Lake Belle View AIS Carp Removal Progress Report

2014 Lake Drawdown and Commercial Seining Operation

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For

Village of Belle View AIS Grant

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Common carp (*Cyprinus carpio*) remains one of the most widespread and destructive exotic species in North America. It is tolerant of environmental degradation and its aggressive benthic feeding behavior can further degrade water quality and habitat for native fish populations. Controlling the destructive effects of common carp is a significant challenge due to a combination of factors including fast growth, large body size, prolific egg production and long lifespan. As part of a Wisconsin Department of Natural Resources (WDNR) Aquatic Invasive Early Detection and Response grant, the Village of Belle View, through a cooperative agreement with WDNR, hired a commercial fisherman to remove nuisance common carp in Lake Belle View. The carp removal effort was established for eradication and disposal and not for commercial sale. To improve seining catch rates, the lake was drawn down in the spring. Over a three day harvest/channel herding effort, 2,200 lbs of carp were removed from the lake. Consultants Richard Wedepohl and Dave Marshall participated in the commercial harvest and conducted water quality/fish shocking as monitoring efforts to assess the effectiveness of the eradication. While water quality monitoring continued, no commercial carp removal was conducted in 2015.

Eutrophic conditions in Lake Belle View continued through the 2015 growing season. Trophic State Index values in Figure 1 demonstrate that a significant water quality change did not occur after the carp removal in 2014. These conditions indicated that common carp numbers in the lake remain high enough to maintain the turbid conditions. However, lake users reported that lake conditions are generally favorable since Cyanobacteria blooms have not occurred for the last two summers. In Figure 2, high turbidity measurements continued in 2014 and 2015.

A partial winterkill occurred in early 2014 and the resulting environmental stress had potential to benefit common carp at the expense of native fish populations. Deep hole dissolved oxygen profiles in Figure 3 demonstrate low dissolved oxygen levels measured during the winters of 2014 and 2015. The 2014 winterkill occurred due to very low dissolved oxygen concentrations that dropped below 1 mg/l throughout the water column. However, the loss of walleyes and some other large gamefish 2014 did not affect high numbers of panfish that may have overwintered in spring seeps elsewhere in the lake. Figures 4 displays nearshore fish shocking surveys in 2014 and 2015. In September 2014, two young of year common carp were collected and demonstrated recruitment for the first time in the lake. As part of citizen outreach and efforts to encourage carp removal from the lake, carp fishing contests were organized as part of the 2014 and 2015 Lakefest events. Results demonstrated that common carp were still abundant in the lake following commercial harvests and additional carp removal efforts should continue. Figure 5 displays the length frequency distribution from the carp fishing contests. Comparing the 2014 and 2015 data, carp recruitment occurred after the lake was constructed and some growth had occurred in 2015. In Figure 6, the catch and harvest rates did not change significantly comparing the 2014 and 2015 contests. Vertical temperature and conductivity

profiles appear in Figures 7and 8. In addition to relatively high phosphorus and chlorophyll concentrations in the lake, chloride was measured in 2015 and high concentrations were found; 55.4 mg/l (June 16, 2015), 50.4 mg/l (July 15, 2015) and 67.3 mg/l (August 11, 2015). These high concentrations reflect the urbanized watershed and impervious surfaces where road salt is applied

Figure 1: Lake Belle View Trophic State Index 2011 – 2015

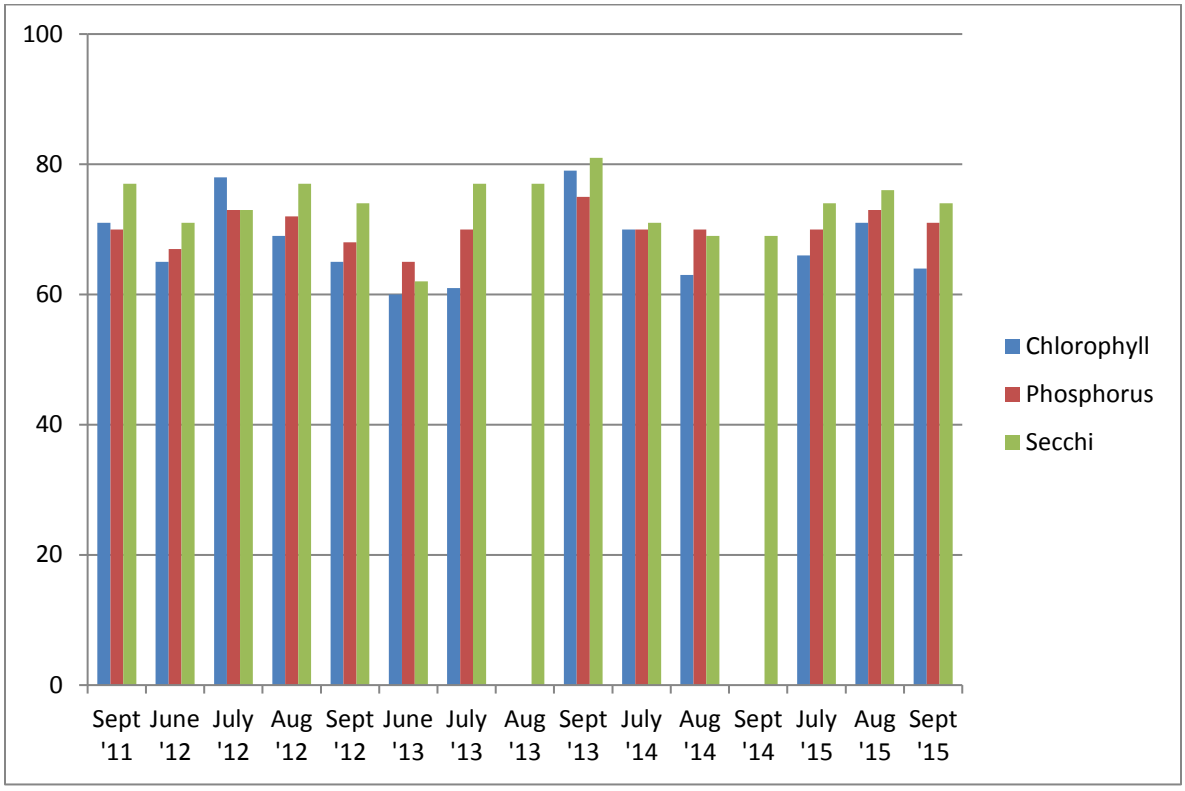


Figure 2: Lake Belle View Turbidity Levels 2011 – 15

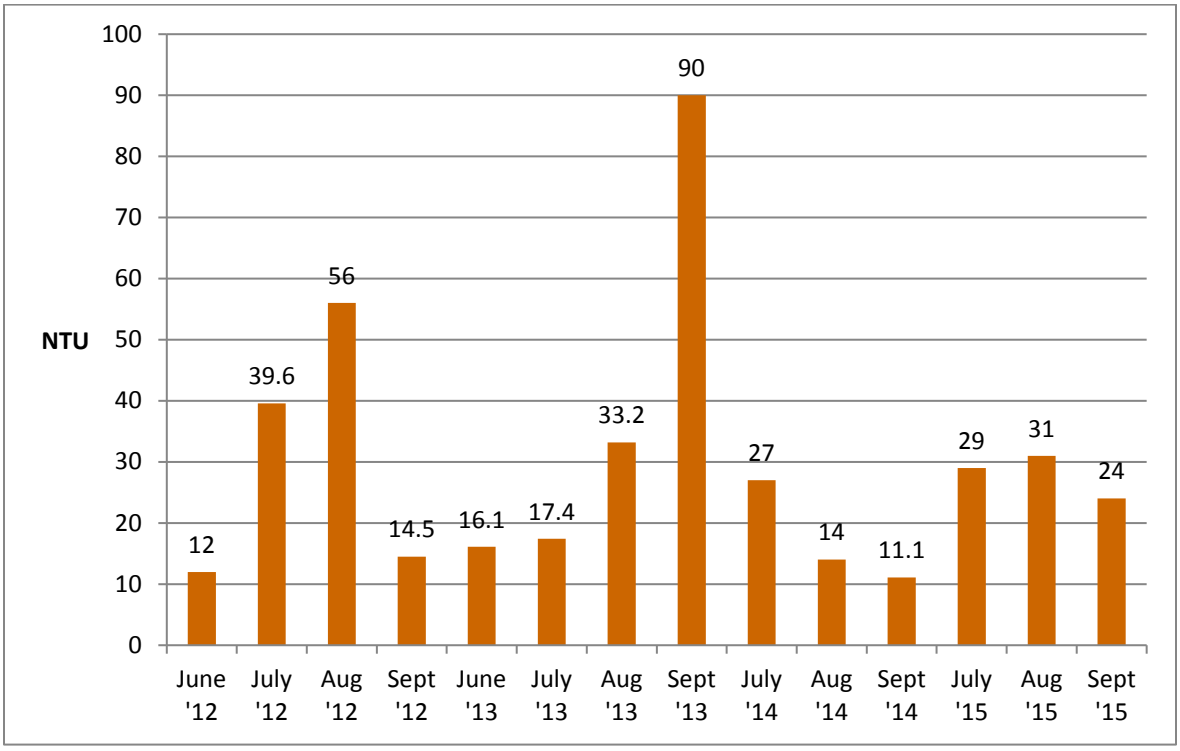
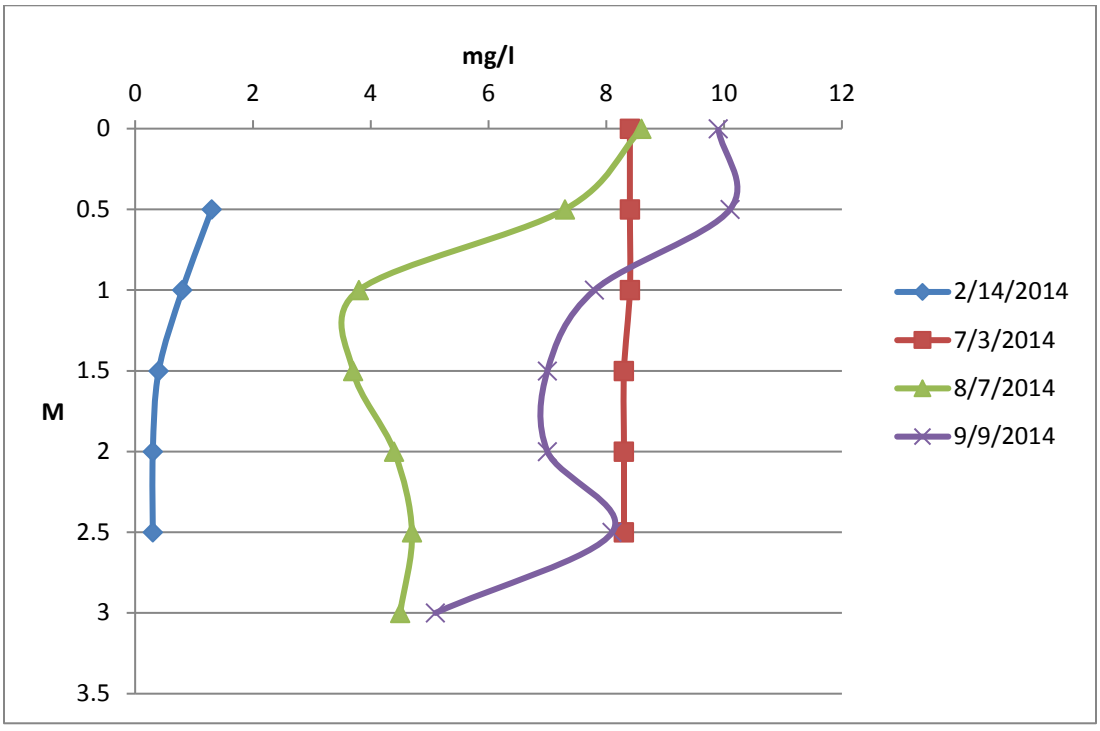


Figure 3: 2014 and 2015 Lake Belle View Dissolved Oxygen Profiles



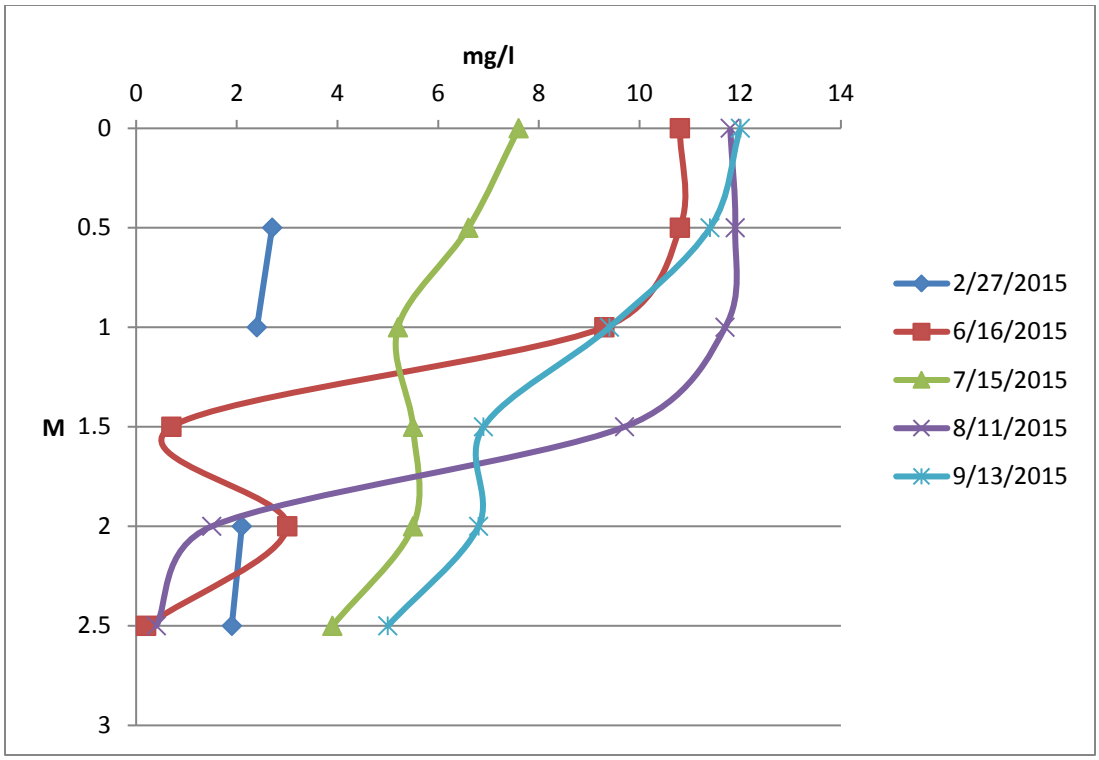


Figure 4: 2014 and 2015 Nearshore Fish Shocking Survey Results

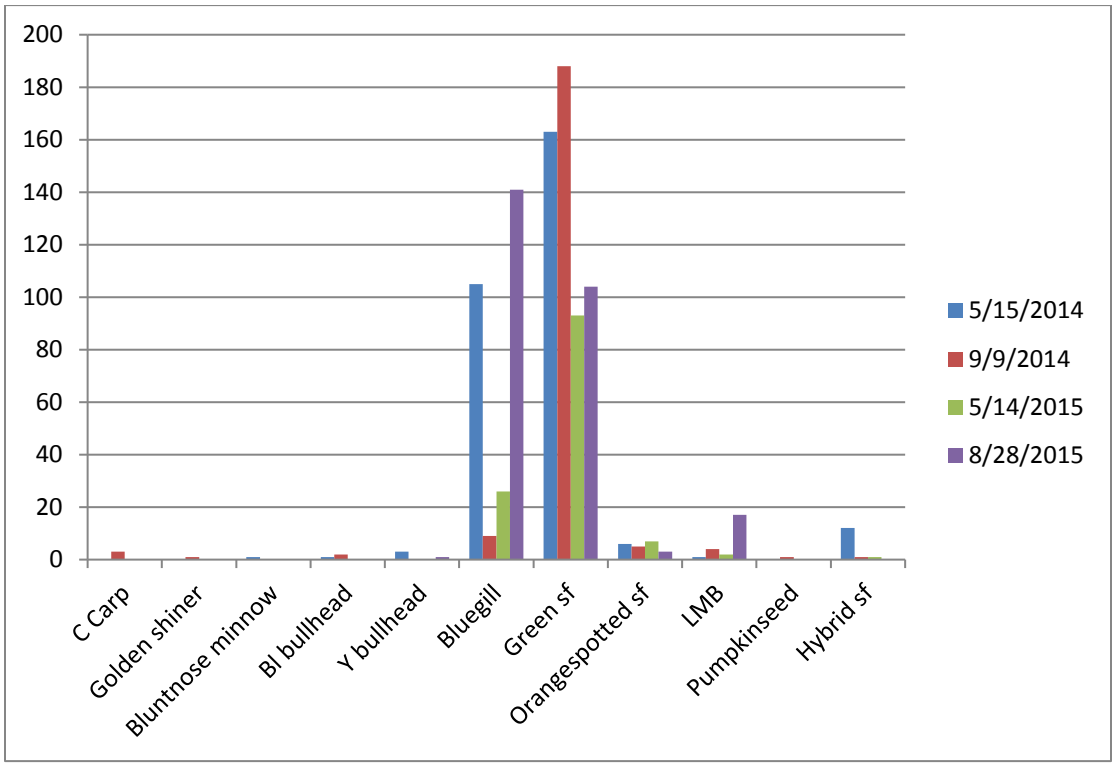


Figure 5: “Catch Me if You Can” Carp Contest Results

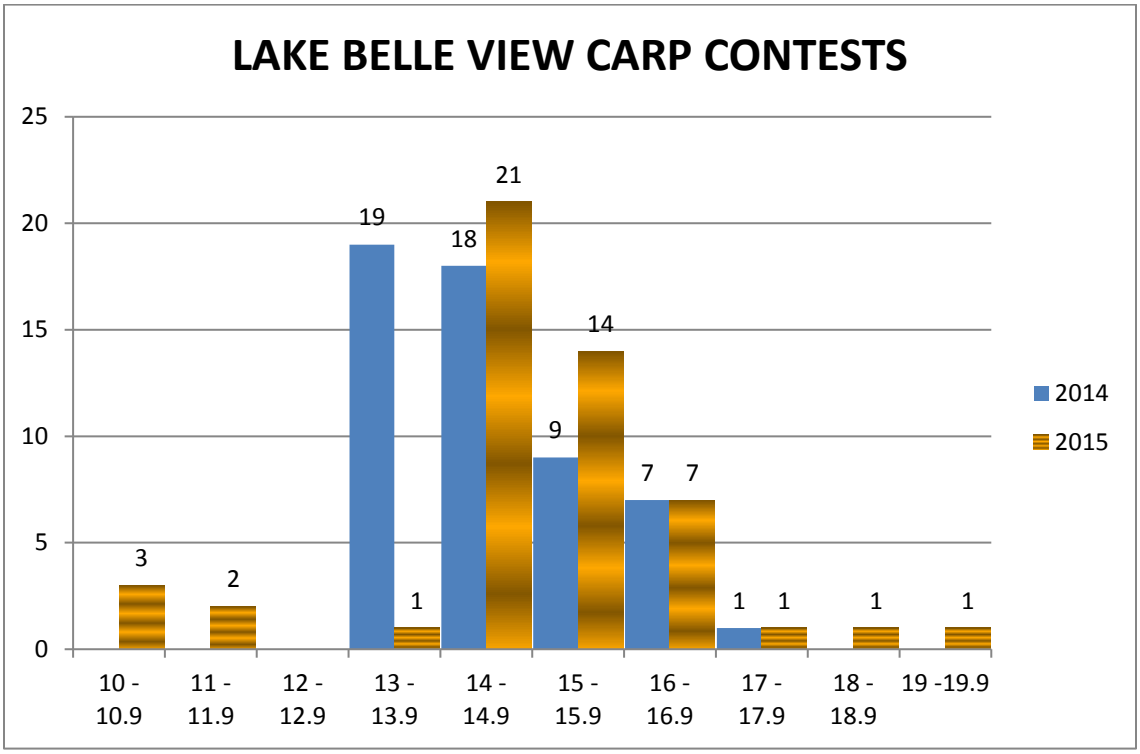
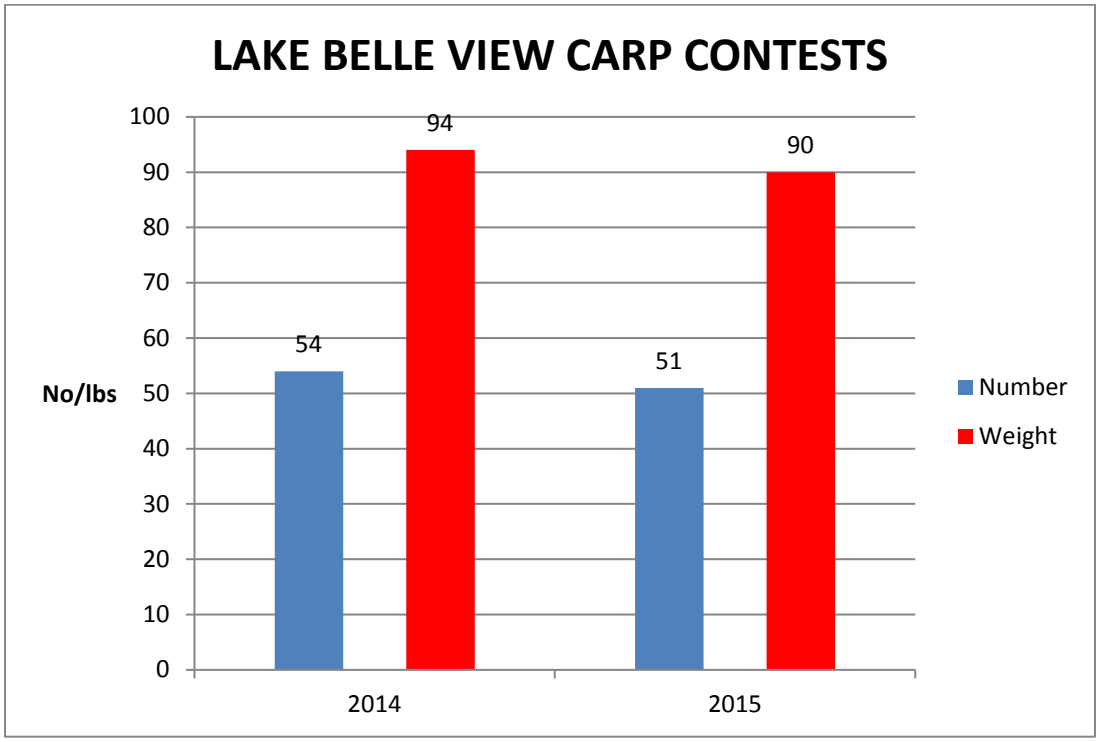
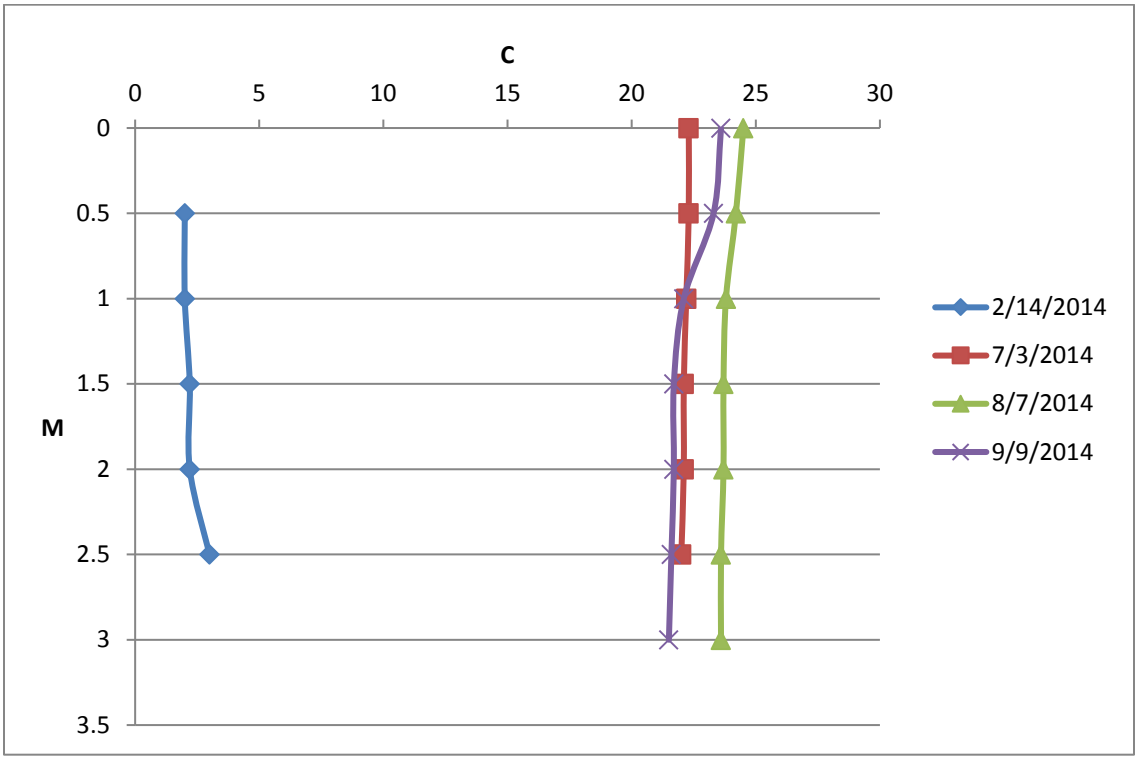


Figure 6: Carp Contest Harvest Data



Catch Me if You Can Tournament Winners

Figure 7: 2014-15 Lake Belle View Temperature Profiles



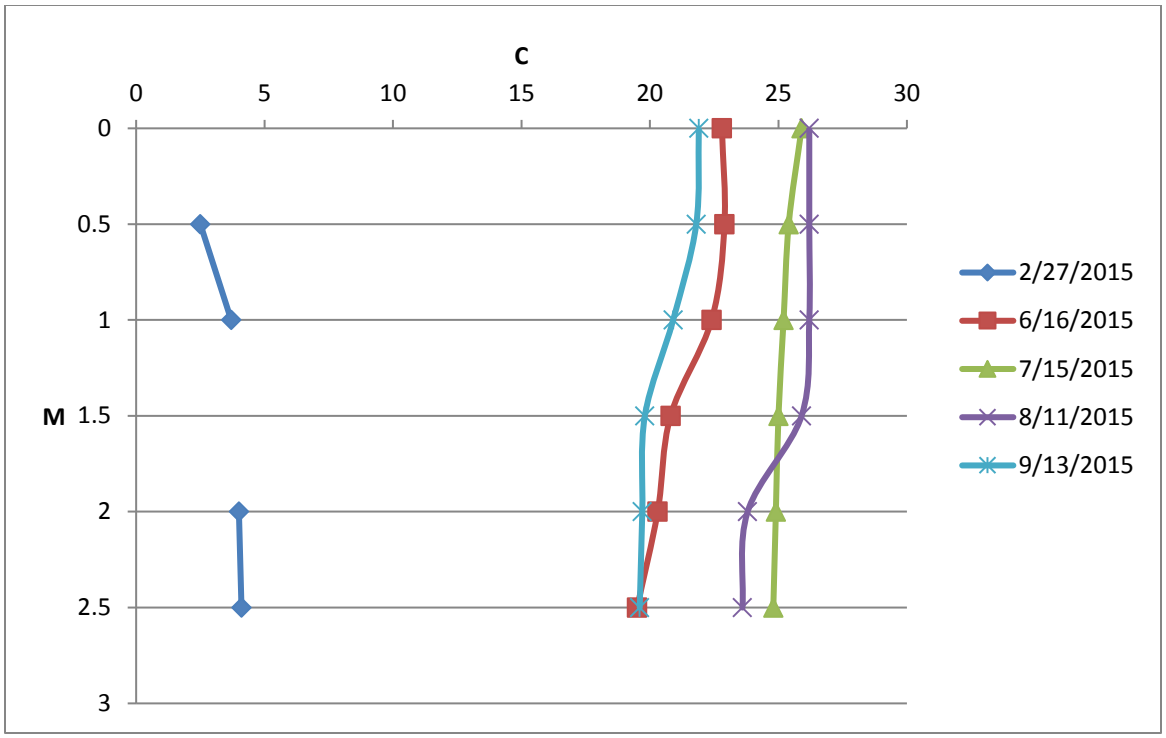
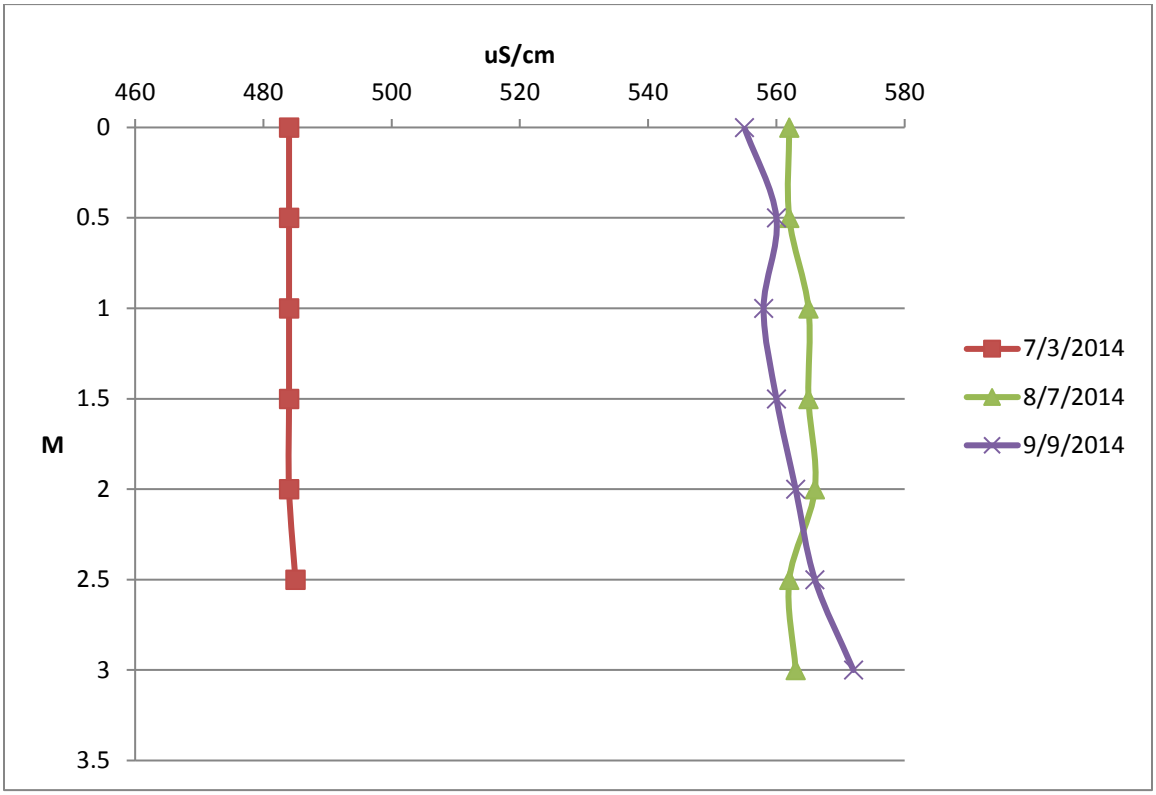
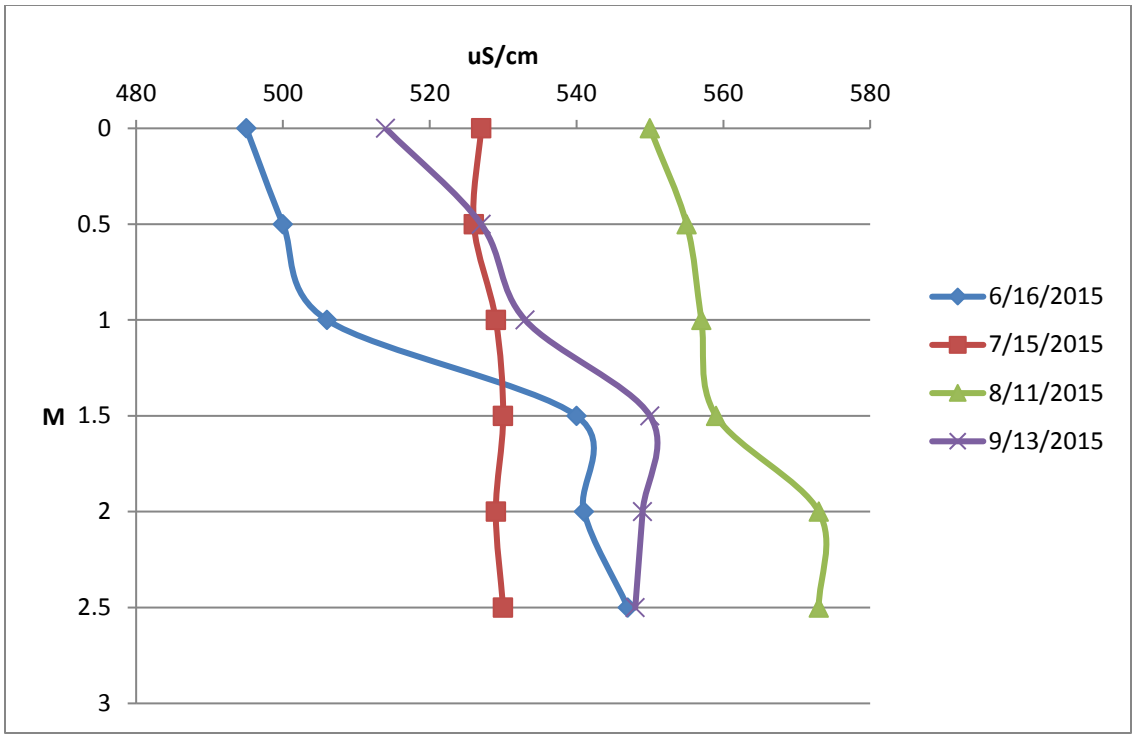


Figure 8: 2014 and 2015 Lake Belle View Specific Conductance Levels





Establishing diverse submersed and floating leaf aquatic plants was identified as an important goal of the oxbow lake restoration. However, the relatively short initial drawdown and common carp refuge undermined that effort. On June 16, 2015 we conducted a modified point intercept aquatic plant survey based on an earlier map of the old millpond. We sampled a subset of survey points that lie within the new lake boundaries but many other points now occur in the much reduced millpond, separation berm and newly expanded floodplain forest (Figure 9). Our data demonstrate the scarcity of both submersed and floating leaf pondweeds even though numerous white water lily and wild celery propagules were planted in the lake. Table 1 summarizes the aquatic plant survey results. Aquatic plant species collected or observed during the survey included coontail, Sago pondweed, curly-leaf pondweed, white water lily, small duckweed, large duckweed and long-leaf pondweed.

Figure 9: Lake Belle View (former millpond) Point Intercept Map and Sampled Areas Highlighted

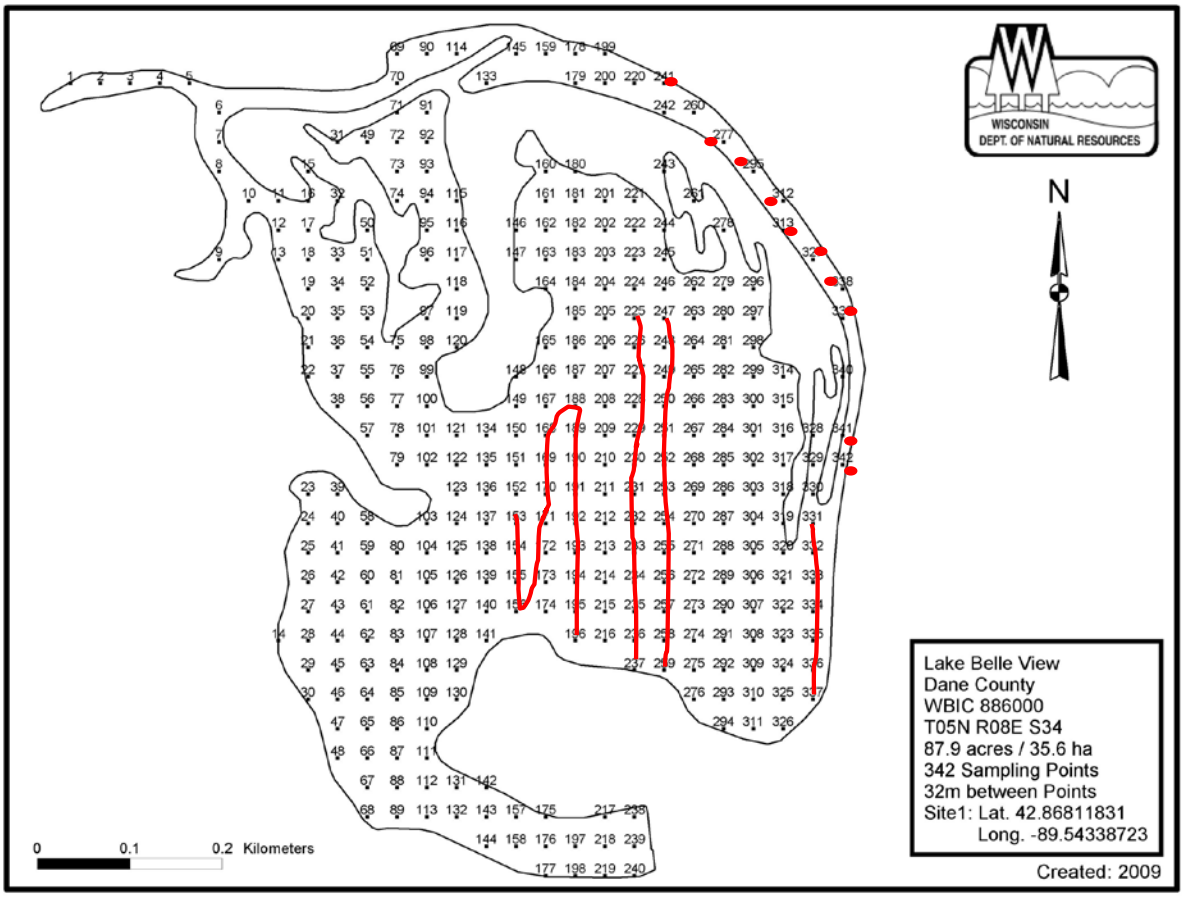


Table 1: Point Intercept Statistics

INDIVIDUAL SPECIES STATS:	Tot. Veg.
Frequency of occurrence within vegetated areas (%)	
Frequency of occurrence at sites shallower than maximum depth of plants	
Relative Frequency (%)	
Relative Frequency (squared)	0.43
Number of sites where species found	
Average Rake Fullness	
#visual sightings	
present (visual or collected)	
SUMMARY STATS:	
Total number of points sampled	**58**
Total number of sites with vegetation	**7**
Total number of sites shallower than maximum depth of plants	**50**
Frequency of occurrence at sites shallower than maximum depth of plants	**14.00**
Simpson Diversity Index	**0.57**
Maximum depth of plants (ft)	**8.50**
Number of sites sampled using rake on Rope (R)	**0**
Number of sites sampled using rake on Pole (P)	**0**
Average number of all species per site (shallower than max depth)	**0.14**
Average number of all species per site (veg. sites only)	**1.00**
Average number of native species per site (shallower than max depth)	**0.06**
Average number of native species per site (veg. sites only)	**1.00**
Species Richness	**3**
Species Richness (including visuals)	**7**

Species	Sites Found	Rake Fullness
Coontail (*Ceratophyllum demersum*)	4	1
Sago pondweed (*Struckenia pectinatus*)	3	1
Curly-leaf pondweed (*Potomogeton crispus*)	3	Visual
Long-leaf pondweed (*Potomogeton nodusus*)	1	Visual
White water lily (*Nymphaea odorata*)	1	Visual
Small duckweed (*Lemna minor*)	11	Visual
Large duckweed (*Spirodela polyrhiza*)	2	Visual
Filamentous algae	4	1

Management Needs

Given the limited commercial common carp removal and apparent strength of the population, a meeting was held on October 15, 2015 to discuss future management options. Below is a summary of the meeting between April Little, Richard Wedepohl, David Rowe, Kurt Welke (meeting notes preparer) and Dave Marshall. The AIS grant has since been amended to reflect the changes summarized below.

Notes- Meeting of Lake BelleView partners

October 15, 2015

In Attendance:

Kurt Welke, David Rowe WDNR

David Marshall, Richard Wedepohl, consultants to Village

April Little Village administrator

We discussed the proposal by The Village and the consultant to use remaining AIS grant funding (balance approximately $2000) to fund an electrofishing population estimate of carp using the Bajer- Sorenson method of Catch-per-unit-effort.

Our underlying problem is-was that contract fishing has been ineffective at reducing adult carp numbers. Efforts to attract a fisherman have been unsuccessful.

David re-visited the lake management plan and the elements therein:

- Enacting of a NR20.35 bag and size limit change on largemouth bass from 14" X 5 fish to 18" X 1 fish. This became effective in august 2015.
- Stocking of largemouth bass, Northern Pike and bluegill (in addition to field transfers) in order to provide predatory pressure on carp recruitment. Stockings have occurred in both 2014 and 2015.
- DNR intention to perform a spring (May) 2016 electrofishing survey to provide a carp CPUE metric and an idea of panfish abundance and size structure: in relation to goals established in the lake management plan.

We also discussed other tools that may be available. These were:

1. Supplemental stocking of channel catfish fingerlings at a rate of 10/acre. The Village may submit a stocking permit by on-line application: https://cida.usgs.gov/wdnr/apex/f?p=244:1:

Raw Field Data

Temp C				
	2/14/2014	7/3/2014	8/7/2014	9/9/2014
0		22.3	24.5	23.6
0.5	2	22.3	24.2	23.3
1	2	22.2	23.8	22.1
1.5	2.2	22.1	23.7	21.7
2	2.2	22.1	23.7	21.7
2.5	3	22	23.6	21.6
3			23.6	21.5

Temp C					
	2/27/2015	6/16/2015	7/15/2015	8/11/2015	9/13/2015
0		22.8	25.9	26.2	21.9
0.5	2.5	22.9	25.4	26.2	21.8
1	3.7	22.4	25.2	26.2	20.9
1.5		20.8	25	25.9	19.8
2	4	20.3	24.9	23.8	19.7
2.5	4.1	19.5	24.8	23.6	19.6

D.O. mg/l				
	2/14/2014	7/3/2014	8/7/2014	9/9/2014
0		8.4	8.6	9.9
0.5	1.3	8.4	7.3	10.1
1	0.8	8.4	3.8	7.8
1.5	0.4	8.3	3.7	7
2	0.3	8.3	4.4	7
2.5	0.3	8.3	4.7	8.1
3			4.5	5.1

D. O. mg/l					
	2/27/2015	6/16/2015	7/15/2015	8/11/2015	9/13/2015
0		10.8	7.6	11.8	12
0.5	2.7	10.8	6.6	11.9	11.4
1	2.4	9.3	5.2	11.7	9.4
1.5		0.7	5.5	9.7	6.9
2	2.1	3	5.5	1.5	6.8
2.5	1.9	0.2	3.9	0.4	5

Sp. Cond uS/cm			
	7/3/2014	8/7/2014	9/9/2014
0	484	562	555
0.5	484	562	560
1	484	565	558
1.5	484	565	560
2	484	566	563
2.5	485	562	566
3		563	572

Sp Cond uS/cm				
	6/16/2015	7/15/2015	8/11/2015	9/13/2015
0	495	527	550	514
0.5	500	526	555	527
1	506	529	557	533
1.5	540	530	559	550
2	541	529	573	549
2.5	547	530	573	548

Secchi	ft.
7/3/2014	1.5
8/7/2014	1.8
9/9/2014	1.8
6/16/2015	2
7/15/2015	1.3
8/11/2015	1.1
9/13/2015	1.2