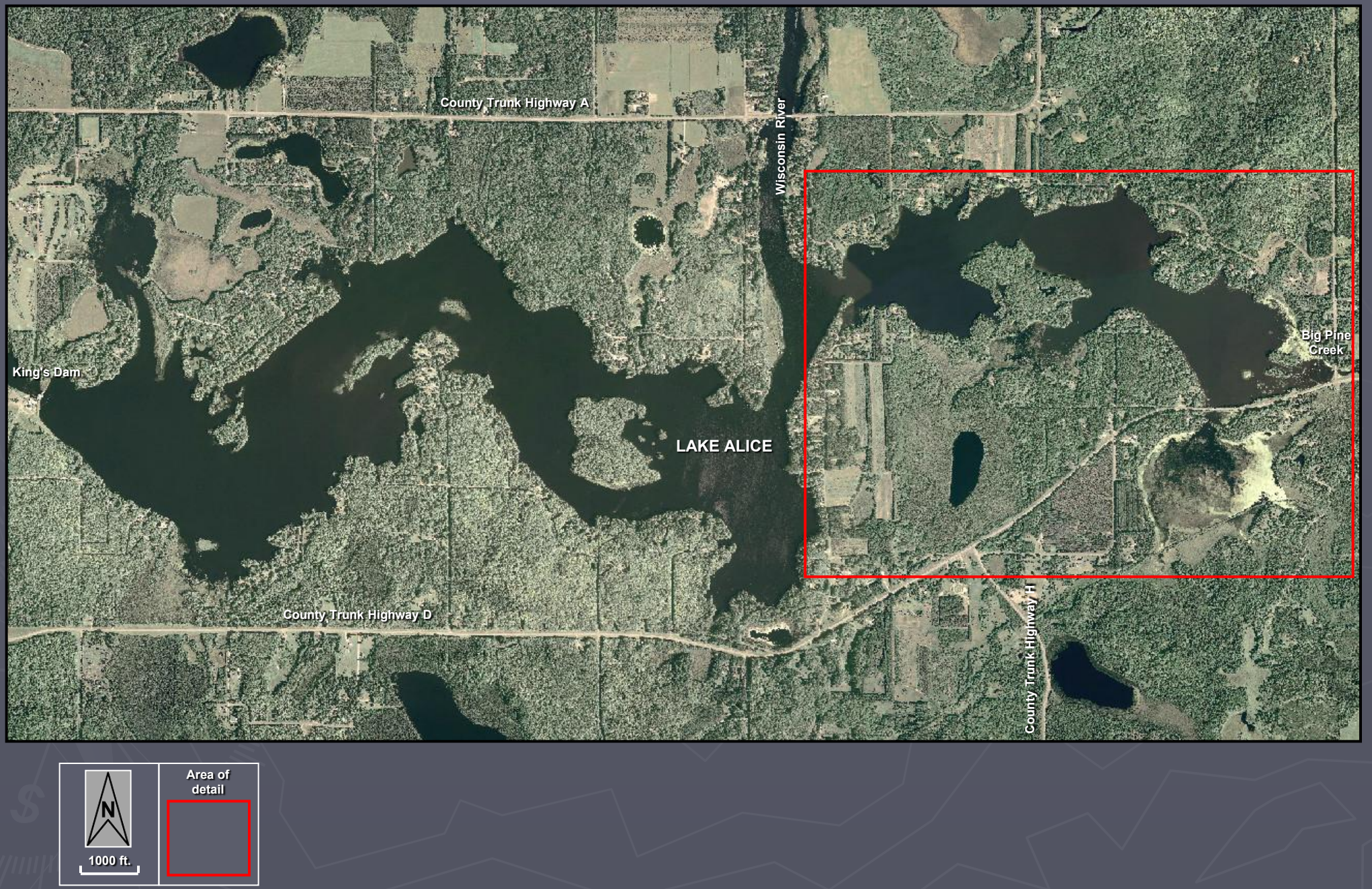


Figure 2. 2011 Curly Leaf Pondweed Status, Lake Alice, Lincoln County, Wisconsin

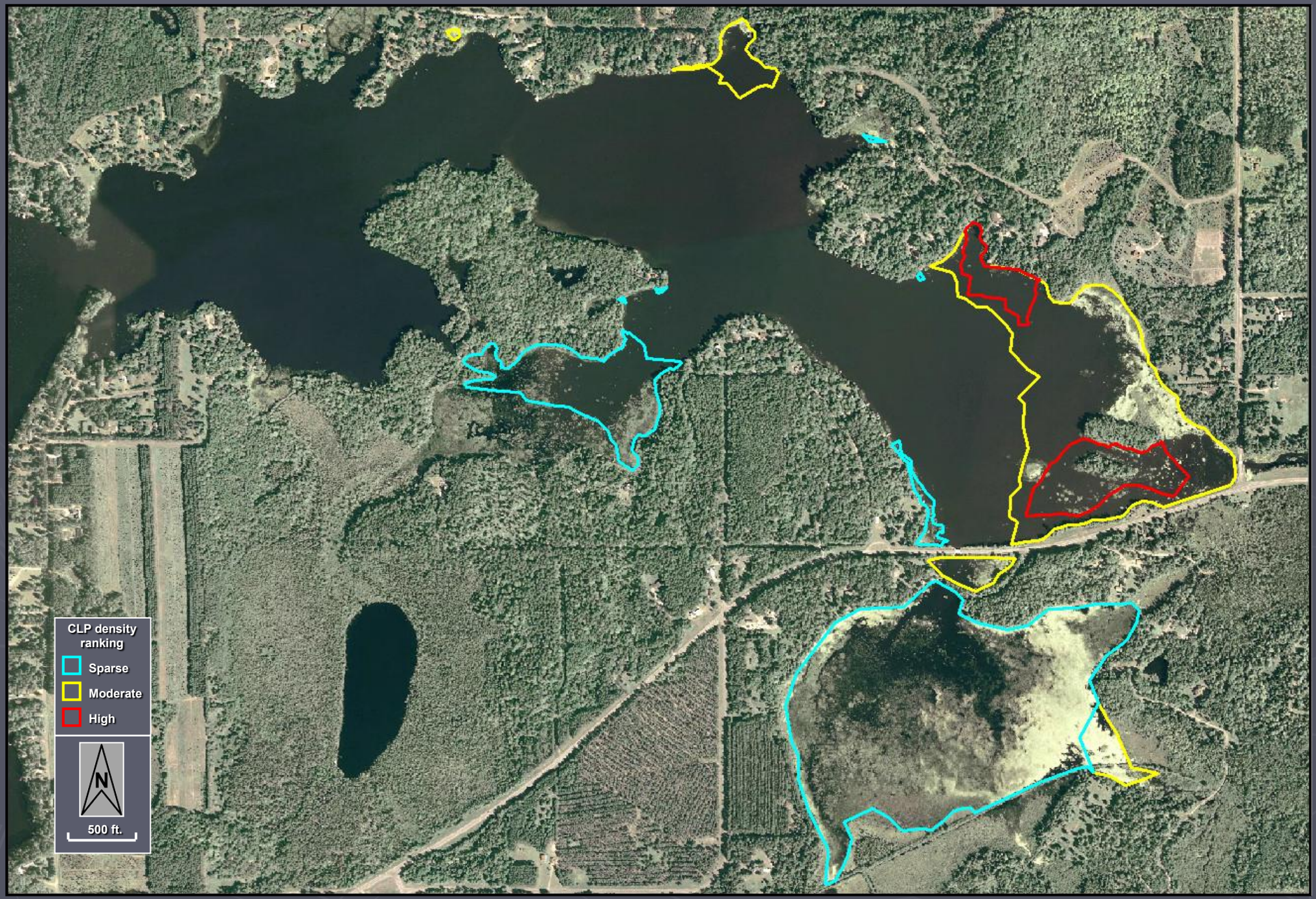


Figure 3. 2012 Curly Leaf Pondweed Status, Lake Alice, Lincoln County, Wisconsin

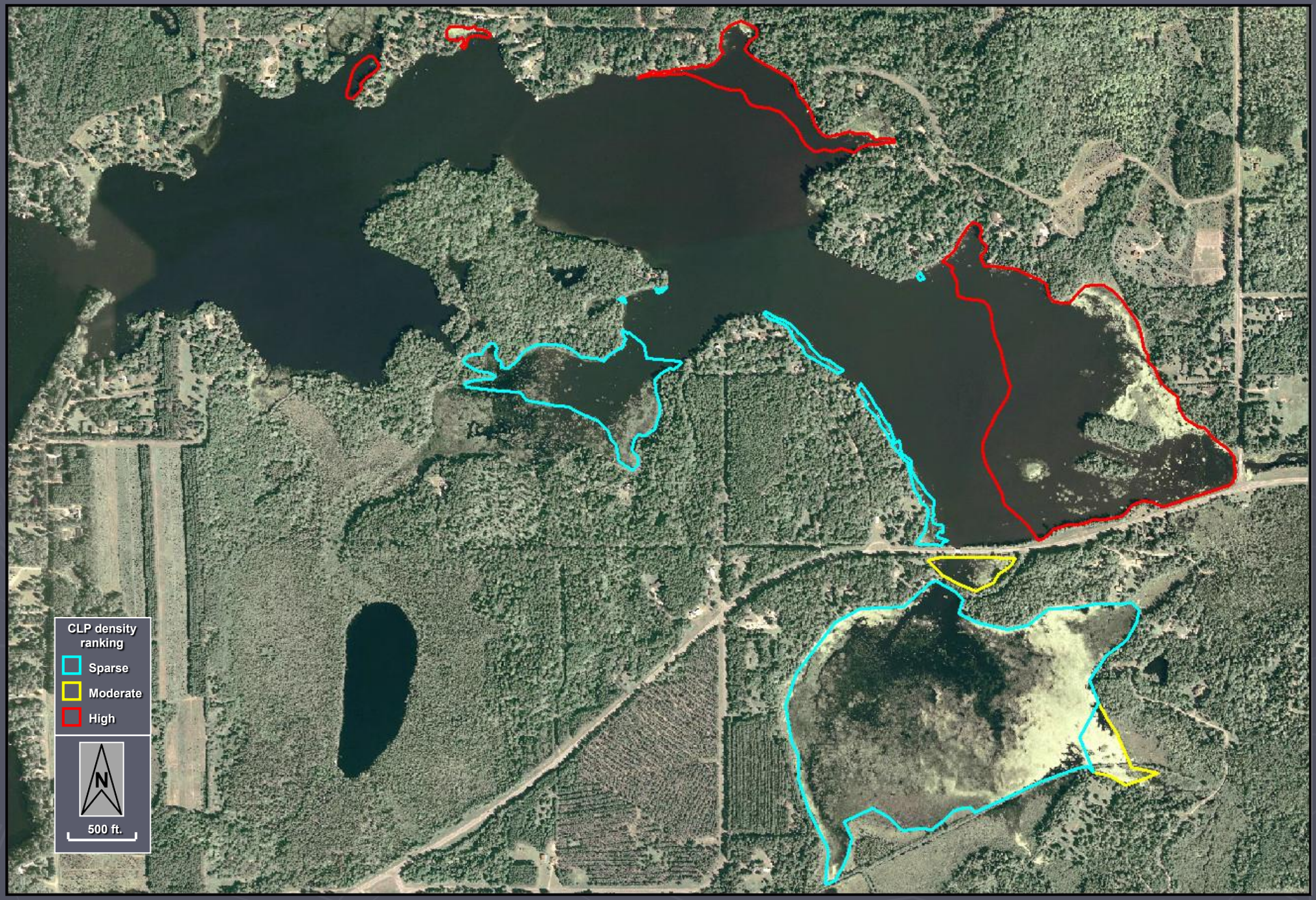
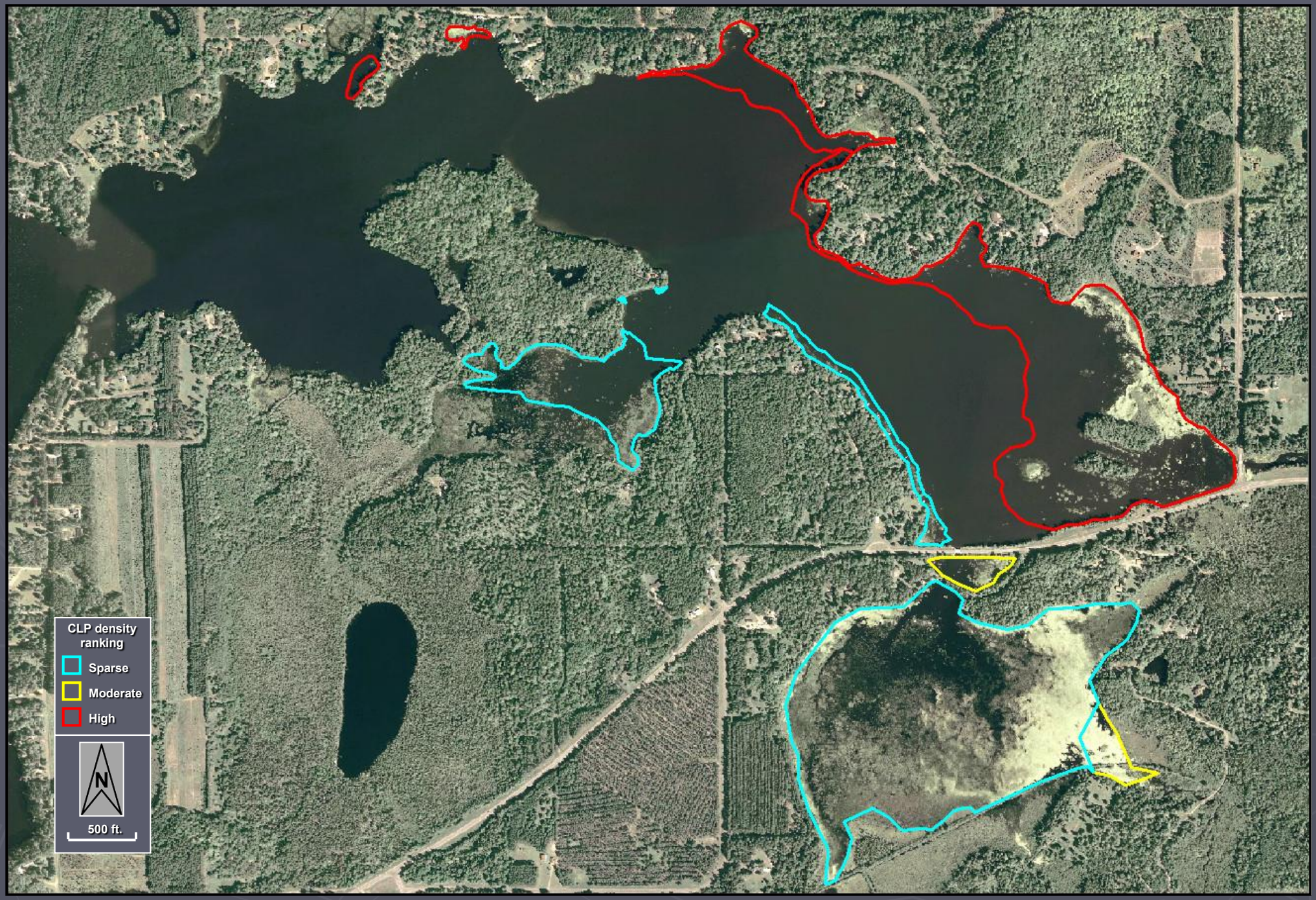


Figure 4. 2013 Curly Leaf Pondweed Status, Lake Alice, Lincoln County, Wisconsin



Appendix 5
Eurasian water-milfoil in Lake Alice

Appendix 5

Eurasian water-milfoil in Lake Alice, Lincoln County, Wisconsin

In summer 2014, the Lincoln County AIS coordinator discovered a small patch of Eurasian water-milfoil in Lake Alice near Generator Island. This was the first known occurrence of Eurasian water-milfoil in the lake. In its mission to maintain the health of the Lake Alice ecosystem, the Lake Alice Association (LAA) applied for and received a WDNR Early Detection and Response Grant for Eurasian water-milfoil.

As soon as the Eurasian water-milfoil discovery was confirmed in 2014, LAA member Fred Brach and White Water Associates staff visited the site to locate and document the Eurasian water-milfoil population in the vicinity of the original find. Fred Brach also worked with White Water biologists Angie Stine and Caitlin Clarke to investigate all of Lake Alice by way of a meander search in likely habitat to determine if additional Eurasian water-milfoil colonies were present. That effort took place on August 6, 2014. The crew began their search near the known population by Generator Island. From there, they worked counter-clockwise around the lake, following the shoreline, and staying in depths where Eurasian water-milfoil would most likely grow. Searches took place around islands as well. No additional Eurasian water-milfoil sites were found during the August 6 meander search.

The Early Detection and Response Grant assisted the LAA and White Water Associates to continue the monitoring and hand-pulling work in 2015 and 2016. The grant also provided funding for a point-intercept aquatic plant survey in all of Lake Alice. White Water conducted this type of survey on Lake Alice back in 2010. The second aquatic plant survey was conducted in summer of 2016 and allowed determination of how the aquatic plants in Lake Alice may have changed since 2010. This is an important way to determine if AIS like Eurasian water-milfoil and curly-leaf pondweed are being detrimental to the native plants. Details of this analysis are in the Lake Alice Aquatic Plant Management Plan (2nd Edition).

In both the 2010 and 2016 aquatic plant surveys, White Water Associates staff observed no aquatic plant species that would be considered a nuisance-level population density/distribution. The 2016 survey, however, did further document Eurasian water-milfoil locations in Lake Alice. During the same year that Eurasian water-milfoil was first documented in Lake Alice (2014), White Water Associates staff characterized its distribution and began hand-pulling in the vicinity of Generator Island. This Appendix documents the distribution and density of Eurasian water-milfoil in Lake Alice. It also describes the hand-pulling results.

GPS coordinates obtained during initial reconnaissance and monitoring of the Generator Island colony and 2016 data from the point-intercept plant survey reveal an area of approximately six acres near Generator Island that contains Eurasian water-milfoil interspersed with native plants. A one acre

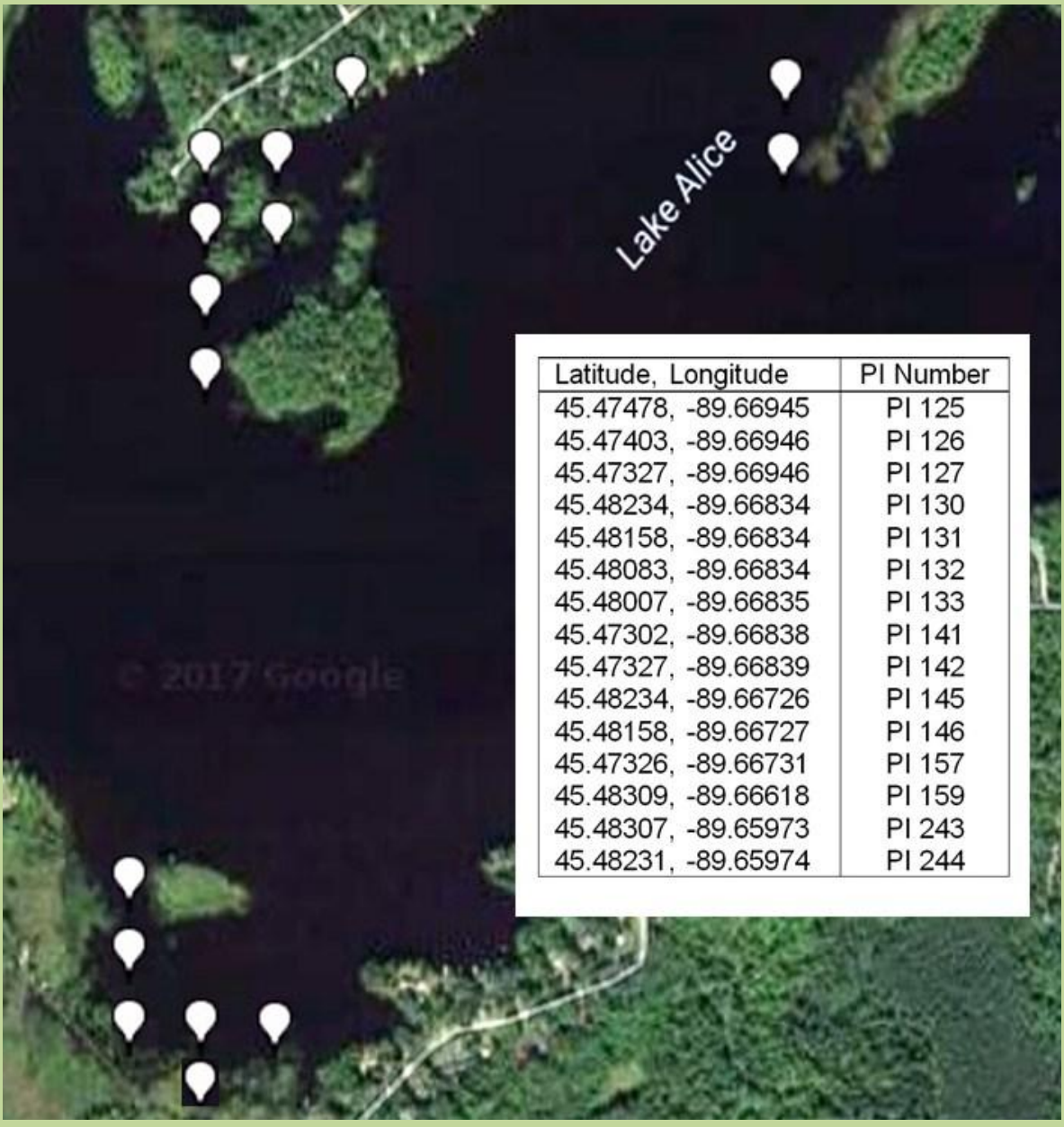
area within that polygon seemed to contain the densest number of the aquatic invasive plant. Figure 1 illustrates these findings.

Figure 1. Eurasian water-milfoil in the vicinity of Generator Island on Lake Alice.

The 2016 point-intercept survey revealed two new areas where Eurasian water milfoil was present: (1) about 0.3 mile due east of Generator Island population (represented by 2 point-intercept

points) and (2) about 0.3 mile south of Generator Island population (represented by 6 point-intercept points). Figure 2 illustrates the locations of these finds.

Figure 2. Point-intercept locations on Lake Alice where Eurasian water-milfoil was either collected by a rake or observed from the boat.



Latitude, Longitude	PI Number
45.47478, -89.66945	PI 125
45.47403, -89.66946	PI 126
45.47327, -89.66946	PI 127
45.48234, -89.66834	PI 130
45.48158, -89.66834	PI 131
45.48083, -89.66834	PI 132
45.48007, -89.66835	PI 133
45.47302, -89.66838	PI 141
45.47327, -89.66839	PI 142
45.48234, -89.66726	PI 145
45.48158, -89.66727	PI 146
45.47326, -89.66731	PI 157
45.48309, -89.66618	PI 159
45.48307, -89.65973	PI 243
45.48231, -89.65974	PI 244

Hand-pulling of Eurasian water-milfoil plants in Lake Alice is challenging. This is because the water clarity of Lake Alice is low (due in part to a fair amount of suspended materials including algae).

Nevertheless, hand-pulling was effective in removing quantities of the invasive plant. On August 20, 2014, 56 pounds (wet weight) was removed in a single bout at the Generator Island colony. About 18 pounds were removed in two bouts in 2015 (June 10 and July 9) from the same area. Three bouts in 2016 (June 7, July 6, and July 7) removed a total of 1,145 pounds of Eurasian water-milfoil from the Generator Island site (see Figure 3). No hand-pulling has been conducted at the new areas of EWM documented by the 2016 point-intercept survey.

Figure 3. White Water Associates staff Angie and Riley Stine hand-pulling Eurasian water-milfoil in Lake Alice in 2016.

Acknowledgement and thanks is deserved by Fred Brach for his many hours in the field in monitoring and hand-pulling of Eurasian water-milfoil and other Lake Alice Stewardship tasks. Ron Miller was helpful in hand-pulling of Eurasian water-milfoil in 2016.

Appendix C
Lake Alice Conductivity Study

Lake Alice Conductivity Study

Introduction

Conductivity is the measure of the water's ability to conduct an electric current (Shaw et al., 2004). It depends on ions (such as chloride, calcium, potassium or iron) in the water. The more ions present, the higher the conductivity. A lake's natural conductivity is influenced by the geology and soils in the watershed. Minerals that leach from the bedrock and soils that enter the lake through runoff and contribute to conductivity. Human activities also affect lake water conductivity. When elevated or increasing conductivity is observed in a lake, it can be due to human activity such as road salting, faulty septic systems, urban runoff, or agricultural runoff. New construction that alters runoff patterns and exposes new soil and bedrock areas can also contribute to elevated conductivity. Conductivity is also influenced by temperature. As water temperature increases, conductivity increases (EPA, 2012).

Lake conductivity studies are sometimes conducted to determine if there are any faulty septic systems or other pollution sources present that could be delivering excess nutrients into the lake. Low values of conductivity are characteristic of high-quality, oligotrophic (low nutrient) lake waters (GVSU, 2014). High values of conductivity are observed in eutrophic lakes where plant nutrients (fertilizers) are in great abundance (GVSU, 2014). Very high values are indicators of possible pollution sites (GVSU, 2014). A shoreline study compares conductivity levels found along the shoreline with those baseline levels found in the middle of the lake.

Procedure

A White Water biologist and Lake Alice volunteer conducted the study via boat on September 3, 2013. Due to the unique shape and size of Lake Alice, the lake was divided into three sections: King's Dam, Mid Lake, and Pine Creek. Eight points were positioned in the middle of each of these areas to establish a control value for conductivity in these sections. Samplers began at the volunteer's dock and collected water samples for conductivity reading approximately every 200 feet around the shoreline. The perimeter points would later be evaluated against the control data. The coordinates for each perimeter point were plotted in a GPS prior to sampling, so that identifying sample points locations and navigation was easier. Water conductivity samples were analyzed using a Myron Ultrameter II 6P conductivity meter. At each sample site the conductivity level was recorded along with any comment (e.g., site not accessible, fishermen, etc.).

Results

There was a total of 548 sample points around Lake Alice, plus the 24 control sites (eight sites in three sections). Of the 548 sample points, 217 sites were not sampled or 39.6%. As mentioned previously, because of Lake Alice's unique shape and size, the lake was divided into three sections: King's Dam, Mid Lake, and Pine Creek. We will present data analyses of each section and also of the lake as a whole.

King's Dam

In the King's Dam section 212 points were sampled. The conductivity levels ranged from 88.6 µmhos/cm to 110.6 µmhos/cm (a range of 22.0 µmhos/cm). The eight control points had a mean conductivity of 97.6 µmhos/cm. The standard deviation of these points was 1.2. The confidence interval (at 95%) was ±0.841. Any shoreline-sampled value that was within the range of the confidence interval (97.6±0.841 or 96.7 to 98.4) was not statistically different than the control value mean. In the King's Dam section, there were 57 sites that fell below the 95% confidence interval and 66 that were above it. Of these high conductivity shoreline sample sites, only two (sites 5 and 477) exceeded the control mean value by 6.0 µmhos/cm.

Figure 1 displays the shoreline sample points within the King's Dam section of Lake Alice. The control values are seen in the center portion of the King's Dam section. We see that conductivity values ranged from -9.1 units below average (97.6 µmhos/cm) to 13.1 units above average. Conductivity values appear below average along the northern shore of the King's Dam section. Areas along the golf course appear to be similar to the control average for the section. One site located near the King's Dam had a high conductivity value (13.1 units higher) compared to the control average. This higher value may be due to a leaky septic in the area, or nutrient runoff from the dam. Because conductivity samples were not collected closer to the dam, we cannot definitively make this conclusion.

Mid Lake

In the Mid Lake section 225 points were sampled. The conductivity levels ranged from 81.8 µmhos/cm to 108.7 µmhos/cm (a range of 26.9 µmhos/cm). The eight control points had a mean conductivity of 92.5 µmhos/cm. The standard deviation of these points was 0.86. The confidence interval (at 95%) was ±0.598. Any shoreline-sample value that was within the range of the confidence interval (92.5±0.598 or 91.9 to 93.1) was not statistically different than the control value mean. In the Mid Lake section, there were 90 sites that fell below the 95% confidence interval and 59 that were above it. Of these high conductivity shoreline sample sites, 35 sites exceeded the control mean value by 6.0 µmhos/cm.

Figure 2 displays the shoreline sample points within the Mid Lake section of Lake Alice. The control values are seen west of the large island. We see that conductivity values ranged from -10.8 units below average (92.5 µmhos/cm) to 16.3 units above average. Conductivity values appear lowest at the inflow of the Wisconsin River. Areas that appear above the control average are near the public access along Horseshoe Road. This may explain higher conductivity levels. It is also possible that because the Wisconsin River flows west toward King's Dam, it is moving nutrients out at a fast rate than the water east of the river. This natural flushing may explain why conductivity values in the western half of the lake appear average or below average.

Pine Creek

In the Pine Creek section, 175 points were sampled. The conductivity levels ranged from 84.8 µmhos/cm to 110.4 µmhos/cm (a range of 25.6 µmhos/cm). The eight control points had a mean conductivity of 107.4 µmhos/cm. The standard deviation of these points was 0.938. The confidence interval (at 95%) was ±0.650. Any shoreline-sample value that was within the range of the confidence interval (107.4±0.650 or 106.7 to 108.0) was not statistically different than the control value mean. In the Pine Creek section, there were 28 sites that fell below the 95% confidence interval and 33 above it. Of these high conductivity shoreline sample sites, no sites exceeded the control mean value by 6.0 µmhos/cm.

Figure 3 displays the shoreline sample points within the Pine Creek section of Lake Alice. The control values are seen northeast of the island/peninsula. We can see that conductivity values ranged from -22.7 units below average (107.4 µmhos/cm) to 3.1 units above average. This range is a bit deceptive because the average is overall higher than the averages of the other lake sections. We can observe that, similar to the Mid Lake section, shoreline conductivity values nearest the Wisconsin River inlet are near or below average. Sites along the eastern side of the Pine Creek section are the highest. One explanation of these higher values is the likelihood of non-point source runoff from Highway D. There is little buffer from the roadside to the lake, which increases the potential of nutrients running into the water. It should also be noted that curly-leaf pondweed (*Potamogeton crispus)* is found in this area. Some sources report that curly-leaf pondweed prefers nutrient-rich waters, which is indicative of this area.

Lake Alice (as a whole)

As mentioned previously, of the 548 points around Lake Alice, 331 points were sampled for conductivity. Overall, the conductivity levels ranged from 81.8 µmhos/cm to 110.6 µmhos/cm (a range of 28.8 µmhos/cm). If we calculate an average of the 24 control points, the overall average

conductivity of Lake Alice is 99.2 µmhos/cm. The standard deviation of these points was 6.37. The confidence interval (at 95%) was ±2.55. Any shoreline-sample value that was within the range of the confidence interval (99.2±2.55 or 96.6 to 101.7) was not statistically different than the control value mean. In Lake Alice as a whole, there were 161 sites that fell below the 95% confidence interval and 122 above it. Of these high conductivity shoreline sample sites, 71 sites exceeded the control mean value by 6.0 µmhos/cm.

Figure 4 displays the shoreline sample points in Lake Alice. We can see that the highest conductivity values are on the eastern side of the lake and that the lowest values are near the inlet of the Wisconsin River. It's possible these areas with increased conductivity levels are caused by runoff of materials (for example, lawn fertilizers or road salts) into the lake. It is also possible that the Wisconsin River is flushing out nutrients in the western half of the lake at a faster rate than in the eastern half of the lake, resulting in lower conductivity values.

Discussion

Elevated conductivity readings are typically due to human activity such as road salting, faulty septic systems, and agricultural runoff. The following are things riparian landowners can do to minimize the potential for increasing conductivity:

1. Limit soil disturbance and bedrock exposure on your property
2. Create vegetative buffers to filter and reduce the amount of storm water runoff from your property
3. Replace a conventional beach to a natural beach
4. Pump your septic system tank once every one to three years
5. Replace or upgrade a failing leach field immediately
6. Discuss alternatives to road salt use near the lake and its tributaries

A future conductivity study would provide insight as to whether conductivity values in Lake Alice are changing over time.

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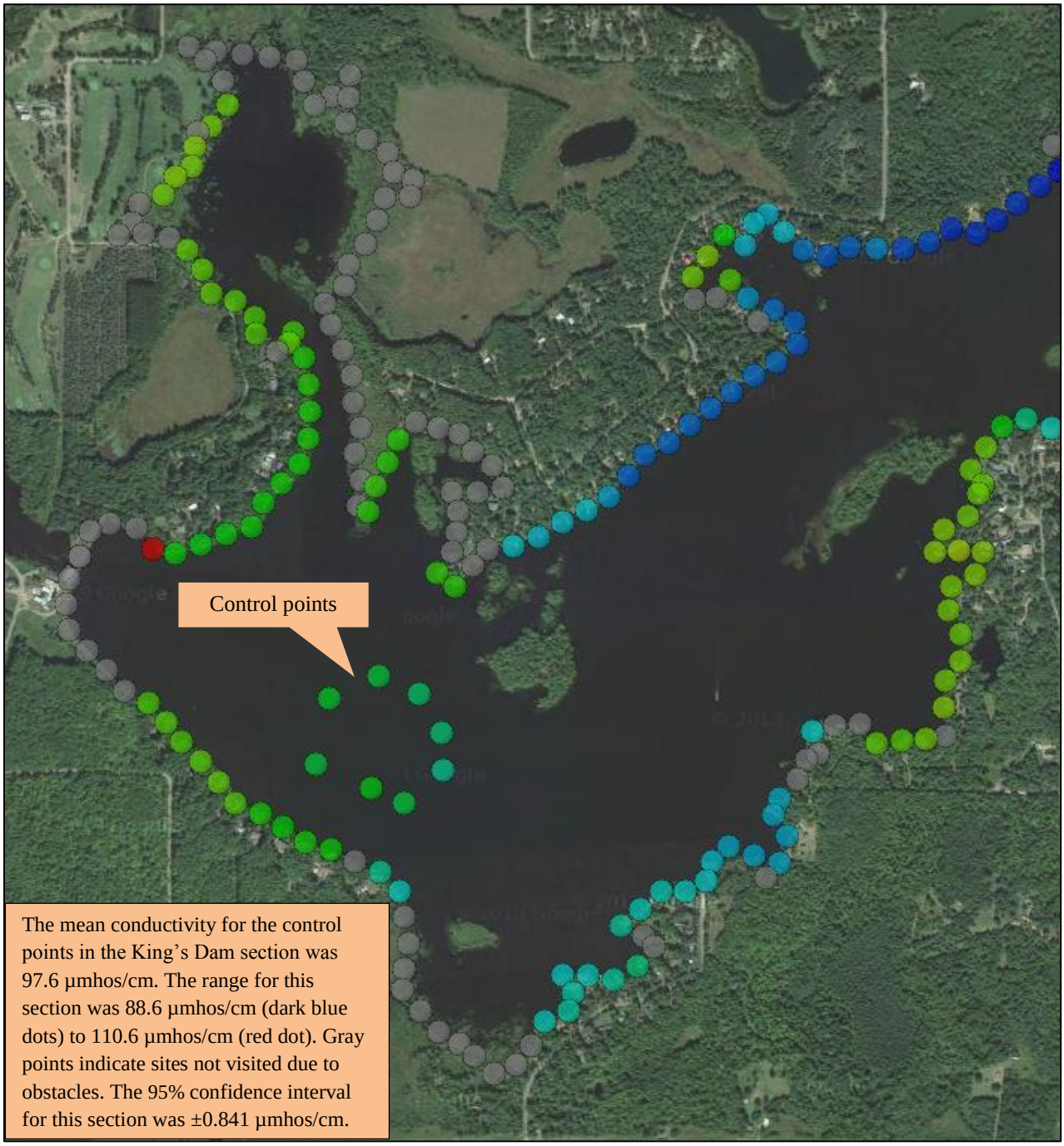


Figure 1. King's Dam conductivity levels.

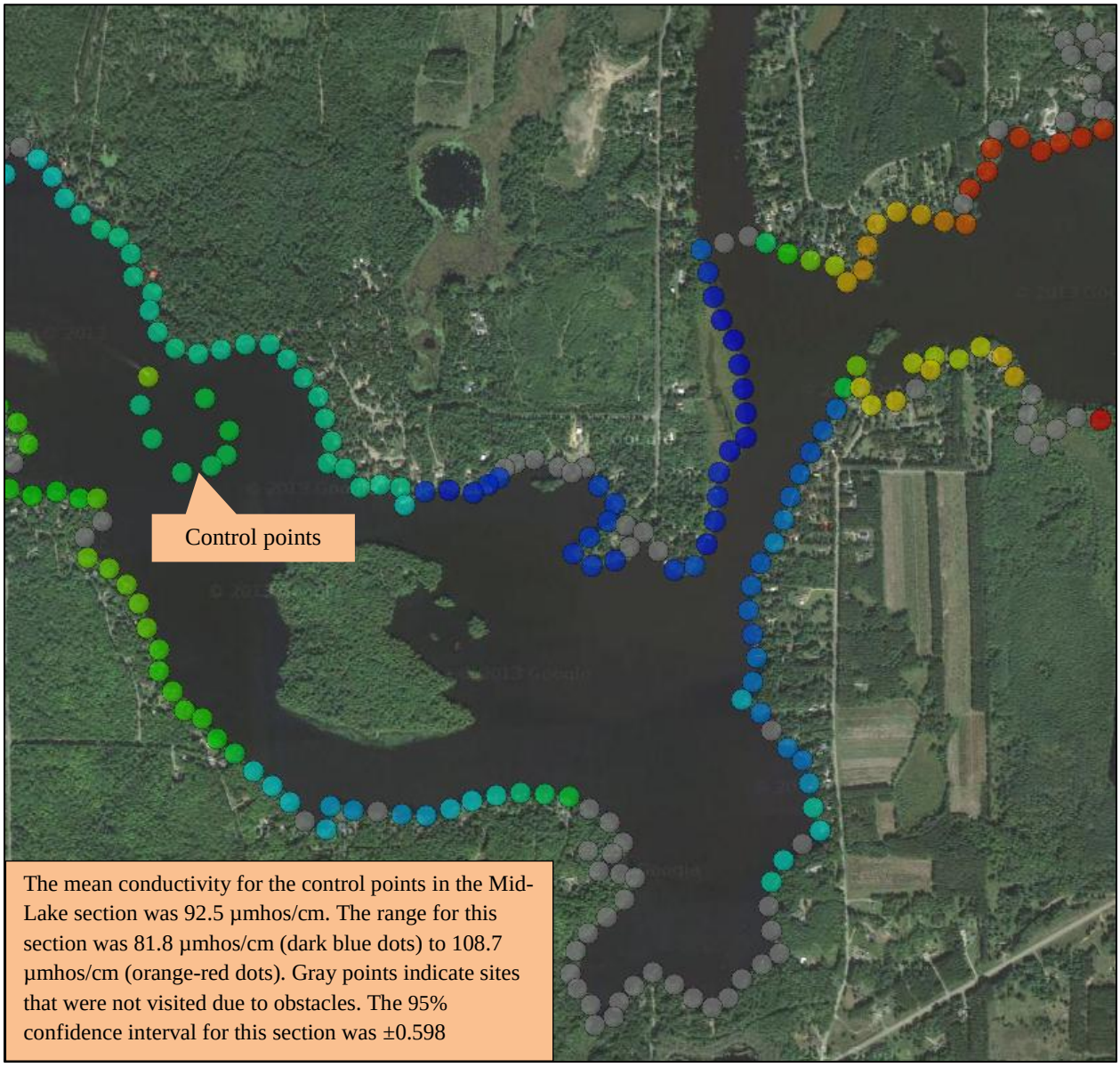


Figure 2. Mid Lake conductivity levels.

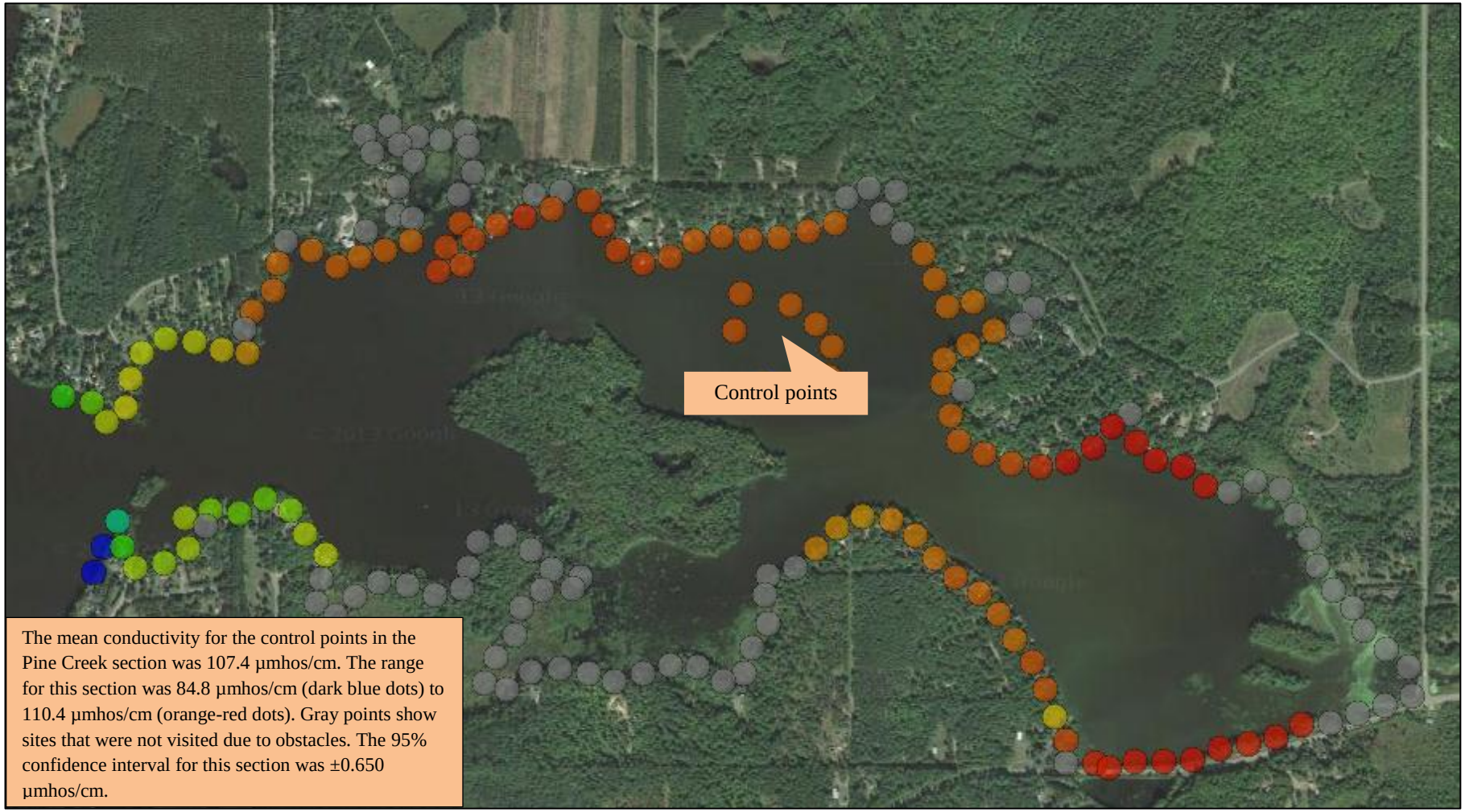


Figure 3. Pine Creek conductivity levels.

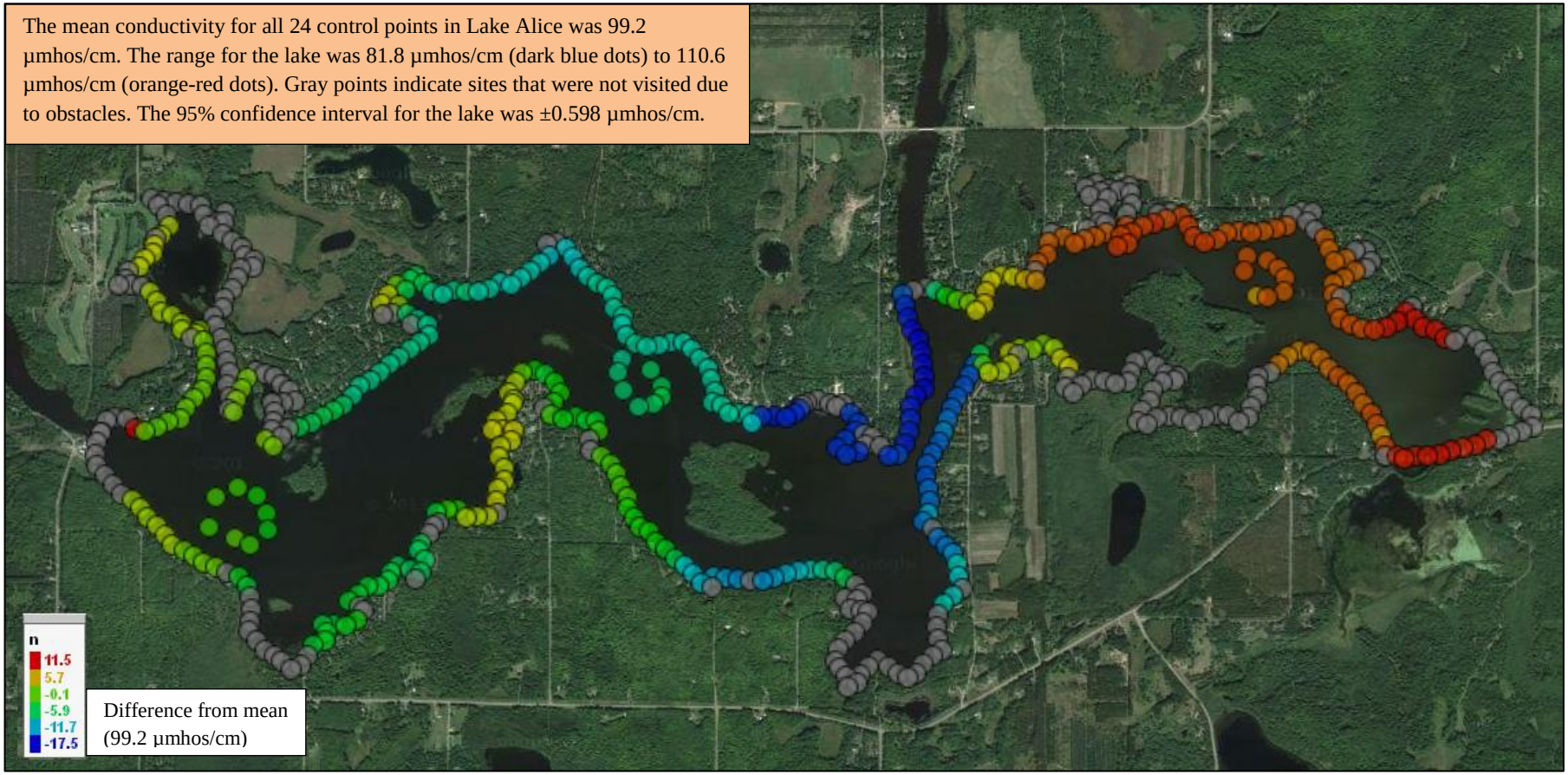


Figure 4. Lake Alice conductivity values.

Appendix D
Littoral Zone and Shoreland Survey

Lake Alice Littoral and Shoreline Activities

Introduction

Lake Alice's littoral and shoreline zones were assessed in 2013 by White Water field staff using the US Environmental Protection Agency's (EPA) National Lakes Assessment (NLA) protocol and the Wisconsin Department of Natural Resources (WDNR) Supplemental Lakeshore Assessment protocol. The intention of the National Lakes Assessment (NLA) project was to provide a comprehensive State of the Lakes assessment for lakes, ponds, and reservoirs across the United States (USEPA, 2009). This assessment at Lake Alice will stand as a baseline against which future changes can be measured and can be used to compare Lake Alice with other lakes measured using the same protocols.

Methods

Ten physical habitat (P-Hab) stations were spaced equidistantly around the lake (Figure 1 and 2). At each station (labeled "A-J"), White Water biologists recorded information about the littoral zone bottom substrate, littoral zone aquatic macrophytes (plants), littoral zone fish cover, riparian zone canopy, understory and ground cover, shoreline substrates, human influences, classification of fish habitat, bank features, any invasive species observed (terrestrial or aquatic), land cover, human development and the number of piers between sites.

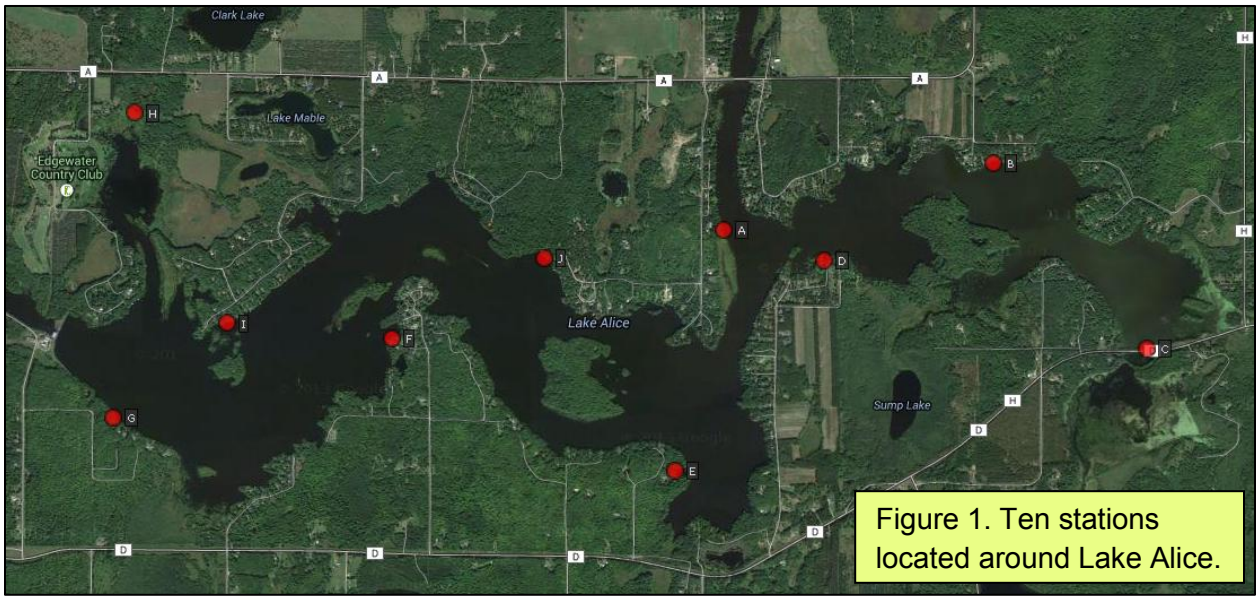


Figure 1. Ten stations located around Lake Alice.

At each P-Hab site, biologists collected macroinvertebrates for later identification. A fecal indicator sample was collected at one site to be analyzed for levels of *E. coli*.

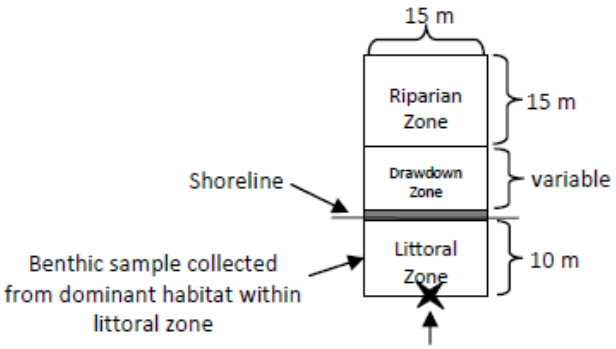


Figure 2. Dimensions and layout of a P-Hab station.

Results

Average depth of the ten stations was 3.09 feet (the range was from 1.5 to 6.0 feet). Four out of ten stations had surface film with three having an algal mat and one having pollen at the surface.

Table 1 contains the littoral zone bottom substrate data collected from the ten Lake Alice sampling stations. Bedrock was not observed as a bottom substrate in any of the ten stations. Boulders were sparse at four stations. Cobble was present at five stations. Gravel was present at seven stations. Sand was present at six stations. Silt, clay, muck was observed at six stations. Woody debris was present at eight stations. Black (3 stations), gray (6 stations), and brown (1 station) colored sediments were encountered. No odor was associated with the bottom substrate in any of the ten stations.

Table 1. USEPA Habitat Characterization – Littoral Zone Bottom Substrate.

Station	A	B	C	D	E	F	G	H	I	J
Bedrock	0	0	0	0	0	0	0	0	0	0
Boulders	0	0	1	0	1	1	0	0	0	1
Cobble	0	2	3	0	3	1	0	0	2	0
Gravel	0	2	1	3	2	2	2	0	1	0
Sand	0	1	0	3	2	3	4	0	4	0
Silt, Clay, Muck	4	3	0	2	0	1	0	4	0	4
Woody Debris	3	0	1	1	0	1	1	2	1	1
Color	Black	Black	Gray	Gray	Gray	Gray	Gray	Black	Gray	Brown
Odor	None	None	None	None	None	None	None	None	None	None

Bedrock (>4000mm); Boulders (250-4000mm); Cobble (64-250mm); Gravel (2-64mm); Sand (0.02-2mm); Silt, Clay, or Muck (<0.06mm, not gritty). 0=Absent (0%); 1=Sparse (<10%); 2=Moderate (10-40%); 3=Heavy (40-75%); 4=Very Heavy (>75%)

Table 2 presents the observations made on aquatic macrophytes in the littoral zone. Submergent macrophytes were observed at seven of the ten stations. Emergent macrophytes were observed at six of the ten stations. Nine of the ten stations had floating macrophytes present. Total macrophyte cover was sparse at four stations, moderate at four stations, and very heavy at two stations. Macrophytes extended lakeward in seven of ten stations.

Table 2. USEPA Habitat Characterization – Littoral Zone Aquatic Macrophytes.

Station	A	B	C	D	E	F	G	H	I	J
Submergent	1	1	1	0	0	1	1	4	0	1
Emergent	4	1	0	1	0	1	0	2	2	0
Floating	2	2	1	2	1	2	0	4	2	1
Total Aquatic Macrophyte Cover	4	2	1	2	1	2	1	4	2	1
Do macrophytes extend lakeward from plot?	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes

0=Absent (0%); 1=Sparse (<10%); 2=Moderate (10-40%); 3=Heavy (40-75%); 4=Very Heavy (>75%)

Littoral zone fish cover observations are presented in Table 3. Aquatic and/or inundated herbaceous vegetation was observed at seven stations. Woody debris and snags greater than 0.3 meters in diameter were observed at four of the ten stations. Woody brush/woody debris less than 0.3 meters in diameter was found at nine stations. Inundated live trees (greater than 0.3 meters in diameter) were observed at four stations. Overhanging vegetation within one meter of the surface was observed at eight stations. Ledges or sharp drop-offs were observed at one station. Boulders were observed at one station. Finally, human structures (such as docks, landings, etc.) were observed as fish cover at four stations.

Table 3. USEPA Habitat Characterization – Littoral Zone Fish Cover.

Station	A	B	C	D	E	F	G	H	I	J
Aquatic & Inundated Herbaceous Cover	4	1	1	1	0	1	0	4	2	0
Woody Debris/Snags >0.3 m dia.	3	0	0	0	0	0	0	1	1	1
Woody Brush/ Woody Debris <0.3 m dia.	1	0	1	1	1	3	1	2	1	1
Inundated Live Trees >0.3 m dia.	0	0	1	0	1	0	1	0	1	0
Overhanging veg. w/in 1 m of surface	3	1	0	3	0	4	3	2	1	3
Ledges or Sharp Drop-offs	0	0	0	0	3	0	0	0	0	0
Boulders	0	0	0	0	0	1	0	0	0	0
Human Structures (docks, landings, etc.)	0	1	0	0	0	1	0	0	1	1

0=Absent (0%); 1=Sparse (<10%); 2=Moderate (10-40%); 3=Heavy (40-75%); 4=Very Heavy (>75%)

Table 4 shows observations made in the canopy (> 5 meters high), understory (0.5 to 5 meters high), and ground cover (<0.5 meters high). Mixed (conifer and deciduous) canopy type was observed in all the ten stations. The coverage of big trees (>0.3 meters diameter) was sparse at three stations, moderate at two stations, heavy at four stations, and very heavy coverage at one station. The coverage of small trees (<0.3 meters diameter) was sparse at four station and moderate at three stations. Mixed (conifer and deciduous) understory type was observed at six stations and deciduous was observed at three stations. Coverage of understory woody shrubs and saplings was sparse at two stations, moderate at five stations, heavy at one station, and very heavy at one station. Tall herbs, grasses, and forbs were present at six stations with sparse at three stations and moderate at three stations. Ground cover woody shrubs and saplings were observed at eight stations with sparse coverage at six stations, moderate at one station, and very heavy at one station. Groundcover herbs, grasses, and forbs were observed at all ten stations with a coverage of sparse at three stations, moderate at four stations, heavy at two stations, and very heavy coverage at one station. Standing water or inundated vegetation was observed at two stations. Barren, bare, dirt, or buildings was observed at one station.

Table 4. USEPA Habitat Characterization – Riparian Zone.

Station	A	B	C	D	E	F	G	H	I	J
CANOPY (>5 m high)										
Type	Mix	Mix	Mix	Mix	Mix	Mix	Mix	Mix	Mix	Mix
Big Trees (Trunk >0.3 m dia.)	1	1	2	1	4	3	2	3	3	3
Small Trees (Trunk <0.3 m dia.)	2	0	0	2	1	1	2	1	1	0
UNDERSTORY (0.5 to 5 m high)										
Type	Mix	None	Mix	Mix	Mix	Dec	Mix	Dec	Mix	Dec
Woody Shrubs and Saplings	4	0	2	3	1	2	2	2	1	2
Tall Herbs, Grasses, Forbes	2	0	1	2	0	1	1	2	0	0
GROUND COVER (<0.5 m high)										
Woody Shrubs and Saplings	4	0	1	0	1	1	1	2	1	1
Herbs, Grasses and Forbes	4	1	2	1	2	2	3	3	2	1
Standing Water/ Inundated Veg.	2	0	0	0	0	0	0	1	0	0
Barren, Bare Dirt, or Buildings	0	1	0	0	0	0	0	0	0	0

0=Absent (0%); 1=Sparse (<10%); 2=Moderate (10-40%); 3=Heavy (40-75%); 4=Very Heavy (>75%); Mix = Mixed conifer and deciduous; Dec = Deciduous

Table 5 presents observations recorded on the riparian shoreline substrate zone. Bedrock was not observed at any of the stations. Boulders were observed at two stations with sparse and moderate coverage. Cobble substrate was observed at six stations with sparse (one station),

moderate (one station), heavy at two stations, and very heavy coverage at two stations. Gravel substrate was observed at two stations and was sparse. Sand substrate was observed at one station and was sparse. Silt, clay, or muck substrate was not observed. Woody debris was observed at nine stations with sparse (six stations), moderate (one station), heavy (one station), and very heavy (one station) coverage. Vegetation or other was observed at all stations with a coverage of sparse (one station), heavy (three stations), and very heavy (six stations).

Table 5. USEPA Habitat Characterization – Riparian Zone – Shoreline Substrate Zone.

Station	A	B	C	D	E	F	G	H	I	J
Bedrock	0	0	0	0	0	0	0	0	0	0
Boulders	0	0	2	0	0	0	0	0	0	1
Cobble	0	3	3	1	4	2	0	0	4	0
Gravel	0	0	1	1	0	0	0	0	0	0
Sand	0	0	0	0	0	0	1	0	0	0
Silt, Clay, Muck	0	0	0	0	0	0	0	0	0	0
Woody Debris	3	0	1	1	1	1	2	1	1	4
Vegetation or other	4	4	3	4	3	4	4	4	3	1

0=Absent (0%); 1=Sparse (<10%); 2=Moderate (10-40%); 3=Heavy (40-75%); 4=Very Heavy (>75%)

Observations on human influence in the riparian zone are contained in Table 6. Human influence was quite low. Buildings were observed inside the plot at one station and outside of the plot at five stations. Docks or boats were observed inside the plot at five stations and outside the plot at six stations. Walls, dykes and revetments were located within the plot at three of the stations and outside the plot at two stations. Landfill/trash was found inside the plot at one station and outside the plot on one station. Roads or railroads were found inside the plot at one station and outside the plot at one station. Lawn was observed inside the plot at two stations and outside the plot at three stations. No other human influences (commercial, park facilities/manmade beach, power line, row crops, pasture/range/hayfield, and orchards) were observed at any of the stations.

Table 6. USEPA Habitat Characterization – Riparian Zone – Human Influence Zone.										
Station	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Buildings	0	PC	0	P	0	P	0	0	P	P
Commercial	0	0	0	0	0	0	0	0	0	0
Park Facilities/ manmade beach	0	0	0	0	0	0	0	0	0	0
Docks/Boats	P	PC	0	C	P	C	P	0	PC	PC
Walls, dykes, revetments	0	P	C	0	0	P	0	0	C	C
Landfill/Trash	0	0	0	0	0	C	0	0	P	0
Roads or Railroad	0	P	C	0	0	0	0	0	0	0
Powerline	0	0	0	0	0	0	0	0	0	0
Rowcrops	0	0	0	0	0	0	0	0	0	0
Pasture/Range/Hayfield	0	0	0	0	0	0	0	0	0	0
Orchard	0	0	0	0	0	0	0	0	0	0
Lawn	0	PC	0	0	0	0	0	0	P	PC
0 = Not Present; P = Present outside plot; C = Present within plot										

Table 7 reports the observations made on littoral fish macrohabitat classification. Human disturbance were observed at six stations and was low at five stations and moderate at one station. Cover class was recorded as no/ little at one station, patchy at five stations, and as continuous at four stations. Cover type was recorded as woody at eight stations, as vegetation at all ten stations, artificial at three stations, boulder at four stations, vegetation at nine stations, and artificial at four stations. Dominant substrate was recorded as sand/gravel at four stations, mud/muck at three stations, and cobble/boulder at three stations.

Table 7. USEPA Habitat Characterization – Littoral Zone Macrohabitat Classification.										
Station	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Human Disturbance	None	Mod	Low	Low	None	Low	None	None	Low	Low
Cover Class	Cont	No/Lit	Patchy	Patchy	Patchy	Cont	Cont	Cont	Patchy	Patchy
Cover Type	Woody/ Veg	Art/ Bould	Bould/ Woody/ Veg	Woody/ Veg	Bould/ Veg	Art/ Woody/ Veg	Woody/ Veg	Woody/ Veg	Art/ Woody/ Veg	Art/Veg/ Bould/ Woody
Dominant Substrate	M/M	SG	C/B	S/G	C/B	C/B	S/G	M/M	S/G	M/M
Mod = Moderate; Cont = Continuous Cover; Art = Artificial; No/Lit = No or Little Cover; Bould = Boulder; Veg = Vegetation; M/M = Mud/Muck; C/B = Cobble/Boulder; S/G = Sand/Gravel										

Plot bank features are presented in Table 8. Bank angle was considered flat at one station, gradual at four stations, steep at three stations, and near vertical at two stations. The vertical height from waterline to the high water mark varied at all stations (range 0.012-0.03 meters). The horizontal distance from waterline to the high water mark was zero.

Table 8. USEPA Habitat Characterization – Within Plot Bank Features.

Station	A	B	C	D	E	F	G	H	I	J
Angle	Grad	Grad	Steep	Grad	Steep	Grad	NV	Flat	Steep	NV
Vertical Height (m) to HWM	0.02	0.025	0.025	0.03	0.025	0.025	0.025	0.012	0.03	0.025
Horizontal Distance (m) to HWM	0	0	0	0	0	0	0	0	0	0

HWM = High Water Mark; Flat = <5 degrees; Grad = Gradual (5-30 degrees); Steep (30-75 degrees)

Table 9 displays invasive plant and invertebrate species found in Lake Alice. Curly-leaf pondweed was present at two stations. Honeysuckle (*Lonicera* sp.), was observed in the shoreline/riparian plot in one station. Because the species was unknown for the honeysuckle, it is unknown if this was an invasive or native honeysuckle.

Table 9. USEPA Habitat Characterization – Invasive Plant and Invertebrate Species.

Station	A	B	C	D	E	F	G	H	I	J
Target Invasive Species in Littoral Plot	None	CLP (afloat)	CLP (afloat)	None	None	None	None	None	None	None
Target Invasive Species in Shore-line/Riparian Plot	None	None	*Lonicera* sp.	None	None	None	None	None	None	None

Target Invasive Species include: Zebra or Quagga Mussel, Eurasian Water-milfoil, Hydrilla, Curly Pondweed, African Waterweed, Brazilian Waterweed, European Water Chestnut, Water Hyacinth, Parrot Feather, Yellow Floating Heart, Giant Salvinia, Purple Loosestrife, Knotweed (Giant or Japanese), Hairy Willow Herb, Flowering Rush, Lonicera sp. (Honeysuckle)

The Wisconsin Department of Natural Resources Supplemental Methodology data are presented in Tables 10 and 11. A total of 20 pieces of small woody debris (>5cm diameter) and 44 pieces of large woody debris (>10 cm diameter) was found in the lake. None of the five target invasive species (Japanese stilt grass, reed canary grass, Phragmites, cattails, or yellow iris) were observed at any of the stations.

Table 10. WDNR Supplemental Methodology– Wood and Invasive Plant Species.										
Station	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Wood: >5cm diameter	3	0	1	1	0	8	2	2	1	2
Wood: >10cm diameter	24	0	0	5	0	8	2	3	0	2
Invasive: Japanese stiltgrass	No	No	No	No	No	No	No	No	No	No
Invasive: Reed canary grass	No	No	No	No	No	No	No	No	No	No
Invasive: Phragmites	No	No	No	No	No	No	No	No	No	No
Invasive: Cattails	No	No	No	No	No	No	No	No	No	No
Invasive: Yellow Iris	No	No	No	No	No	No	No	No	No	No

Table 11 displays the land cover, human development and piers found on Lake Alice. No seawalls, artificial beaches, commercial buildings or swim rafts were observed. Rip rap was observed at four stations, lawn was observed in the riparian plot of two stations and in the upland plot of two stations. Pavement was observed in one station. Residences were not observed in riparian plots, but eight upland plot stations had residences. Structures were observed in two riparian plot stations and one upland plot station. A boat lift was observed at one station and a dock was observed at four stations. Four hundred and twenty-four piers were counted around the perimeter of Lake Alice.

Table 11. WDNR Supplemental Methodology– Land cover, Human Development, and Piers.										
Station	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
LANDCOVER Key: 0 (0-1%), 1 (>1-10%), 2 (>10-40%), 3 (>40-75%), 4 (>75%)										
Seawall	0	0	0	0	0	0	0	0	0	0
Rip Rap	0	1	4	0	0	0	0	0	3	2
Artificial beach	0	0	0	0	0	0	0	0	0	0
Lawn	0	4	0	0	0	0	0/4	0	0	2/2
Pavement	0	0	3	0	0	0	0	0	0	0
HUMAN DEVELOPMENT (1 number given for riparian plot; if 2 numbers, 1st for riparian plot & 2nd for upland plot)										
Residences	0/1	0/2	0	0/1	0/1	0/1	0/1	0	0/1	0/2
Commercial buildings	0	0	0	0	0	0	0	0	0	0
Structures (sheds/boat houses)	0	1/0	0	0	0	0/3	0	0	0	1
Boat lifts	0	0	0	0	0	0	0	0	1	0
Swim rafts	0	0	0	0	0	0	0	0	0	0
Docks	1	1	0	0	0	1	0	0	1	0
NUMBER OF PIERS BETWEEN STATIONS										
From:	A-B	B-C	C-D	D-E	E-F	F-G	G-H	H-I	I-J	J-A
Count	63	35	37	54	73	39	18	13	52	40

The USEPA protocol called for a composite sample of aquatic benthic macroinvertebrates, combining net sweeps from each station into one sample. Table 12 provides the identified invertebrate taxa and counts of individuals by taxa for the composite sample. A total of twenty-six (26) taxa and 523 individual organisms were identified.

Table 12. Composite Benthic Macroinvertebrate Sample from Lake Alice.				
Taxon	**Count**		**Taxon**	**Count**
Nematomorpha	3		Trichoptera (caddisflies): Lepidostomatidae (2), Leptoceridae (17), Molannidae (6), Odontoceridae (1)	26
Crustacea: Amphipoda (55), Isopoda (56)	111		Lepidoptera: Noctuidae	3
Arachnoidea: Hydracarina	13		Coleoptera (aquatic beetles): Dytiscidae (1), Elmidae (2), Haliplidae (2 larvae)	5
Ephemeroptera (mayflies): Caenidae (68), and Ephemerellidae (3)	71		Diptera (true flies): Ceratopogonidae (6), Chaoboridae (1), Chironomidae (148)	155
Odonata: Anisoptera: Gomphidae (1), Libellulidae (6)	7		Mollusca: Gastropoda: Bithyniidae (46), Physidae (1), Planorbidae (11)	58
Odonata: Zygoptera (damselflies): Coenagrionidae	4		Pelycypoda: Sphaeriidae	30
Hemiptera: Corixidae (29), Pleidae (9)	38		**Total Taxa**	**26**

Finally, the USEPA protocol called for a fecal indicator sample at the final sampling station (Station J). In the case of Lake Alice, we analyzed the sample collected at Station 10 for *Escherichia coli* (*E. coli)*. The *E. coli* analysis resulted in values of 18 CFU (Colony Forming Units) per 100 milliliters of sample. To place this value in context, the USEPA recommends a water quality advisory (for swimming) when levels of the indicator bacterium *E. coli* exceed a limit of 235 CFU in 100 milliliters of water.

Table 13 indicates the coordinates of Stations A-J. A photo was taken at each station. The station photos are displayed below.

Table 13. Lake Alice USEPA & WDNR Physical Habitat Locations.		
Station	*Latitude*	*Longitude*
A	45.48791	-89.62915
B	45.49150	-89.60867
C	45.48161	-89.59703
D	45.48631	-89.62154
E	45.47509	-89.63289
F	45.48214	-89.65444
G	45.47796	-89.67563
H	45.49415	-89.67396
I	45.48297	-89.66695
J	45.48644	-89.64287

Station A – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station B – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station C – Lake Alice

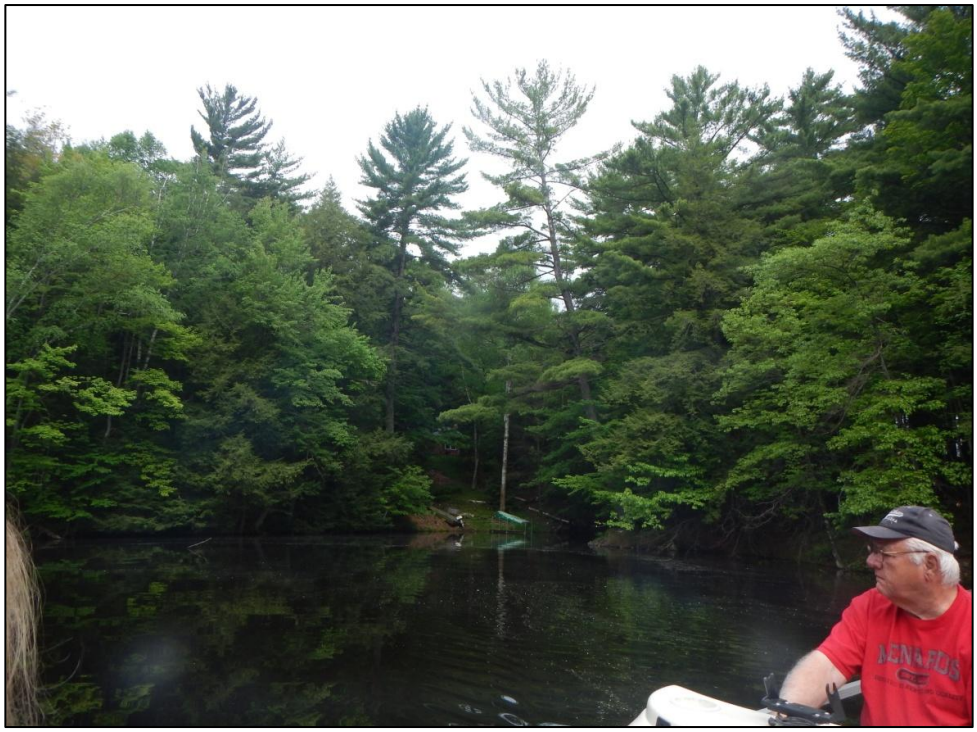
USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station D – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station E – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.



Station F – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station G – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station H – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station I – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Station J – Lake Alice

USEPA & WDNR Physical Habitat Assessment, 6/11/2013, White Water Associates, Inc.

Literature Cited

United States Environmental Protection Agency (USEPA). 2009. National Lakes Assessment: A Collaborative Survey of the Nation's lakes. EPA 841-R-09-001. U.S. Environmental Protection Agency, Office of Water and Office of Research and Development, Washington, D.C. Retrieved 2014. <water.epa.gov/type/lakes/upload/nla_newlowres_fullrpt.pdf>

Appendix E
Shoreline Survey Summary

Lake Alice Shoreline Summary

A photo survey was conducted on Lake Alice in August, 2014. This survey was done to systematically document the littoral zone and riparian area condition of the lake. Documenting the shoreline condition of the lake helps to determine the extent of future changes and impacts, and assess the efficacy of regulatory programs intended to protect the riparian area and lake. Five-hundred thirteen (513) shoreline segments were assessed for a variety of shoreline parameters by members of the Lake Alice Association. The data and photographs of each segment are provided in CD-ROM format. This data summary is included as an addendum to that report. This data will be a useful tool in identifying and planning restoration projects in the Sevenmile Lake riparian area and for monitoring long-term change.

Lake Alice Shoreline – Development		
Type	Number of records	% records
None	192	37%
house	282	55%
shed	56	11%
garage	19	4%
gravel drive	3	1%
paved drive	5	1%
lawn	120	23%
other	6	1%

At 282 sites, a house was observed (55% of sites).

Lake Alice Shoreline – Structures		
Type	Number of records	% records
none	193	38%
dock	289	56%
breakwater	1	0%
storm wall	1	0%
boathouse	9	2%
rip-rap	79	15%
other	4	1%

At 289 sites, a dock was observed (56% of sites).

Lake Alice Shoreline – Access		
Type	Number of records	% records
none	216	42%
unimproved path	210	41%
gravel path	30	6%
chip path	2	0%
paved path	12	2%
boardwalk	7	1%
stairs	39	8%
other	15	3%

At 216 sites, no access was noted (42% of sites).

Lake Alice Shoreline – Beach		
Type	Number of records	% records
none	434	85%
natural	46	9%
artificial	13	3%
stable	4	1%
eroding	7	1%
other	2	0%

The majority of sites had no beach.

Lake Alice Shoreline – Vegetation		
Type	Number of records	% records
none	17	3%
upland	20	4%
wetland	95	19%
forested	293	57%
shrub	152	30%
natural openings	18	4%
stream	0	0%
other	30	6%

The majority of sites had upland, forested vegetation present (around 57% of sites)

Lake Alice Shoreline – Buffer		
Type	Number of records	% records
none	129	25%
1-3 ft	137	27%
4-10 ft	71	14%
above 10 ft	176	34%
type: herbaceous	3	1%
type: shrubs	27	5%
type: trees	49	10%
type: other	0	0%

At 176 sites, the shoreline buffer was "above 10 ft." (34% of sites).

Lake Alice Shoreline – Erosion		
Type	Number of records	% records
none	237	46%
undercut banks/slumping	247	48%
furrows/gullies	2	0%
bare earth	18	4%
other	1	0%

Erosion was not observed at 237 sites along the shoreline (46% of sites).

Lake Alice Shoreline – Bank Height		
Type	Number of records	% records
none	52	10%
slight (< 2 ft.)	291	57%
abrupt (≥ 2 ft.)	164	32%

The bank height was abrupt (≥ 2 ft.) at 164 sites (32% of sites).

Appendix F
Lake Alice Volunteer Angler Journal

Lake Alice Association Volunteer Anglers' Journal

Table of Contents

Introduction

One component of the Lake Alice Stewardship Program was to establish a means by which anglers could collect meaningful fisheries data. Members of the Lake Alice Association (LAA) and their consultant (White Water Associates) worked with the Wisconsin Department of Natural Resources (WDNR) to develop the Volunteer Anglers' Journal. The goal of the journals (and the resulting data) was to augment the periodic WDNR fish surveys (including Fyke nets, electroshocking, and creel surveys) with continuously collected and annually reported fishing data from systematically recorded angler journals. This report documents the methods and findings for 2014 volunteer fish monitoring in Lake Alice.

Methods

This volunteer angler journal program was designed so that volunteer anglers can systematically record their fishing experiences. The program was conceived and designed by White Water Associates although components of the program (and field form) were drawn from literature sources (similar programs have been established in other states). Review by WDNR fisheries staff (Dennis Scholl and David Seibel) and WDNR Water Resources Management Specialist (Kevin Gauthier) resulted in several meaningful modifications.

We hope that participating anglers will be engaged in the journaling process on an ongoing basis, however, the system can also accommodate anglers who participate for one fishing trip only. This activity will engage anglers in collecting fish data and contribute to the understanding of fish population dynamics. The objectives for the angler journal program include providing information on:

- Species of fish caught while angling on Lake Alice;
- Size distribution of fishes caught on Lake Alice;
- Fishing emphases of Lake Alice anglers (time spent on panfish, walleyes, bass, etc.);
- Fishing techniques used on Lake Alice (trolling, bait fishing, spin fishing, etc.);
- Relative amount of catch and release fishing; and
- Catch-per-effort for various Lake Alice fish species

Volunteer anglers participating in the journal program were provided with field data forms and specific instructions on how to fill out the forms (Figure 1).

Figure 1. Volunteer Anglers' Journal field data form.

VOLUNTEER ANGLERS JOURNAL FIELD DATA FORM

Important Instructions (*see Angler Journal Description for details*)
Fill sheet out only for yourself (a partner fills out a separate sheet). Use new sheet for each fishing trip. Record unsuccessful trips too. Measure and record all gamefish caught and indicate if kept/released. For panfish, measure the length of the first ten of each species and indicate if kept or released. For additional panfish, count number kept and number released and record. Complete a journal form every time you fish.

Angler and Fishing Trip Data		
Angler Name:	Phone:	Date:
Time start (actual fishing time):	Time end (actual fishing time):	Total time fishing (excluding lunch break, etc.):
List fish species sought and % time spent for each. If you are seeking all species listed during your entire outing, list "100%" by each.		
Watercraft (circle one): Ice Pontoon Fishing boat Canoe Kayak Other (specify):		
Fishing Style (circle 1 or more): Tip-up Jigging Trolling Casting Bait Fly Other (specify):		
Weather Conditions: Sunny _____ Partly Cloudy _____ Overcast _____ Air temp (°F) _____ Water temp (°F) _____ Rainy _____ Calm winds _____ Moderate winds _____ Strong winds _____ Wind Direction _____ Other weather notes:		
Level of satisfaction (circle one): Low Medium High Explain:		

Record Fish Caught on Trip											
Catch #	Fish Species Common Name	Length (nearest ¼ inch)	Check one: Kept	Released		Catch #	Fish Species Common Name	Length (nearest ¼ inch)	Check one: Kept	Released	Counts of unmeasured panfish
1						11					Bluegill
2						12					
3						13					Pumpkinseed
4						14					
5						15					Crappie
6						16					
7						17					Yellow Perch
8						18					
9						19					Other (specify)
10						20					

Data continued on second page? (circle one): YES NO Note: If you need more space, indicate by circling "YES" and then record data on back of this sheet or on a 2nd data form.

Important instructions to the volunteers were summarized on the data form and emphasized on a separate handout. These instructions included the following:

- Fill out the data form only for yourself (if they wish, a fishing partner should fill out his/her own);
- Use a new sheet for each fishing outing;
- Record all trips including unsuccessful trips (even if you have caught no or few fish);
- Record actual time spent fishing (boating to and from your fishing areas and time spent doing reconnaissance with sonar are considered fishing activities and you should include the time spent on these activities even though you may not have a line in the water). Don't include non-fishing activity such as a lunch break or time spent swimming);

- Measure all fish caught (even tiny ones) in inches from tip of the snout to tip of the tail. Measure to the nearest one-quarter (1/4) inch. We want to understand the population size structure;
- Indicate if the fish was kept or released;
- Be consistent; fill out a journal field data sheet every time you fish;
- List the fish species you are seeking during a fishing trip and estimate a percentage of time devoted to each. If you are seeking all species listed during your entire outing, record "100%" by each species;
- Measure and record all game fish species caught. For panfish species, measure the length of the first ten of each species and indicate if kept or released. For additional panfish (beyond 10), simply count (don't measure) the number kept and number released. Record these numbers;
- If you need additional space for recording fish, indicated "continued on another page" and then record on back of the Field Data Form or on a second Field Data Form.

As with any biological sampling (whether done by professionals or volunteers), appropriate scientific and resource management use of data must recognize possible limitations of the data. In the case of the Lake Alice Volunteer Anglers' Journal, data will be most valid and useful if volunteers: (1) carefully follow directions regarding data recording, (2) accurately identify fish and measure fish length, (3) honestly record all data (big fish, little fish, many fish, and few fish), (4) consistently use the journal on all fishing outings, and (5) participate for multiple years.

Results

General Statistics

Lake Alice is a 1438 acre lake with a maximum depth of 32 feet. It is located in Lincoln County and is a eutrophic drainage lake. The volunteer anglers' journal endeavor began with a small number of participants, but we anticipate that this number will grow. The scientific value of the information collected will increase with a greater number of participants and participation of several years. There were a total of 23 angler journals in 2014 and 2 people participated. There were 37 angler journals in 2015 and 5 people participated. The completed journal entries

represent fishing trips (outings). The journal periods referred to in this report were from May 24, 2014 to August 28, 2014.

Table 1. Sport fishing effort summary, Lake Alice, 2014 season.

Month	*Total Angler Hrs. (Angler Journal)*	*Total Angler Hrs./Acre (Angler Journal)*
	2014	*2014*
March		
May	15.5	1.1
June	16.75	1.2
July	6	0.4
August	12	0.8
September		
Total	**50.25**	**3.5**

Table 1 displays the fishing effort of anglers on Lake Alice in 2014. Total angler hours are the estimated number of hours that anglers spent fishing on Lake Alice during each month. Total angler hours/acre is the total angler hours divided by the area of the lake in acres.

Figure 2 illustrates the fishing effort reported on Lake Alice by month. June was the most fished time recorded by anglers in 2014 (16.75 hours).

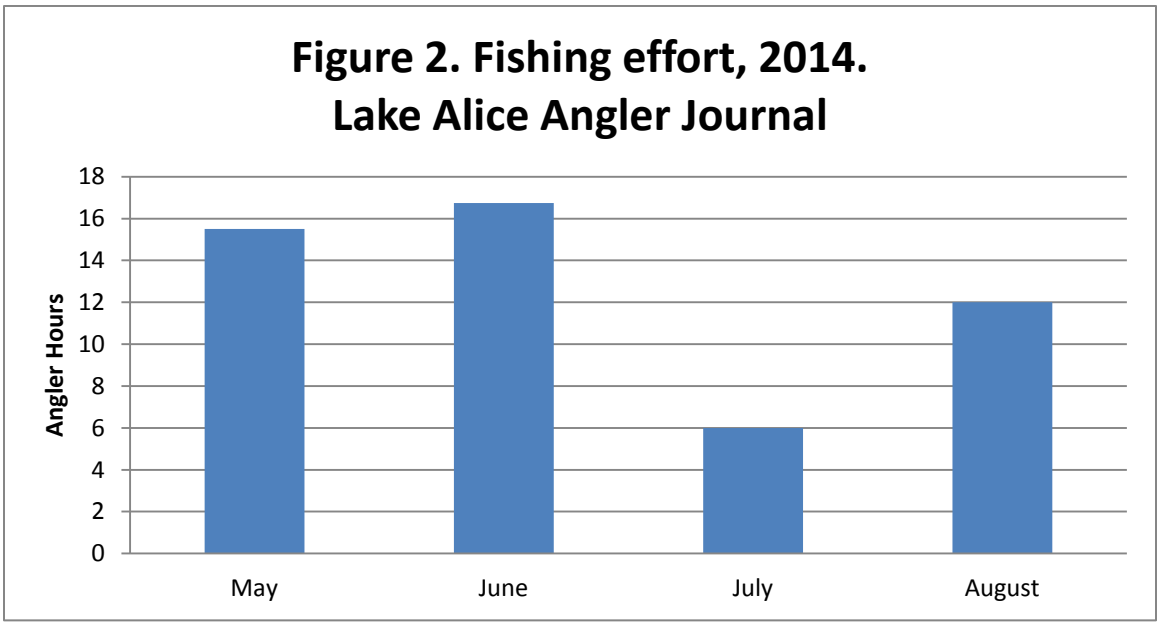
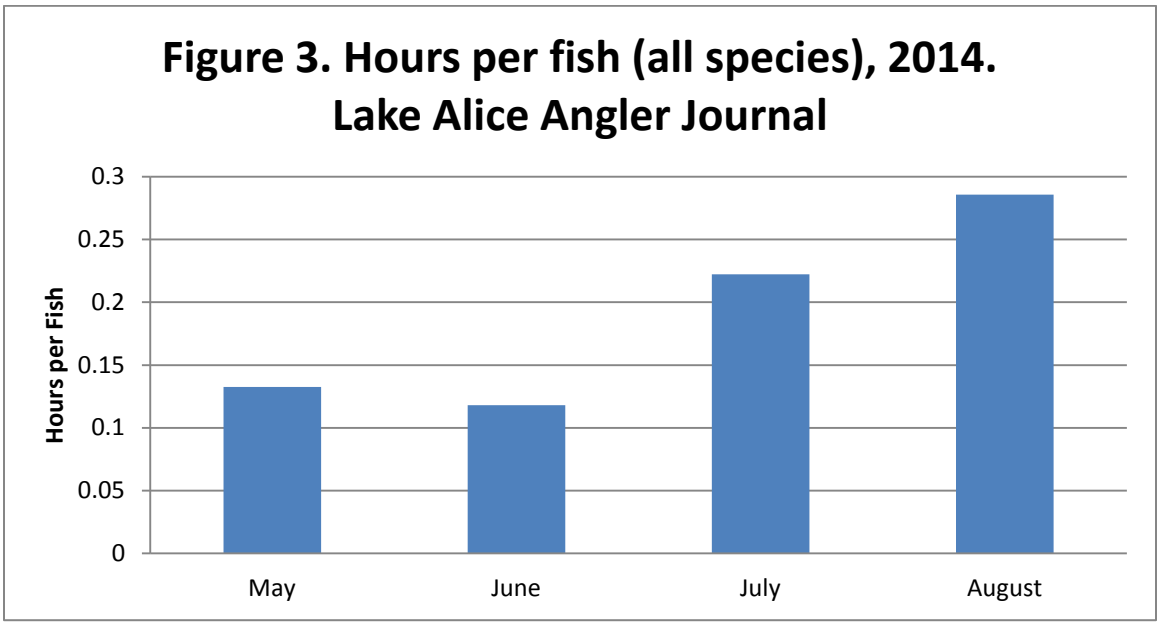
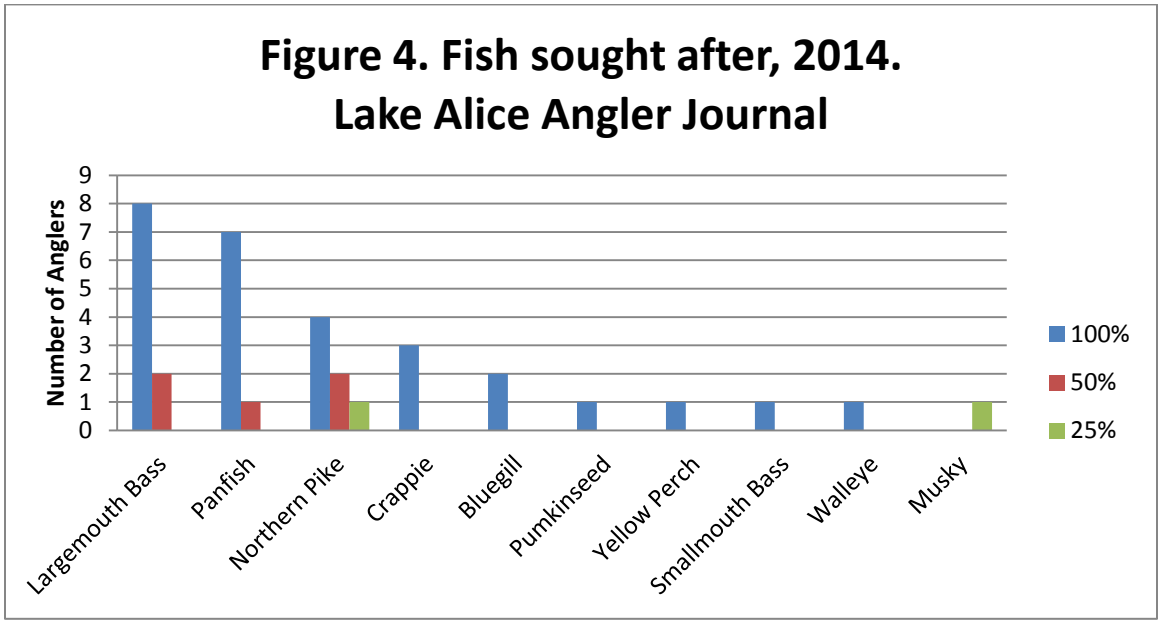


Figure 3 indicates the hours spent per fish in 2014. August had the highest effort per fish.



Anglers indicated (with a percentage) what species of fish they were intending to catch (Figure 4). In some cases, it was recorded that anglers intended to catch different species in the same outing. Largemouth Bass and panfish were the most sought after fish.



Anglers recorded the platforms from which they fished. A fishing boat was used for the anglers that filled out journals in all occasions. One angler put both fishing boat and shore. (Figure 5).

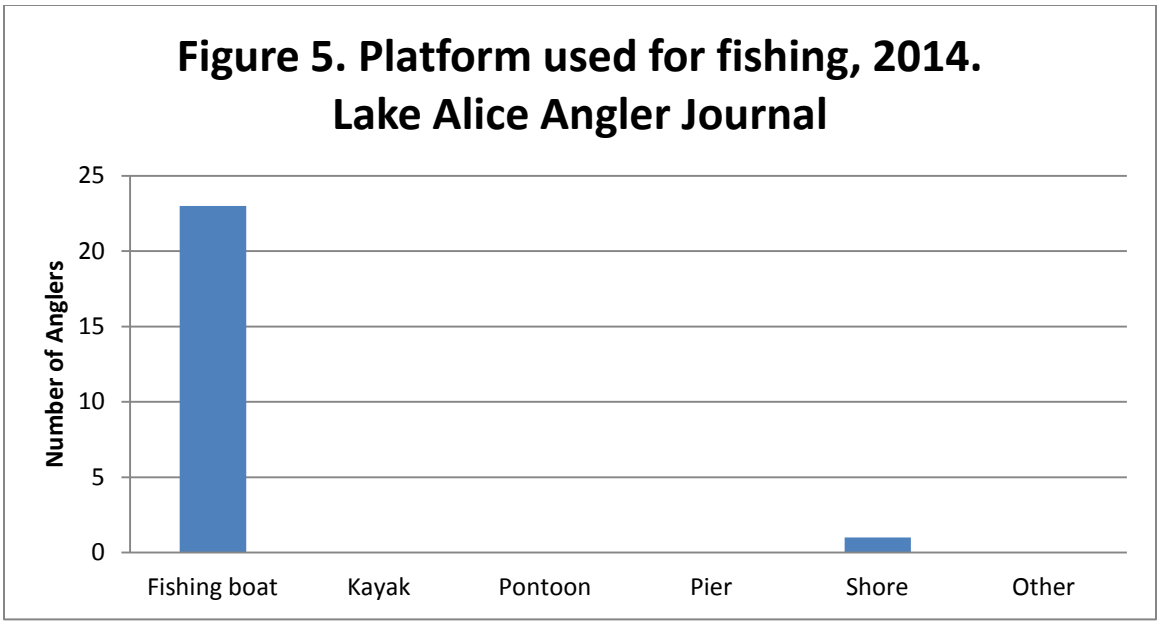
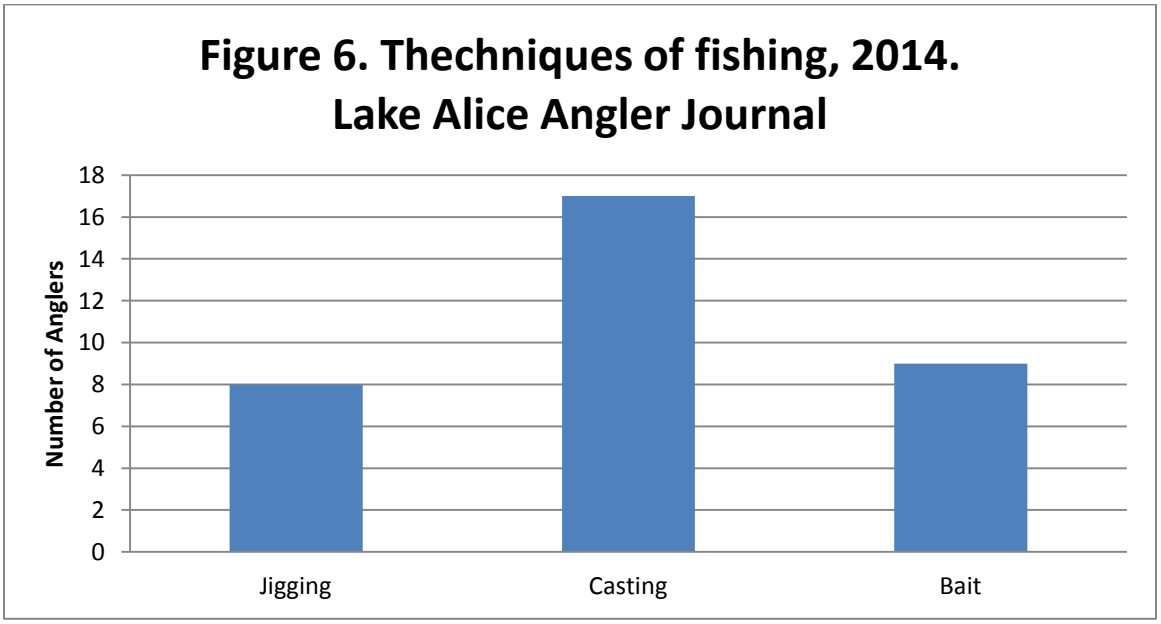
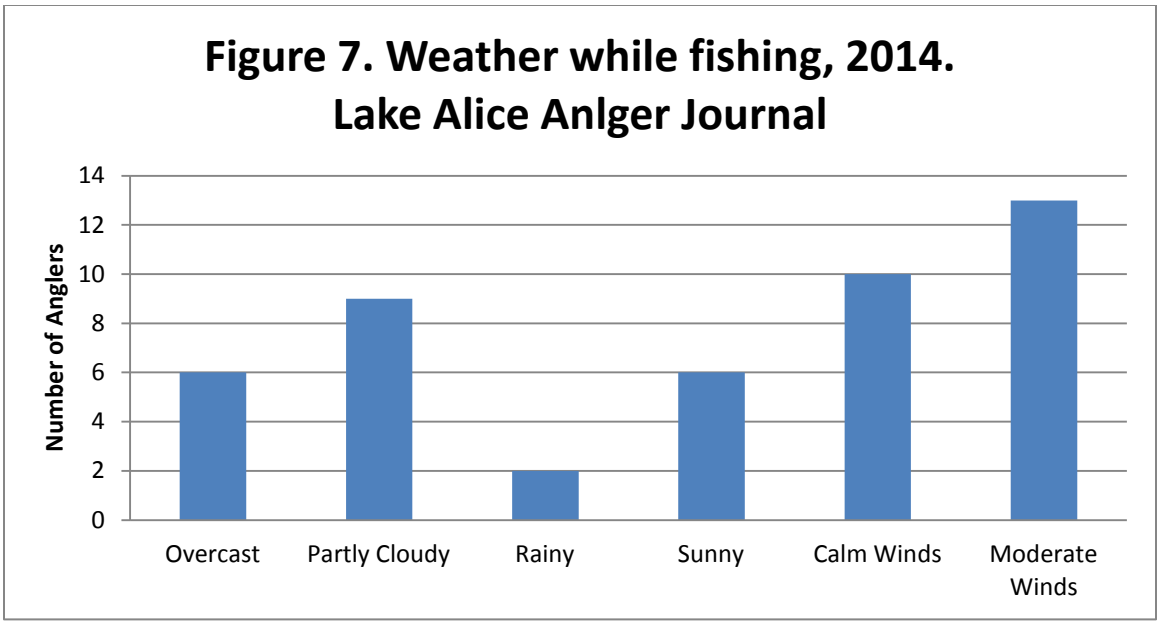


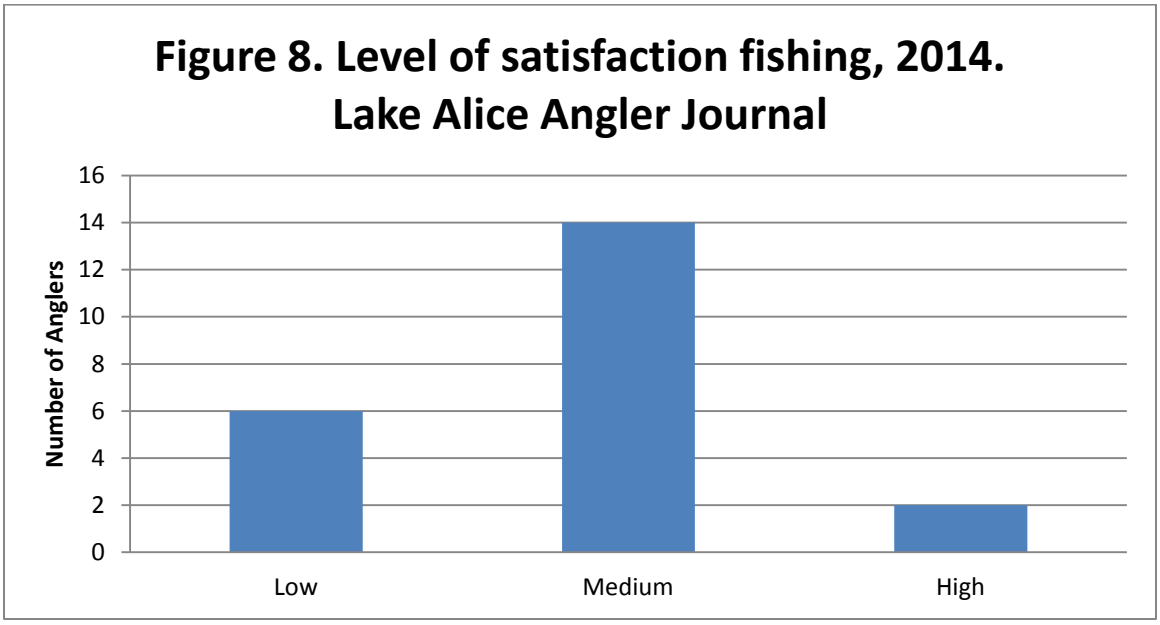
Figure 6 displays different techniques of fishing used by anglers. The most common technique was casting, followed by bait.



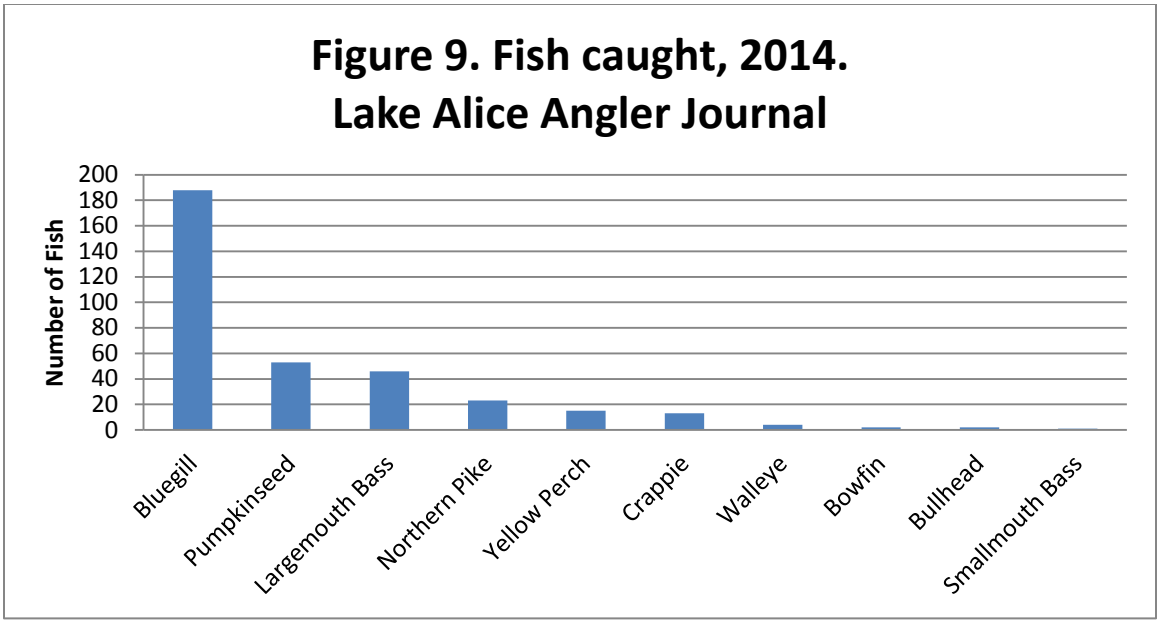
Weather data was also recorded as part of the anglers' journals. Anglers fished when it was sunny or partly cloudy for the majority of the time (Figure 7).



Anglers rated their level of satisfaction fishing as low, medium, or high (Figure 8). In 2014, 64% of the fishing trips rated as medium, 27% of trips was rated as low, and 9% rated the trip with a high level of satisfaction.



A total of 347 fish were recorded in the anglers' journals 2014. Bluegill was the top fish species caught (Figure 9). Other fish species caught included: pumpkinseed, largemouth bass, northern pike, yellow perch, crappie, walleye, bowfin, bullhead, and smallmouth bass.

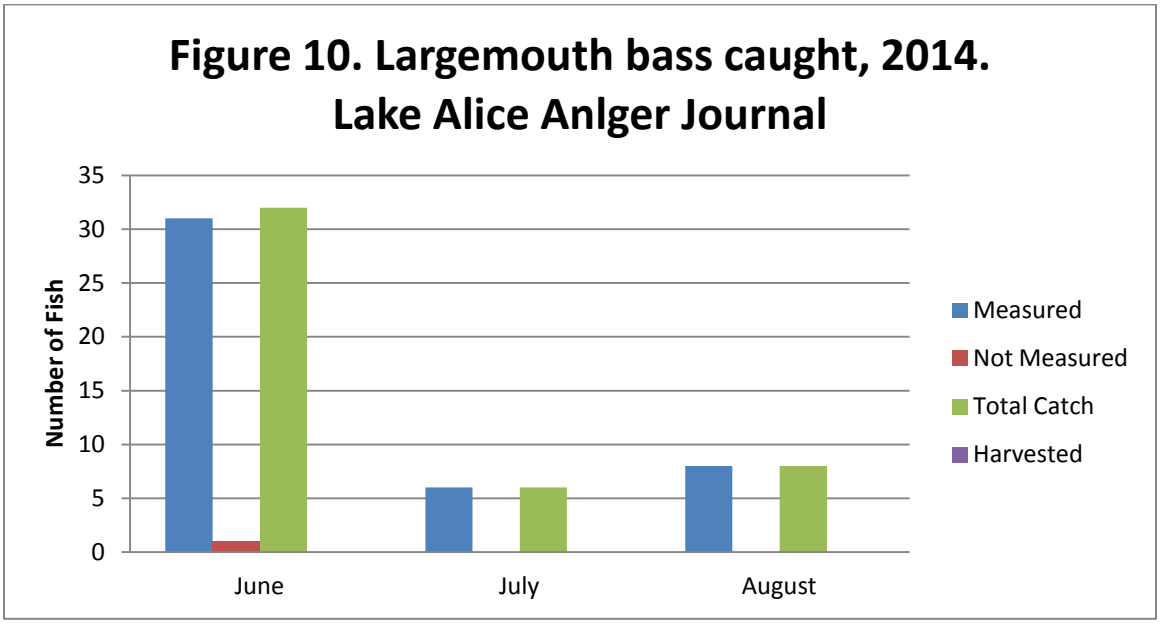


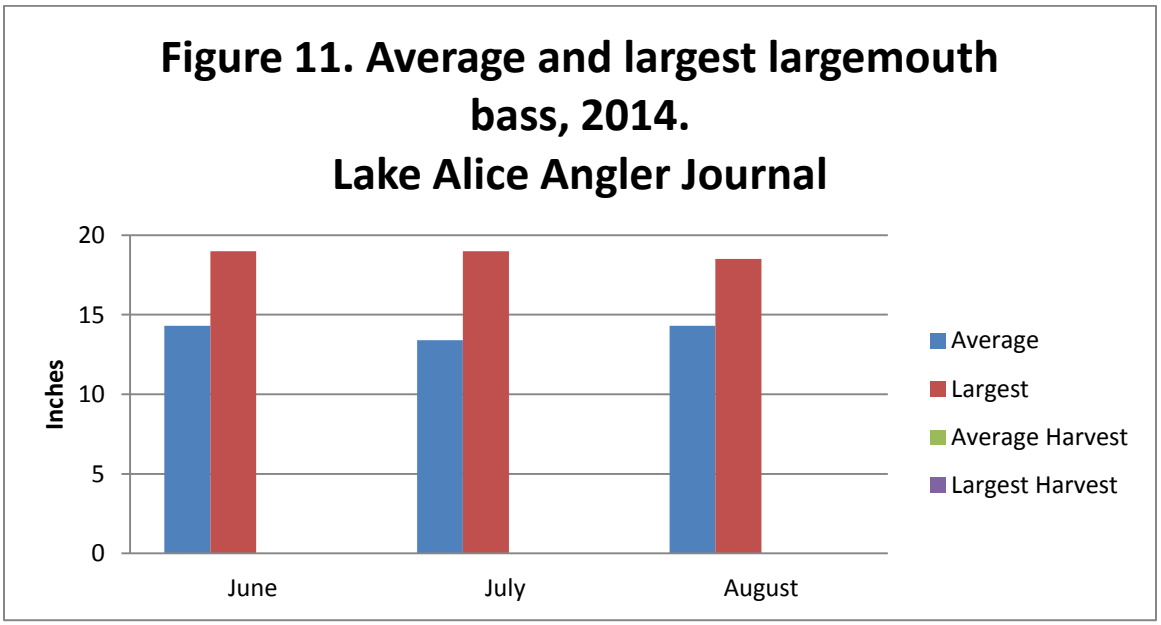
Species-specific data

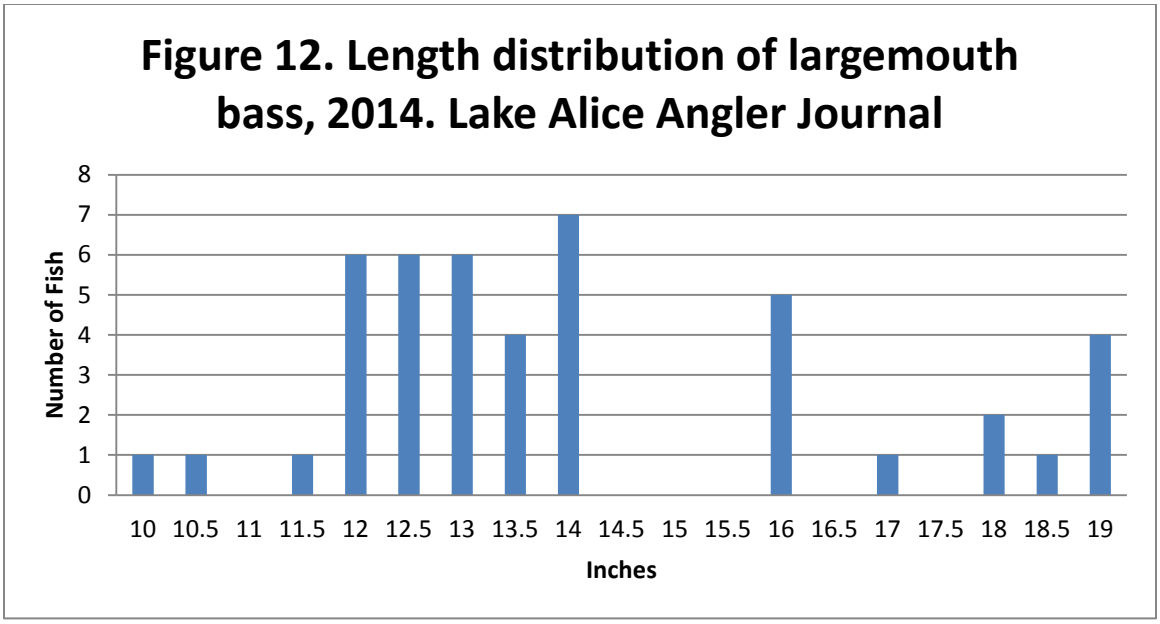
For each fish species caught in Lake Alice, several statistics were recorded. These statistics include: number caught and harvested, average and longest length of fish both released and harvested, and length distributions. Catch and harvest numbers are the calculated number of fish (of the indicated species) caught regardless of targeted species. Average and longest length of fish caught and harvested is the monthly longest and average length of fish caught and/or harvested fish species. Length distribution is all fish of a species that were measured by the anglers from May to August. Fish species with these data are: largemouth bass, crappie, northern pike, bluegill, pumpkinseed, yellow perch, smallmouth bass, and walleye.

LARGEMOUTH BASS

In 2014, there were 46 largemouth bass caught and there were no harvest of largemouth (Figure 10). The highest catch of largemouth bass in 2014 occurred in June with 32 caught. The largest largemouth bass caught in 2014 was 19 inches (Figure 11). In Figure 12 we see that the size range of largemouth bass caught in Lake Alice was between 10 and 19 inches.

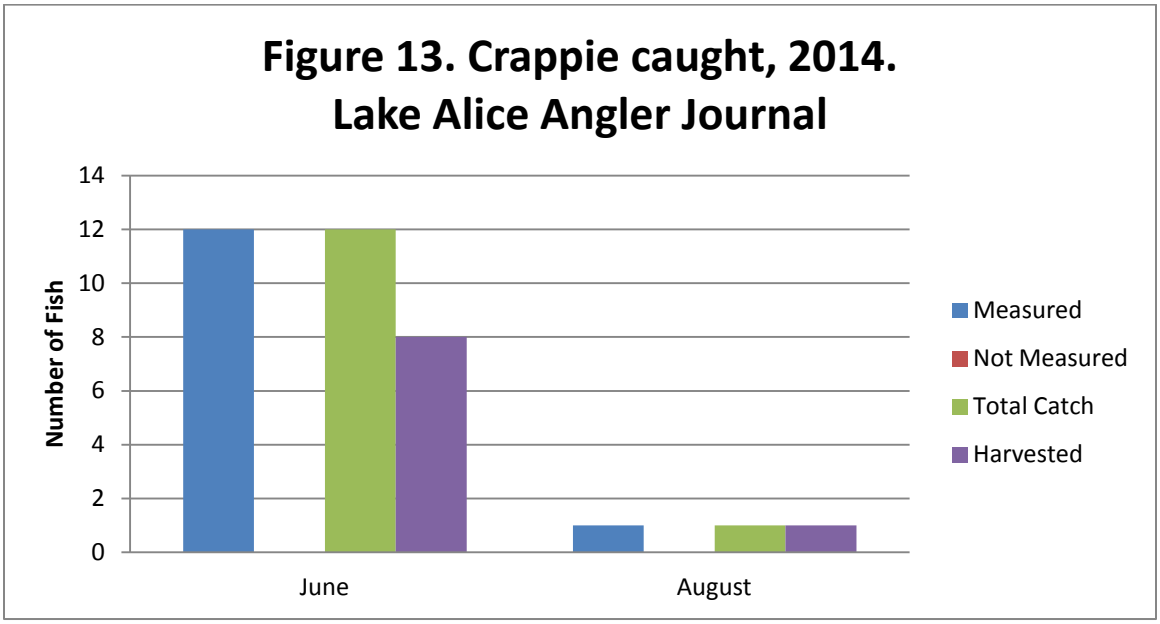


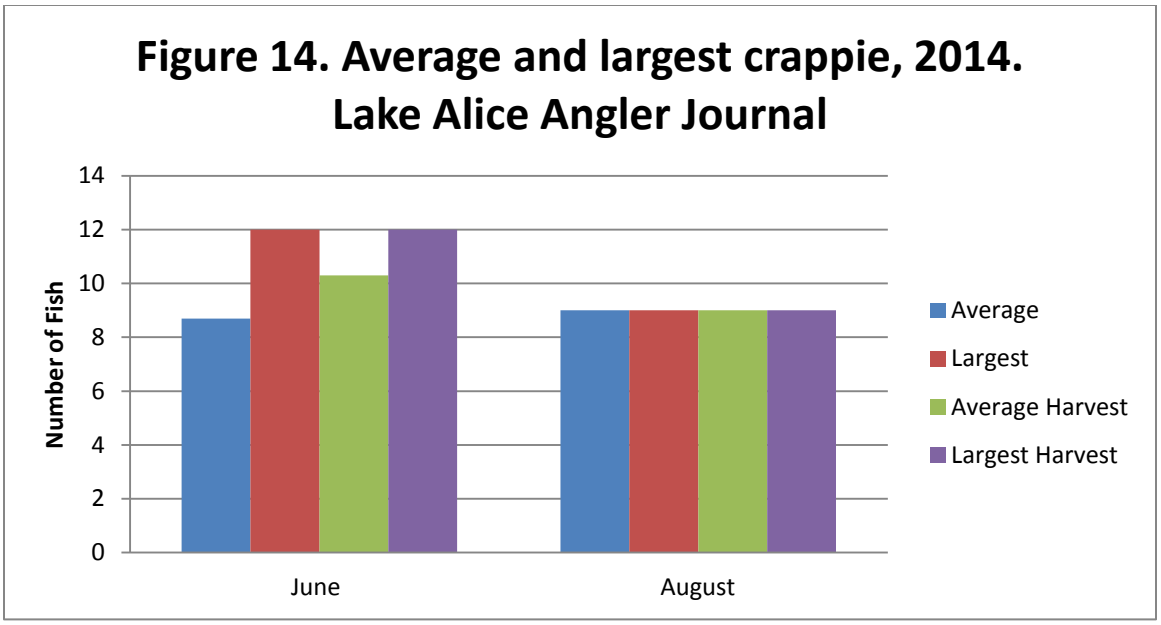


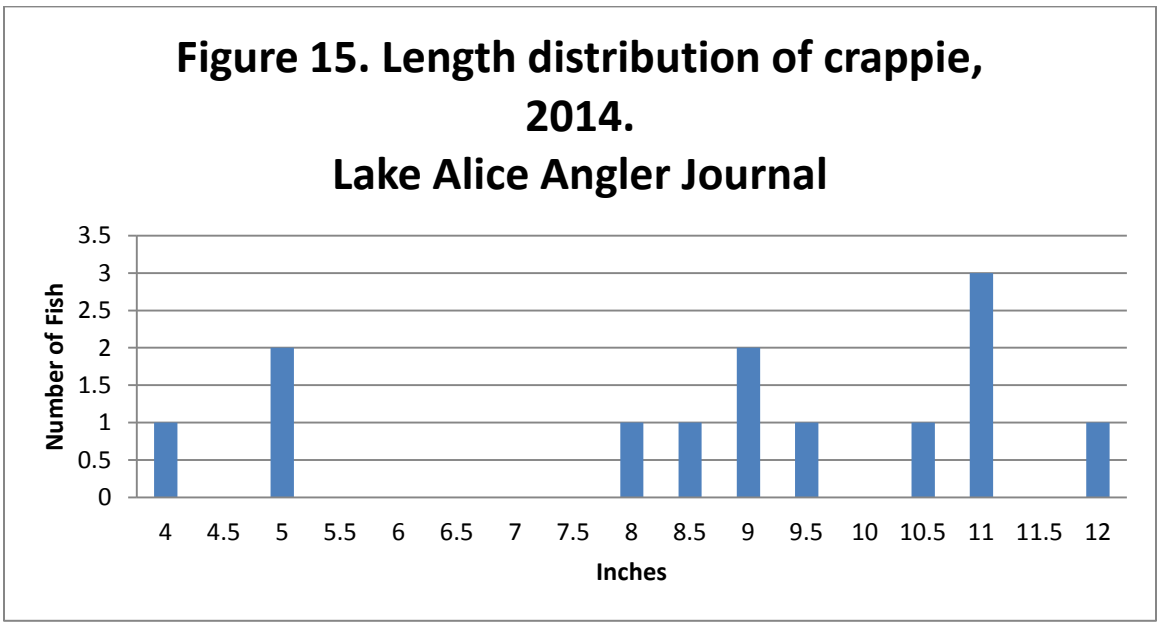


CRAPPIE

The total crappies caught in 2014 were 13 with 9 harvested (Figure 13). In 2014, the largest harvested crappie was 12 inches in length (Figure 14). In 2014, the lengths of crappies caught ranged from 4.0 inches to 12.0 inches (Figure15).







NORTHERN PIKE

In 2014, there were 23 northern pike caught and 0 harvested, with the majority caught in May (Figure 16). The largest northern pike caught was 32 inches in May 2014 (Figure 17). The length of northern pike caught in 2014 ranged from 14.5 to 32 inches (Figure 18).

Figure 16. Northern pike caught, 2014. Lake Alice Angler Journal

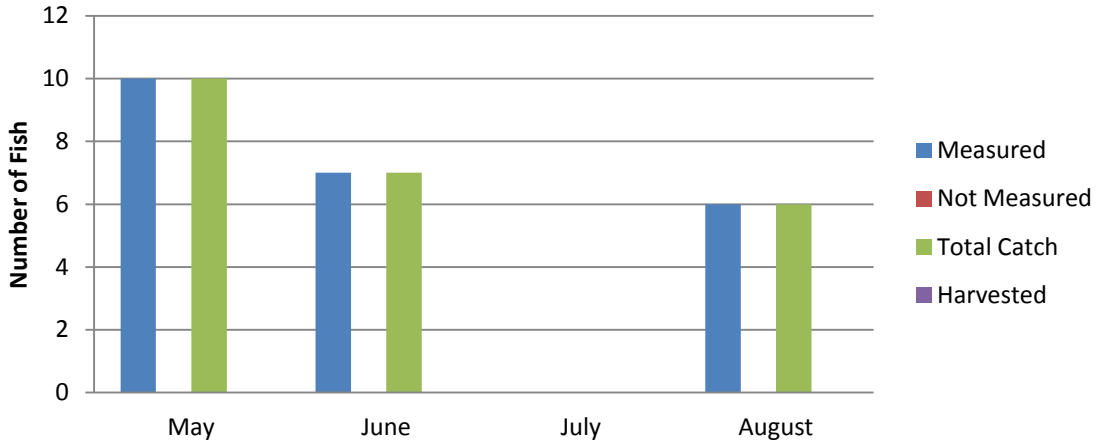
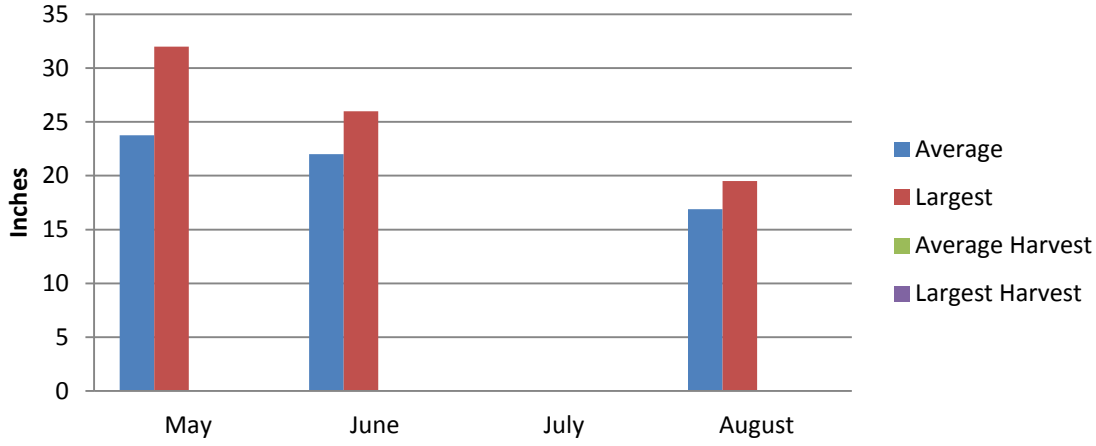
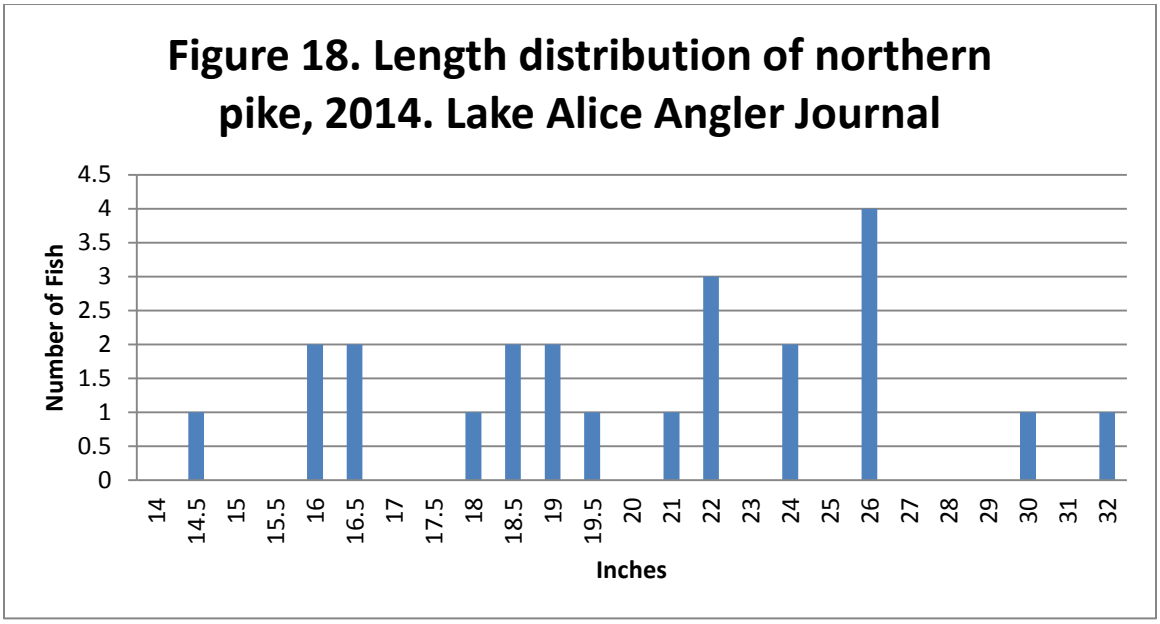


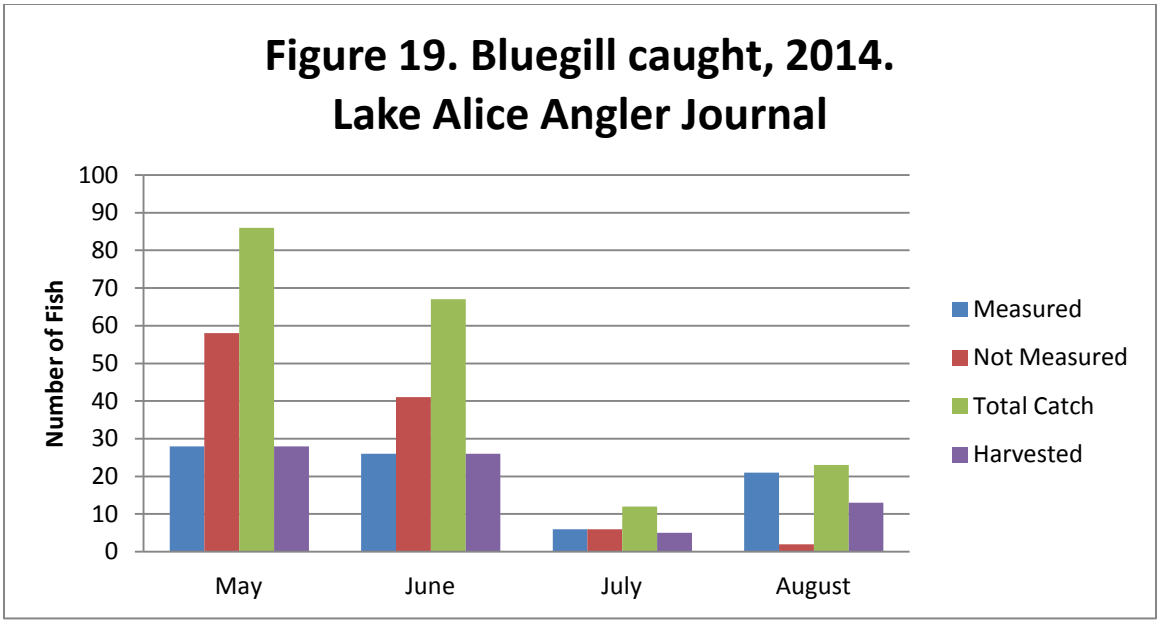
Figure 17. Average and largest northern pike, 2014. Lake Alice Angler Journal

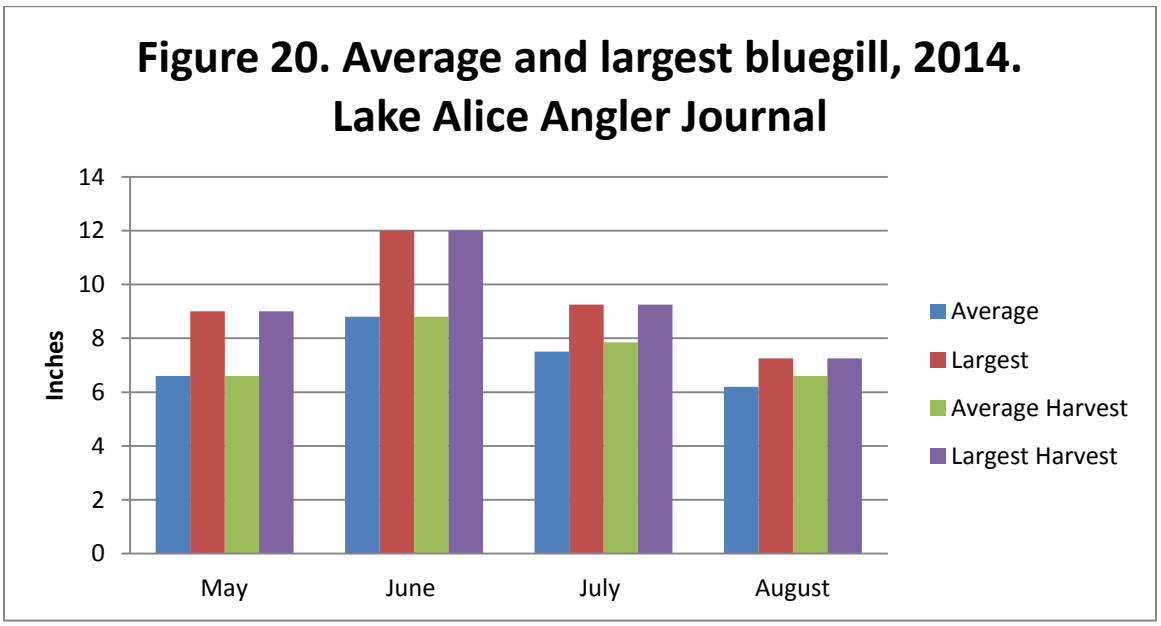


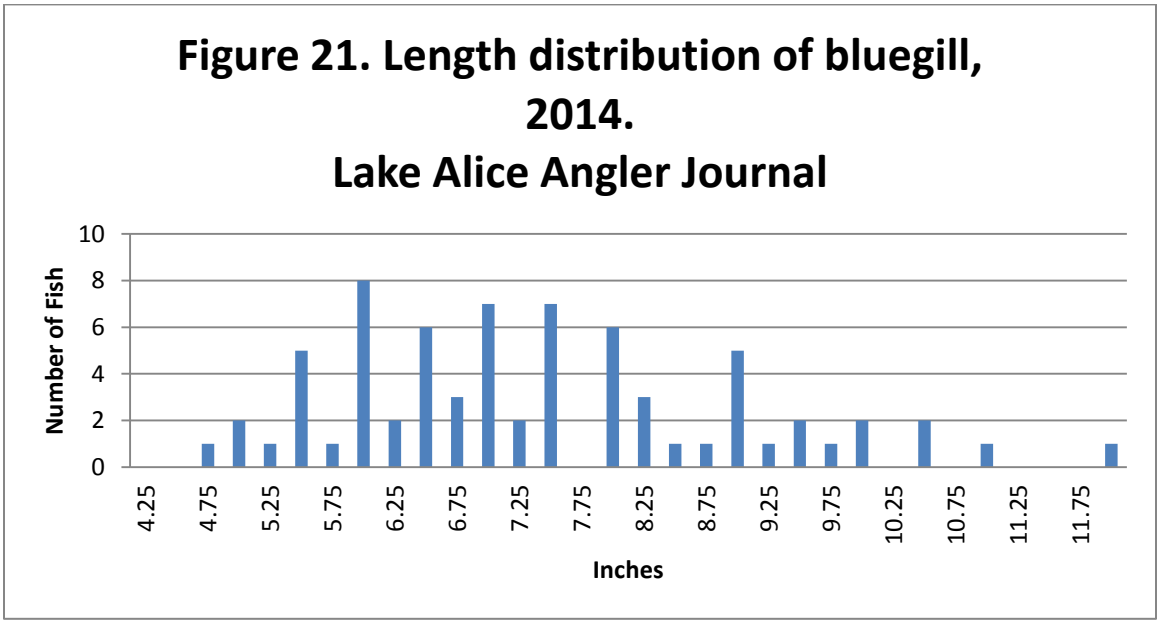


BLUEGILL

In 2014, 121 bluegill were caught and 72 were harvested (Figure 19). In 2014, July and September had the most bluegills caught. In 2014, May and June had the most catches of bluegill. The largest bluegill caught in 2014 was 12 inches (Figure 20). In 2014, the bluegill size ranged from 4.5 inches to 9 inches. In 2013, the size ranged from 4.75 to 12 inches (Figure 21).







PUMPKINSEED

In 2014, 53 bluegill were caught and 9 were harvested (Figure 22). In 2014, May had the most bluegills caught. The largest bluegill caught in 2014 was 7 inches (Figure 23). In 2014, the size ranged from 4.75 to 7 inches (Figure 24).

Figure 22. Pumpkinseed caught, 2014. Lake Alice Angler Journal

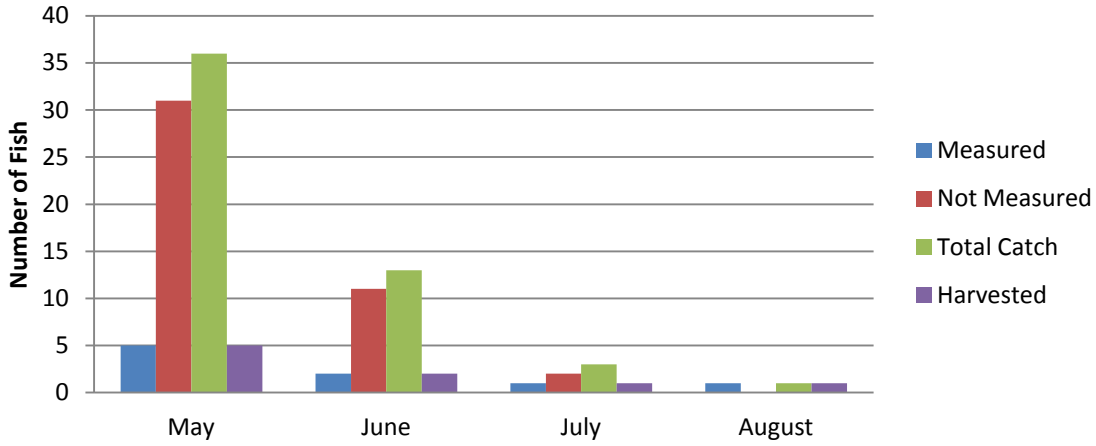
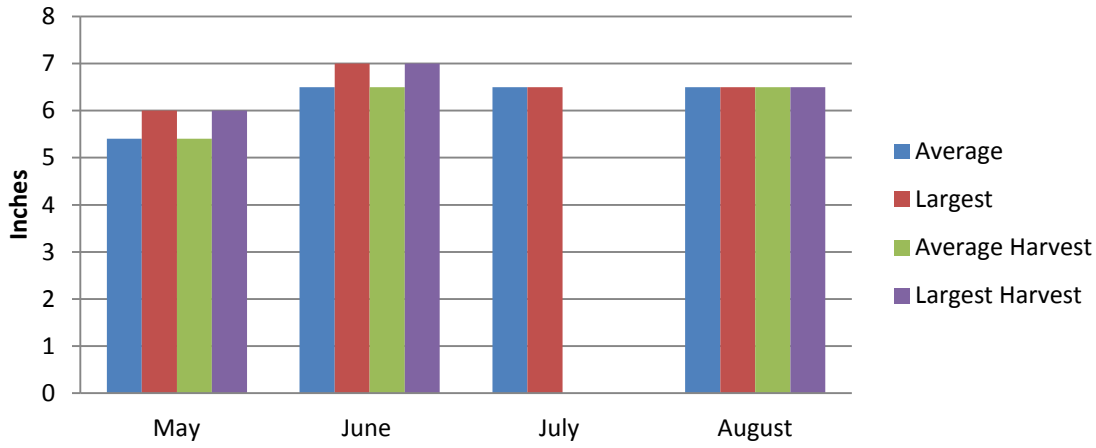
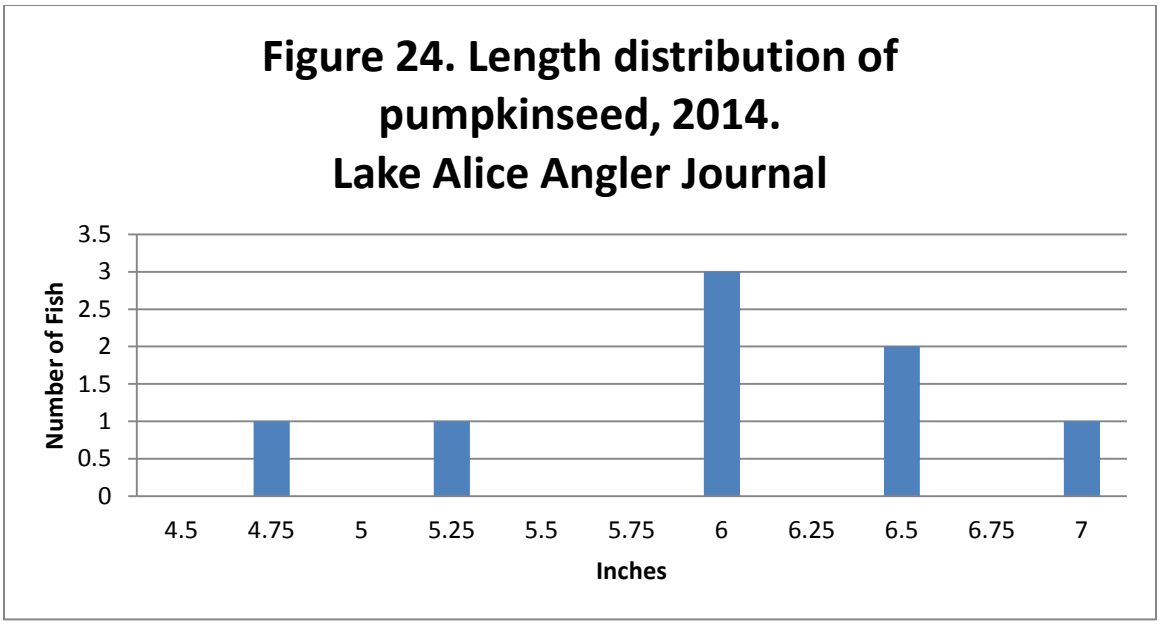


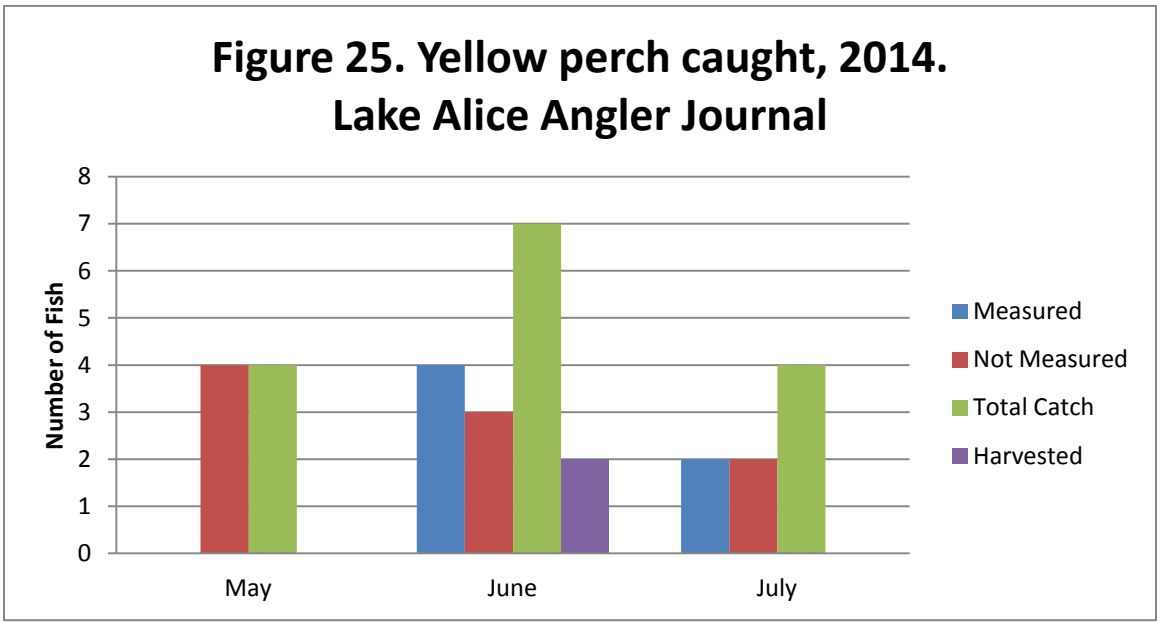
Figure 23. Average and largest pumpkinseed, 2014. Lake Alice Angler Journal

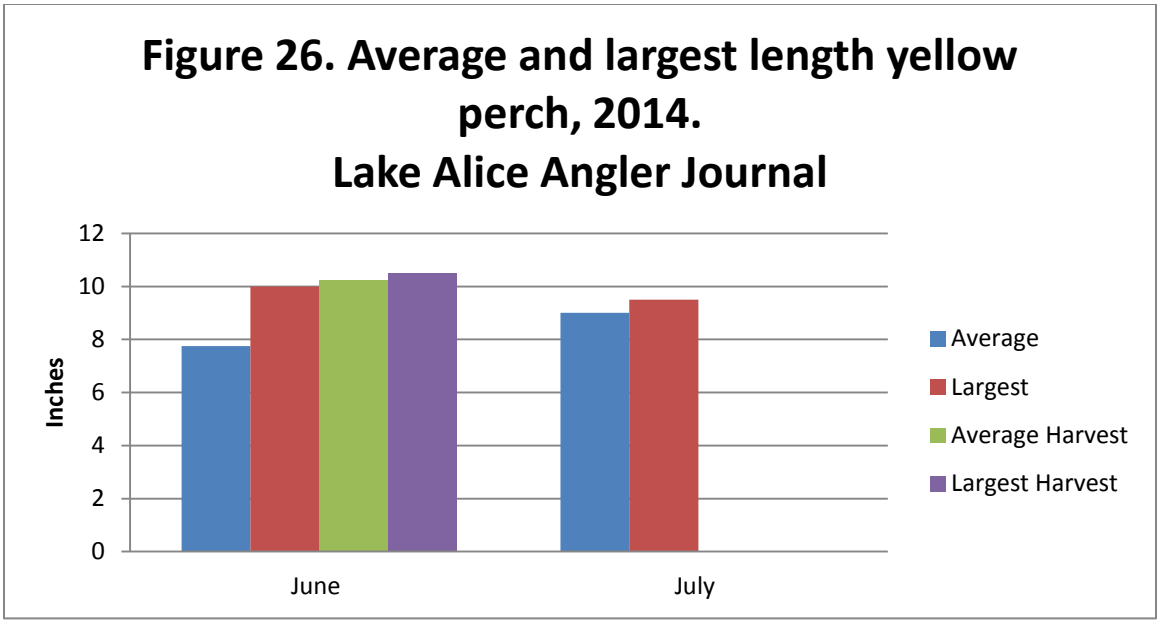


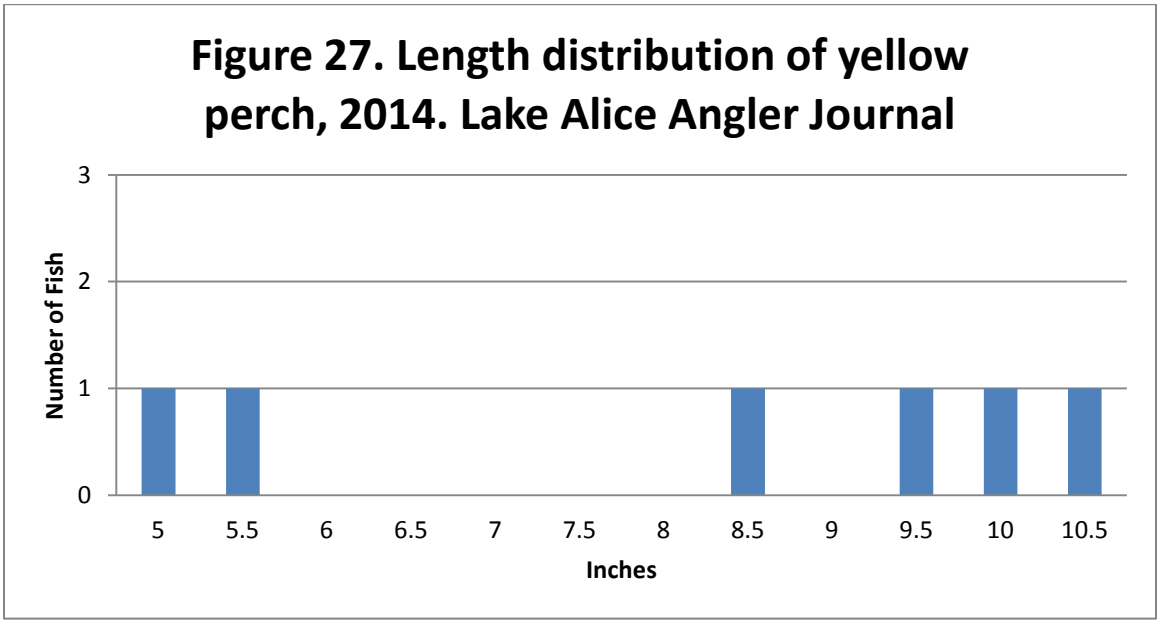


YELLOW PERCH

In 2014, 15 yellow perch were caught and 2 were harvested (Figure 25). The largest yellow perch caught in 2014 was 10.5 inches (Figure 26). The length of yellow perch caught in 2014 ranged from 4.5 to 9 inches (Figure 27).





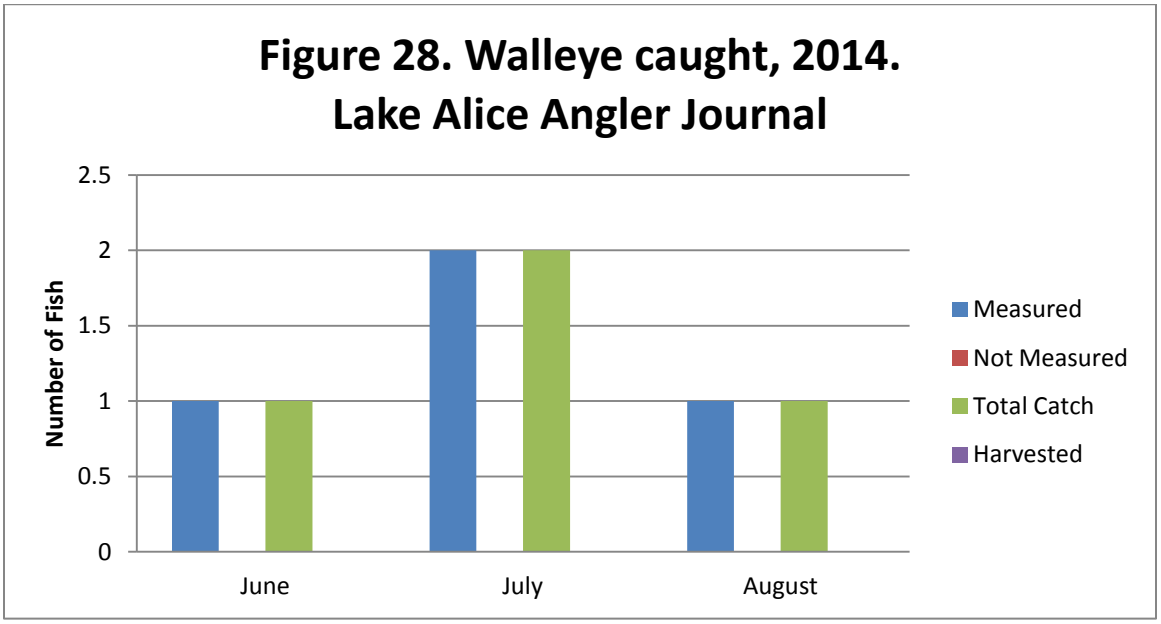


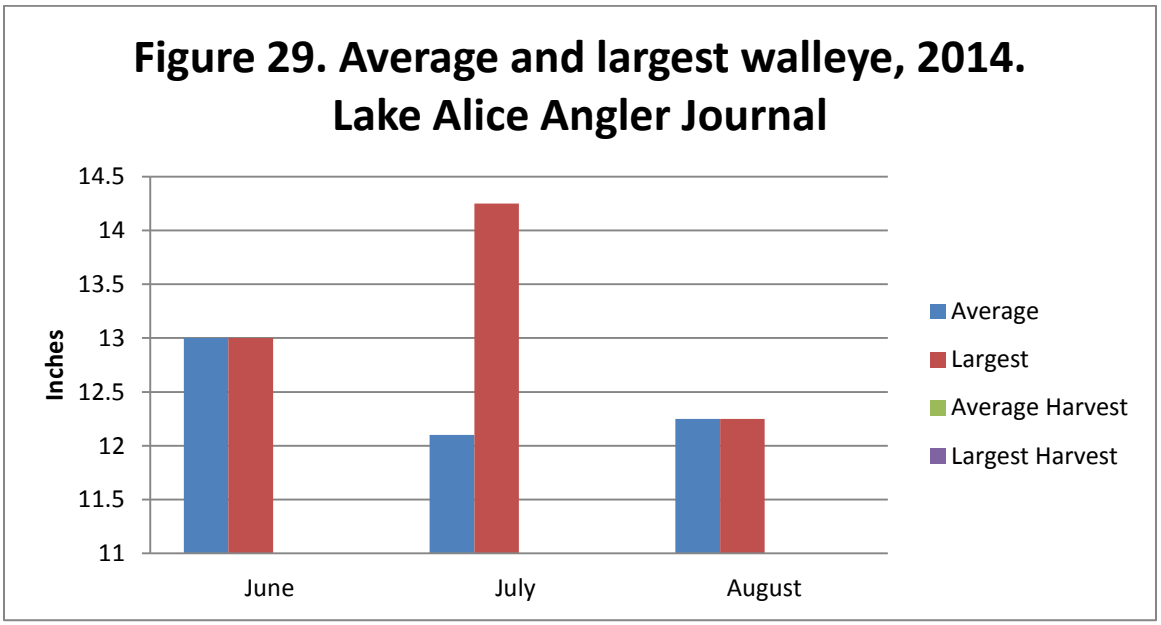
SMALLMOUTH BASS

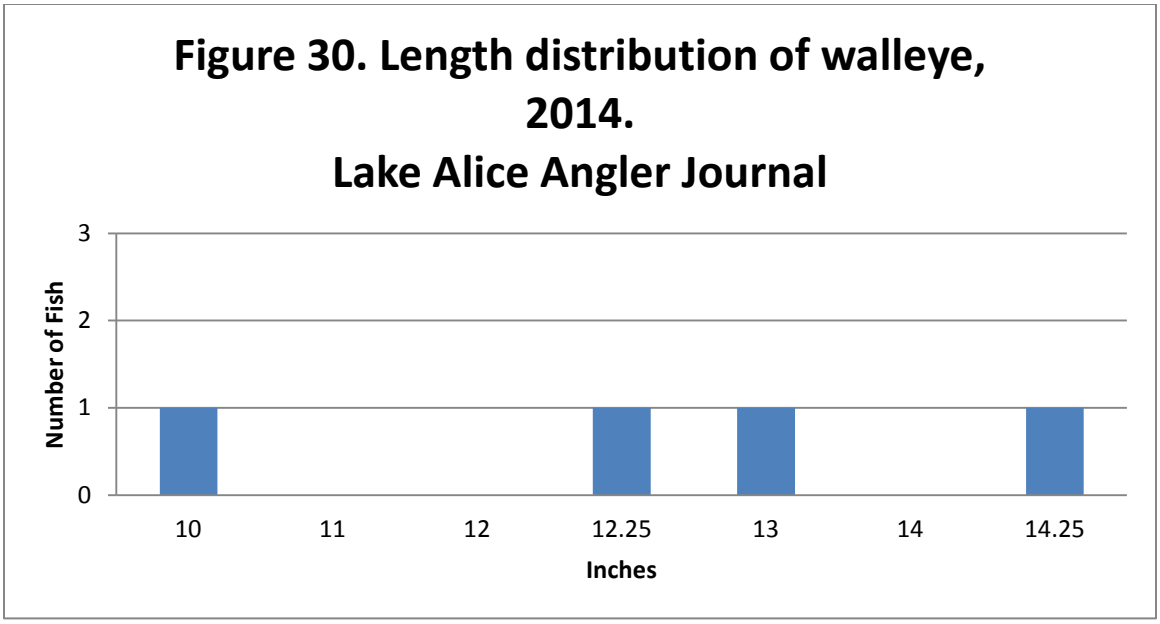
In 2014, only 1 smallmouth bass was recorded being caught in August. It was 13.25 inches and it was released.

WALLEYE

In 2014, 4 walleye were caught and there was no harvest (Figure 28). The largest walleye caught in 2014 was 14.25 inches (Figure 29). The length of walleye caught in 2014 ranged from 10 to 14.25 inches (Figure 30).







OTHER SPECIES

There were two bowfin (dogfish) caught in 2014. They measured 18.5 and 20 inches. One was caught in June and the other was caught in August. There were also two bullhead caught in June with one being 10.5 and the other 8.5 inches.

Appendix G
Lake Alice Volunteer Angler Journal

Lake Alice Stewardship Program Frog & Toad Survey

Bullfrog (*Rana catesbeiana*) from a Lake Alice wetland (photo by Neil Pietenpol)

This document is a product of a WDNR Lake Planning Grant awarded to:

Lake Alice Association
Contact: Glenn Mott, Board President
W 4945 Echo Point, Tomahawk, WI 54487
Phone: (715) 453-7378 E-mail: glen.mott@yahoo.com

Submitted to:

Wisconsin Department of Natural Resources
Attention: Kevin Gauthier, Sr., Lakes Management Coordinator
107 Sutliff Ave, Rhinelander, WI 54501
Phone: (715) 365-8937 Fax: (715) 365-8932
Email: Kevin.GauthierSr@wisconsin.gov

Prepared by:

White Water Associates, Inc.
Dean Premo, Ph.D.
429 River Lane, P.O. Box 27
Amasa, Michigan 49903
Phone: (906) 822-7889; Fax: (906) 822-7977
E-mail: dean.premo@white-water-associates.com

Date: March 10, 2017

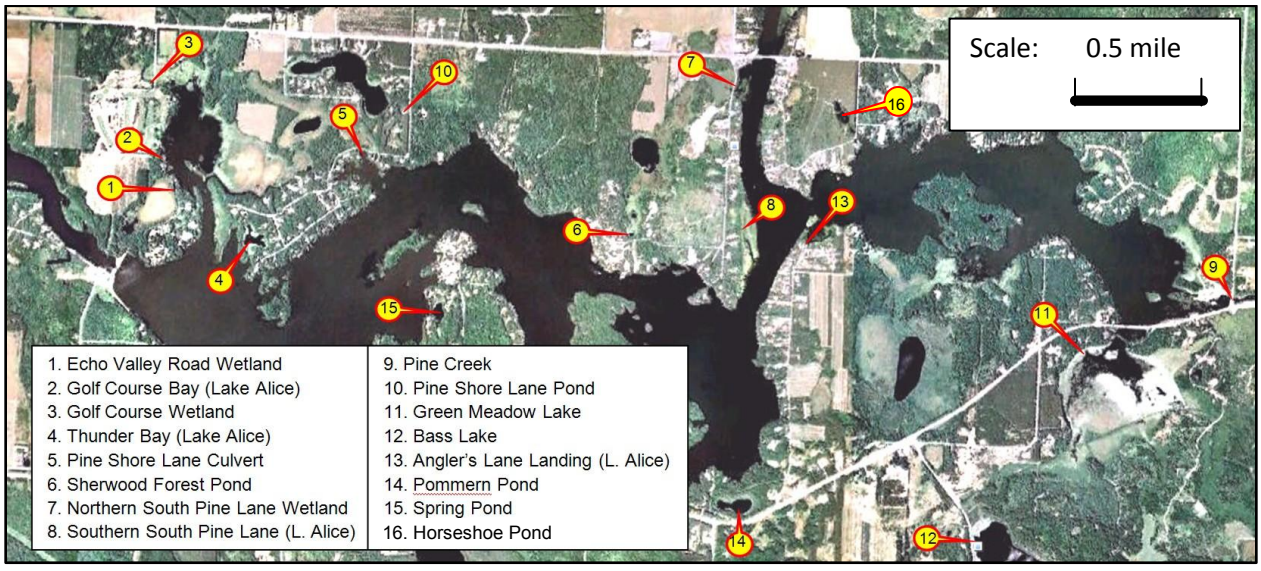
Introduction

A component of Phases 2 and 3 of the Lake Alice Stewardship Program was a volunteer frog and toad survey of habitats in the Lake Alice watershed. The decline of amphibian populations in many areas in North America has prompted monitoring of local frog and toad populations. Many states (including Wisconsin) have developed frog and toad survey protocols for this purpose. This report documents the methods and findings for the three years of monitoring around Lake Alice: 2010 (Phase 2) and 2013 and 2014 (Phase 3).

Methods

We followed the Wisconsin Frog and Toad Survey Manual[1] for site selection and field methodology. Working in consultation with Lake Alice Association members with local knowledge of area wetlands, Dean Premo (a trained herpetologist) selected fifteen sites in the Lake Alice watershed as prospective frog and toad survey wetlands for the 2010 field season. These sites are shown in Exhibit 1. In general, these sites are at least one-half mile apart (exceptions include Sites 8 and 13, Sites 2 and 3, and Sites 10 and 11). In 2013 and 2014, the survey crew added Site 16 (also in Exhibit 1).

Exhibit 1. Fifteen frog and toad survey wetlands.



[1] Paloski, R.A. T.L.E. Bergeson, M. Mossman, and R. Hay (eds). 2006. Wisconsin Frog and Toad Survey Manual PUB-ER-649. Bureau of Endangered Resources, Wisconsin Department of Natural Resources, Madison, WI. 25 pp.

Over the years, several hearty volunteers, active members in the Lake Alice Association, offered their efforts for the "swing-shift" activity of surveying for frogs and toads (frog and toad monitoring starts after dark and may go late into the night). This group was given instruction from Dean Premo and provided recordings of frog calls from which to study. In 2010, the team was split into two groups (each group taking about half the wetlands to survey. All fifteen wetlands were surveyed on the same three dates ("first run" on April 22, "second run" on May 20, and "third run" on June 8, 2010) under weather conditions conducive to frog/toad activity and to hearing the breeding males vocalize. In 2013 and 2014, eleven and twelve sites were surveyed, respectively. The dates for the 2013 survey were May 7, June 3, and July 9) and for the 2014 were May 13, June 3, and July 8.

According to range maps in the scientific literature and the Frog and Toad Survey Manual, eight anuran (frogs and toads) species have been documented in Lincoln County. Two additional species have been documented in adjacent counties. Exhibit 2 provides this list. These species are the most likely anurans to be heard in the Lake Alice watershed. The volunteers became familiar with their vocalizations.

Exhibit 2. Lincoln County Frogs and Toads (Anurans)

Anurans for which Lincoln County Records Exist

1. Eastern American Toad (*Bufo americanus*)
2. Striped Chorus Frog (*Pseudacris triseriata*)
3. Northern Spring Peeper (*Pseudacris crucifer*)
4. Gray Tree Frog (*Hyla versicolor*)
5. Bullfrog (*Rana catesbeiana*)
6. Green Frog (*Rana clamitans*)
7. Wood Frog (*Rana sylvatica*)
8. Northern Leopard Frog (*Rana pipiens*)

Not documented in Lincoln, but from adjacent county(s)

9. Pickerel Frog (*Rana palustris*)
10. Mink Frog (*Rana septentrionalis*)

Note: *Hyla chrysoscelis* has not been documented in Lincoln or adjacent counties (but from two counties away)

Results

All field data collected in 2010, 2013, and 2014 are presented in the site data summary sheets at the end of this report. These summary sheets also show the location of the wetland on an aerial photograph and describe the habitat. If available, site photos are included for the subject wetlands.

A total of seven anuran species were detected during the auditory surveys in 2010 and 6 species were documented in 2013 and 2014. These species are presented in Exhibit 3. This represents all of the species for which Lincoln County records exist.

Exhibit 3. Anuran species detected in the Lake Alice Watershed

Anuran Species	Number of Sites Detected		
	2010	2013	2014
Eastern American Toad (*Bufo americanus*)	9	2	3
Northern Spring Peeper (*Pseudacris crucifer*)	13	7	6
Gray Tree Frog (*Hyla versicolor*)	2	0	0
Bullfrog (*Rana catesbeiana*)	12	7	10
Green Frog (*Rana clamitans*)	15	11	11
Wood Frog (*Rana sylvatica*)	3	1	0
Northern Leopard Frog (*Rana pipiens*)	2	0	5
Striped Chorus Frog (*Pseudacris triseriata*)	0	1	10

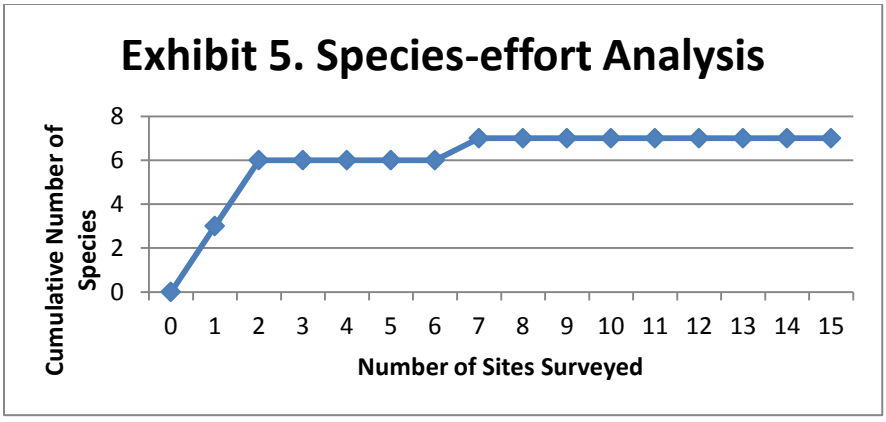
The Green Frog was the most widely distributed species, occurring at all fifteen sites in 2010, all eleven sites in 2013, and all twelve sites 2014. Northern Spring Peeper and Bullfrog were also widespread. The Gray Tree Frog (three sites over all survey years) and Northern Leopard Frog (four sites over all survey years) were the most restricted in distribution. The high number of sites detected with this Striped Chorus Frog in 2014 is a bit curious (with novice listeners, spring peeper calls are sometimes identified as striped chorus frog), but could reflect simply that this species was present, but not detected in past years or a new presence in 2014.

Exhibit 4 displays the species detected at each of the fifteen study sites. Sites 1 and 9 had the highest number of species (seven). Two sites (12 and 13) had only two species. The median number of species per site was 5 and the average number per site was 4.9.

Exhibit 4. Anuran species distribution across Lake Alice watershed study sites.

Site	Total Species	Years Sampled	Amer. Toad	Spring Peeper	Gray Treefrog	Chorus Frog	Bullfrog	Green Frog	Wood Frog	Leopard Frog
1	7	2010, 2013, 2014		X	X	X		X	X	X
2	6	2010, 2013, 2014	X	X		X	X	X	X	
3	5	2010, 2013, 2014		X	X	X	X	X		
4	3	2010	X				X	X		
5	5	2010, 2013, 2014	X	X		X	X	X		
6	5	2010, 2013, 2014		X		X	X	X		X
7	5	2010, 2013, 2014	X	X		X	X	X		
8	4	2010	X	X			X	X		
9	7	2010, 2013, 2014	X	X		X	X	X	X	X
10	4	2010	X	X			X	X		
11	6	2010, 2013, 2014	X	X		X	X	X	X	
12	2	2010, 2013, 2014		X				X		
13	2	2010					X	X		
14	6	2010, 2013, 2014	X	X		X	X	X	X	
15	5	2010, 2013, 2014	X	X			X	X	X	
16	6	2013, 2014		X	X	X	X	X		X

As a measure of survey thoroughness, we analyzed 2010 species detected against effort expended. Our measure of effort is the number of sites surveyed (15 in 2010). Exhibit 5 graphs cumulative number of species against number of sites visited. The site numbers were randomly arranged for this analysis (2, 9, 10, 6, 8, 13, 1, 7, 5, 15, 3, 11, 14, 12, 4). The curve levels off after 8 or 9 sites indicating our effort with regard to number of sites was more than adequate.



Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 1 Site Name: Echo Valley Road Wetland

Site Location: Echo Valley Rd, south of golf course (Edgewater Country Club)

Habitat Description: Partially flooded bog and marsh.

Site Photo: None available

SITE 1 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species, call index)	Spring peeper (1) Northern leopard frog (1)	Spring peeper (2) Eastern gray treefrog (1) Green frog (1)	Green frog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 1 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	69°F	58°F	74°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Spring peeper (2)	Green frog (1)	Green frog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 1 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	52°F	63°F	72°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (3) Spring Peeper (1) Leopard frog (1)	Spring Peeper (1) Green frog (2)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 2 Site Name: Golf Course Bay

Site Location: Echo Valley Rd, south of golf course (Edgewater Country Club)

Habitat Description: Wooded riparian area and shrub shoreline of Lake Alice.

Site Photo: None available

SITE 2 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species, call index)	Spring peeper (1) American toad (1)	Spring peeper (2) American toad (3)	Green frog (1)
Notes	Noisy golf course sprinkler		

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers.

SITE 2 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	68°F	60°F	74°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	American toad (2)	Green frog (1) Bullfrog (1)	Green frog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 2 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	60°F	66°F	70°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (2) Spring Peeper (1) Leopard frog (1)	Spring Peeper (2) Green frog (2) Bullfrog (1)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 3 Site Name: Golf Course Wetland

Site Location: Echo Valley Rd, south of golf course (Edgewater Country Club)

Habitat Description: Weedy, shallow marsh with stumps.

Site Photo: None available

SITE 3 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species, call index)	Spring peeper (1)	Spring peeper (3) Eastern gray treefrog (3) Green frog (1) Bullfrog (1)	Green frog (1) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 3 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	68°F	66°F	74°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Spring peeper (1)	Green frog (1)	Green frog (2) Bullfrog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 3 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	60°F	72°F	72°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (1)	Chorus frog (2) Green frog (1) Bullfrog (2)	Green frog (3) Bullfrog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 4 Site Name: Thunder Bay (Lake Alice)

Site Location: Private residence off South Bay Road

Habitat Description: Shallow bay; lots of emergent macrophytes, wooded riparian area.

Site Photo: None available

SITE 4 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species, call index)	American toad (1)	American toad (3)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 5 Site Name: Pine Shore Lane Culver (L. Alice & wetland)

Site Location: Pine Shore Lane

Habitat Description: Shallow bay with emergent macrophytes on Lake Alice side and permanent water marsh on north side of culvert, wooded riparian area.

Site Photo: None available

SITE 5 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species, call index)	Spring peeper (2)	Spring peeper (3) American toad (2)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 5 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	62°F	62°F	70°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)		Green frog (1)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 5 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	56°F	69°F	73°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (3) Spring peeper (2)	Spring peeper (2) Green frog (2)	Green frog (2) Bullfrog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 6 Site Name: Sherwood Forest Pond

Site Location: Near end of Sandy Lane

Habitat Description: Marshy permanent pond, but some areas become dry, wooded riparian area.

Site Photo: None available

SITE 6 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species, call index)	Spring peeper (3)	Green frog (3) Bullfrog (3)	Green frog (2) Bullfrog (1)
Notes	Likely erroneous determination of Cricket frog at this site (will check in Spring 2011)		

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 6 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	62°F	62°F	76°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	62°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Spring peeper (2)	Green frog (2)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 6 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	60°F	70°F	69°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (3) Leopard frog (1)	Chorus frog (2) Spring peeper (2) Green frog (1)	Green frog (2) Bullfrog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 7 Site Name: Northern South Pine Lane Wetland

Site Location: North part of South Pine Lane (a bit more than 0.1 mile south of CR-A)

Habitat Description: Marshy permanent pond west of road and Lake Alice emergent wetland on east of road. Surrounded by woods and shrubs.

Site Photo: None available

SITE 7 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species/index)	Spring peeper (3)	Spring peeper (3) Green frog (2)	Green frog (1) Bullfrog (1)
Notes	Likely erroneous determination of Cricket frog at this site (will check in Spring 2011)		

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 7 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	62°F	62°F	68°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Leopard frog (1)		American toad (3)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 7 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	52°F	68°F	69°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (1)		Green frog (2) Bullfrog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 8 Site Name: Southern South Pine Lane (L. Alice wetland)

Site Location: South part of South Pine Lane (approx. 0.7 mile south of CR-A)

Habitat Description: Lake Alice emergent wetland (lots of pickerelweed)

Site Photo: See inset

SITE 8 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Neil and Carol Pietenpol, Dave and Linda Barrow	Neil and Carol Pietenpol, Bruce Orader	Neil and Carol Pietenpol, Dave and Linda Barrows, Bruce Orader, Dale and Joan Zutz
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	1	0
Sky	0	1	0
Begin Air Tmp	47°F	70°F	70°F
End Air Temp	38°F	62°F	64°F
Observations (species, call index)	Spring peeper (1)	Spring peeper (1) American toad (3)	Green frog (3) Bullfrog (3)

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 9 Site Name: Pine Creek (L. Alice wetland at mouth of creek)

Site Location: CR-H crossing of Pine Creek (approx. 90 yards north of CR-D)

Habitat Description: Lake Alice floating and emergent plant wetland at mouth of creek.

Site Photo: See inset

SITE 9 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Neil and Carol Pietenpol, Dave and Linda Barrow	Neil and Carol Pietenpol, Bruce Orader	Neil and Carol Pietenpol, Dave and Linda Barrows, Bruce Orader, Dale and Joan Zutz
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	1	0
Sky	0	1	0
Begin Air Tmp	47°F	70°F	70°F
End Air Temp	38°F	62°F	64°F
Observations (species, call index)	Wood frog (1) Spring peeper (1) Northern leopard frog (1)	Spring peeper (2) American toad (3)	Green frog (2) Bullfrog (1)

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 9 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	60°F	62°F	64°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Spring peeper (2)	Spring peeper (1)	Green frog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 9 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	55°F	64°F	63°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (3) Spring peeper (2) Leopard frog (2) American toad (1)	Chorus frog (3) Spring peeper (3)	Green frog (1) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 10 Site Name: Pine Shore Lane Pond

Site Location: Pine Shore Lane (one quarter mile south of CR-A)

Habitat Description: Permanent pond with emergent plants and surrounding forest.

Site Photo: None available

SITE 10 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Glenn Mott, Mike Sigl	Glenn Mott, Mike Sigl, Hank and Andrea Michaud	Glenn Mott, Mike Sigl, Hank and Andrea Michaud
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	0	0
Sky	0	0	0
Begin Air Tmp	47°F	70°F	68°F
End Air Temp	40°F	62°F	65°F
Observations (species, call index)	Spring peeper (1) American toad (1)	American toad (3) Green frog (3)	Green frog (1) Bullfrog (1)
Notes		Toads & green frogs so loud as to obscure other sounds	

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 11 Site Name: Green Meadow Lake

Site Location: Approx. 0.1 mile south of CR-H

Habitat Description: Shallow, marshy lake, lots of floating and emergent vegetation.
Site Photo: See inset

SITE 11 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Neil and Carol Pietenpol, Dave and Linda Barrow	Neil and Carol Pietenpol, Bruce Orader	Neil and Carol Pietenpol, Dave and Linda Barrows, Bruce Orader, Dale and Joan Zutz
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	1	0
Sky	0	1	0
Begin Air Tmp	47°F	70°F	70°F
End Air Temp	38°F	62°F	64°F
Observations (species, call index)	Spring peeper (2) American toad (2)	Wood frog (1) Spring peeper (2) American toad (3)	Green frog (1) Bullfrog (1)
Notes	May 22 seems late for wood frog (could be misidentified)		

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 11 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	70°F	70°F	77°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Spring peeper (1)		Green frog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

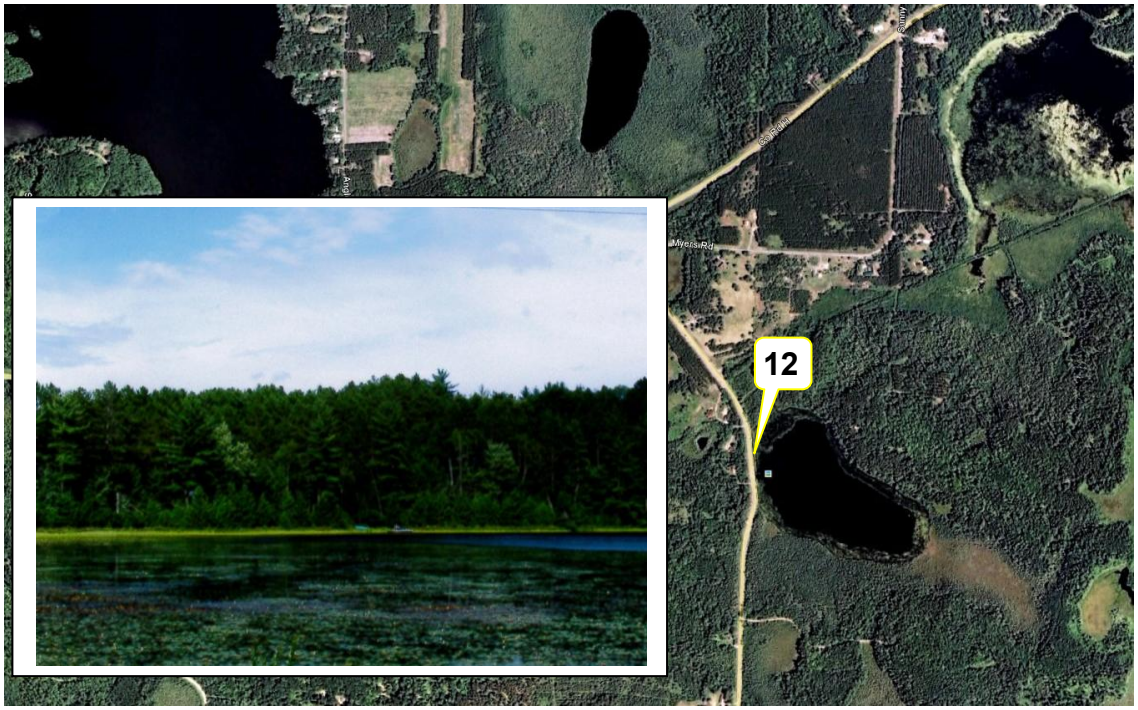
SITE 11 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	59°F	69°F	66°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (3)	Green frog (1)	Green frog (1) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 12 Site Name: Bass Lake and adjacent wetland

Site Location: CR-H about, 0.5 miles south of intersection of CR-H and CR-D



Habitat Description: Shallow, marshy lake, lots of floating and emergent vegetation.
Site Photo: See inset

SITE 12 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Neil and Carol Pietenpol, Dave and Linda Barrow	Neil and Carol Pietenpol, Bruce Orader	Neil and Carol Pietenpol, Dave and Linda Barrows, Bruce Orader, Dale and Joan Zutz
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	1	0
Sky	0	1	0
Begin Air Tmp	47°F	70°F	70°F
End Air Temp	38°F	62°F	64°F
Observations (species/index)	Spring peeper (2)	Spring peeper (2)	Green frog (2)
Notes	May 22 seems late for wood frog (could be misidentified)		

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 12 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	74°F	--	--
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)			Green frog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 12 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	59°F	70°F	72°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)		Spring peeper (2)	Green frog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 13 Site Name: Angler's Lane Landing (L. Alice wetland)

Site Location: Angler's Lane Boat Landing on Lake Alice

Habitat Description: Lake Alice emergent wetland and wooded riparian area

Site Photo: See inset

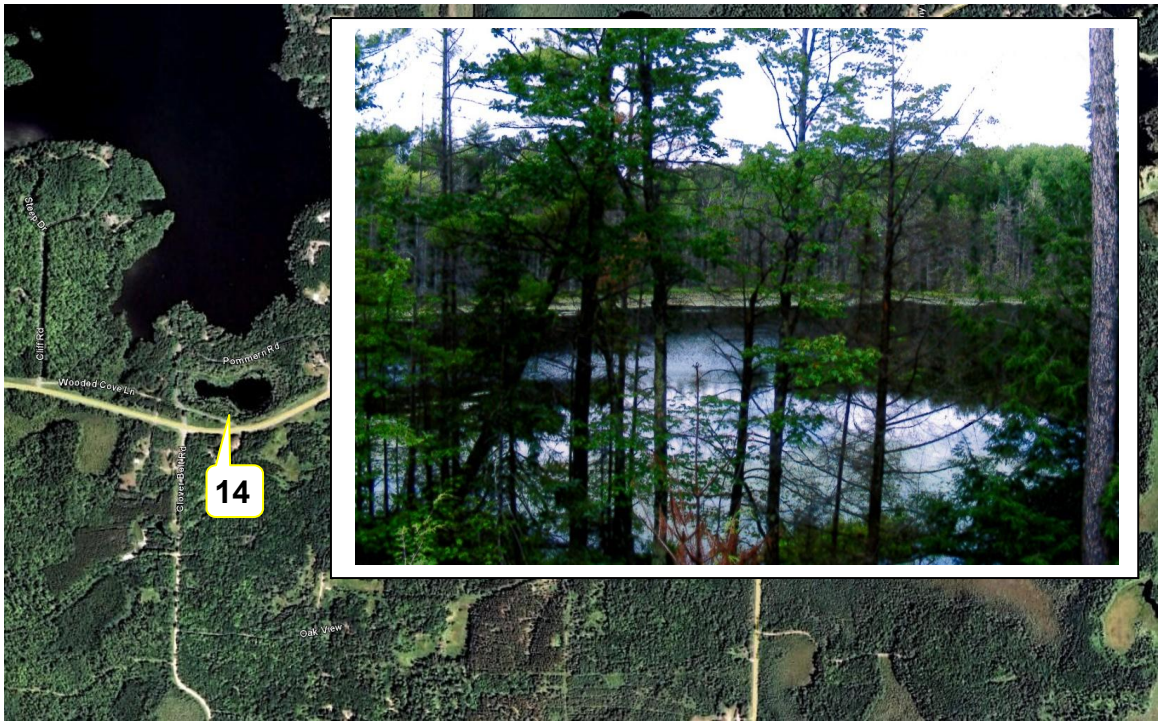
SITE 13 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Neil and Carol Pietenpol, Dave and Linda Barrow	Neil and Carol Pietenpol, Bruce Orader	Neil and Carol Pietenpol, Dave and Linda Barrows, Bruce Orader, Dale and Joan Zutz
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	1	0
Sky	0	1	0
Begin Air Tmp	47°F	70°F	70°F
End Air Temp	38°F	62°F	64°F
Observations (species/index)	No calling	No calling	Green frog (2 Bullfrog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 14 Site Name: Pommern Pond

Site Location: Immediately north of CR-D (30 yards) and south of Pommern Road



Habitat Description: Secluded pond, floating & emergent plants, wooded riparian area

Site Photo: See inset

SITE 14 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Neil and Carol Pietenpol, Dave and Linda Barrow	Neil and Carol Pietenpol, Bruce Orader	Neil and Carol Pietenpol, Dave and Linda Barrows, Bruce Orader, Dale and Joan Zutz
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	1	0
Sky	0	1	0
Begin Air Tmp	47°F	70°F	70°F
End Air Temp	38°F	62°F	64°F
Observations (species/index)	Spring peeper (3)	Spring peeper (2) American toad (3)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 14 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	64°F	--	--
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Wood frog (1) Chorus frog (3)		Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

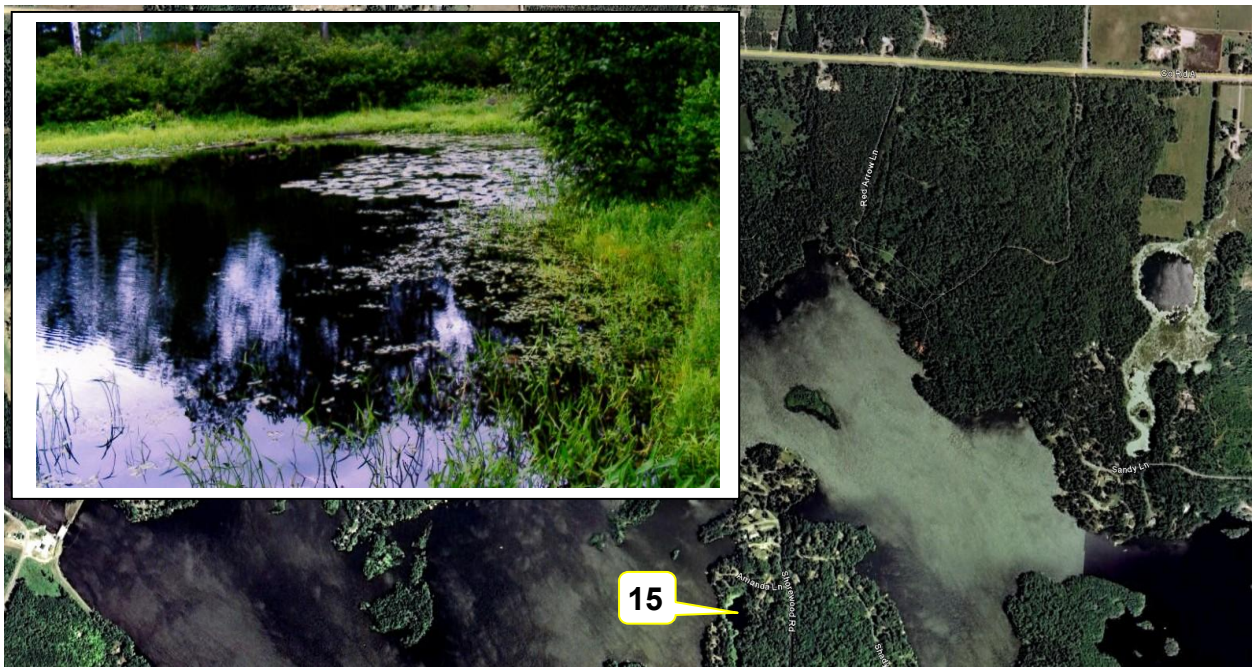
SITE 14 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	--	--	--
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (3) American toad (1)	Chorus frog (2) Spring peeper (2) Green frog (2) Bullfrog (1)	Green frog (2) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 15 Site Name: Spring Pond

Site Location: Immediately south of Amanda Lane



Habitat Description: Permanent small pond, floating & emergent plants, wooded margin

Site Photo: See inset

SITE 15 - Field Results for 2010 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	April 22, 2010	May 20, 2010	June 8, 2010
Observers	Neil and Carol Pietenpol, Dave and Linda Barrow	Neil and Carol Pietenpol, Bruce Orader	Neil and Carol Pietenpol, Dave and Linda Barrows, Bruce Orader, Dale and Joan Zutz
Begin Time	8:30 PM-CT	9:00 PM-CT	9:30 PM-CT
End Time	10:00 PM-CT	10:30 PM-CT	10:50 PM-CT
Water Temp	58°F	68°F	77°F
Wind	0	1	0
Sky	0	1	0
Begin Air Tmp	47°F	70°F	70°F
End Air Temp	38°F	62°F	64°F
Observations (species, call index)	Spring peeper (1)	Wood frog (1), Spring peeper (2), American toad (3), Green frog (1), Bullfrog (1)	Green frog (2) Bullfrog (1)
Notes		Seems late for wood frog (could be misidentified)	

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 15 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	56°F	72°F	71°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)			
Notes			Green frog (2) Bullfrog (1)

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Lake Alice Watershed Frog & Toad Survey - Site Data Summary

Site Number: 16 Site Name: Horseshoe Pond

Site Location: Off Horseshoe Road about 0.25 mile south of CR-A

Habitat Description: Permanent small pond, floating & emergent plants, wooded margin

Site Photo: None available

SITE 16 - Field Results for 2013 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 7, 2013	June 3, 2013	July 9, 2013
Observers	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei	Glenn Mott, Fred Brach, Wayne Allen, Bruce Oradei
Begin Time	8:30 PM-CT	8:30 PM-CT	9:15 PM-CT
End Time	10:30 PM-CT	10:00 PM-CT	10:35 PM-CT
Water Temp	64°F	62°F	64°F
Wind	1	2	0
Sky	01	2	0
Begin Air Tmp	63°F	55°F	72°F
End Air Temp	52°F	54°F	68°F
Observations (species, call index)	Spring peeper (2)	Green frog (1)	Green frog (1) Bullfrog (2)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

SITE 16 - Field Results for 2014 Lake Alice Stewardship Program Frog/Toad Survey			
	First Run	Second Run	Third Run
Date	May 13, 2014	June 3, 2014	July 8, 2014
Observers	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett	Glenn Mott, Fred Brach, Wayne Allen, Ron Miller, Jerry Bennett
Begin Time	8:00 PM-CT	9:00 PM-CT	9:15 PM-CT
End Time	9:45 PM-CT	10:15 PM-CT	10:25 PM-CT
Water Temp	62°F	72°F	69°F
Wind	0	0	0
Sky	2	2	2
Begin Air Tmp	55°F	65°F	55°F
End Air Temp	50°F	58°F	63°F
Observations (species, call index)	Chorus frog (3) Spring peeper (2) Leopard frog (1)	Chorus frog (3) Spring peeper (2) Eastern gray treefrog (1) Bullfrog (1)	Green frog (1) Bullfrog (1)
Notes			

Call index: 1=individuals can be counted, there is space between calls (no overlapping of calls); 2=calls of individuals can be distinguished but there is overlapping of calls; 3=full chorus, calls are constant, continuous, and overlapping, individual calls cannot be distinguished. **Wind Codes**: 0=less than 1mph, 1=1 to 3mph, 2=4 to 7mph, 3=8 to 12mph, 4=13 to 18mph. **Sky Codes**: 0=clear or a few clouds, 1=partly cloudy or variable, 2=cloudy (broken) or overcast, 4=fog, 5=drizzle, 6=showers

Appendix H
Review of Water Regulations and Planning

Review of Water Resource Regulations and Planning Relevant to Lake Alice

In this appendix, we provide reviews of documents created to preserve and protect Wisconsin waters, including Lake Alice. These reviews were developed from documents created by a variety of sources, including: the Environmental Protection Agency, the Wisconsin Administrative Code, the Wisconsin Department of Natural Resources, the Lincoln County Planning and Zoning Department, the Lincoln County Land and Water Conservation Department, and the Lincoln County Board.

The first part of this appendix is a review of the federal, state and county regulations and ordinances that influence the water quality of Lake Alice. The second part of this Appendix is a letter sent to the Lincoln County Land and Water Conservation Department, providing recommendations to enhance an already well-documented and comprehensive *Lincoln County Land & Water Resource Management Plan.*

Regulations and Ordinances that Protect Lake Alice Water Quality

Federal

The Army Corps of Engineers oversees projects that alter waterways-including discharges to wetlands, and the Environmental Protection Agency (EPA) regulates water quality pollution and drinking water standards. The EPA revised The Clean Water Act in 1972 in order to reduce pollutant discharges into waterways and mange polluted runoff. It has set waste water standards for industries, and for all contaminants in surface waters. The Clean Water Act deemed it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. You can view parts of the Clean Water Act at the EPA's website (http://www.epa.gov/npdes/pubs/cwatxt.txt).

State

For any given lake in Wisconsin, shoreland protection regulations can be set by the county, town or lake association; however, they must *at least* follow the regulations listed under the State of Wisconsin's Administrative Code, Chapter NR115: Wisconsin's Shoreland Protection Program. The purpose of this Program is to: "establish minimum shoreland zoning standards for ordinances…and to limit the direct and cumulative impacts of shoreland development on water quality; near—shore aquatic, wetland and upland wildlife habitat; and natural scenic beauty" (NR115). This document states that a setback of 75 feet from the ordinary high-water mark (OHWM) of any navigable waters is required for all buildings and structures. It also states that the county will be in charge of establishing ordinances that consider the effect of vegetation removal on water quality, including soil erosion, and the flow of effluents, sediments and nutrients. Lastly, it says that a minimum of 35 feet vegetative buffer zone is required from the OHWM.

Changes to the Wisconsin Administrative Code have limited the amount of phosphorus running off into waterbodies. Chapter 151 now restricts the amount of phosphorus farmers can have come off their fields. Moreover, in 2009-2010, Wisconsin legislatures passed laws so that fertilizers with phosphorus would be banned from use on lawns or turfs, and that phosphorus levels in dishwater detergent were reduced considerably.

The Wisconsin Department of Natural Resources (WDNR) has developed the Wisconsin Pollutant Discharge Elimination System (WPDES) program. This program regulates the discharge of pollutants into waters. Types of permits issued are: individual, general (including ballast water discharge, pesticide pollutant discharge, etc.), storm water and agricultural.

The WDNR also requires permits for specific aquatic plant control techniques. Permits are required for aquatic plant control when: chemicals are used, biological controls are used, and physical techniques (such as barriers) are used; when wild rice is involved; when plants are mechanically removed, or when plants are removed from an area greater than 30 feet in width along a shoreline (http://dnr.wi.gov/lakes/plants/).

Personal Watercrafts (PWCs) are restricted to slow, to no-wake speed when within 200 feet of a shoreline, while boats must be at slow, to no-wake speed within 100 feet. These regulations can be more stringent under county or town ordinances.

County

Regulations and ordinances set by Lincoln County can be found in the Lincoln County Code of Ordinances, Chapter 21: Shoreland Zoning. This document provides detailed information about zoning and planning near shoreland areas. The following is a brief summary of some of these regulations that inherently protect the water quality of Lake Alice.

According to the Ordinance, Shorelands are defined as lands within 1,000 feet from a lake, pond or flowage; and 300 feet from a river or stream (21.18). In general, all structures are required to be 75 feet from the ordinary high-water mark (OHWM) of a navigable waterbody.

To prevent erosion, Section 21.11 (Soil Disturbing Activities) states that permits are required for soil disturbing activities within 300 feet of the OHWM. These activities include: filling, grading, lagooning, dredging, ditching or excavating. It also states that "soil conservation practices such as tiled terraces, runoff diversions and grassed waterways used for erosion control shall not require a permit when designed and constructed to Natural Resources Conservation Service technical standards." Stairways, walkways and lifts are permitted for pedestrian access to piers or boathouses within the 75 foot setback only when there are steep slopes, or rocky, wet, or unstable soils. This is to prevent the soil from eroding into the lake.

Preserving the native vegetation can also prevent erosion, but can act as a deterrent for pollution runoff. All shoreland cutting and clearing is restricted to at least 35 feet from the OHWM, and can be increased depending on the sensitivity of the lake. Removal of dead, diseased or dying vegetation is permitted within the buffer, but it must be replaced with vegetation that is equally effective in retarding runoff, preventing erosion and preserving natural beauty (21.09). By keeping this native vegetation, soils are less likely to erode and contaminants are less likely to enter the water.

Local

King Township created an ordinance in 2004 that regulates water traffic, boating and water sports upon the waters of Lake Alice and the Wisconsin River. It says that "the slow-no-wake zones shall be located on that portion of Lake Alice and the Wisconsin River lying 300 feet north and 300 feet south of the County Highway "A" bridge." The purpose of the ordinance is to provide safe and healthful conditions for the enjoyment of aquatic recreation consistent with public rights and interest, and water resource capability.

White Water Associates, Inc.
429 River Lane, P.O. Box 27
Amasa, Michigan 49903
(906)822-7889

Lincoln County Land Information and Conservation Department
801 N Sales Street - Suite 105
Merrill, WI 54452
(715) 539-1049

To whom it may concern:

As ecological consultants, White Water Associates works with lake associations to conduct studies, review data, and create lake management plans. We have helped organizations like *Lake Alice Association* collect water quality data, fisheries data, and invasive species data, and prepare reports conveying these data. We currently have projects with these associations that are funded by the Wisconsin Department of Natural Resources. One of our tasks in these projects was to review the Lincoln County Land & Water Resource Management Plan.[1] The purposes of that review are to (1) determine where our lake management efforts integrate with the county plan and (2) provide input to the county for how future iterations of the plan might better address water resource issues. It is with those purposes in mind that we submit this summary of recommendations for your consideration to further improve an already comprehensive plan.

Organization

I first recommend creating one major heading (Resource Assessment) with two major categories: Land Resources and Water Resources. The Land Resources can incorporate: Land Use, Geology, Soils and Erosion topics, and Water Resources can include: Basins, Watersheds, Rivers, Lakes, and Impaired/Outstanding Waters.

I suggest placing the Geology and Topography section before Land Use so that readers have a mental image of Lincoln County before they continue reading.

Within the Land Use section, creating sub-sections for each land use type would be beneficial. For example: Agriculture, Forest, Water, and Developed Land (which includes residential, commercial, industrial and transportation). This provides a more definitive separation of information where you can relay general information, statistics, regulations, and provide recommendations.

[1] The Lincoln County Land & Water Resource Management Plan used for this review was found at http://www.co.lincoln.wi.us/i/f/file/2010%20LWRM%20Plan%20-%20FINAL.pdf.

The Plan would also benefit from a section dedicated to Wetlands. This could be placed in either the Land or Water Resources sections, and should discuss the positive effects wetlands have on water quality in Lincoln County.

Lastly, I propose that within the Invasive Species section, sub-categories are created for each Terrestrial and Aquatic Species.

The last three recommendations will be described in more detail in the Content section of this review.

Content

If you decide to create sub-sections under the Land Use category, it would be important to describe how much acreage each category covers (and percent coverage). An image, such as a pie chart, would show the Land Use acreages well.

Under the Agriculture sub-section, I recommend listing the types of crops grown, the acreages of those crops, where they are grown in the county, and which crop is most predominant. Since there is cranberry farming in Lincoln County, I suggest describing the methods used to harvest cranberries and the potentially harmful impacts it can have on nearby water resources. Mentioning the NRCS Nutrient Management Conservation Practice Standard (the "590 Standard") would be prudent.

Under the Forestry section, I recommend talking about forest management (including timber harvesting and Christmas tree harvesting) and the specific soil erosion concerns stemming from silvicultural activities.

Within the Developed Land section, I suggest providing acreages of residential, commercial, industrial and transportation areas. This would be a good place to take advantage educating the community as to how these areas can negatively impact the water resources around them. You could also provide predictions of population increases or decreases and explain how that might affect the water quality.

The Soils section is already very thorough; however, a sentence or two describing the groundwater's susceptibility to contamination from point and non-point sources would be educational.

Similarly, the Impaired Waters section would benefit from a few sentences describing the priority level of clean-up on those waters.

Within the Rivers section, if there are any rivers associated with the Northern Rivers Initiative (NRI), here would be a good place to inform the reader about NRI, and list the rivers involved.

Within the Shorelands section, you might take advantage of a nice educational opportunity by explaining why implementing the Shoreland Zoning Ordinance is necessary, and what benefits might come of it. It helps to reiterate why development within a certain distance of the shoreline is not desirable.

In a similar educational manner, if you decide to create a Wetlands section, you might take advantage of explaining why wetlands are so important to the quality of our water resources. For example, how they positively affect water quality and how wetland plants can take up and store pollutants, which results in cleaner waters. I also recommend stating the acreage of wetlands in the county, and make references to the Clean Water Act (Section 404) in regard to wetland protection.

A third educational opportunity you could take advantage of is to add more information to the Invasive Species section. In general, invasive species are detrimental to the native communities around them, but describing in detail how aquatic and terrestrial invasives species specifically affect the water quality of nearby waterbodies is also important. In each Aquatic and Terrestrial Invasive Species sections, I recommend first speaking generally about these species, list which are found in Lincoln County, and provide a short paragraph (and picture) for each species. In that paragraph, address how they arrived, how they are spread, how they affect the native community, why it's a concern to the water quality, and in which lakes in Lincoln County they are found.

Lastly, since you have a map illustrating where the Impaired Waters are located, it would also be beneficial to have a map showing where the Outstanding and Exceptional Resource Waters are found.

I was very impressed with the detail you have incorporated in this plan. It is thorough and comprehensive. I am sure it serves the residents of Lincoln County well. If you have questions or comments regarding my recommendations, please contact me at the phone number given above.

Sincerely,

Caitlin Clarke
Biologist

Appendix I
Lake Alice History

A LAKE NAMED ALICE [1]

Prepared by Dave Barrows, Lake Alice Association

Dean Premo Ph.D. noted, in the **Lake Alice Stewardship Program: Phase 1**, that you have to view and study Lake Alice as part of a larger landscape, if you are going to effectively understand it and the tightly connected ecological system of which it is a part.[2] The same is true of the history of Lake Alice.

When we purchased our place on Lake Alice, we were excited and curious. My wife asked, "How did Alice get its name?" [3] We did not find out the answer to this question until almost seven years later, but that simple question lead to learning a fascinating story of glaciers, Indians, French *voyageurs* and *coureurs de bois,* lumberjacks, lumber barons and much more.

OF ICE & TIME

In Northern Wisconsin, we live in a landscape that was shaped by ice. In Canada, unmelted snow accumulated and compacted into ice thousands of feet thick. Between 50,000 and 10,000 years ago, this ice pushed southward in finger-like lobes called glaciers. Several of these glaciers advanced across the immense rock dome, the Northern Highland rock shield that extends down from Hudson Bay to cap northern Wisconsin. The part of the glacier that covered all of Oneida and Vilas counties and nearly two thirds of the of the upper part Lincoln County, is known as the Chippewa lobe.[4] For those living around Lake Alice today, it is interesting to try imagine seeing an endless wall of ice a mile high, looming over us, rather than our beautiful lake views.

Our landscape was for the most part not created by the glaciers advancing and gouging out lakes or rivers out of the bedrock of the rock shield. The landscape we enjoy and marvel at today was created when

[1] **Cite as:** Barrows, Dave. 2009. A Lake Named Alice. i.p. of D.B.B.
[2] Premo, Dean and Kent Premo. 2009. Lake Alice Stewardship Program: Phase 1. pg 13-14
[3] **Dave** and Linda **Barrows** purchased their home, WeGotAway in 10/02
[4] Jones, George. 1924. History of Lincoln, Oneida and Vilas Counties. pg.13

the glaciers began to recede and blanketed the land with debris that it had picked up and carried in its descent into northern Wisconsin. When a glacier stopped advancing, the ice along its front edge melted as the ice behind it was pushed forward, depositing its sand, rock and gravel in ridges called moraines. Huge chunks of ice that had broken off and suspended in the debris, melted to form distinctive features, such as potholes and kettles.

Another way the contents of glaciers spread over the land occurred when the water streaming from their melting base carried sand, gravel and stone, depositing material to form an outwash plain. The Northern Highland Pitted Outwash extends from the Winegan Moraine along the upper Michigan border to Harrison Hills in northeast Lincoln County and includes the Northern Highland American Legion State Forest, most of Oneida and Vilas county forests and the northern units of the Lincoln County Forest. [5]

A mile high glacier exerted a pressure over a thousand tons per square yard, and it actually pushed the ground beneath below the water table as it advanced. As the glaciers retreated, some of the compressed ground began to rise. As in the moraines, huge ice chunks deposited in the outwash plain melted to form potholes, hollows and kettles. Water filled these depressions, creating some of the numerous kettle lakes in the Northern Highland Pitted Outwash region. Other lakes were formed by glacial debris damning streams. In this region, Vilas County has the greatest number of lakes. Oneida comes next. While in Lincoln County, lakes are not as numerous and chiefly found in its northern portion in the vicinity of Tomahawk, which may be regarded as the gate way into the lake region.[6]

Many of the Highland glacial lakes are small, irregular in shape and often interconnected by streams, creating an enchanting network of water. The rambunctious Wisconsin and Tomahawk rivers also originate in this outwash. The glaciers left the Highlands a rare and beautiful concentration of lakes, rivers and streams. Only in two other areas on earth, southern Finland and the Minnesota-Ontario boundary waters, contain as many lakes per square mile.

[5] Willow Flowage Scenic Waters Area Master Plan Draft. May, 2000; Wisconsin Department of Natural Resources, pgs. 86

[6] Jones, George O. 1924. History of Lincoln, Oneida and Vilas Counties Wisconsin. pg.15, 19

In the Highland region, the soil types vary greatly over short distances because of the capricious way the glaciers dumped their material. Much of the massive deposits of sandstone that the glaciers carried into Wisconsin was ground down and then broken down by weather into a poor, sandy soil.[7] Lincoln County has more farmland and developed its agriculture much more quickly than Vilas or Oneida because it was only partially covered by the glacier in its northern area.

The glaciers scoured all vegetation in their path, leaving an infertile, barren wake. It was the hardy jack pine, called the cactus of the north because of its ability to grow in sandy soil that took root in the Highlands. The organic matter from the jack pine eventually made it possible for white and red pine to take hold as well. It was the start of the magnificent coniferous forest that would play an important role in the region's history. Spruce, fir, cedar, hemlock and tamarack found niches in which to flourish. Beach and maple also gained a foothold.

THE WILDERNESS

As the glaciers receded, prehistoric Indians followed and hunted caribou and other animals that thrived in the cold, moist ecosystem of the glacial rim. About the time of the birth of Christ, a large community of Indians in southern Wisconsin traded with another Indian culture in northern Wisconsin for copper tools and goods.[8] These and other Indian cultures came and disappeared. In latter part of the seventeenth century, Ojibwa immigrated from the mouth of the St. Lawrence to the east and began fighting for control of the Wisconsin area with the resident Sioux. Eventually, the Ojibwa (also Ojibway or Ojibwe) became the dominant tribe in northern Wisconsin, but flare-ups and fighting with the Sioux continued as late as 1862.[9] The Ojibwa are also commonly referred to as

[7] Premo Dean, and Kent Premo. 2009. Lake Alice Stewardships Program: Phase 1. pgs. 19-20 Describes the type of soil around Lake Alice as being only Type A (sandy types) and Type B (loam).
[8] Mizaga, Vicki. 1988. The First 100 Years. Don Walker. pg.12 The climax of copper manufacturing in northern Wisconsin was from 200 B.C to A.D. 700 B.C. the southern Indian culture had collapsed.
[9] American Guide Series. 1941.Wisconsin. Hastings House. pgs. 26-31. In 1634, there was only one tribe of Algonquian stock residing in Wisconsin, the Menominee, who still reside west of Green Bay. Other branches of the Algonquian people, the Ojibwa, Ottawa and Potawatomie, were forced west into Wisconsin by the fierce Iroquois confederation. By 1654 Fox, Sauk, Miami, Huron and Kickapoo

the Chippewa, a European phonetic corruption of their name.[10] Different communities of Ojibwa were identified with specific names, such Lac du Flambeau and Lac Coutre Oreilles. The Ojibwa are by far the largest tribal group in Wisconsin today.

The French were the first Europeans to set foot in Wisconsin. Jean Nicolet was sent in 1634 to find an easy waterway leading to Pacific Ocean and trade with China and India. Nicolet did not find the fabled passage, but did open up the exploration of a new land and contact with its inhabitants.

In 1660, Father Rene Menard, the first missionary in Wisconsin, was paddling down the upper portion of the Wisconsin River, when he elected to walk around a portage, while his companion took their small craft through the water. Father Menard never emerged from the woods and was never seen again. His cassock and kettle were later found in a Sioux lodge and it is probable that he was murdered.[11] Appropriately, an island accessible from Lake Alice by going under the Highway A Bridge and up the Wisconsin River has been renamed Menard's Island.

The French interest in Wisconsin may have started with hope of a northwest passage to the orient or a desire to do missionary among the Indians, but it soon focused on a more profitable venture, the fur trade. Although pelts from animals, such as the black bear and martins, commanded the best price, it was the numerous beaver and their pelts used to make fur hats was the bulk and back-bone of the fur trade. The fur trade brought European goods into the north woods. It also resulted in unions between the French traders and Indians. French surnames are not unusual among the Ojibwa.[12]

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fled into Wisconsin too. There was immediate enmity between them and the resident Siouan tribes: Dakota, Iowa and Winnebago.

[10] Mizaga, Vicki. 1998. The First 100 Years…pg. 4 The Ojibwa originally called themselves the *Anishinaabe*, meaning "Human Beings" or "The People." Ojibwa means "puckered" and refers to how the tops of their moccasins were stitched.

[11] American Guide Series. 1941. Wisconsin. Pg. 2, 31

[12] Jones, George O. .History of Lincoln, Oneida and Vilas Counties Wisconsin. 1924. H.C. Cooper, JR. & CO. pgs.6-8.French were not accepted by every Indian tribe. The fierce Fox, and their confederates, the Sauk, Mascouten and Kickapoo, waged war against the French for thirty years in Wisconsin until 1740, and their hostility blocked the French from exploiting the Fox-Wisconsin waterway. In close proximity, the Fox River accessed the Great Lakes, while the Wisconsin flowed into the Mississippi River so this area was of great strategic importance. The French and Indian war, began in1754 and ended in 1763, gave England control of Canada and the Northwest territory. French *voyageur*s and *coureurs de bois* were employed by the British and traded with the superior British

By the mid 1800's, the beaver population in northern Wisconsin was pretty well decimated and beaver hats went out of fashion in Europe.[13] A few independent traders and posts remained, but northern Wisconsin was basically deserted until after the Civil War and the start of the lumber industry in late 1800's. The Ojibwa, who had become dependent of trade goods had to fend for themselves. There were a series of treaties with the American government, that promised provisions and annual payments, but these commitments were often not kept.[14]

The Treaty of 1854 established Ojibwa reservations in Wisconsin. But into the 1880's, scattered Indian settlements were found off reservation. There are accounts from this time of large bands of a hundred or more Indians riding into Tomahawk on horses to set up camp. Chee-kee-gwa, or Indian Pete, was well known personality and Ojibwa leader. Until his death 1905 at his cabin seven miles north of the city, Indian Pete led large processions of Indians into Tomahawk on the 4th of July. The town residents enjoyed watching the Indians staging pow-wows with drums and dancing along the river.[15] The current 4th of July celebration in Tomahawk is called Pow-Wow Days, recalling a time when Indian drums reverberated through the town and across the water.

Over a hundred years after the signing, the terms of the Wisconsin Indian treaties were still under contention. In 1983, the courts determined how Indian treaty rights to hunt, fish and gather off reservation on the lands ceded by the tribes in the original treaties were to be implemented. Although created well after the original treaties,

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goods. French remained the European language of the Wisconsin woods. In 1763, Pontiac, an Ottawa chief, united the tribes between the Allegheny Mountains and the Mississippi in a revolt lasting three years. For the most part, Wisconsin tribes refused to participate in the uprising.

[13] Jones, George. History of Lincoln…pg. 7. The yearly harvest of Wisconsin fur amounted to 500 to 600 packs, valued at a quarter of million dollars, but the dishonesty of payment and poor quality goods from the French caused trouble with tribes like the Fox and their allies.

[14] American Guide Series. 1941. Wisconsin .pg. 32-34 The British ceded the northwest to America in 1783, but the British maintained their control over the tribes in Wisconsin and American influence was nominal. In the War of 1812, Scotch/British fur traders, voyageurs and Indians captured American out posts Mackinac and Prairie du Chien. By 1816, American authority was established and the British trade monopoly was broken. American settlement moved in aggressively. Grievances between Indians and white settlers climaxed in the tragic Black Hawk War of 1832 which ended Indian resistance of white expansion into Wisconsin. Thereafter the tribes ceded to the United States much of their land. Between 1825 and 1837, many Indian tribes were relocated west of the Mississippi. By 1856, Indian title to Wisconsin lands covered only a few reservations.

[15] The Tomahawk Area Historical Society. Remembering Yesterday. pgs. 9-10, 20, 54, 56.

Lake Alice is in the ceded territory and subject to all the ramifications of Lac Courtre Orelilles vs. Keist.

ENTERPRIZE IN THE PINES

The Forks, at the confluence of the Tomahawk, Somo and Wisconsin Rivers, was an attractive site at which Indians visited and camped. In 1858, Germaine Bouchard operated a ferry and tavern where the Tomahawk and Somo Rivers ran into the Wisconsin. Fur traders and Indians frequented Bouchard's outpost, which was called Tomahawk because the shape of a near-by lake resembled an axe blade.[16] This was the extent of the habitation, until the arrival of the Tomahawk Land and Boom Company that was organized by William H. Bradley in 1881. In the spring of 1886, the city of Tomahawk was surveyed and laid out with its lots up for sale in Milwaukee in 1887. The **Lincoln County Advocate** noted in its July 16, 1887 edition:

> *It is a clearing in the woods, an opening in the heart of the great pinery, 25 miles due north of Merrill. The great jumping off place; it is on the Wisconsin River, away up where the logs come from – where the raging Tomahawk River comes cutting and scalping its way through the rough hard pan, eagerly scampering to join the waters of the "old Wisconsin" previous to their break neck plunge down the confined falls of the Grandfather Bull…northern Wisconsin is "pointing with pride" to the remarkable career of Tomahawk.*

Tomahawk became a bustling town, a startling and remarkable over-night achievement, due to the vision and drive of W. H. Bradley. This lumber baron saw the Somo, Spirit, Tomahawk and Wisconsin Rivers as highways for massive flotillas of logs to be carried down to hungry sawmills. At conflux of these rivers, he could build not just a town, but an empire.

William H. Bradley was born in Bangor, Maine, in 1838, and was a teenager when he came west with his father to find their fortunes in the vast stands of lumber in Michigan and Wisconsin. When he arrived in Tomahawk 1887, "Colonel" William Bradley was already very

[16] American Guide Series. 1941 Wisconsin. Pg. 379

successful businessman. A large, imposing man, he was called "Big Bill" by his mill workers. He had a long gray beard that gave him a patriarchal look. Impeccably groomed, he usually wore gray suits and always had a black cane topped with a gold handle in hand.

The Bradley Bank was started by William H. and, his brother, James W. Bradley in a small wooden building when Tomahawk was little more than a clearing in the woods. The first officers were: J.W. Bradley, president; Robert B Tweedy, vice president; and John W. Frohlich, cashier.[17]

Robert B. Tweedy was the son-in-law of the third Bradley brother, Edward Bradley.[18] As the Bradley enterprises grew rapidly to include mills, a large box factory, tannery, electric generating dams, farms, grist mill, mercantile stores, the elegant Mitchell Hotel and other concerns, R.B Tweedy took on increasing responsibilities in the management of the Bradley interests, which would lead him to having a major role in the creation of Lake Alice.

UP RIVER AT A PLACE CALLED KING'S

While "Big Bill" was conducting business or entertaining guests in the posh, luxurious amenities of the Mitchell Hotel in Tomahawk, Lisum King and his wife operated a rustic station, three miles east on the Wisconsin River where an old military road, running north to Eagle River, crossed the river by a ford.[19] Their clientele consisted lumberjacks, log drivers and "river rats," who stopped here to sort out the logs that they had floated down the river, and travelers, arriving with wet feet after wading across the river. Both enjoyed Mrs. King's warm food and lodging, if they needed it.

[17] Jones, George O. History of Lincoln, Oneida and Vilas Counties Wisconsin…..pg
[18] Of the three Bradley brothers, William was the only one to spend any significant time in Tomahawk.
[19]While W.H. Bradley was the quintessential Yankee entrepreneur, the Kings were of French Canadian and Indian descent. This racial combination is some times referred to as Métis, meaning mixed in French. Originally used in Manitoba, Canada referring to a people of French and Cree Indian extraction, who rebelled in 1869-70, when they were systematically pushed off their land, and forced into to Saskatewan, where they again revolted in the Northwest Rebellion of 1885. Today many people of partial Indian ancestry in Canada and the northern parts of bordering American states, such as Wisconsin and Minnesota, refer to themselves as Métis.

Lisum and his brother, Charlie King, worked as log drivers and were known for their ability to break up log jams.[20] It is hard to imagine how dangerous the work was in the mills, logging camps and, certainly, on the rivers at this time. While guiding huge log flotillas down river, men became suddenly trapped and were crushed, when the crossed, jammed logs unexpectedly shifted. Some were never found, others appeared floating down stream and a few stayed hidden to emerge when the ice broke up following spring. A popular a ballad of the time, lamenting the loss of a young log driver, poignantly asks if anyone knows where their loved one was laid to rest for when a body was found, sometimes it was just buried unmarked "on the spot" and the river drive continued.

Charlie King, some what of a recluse, lived in small, sparsely furnished log shanty that was a couple miles east of Lisum's inn. A typical lumberjack, he would work in the woods or on the river, get paid and then hike into town, where most of his hard earned wages was spent in the taverns. Both King brothers avoided the hazards of their work and lived long lives. Lisum died in 1929 at the age of seventy. Charlie was a well recognized figure around town for many years who died at ninety years (or more) in 1954. [21]

When a dam was built over the ford by Lisum's inn, unlike the lake it created, there was no doubt what to name it. That particular place had been so identified with the family for so long, it was called King's Dam. The road, between the dam and town, undoubtedly the same trail Charlie trekked into Tomahawk for so many years on, was appropriately called King's Road. Along King's Road is Squaw Point where Chee-kee-gwa's, Indian Joe's, wife is believed to be buried.

Today, the water is too swift and dangerous to ford below the dam. A portage has been installed around King's Dam to allow canoe and kayak enthusiasts to continue on down the river. As they carry their crafts around the dam to head down river into Tomahawk, it is a reminder of a time when this particular stretch of the river was active with log drives, settlers and travelers passing back and forth and stopping over at a place called King's.[22]

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[20]The Tomahawk Area Historical Society. Remembering Yesterday…..pg.73

[21] Remembering Yesterday…pg.73

[22] **LINCOLN COUNTYY OUTDOOR RECREATIONAL PLAN** notes that while the number of residents that canoe or kayak is much less than those power boating, canoeing and kayaking

DAMMING CREATES OPPORTUNITY AND A LAKE

In its heyday, the annual cut of Tomahawk was between sixty to seventy-five million board feet of lumber and some 25 million shingles. The stands of old white pine were harvested until today there are very few virgin stands of pine in northern Wisconsin.[23] Pulp and paper production was seen at that time as a way to diversify. Upon W.H. Bradley's death in 1902, Robert B. Tweedy took over management of the Bradley holdings.[24] Just as Bradley, Tweedy built, sold and bought a number of businesses and was a dynamic force in the area's economy. In 1909, the Bradley Company under Tweedy's guidance began construction the King's Dam. [25]

Newspaper articles from **The Tomahawk** communicate the excitement and anticipation of the dam and new mill.[26]

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participants are the fastest growing having increased by 413.7%. From on line, **Wisconsin River Centennial Trail: Rhinelander to King's Dam** notes for kayakers:: Miles 080 – 082 (eighty miles from the headwater of the Wisconsin River) Rhinelander to USH 8; miles 082-087 USH 8 to Hat Rapids (attractive); miles 087-091 Hat Rapids to Whirlpool Rapids(natural, scenic riffles, Class II rapids, then minor rapids); miles 091-099 Whirlpool Rapids to County A Bridge (fast water ends at Menards Island); miles 099-104 County A Bridge to Kings Dam (heavy boating & challenging west winds. The County A Bridge is where Lake Alice is considered to begin.

[23] White pine has a lifespan much longer than most trees. The white pine would grow to towering heights over 100 feet and their crowns would shade out competition, as well cause their sun starved side braches to fall off, producing tall straight trunks. Storms, drought, ice, fire, insects and diseases punched out holes in the pinery, allowing for a more diverse forest. Some of the white pine taken cut by loggers in the 1800's was over 400 years old. Pine floats very well and vast amounts were moved over the area's rivers. Most of the larger pine tree today date form the 1800's and are 90 to 100 years old.

The harvesting of the pinery allowed for a more diverse & colorful forest, as well as causing the white tailed deer population to grow immensely, according to Robert Willging, author of **On the Hunt: the History of Hunting in Wisconsin**, during a reception on Sept. 28, 2009 at the Tomahawk Library.

[24] On his death, W.H. Bradley had been a generous benefactor giving the schools, parks, churches, newspaper and hospital of Tomahawk a splendid start.

[25] Jones, George, 1924. History of Lincoln…pg. 79 Notes that the dam was build by the Bradley Company in 1909 or 1910, while the newspaper article says the dam is nearing completion in 1911. What was to be Lake Alice had been created in 1910, as the dam construction proceeded and the river was blocked and backed up.

[26] Jones, George. 1924. History of Lincoln… pgs. 71-72. Tomahawk has had a number of newspapers, including the **Tomahawk Blade, The Tomahawk** (1887) and the **Tomahawk Leader,** which published its first issue July 4, 1896. The present **Tomahawk Leader** carries on the tradition of its predecessors and is an excellent weekly newspaper.

The Tomahawk, Nov. 12, 1910:

THE TOMAHAWK is authoritatively informed that the power of the King dam, built by the Bradley Company, will be utilized to drive electric generators which will furnish electrical power…for a pulp mill and a paper mill The new dam will furnish 3,200 horsepower. The mills will be substantially built and the new manufacturing plants will be factors in the furthering the advancement of Tomahawk and development of this part of the country. The dam was built by the Bradley Company, another institution, which is and has been a potent factor in the developing the resources of northern Wisconsin.

The Tomahawk, Feb. 18, 1911 :

MUCH ACTIVITY AT NEW DAM

Pulp Mill Will Be The Most Modern On The River

Dam Will Also Supply Power For Pulp Mill

A trip to the new King Dam two miles east of the city will convince one that something is doing… which means a a whole lot in furthering the advancement and development of the city of Tomahawk and Lincoln County.[27]

The dam which is conceded to be one of the best and most substantial on the river is about completed, and the and the construction of the new pulp mill is well under way.

These articles show that there was legitimate concern that the boom and growth that Tomahawk enjoyed would evaporate when the timber was exhausted.

The Tomahawk, April 8,1911:

TOMAHAWK'S PULP AND PAPER MANUFACTURING INDUTRIES BUSY

While Tomahawk is known as a lumbering town and there is still an abundance of raw material. Tomahawk is at present a paper manufacturing town… In the early days many were of the opinion that the lumber would soon be

[27] Jones, George. 1924. History of Lincoln… pg. 2. Lincoln County was erected from Marathon County under chapter 128 of the Laws of 1874.
Lincoln County Outdoor Recreational Plan notes: Lincoln County is 584,960 acres, with 15,000 acres in water. 16 townships; 2 cities, Tomahawk in the north and Merrill in the south…

gone and the town… would decrease in population… the Tomahawk Pulp & Paper Company's[28] are at the present Tomahawk's most substantial business enterprise…. the new Pulp mill at King dam will be put into operation in about two weeks… the grinder room… is provided with four water wheels, one is 500 horse power and three of 950 horse power. There are six grinders of the latest type… There is at present About 1500 cords of barked spruce bolts ready for the grinders… The importance of the paper industry in Tomahawk should not be under estimated.[29]

A LAKE NAMED ALICE

The building of King's Dam and the expansion of the pulp industry was so greatly valued that the lake created by the King's Dam was almost given the appropriate name, if not too attractive name, of Pulp Lake. The first trip from the King's Dam up the impounded Wisconsin River was noted in **The Tomahawk,** July 29, 1911:

The first motor boat trip made up the Wisconsin was enjoyed last Wednesday, by Messrs. A.G. Schutte, H.J. Taylor and and Frank Theiler. They went as far as Nigger Island[30]… the water is clear as a mirror, and there is no difficulty in following difficulty in following the channel... It has been has been suggested to name this picturesque body of water Pulp Lake. ***THE TOMAHAWK*** *would be pleased to receive other suggestions.*

The newspaper received many suggestions, but was captivated by one charming account. Robert B. Tweedy, the director of the Bradley

[28] Tomahawk Pulp and Paper Co was built by Anson M. Pride. After 1916, run by Charles B. Pride.
[29] Besides the dam & mill, a spur railroad was built to service the facility. Remnants of the old line can be seen in aerial photographs as a line cutting across the bay behind Pine Island southeast of the dam.
[30] Jones, George O. 1924, History of Lincoln… pg. 80. This offensive name was later referred to and mapped as Negro Island. The name is attributed to black rocks on the island. Folklore has this being an under ground railroad stop, but that is unlikely . Today, it has been renamed **Menards Island.** It is a local landmark, denoting how far motorized craft ascend up the Wisconsin River from Lake Alice. For kayakers, **Menards Isand** is where the fast water ends It is an appropriate setting to recall how Father Menard was lost, while descending the Wisconsin in the 1600's.

business interests, that built the King's Dam, married Edna Bradley, the niece of W.H. Bradley, in Milwaukee in 1891. Their three daughters visited and fished as the new dam was being completed in 1910. They made a tremendous impression on the men working there.

The Tomahawk, August 12,1911:

LAKE ALICE

Many names have been suggested for the name of Tomahawk's new lake above the King Dam, but the name which meets with the approval of a great majority of those interested in naming this beautiful sheet of water is ***Lake Alice****. This name was suggested by a number of men who worked on the construction of the new dam and this is the reason for making their suggestion:*

One day last summer the Misses Alice, Dorothy and Laura Tweedy after watching the men at work for a time decided to try their luck fishing. Miss Alice had a place above the dam as her fishing place, while the other young ladies fished below the dam. Miss Alice was favored with the best luck and when the other two young ladies discovered this one of them said: "Let's go fish Alice's Lake." The workmen heard this and from then on, many of the men referred to the water above the dam as Lake Alice.

So here's all kinds of good luck to Alice while fishing at Lake Alice in the future and may the lake always remain as As beautiful as it is at the present time.[31]

Lake Alice has retained its beauty. Public access for fishing from shore on the King's Dam property allows current anglers to enjoy a day of fishing, just as Alice and her sisters did a hundred years ago.

Less then a month after the first boat trip up Lake Alice and the Wisconsin River, there were numerous sightseers and fisherman boating

[31] This article, as well as the others cited here from **The Tomahawk**, were found by our fellow Lake Alice Association board members**, Andrea and Hank Michaud**, who located them after viewing page
after page of old newspapers at the Tomahawk Public Library. Thanks to their patience, we know not just how Lake Alice got its name, but the excitement of the building of the dam and how early travelers on the lake were impressed by its beauty.

on Lake Alice. The fisherman were interested reaching previous hard to get to the trout streams, as such Spring Creek and Trout Creek, that run into the Wisconsin and Pine Creek, that merges with the stream fed Green Meadow Lake to form the Pine Creek Flowage part of Lake Alice.

The Tomahawk, Aug. 26, 1911:

> *Lake Alice above the King dam is attracting much attention among sportsmen and pleasure seekers. There is no channel in this new lake. It is all channel. But just now the numerous motor boat owners are interested in finding the outlet of the various streams that empty into Lake Alice. Although a motor boat ride up the Somo river is delightful and the scenery picturesque, it is the opinion of many that Lake Alice surpasses the Somo river in this respect.*

THE ALLURE OF ALICE

Although a man-made phenomena, Lake Alice has all the charm and allure expected of a north woods lake. An early description of the northern Wisconsin lake region could just was well describe early Lake Alice, when it says: "…it is not its geographical or geological importance that has made it famous, but its irresistible appeal to the tourist, sportsman, health seeker, and the lover of the beautiful in nature.[32] It is beyond all things a paradise of the fisherman…The fishing season is long, beginning early in the spring and lasting well into the fall. Trout abound…unexcelled bass fishing, with plenty of pickerel and perch. The muskellunge , or "muskie," is plentiful… there is plenty of tackle to be had, with bait for every sort of fish, together with canoes, boats and camping outfits… Also there are experienced guides and congenial to be had for trips… Yet the tourist who loves to get close to nature has no

[32] D.N.R. 2000. Willow Flowage Scenic Watters Area Master Plan Draft **.** pgs. 86**.** Notes that: the region was a pinery and contained a rich mixture of white, red and jack pine prior to European settlement. Much of the region still contains abundant pine, however, aspen and paper birch increased substantially early in this century following the harvesting of the pine…The northern third of Wisconsin is part of a large eco-region called the Laurentian Mixed Forest.. The regions forest is about 25% aspen and white birch, 30% northern hardwood, 25% forested wetland and 20% pine… The region has 350 species of terrestrial vertebrates,30 species of major trees and 1,200 plant species.

need to "rough it"…the hospitable log cabin or more awaits him at the end of his daily trips."[33]

Lake Alice became a much visited lake with active seasonal cottages, resort cabins and tourist sites lining its shoreline. It was a special place where many came to have their "up north" experience. Because of this heavy and democratic use, Lake Alice was referred in town as the "poor-man's Nokomis." Some of these resorts, such as the Red Arrow and Weegies are no longer in existence and many of the seasonal cottages have become condos or converted into year-round homes and north woods getaways. [See Sidebar at end of this document, p33 for a personal account.]

As a popular tourist destination, Lake Alice was an important resource and attraction, that helped support the local economy through tough times. In the 1940's, **WISCONSIN A Guide to the Badger State** described Tomahawk and the area around it as "Paper and pulp , furs and farming keep the city alive through the winter; in the summer it earns what it can from selling fishing tackle and bait, groceries, gasoline and bathing suits to the… tourists hurrying northward… By 1890…the mill hands, trades people, industrialists, and railroad were all making money. But the boom collapsed as suddenly as it began. With timber exhausted, the sawmills closed, then the paper and pulp mills: only one continues to operate, working sporadically." [34]

Presently, Tomahawk is fortunate to have large employers, such as Harley Davidson (400 employees), Packaging Corporation of America Mill (450 employees), Daigle Brothers, and a host of other businesses, that are great corporate citizens, sponsoring many community events, enriching our town's quality of life. There is an excellent blend between industry and tourism that gives the local economy balance and diversification.

Lake Alice still has its charms and mystique for today's visitor, as well as accommodations at Pine Pointe Resort, Zipp Inn, Lueth Landing and the Surewood Forest Campgrounds. Out door columnist, Jeff Lampe, in an article about fishing Lake Alice for his Illinois audience, noted that

[33] Jones, George O. 1924. History of Lincoln…pg 15
[34] American Guide Series. 1941. WISCONSIN A Guide To the Badger State. pg. 379

the appeal of northern Wisconsin is more than catching fish, that there is something transformational and therapeutic of being on a lake enclosed by pines and birch, with eagles over head and returning each night to the camaraderie around a bonfire and recalling the day's adventures.[35] He also lamented the fact that this "up north" experience is becoming harder to come by as the resorts that once lined Lake Alice are disappearing, as more of them are converted into year around homes or condos.[36]

There is a real concern about the impact of increased development on the lake's shoreline and if it will threaten vulnerable, fragile ecosystems, such as shallow bay areas. A proposed condo development in the Edgewater Golf Course Bay included plans to dredge a shallow bay for a marina. This project was abandoned and critical spawning areas were spared damage. Lake Alice Association President Glen Mott,[37] defined the Lake Association's position as "encouraging responsible development, but discouraging ill conceived projects that threaten fragile areas." Also, there is a strong desire to preserve the large islands and island clusters on Lake Alice as they are with minimal development. The Lake Association investigated purchasing the fifty-four acre Krull Island to preserve its unique ecological and aesthetic values.

A FISHERY TO SAFEGUARD

Because of its large shallow, stump-filled bays, Lake Alice has been a good fishery since its creation. Its natural reproduction was enhanced by stocking in 1938, when some 3,000 adult bluegills, 3,000 adult crappie and 50,000 walleye fingerlings were introduced. Stocking abruptly stopped in 1969, because fish had high levels of mercury. Lake Alice

[35] NCRPC 2006. LINCOLN COUNTY RECREATIONAL PLAN 2007-2011. pgs 85 The area's weather is described as: climate continental type - summers warm, but not excessively hot with cool and comfortable nights – Winter long, cold, snowy – Mean annual precipitation 32 inches - Snow cover on ground & ice on lake December – April, -growing season frost free 124 days May 22 – Sept 23 – Prevailing winds NW in fall through Spring from South remainder of the year – Wind spend 4-15j mph –Winter conductive to snowmobling & cross country skiing due to long duration of snow – Summer camping, fishing

[36] Lampe, Jeff.. September 24, 2006**. Journal Star.** pg. D12.

[37]**Glen Mott, LLA President**, is the LAA's main spokesman. His drive, energy and persistence pushed needed reforms to protect Lake Alice through the system. More than an orator, Glen has made numerous wood duck nesting boxes for the lake and his welding skills have helped lake residents with many problems, like a broken log crib(Thanks!). **Glen is the LLA's best contact on any question concerning the LAA and its position on any issue Lake Alice (715-453-7378).**

waters were polluted and degraded by the effects of paper mill and industrial pollution coming down river from Rhinelander.

Fishermen on Lake Alice even commented on fish they caught in the Pine Creek section of the lake, that was fed by trout streams, as tasting fine, but those caught from the Wisconsin River to the dam, as having a terrible odor and taste when cooked. The Clean Water Act of 1978 instituted the regulations and enforcement, that were needed to clean up the system. Today, Alice has healthy water and is a great fishery.

In 1983, walleye stocking started again and continued until 2000. Over 400,000 walleyes were introduced in this period. After 2000, the Wisconsin Department of Natural Resources (WDNR) became reluctant to stock Lake Alice because it might introduce disease, exotic species or lead to the gene pool becoming tainted and weakened. [38]

The WDNR wants Lake Alice managed as a self-sustaining system. This recognizes the current fishery as being very good and capable of maintaining its current healthy populations levels of fish if managed properly. The goal would be a balanced community of predator and prey species so that muskellunge, northern pike, bass and pan fish would all flourish. The management would utilize creel limits, size limits and fishing season dates to achieve this goal.[39]

If there is not to be any stocking and supplementing the natural fish populations in the future, the importance of having the correct regulations for the lake is essential. The wrong regulations would slowly, but progressively degrade the system, causing long-term harm to the fishery.

Recognizing the seriousness of this challenge, the Lake Alice Association[40] entered into a series of open meeting with local and regional Wisconsin Department of Natural Resources, Conservation Congress representatives and concerned citizens about the resource

[38] Dean, Premo,and Kent Premo…pg 27
[39] Premo, Dean, and Kent Premo. 2009…pg. 28
[40] The Lake Alice Association was organized in 1999 and incorporated under Chapter 181 Wisconsin Statues in 2000. The Association exists for the benefit of the general public. The purpose of the Association is to protect, preserve and improve the integrity of Lake Alice and its ecosystems through education of and communication between concerned citizens.

management of Lake Alice. In a series of open meetings, information was shared. With "everything on the table," issues, such as slot sizes for walleyes, comprehensive fish surveys and fishing seasons, were all discussed in depth.

In the January, 2008 issue of the **Lake Alice Association Newsletter**[41], Neal Pietenpol[42] summarized the conclusions of these meetings and the actions that all the participants agreed were necessary to maintain lake Alice as "one of the better fisheries:"[43]

> *DNR Rule Change and Proposal for Lake Alice at the April of 2008 Spring Hearing. As you remember, we were working on a rule change for a slot size on Walleye as well a proposal for the regular season (not year round) for game fish on the Wisconsin River from Rhinelander down through Lake Alice. both were forwarded to the DNR statewide review team for consideration.*
>
> *The proposal for a regular Wisconsin inland season, 1st Saturday In May to the first Saturday in March for game fish and 0 bag, catch and release for Bass until the 3rd Saturday in June from Rhinelander Dam to Kings Dam passed and will be voted on at the Spring Hearings.*
>
> *The slot size proposal was 14" to 18" on Walleye with a 3 fish limit. You could have 2 fish under 14" and 1 over 18" or 3 fish 14" or under. This will be coming up now as a Conservation Congress resolution. Our committee will try to get it bumped up to a DNR rule change for 2009.*
>
> *We feel the change to a regular season, like the rest of the state will help our fishery the most. This will eliminate the tremendous amount of fishing pressure on a small section of the Wisconsin*

[41] **Lake Alice Association Newsletter** is edited by **Michael** and **Kris Toelle**, whose efforts have made it a quality publication, that has done a great job in communicating LAA concerns, its positions on issues and has enhanced the image of the LAA in the community it serves..

[42] **Neal Pietenpol** is a LAA board member, committee head, past Conservation Congress representative, who has had a life time interest in the improvement and enhancement of the of quality fishing and hunting experience in Wisconsin. Always willing to share his opinion and wisdom (as well his waders), he is an excellent contact on conservation issues (715-612-6302).

[43] Dave Seibel, fish biologist quoted in Premo, Dean. and Kent Premo. 2009….pg.26

when the Walleye, Northern and Smallmouth Bass are spawning.

With the invasion of Invasive Aquatic Species, VHS, Shore land Development, and change in water quality, we should at least try to preserve our fishery so that the next generation can enjoy the wonderful recreation opportunities on Lake Alice and the Wisconsin River…

We are getting excellent cooperation and guidance from the DNR Fishery specialist Steven Avelallemant of Rhinelander, John Kubisak, who is the DNR biologist from Rhinelander, and Dave Seibel who is the fish biologist out of Antigo….

This documents the high degree of involvement of both the LAA, Conservation Congress members, and WDNR in crafting the final proposal for the vote at the Spring Hearings. In a later conference, LAA was informed that after review by the WDNR at state level, the slot limit proposal needed further study and "more biology." This additional information would be acquired in Lake Alice's next lake survey. But as fish biologist Dave Seibel commented: "The WDNR tends to survey Lake Alice fish populations fairly infrequently (it is a large and expensive undertaking). Surveys were conducted in 1977, 1982 and 2003. It will be ten or twelve years before another one is done on Lake Alice." [44]

Always a well-known and a much-used fishing lake, the recent years of drought has made Lake Alice the focus of even greater fishing and recreational pressure. Many surrounding lakes and flowages experienced significant drops in water levels, while Lake Alice levels remained constant because of the King's Dam being a hydroelectric generating facility and the water levels it requires.[45] Lake Alice's constant water levels attracted boaters and fishermen that usually used other bodies of waters. Business shut downs and lay offs in Merrill and Rhinelander put more fishermen on the ice and Alice was covered with increasing

[44] Premo, Dean, and Kent Premo. 2009…pg. 28 Side note: WDNR did find the time and money to perform a fish survey from April 15- 30, 2009 on Lake Mohawksin.. The results of this Mohawksin survey and a future one for Lake Alice are part of the criteria cited to the LAA by the WDNR for determining regulation changes, such as slot limits.

[45] Premo, Dean, and Kent Premo. 2009…pg 14

numbers of shanties, that continued the heavy fishing pressure on the lake's fishery.

Lake Alice and the Wisconsin River upstream of the lake had for years a continuous fishing season. While other lakes were closed in the spring, Lake Alice was a magnet and focus of heavy pressure of the "spring run" that focused on harvesting spawning game fish. WDNR fish biologist, Dave Seibel, noted, that while "Some of the walleye population spawns in the lake…A good many walleyes travel from the lake up the Wisconsin River for spawning."[46]

The river above Lake Alice is relatively narrow and confined. The management practices used on larger systems should not be considered applicable to this situation. Even the limit of walleyes allowed is significantly higher for the river above the HWY A Bridge than for the much larger lake. The continuous season made the lake's adult walleyes especially vulnerable to both legal and illegal exploitation, as they migrated up into the river.[47]

Not surprisingly, a very few in a very short time were able remove a lot of fish. Ironically, there were those who vehemently objected to the decision of Lac Courtre Oreilles vs. Keist, because of a visceral aversion to the image of a large egg ladened fish being rendered helpless by a blinding light and then removed at the end of a spear before they even had a chance to procreate. What is the difference if a fish is speared off its spawning area or taken by hook & line?

The supporters of the easy up river "shooting fish in a barrel" harvest are at odds with sportsmen who believe that nature should be allowed to take its course, letting the fish population replenish each year without interruption and then allow these fish to return back to the lake so they can to be sought after to the benefit of many more anglers, including the elderly and disabled, who can not brave the spring weather, as well as the vast majority of tourists, that contribute so much to the local economy.

[46] Premo, Dean, and Kent Premo .2009…pg. 28

[47] Local wardens Rich Peters and Ron Nerva both supported the proposed change and its ability to stop illegal, over-harvest of fish on the Wisconsin River between Rhinelander and King's Dam during this time.

There is danger of becoming "walleye blind," when considering the correct way to manage a fishery, and ignore other populations of fish, such as bass. The continuous season of Lake Alice created a loop-hole that allowed bass to be fished off their spawning beds. While bass in surrounding bodies of water were regulated and protected, unregistered bass tournaments descended on Lake Alice to take advantage of the aggressive instincts of the bass protecting their nests. When a male bass is removed from its spawning bed, the nest and its eggs are devastated within minutes by crayfish and panfish and the reproduction of that species can be severely affected.

Bass are fun to catch, easy to let go and give a lot of fight and excitement through out the fishing season. Beyond their recreational value, bass are an very important component in control of the rusty crayfish. An Invasive Species, an unchecked population of rusty crayfish, which are in Lake Alice, will decimate natural, native aquatic plants to the detriment of native fish, amphibian and bird populations. As fish biologist, Dave Seible noted: "Smallnouth bass and rock bass are important controllers of this AIS crayfish."[48]

There are some that rightly value bass as a great game fish, while others dismiss it as a "green carp," in order to make their case for management practices favoring other species. Bass, as well as carp, have their own role in a healthy fishery. As fish biologist, Dave Seibel said: "Redhorse, suckers, and trout perch are also critical members of the fish community and must be present if the system is to be considered healthy."[49]

We can no longer afford the opinions of the ecologically ignorant and biased or allow their preferences for easy targets of spawning fish, like bass, to jeopardize our system by reducing a species that is an important biological control and allowing an AIS to run rampant. Protection of the bass population was an important consideration by the LAA in its efforts to make the regulations on Lake Alice and its portions of the Wisconsin River to be consistent with all the other inland waters in this part of the state, as well as the same as the entire Wisconsin River above.

[48] Premo, Dean, and Kent Premo. 2009…pg. 29
[49] Premo, Dean, and Kent Premo. 2009….pg 27

Sponsored by the LAA, the DNR rule change read:

Question: **Open Season on Lake Alice, Hat Rapids Flowage and connecting portion of the Wisconsin River**
Make open seasons on the portion of the Wisconsin River system from Rhinelander Paper Mill (St. Regis) Dam downstream to **Kings Dam**, including Hat Rapids Flowage and **Lake Alice** consistent with other inland waters in northern Wisconsin. This change would protect gamefish from harvest during spawning in March and April. This encompasses about 22 miles of the Wisconsin River system.

The angling season on this stretch of the Wisconsin River has been open continuously for largemouth bass, northern pike, and walleye since 1970 while all surrounding water are subject to the general inland open seasons for these species. At that time, the river was highly polluted, and closed seasons were not needed to protect fish that people either did not want to eat or couldn't safely eat. The Wisconsin River has undergone a dramatic restoration in response to cleanup mostly due to the passage of the Clean Water Act in 1972. It now supports improved populations of fish that are safe for human consumption. However, many anglers believe that high exploitation during spawning seasons when all surrounding waters are closed for gamefish is impacting abundance and size structure, especially of bass and walleye. The public voted in favor of a resolution to follow the same seasons as other inland waters in this part of the state by 78% and 71% margins at the 2007 Lincoln and Oneida spring hearings, respectively.

Question: Do you favor making the open season on the Wisconsin River system from Kings Dam (Lake Alice) upstream to the St. Regis Dam (Rhinelander Paper Mill) consistent with the general inland open season in northern Wisconsin? For largemouth bass, smallmouth bass, northern pike, and walleye, this would change the open season from continuous to the first Saturday in May through the first Sunday in March. In addition, the daily bag limit for largemouth and smallmouth bass would be 0 (catch and release only) from the first Saturday in May through the Friday before the third Saturday in June.

In Lincoln County, the Congress was held in the Tomahawk High School gym on April 14, 2008. There were speakers to both sides of the

issues. Glen Mott and Neal Pietenpol gave the most persuasive, concise arguments for the measure. After his father Phil Zipp spoke in favor of the Question, Greg Zipp, a well-known fish guide, stood to support the passage of the Question and said, " You may not like it, but we all know what the RIGHT THING to do is."

That night the right thing was done and vote in Lincoln County was 116 to 81 in favor of the Question. Of the 72 counties in Wisconsin, 68 voted in favor, 8 voted no (4 of these were decided by 3 or fewer votes) and one voted a tie. Of the counties, 88% voted in favor of passing the question. The state wide vote was even more dramatic: 2279 yes-1251 no. Later that year, the representatives of each county of the Conservation Congress voted and gave it even greater support, with some representatives, such Oneida County, voting in favor of the Question when their county vote had been no. At the Governor's Board, the measure was presented for approval by the DNR and spoken for by Glen Mott, representing the LAA. It then moved on to the legislature and was approved.

February 20,2009, the DNR issued a news release, **New Regulation changes game fishing on the Wisconsin River between Rhinelander and Kings Dam**. From the headwaters of the Wisconsin River down to King's Dam were properly governed by the same consistent regulations. After the King's Dam, the river has a hodge-podge of different statutes. Finally, the spawning fish of Lake Alice and the vulnerable river flowing into it were protected just like all the other gamefish in surrounding waters and were no longer easy targets.

This material, the collective reasoning behind the needed reform, and an account of the whole process has been presented in some depth because there has been misinformation circulated in a persistent attempt to reverse this rule change. When listening to discussions about this topic, one can now determine what is being distorted and more importantly , which view best serves the long term interests of Lake Alice, its wildlife, fish and the many who use it recreationally. Persuasive arguments and distortions can be used to cloak rather selfish desires and a wanton so-long-as-I-get-mine-to hell-with-everyone-else mentality.

A PLAN FOR LAKE ALICE

Steve Avelallemant, the Northern Region Fishing Specialist, was an effective coordinator throughout the whole rule change process. He let a lot of different opinions be expressed and yet kept a diverse group on track. This created a dynamic in which all participants felt comfortable. Kevin Gauthier, WDNR Water Resource Management Specialist, was also a key participant and the LAA felt very comfortable in getting his guidance on the need for and reasons why Lake Alice should develop comprehensive a lake plan.

The LAA board scheduled a meeting with Kevin Gauthier at the WNDR Rhinelander office. He concisely outlined the reasons why an association should pursue creating a lake plan and all the elements that the WDNR felt necessary in a successful lake plan. He emphasized that having such a plan in place would be of great value in getting assistance of the state and WNDR to address any issues or help fund any challenges the lake may have in the future.

Lake Mohawksin, just on the other side of King's Dam, as well as other area lakes, had become infested with the AIS, Eurasian Water-Milfoil. This invasive formed dense mats that had chocked out native plants, reducing the habitat need by fish, wildlife and even made some areas unnavigable. Eventually, Mohawksin received grants totaling $200,000 to address their infestation.[50] Usually introduced to a body of water by a boat trailers, an invasive, such Eurasian Water-Milfoil, could get a foothold in the shallow bays associated with the highly used boat launches on Lake Alice. If such an infestation was to occur, a lake plan would be of great value in applying for aid from the state in the form of grants to combat problems.

A lake plan is much more than a potential revenue stream. In its best form, a lake plan would **assess**: the fishery, aquatic habit, watershed and water quality; **describe**: land uses, habitat conditions and ecological relationships; and **identify**: water quality problems, sources of pollution, endangered areas, potential threats to habitat, fish and wildlife. This information would be tracked, evaluated, updated, revised and analyzed

[50] Buelow, Jed. Sept.15, 2009. "Mohawksin Friends look to double milfoil treatment". **Tomahawk Leader**. pg 7

to ultimately produce a strategy that will help **protect** and **enhance** the entire lake system. It would incorporate immediate yearly goals within the context of an adaptive management plan that would be implemented for decades.

The LAA board came out that meeting believing that Lake Alice needed and would benefit greatly from a comprehensive lake plan. The information and insights, that Kevin Gauthier had provided, made it very clear that LAA would need professional guidance to be successful. The application process to initiate the plan was complex and criteria based. If you submitted a plan that was incomplete, it would be passed over in a competitive process, as better conceived plans were accepted. Requirements in the plan, such as a point-intercept survey, which is an extensive rake survey and identification of aquatic plants at numerous GPS points across the lake, required expertise far beyond the abilities of the Association and its members.

LAA started interviewing firms that specialized in creating lake plans and already had experience in Wisconsin and the WDNR process. Surprisingly, one was little more than a chemical company that wanted a contract for expensive yearly treatments, basically offering strategic poisoning rather than strategic planning. Another firm, that was well used in the area, offered a substantive plan, but intended to execute it with in a year. Quick results, but it meant that the grant applied for through the state would be for a very large sum, of which LAA be responsible for a co-pay of 25%. These proposals might have had more appeal if Lake Alice had an AIS threat for which immediate treatment was already decided upon as the course of action. The LAA board did not see in them the vision and long term commitment, that Kevin Gauthier had described.

The search for a firm to provide the professional guidance , that the LAA needed, led to a road trip to Amasa, a small town in Michigan's Upper Peninsula, to meet with Dean Premo, Ph.D., President of White Water Associates, Inc. The company was established in 1985, as an independent environmental laboratory and ecological consulting firm. Although lake planning was not its primary focus, there was no doubt that White Water Associates, Inc., and the family that guided it, was highly qualified and had needed the technical expertise.

Dr. Dean Premo, a Certified Senior Ecologist, is a nationally recognized expert in biodiversity and ecosystems, whose scientific leadership and consul had been sought by institutions, such as the U.S. Environmental Protection Agency, National Wildlife Federation, Natural Research Council, college of Natural Science at Michigan State, Great Lake Indian Tribes and the Michigan Technological School of Forestry.

Kent Premo, M.S., a systems support scientist, is an outstanding technical editor and writer, whose skills at creating scientific and educational publications, would be a great benefit to any project like ours.

Dr. Bette Premo, the White Water Chief Executive Officer, was the principal scientist for water quality and aquatic ecosystem assessment related to FERC relicensing projects for major hydroelectric companies. She has extensive experience in writing and procuring grants for municipalities, schools, universities and corporations. In addition to her CEO duties, she manages the laboratory staff and consults on data quality control issues.

Recently, Kent Premo and Dr. Bette Premo helped our neighbor, Oneida County, develop a geographical information system (GIS) for its 1,200 lakes and then assisted Oneida in the classification and designation of these numerous 1,200 lakes for purposes of shoreland ecosystem management and zoning regulations.

Dr. Dean Premo discussed with members of the LAA the purpose of the lake plan, the application process and showed examples of publications and lake plans that White Water had done. The material was impressive in its contents, layout and design. More importantly, it contained the strategic focus and long-term perspective, that the LAA board was looking for in a lake plan. Dean quipped that Bette had to approve a taking on such a project and that she normally would only allow White Water to be involved in only one lake plan a year.

White Water, Inc. was contracted by the LAA and applied to the Wisconsin Department of Natural Resources (WDNR) for a large-scale lake management planning grant on January 1, 2009. The application was successful and the WDNR gave LAA a grant of $10,000 to fund the plan's first year, from March of 2009 to March of 2010. This, along with

a generous grant of $500 from the Tomahawk STAR Foundation, as well as $2,500 from the Association's fund raising efforts, provided the start up capital needed to underwrite the project's first year was in place.

Initially, the focus would be on gathering and reviewing information, establishing a coalition of participants and producing the first iteration of an Adaptive Lake Management Plan. Dr. Premo said: "The plan will not be a cookbook telling you what to do next. Instead, it will change as findings are made and news issued arise." From the start, it was conceived as a dynamic entity, evolving and improving to fit the needs of the Lake Alice watershed with the long term goal establishing a stewardship, that would perpetuate a healthy Lake Alice and its surrounding ecosystem far into the future.[51]

White Water and Dr Dean Premo provided a vision to the Lake Alice Stewardship Program, that was broad, substantive and inclusive. They effectively utilized the resources of the Wisconsin Department of Natural Resources, the application of the WDNR Headwater Basin Integrated Management Plan (2202) to Lake Alice and have made the WDNR an valued shareholder in the process. They have identified organizations, such as the Lincoln County Land Information and Conservation Department, that will be important participants in the future. They were also instrumental in getting the Tomahawk High School as a partner.

Two science teachers of the Tomahawk High School (THS), Todd Fredrickson (an Environmental Science & Biology teacher) and Jen Pfannerstill (teacher of Advanced Placement Biology) were interested in a project that would engage themselves and their students in a real-world environmental project. In a meeting, White Water scientist Dr. Dean Premo, LAA board members and THS faculty discussed the prospects of a collaborative effort on the lake study and management planning for the Lake Alice watershed.

[51] Premo, Dean, and Kent Premo. 2009..pg 18 **" In order to have a more practical sized watershed with which to work in the Lake Alice Stewardship program, we delineated a sub-watershed that extends from Kings Dam up to the point where Trout Creek enter the Wisconsin River**…**The Lake Alice sub-watershed is approximately seventy-four square miles (47,000 acres) and located entirely within Lincoln County, Wisconsin."** This recognizes the interrelationship of Lake Alice and the navigable portion of the Wisconsin River above it.

LAA was already highly committed and eager to contribute to the plan. The project-based learning that THS students would participate in, would of great help and value. White Water would provide the expertise of their scientists and their immense experience of successfully implementing and coordinating such projects. The Lake Alice Stewardship Program became a collaborative effort, having a much greater impact, study and scale, than other lake plans that are little more than a documentation of good & bad plants and water clarity. It is a partnership, that has good synergy and the promise of great results.

In the fall of 2009, a field trip was organized on Lake Alice with members of the LAA providing pontoons to carry over forty THS students, their two teachers and Dr.Premo for a complete tour around the lake. The outing was much more than a sight seeing excursion, Dr. Premo assigned tasks for each boat, that would be combined to create a written and digital photographic record of the lake, delineating its shoreline and attributes. Specific activities, such as testing for water clarity, were documented as well.

The field trip was a great experience, especially for the LAA members. The participation of THS students and teachers infused the project with a new energy. It was great to be see a new generation getting involved in the issues of resource management, that many LAA members had devoted so much time and energy to. During the lunch at Pine Pointe after the outing, Bruce Oradei commented: "We want them to be aware that this will all be theirs some day. That our concerns now will be theirs in the future."[52]

IMMEDIATE AND FUTURE CHALLENGES

In the November, 2009 LAA monthly board meeting, the success of the THS outing was recapped. The agenda also included preparation of a detailed checklist for the upcoming *Alice in Winterland* fishery. This popular winter event, occurring in the second week of February, is the

[52] **Bruce Oradei** is a LAA board member, past Town of King Supervisor, the Vice President of the Lincoln County Lakes and Rivers Association and a good rope man to have when a felling a tree. LAA was a participant in the forming of Lincoln County Lakes and Rivers Association and LAA board member, **Hank Michaud,** was its first V.P. Bruce's comments were also used by Jed Below in the **Tomahawk Leader** in an article about the event.

LAA's primary fund raiser. The revenue that it generates is used to fund the lake plan, scholarships for THS students, the Association's news letters and all the other LAA activities. The status of our web site was also discussed.

Our old web site had crashed and never really recovered. Board member Mike Sigl had just coordinated the creation of a new site, **www.lakealice.info**, with a new web site manager. It was exciting to be back on line and be able to post current information and pictures of our events. The site could now evolve and become a major repository for the information collected through the lake plan process that anyone interested in Lake Alice could review. Hopefully, users will one day be able to access interesting related links, such as current community and fishing information, as well.

We also hope that this new web site will become a place where stories and reminisces about the Lake Alice experience can be posted. That it will document the community life of Lake Alice, in much the same way as the Tomahawk Area Historical Society's excellent publication, **Remembering Yesterday Memories of Tomahawk**, contains recollections from many contributors, whose individual stories create a very interesting a first hand, historic tableau.[53]

There were two guest presentations, as well. Chris Hamerla, Lumberjack Aquatic Invasive Coordinator Lincoln, Langlade & Forest Co., brought a book that he had compiled with photographs of native aquatic plants and invasives, such as the Eurasian Water-Milfoil. He offered to let this be posted on our web sight.

Ben Niffenegger, Shoreland Protection Specialist for Lincoln County Planning & Zoning, also brought information that could be posted for the benefit of Association members, interested in rehabilitating and renewing their shorelines and properties with native, non-invasive plants.

[53] **Mike Sigl,** a board member , whose patient efforts have really brought the LAA into the electronic age, is the coordinator and filter through which all web site entries pass. We encourage any one who wants to contribute their Lake Alice experiences to submit them to Mike at **gbfdcapt4b@yahoo.com**. All submissions may subject to editing and LAA retains the privilege to reject any submission.

Both offered to give presentations at the Association's spring meeting, that occurs in June each year. Both also volunteered to tour the lake and offer their expertise and suggestions during the summer.

The information and expertise that Chris and Ben offered will help LAA begin fulfilling one of the 15 Actions (&Objectives & Outcomes) that White Water had developed for LAA to focus on.[54] In this case, increase the awareness of landowners and encourage good shoreline stewardship, that preserves or restores natural shorelines.

The Lake Alice Stewardship Program Phase 1 as sent Dr. Dean Premo was reviewed. **Part 8. Lake Alice Special Attributes,** that the LAA had contributed, was in this iteration and the **Lake Alice History** was the last segment needed from the LAA.[55]

There was discussion concerning remarks made at a Lincoln County Lakes and Rivers Association meeting about removing water from Lake Alice. Lake Alice is a fairly shallow lake best described as an "impoundment." Its water level is controlled by the King's Dam (operated by Tomahawk Power and Pulp and controlled by the Wisconsin Valley Improvement Company (WVIC).[56]

The WVIC manages some 20 reservoirs in the Wisconsin River system through a license from the Federal Energy Regulation Commission (FERC), that was reissued in 1996. Since the King's Dam has continued to generate electricity, the FERC license agreement stipulates that the water level of Lake Alice be kept within certain parameters. This gives Lake Alice a constant water level, while surrounding reservoirs experience fluctuations.

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[54] Premo, Dean, and Kent Premo. 2009…pgs. 48-51. Series of 15 Actions: 1) conduct temperature and dissolved oxygen profiles, 2) work closely with the WDNR to understand and manage the resource, 3) assess rusty cray fish presence, 4) amphibians survey, 5) have and maintain informational kiosks at landings, 5) point-intercept survey for aquatic plants, 6) periodic assessments of AIS, 7) implement WDNR water quality sampling, 8) pursue protection of Krull Island, 9) wetlands identification and mapping, 10) Aerial and digital photography documentation of shoreline, 11) monitor loon nesting success, 12) monitor bald eagle nesting and success, 13) educate and reward good shoreline stewardship, 14) field trips with THS and 15) update adaptive management plan, that will be implemented and the goals of the Lake Alice Stewardship Program..

[55] **Dave Barrows** started to compile and write the history in November of 2009.

[56] Premo, Dean, and Kent Premo. 2009…pg. 14

The drought-like conditions of the last three years is similar to those in 1910, when north woods had less than 19 inches of rain (normal precip is above 30). The impact of water level drops on tourism and WVIC management of the system was reviewed by the State Board of Forestry and WVIC was found to be acting in good faith. In 1913, water level limits were established. From this time, Lake Alice and the entire system have been managed accordingly.[57]

Glen Mott, LAA President, said that the LAA will categorically oppose any proposition that proposes the modification of current regulations of the water levels of Lake Alice. It would violate licensing agreements that were supposed to be in effect for decades and management practices that WVIC had used for almost a century.

It is even doubtful that if any additional water was drained from Lake Alice that less water would be taken from other parts of the system. There is no doubt, that such fluctuations in Alice's water level would have a serve impact on several ecologically sensitive areas.

The valuable spawning and nesting habitats found in hundreds of acres in the, as noted by the WDNS fish biologist assigned to our lake, " the entire eastern bay (often known as the "Pine Creek Flowage," where Pine Creek enters the system) forms a crucial habitat complex. The northerly extending bay off King's Dam Reservoir zone of the lake (the Golf Course Bay) is also an important shallow, well-vegetated habitat."[58] If water levels are reduced, these vital areas, essential to the lake's health, maintenance and reproduction of fish, birds, invertebrates and mammals, will be devastated, even destroyed. The Wisconsin River portion of the system is even more vulnerable.

The Wisconsin River portion of the Lake Alice sub-ecosystem includes 12,094 acres of the Menard Island Area Recourse, which is managed by the WDNR. This is a relatively narrow and shallow river corridor of immense ecological and recreational value, that could be left high and dry if the water level of Lake Alice were lowered. It would be tragic if recently protected spawning fish, migrating up from the lake to this

[57] Miazga, Vicki. 1988. The First 100 Years…pg. 31
[58] Premo, Dean,and Kent Premo. 2009…pg. 28

portion of the river, as well as nesting loons, would now have their habitat destroyed by draining. It would be a devastating blow to tourism and the lake's economy, as well.

As long as the FERC license remains in effect and King's Dam continues to produce electricity, it is highly unlikely that there will be any change in the management of Lake Alice's water level. But the facility is a 100 years old and the up-keep and licensing process is very expensive. The LAA has to remain vigilant and react to any suggestion of excessive draining and be able vocalize the extensive, detrimental impact it would have.

The board members present also discussed and voted unanimously to send a delegation to the Warm Water Committee of the Conservation Congress, in December, to voice the Association's disapproval of an question before the committee, that asks the Congress to consider reversing its recent over whelming approval of protecting spawning fish Lake Alice and its portion of the Wisconsin River.

These are not all the items discussed that November night, but provide a good overview of the both the immediate and future focus of the LAA and its ongoing mission to protect, preserve and improve the integrity of Lake Alice through prudent management, education and communication. Years from now, the history of Lake Alice will hopefully be an account of how the LAA was successful in these endeavors. So that the sentiment expressed in **The Tomahawk** a hundred years ago will still ring true:

> *So here's all kinds of good luck to Alice while fishing at Lake Alice in the future and may the lake always remain as beautiful as it is at the present time.*

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- Stark, William F. Wisconsin-River of History

Sidebar: Memories of Lake Alice

A personal account by Jim Wunsch, Lake Alice Property Owner (2/25/2008)

I am originally a Marshfield man. Born in nearby Rozellville in 1938, my family moved to town when I was four. We started taking a vacation shortly after, and I will always remember loading up the 1930 Chevrolet and taking the 3.5 hour trip to Tomahawk and Pine Creek Resort on Lake Alice. This resort was on the eastern most end of the lake on what was then, old highway "D". My dad and uncles seined minnows from a small creek near Marshfield, and we transported them in an old milk can, which was mounted on the front bumper of the car. Sometimes when we went through Tomahawk, we would stop by the old Tourist Information Hut on main street and look at pictures of fish and get an ice cream cone.

Arriving at Pine Creek Resort was always exciting. The old cabins were indeed rustic with an icebox rather than a refrigerator. Ice harvested from Lake Alice in the winter was stored deep under sawdust in the icehouse, and it was from there that we retrieved the blocks as needed. We also stored the fish we caught in the icehouse, wrapping them in waxed paper and burying them deep in the sawdust and marking the spot with a stick.

And did we catch fish? The fishing was always great. The first year we were there a guy caught a northern that was so big they took a picture of it next to me, and it was longer than I was. We generally fished fairly close to the resort because outboard motors were pretty rare. The stumps across the lake were eight feet high back in those days and loaded with crappies and blue gills. There was no such thing as a spinning rod back then. You caught the majority of your fish on worms and minnows. The minnows we transported from Marshfield kept nicely all week in a screened live box in the lake, and the worms and night crawlers were kept in an apple crate covered with ferns and parked under the cabin where the icebox vent dripped cool water. Fishing was still always best in the morning or evening. Of course, when the kids were bedded down after dark, mom and dad could walk over to the bar and socialize with other adults.

Twenty years passed. I am then married with four young daughters and living in Sheboygan Falls, Wisconsin. We know the people who ran Al's Point Resort on Lake Alice. They are from Marshfield as well. We decide to vacation at one of their cabins in 1966. My parents and other siblings in my family joined us in the years that followed. And in 1968 my father Elmer found out Hal DeRoche was selling lake frontage from his Pine Creek Resort property. He was quick to buy the first lot from Hal (110 feet, $2,500), and in 1969 my brothers and I helped him build a cabin on that property, which I own today. The cabin has undergone quite a transformation during the last 40 years: a garage, a boat shed, a pontoon shed, an adjoining back lot to burn brush and park vehicles, and some internal improvements as well. In late September of 1983 when the lake was drawn down 5.5 feet to repair Kings Dam, we built a fish crib just out from our pier. That crib is still there today and still a popular fishing spot on the lake.

The lake has changed too. In the mid 1990's, the 485 acre property directly across from our cabin, which was a tree farm owned by Ed Stiegerwald, was finally developed and 20 or more properties were sold with cabins quickly following. Virgin shoreline gone forever. Surely the fishing is not what it was. While it was very common to go out and catch 50 crappies or bluegills in the 1970's and 80's, it is a struggle now to catch a half dozen. Bass fishing with a surface bait was something I always enjoyed, but I don't even try anymore. It was hard to find an ice shanty on our end of the lake in those early years. Now it's like a city out there in some places. I surely wonder how the lake can be expected to produce enough fish for that kind of pressure. On the bright side, the northern fishing is still good, and there certainly are more walleye in the lake than there were years ago.

There was such a concern over the years with the development of larger boats and PWC's, but it seems to me to be offset by the pontoon boats. People are finding that a great way to enjoy the lake is from the comfortable seat of a quiet, slow-moving pontoon. There is no better way to enjoy a summer day in northern Wisconsin than to cruise around on a pontoon boat. And if you find yourself doing just that, and you happen to see my pontoon ("Rosebud") go by, wave and say hi. I'm the guy in the tan hat.

Building a fish crib during the draw down on Lake Alice -- September 1983.

Appendix J
Lake Alice User Survey

Lake Alice Aquatic Plant Management Plan – Lake User Survey

Technical assistance by
White Water Associates, Inc.

Note: This public questionnaire was delivered to President Glenn Mott via email to be distributed to Lake Alice stakeholders. The Lake User Survey was mentioned in the May 2013 Volume 15 Number 2 on page 7 of the Lake Alice newsletter. The front page was included along with the statement that the Lake User Survey could be found on the Lake Alice Association website. No surveys were completed and returned at that time. White Water Associates worked with President Glenn Mott to create an email version of the Lake User Survey that was distributed March 16, 2017. One response was emailed back and seven hard copy surveys were completed and mailed. The eight completed surveys were scanned and attached to this report. The following paragraphs formed the cover sheet for each survey form and provided the explanation and directions to the respondent.

We are writing to inform you about the Lake Alice planning process that will have important outcomes for Lake Alice and how you use and enjoy the lake. Please assist by completing this questionnaire and conveying your ideas. Please respond as soon as possible.

An aquatic plant survey was conducted in the summer of 2010 and it provided substantial information on plant presence and distribution in the lake. Lake Alice currently has a healthy and diverse community of native aquatic plants, but also harbors the aquatic invasive curly-leaf pondweed.

An aquatic plant bed is often termed a "weed bed." In fact, many aquatic species have "weed" as part of their names (e.g., duckweed, pondweed, musky weed). This usage is not meant to disrespect aquatic plants, but unfortunately "weed" also connotes an unwanted plant. Such is not the case for the vast majority of native plants in lakes. In fact, aquatic plants are a vital part of a lake ecosystem. They provide habitat for fish and other animals, filter runoff, stabilize the shoreline against erosion, offer fish spawning areas, produce oxygen, absorb nutrients (making them less available for nuisance algae), provide food for many animals, and make it difficult for aquatic invasive plant species to become established.

In lakes that receive an overabundance of nutrients (particularly from excessive fertilizers or leaking septic tanks), plant growth can become too lush and dominated by only a few species. This process of accelerated lake plant growth (often caused by human influences) can give aquatic plants a bad name. Aquatic invasive plant species (non-native plants) can become established in a lake and even dominate a lake, excluding native species.

Aquatic invasive species (AIS) are non-native plants and animals that are introduced into our lakes and streams and can upset the natural balance of the ecosystem and decrease recreational opportunities. Curly-leaf pondweed and the rusty crayfish are invasives established in Lake Alice. Other AIS examples include zebra mussels, carp, white perch, round goby, spiny water flea, Chinese mystery snail, Eurasian water milfoil and purple loosestrife. A helpful link: http://dnr.wi.gov/lakes/invasives/

Lake Alice stakeholders want to maintain the high quality condition present in Lake Alice and have established the foundation to conduct plant management should the need arise. An Aquatic Plant Management Plan is required by the WDNR prior to any plant management and the Lake Alice Association established its APM plan in Phase 2 (2011). Public input is needed to refine the plant management goals and formulate reasonable management methods. Completing this survey will help guide plan refinement and implementation. Please complete and return this form as soon as possible to the address provided on page 6.

NOTE: Eight completed lake user surveys are included. Page 1 (the explanation and directions page) was not scanned. Each unique completed survey begins with question #1

1. Please circle the response(s) that describes your affiliation with Lake Alice and the community.

A. Shoreline home/cottage/apartment owner
B. Shoreline home/cottage/apartment renter
C. Shoreline vacant landowner
D. Shoreline year-round resident
E. Shoreline seasonal resident
F. Nearby offshore resident (year-round)
G. Nearby offshore resident (seasonal)
H. Area business owner
I. Tourist or vacationer
J. Other (specify)_____

2. How many years of experience do you have with Lake Alice? 20yr

3. Please circle the activities that you do on Lake Alice. (Circle all that apply)

A. Fishing (open water)
B. Ice fishing
C. Personal watercraft
D. Swimming
E. Pontoon boating
F. Waterskiing/tubing
G. Pleasure boating
O. Other_____
H. SCUBA
I. Canoeing & kayaking
J. Nature viewing
K. Enjoyment of scenery
L. Hunting
M. Snorkeling
N. Sailing
P. None of the above (please skip to question 9)

4. Please rank the four activities that are most important to you on Lake Alice. (Use "1" for the most important, "2" for your next choice and so on.)

2 Open water fishing
___Waterskiing
___Personal water craft
___Swimming
___Pontoon boating
___Sailing
___Pleasure boating
___Other (specify) _____
___SCUBA
___Canoeing & kayaking
1 Nature viewing
___Scenery
___Hunting
___Snorkeling
___ Ice fishing

5. Overall, how satisfied are you with your recreational experiences on Lake Alice? (Circle only one)

A. Very satisfied B. Fairly satisfied C. Not too satisfied D. Not at all satisfied

6. Please circle the statement that best describes how often you recreate on Lake Alice during the summer (between Memorial Day and Labor Day).

A. 10 or more days per month B. 3-9 days per month C. 1-2 days per month
D. 1-2 days for the summer E. Never

7. What types of watercraft do you use on Lake Alice?

___Do not use watercraft (please skip to question 9)

___Paddleboat

___Sailboat

X Canoe

X Rowboat

___Kayak

X Motorboat with 25 hp or less

___Motorboat with greater than 25 hp

X Pontoon

___Jet Ski (personal watercraft)

8. On what waters do you use your watercraft(s)? (Check all that apply.)

X I use my watercraft on Lake Alice

___I use my watercraft on other water bodies in Wisconsin

___I use my watercraft on waters outside of Wisconsin

9. From the list below, please rank your top four (1, 2, 3, and 4) concerns for Lake Alice. Write a 1 for your primary (most important) concern.

1 Water quality

___ Human-caused noise

___ Shoreline erosion

___ Storm drain runoff

___ Near-shore human development

___Boat traffic

___Boating safety

2 Quality of fish habitat

___ Aquatic plant growth

3 Algae growth

___ New Aquatic Invasive Species (AIS) introductions

___ Human development on the greater watershed

4 Shoreline vegetation removal

___Other (explain_____)

10. Considering the lake issues in question 9, please evaluate the overall lake quality. (Circle one)

A. Excellent B. Good (C. Fair) D. Poor E. Unsure

11. During the years you've been familiar with Lake Alice, what changes have you seen in the aquatic plants (including algae)? (Circle all that apply)

A. No dramatic changes – about the same as always.

(B.) More aquatic plants than in the past.

(C.) Fewer aquatic plants than in the past.

(D.) More algal blooms than in the past.

E. Fewer algal blooms than in the past.

F. Other (describe :_____)

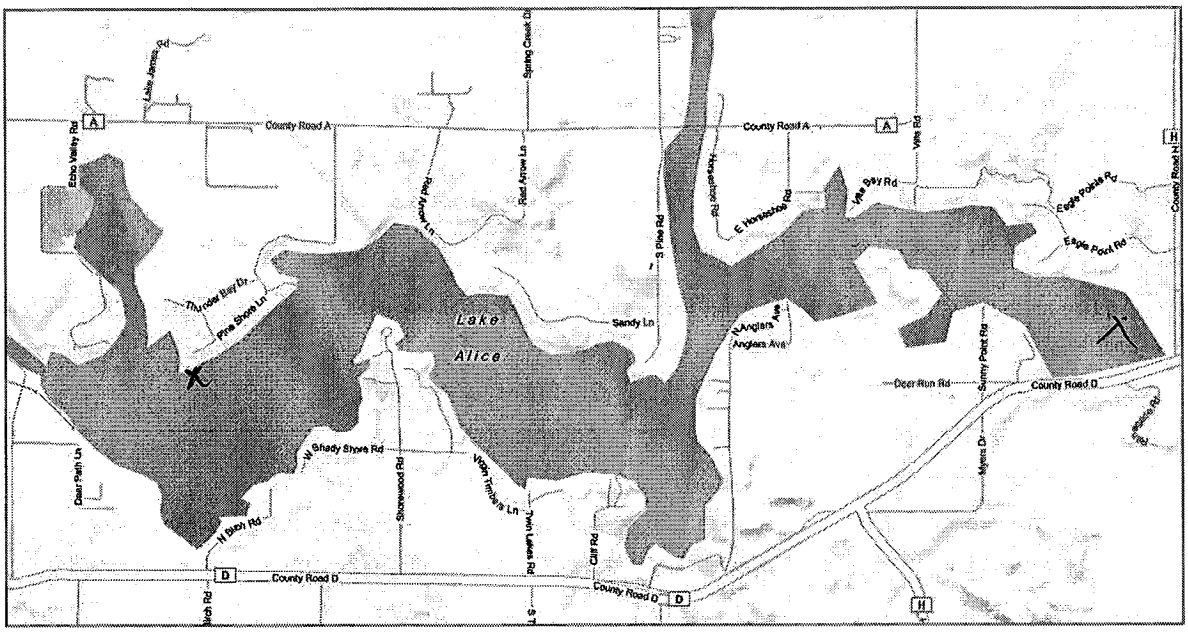
12. In the summer months (Memorial Day through Labor Day), how often does aquatic plant growth (including algae) negatively affect your use of Lake Alice? (Circle one)

A. Always B. Most of the time (C. Sometimes) D. Rarely E. Never

13. Do you believe that aquatic plant management is needed on Lake Alice? (Please circle only one)

(A. Yes) B. No (please skip to question 15) C. Unsure (please answer question 14)

14. If you answered "Yes" to question 13, please describe the problem on Lake Alice that you believe requires aquatic plant management. Label on the map (if appropriate) where you have observed plant problems with an "X" and provide a description.



15. Education is a fundamental component of Aquatic Plant Management (APM) planning projects. Please use the following scale to rank your understanding of the AIS topics listed below. (For example if you have no knowledge about methods of AIS transport, place a 4 next to that choice).

Scale 1. Very good knowledge of subject 3. Limited knowledge of subject
(2.) Good knowledge of subject 4. No knowledge of subject

___ AIS present in the County	___ Effects of AIS on recreation
___ Able to identify AIS	___ Long term results of AIS control
___ Effects of AIS on ecosystem	___ Methods of AIS control
___ Methods of AIS prevention	___ Methods of AIS transport from lake to lake

16. How interested would you be in receiving information about aquatic invasive species? (Circle one)

A. Very interested B. Somewhat interested C. Not too interested D. Not at all interested

Have all I need

17. Have you ever looked specifically for aquatic invasive species in Lake Alice? (circle one)

A. No B. Yes, but no more than once a year C. Yes, but no more than once a month
D. Yes, at least weekly E. If you answered yes (that is, circled B, C, or D), describe what you did.

_____

18. Curly-leaf pondweed is an invasive aquatic plant that is found in many lakes in Wisconsin and is present in Lake Alice. Do you believe you can identify this plant? (Circle one)

A. Definitely no B. Probably no C. Not sure D. Probably yes E. Definitely yes

19. Prior to receiving this survey, did you know that curly-leaf pondweed was present in Lake Alice?

A. Definitely yes B. I think so, but uncertain C. Definitely no

20. How would you consider curly-leaf pondweed growth in Lake Alice?

A. Large problem B. Moderate problem C. Unsure D. Small problem E. No problem

21. Below are several methods used by professionals to manage various aquatic invasive plants. Using the following scale, please indicate your level of support or opposition for each control method.

A. Definitely support B. Probably support C. Unsure D. Probably oppose E. Definitely oppose

___Do nothing
A Hand pulling and raking – use of SCUBA or Snorkeling
___Mechanical harvesting – use of a machine to eliminate invasive aquatic plants
A Biological controls (native weevils) – placed in the lake to naturally control Eurasian watermilfoil
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22. The impacts of curly-leaf pondweed include overtaking native plants, impeding navigation in early summer, and increasing phosphorus levels when the plants die in summer. Chemical treatment can be applied to curly-leaf pondweed, but can impact native plants, is quite expensive, and must continue over several years or indefinitely (eradication of the curly-leaf pondweed is unlikely). Do you think the potential benefits of controlling curly-leaf pondweed are worth the risks of chemical treatment?

A. Definitely worth the risks B. Not sure C. Definitely not worth the risks D. Need more information

23. The choices below list possible funding sources for Aquatic Invasive Species (AIS) management. Please rank your top three choices. Write a 1 to indicate your top choice and a 3 for your third choice. (Choose only 3)

1 State grant assistance
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2 Resource user fee (e.g. AIS boat sticker)
3 Boat launch fee
___Property tax or special assessment
___Other _____

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3. Scanning the shoreline looking for any unusual snails or mussels

✓ 4. Observing the water for presence of the spiny water fleas

✓ 5. Observing the rusty crayfish Why don't we have a 18" small Mouth size like on the lakes With rusty crayfish

✓ 6. Report fish that have abnormalities or are a different species than you have seen.

7. Use SCUBA to look for Aquatic Invasive Species (early detection monitoring)

8. Snorkeling to look for Aquatic Invasive Species (early detection monitoring)

B. Grant writing – help in finding money for planning and management on the lake

C. Citizen Lake Water Quality Monitor

✓ 1. Collecting water samples

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3. Temperature/dissolved oxygen profile (using a meter to determine temperature and dissolved oxygen at various depths in the water column)

✓ 4. Use of your boat by scientists or volunteers for water quality monitoring activities.

D. Clean Boats, Clean Waters – educate the boaters on AIS and inspect boats

E. Volunteer Coordinator – organize volunteers for specific tasks on the lake

F. Other (specify :______________________________)

G. Do not wish to volunteer

NOTE: If you checked any of the volunteer opportunities or would like more information on AIS, please provide your contact information.

*Name*______________________________

*Address*______________________________

*City*__________________ *State*_____ *Zip Code*__________

*Phone*________________ *Email*____________________

25. Please provide suggestions that you would like addressed by the APM plan on separate sheet.

Thank you for taking time to complete this survey. Return completed survey to:

Lake Alice Association
Contact: Glenn Mott
W 4945 Echo Point
Tomahawk, WI 54487

Help stop aquatic hitchhikers:
http://www.protectyourwaters.net/

I feel this form was not updated, it stressed the curly leaf pond problem, which has died back the last couple of years. Eurasian Water milfoil has been established and spreading in back of Generator Island, which was never mentioned.

There has been many success stories in treating Eurasian water milfoil. Shawano Lake, by the use of herbicides which did not kill their native aquatic plants. On small lakes by the use of professional scuba divers. (Things to think about)

All treatment programs are very expensive. We only have a lake association with a very dedicated board that can't do it all. Could we form a "lake district" to involve more property owners & a source of revenue if needed. Plants are drying up if they are not used to solve our milfoil, or to lesser extent curly leaf problem. They are a waste of time and money.

We would be smart to put money from our fisheree in a bank account for the use of fighting invasive species.

We are also getting a blue-green algae problem. from August to first frost. that makes some bays almost unuseable.

On the lighter side, its almost getting like the T.V. ad "I am not a cop, just here to monitor the problem. For the dedicated few that are doing their best, I wish you had more support from lake property owners, and the many who recreate on Lake Alice, but contribute nothing.

1. Please circle the response(s) that describes your affiliation with Lake Alice and the community.

A. Shoreline home/cottage/apartment owner
B. Shoreline home/cottage/apartment renter
C. Shoreline vacant landowner
(D.) Shoreline year-round resident
E. Shoreline seasonal resident
F. Nearby offshore resident (year-round)
G. Nearby offshore resident (seasonal)
H. Area business owner
I. Tourist or vacationer
J. Other (specify)_____

2. How many years of experience do you have with Lake Alice? 70 YRS

3. Please circle the activities that you do on Lake Alice. (Circle all that apply)

(A.) Fishing (open water)
(B.) Ice fishing
C. Personal watercraft
D. Swimming
E. Pontoon boating
F. Waterskiing/tubing
G. Pleasure boating
O. Other_____
H. SCUBA
I. Canoeing & kayaking
J. Nature viewing
K. Enjoyment of scenery
L. Hunting
M. Snorkeling
N. Sailing
P. None of the above (please skip to question 9)

4. Please rank the four activities that are most important to you on Lake Alice. (Use "1" for the most important, "2" for your next choice and so on.)

1 Open water fishing
___Waterskiing
___Personal water craft
___Swimming
___Pontoon boating
___Sailing
___Pleasure boating
___Other (specify) _____
___SCUBA
___Canoeing & kayaking
3 Nature viewing
4 Scenery
___Hunting
___Snorkeling
2 Ice fishing

5. Overall, how satisfied are you with your recreational experiences on Lake Alice? (Circle only one)

A. Very satisfied (B.) Fairly satisfied C. Not too satisfied D. Not at all satisfied

6. Please circle the statement that best describes how often you recreate on Lake Alice during the summer (between Memorial Day and Labor Day).

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7. What types of watercraft do you use on Lake Alice?

___Do not use watercraft (please skip to question 9)

___Paddleboat

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___Canoe

___Rowboat

___Kayak

___Motorboat with 25 hp or less

___Motorboat with greater than 25 hp

___Pontoon

___Jet Ski (personal watercraft)

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___I use my watercraft on Lake Alice

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1 Water quality

___ Human-caused noise

___ Shoreline erosion

___ Storm drain runoff

___ Near-shore human development

4 Boat traffic

___Boating safety

2 Quality of fish habitat

___ Aquatic plant growth

___ Algae growth

3 New Aquatic Invasive Species (AIS) introductions

___ Human development on the greater watershed

___ Shoreline vegetation removal

___Other (explain_____)

10. Considering the lake issues in question 9, please evaluate the overall lake quality. (Circle one)

A. Excellent B. Good (C.) Fair D. Poor E. Unsure

11. During the years you've been familiar with Lake Alice, what changes have you seen in the aquatic plants (including algae)? (Circle all that apply)

A. No dramatic changes – about the same as always.

B. More aquatic plants than in the past.

(C.) Fewer aquatic plants than in the past.

(D.) More algal blooms than in the past.

E. Fewer algal blooms than in the past.

F. Other (describe :_____)

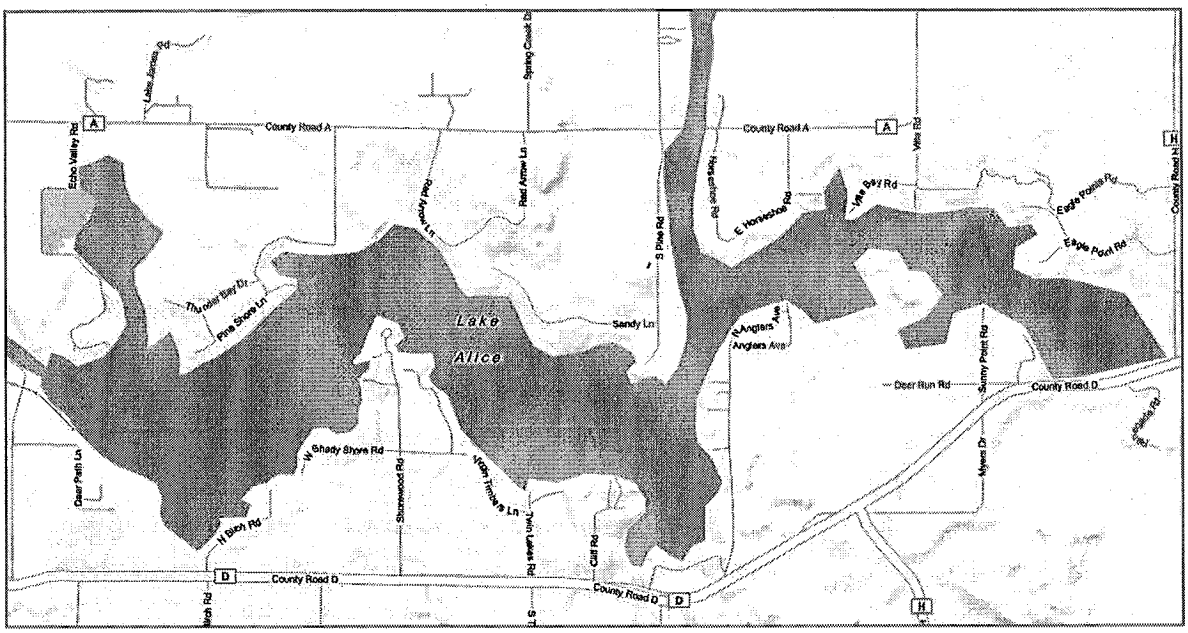
12. In the summer months (Memorial Day through Labor Day), how often does aquatic plant growth (including algae) negatively affect your use of Lake Alice? (Circle one)

A. Always B. Most of the time (C.) Sometimes D. Rarely E. Never

13. Do you believe that aquatic plant management is needed on Lake Alice? (Please circle only one)

(A). Yes B. No (please skip to question 15) C. Unsure (please answer question 14)

14. If you answered "Yes" to question 13, please describe the problem on Lake Alice that you believe requires aquatic plant management. Label on the map (if appropriate) where you have observed plant problems with an "X" and provide a description.



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Scale 1. Very good knowledge of subject 3. Limited knowledge of subject
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16. How interested would you be in receiving information about aquatic invasive species? (Circle one)

A. Very interested (B.) Somewhat interested C. Not too interested D. Not at all interested

17. Have you ever looked specifically for aquatic invasive species in Lake Alice? (circle one)

(A. No) B. Yes, but no more than once a year C. Yes, but no more than once a month D. Yes, at least weekly E. If you answered yes (that is, circled B, C, or D), describe what you did.

_____

18. Curly-leaf pondweed is an invasive aquatic plant that is found in many lakes in Wisconsin and is present in Lake Alice. Do you believe you can identify this plant? (Circle one)

A. Definitely no B. Probably no C. Not sure (D) Probably yes E. Definitely yes

19. Prior to receiving this survey, did you know that curly-leaf pondweed was present in Lake Alice?

(A) Definitely yes B. I think so, but uncertain C. Definitely no

20. How would you consider curly-leaf pondweed growth in Lake Alice?

(A) Large problem B. Moderate problem C. Unsure D. Small problem E. No problem

21. Below are several methods used by professionals to manage various aquatic invasive plants. Using the following scale, please indicate your level of support or opposition for each control method.

A. Definitely support B. Probably support C. Unsure D. Probably oppose E. Definitely oppose

E Do nothing

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C Mechanical harvesting – use of a machine to eliminate invasive aquatic plants

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___Other _____

24. There are several opportunities for citizens to help in Aquatic Plant Management Plan implementation. From the list below, please identify which activities, if any, you would be interested in helping with. Your answers are not a commitment, only an indication of interest. (Select all that apply.)

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E. Volunteer Coordinator – organize volunteers for specific tasks on the lake

F. Other (specify :_____)

G. Do not wish to volunteer

NOTE: If you checked any of the volunteer opportunities or would like more information on AIS, please provide your contact information.

*Name*_____

*Address*_____

*City*_____ *State*_____ *Zip Code*_____

*Phone*_____ *Email*_____

25. Please provide suggestions that you would like addressed by the APM plan on separate sheet.

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1. Please circle the response(s) that describes your affiliation with Lake Alice and the community.

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E. Shoreline seasonal resident
F. Nearby offshore resident (year-round)
G. Nearby offshore resident (seasonal)
H. Area business owner
I. Tourist or vacationer
J. Other (specify)_____

2. How many years of experience do you have with Lake Alice? 25 yrs

3. Please circle the activities that you do on Lake Alice. (Circle all that apply)

A. Fishing (open water)
B. Ice fishing
C. Personal watercraft
D. Swimming
E. Pontoon boating
F. Waterskiing/tubing
G. Pleasure boating
O. Other_____
H. SCUBA
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_2_ Water quality

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_3_ Shoreline erosion

___ Storm drain runoff

___ Near-shore human development

___Boat traffic

___Boating safety

___Quality of fish habitat

_1_ Aquatic plant growth

___ Algae growth

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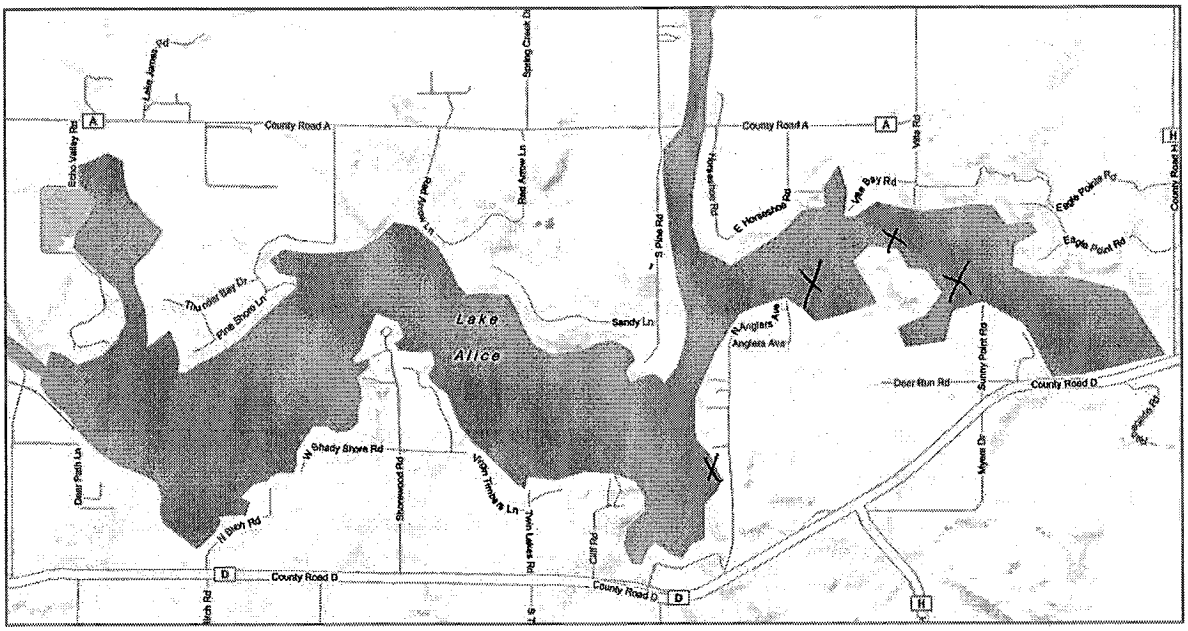

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E. Volunteer Coordinator – organize volunteers for specific tasks on the lake

F. Other (specify :_____)

G. Do not wish to volunteer used to but can of my wife doesn't allow helping

NOTE: If you checked any of the volunteer opportunities or would like more information on AIS, please provide your contact information.

Name Bruce Oradei _____

Addres N9981 Anglers Ave. _____

Tomahawk, WI 54487-8504

City _____ *State*____ *Zip Code*_____

Phone 715-453-8935 *Email* don't have any.

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G. Nearby offshore resident (seasonal)
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I. Tourist or vacationer
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2. How many years of experience do you have with Lake Alice? 45

3. Please circle the activities that you do on Lake Alice. (Circle all that apply)

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D. Swimming
E. Pontoon boating
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✓ Motorboat with greater than 25 hp

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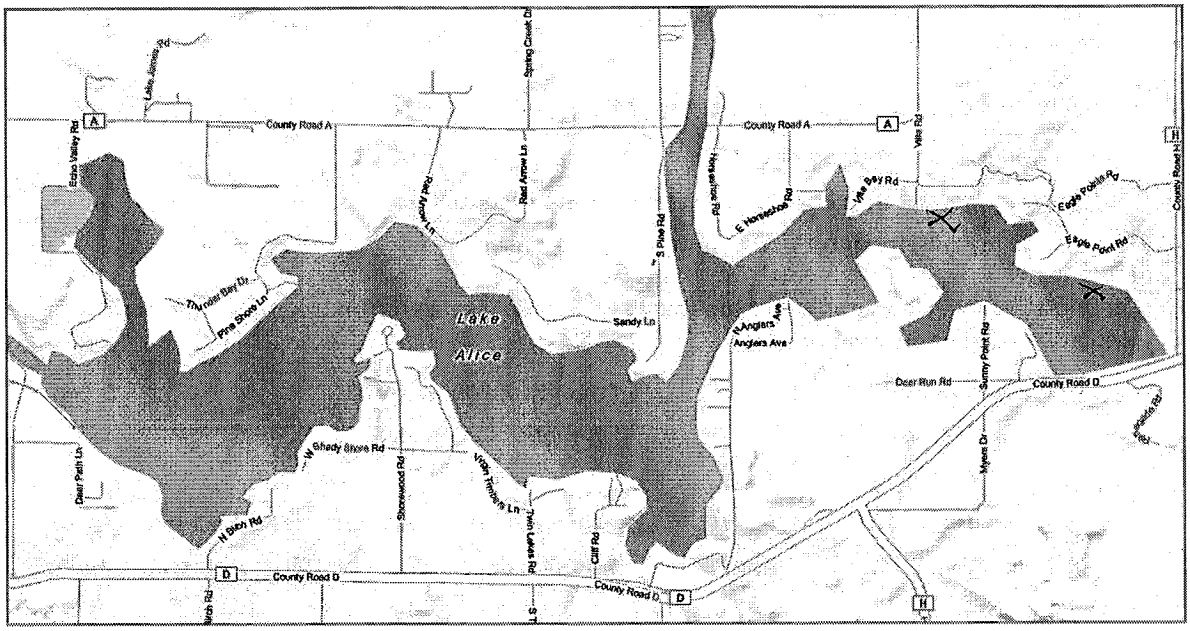

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F. Other (specify :_____)

G. Do not wish to volunteer

NOTE: If you checked any of the volunteer opportunities or would like more information on AIS, please provide your contact information.

Name DENNIS BAFFA

Address N 9926 VIRGIN TIMBERS LN.

City TOMAHAWK *State* WI *Zip Code* 54487

Phone 715-453-9575 *Email* D. BAFFA @ FRONTIER.COM

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H. Area business owner
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O. Other_____
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(J) Nature viewing
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___Do not use watercraft (please skip to question 9)

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ALGAE ONLY

13. Do you believe that aquatic plant management is needed on Lake Alice? (Please circle only one)

(A.) Yes B. No (please skip to question 15) (C.) Unsure (please answer question 14)

OF TYPE TO BE DONE

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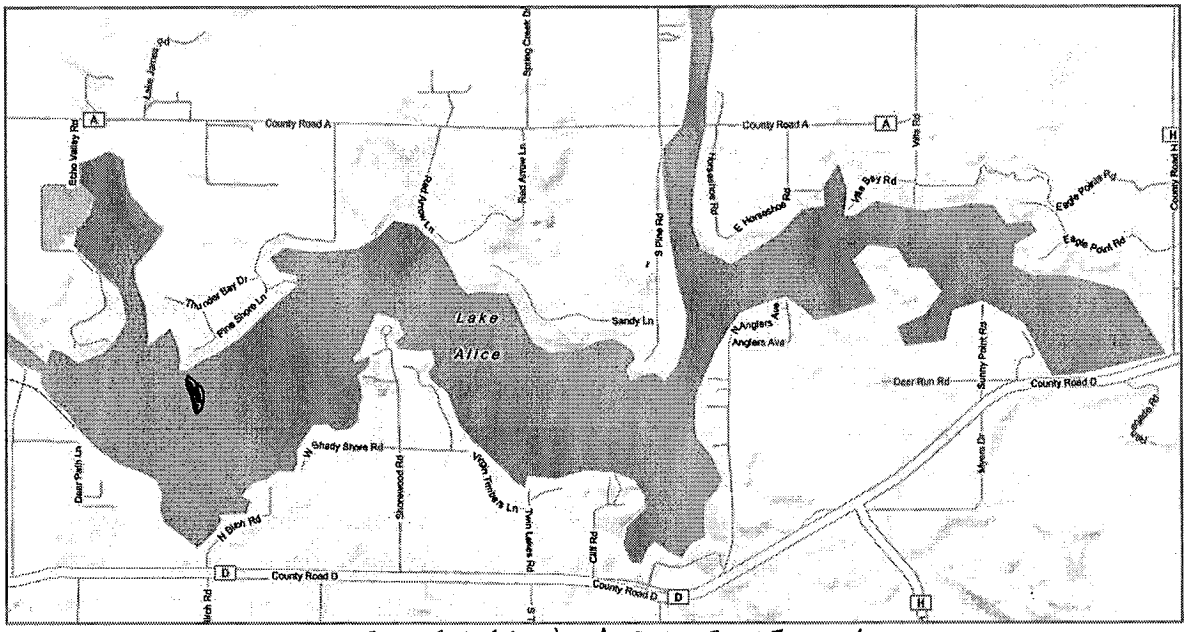

EURASIAN W. MILFOIL

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VISUAL WHILE FISHING & PONTOONING

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NOTE: If you checked any of the volunteer opportunities or would like more information on AIS, please provide your contact information.

Name GEORGE NELSON

Address W4691 E. PINE SHORE LANE

City TOMAHAWK *State* WI *Zip Code* 54487

Phone 815-262-7216 (CELL) *Email*_____

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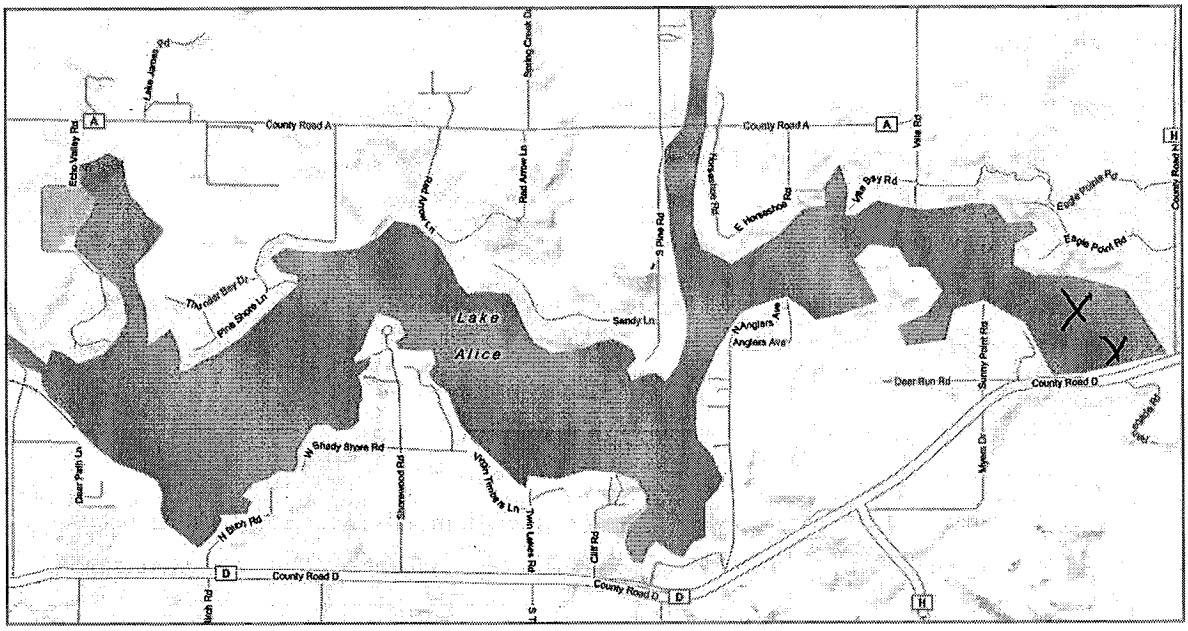

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Name Tom Fahey

Address W4374 Tributes Rd

City Tomahawk *State* WI *Zip Code* 54487

Phone 715-966-3170 *Email* [illegible]

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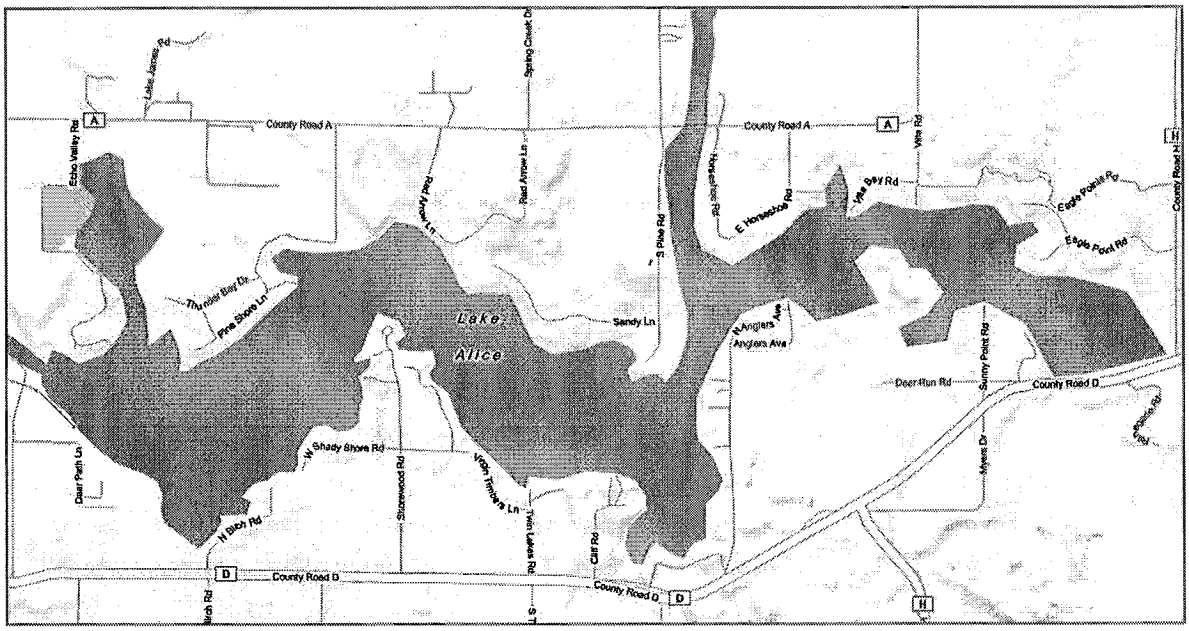

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A. Very interested (B.) Somewhat interested C. Not too interested D. Not at all interested

17. Have you ever looked specifically for aquatic invasive species in Lake Alice? (circle one)

A. No B. Yes, but no more than once a year C. Yes, but no more than once a month
(D.) Yes, at least weekly E. If you answered yes (that is, circled B, C, or D), describe what you did.
CHECK TO SEE IF SPREADING

18. Curly-leaf pondweed is an invasive aquatic plant that is found in many lakes in Wisconsin and is present in Lake Alice. Do you believe you can identify this plant? (Circle one)

A. Definitely no B. Probably no C. Not sure (D.) Probably yes E. Definitely yes

19. Prior to receiving this survey, did you know that curly-leaf pondweed was present in Lake Alice?

A. Definitely yes B. I think so, but uncertain C. Definitely no

20. How would you consider curly-leaf pondweed growth in Lake Alice?

A. Large problem (B.) Moderate problem C. Unsure D. Small problem E. No problem

21. Below are several methods used by professionals to manage various aquatic invasive plants. Using the following scale, please indicate your level of support or opposition for each control method.

A. Definitely support (B.) Probably support C. Unsure D. Probably oppose E. Definitely oppose

___Do nothing
___Hand pulling and raking – use of SCUBA or Snorkeling
___Mechanical harvesting – use of a machine to eliminate invasive aquatic plants
X Biological controls (native weevils) – placed in the lake to naturally control Eurasian watermilfoil
___Aquatic herbicides – applying herbicides to the AIS to control them

22. The impacts of curly-leaf pondweed include overtaking native plants, impeding navigation in early summer, and increasing phosphorus levels when the plants die in summer. Chemical treatment can be applied to curly-leaf pondweed, but can impact native plants, is quite expensive, and must continue over several years or indefinitely (eradication of the curly-leaf pondweed is unlikely). Do you think the potential benefits of controlling curly-leaf pondweed are worth the risks of chemical treatment?

A. Definitely worth the risks (B.) Not sure C. Definitely not worth the risks D. Need more information

23. The choices below list possible funding sources for Aquatic Invasive Species (AIS) management. Please rank your top three choices. Write a 1 to indicate your top choice and a 3 for your third choice. (Choose only 3)

1 State grant assistance
___Private (landowner) funding
___Resource user fee (e.g. AIS boat sticker)
2 Boat launch fee
3 Property tax or special assessment
___Other _____

24. There are several opportunities for citizens to help in Aquatic Plant Management Plan implementation. From the list below, please identify which activities, if any, you would be interested in helping with. Your answers are not a commitment, only an indication of interest. (Select all that apply.)

A. Lake Aquatic Invasive Species Monitor (training can be provided) – possibilities might include

1. Placing a zebra mussel sampler off your dock and monitor for presence/absence
2. Looking for Eurasian water milfoil and purple loosestrife
3. Scanning the shoreline looking for any unusual snails or mussels
4. Observing the water for presence of the spiny water fleas
5. Observing the rusty crayfish
6. Report fish that have abnormalities or are a different species than you have seen.
7. Use SCUBA to look for Aquatic Invasive Species (early detection monitoring)
8. Snorkeling to look for Aquatic Invasive Species (early detection monitoring)

B. Grant writing – help in finding money for planning and management on the lake

C. Citizen Lake Water Quality Monitor

1. Collecting water samples
2. Using a Secchi disk (white and black disc dropped into the water to see how far down you can see determining the water clarity)
3. Temperature/dissolved oxygen profile (using a meter to determine temperature and dissolved oxygen at various depths in the water column)
4. Use of your boat by scientists or volunteers for water quality monitoring activities.

D. Clean Boats, Clean Waters – educate the boaters on AIS and inspect boats

E. Volunteer Coordinator – organize volunteers for specific tasks on the lake

F. Other (specify :_____)

G. Do not wish to volunteer

NOTE: If you checked any of the volunteer opportunities or would like more information on AIS, please provide your contact information.

Name WAYNE T. & JULIE L. ALLEN

Address N10189 N. ANGLERS AVE.

City TOMAHAWK *State* WI *Zip Code* 54487

Phone 715-453-8578 *Email*_____

25. Please provide suggestions that you would like addressed by the APM plan on separate sheet.

Thank you for taking time to complete this survey. Return completed survey to:

Lake Alice Association
Contact: Glenn Mott
W 4945 Echo Point
Tomahawk,WI 54487

Help stop aquatic hitchhikers:
http://www.protectyourwaters.net/

Email version - completed by Fred Brach

Lake Alice Aquatic Plant Management Plan – Lake User Survey

Instructions:

1. To complete the survey, press "Reply"

2. Complete multiple choice questions by highlighting or placing an "X" in front of your answer

3. For questions that require a response, simply type your answer below the question (please highlight your response so it is easy for us to see.

4. For questions that require ranking, simply type a number in front of the blank.

5. When you have completed the survey press "Send".

1. Please highlight the response(s) that describes your affiliation with Lake Alice and the community.

A. Shoreline home/cottage/apartment owner
B. Shoreline home/cottage/apartment renter
C. Shoreline vacant landowner
X D. Shoreline year-round resident
E. Shoreline seasonal resident
F. Nearby offshore resident (year-round)
G. Nearby offshore resident (seasonal)
H. Area business owner
I. Tourist or vacationer
J. Other (specify)_____

2. How many years of experience do you have with Lake Alice? _____29_____

3. Please highlight the activities that you do on Lake Alice. (Highlight all that apply)

X A. Fishing (open water)
X B. Ice fishing
X C. Personal watercraft
X D. Swimming
E. Pontoon boating
X F. Waterskiing/tubing
X G. Pleasure boating
H. SCUBA
I. Canoeing & kayaking
X J. Nature viewing
X K. Enjoyment of scenery
X L. Hunting
M. Snorkeling
N. Sailing

O. Other_____ P. None of the above (please skip to question 9)

4. Please rank the four activities that are most important to you on Lake Alice. (Use "1" for the most important, "2" for your next choice and so on.)

__1_ Open water fishing
___Waterskiing
___Personal water craft
___Swimming
___Pontoon boating
___Sailing
___Pleasure boating
___Other (specify) _____
___SCUBA
___Canoeing & kayaking
__2_Nature viewing
__3_Scenery
___Hunting
___Snorkeling
__4 Ice fishing

5. Overall, how satisfied are you with your recreational experiences on Lake Alice? (Highlight only one)

A. Very satisfied X B. Fairly satisfied C. Not too satisfied D. Not at all satisfied

6. Please highlight the statement that best describes how often you recreate on Lake Alice during the summer (between Memorial Day and Labor Day).

X A. 10 or more days per month B. 3-9 days per month C. 1-2 days per month

D. 1-2 days for the summer E. Never

7. What types of watercraft do you use on Lake Alice? (Highlight one or more)

___Do not use watercraft (please skip to question 9)
__x_Paddleboat
___Sailboat
___Canoe
___Rowboat
___Kayak
___Motorboat with 25 hp or less
_x__Motorboat with greater than 25 hp
___Pontoon
___Jet Ski (personal watercraft)

8. On what waters do you use your watercraft(s)? (Highlight all that apply.)

__x_I use my watercraft on Lake Alice
__x_I use my watercraft on other water bodies in Wisconsin
__x_I use my watercraft on waters outside of Wisconsin

9. From the list below, please rank your top four (1, 2, 3, and 4) concerns for Lake Alice. Write a 1 for your primary (most important) concern.

__3_ Water quality
___Quality of fish habitat
___ Human-caused noise
___ Aquatic plant growth
___ Shoreline erosion
___ Algae growth
___ Storm drain runoff
__4_ New Aquatic Invasive Species (AIS) introductions
__1_ Near-shore human development
___ Human development on the greater watershed
___Boat traffic
_2__ Shoreline vegetation removal
___Boating safety
___Other (explain_____ _____)

10. Considering the lake issues in question 9, please evaluate the overall lake quality. (Highlight one)

A. Excellent X B. Good C. Fair D. Poor E. Unsure

11. During the years you've been familiar with Lake Alice, what changes have you seen in the aquatic plants (including algae)? (Highlight all that apply)

A. No dramatic changes – about the same as always.

B. More aquatic plants than in the past.

C. Fewer aquatic plants than in the past.

D. More algal blooms than in the past.

E. Fewer algal blooms than in the past.

X F. Other (describe :_____invasives increasing_____ _____ ___)

12. In the summer months (Memorial Day through Labor Day), how often does aquatic plant growth (including algae) negatively affect your use of Lake Alice? (Highlight one)

A. Always B. Most of the time X C. Sometimes D. Rarely E. Never

13. Do you believe that aquatic plant management is needed on Lake Alice? (Please highlight only one)

X A. Yes B. No (please skip to question 15) C. Unsure (please answer question 14)

14. If you answered "Yes" to question 13, please describe the problem on Lake Alice that you believe requires aquatic plant management. Describe where on Lake Alice the problem exists. (Type your answer below and highlight).

Milfoil growth increased near generator island

Curly leaf needs monitoring on east end and for spread throughout lake

15. Education is a fundamental component of Aquatic Plant Management (APM) planning projects. Please use the following scale to rank your understanding of the AIS topics listed below. (For example if you have no knowledge about methods of AIS transport, place a 4 next to that choice).

Scale 1. Very good knowledge of subject 3. Limited knowledge of subject

2. Good knowledge of subject 4. No knowledge of subject

__2_ AIS present in the County
_2__ Able to identify AIS
_2__ Effects of AIS on ecosystem
__2_ Methods of AIS prevention
_2__Effects of AIS on recreation
___2 Long term results of AIS control
_2__ Methods of AIS control
2___Methods of AIS transport from lake to lake

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___ Boat launch fee

_3__Property tax or special assessment

_1__Other _____lake district (property tax)_____

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X5. Observing the rusty crayfish

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