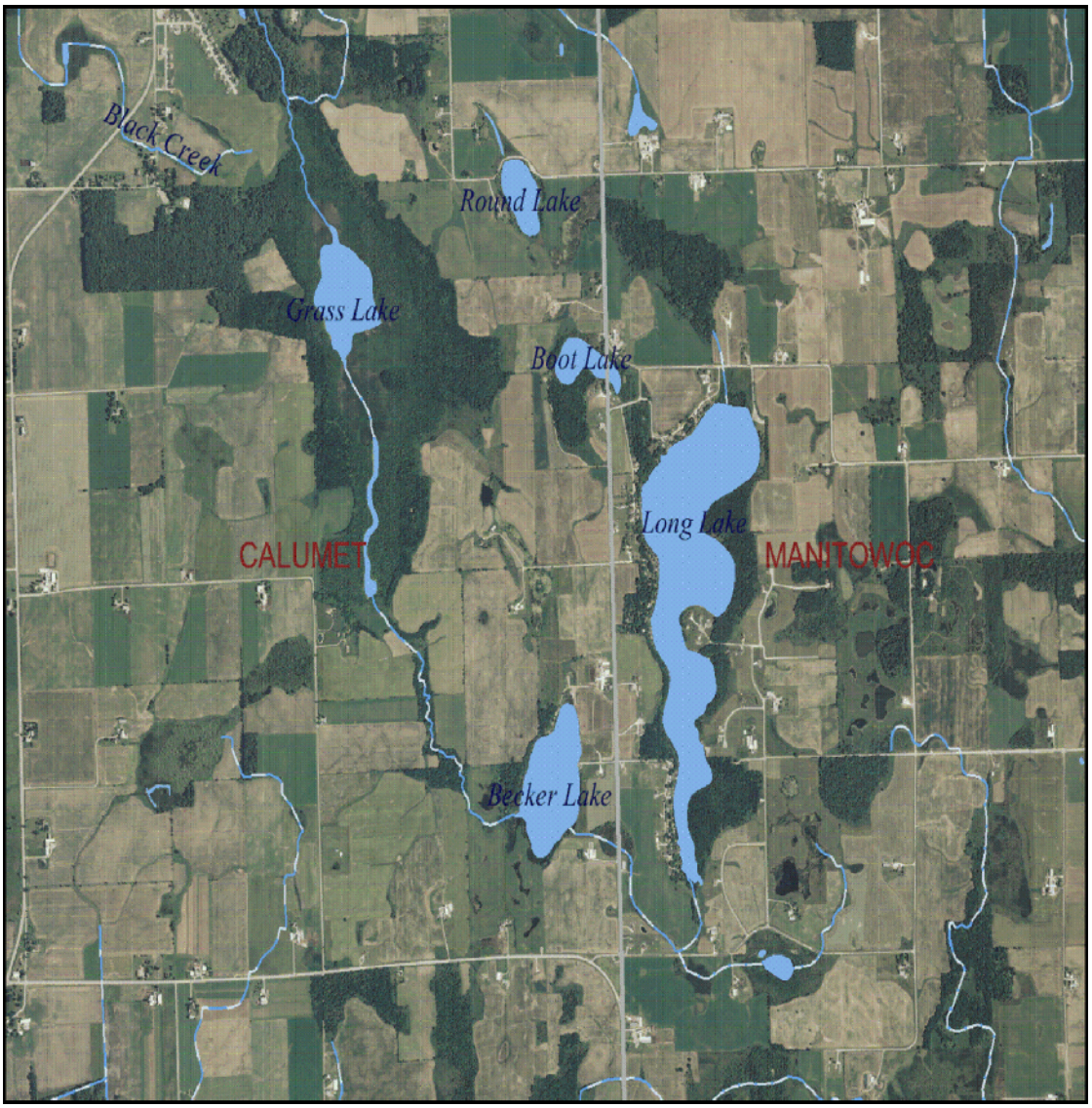

CalMan Lakes Organizational Project

Calumet County Resource Management Department
April 24, 2012

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I. BACKGROUND

In spring 2011, Calumet County received a small-scale lake management planning grant from the Wisconsin Department of Natural Resources for the CalMan Lake Organizational Project. The CalMan Lake Organizational Project includes five lakes; Becker, Boot, Grass, Long and Round Lakes.

- Becker Lake, which is located in Calumet County, is a 31 acre, seepage lake. There is an intermittent inlet and outlet which sometimes connect the lake to Grass Lake (outlet) and Long Lake (inlet). Due to the inlet from Long Lake, what happens in Long Lake affects the water quality of Becker Lake. Becker Lake has a county park located at the southwest corner of the lake which provides lake access for kayaks and canoes, along with access off a local road on the east side of the lake for boats. Most of the land use around the lake is cropland and recreational. Currently, there are two residential sites on the lake both with code compliant mound systems (one is from 1988, the other from 2001). However, another site along the lake is being prepared for residential development.

  The maximum depth of Becker Lake is 53 feet. There is 0.98 miles of shoreline, of which 0.05 miles are publicly owned. Fish include panfish, largemouth bass, northern pike, walleye, and carp. There are occasional to frequent winterkills with the most recent occurring in 2010.

- Boot Lake, which is located in Calumet and Manitowoc Counties, is a landlocked 11 acre seepage lake. During high water periods, it is connected to Long Lake. The lake has no public access. Land use around the lake is woodlands, open land, residential, and cropland.

  The lake is fairly shallow with a maximum depth of 16 feet. Fish include panfish, largemouth bass, and northern pike.

- Grass Lake, which is located in Calumet County, is the most notable lake from a wildlife standpoint. The lake is essentially a northern bog lake in a southern setting, surrounded by farmland. Vegetation includes various orchid species,

calla lilies, buck bean and a variety of other bog plants. It is the only bog of its type in Calumet County. The area is a significant nesting area for many species of ducks and Canada geese. The Wisconsin Department of Natural Resources lacks sufficient data regarding the fishery. The bog surrounding the lake is of statewide significance. This 240 acre bog features the wild pothole lake surrounded by extensive wetlands, including cattail and reed canary grass monotypes, willow and alder thickets, tamarack swamp forest, and scrubby bog.

The site is privately owned with no public access. Grass Lake receives water from Becker Lake. Due to the wetland soils, there are no residential home sites on the perimeter of the lake.

- Long Lake, which is located in Manitowoc County, is the largest of the five lakes and has the most developed shoreline. It is a 127 acre natural seepage lake with a maximum depth of 38 feet. In high water periods, it is connected to Boot Lake and possibly Round Lake by wetlands and has stream flow to Becker Lake. A dam regulates outflow. Fish include panfish, largemouth bass, northern pike, and a large carp population.

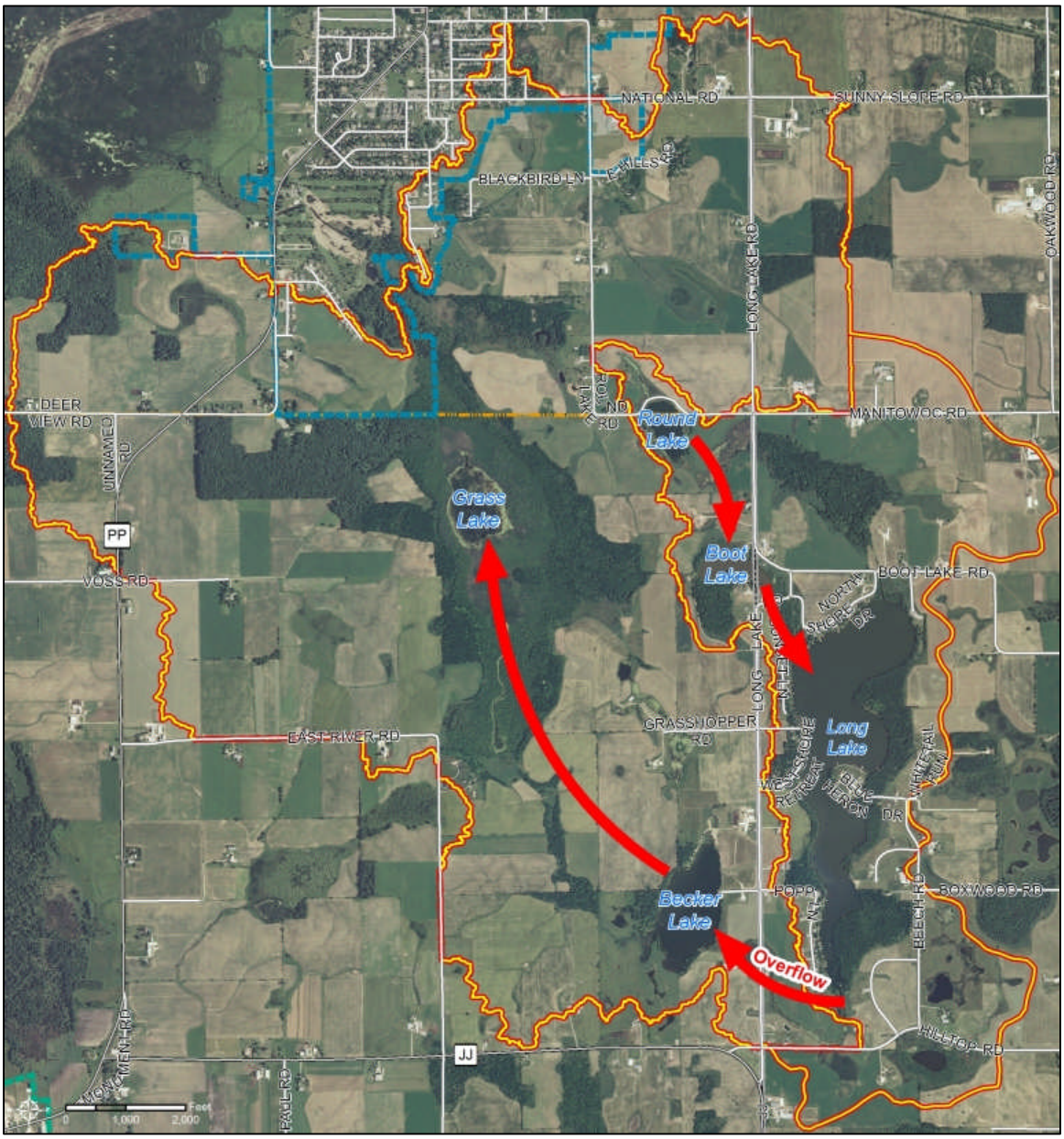
There is a county park at the northeast corner with a public boat access. In addition to residential development along the shoreline, there is an extensive amount of cropland on the perimeter and outlying areas.

- Round Lake, which is located in Calumet County, is a landlocked, 11 acre seepage lake and has a maximum depth of 50 feet. During high water periods, it may be connected by wetlands to Long Lake. Fish include panfish, largemouth bass, and trout. It is the only one of the five lakes where trout are stocked.

The majority of the land use around the lake is cropland with some open land along the shoreline. There are two residential sites on the lake's perimeter.

Map 1 demonstrates the direction of flow between the CalMan Lakes within the watershed.

Map 1
Direction of Flow, CalMan Lakes



In cooperation with Manitowoc County Soil and Water Conservation Department, Lakeshore Natural Resource Partnership, Wisconsin Department of Natural Resources, Wisconsin Lakes, and the public, Calumet County was able to create a CalMan Lakes land use inventory of the watershed, establish a volunteer lakes monitoring group, and develop an action plan among stakeholders.

This organizational project piggy-backed on public informational meetings held as part of the CalMan Lake Education Project. On September 27, 2011, 24 individuals, composed of staff and area landowners, discussed what the major problems with the lakes are, what's causing these problems, and how can they be solved. The responses received were used to formulate several of the action items included in Section V of this plan. A high emphasis was placed on continued education.

A meeting was held on March 12, 2012 to review the project's draft action plan and land use inventory. Over 40 people attended the meeting. Changes were made based on that discussion and a final draft was presented publicly on April 24, 2012.

March 12, 2012 organizational project meeting. Photo courtesy of June Scharenbroch

II. LAND USE

Before the land use inventory could begin, an accurate watershed of the five lakes needed to be determined. Calumet County staff utilized its geographic information system (GIS) capabilities to develop the watershed. Spatial hydrology software, LiDAR mapping, culvert inventory data and the Natural Resources Conservation Service (NRCS) 12-digit hydrologic unit code (HUC) data was used. The resulting watershed of the CalMan lakes is approximately 4168 acres or 6.5 square miles. The GIS analysis also revealed that smaller watersheds exist within the larger one. Becker and Grass Lakes are part of one watershed while Boot, Long and Round Lakes are part of the other.

Spring runoff draining into Becker Lake.

Understanding the watershed is important because it's the area of land that drains to the lakes. All water in these lakes comes from either rain and surface runoff or groundwater. As rain and snowmelt run off the land within the watershed, the runoff picks up soil and any other materials that are spread, stored, spilled, dumped or applied to the land surface and carry them downhill to the lakes. The soil sediment and nutrients in this polluted runoff cause many of the problems seen in the lakes.

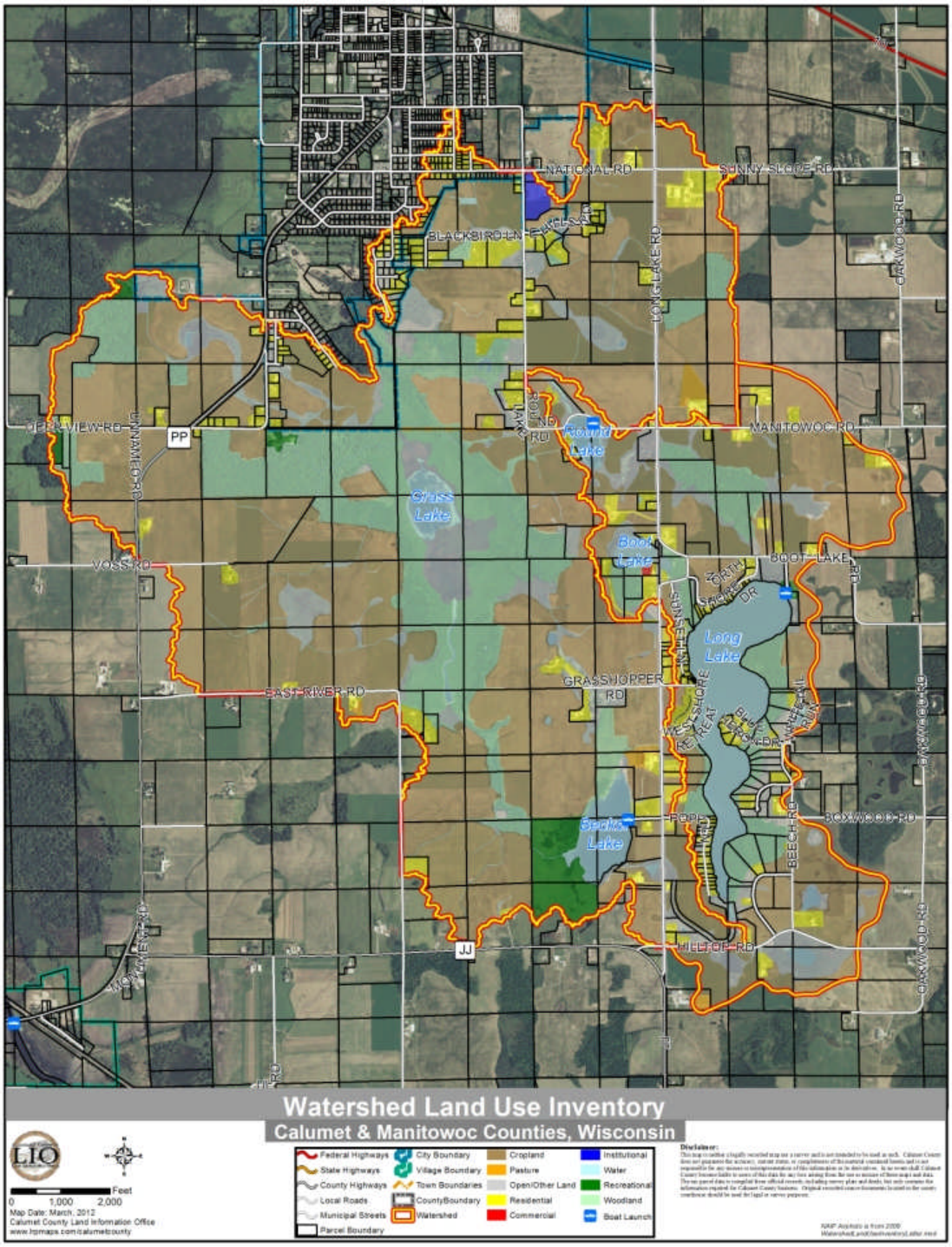
A land use inventory was completed to help identify land uses within the watershed which may be contributing to the poor water quality of the lakes. The land use inventory was accomplished by using 2004 Calumet County and 2008 Manitowoc County existing land use data, aerial photography, was field verified by the lakes monitoring group and ultimately reviewed for accuracy by those at the March 12, 2012 Organizational Project Meeting. Table 1 identifies the amount of land in each land use and Map 2 is the land use inventory. According to Table 1, cropland is the most common land use at 56% followed by woodland at 16%.

Table 1
Watershed Existing Land Use, CalMan Lakes, 2012

Existing Land Use	Acres	% of Total
Cropland	2314.01	55.52%
Pasture	15.48	0.37%
Woodland	668.95	16.05%
Open Land/Other	376.25	9.03%
Recreational	66.08	1.59%
Residential	311.92	7.48%
Commercial	0.92	0.02%
Institutional	9.64	0.23%
Water	265.73	6.38%
Transportation	138.56	3.32%
TOTAL	**4167.53**	**100.00%**

Source: Calumet County Resource Management Department

Map 2
Watershed Existing Land Use Inventory, CalMan Lakes, 2012



Land use changes need to be made to contributing sites. Reducing polluted runoff and infiltration from these land uses will improve water quality, fishing and recreational opportunities. Adjustments in land practices and behaviors need to occur around farms and homes to keep soil, nutrients, and chemicals where they belong and not in our lakes. Examples include: maintain a vegetative buffer around water bodies; minimize soil disturbance and leave residue or vegetation during crop planting and construction; apply fertilizers and manure according to soil tests and plant needs; contract only with contractors/pumpers who practice best management practices; maintain septic systems; and pick up and properly dispose of pet wastes.

Round Lake Road, beside Round Lake, often gets washed out due to upslope drainage.

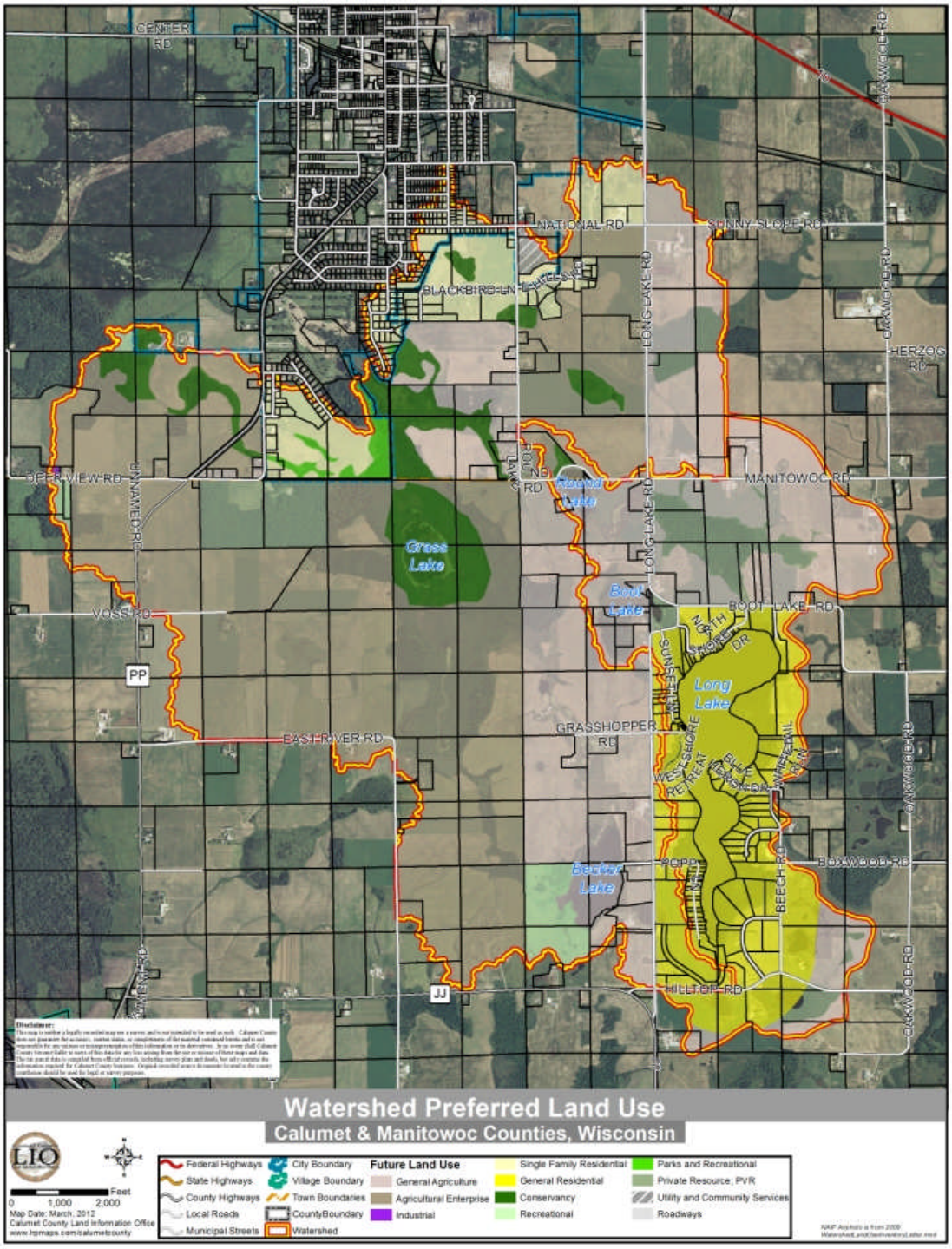
Existing land use, which is what's shown on Map 2, is important, but future land use is equally as important. It depicts what a community's intention is regarding growth. Subsequently, tools such as zoning get implemented to help achieve that vision. Table 2 identifies the amount of land in each land use and Map 3 depicts the planned preferred land use of the CalMan Lakes watershed for the next fifteen years.

Table 2
Watershed Preferred Land Use, CalMan Lakes

Preferred Land Use	Acres	% of Total
General Agriculture	1173.32	28.93%
Agricultural Enterprise	1538.00	37.92%
Industrial	1.03	0.03%
Single Family Residential	248.29	6.12%
General Residential	556.99	13.73%
Conservancy	233.77	5.76%
Recreational	94.74	2.34%
Private Resource	195.47	4.82%
Utility and Community Service	14.04	0.35%
***TOTAL**	**4055.64**	**100.00%**

*Transportation facilities (i.e. roads) are not included in these calculations.
Source: Calumet County Resource Management Department

Map 3
Watershed Preferred Land Use, CalMan Lakes



The area surrounding Becker, Boot and Round Lakes could experience significant growth specifically in Calumet County. Based on the preferred land use map, and current land division and zoning regulations, one residence is allowed per one acre. Therefore, over 500 residences could potentially be located around these lakes.

III. PRIVATE ON-SITE WASTEWATER TREATMENT SYSTEM (POWTS)

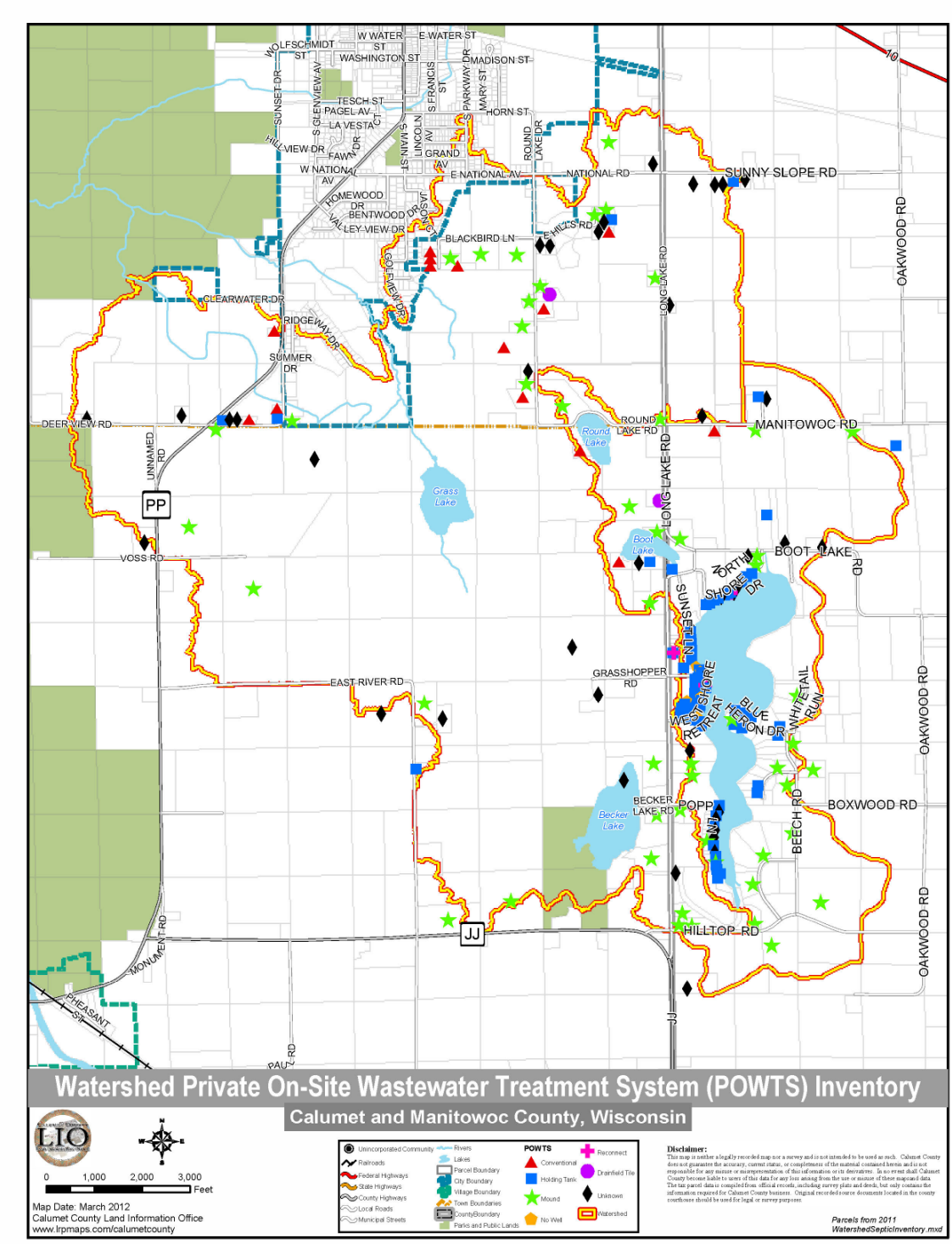
Because human activity has an impact on water quality, especially sanitary systems, properly functioning POWTS are a concern of the public. To get a better understanding of the current situation of sanitary systems in the watershed, a POWTS inventory was completed.

Map 4 identifies the type and location of the POWTS. According to this data, there are 44 unknown POWTS. The counties currently track the condition of all POWTS installed after 1980. In 2013, Calumet County will conduct an inventory of the systems installed prior to 1980, which includes the unknown systems, located within the county's portion of the watershed. The inventory will require an inspection of all system components. Any system found discharging sewage to the ground surface will need to be replaced as well as those systems with bad tanks. The inventory will not require the replacement of an older functioning system located in poor soils. Properly functioning systems will be allowed to remain as installed until the property is sold or a land division occurs, at which point a soil evaluation will be required.

Before – A failing holding tank discharging effluent to the ground surface.

After – A new, fully functioning mound system replaces the old holding tank.

Map 4
Watershed Private On-Site Wastewater Treatment Systems (POWTS) Inventory, 2012



IV. CALMAN VOLUNTEER LAKE MONITORING GROUP

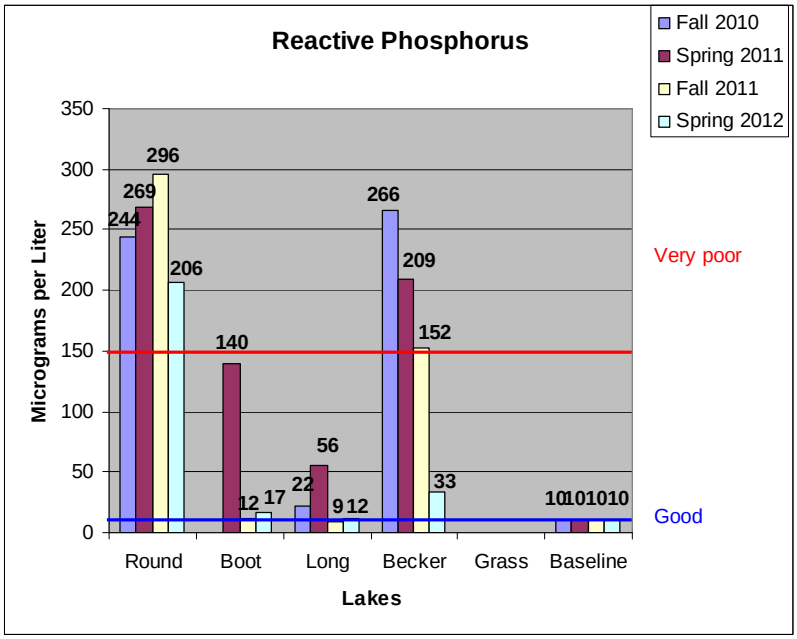
During the CalMan Lake Educational Project, a request was made for interested individuals to become a part of a CalMan Lake Organizational Project volunteer lake monitoring group. A few individuals rose to the occasion and volunteered. These individuals were Bob Sengbusch, Joe Kocourek, and Russ Calaway. The monitoring group was responsible for water sampling in spring 2011, fall 2011 and spring 2012. Because the group was not formed until 2011, they did not do the water sampling in fall 2010 (as originally planned). The 2010 samples were taken by another individual. Throughout all of the sampling, samples were not taken from Grass Lake because of the lack of access. It is staff's estimation that the spring 2012 results came back lower than previous testings because the lake may not have completely turned over when the samples were obtained.

The testing of the samples was done through the University of Wisconsin - Stevens Point and University of Wisconsin - Extension Water and Environmental Analysis Lab. Package B for Lake Monitoring was the testing package used for this project. Figures 1-4 highlight some of the results. The order of the lakes shown on the charts has been organized to represent the direction of flow between the lakes. A complete list of the water sampling results can be found in Appendix A (CalMan Lakes Water Sampling Results). The University of Wisconsin Extension "*Understanding Lake Data*" document was used to define phosphorus, reactive phosphorus, total phosphorus, nitrogen, inorganic nitrogen, and chloride in the paragraphs below.

<u>Phosphorus</u>

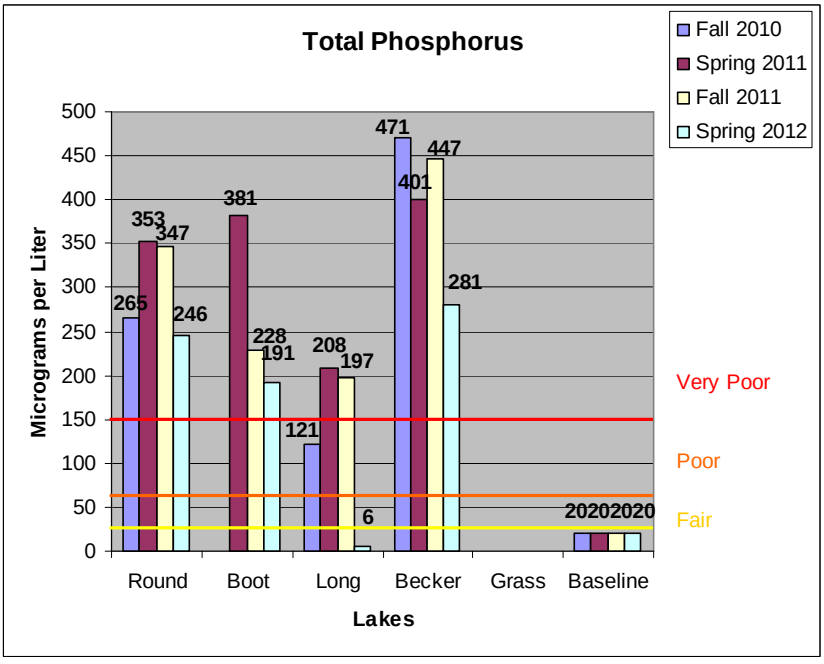
Phosphorus promotes excessive aquatic plant growth and affects the amount of algae and weed growth found within a waterbody. Phosphorus originates from a variety of sources, many of which are related to human activities. Major sources include human and animal wastes, soil erosion, detergents, septic systems and runoff from farmland or lawns. Reactive phosphorus dissolves in the water and readily aids plant growth. As demonstrated in Figure 1, an ideal amount of reactive phosphorus is 10 micrograms per liter at spring turnover. Becker and Round Lakes have the highest concentrations of reactive phosphorus. Anything over 150 micrograms per liter is considered very poor.

Figure 1
Reactive Phosphorus



Total phosphorus is considered a better indicator of a lake's nutrient status because its levels remain more stable than reactive phosphorus. A concentration of total phosphorus below 20 should be maintained to prevent nuisance algal blooms. According to Figure 2, all of the lakes on average, except Long Lake, are considered very poor in terms of total phosphorus. Becker Lake contains the highest amount of total phosphorus.

Figure 2
Total Phosphorus

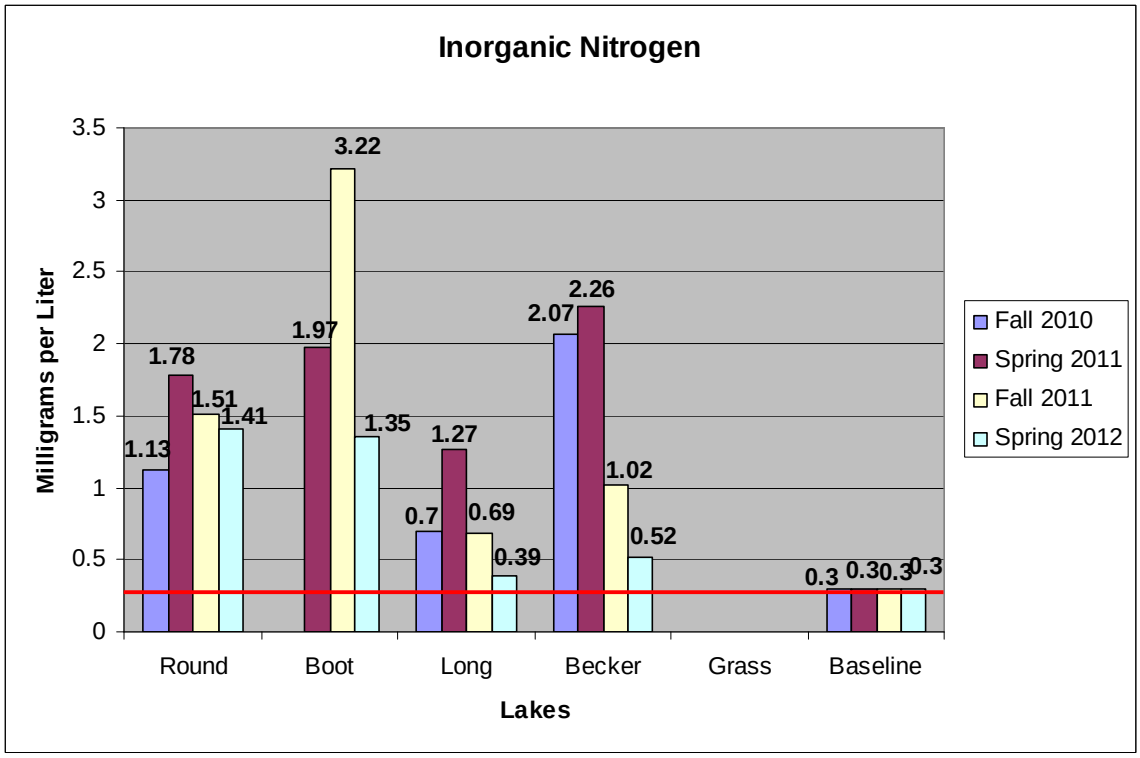


Nitrogen

Nitrogen is second only to phosphorus as an important nutrient for plant and algae growth. A lake's nitrogen sources vary widely. Rainfall may be the main nitrogen source for seepage and some drainage lakes. In most cases, the amount of nitrogen in lake water corresponds to local land use. Nitrogen may come from fertilizer and animal wastes on agricultural lands, human waste from sewage treatment plants or septic systems, and lawn fertilizers used on lakeshore property. Nitrogen may enter a lake from surface runoff or groundwater sources.

Nitrogen does not occur naturally in soil minerals, but is a major component of all organic matter. Decomposing organic matter releases ammonia, which is converted to nitrate if oxygen is present. This conversion occurs more rapidly at higher water temperatures. All inorganic forms of nitrogen can be used by aquatic plants and algae. If these inorganic forms of nitrogen exceed 0.3 mg/l (milligrams per liter) in spring, there is sufficient nitrogen to support summer algae blooms. Because all of the lakes exceed 0.3 mg/l in inorganic nitrogen as shown in Figure 3, they will experience summer algae blooms.

Figure 3
Inorganic Nitrogen



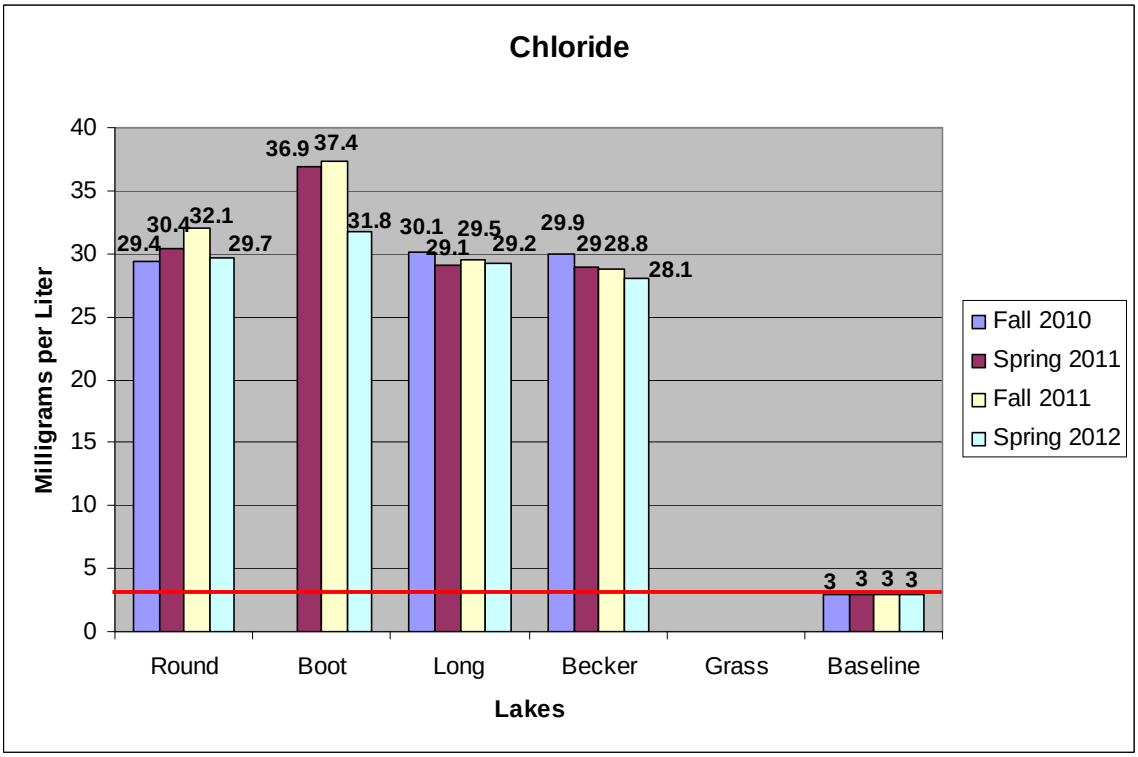
Chloride

The presence of chloride where it does not occur naturally indicates possible water pollution. Chloride does not affect plant and algae growth and is not toxic to aquatic organisms at most of the levels found in Wisconsin. Chloride is not common in Wisconsin soils, rocks or minerals, except in areas with limestone deposits. The CalMan

Lakes are located in an area where limestone deposits are not a factor in the amount of chloride present.

Sources of chloride include septic systems, animal waste, potash fertilizer, and drainage from road-salting chemicals. Increases in chloride, either seasonally or over time, can mean that one or more of these sources is affecting the lakes. For the CalMan Lakes area, chloride levels should be less than 3 mg/l. The water sampling results has revealed that the CalMan Lakes chloride readings are over nine times greater than the baseline.

Figure 4
Chloride



In order to keep monitoring of these lakes going, Bob Sengbusch with the monitoring group was able to get Becker Lake into the water chemistry program of the Citizen Lake Monitoring Network (CLMN). This is in addition to Long Lake, which has been conducting water chemistry through the CLMN since 2004. The group will pursue getting Round Lake into the CLMN's water chemistry program as well. However, all of the CalMan Lakes, with the exception of Grass Lake, will be monitored for water clarity through CLMN.

Because the monitoring group is accessible to the activity occurring within the watershed on a daily basis, it is important for them to identify and report any inappropriate land uses. Since they have formed, the lake monitoring group has been working independently of this project to meet monthly with landowners around Becker Lake to discuss the lake's condition. Through these meetings, they have encouraged these landowners to contact the Calumet County Resource Management Department to discuss

possible best management practices on their land near the lake. The monitoring group's plan is to do this same process for Boot and Round Lakes too. Long Lake has a lake association therefore the monitoring group does not plan to meet with those property owners.

While the group has been cognizant of the impacts land use has on the health of the lakes from the very start, training on inappropriate land uses was given to the monitoring group on March 6, 2012 by the Calumet County Resource Management Department. At that meeting, the monitoring group also indicated that no fish kills were seen.

V. ACTION PLAN

To organize future efforts towards improving the water quality of the CalMan Lakes, an action plan has been developed. For every action identified, a responsible party, estimated expense, and timeline are noted.

Education

- **Action Item #1**
  Action: Develop web page where landowners can find resources and other information.
  Responsible Party(s): Calumet County Resource Management Department
  Cost: Cost and web hosting is dependant on design
  Timeline: Summer 2012

- **Action Item #2**
  Action: Meet with all residential property owners in the watershed to identify inappropriate land use activities which may be contributing to the degradation of the watershed and offer less damaging alternatives.
  Responsible Party(s): Calumet County Resource Management Department and Manitowoc County Soil and Water Department
  Cost: None
  Timeline: Continuous

- **Action Item #3**
  Action: Meet with all large landowners individually on their property to identify inappropriate land use activities which may be contributing to the degradation of the watershed and offer less damaging alternatives.
  Responsible Party(s): Calumet County Resource Management Department, Manitowoc County Soil and Water Department, and Lakeshore Natural Resource Partnership
  Cost: None
  Timeline: Continuous

- **Action Item #4**
  Action: Seek funding, if available, to help offset expenses incurred by a landowner who changes a land use practice to an alternate land use practice intended to improve the watershed's water quality.
  Responsible Party(s): Calumet County Resource Management Department, Manitowoc County Soil and Water Department, and Natural Resources Conservation Service
  Cost: None, unless cost sharing is required
  Timeline: Continuous

- **Action Item #5**
  Action: Provide high-level watershed and conservation training to volunteers who can then assist with educational efforts.
  Responsible Party(s): Calumet County Resource Management Department, Manitowoc County Soil and Water Department, and Lakeshore Natural Resource Partnership
  Cost: None
  Timeline: Fall 2012

- **Action Item #6**
  Action: Establish educational demonstration sites within the CalMan Lakes watershed of appropriate land use practices for both residential and agricultural land uses. Examples include: proper tiling techniques; proper manure spreading methods; proper shoreline restoration methods; and recommended vegetative buffers.
  Responsible Party(s): Calumet County Resource Management Department, Manitowoc County Soil and Water Department, and Lakeshore Natural Resource Partnership
  Cost: Dependant on demonstration. Grant funding may be required.
  Timeline: Summer 2013

- **Action Item #7**
  Action: Distribution of shoreland packets to new and existing shoreline property owners.
  Responsible Party(s): Zoning agencies and building inspectors
  Cost: $500
  Timeline: Spring 2013

- **Action Item #8**
  Action: Conduct presentations to landowners and/or interested parties in the CalMan Lakes watershed on aquatic invasive species.
  Responsible Party(s): Calumet County Aquatic Invasive Species Coordinator and Manitowoc County Lakes Association Aquatic Invasive Species Coordinator
  Cost: None
  Timeline: Continuous

- **Action Item #9**
  Action: Establish shoreland "scores" for water and habitat quality purposes.
  Responsible Party(s): Calumet County Resource Management Department
  Cost: $2500
  Timeline: Spring 2013

Planning Activities

- **Action Item #10**
  Action: Apply for a CalMan Lakes Large-Scale Planning Grant from the Wisconsin Department of Natural Resources.
  Responsible Party(s): Calumet County Resource Management Department
  Cost: Dependant on grant
  Timeline: August 2012

- **Action Item #11**
  Action: Development of CalMan Lakes Plan, if awarded.
  Responsible Party(s): Hired consultant
  Cost: Dependant on bid
  Timeline: Spring 2013

- **Action Item #12**
  Action: Improve enforcement of shoreland zoning around the lakes.
  Responsible Party(s): Calumet County Resource Management Department and Manitowoc County Planning
  Cost: None
  Timeline: Continuous

- **Action Item #13**
  Action: Soil sampling of watershed for intensive nutrient management, development of intensive nutrient management plans, livestock compliance and installation of waterway buffers.
  Responsible Party(s): Calumet County Resource Management Department
  Cost: $315,000
  Timeline: Fall 2013

- **Action Item #14**
  Action: Develop and adopt a Shoreland Manure Ordinance
  Responsible Party(s): Calumet County Resource Management Department
  Cost: $3000
  Timeline: Fall 2013

Water Quality Monitoring

- **Action Item #15**
  Action: Get Round Lake into Citizen Lake Monitoring Network for water chemistry but, in the meantime, check for water clarity. Get Boot Lake into Citizen Lake Monitoring Network for water clarity.
  Responsible Party(s): CalMan Lakes Volunteer Lake Monitoring Group
  Cost: None
  Timeline: Water Clarity - Boot and Round Lakes, Summer 2012; Water Chemistry - Round Lake, Spring 2014

- **Action Item #16**
  Action: Continued monitoring of Becker and Long Lakes.
  Responsible Party(s): Citizen Lake Monitoring Network
  Cost: None
  Timeline: Continuous

- **Action Item #17**
  Action: Test specific channels within the watershed. Sites identified for continued specific monitoring include: channel between Long and Becker Lakes; and tributary north of Long Lake. Testing to be conducted after heavy rains to determine where the pollution is coming from.
  Responsible Party(s): Local high schools students or youth groups
  Cost: None
  Timeline: Fall 2012

POWTS

- **Action Item #18**
  Action: Evaluate unknown POWTS and remediate all failing POWTS within the watershed. Require repairs and replacements where needed.
  Responsible Party(s): Calumet County Resource Management Department and Manitowoc County Planning Department
  Cost: None
  Timeline: Summer 2013

VI. SUMMARY

This organizational project has helped to clarify several assumptions that have been made about the health of the CalMan Lakes and the impacts land use is having on the water's quality. With the exception of Long Lake, not much water sampling of the lakes has been done. While it was assumed that the health of the lakes was bad because of the fish kills occurring in some of the lakes and the continuous appearance of algae blooms, the water sampling results have confirmed what has been suspected all along…..the lakes are unhealthy and they need help.

Phosphorus levels are almost off the charts. Becker, Boot and Round Lakes are considered very poor when it comes to total phosphorus. Becker Lake has the highest concentration of total phosphorus at over 20 times the limit to prevent nuisance algal blooms. While all of the lakes are experiencing high levels of inorganic nitrogen, Boot Lake's levels are the highest averaging 2.2 mg/l when those levels should be less than 0.3 mg/l. Similar to the other results, chloride levels are more than nine times the acceptable limits. The only way these numbers are going to improve is if everyone works together to reduce human impacts on water quality. A wonderful example is being set by the volunteering monitoring group. They are meeting monthly with the property owners around Becker Lake and are encouraging the landowners to meet with Calumet County Resource Management Department staff to determine best management practices. They were also able to get Becker Lake into the Citizen Lake Monitoring Network so water quality could continue to be monitored.

This project also revealed the inner workings of the lakes' watershed. Boot, Long and Round Lakes share a watershed while Becker and Grass Lakes share another within the overall watershed. It has been assumed that Long Lake was having a significant impact on the health of Becker Lake due to their connection during high water periods. Using the watershed map and water sampling data, this may not be true. Compared to all of the lakes, Long Lake is the healthiest. In order for Long Lake to improve, more attention may need to be paid to Boot and Round Lakes since they share a watershed and connect to Long Lake during high water periods.

The general impression received from those at the meetings is that there is interest in working together to improve the lakes' water quality. It is anticipated that positive results in improving the water quality of the CalMan Lakes will occur over time as implementation of this organizational project progresses.

Appendix A
CalMan Lakes Water Sampling Results

DATA REPORT FORM

REPORT IDENTIFICATION: LAKES
Sample Location: CALUMET & MANITOWOC CO
Date Sampled: NOVEMBER 19, 2010
Sample Time:
Date Received in Lab: NOVEMBER 22, 2010
Purchase Order #:
WEAL Invoice: 941810

Sampled By: EUGENE MCLEAD
Preserved: H2SO4
Sample Type: SW
Field Filtered:
Unusual circumstances that may affect results:

Water & Environmental Analyses Lab
DNR Cert. No.: 750040280
College of Natural Resources
UW-Stevens Point
Stevens Point, WI 54481
(715) 346-3209

ALL DATA mg/l UNLESS NOTED		Conductivity	Reactive Phosphorus	Total Phosphorus	Ammonium (N)	NO2+NO3(N)	Total Kjeldahl Nitrogen	Chloride
Date Prepared				30-Nov			30-Nov	
Date Analyzed		30-Nov	23-Nov	2-Dec	23-Nov	28-Nov	2-Dec	23-Nov
Method		2510 B	4500 P F	4500 P F	10-107-06-1B	4500 NO3 F	4500-NH3 G	4500 Cl E
Lab #	Site							
581-10-1	BEKCER LAKE	396	0.266	0.471	1.94	0.13	1.11	29.9
581-10-2	LONG LAKE	372	0.022	0.121	0.61	0.09	3.07	30.1
581-10-3	ROUND LAKE	434	0.244	0.265	1.11	<0.02	2.88	29.4

DATA REPORT FORM

REPORT IDENTIFICATION: CALUMET COUNTY LWCD
Sample Location: LAKES
Date Sampled: APRIL 17, 2011
Sample Time:
Date Received in Lab: APRIL 19, 2011
Purchase Order #:
WEAL Invoice: 380649

Sampled By:
Preserved: H2SO4
Sample Type: SW
Field Filtered:
Circumstances that may affect results: *

WEAL
DNR Cert. No.: 750040280
College of Natural Resources
UW-Stevens Point
Stevens Point, WI 54481
(715) 346-3209

FLAGS
B = Blank Contamination
D = Dilution
HT = Holding Time
J = Between LOD & LOQ (est.
Q = QC Failure
R = Rejected

ALL DATA mg/l UNLESS NOTED		Conductivity	Reactive Phosphorus	Total Phosphorus	Ammonium (N)	NO2+NO3(N)	Total Kjeldahl Nitrogen	Chloride
Date Prepared			2-May	28-Apr			28-Apr	
Date Analyzed		18-May	3-May	29-Apr	3-May	9-May	29-Apr	9-May
Method		2510 B	4500 P F	4500 P F	4500 NH3 H	4500 NO3 F	4500-NH3 G	4500 Cl E
Lab #	Site							
123-11-1	ROUND LAKE	441	0.269	0.353	1.68	0.10	3.10	30.4
123-11-2	BECKER LAKE	391	0.209	0.401	1.94	0.32	4.07	29.0
123-11-3	LONG LAKE	380	0.056	0.208	1.06	0.21	3.17	29.1
123-11-4	BOOT LAKE	423	0.140	0.381	1.79	0.18	4.32	36.9

WATER & ENVIRONMENTAL ANALYSIS LAB - DATA REPORT FORM

REPORT IDENTIFICATION: CALUMET COUNTY LWCD
Sample Location: LONG, BECKER, BOOT, POUND
Date Sampled: NOVEMBER 13, 2011
Sample Time: NOVEMBER 15, 2011
Date Received in Lab:
Purchase Order #:
WEAL Invoice: 371660

Sampled By:
Preserved:
Sample Type:
Field Filtered:
Circumstances that may affect results: *

		COND	PO4	TP	NH4	NO32	TKN	CL
ALL DATA mg/l UNLESS NOTED		Conductivity	Reactive Phosphorus	Total Phosphorus	Ammonium (N)	NO2+NO3(N)	Total Kjeldahl Nitrogen	Chloride
Date Prepared								
Date Analyzed		29-Nov	21-Nov	9-Dec	21-Nov	17-Nov	9-Dec	17-Nov
Method		2510 B	4500 P F	4500 P F	4500 NH3 H	4500 NO3 F	4500-NH3 G	4500 Cl E
Lab #	Site							
640-11-1	LONG	355	0.009	0.197	0.60	<0.1	3.90	29.5
640-11-2	BECKER	372	0.152	0.447	0.93	<0.1	4.34	28.8
640-11-3	ROUND	415	0.296	0.347	1.42	<0.1	3.10	32.1
640-11-4	BOOT	383	0.012	0.228	1.22	2.0	4.23	37.4

WATER & ENVIRONMENTAL ANALYSIS LAB - DATA REPORT FORM

REPORT IDENTIFICATION: CALUMET COUNTY
Sample Location: LAKES
Date Sampled: MARCH 18, 2012
Sample Time:
Date Received in Lab: MARCH 18, 2012
Purchase Order #:
WEAL Invoice: 372582

Sampled By: R CALAWAY
Preserved: H2SO4
Sample Type: SW
Field Filtered:
Circumstances that may affect results: °

ALL DATA mg/l UNLESS NOTED		Conductivity	Reactive Phosphorus	Total Phosphorus	Ammonium (N)	NO2+NO3(N)	Total Kjeldahl Nitrogen	Chloride	TEMP	DEPTH	DISC
Date Prepared				28-Mar			28-Mar				
Date Analyzed		3-Apr	26-Mar	29-Mar	26-Mar	2-Apr	29-Mar	2-Apr			
Method		2510 B	4500 P F	4500 P F	4500 NH3 H	4500 NO3 F	4500-NH3 G	4500 Cl E			
Lab #	Site										
77-12-1	BECKER LAKE	401	0.033	0.281	0.08	0.44	2.83	28.1	55°	45'	2'
77-12-2	BOOT LAKE	378	0.017	0.191	0.24	1.11	2.88	31.8	55°	15'	2'
77-12-3	LONG LAKE	384	0.012	<0.006	0.09	0.30	2.61	29.2	53°	31'	1.5'
77-12-4	ROUND LAKE	440	0.206	0.246	1.16	0.25	2.74	29.7	54°	45'	17'