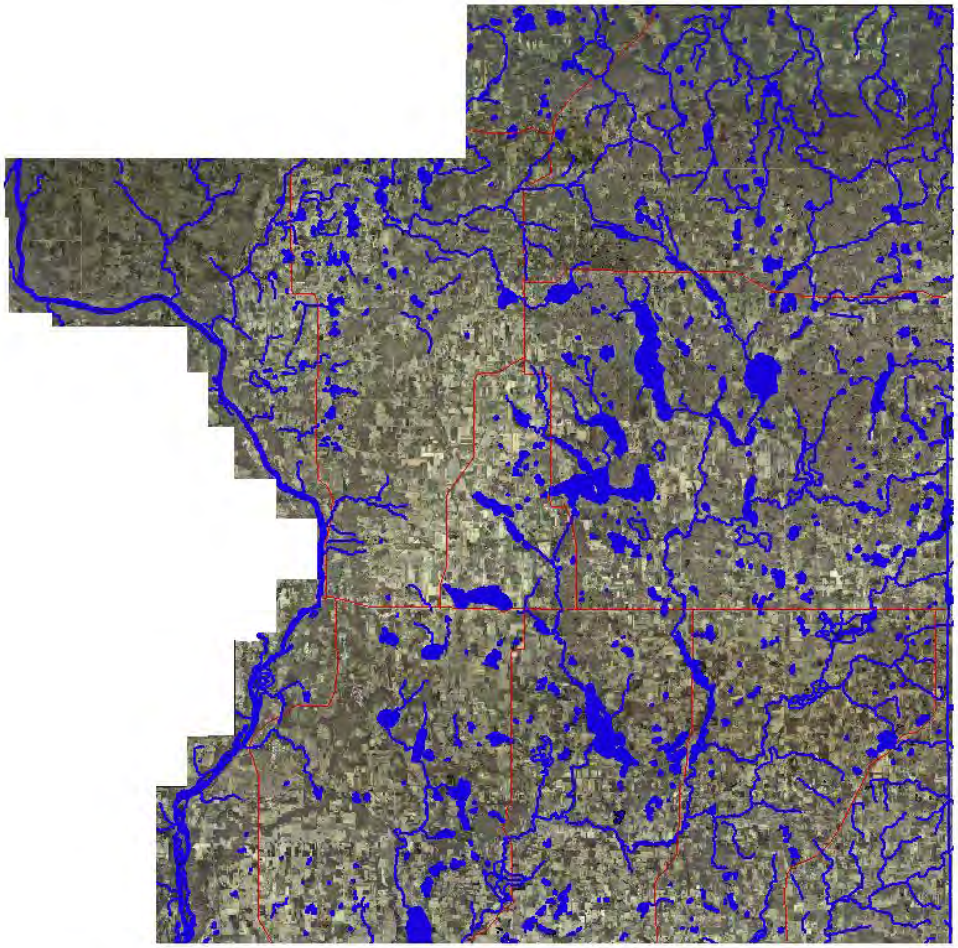
Polk County Aquatic Invasive Species Monitoring and Management Project Grant Report

Education, Prevention, and Planning Project AEPP-174-09



Polk County Land and Water Resources Department
100 Polk County Plaza, Suite 120
Balsam Lake, Wisconsin 54810

Jeremy Williamson, jeremyw@co.polk.wi.us, 715.485.8639
Eric Wojchik, ericw@co.polk.wi.us, 715.485.8644
Katelin Holm, katelin.holm@co.polk.wi.us, 715.485.8637
Scott Geddes, P.E., scott.geddes@co.polk.wi.us, 715.485.8638

Table of Contents

Introduction 4
Eurasian Water Milfoil 5
Trade River System 8
Horseshoe Lake 10
Pike Lake 11
Purple Loosestrife 12
Chinese Mystery Snails 16
Rusty Crayfish 18
Zebra Mussels 20
Japanese and Giant Knotweed 22
Early Detection Smart Prevention Protocol 25
"Illegal to Transport" Education and Outreach Campaign 28
Youth Education 28
Lake Group Meetings and Events 29
Other Organizations 29
"Stop Aquatic Hitchhikers" Stickers for Bait Containers 30
Advertisement for 2010 Polk County Visitors Guide 30
Trainings 30
Clean Boats, Clean Waters Trainings 30
Citizen Plant Monitoring Trainings 30
Media Campaign 31
Inter-County Leader Outdoor Section 31
WPCA Radio Campaign 31
Illegal Transport of Aquatic Plants and Invasive Animals Ordinance 32
Discussion 33

List of Figures

Figure 1. Eurasian water milfoil fragment with new root growth, Long Trade Lake, Polk County, Wisconsin, 2010. 5
Figure 2. Polk County Lakes with known populations of Eurasian water milfoil, as of 2011. 6
Figure 3. Burnett County Lakes in the Trade River System. As of 2011, Little Trade Lake and Round Trade Lake have known populations of Eurasian water milfoil. 7
Figure 4. Eurasian water milfoil on Long Trade Lake, 2010. 8
Figure 5. Location of Alabama Lake, Little Mirror Lake, and Herby Lake in relation to Long Trade Lake. 9
Figure 6. Location of Bass Lake, Silver Lake, and Little Horseshoe Lake in relation to Horseshoe Lake. 10
Figure 7. Hand removal of Eurasian water milfoil, Pike Lake. 11
Figure 8. Purple loosestrife inflorescence. 12
Figure 9. Cutting and bagging purple loosestrife flowers. 12
Figure 10. Map of purple loosestrife sites in Polk County, Wisconsin as of 2011. 13
Figure 11. Rearing *Galerucella* beetles. 15
Figure 12. Releasing *Galerucella* beetles. 15
Figure 13. Luck wetland beetle release site, 2010. 15
Figure 14. White Ash Lake Channel beetle release site, 2011. 15
Figure 15. Chinese mystery snails. 16
Figure 16. Tiles for monitoring New Zealand mud snails in the bed of Knapp Creek. 17
Figure 17. Polk County water bodies with known populations of rusty crayfish, as of 2011. 19
Figure 18. Zebra mussels from Bass Lake, St. Croix County, 2011. 20
Figure 19. Zebra mussel traps, Lake Wapogasset, 2010. 20
Figure 20. Lakes monitored for zebra mussels in the Horse Creek Watershed. 21
Figure 21. Japanese knotweed. 22
Figure 22. Japanese knotweed stand on County Road W, outside of Frederic. 22
Figure 23. Japanese knotweed locations in Polk County prompting application for a WDNR rapid response grant, 2009. 23
Figure 24. Japanese knotweed locations in Burnett County prompting application for a WDNR rapid response grant, 2009. 24
Figure 25. Polk County Lakes chosen for the early detection smart prevention protocol, 2011. 25
Figure 26. First graders learning the impacts of invasive species on zooplankton communities. 28
Figure 27. Invasive species education for 1st graders. 28
Figure 28. AIS display, Half Moon Lake Annual Meeting, 2011. 29
Figure 29. AIS display, Polk County Fair, 2011. 29
Figure 30. Stop Aquatic Hitchhikers stickers for bait containers. 30
Figure 31. Half Moon Lake Citizen Plant Monitoring Training, 2009. 30
Figure 32. Local ordinance sign for boat landings. 32

List of Tables

Table 1. Aquatic macrophyte survey dates, surveyors, and points generated for lakes in the Trade River System. 8
Table 2. Results of Eurasian water milfoil monitoring on the lakes near Long Trade Lake, 2011. 9
Table 3. Results of Eurasian water milfoil monitoring near Horseshoe Lake, 2010. 10
Table 4. Identity, GPS coordinates, notes, and descriptions for purple loosestrife sites located in 2010 and 2011. 14
Table 5. Chinese mystery snail presence/absence in Polk County Lakes with boat launches, 2010. 17
Table 6. Zebra mussel monitoring results from the Horse Creek Watershed, 2011. 21
Table 7. DNR early detection smart prevention protocol AIS data, 2011. 27

List of Appendices

A. Aquatic Plant Management Plan: Long Trade, Round, Little Trade, and Big Trade Lakes: Polk and Burnett Counties, Wisconsin
B. 2011 Update: Purple Loosestrife Monitoring in Polk County
C. Wisconsin DNR Aquatic Invasive Species Early Detection Monitoring Standard Operating Procedures
D. Education and Outreach Campaign: Example Materials
E. Information Provided Through Packets and Displays
F. Polk County Visitors Guide
G. Inter-County Leader Outdoor AIS Section
H. Illegal Transport of Aquatic Plants and Invasive Animals Ordinance

Introduction

Polk County is a water rich county with 437 lakes and 365 miles of streams and rivers. Due to the fact that Polk County has a tourism-based economy centering on its lakes and rivers, the threat of aquatic invasive species comes in large part from places outside of the county boarders. It is evident that the counties larger, highly recreated and developed lakes have a higher occurrence of aquatic invasive species.

The receipt of a 2009 WDNR AIS grant allowed the Polk County Land and Water Resources Department to systematically monitor and map the water bodies of Polk County for aquatic invasive species such as Eurasian water milfoil, purple loosestrife, Chinese mystery snails, rusty crayfish, zebra mussels, and Japanese and giant knotweed. When new populations were identified LWRD was able to work with community partners to develop prevention, rapid response, and Aquatic Plant Management Plans, such as in the case of Pike Lake and the Trade River System.

In 2011, LWRD partnered with the WDNR to implement the early detection monitoring smart prevention protocol on Polk County Lakes. After monitoring data was collected at each lake, it was entered into the SWIMS database.

In addition to monitoring for AIS, the grant allowed LWRD to deliver an "Illegal to Transport" education and outreach campaign at numerous public events and meetings throughout Polk County. Examples of events include Mr. Y's 5th Grade Camp, the White Ash Lakes Fair, the Polk County Fair, and the 100 Year Lake Wapogasset/Bear Trap Association Celebration. Packets of information for attendees of each event were put together using existing DNR resources when possible and with LWRD designed information as necessary. At each event and meeting attended, LWRD provided updates to citizens regarding the locations of populations of AIS in the county and identification and management options for AIS.

The Polk County Association of Lakes and Rivers (PCALR), in partnership with LWRD, developed and distributed "Stop Aquatic Hitchhikers" stickers for bait containers. Additionally, LWRD developed a two page advertisement for the 2010 Polk County Visitors Guide. LWRD also coordinated activities in Polk County related to the Clean Boats, Clean Waters and Citizen Lake Monitoring Network Program. In 2010, LWRD staff provided information for a nine part series dedicated to invasive species in the Inter-County Leader; and in 2011 LWRD appeared bi-weekly on a local radio station to provide information and education regarding aquatic invasive species.

With support from the WDNR AIS grant, LWRD worked extensively with local law enforcement officials to enforce the Polk County Illegal Transport of Aquatic Plants and Invasive Animals Ordinance which was amended in 2011. In 2009, boat landing ordinance signs were ordered and installed at most boat landings in Polk County.

Each project completed as part of the AIS grant is detailed in the following report.

Eurasian Water Milfoil

Eurasian water milfoil is a submerged aquatic invasive plant with delicate, feather-like leaves arranged in a whorl around the stem of the plant. Eurasian water milfoil can be distinguished from native milfoils by the numerous (usually 12-21 leaflets) that make up each leaf. Additionally, whereas the leaves of most native milfoils remain erect when out of water, the leaves of Eurasian water milfoil are usually limp when out of water. Eurasian water milfoil is highly invasive and is capable of forming large, thick mats which interfere with swimming, boating, fishing, and waterfowl hunting. Additionally, Eurasian water milfoil can have devastating effects on native ecosystems, displacing native aquatic plants and impacting fish and wildlife populations.

Figure 1. Eurasian water milfoil fragment with new root growth, Long Trade Lake, Polk County, Wisconsin, 2010.

Eurasian water milfoil was first discovered in North America in the 1940's. Since this time Eurasian water milfoil has invaded nearly every state in the United States. Eurasian water milfoil spreads when small fragments of the plant break off and float on water currents or are transported by boater traffic. Eurasian water milfoil is able to reproduce from small fragments, which sprout roots and are able to colonize new areas (Figure 1). Establishment of Eurasian water milfoil populations in Polk County has occurred relatively recently. Eurasian water milfoil was first found in Long Trade Lake in 1995, in Horseshoe Lake in 2006, and most recently in Pike Lake in 2010 (Figure 2).

Long Trade Lake, in Polk County, is part of the Trade River System, which includes Little Trade, Big Trade, and Round Trade Lakes in Burnett County. Eurasian water milfoil was discovered in Round Trade Lake in 2003 and in Little Trade Lake in 2009 (Figure 3).

Eradicating established populations of Eurasian water milfoil is nearly impossible, making monitoring and management of early detection pioneer populations crucial. Polk County LWRD monitored for pioneer populations of Eurasian water milfoil in the lakes with public access near Long Trade Lake (2011) and near Horseshoe Lake (2009). Lakes near Pike Lake were monitored by the Amery Lakes Board.

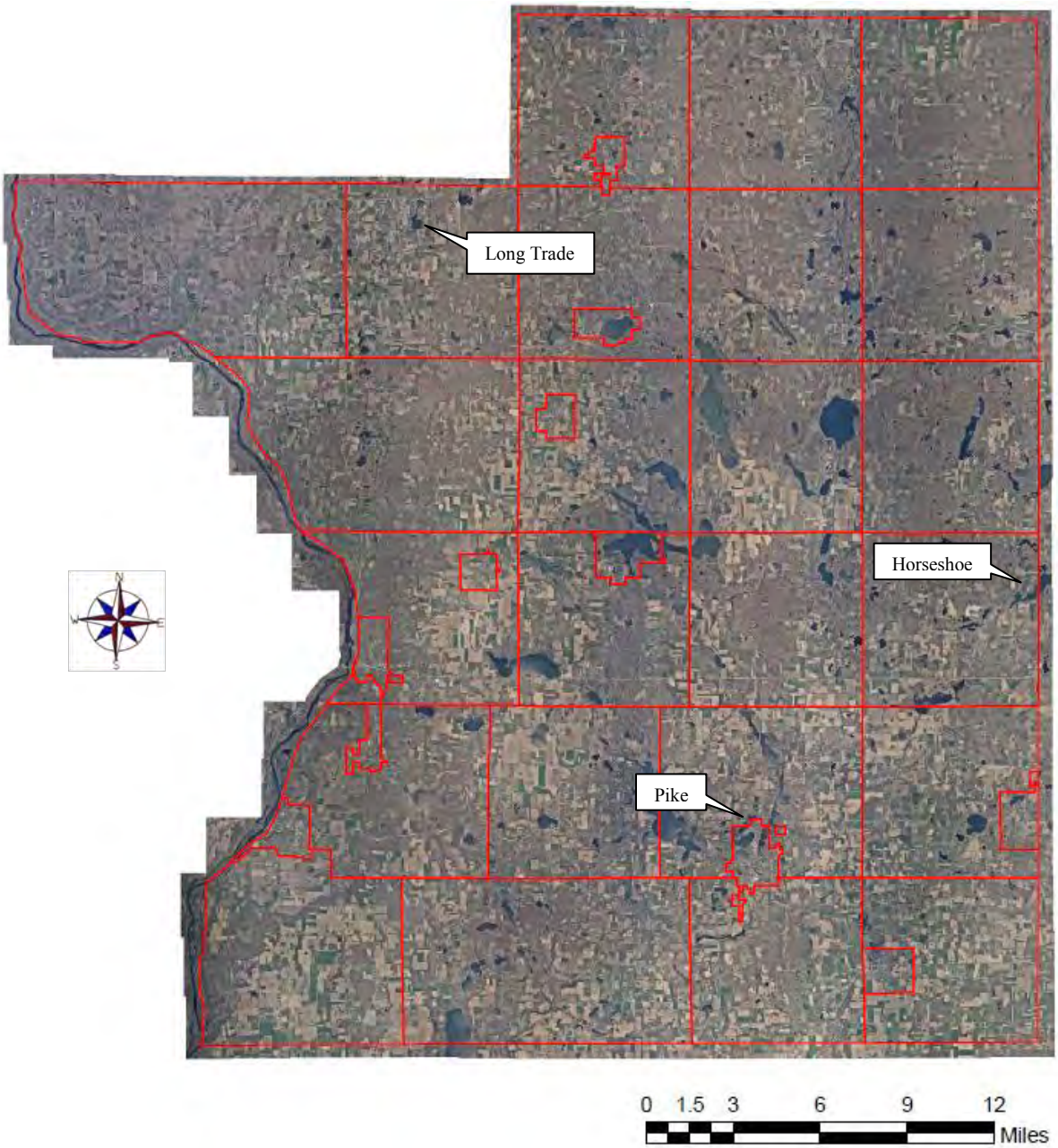


Figure 2. Polk County Lakes with known populations of Eurasian water milfoil, as of 2011.

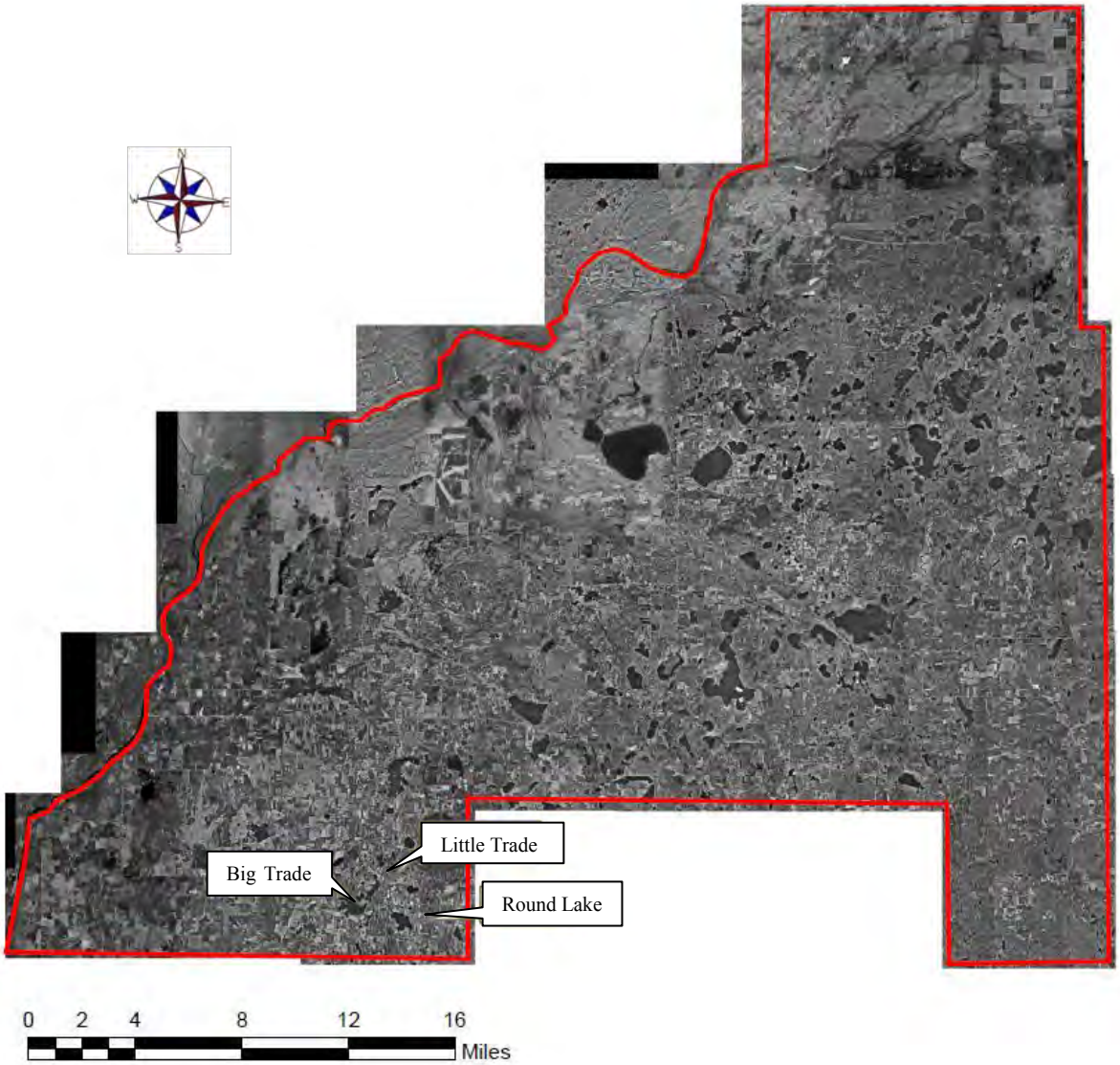


Figure 3. Burnett County Lakes in the Trade River System. As of 2011, Little Trade Lake and Round Trade Lake have known populations of Eurasian water milfoil.

Trade River System

Recent point intercept aquatic macrophyte surveys have been conducted by the WDNR, Polk County LWRD, and Burnett County LWCD on all four lakes that make up the Trade River System (Table 1). All lakes were sampled using the state approved point intercept method using DNR generated point grids. In response to the discovery of Eurasian water milfoil in 2009 in Little Trade Lake, Polk County LWRD partnered with the Burnett County LWCD to conduct a point intercept aquatic macrophyte survey to establish the extent of the Eurasian water milfoil population in Big Trade and Little Trade Lakes.

Figure 4. Eurasian water milfoil on Long Trade Lake, 2010

Lake surveyed	Surveyor	Date	Points generated
Long Trade Lake	WDNR	July 12th, 2006	376
Round Lake	WDNR	July 10th & 11th, 2006	505
Round Lake	WDNR	July 21st & 22nd, 2009	505
Big Trade Lake	Polk LWRD & Burnett LWCD	August 18th & 20th, 2009	652
Little Trade Lake	Polk LWRD	September 3rd & 30th, 2009	336

Table 1. Aquatic macrophyte survey dates, surveyors, and points generated for lakes in the Trade River System.

In 2009, the Round Trade Lake Improvement Association received a WDNR Rapid Response grant to treat Eurasian water milfoil in Little Trade Lake and to develop an Aquatic Plant Management Plan (Appendix A) for the entire system.

On July 12th, 2011, Polk County LWRD monitored the lakes with public access near Long Trade Lake for pioneer populations of Eurasian water milfoil. Lakes monitored included Alabama Lake, Little Mirror Lake, and Herby Lake (Figure 5). Although curly leaf pondweed was found in all three lakes; fortunately Eurasian water milfoil was not present in any of the lakes (Table 2).

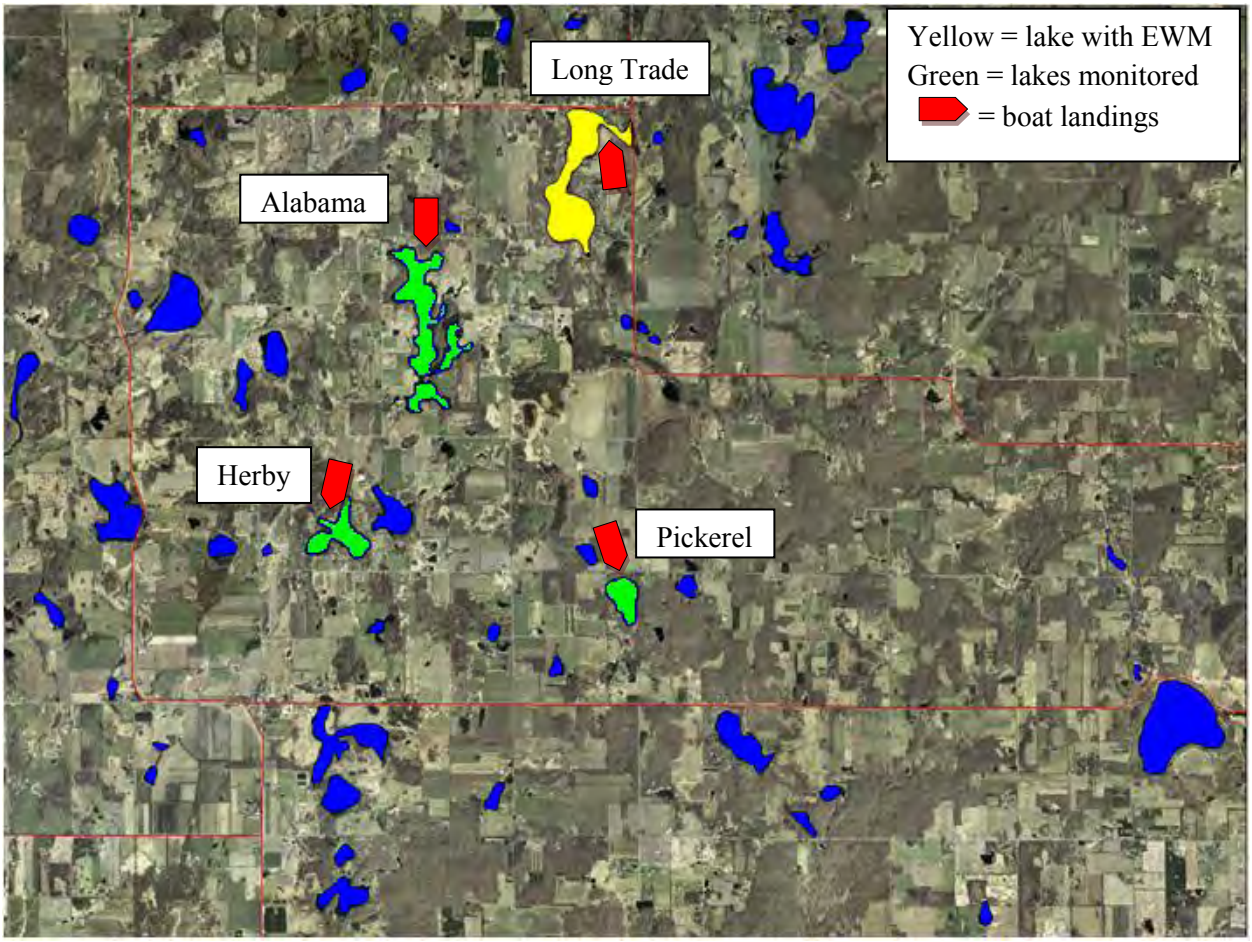


Figure 5. Location of Alabama Lake, Little Mirror Lake, and Herby Lake in relation to Long Trade Lake.

Lake monitored	EWM present?	Other AIS present?
Alabama Lake	No	Curly leaf pondweed Narrow leaf cattail
Little Mirror Lake	No	Curly leaf pondweed
Herby Lake	No	Curly leaf pondweed

Table 2. Results of Eurasian water milfoil monitoring on the lakes near Long Trade Lake, 2011.

Horseshoe Lake

The lakes immediately adjacent to Horseshoe Lake, which is located on the Eastern boarder of Polk County, do not have public access. However, Polk County LWRD was able to visit Bass Lake, Silver Lake, and Little Horseshoe Lake on August 6th, 2009 to monitor for Eurasian water milfoil (Figure 6). Fortunately no new populations of Eurasian water milfoil were found on any of the lakes. However, purple loosestrife and Chinese mystery snails were found on Silver Lake (Table 3).

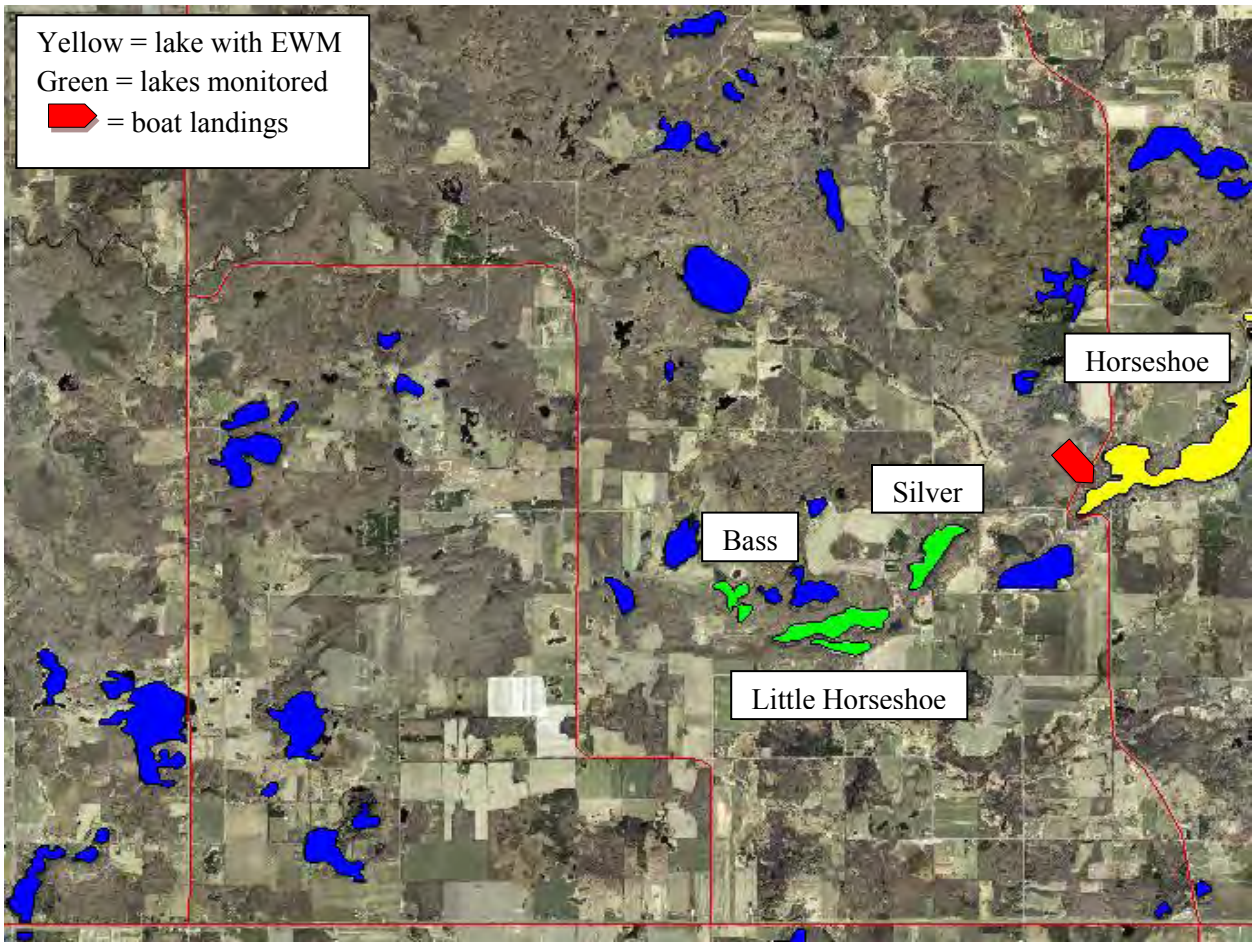


Figure 6. Location of Bass Lake, Silver Lake, and Little Horseshoe Lake in relation to Horseshoe Lake.

Lake monitored	EWM present?	Other AIS present?
Bass Lake	No	None
Silver Lake	No	Purple loosestrife Chinese mystery snail
Little Horseshoe Lake	No	None

Table 3. Results of Eurasian water milfoil monitoring near Horseshoe Lake, 2010.

Pike Lake

Polk County LWRD collaborated with the Amery Lakes Board to map and mark the beds of Eurasian water milfoil with buoys in Pike Lake in 2010 for treatment. After herbicide treatment, LWRD staff assisted with hand pulling Eurasian water milfoil in both 2010 and 2011 (Figure 7).

Figure 7. Hand removal of Eurasian water milfoil, Pike Lake.

Purple Loosestrife

Figure 8. Purple loosestrife inflorescence.

Purple loosestrife is an aquatic invasive perennial plant that grows 3-7 feet tall and develops a spike of small purple flowers in late summer. The leaves of the plant are oblong and arranged oppositely along a square shaped stem (Figure 8). Purple loosestrife spreads rapidly and colonizes wetlands, shorelines, and roadside ditches. Thick stands of purple loosestrife crowd out native vegetation and reduce food, shelter, and nesting sites for a variety of wildlife including birds, turtles, and frogs.

This plant, native to Europe and Asia, was introduced in North America in the 1800's for beekeeping and as a garden ornamental. Purple loosestrife has been present in Polk County for many years. An elaborate inventory was conducted in 2000 by Polk County LWRD to identify the extent of purple loosestrife in the county and to reduce its spread. Sites located in 2000 were re-evaluated in 2005 and 2006. An AIS grant received by the Polk County LWRD in 2009 allowed for additional monitoring and control of existing purple loosestrife countywide.

Polk County LWRD staff identified eighteen new purple loosestrife sites in 2010 and two new purple loosestrife sites in 2011(Figure 10 and Table 4). The majority of these sites were small populations which were controlled immediately by cutting and bagging the flowers and treating the plant with either Habitat or Rodeo herbicide (Figure 9).

Figure 9. Cutting and bagging purple loosestrife flowers.

Full information regarding purple loosestrife sites and management by the Polk County LWRD since 2005 can be found in Appendix B.

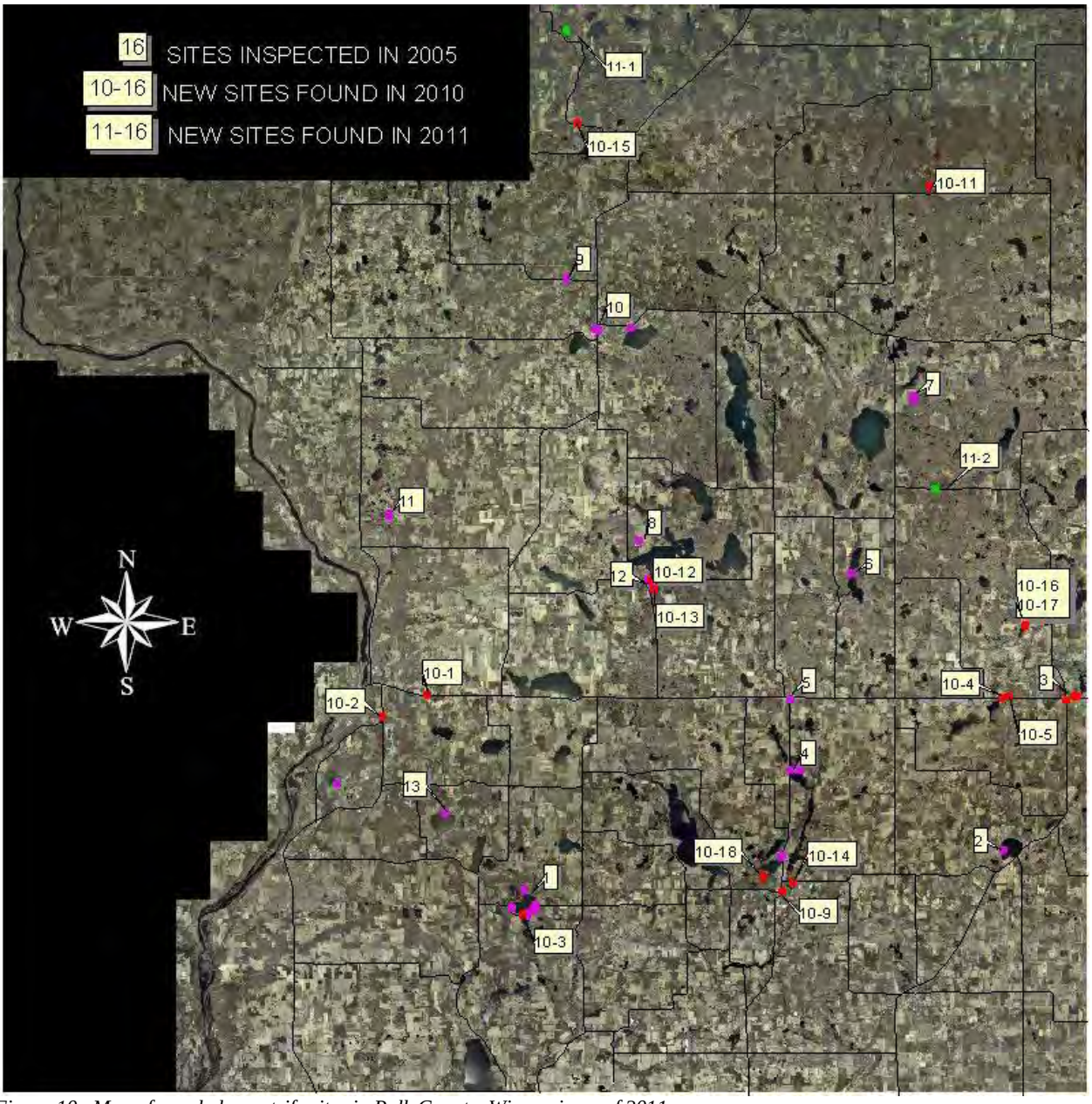


Figure 10. Map of purple loosestrife sites in Polk County, Wisconsin as of 2011.

ID	LAT	LONG	NOTES	DESCRIPTION
10-1	45.39721210	92.60514722	1 plant, cut/bagged flowers & Habitat application	Wetland across from Wal-mart on Hwy 8
10-2	45.38702482	92.63675069	1 plant, cut/bagged flowers & Habitat application	W side of 35 south of Interstate Park Entrance
10-3	45.29051366	92.53968104	No control in water on shoreline	Round Lake box culvert
10-4	45.39552315	92.21037358	Cut/bagged flowers & Habitat application	E of Intersection of Hwy 8 & 125th Ave
10-5	45.39589422	92.20543320	Cut/bagged flowers & Habitat application	Wetland N side of Hwy 8
10-6	45.39559758	92.15839430	Cut/bagged flowers & Habitat application	Hwy 8, Turtle Lake
10-7	45.39556431	92.16081298	Cut/bagged flowers & Habitat application	Hwy 8 on Turtle Lake
10-8	45.39399622	92.16655475	Cut/bagged flowers & Habitat application	Hwy 8 on Turtle Lake
10-9	45.30198086	92.36214353	Cut/bagged flowers & Habitat application	Schumacher Park, Amery
10-10	45.30202805	92.36210145	Cut/bagged flowers & Habitat application	Schumacher Park, Amery
10-11	45.64312650	92.25799209	1 plant, cut/bagged flowers & Rodeo application	County Rd O, Town of Lorain
10-12	45.45261112	92.45158631	2 plants, cut/bagged flowers & Rodeo application	W of Balsam Lake Beach
			5 plants, cut/bagged flowers & Rodeo application. 2 plants (not rooted) entirely removed & bagged	
10-13	45.44820869	92.44970650	1 plant, no treatment	Near Dam on Millpond, Balsam Lake
10-14	45.30672954	92.35460032	Multiple plants, no treatment	Private residence on Apple River, Amery
10-15	45.67435076	92.50186549	Multiple plants, no treatment	County Road W in wetland
10-16	0.00000000	0.00000000	No GPS when cut/bagged flowers & treated	N Shore on Silver Lake
10-17	0.00000000	0.00000000	No GPS when cut/bagged flowers & treated	N Shore on Silver Lake
10-18	0.00000000	0.00000000	No GPS when cut/bagged flowers & treated	W shore on South Twin Lake
11-1	45.71948000	92.50908900	Hand pulled entire plants	Private residence on Grimhs Lake
11-2	45.49656900	92.25523200	1 plant, cut/bagged flowers & treated	County Road G near 200th Ave intersection

Table 4. Identity, GPS coordinates, notes, and descriptions for purple loosestrife sites located in 2010 and 2011.

Figure 11. Rearing Galerucella beetles.

Figure 12. Releasing Galerucella beetles.

Polk County LWRD reared (Figure 11) and released (Figure 12) *Galerucella* beetles in the Luck Wetland in 2010 and in the White Ash Lake Channel in 2011. LWRD also provided technical assistance raising and releasing *Galerucella* beetles to Lotus Lake Association and the Big, Round, Church Pine P&R District.

The site in Luck was located in 2000, and beetles were initially released in 2001. A second beetle release occurred in 2010 because purple loosestrife was still very apparent in the wetland and had increased in size, moving across the road to the west side of Hwy 35 (Figure 13).

The site in the White Ash Lake Channel was located in 2000, and beetles were released in 2003 and 2005. Beetles were released again in 2011 in response to new stands of purple loosestrife without herbivory/beetles being located within the Channel (Figure 14).

Figure 13. Luck wetland beetle release site, 2010.

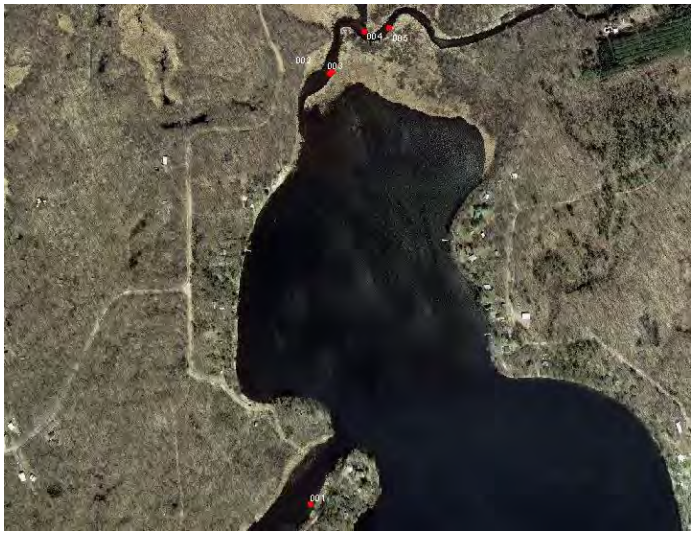


Figure 14. White Ash Lake Channel beetle release site, 2011.

Chinese Mystery Snails

Chinese mystery snails (Figure 15) were imported to the west coast in the late 1800's as a food source for the Asian market and have spread via aquarium release and other accidental and intentional introductions. When introduced to a new water body, the Chinese mystery snail alters the ecosystem composition, structure, and function by competing with native snails for food and space.

Figure 15. Chinese mystery snails.

Populations of Chinese mystery snails are now established in many Northern Wisconsin lakes. In 2010 LWRD surveyed all lakes with boat landings (55 lakes) in Polk County for the presence of Chinese mystery snails. Results of this monitoring activity were entered into a database and snails were preserved in ethanol and given to the WDNR.

Chinese mystery snails were present in 65% of all lakes in Polk County that have boat launches and absent in 20% of all lakes in Polk County that have boat launches. A number of lakes with boat landings were not accessible (5%) (Table 5).

Date sampled	Lake Name	Snail Present?	Comments
8/9/2010	Blake Lake	no	
8/9/2010	Coon Lake	no	
8/9/2010	Diamond Lake	no	
8/2/2010	Dwight Lake	no	
8/2/2010	Horse Lake	no	
7/26/2010	King Lake	no	
8/30/2010	Little Butternut Lake	no	
8/2/2010	Long Trade Lake	no	
8/2/2010	Lotus Lake	no	
8/9/2010	Pickerel Lake	no	
8/2/2010	Rice Lake	no	
8/9/2010	Somers Lake	no	
8/2/2010	Twin Lake	no	
8/9/2010	Vincent Lake	no	
8/30/2010	Ward Lake	no	
8/30/2010	Wild Goose Lake	no	
8/30/2010	Apple River	yes	
8/9/2010	Balsam Lake	yes	
8/9/2010	Bass Lake	yes	
7/26/2010	Bear Trap Lake	yes	South Shore Drive
8/30/2010	Big Butternut Lake	yes	
8/2/2010	Big Lake	yes	
8/9/2010	Big Round Lake	yes	

8/9/2010	Bone Lake	yes	
8/30/2010	Bridget Lake	yes	
7/26/2010	Camelia Lake	yes	
8/2/2010	Cedar Lake	yes	
8/2/2010	Church Pine Lake	yes	
8/9/2010	Clam Falls Flowage	yes	
7/26/2010	Clear Lake	yes	
8/2/2010	Deer Lake	yes	
8/9/2010	Godfrey Lake	yes	
8/9/2010	Half Moon Lake	yes	
7/26/2010	Horseshoe Lake	yes	
8/2/2010	Little Mirror Lake	yes	
8/9/2010	Long Lake	yes	County Road T
8/2/2010	Long Lake	yes	County Road I
8/2/2010	Loveless Lake	yes	
8/2/2010	Lower Pine Lake	yes	
7/26/2010	Magnor Lake	yes	
8/30/2010	McKenzie Lake	yes	
7/26/2010	North Twin Lake	yes	
8/2/2010	Paulsen Lake	yes	
7/26/2010	Pike Lake	yes	
8/2/2010	Pine Lake	yes	
8/9/2010	Pipe Lake	yes	County Road G
8/2/2010	Poplar Lake	yes	
8/2/2010	Sand Lake	yes	
8/2/2010	Sandhill Lake	yes	
7/26/2010	South Twin Lake	yes	
7/26/2010	Wapogasset Lake	yes	County Road F
7/26/2010	White Ash Lake	yes	
8/2/2010	Herby Lake		In-accessible
8/9/2010	Largon Lake		Thick green scum not visible
8/2/2010	Swede Lake		In-accessible

Table 5. Chinese mystery snail presence/absence in Polk County Lakes with boat launches, 2010.

In 2009, tiles were placed in a number of streams and rivers to monitor for the aquatic invasive New Zealand mud snail. Tiles were placed in Knapp Creek, McKenzie Creek, and on the Clam River (Figure 16). Fortunately, no invasive snails were found.

Figure 16. Tiles for monitoring New Zealand mud snails in the bed of Knapp Creek.

Rusty Crayfish

Rusty crayfish are invasive crustaceans that can have profound impacts on lakes, rivers, and streams. They are more aggressive than native crayfish and are better able to avoid predation than native crayfish. Rusty crayfish can also harm native fish populations by eating their eggs and young.

Established populations of rusty crayfish have been documented in many streams and rivers in Polk County (Figure 17).

Traps for rusty crayfish were set in tributaries of the Apple River, which is known to have established populations of rusty crayfish. Rusty crayfish traps were also put out on South Twin Lake in Amery several times since it is connected by a man-made channel to the Apple River. South Twin has a rich aquatic macrophyte community and it would be devastating if rusty crayfish were to invade. Luckily, none of the traps yielded rusty crayfish.

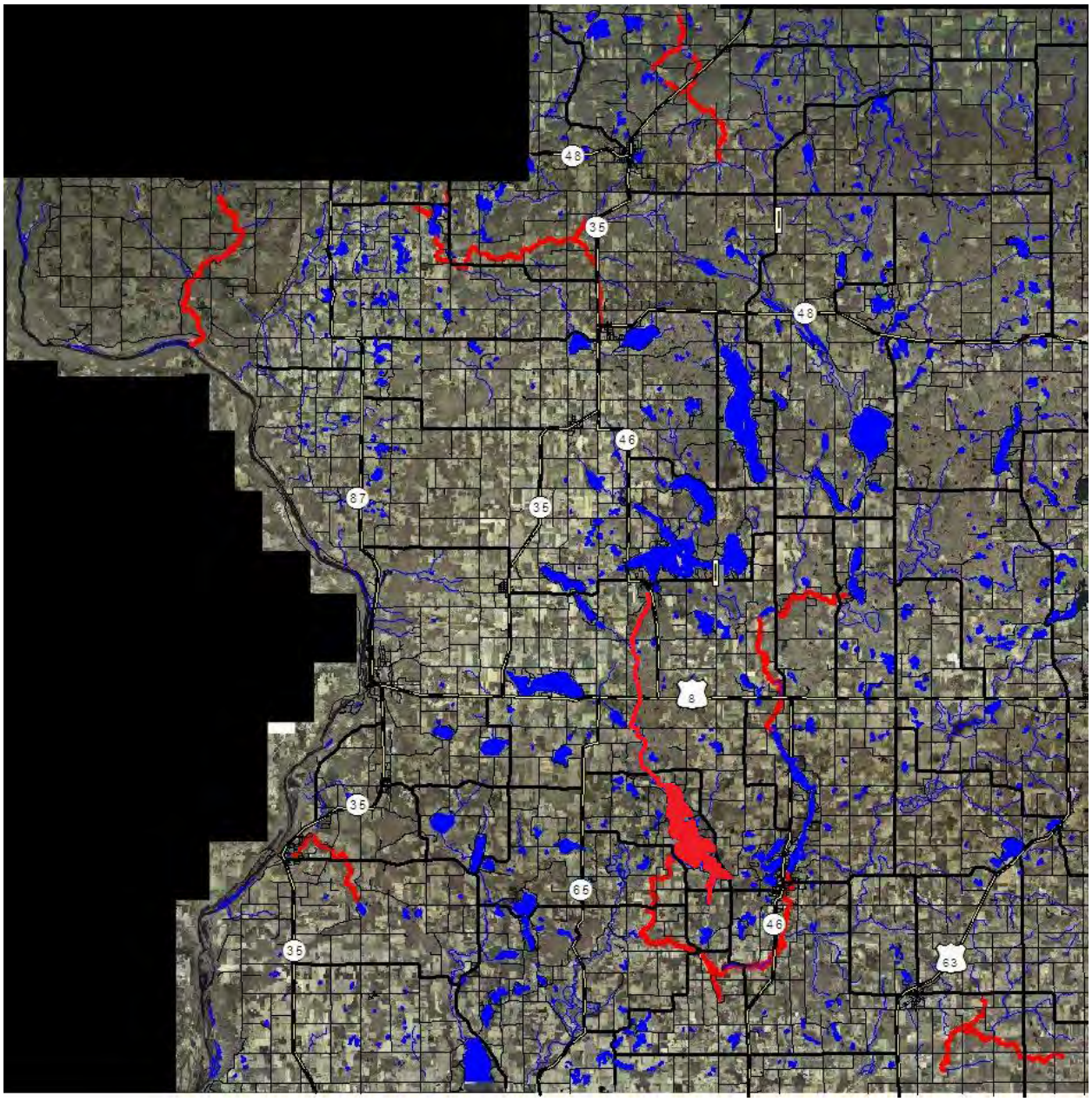


Figure 17. Polk County water bodies with known populations of rusty crayfish, as of 2011.

Zebra Mussels

Zebra mussels are aquatic invasive mussels with a D-shaped shell exhibiting alternating black and white stripes. Since they are able to attach to hard surfaces, zebra mussels can clog water intakes and damage equipment such as boat motors. When water bodies are infested with zebra mussels their shorelines become littered with sharp shells, impeding human recreational opportunities. Additionally, they damage ecosystems by harming fisheries and smothering native mussels, snails, and crayfish.

Figure 18. Zebra mussels from Bass Lake, St. Croix County, 2011.

Zebra mussels arrived in the Great Lakes in the late 1980's from contaminated ballast water. Since that time they have expanded in range via the Mississippi River. Zebra mussels have not been found in Polk County; however, in 2010 they were discovered in Bass Lake in St. Croix County (Figure 18).

In 2009, a zebra mussel trap was placed in Pipe Lake and subsequently stolen. However, hard surfaces such as rock reefs and artificial structures were sampled and yielded no zebra mussels. Additionally, vertical and horizontal plankton tows were taken in Pipe Lake to sample for zebra mussel veligers. In 2010, zebra mussel traps (Figure 19) were placed in Lake Wapogasset and Big Round Lake. These lakes were chosen because they have significant boat traffic and their calcium levels are high enough to support adult populations of zebra mussels. Traps yielded no populations of zebra mussels.

Figure 19. Zebra mussel traps, Lake Wapogasset, 2010.

In response to the discovery of zebra mussels in Bass Lake in St. Croix County in 2011, an extensive monitoring program was implemented for zebra mussels in Polk County Lakes located north of Bass Lake (Figure 20). Vertical and horizontal plankton tows were taken and analyzed for aquatic invasive species. Fortunately, these samples yielded no zebra mussels veligers. Additionally, spiny water fleas were not found in any of the lakes sampled (Table 6).

Lake	Zebra mussels present?
Lotus Lake	No
Horse Lake	No
Big Lake	No
Round Lake	No
Church Pine Lake	No
Paulson Lake	No
Pine Lake	No
Lower Pine Lake	No
Swede Lake	Not accessible

Table 6. Zebra mussel monitoring results from the Horse Creek Watershed, 2011.

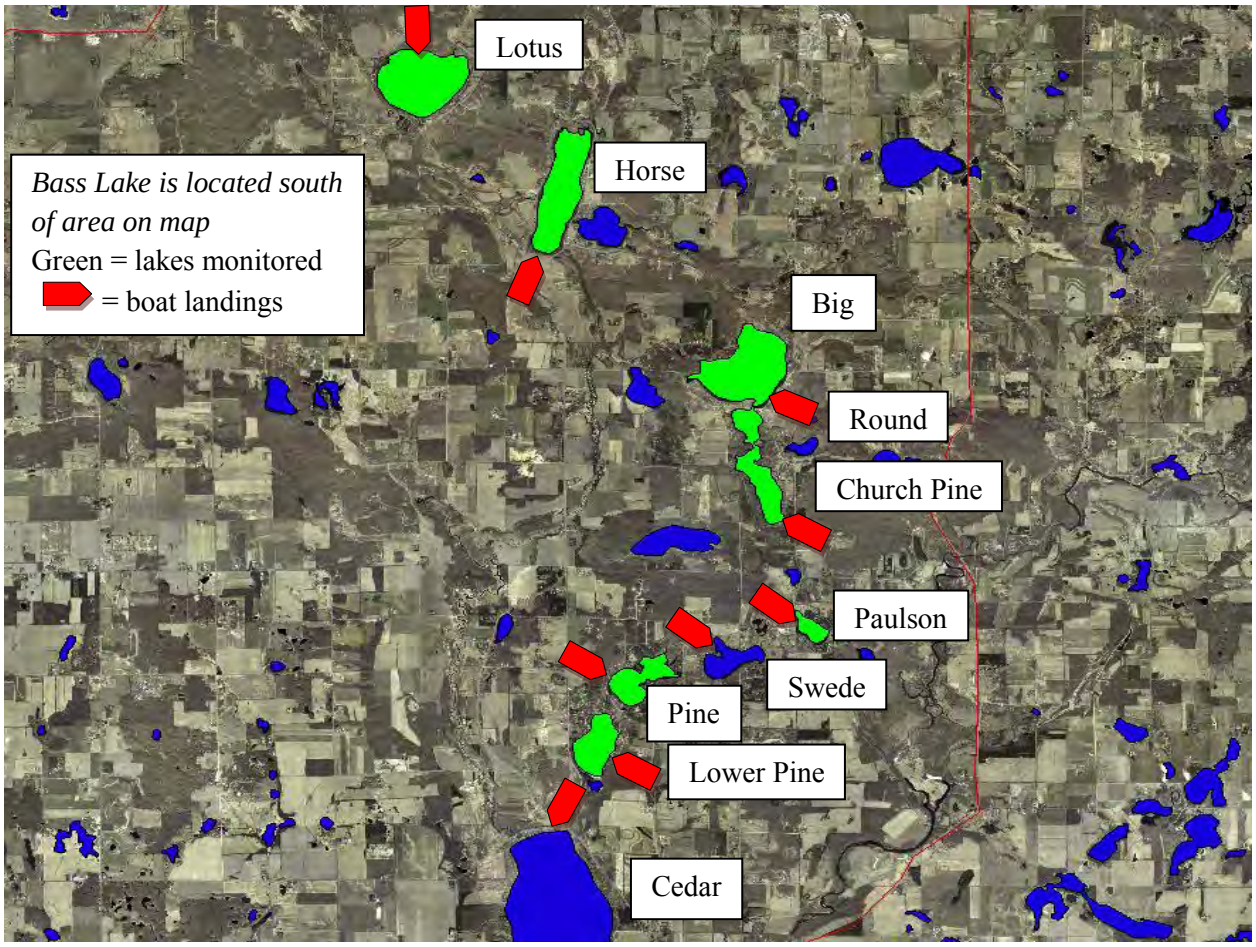


Figure 20. Lakes monitored for zebra mussels in the Horse Creek Watershed.

Japanese and Giant Knotweed

Japanese and giant knotweed are large robust perennial plants with very aggressive growth habits (Figure 21). Knotweed has the ability to grow very fast and out-compete other vegetation. As a result, other vegetation is unable to grow beneath the canopy of a knotweed stand, which leaves the soil exposed. Where this plant has established itself along stream banks, the lack of understory can promote intense erosion allowing both soil and knotweed roots to move downstream. Where root segments wash ashore downstream, new infestations will undoubtedly develop.

Figure 21. Japanese knotweed.

Both Japanese and giant knotweed are native to Asia and were imported in the mid 1900's as an ornamental plant. This species has begun to escape landscaping conditions becoming more prevalent in the wild (Figure 22). In 2009 LWRD discovered Japanese and giant knotweed at numerous sites in Polk and Burnett County (Figure 23 and Figure 24). As a result the LWRD applied for and received an Early Detection and Response Grant for Japanese knotweed in Polk and Burnett Counties in 2009.

Figure 22. Japanese knotweed stand on County Road W, outside of Frederic.

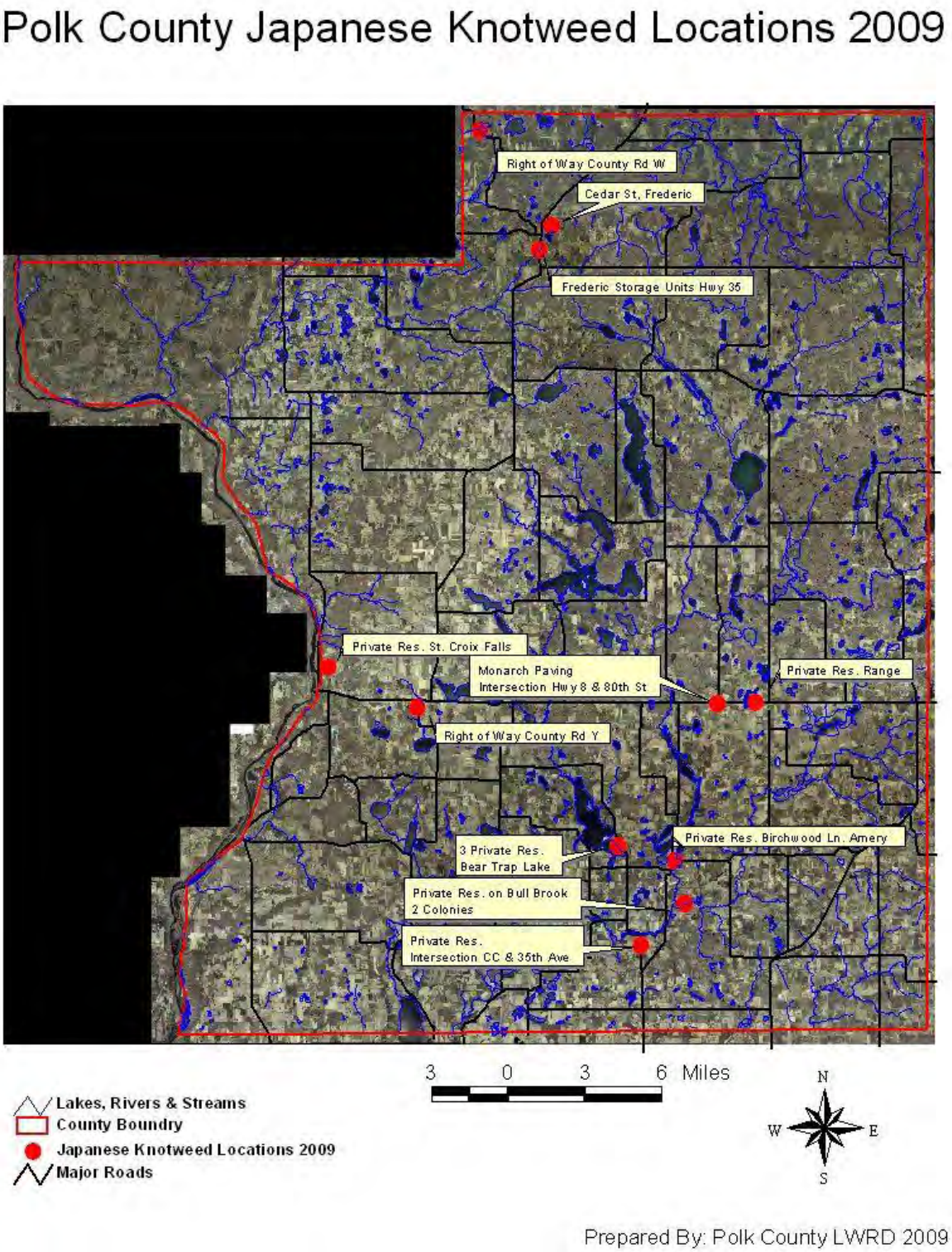


Figure 23. Japanese knotweed locations in Polk County prompting application for a WDNR rapid response grant, 2009.

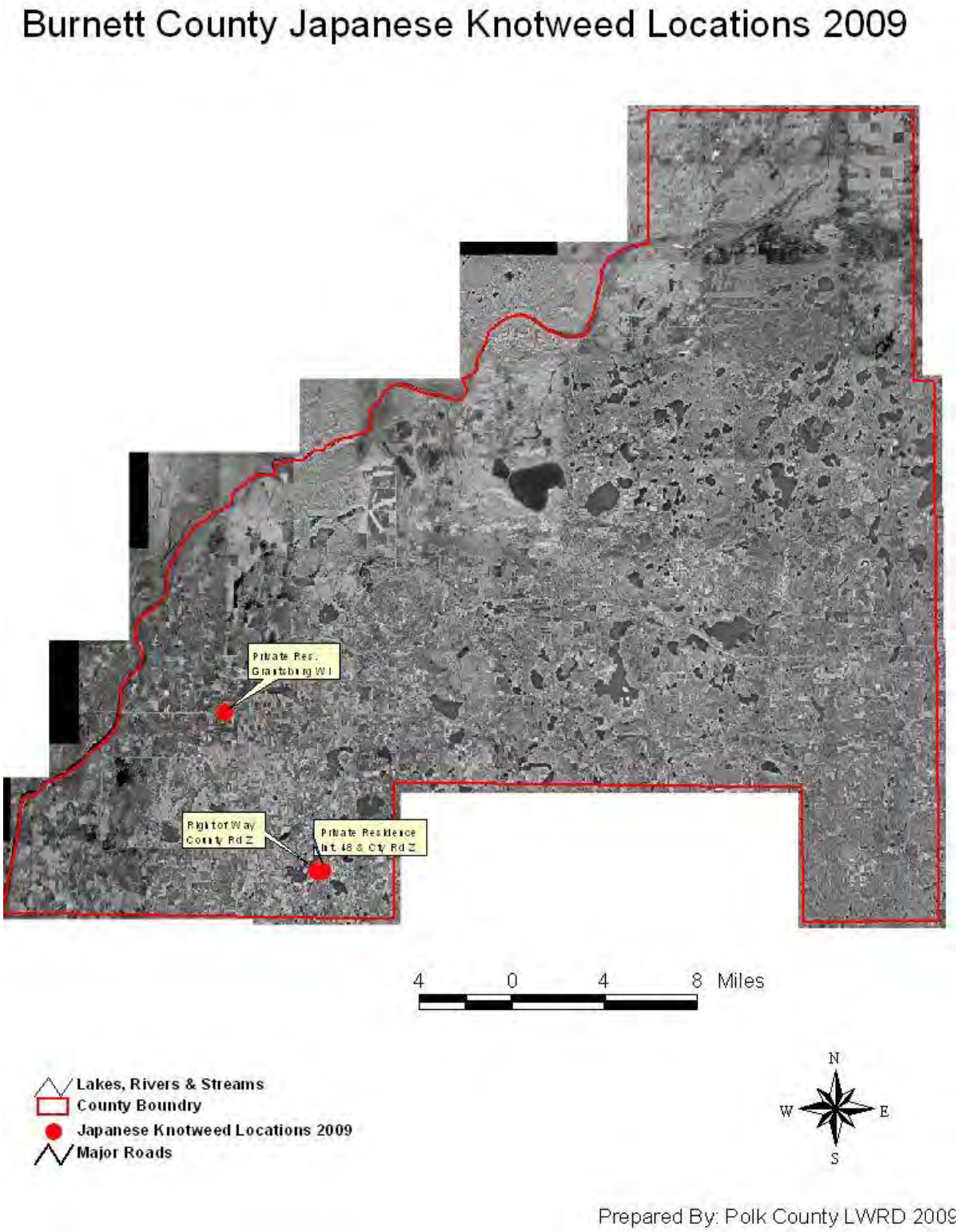


Figure 24. Japanese knotweed locations in Burnett County prompting application for a WDNR rapid response grant, 2009.

Early Detection Smart Prevention Protocol

In 2011 Polk County LWRD partnered with the WDNR to implement the early detection smart prevention protocol on Polk County Lakes (Appendix C). Eleven Polk County Lakes were randomly chosen for monitoring, although one (Swede Lake) was inaccessible (Figure 25). Data for Secchi depth, conductivity, and GIS location of AIS populations were entered into the Surface Water Integrated Monitoring System (SWIMS) (Table 7).

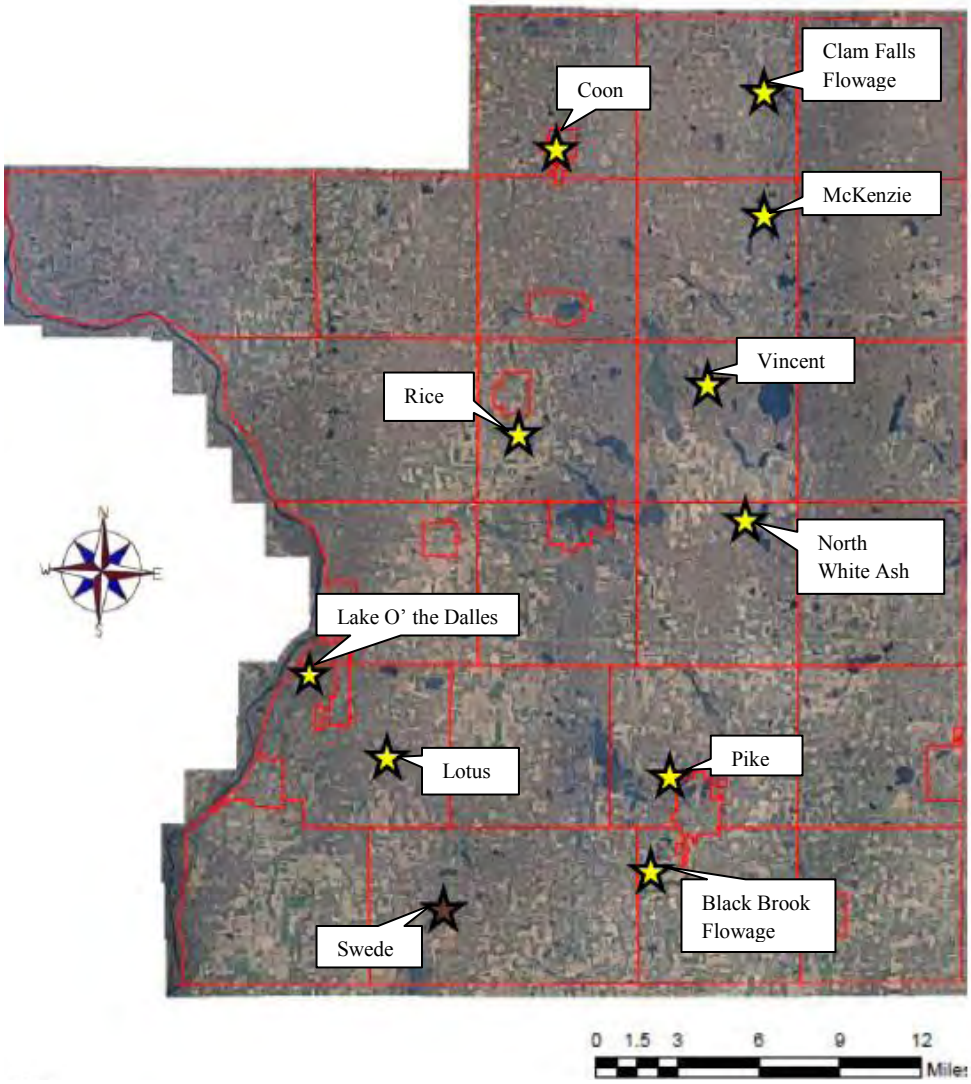


Figure 25. Polk County Lakes chosen for the early detection smart prevention protocol, 2011.

Lake	Date	Secchi depth (ft)	Conductivity (us/s)	AIS present	Density	Latitude	Longitude
Pike Lake	7/26/11	12.5	238	Chinese mystery snail	1 4 1 2 3 1	45.32530 45.32671 45.32092 45.32016 45.31944 45.32367	92.36784 92.36250 92.36796 92.37026 92.37352 92.36929
				Eurasian water milfoil	2	45.32649	92.36689
Rice Lake	8/9/11 8/11/11	5	204.1	None			
Coon Lake	8/16/11	4.5	75.4	Narrow leaf cattail	2 3	45.39565 45.39603	92.27595 92.27683
				Reed canary grass	3 2	45.39565 45.39620	92.27595 92.27449
East (Lotus) Lake	8/17/11	1	179.8	Purple loosestrife	1 2 2 4	45.20366 45.20297 45.20135 45.20370	92.36016 92.35358 92.35322 92.35721
				Phragmites	1 4	45.20135 45.19886	92.35322 92.35773
				Narrow leaf cattail	2	45.20135	92.35322
Clam Falls Flowage	8/18/11	4	162.4	Curly leaf pondweed	1 3 1 3 1	45.41133 45.40556 45.40794 45.40713 45.40602	92.17581 92.17223 92.17273 92.17255 92.17178
				Chinese mystery snail	1 3	45.41133 45.41194	92.17581 92.17748
Vincent Lake	8/22/11 8/23/11	4	23.7	None			
Black Brook Flowage	8/29/11	5.5	218.8	Chinese mystery snail	1 1 4	45.15957 45.16050 45.15968	92.23281 92.22849 92.23107
				Narrow leaf cattail	3 1	45.15957 45.15968	92.23281 92.23107
				Banded mystery snail (shell only)	1	45.15957	92.23281
Lake O' the Dalles	9/1/11	1.5	186.4	Curly leaf pondweed	1 1 1	42.23575 45.23620 45.23589	92.39400 92.39356 92.39386
McKenzie Lake	9/6/11	4	195.5	Chinese mystery snail	3 2 1	45.36721 45.36732 45.36644	92.18214 92.18159 92.18337
				Reed canary grass	1 2	45.36721 45.36550	92.18214 92.18372

				Phragmites	2 1	45.36732 45.36644	92.18159 92.18029
North White Ash Lake	9/8/11	6	148.0	Chinese mystery snail	4 2 1 1 1	45.28094 45.27530 45.27739 45.27906 45.27615	92.18577 92.18801 92.18836 92.18774 92.18648
				Narrow leaf cattail	2 1	45.28094 45.27739	92.18577 92.18836
				Purple loosestrife	1	45.28094	92.18577
				Banded mystery snail (shell only)	1	45.27739	92.18836
				Curly leaf pondweed (non-viable turion only)	1	45.28094	92.18577

Table 7. DNR early detection smart prevention protocol AIS data, 2011.

"Illegal to Transport" Education and Outreach Campaign

Polk County LWRD delivered an "Illegal to transport" education and outreach campaign at numerous events and meetings throughout Polk County and for a variety of audiences. Appendix D provides examples of presentations and posters created by LWRD staff and Appendix E provides examples of information and education materials provided by Polk County LWRD. LWRD presented AIS curriculum to the following groups:

Youth Education

- Land, Air, Soil, and History (LASH) at D.D. Kennedy, 4th graders countywide, 2009, 2010, & 2011
- Earth Day at the Recycling Center, 5th graders countywide, 2010
- Mr. Y's 5th grade camp, St. Croix Falls School District, 2009, 2010, & 2011
- 2nd grade field trip to D.D. Kennedy, St. Croix Falls School District, 2011
- 1st grade field trip to Amery School Forest, Amery School District, 2009, 2010, & 2011 (Figure 26)
- 1st grade classrooms (3 times), Amery School District, 2009 (Figure 27)
- Clear Lake Public Library, 2010 & 2011
- Amery Public Library, 2011
- Balsam Lake Public Library, 2010
- Dresser Public Library, 2010
- Unity area girl scouts, 2011

Figure 26. First graders learning the impacts of invasive species on zooplankton communities.

Figure 27. Invasive species education for 1st graders.

Lake Group Meetings and Events

- Lake Wapogasset Sanitary District Meetings, 2009
- Lake Wapogasset/Bear Trap 100 Year Anniversary Celebration, 2011
- Apple River Flowage P&R District APM Meetings and Annual Meeting, 2010 & 2011
- The Big Round Lake P&R District Meetings, 2009, 2010, & 2011
- Long Lake P&R District Annual Meeting, 2009
- Polk County Association of Lakes and Rivers Meetings, 2009, 2010, & 2011
- White Ash Lake P&R District Lakes Fair, 2010 & 2011
- Loveless Lake Association Meetings, 2009, 2010, & 2011
- Half Moon Lake Annual Meeting, 2010 & 2011 (Figure 28)
- Wild Goose Lake Association Meetings, 2009, 2010, & 2011
- Big Blake Lake Annual Meeting, 2011
- Big, Round, Church Pine Lakes Annual Meeting, 2010

Figure 28. AIS display, Half Moon Lake Annual Meeting, 2011.

Figure 29. AIS display, Polk County Fair, 2011.

Other Organizations

- Amery Lions Club, 2009
- St. Croix Falls Rotary Club, 2009
- Hunters Night Out, 2010 & 2011
- Dairy Breakfast, 2011
- Amery Trail Days, 2009, 2010, & 2011
- Polk County Fair, 2009, 2010, & 2011 (Figure 29)
- Polk County Employee Newsletter, 2011
- Amery City Council, 2009
- Master Gardeners, 2009
- Polk County Sportsman Club Show, 2009 & 2010

"Stop Aquatic Hitchhikers" Stickers for Bait Containers

The Polk County LWRD worked with the Polk County Association of Lakes and Rivers (PCALR) to develop and distribute "Stop Aquatic Hitchhiker" stickers for bait containers (Figure 30) as a means to communicate the Stop Aquatic Hitchhikers message to anglers. Rolls of stickers were distributed by volunteers of PCALR to local bait shops and handed out at community events.

Figure 30. Stop Aquatic Hitchhikers stickers for bait containers.

Advertisement for 2010 Polk County Visitors Guide

Each year a tourism guide is put together for Polk County. In 2010, the Polk County LWRD designed a two page color advertisement regarding invasive species and Polk County's Illegal to Transport Ordinance (Appendix F).

Trainings

The Polk County LWRD often fielded calls regarding the identification of aquatic plant specimens when citizens were concerned they had located an aquatic invasive species. In addition to offering this free service, LWRD also coordinated numerous trainings including Clean Boats, Clean Waters and Citizen Plant Monitoring Trainings.

Clean Boats, Clean Waters Trainings

- Balsam Lake, 2009, 2010, & 2011
- Bone Lake, 2009
- Big, Round, Church Pine Lakes, 2010
- Big Butternut Lake, 2010

Citizen Plant Monitoring Trainings

- Half Moon Lake Citizen Plant Monitoring Training, 2009 (Figure 31)
- Ward Lake Citizen Plant Monitoring Training, 2009

Figure 31. Half Moon Lake Citizen Plant Monitoring Training, 2009.

Media Campaign

Inter-County Leader Outdoor Section

In 2010 the Polk County LWRD provided information for a nine-part series on invasive species in the Inter-County Leader. The complete series (with AIS relevant sections bulleted below) can be found in Appendix G.

- General AIS information
- Eurasian water milfoil
- Chinese mystery snail
- Spiny water flea
- Zebra mussels

WPCA Radio Campaign

The Polk County LWRD was a featured guest on WPCA radio biweekly throughout the 2010 and 2011 year. AIS information was presented on a variety of topics:

- General AIS information
    - Purple loosestrife
    - Japanese and giant knotweed
    - Eurasian water milfoil
    - Zebra mussels
    - Asian carp
    - Spiny water flea
    - Hydrilla
    - Chinese mystery snails
- AIS monitoring in Polk County
- Known locations of AIS in Polk County
- Management strategies for AIS
- Illegal to Transport Ordinance information
- Project Red
- Citizen Lake Monitoring
- AIS youth education

Illegal Transport of Aquatic Plants and Invasive Animals Ordinance

The Polk County LWRD worked extensively to adopt a Polk Countywide Illegal Transport of Aquatic Plants and Invasive Animals Ordinance in 2008 and to amend the ordinance in 2011 (Appendix H). Public input into the decision making process was sought through public meetings which were advertised in local papers.

In 2009, ninety metal signs were purchased and installed at Polk County lakes with boat landings (Figure 32).

In 2011, LWRD staff worked closely with local law officials to ensure enforcement of the amended ordinance. In early July a ticket was given for $232.00 for "Transport Vehicle/Equipment with aquatic plants/animals on highway".

Figure 32. Local ordinance sign for boat landings.

Discussion

Polk County is a water rich county with 427 lakes and 365 miles of streams and rivers. Due to the fact that the county has a tourism-based economy centering on its lakes and rivers, the threat of aquatic invasive species comes in large part from places outside of our county boarders.

To date, there are known populations of Eurasian water milfoil on the St Croix River and in three Polk County Lakes. The St. Croix River and Bass Lake (Northern St. Croix County, 7 miles from Cedar Lake) have known populations of zebra mussels. Additionally, there are many lakes and rivers in Polk County with Chinese and banded mystery snails, narrow leaf cattail, common carp, curly leaf pondweed, purple loosestrife, and rusty crayfish.

To effectively prevent the spread of aquatic invasive species to native aquatic ecosystems the extent of the infestations in Polk County must first be understood. Secondly, a community-focused educational outreach effort on aquatic invasive species prevention methods must be provided. The receipt of a 2009 WDNR AIS grant allowed the Polk County LWRD to achieve numerous measureable results towards meeting these goals.

The results of this grant project, in the form of this report, will be used to help set priorities for the Polk County Land and Water Management Plan. Currently, Goal 1, Objective 1A in the Polk County Land and Water Management Plan states "Prevent, control, or eliminate aquatic invasive species to protect the integrity of our surface water resources." Additionally, the grant report will be disseminated to the public through the Land and Water Resources Department website and PCALR website.

Due to an increase in state funding for aquatic invasive species, the Polk County Land and Water Resources Department (LWRD) has received increasing requests for information, education, and assistance regarding aquatic invasive species from a variety of lake organizations and individuals. The department has provided assistance whenever possible. Additionally, in 2011, LWRD staff completed the WDNR AIS Early Detection Monitoring as part of the Smart Prevention Protocol for Polk County Lakes. This data is part of a comprehensive 5 year, state-wide study. In order to continue to provide these services and to prevent, control, or eliminate aquatic invasive species to protect the integrity of our surface water resources, the Polk County LWRD plans to apply for an additional AIS grant in 2012 with support from the Polk County Association of Lakes and Rivers (PCALR).

The receipt of a 2012 AIS grant would allow the Polk County LWRD to devote the time and resources necessary to implement an effective campaign to prevent the spread of aquatic invasive species to native aquatic ecosystems in Polk County. It would allow for focus to be devoted to the St. Croix River, an Outstanding Resource Water with known AIS populations.

Appendix A

Aquatic Plant Management Plan: Long Trade, Round, Little Trade, and Big Trade Lakes: Polk and Burnett Counties, Wisconsin

Prepared by Jeremy Williamson and with contributions from Jake Macholl, Dave Blumer, and Brad Morris

Aquatic Plant Management Plan

Long Trade, Round, Little Trade, and Big Trade Lakes

Polk and Burnett Counties, Wisconsin

Prepared By:

Jeremy Williamson
Water Quality Specialist
Aquatic Invasive Species Coordinator
Polk county Land & Water Resources Department

With Contributions From:

Jake Macholl
Dave Blumer
Lake Scientists
Short Elliot Hendrickson Inc.

Brad Morris
Burnett County Land and Water Resources

Table of Contents

List of Figures ii
List of Tables iii
List of Appendices iii
Executive Summary 1
Introduction 2
Lake Information 3
Water Quality 7
Watersheds 15
  Phosphorous Loading from Watersheds 17
Aquatic Ecosystems 20
Sensitive Areas 21
Rare and Endangered Species and Habitat 24
Fisheries 24
Wild Rice (*Zizania palustris*) 25
Aquatic Plant Communities 26
Aquatic Invasive Species in the Trade Lakes System 31
  Eurasian Water Milfoil (*Myriophyllum spicatum)* 35
  Curly-Leaf Pondweed (*Potamogeton crispus*) 38
  Purple Loosestrife (*Lythrum salicaria*) 40
  Japanese Knotweed (*Polygonum cuspidatum*) 42
Aquatic Plant Management 43
  Discussion of Management Methods 43
  Current and Past Plant Management Activities 45
Plan Goals and Strategies 47
  Overall Purpose 47
  Aquatic Plant Management Plan Goals 47
  Goal 1) Prevent the spread of Eurasian water milfoil (EWM). 47
    EWM Treatment Standards and Methods for the Trade Lakes system 49
    Schedule and roles for herbicide treatments 50
  Goal 2) Prevent the spread of curly-leaf pondweed (CLP). 51
  Goal 3) Prevent the introduction of other aquatic invasive species. 52
  Goal 4) Preserve the lakes' native plant communities. 53
  Goal 5) Minimize the runoff of pollutants from the Trade River watershed. 54

Adaptive Management Approach 54
Implementation Plan 55
Monitoring and Assessment 59
Aquatic Plant Surveys 59
Aquatic Invasive Species Grants 59

List of Figures

Figure 1. Long Trade Lake Map 4
Figure 2. Round Lake Map 5
Figure 3. Little and Big Trade Lakes Map 6
Figure 4. Secchi Depth Measurements in Long Trade Lake during 2007 7
Figure 5. Secchi Depth Trend for Long Trade Lake, 1986-2009 8
Figure 6. Secchi Depth Measurements in Round Lake during 2007 8
Figure 7. Secchi Depth Trend for Round Lake, 1986-2009 9
Figure 8. Secchi Depth Trend for Big Trade Lake, 1986-2003 9
Figure 9. Historic Total Phosphorus and Chorophyll *a* in Long Trade Lake 11
Figure 10. Long-term Trophic State Index of Long Trade Lake 11
Figure 11. Description of Long Trade Lake Trophic State Index 12
Figure 12. Long-term Trophic State Index of Round Lake 13
Figure 13. Long-term Trophic State Index of Big Trade Lake 14
Figure 14. Long Trade Lake and Round Lake Watersheds 15
Figure 15. Land Use in the Long Trade Lake Watershed 16
Figure 16. Portion of the Round Lake Watershed Downstream of Long Trade Lake 16
Figure 17. Portions of the Big Trade Lake and Little Trade Lake Watersheds 17
Figure 18. Phosphorus Sources in the Long Trade Lake Watershed 18
Figure 19. Phosphorus Sources in the Round Lake Watershed 18
Figure 20. Little Trade Lake Sensitive Areas 22
Figure 21. Big Trade Lake Sensitive Areas 23
Figure 22. Wild Rice on Clam Lake in Burnett County 25
Figure 23. Littoral Zone in Long Trade Lake, 2006 27
Figure 24. Littoral Zone in Round Lake, 2007 28
Figure 25. Littoral Zone in Little Trade Lake, 2009 28
Figure 26. Littoral Zone in Big Trade Lake, 2009 29
Figure 27. 2010 Eurasian Watermilfoil Bed Distribution in Little Trade Lake 32
Figure 28. 2010 Eurasian Watermilfoil Bed Distribution in Round Lake 33
Figure 29. 2010 Eurasian Watermilfoil Bed Distribution in Long Trade Lake 34
Figure 30. Dense, Canopied Eurasian Watermilfoil Bed in Long Trade Lake in 2010 35
Figure 31. Purple Loosestrife Flower Head and Stems 40
Figure 32. Purple Loosestrife and Japanese Knotweed Locations Mapped in the Trade Lakes Area 41
Figure 33. Galerucella Beetle Rearing Station and Galerucella Beetle 42
Figure 34. Japanese Knotweed along a Northern Wisconsin Lakeshore 42
Figure 35. 2010 Eurasian Watermilfoil Treatment Areas in Little Trade Lake 46

List of Tables

Table 1. Lake Characteristics 3
Table 2. Trophic State Index for Long Trade Lake Monitoring Sites, 2007 10
Table 3. Trophic State Index for Round Lake, 2007 12
Table 4. Rare and Endangered Species 24
Table 5. Fishery Resources in the Trade Lakes System 24
Table 6. Aquatic Plant Survey Summary Statistics 26
Table 7. Floristic Quality Assessment Variables 30
Table 8. Eurasian Watermilfoil Infestations in the Surrounding Area 37

List of Appendices

Appendix A Big Trade and Little Trade Lakes Sensitive Area Survey Report and Management Guidelines
Appendix B Aquatic Plant Survey Methods and Results
Appendix C WDNR Northern Region Aquatic Plant Management Strategy
Appendix D Aquatic Plant Management Options
Appendix E NR 109 – Aquatic Plants: Introduction, Manual Removal & Mechanical Control Regulations

Executive Summary

This Aquatic Plant Management Plan for Long Trade, Round, Little Trade, and Big Trade Lakes presents strategies to control an ever expanding population of Eurasian watermilfoil (EWM) (*Myriophyllum spicatum*), and to prevent the introduction of other aquatic invasive species. This plan also includes data on the lakes' watershed and water quality.

Aquatic plant surveys were done by the Wisconsin Department of natural Resources (WDNR), The Polk County Land and Water Resources (LWRD), and the Burnett County Land and Water Conservation Department (LWCD). The aquatic plant surveys show that the lakes have diminished species richness, and seem to be highly impacted by disturbances. Improving the native plant community by decreasing the population of EWM and practicing native plant conservation measures will provide better fish habitat, reduce erosion on shorelines, help prevent further invasion of aquatic invasive species, and stabilize the bottom sediments reducing the internal phosphorous load.

Eurasian watermilfoil was first officially confirmed in Long Trade Lake in 2009 (although is presence has been noted for approximately seven to ten years), Round Lake in 2003, and Little Trade Lake in 2009, and was documented in the channel between Little Trade and Big Trade Lakes in 2010. Its growth does not seem to be limited and is found throughout the littoral zone in Long Trade and Round Lakes, and seems to be rapidly expanding in Little Trade, moving its way into Big Trade Lake.

This plan presents a strategy to reduce the population of Eurasian watermilfoil and prevent its spread into Big Trade Lake.

Curly-leaf pondweed (CLP) (*Potamogeton crispus*), another non-native aquatic invasive species, also has significant populations in each of the lakes. To date, the amount of CLP has not been quantified in the system. Management may have to be adjusted to account for the interaction of these two species and on the effectiveness of the herbicide treatments.

The overall goal of this plan is to decrease the impact of EWM on the lakes' ecosystems and prevent its spread into Big Trade Lake, as well as other surrounding lakes. The goals of this plan are to:

1. Prevent the spread of Eurasian water milfoil.
2. Prevent the spread of Curly-leaf pondweed.
3. Prevent the spread and introduction of other aquatic invasive species.
4. Preserve, protect, and enhance the lakes' native plant communities.
5. Minimize the runoff of pollutants, nutrients, and sediment from the Trade Lake watershed.

The implementation part of this plan describes the actions to be taken to achieve these goals, which includes implementing an early-season EWM herbicide treatment as to minimally impact the native plant community.

Introduction

This aquatic plant management plan presents a strategy to reduce the population of Eurasian water milfoil and to prevent the introduction of additional aquatic invasive species. In doing so, the native aquatic plant community will be protected and in time enhanced, providing fishery and wildlife habitat as well as possibly improving in-lake water quality. The plan includes data on the aquatic macrophyte communities present in the lake, and watershed information and water quality data where available.

Two lake studies were conducted on Long Trade and Round Lakes by the Polk County Land and Water Resources Department (LWRD) in 2007. The reports from those studies suggested that the Lake Association take action towards controlling the population of Eurasian water milfoil. The discovery of EWM in Little Trade Lake by Wisconsin Department of Natural Resources (WDNR) staff prompted the Association to work with the LWRD, the Burnett County Land and Water Conservation Department (LWCD), and the WDNR to apply for a rapid response grant to attack the EWM in Little Trade Lake. As a result, LWRD and LWCD staff completed point intercept surveys of Little Trade and Big Trade Lakes in 2009. WDNR staff had previously conducted surveys on Long Trade and Round Lakes. EWM beds were mapped in Little Trade Lake in 2009, and again in 2010. Long Trade and Round were also mapped in 2010.

The Lake Association has been involved with the development of this Aquatic Plant Management Plan through several meetings and conference calls conducted to gather public input from lake residents and from the Lake Association.

Lake Information

The Trade River system begins in Polk County near of the Villages of Luck and Frederic, flows west into Long Trade Lake, then into Round Lake (Burnett County) and then Little Trade and Big Trade Lakes, eventually returning to Polk County and emptying into the St. Croix River. These lakes are considered drainage lakes because they are fed by the Trade River and other streams, groundwater, precipitation and runoff and are drained by the Trade River. Long Trade Lake is also an impoundment with an 11-foot dam at its outlet.

Physical characteristics of the lakes can be found in Table 1. Long Trade Lake (WBIC 2640500) is a shallow, 152.6-acre lake with a mean depth of 7.5 feet and a maximum depth of 13 feet. Round Lake (WBIC 2640100) is approximately 26 feet deep, with a mean depth of 15.2 feet and covers 204.2 acres. Little Trade (WBIC 2639300) and Big Trade Lakes (WBIC 2638700) cover a combined 460 acres. Little Trade Lake has a maximum depth of 19 feet and a mean depth of approximately 8.2 feet whereas Big Trade Lake has a maximum depth of 39 feet and a mean depth of nearly 14 feet.

Table 1. Lake Characteristics

Lake Characteristic	Long Trade	Round	Little Trade	Big Trade
Lake Area (acres)	152.6	204.2	128.3	331.7
Watershed Area (acres)	32,572	34,954	39,238	41,749
Watershed to Lake Ratio	212:1	170:1	305:1	125:1
Maximum Depth (feet)	13	27	19	39
Mean Depth (feet)	7.5	15.2	8.2	13.8
Volume (acre-feet)	1,141.4	3,104.6	1,051.8	4,577.6
Osgood Index	2.9	5.1	3.5	3.6
Elevation (feet AMSL)	971	928	907	907
Miles of Shoreline	4.34	3.33	3.89	7.37
Lake Type	Drainage (Impoundment)	Drainage	Drainage	Drainage

The Osgood Index is used to describe how likely a lake is to mix due to wind forces and is defined as the mean depth of a lake in meters divided by the square root of the surface area in kilometers. Large, shallow lakes have a lower Osgood Index than smaller, deeper lakes. Lakes with Osgood Index values less than 4 tend to be polymictic, that is, they undergo a number of periods of stratification and mixing during the summer months. Periods of stratification followed by mixing during the summer can release large amounts of phosphorus into the water column which can fuel algal blooms. All of the lakes except Round Lake have an Osgood Index less than 4 (Table 1). Temperature monitoring of Long Trade Lake indicates that it likely remains mixed throughout the summer and monitoring of Round Lake found that the lake does stratify, but does not develop a strong gradient.

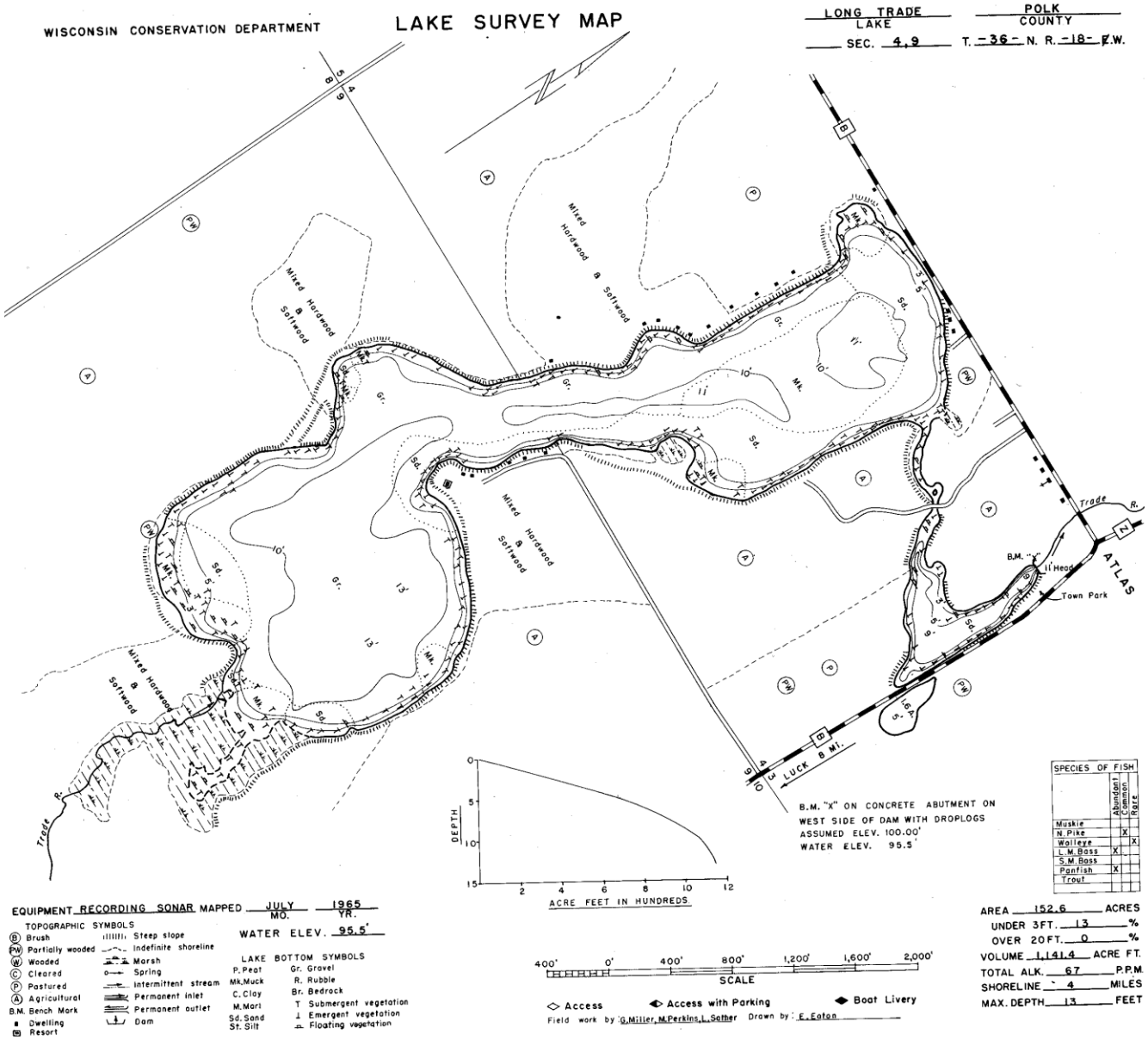


Figure 1. Long Trade Lake Map

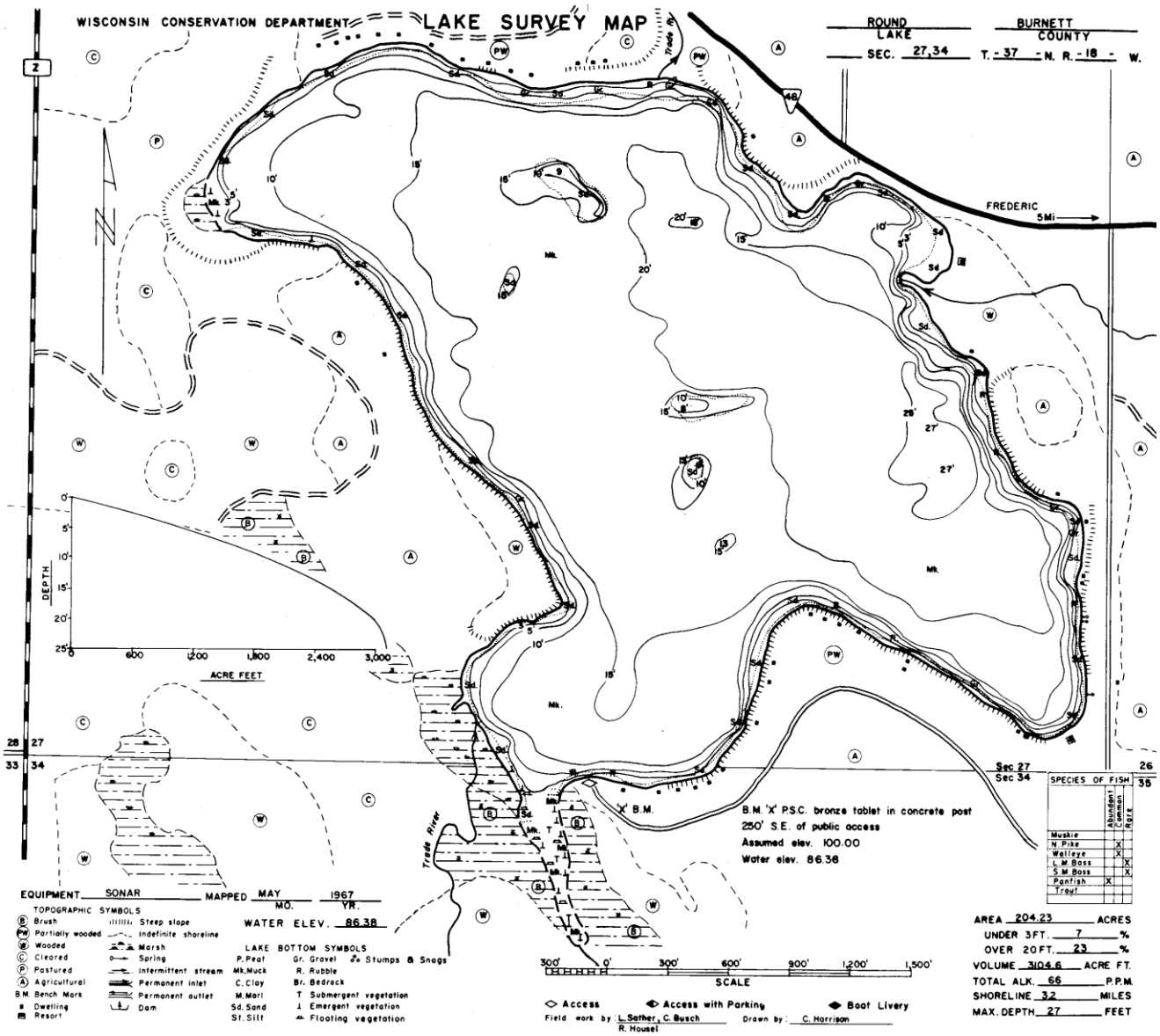


Figure 2. Round Lake Map

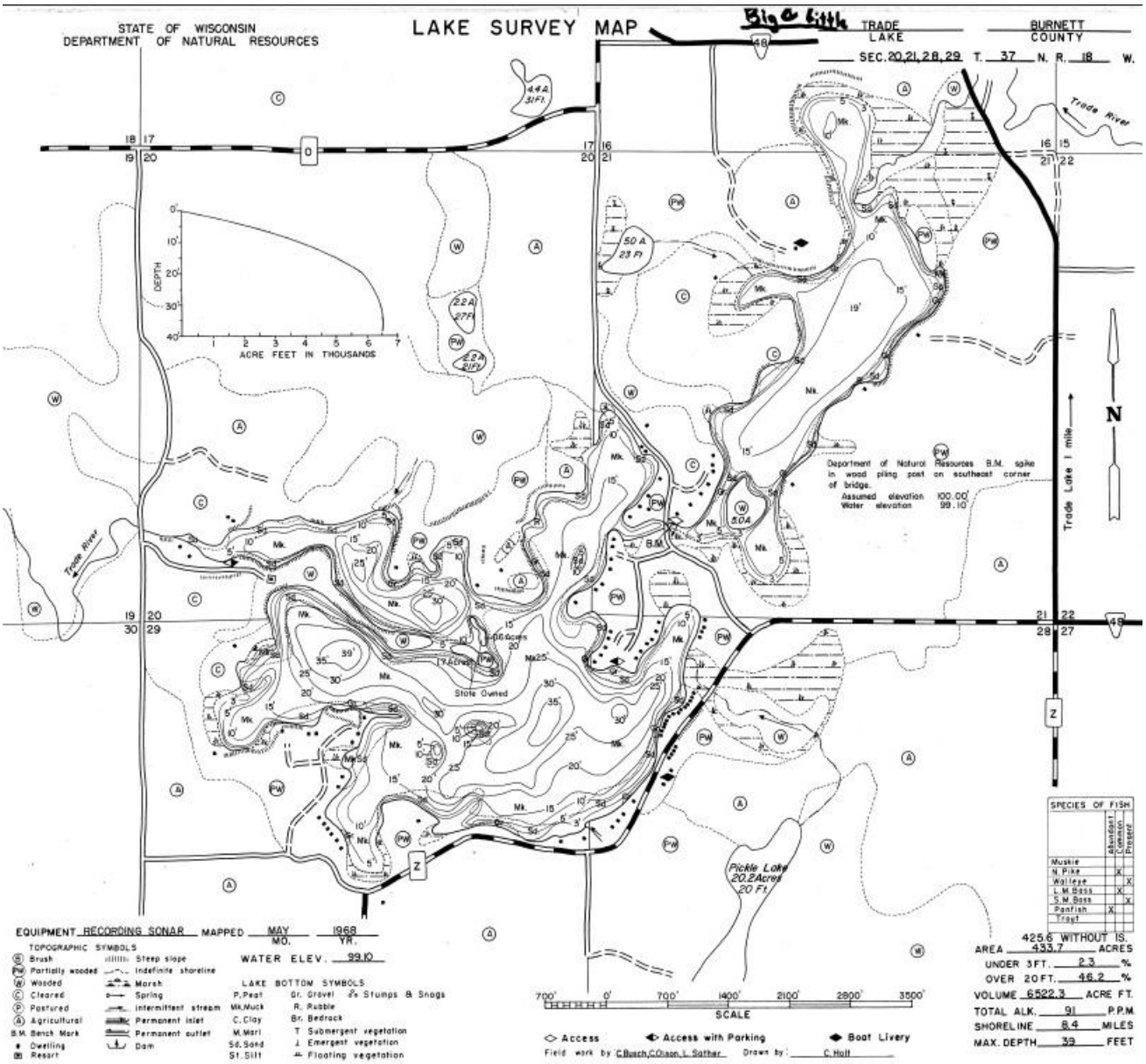


Figure 3. Little and Big Trade Lakes Map

Water Quality

Water quality is frequently reported by the trophic status or nutrient level of the lake. Nutrient rich lakes are classified as eutrophic. These lakes tend to have abundant aquatic plant growth and low water clarity due to algae blooms. Mesotrophic lakes have intermediate nutrient levels and only occasional algae blooms. Oligotrophic lakes are nutrient poor with little growth of plants and algae.

Secchi depth is a measure of the clarity of the water, and helps determine the trophic state of a lake. The Secchi depth of a lake is affected by minerals dissolved in the water column as well as algae and sediment suspended in the water. A deeper Secchi depths means more light penetrates the water column allowing aquatic macrophytes to grow.

The average Secchi depth for the south basin of Long Trade Lake was 2.2 feet and 2.1 feet for the north basin in 2007 (Figure 4). This correlates to very poor water clarity and highly eutrophic conditions. As reflected by the Secchi depth measurements, the amount of suspended particles in the lake increased during the growing season (May – September). This was most likely the growth of algae due to warmer temperatures, increased hours of daylight, and continuous contributions of nutrients through runoff, surface water inputs, or internal recycling from the sediments. While a decrease in water clarity over the summer months is a normal phenomenon, the summer water clarity in Long Trade Lake is such that it can be considered a nuisance and can limit recreational use and diminish the wildlife value. Poor water clarity is typical in Long Trade Lake and summer Secchi depths have consistently averaged about 2 feet since 1986 (Figure 5).

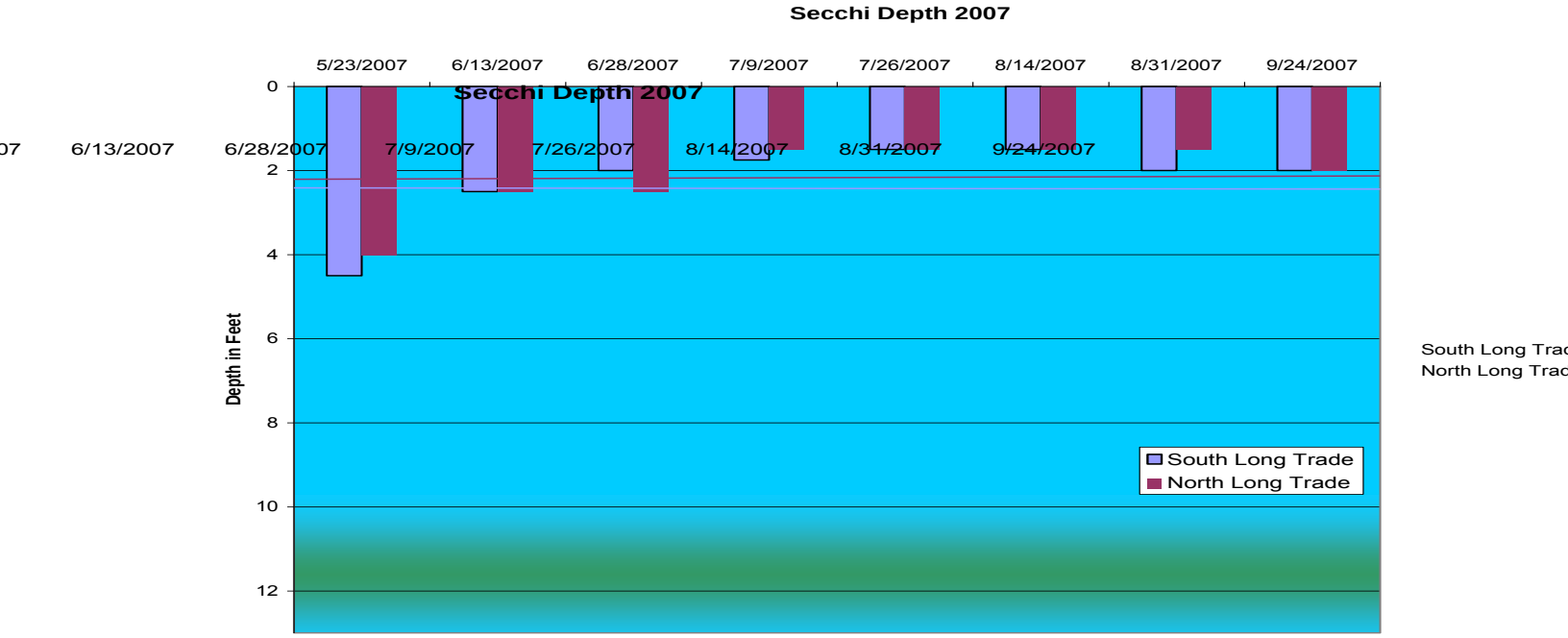


Figure 4. Secchi Depth Measurements in Long Trade Lake during 2007

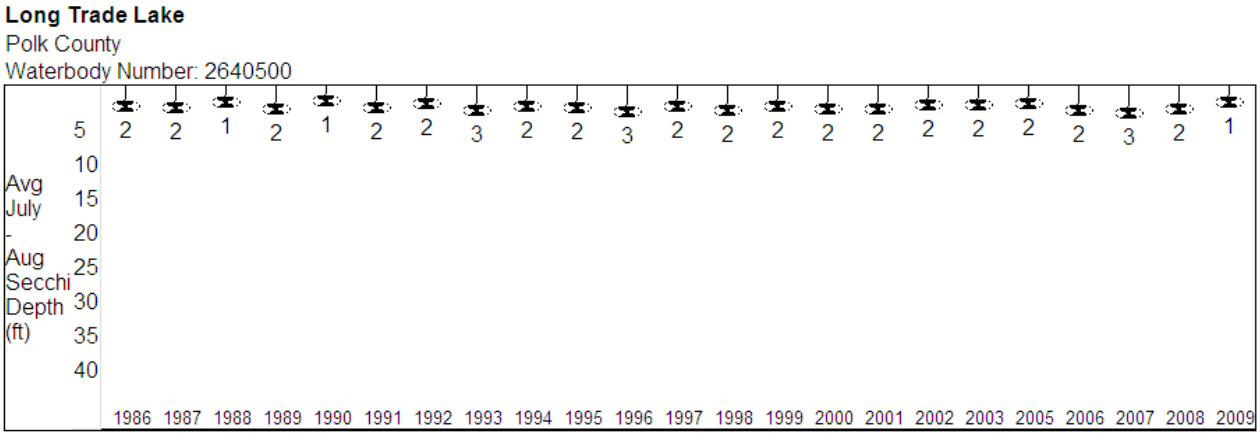


Figure 5. Secchi Depth Trend for Long Trade Lake, 1986-2009

Round Lake did not fare much better in 2007, with an average Secchi depth of 3.8 feet (Figure 6). Low Secchi depth measurements indicative of eutrophic conditions are also typical for Round Lake, which has been monitored since 1986 (Figure 7).

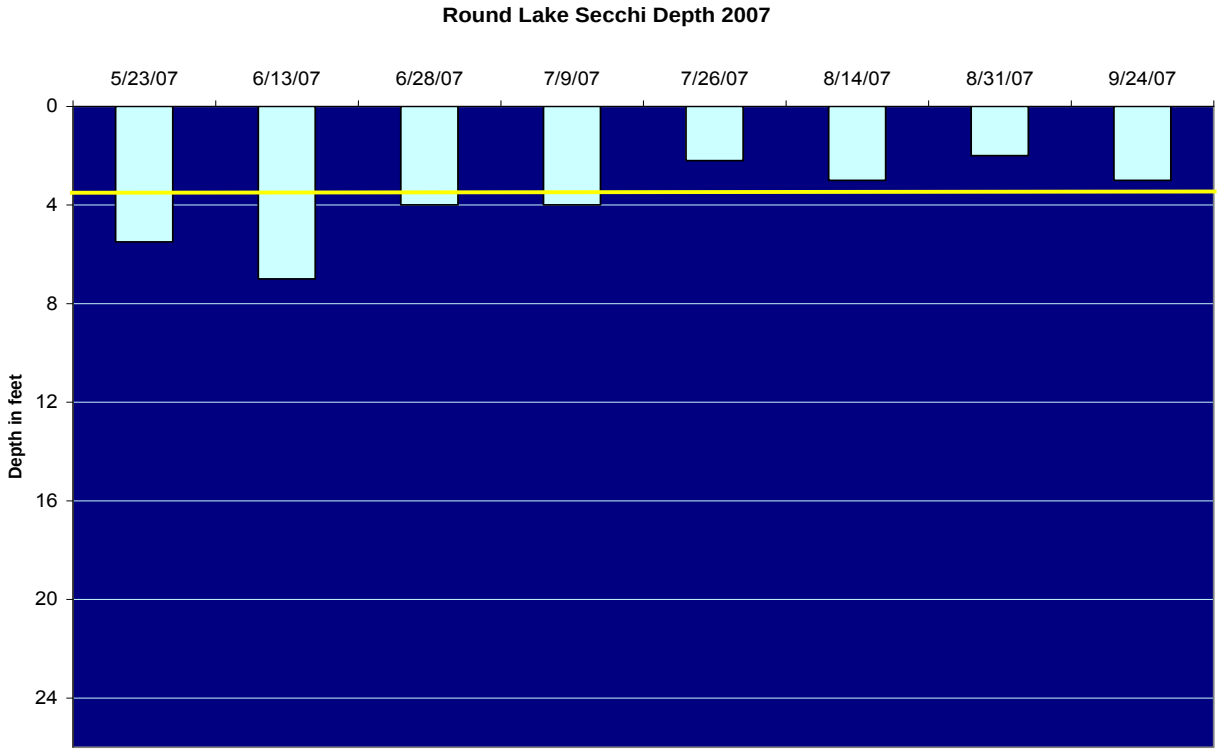


Figure 6. Secchi Depth Measurements in Round Lake during 2007

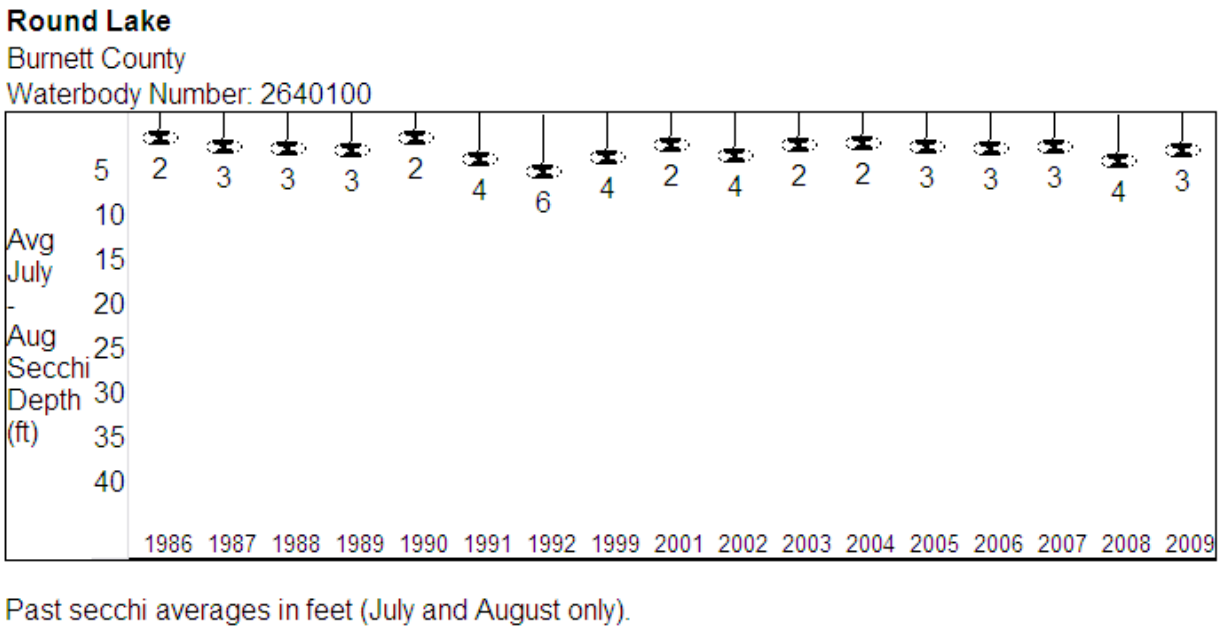


Figure 7. Secchi Depth Trend for Round Lake, 1986-2009

Big Trade Lake has also been monitored since 1986, however monitoring stopped in 2003. The Association should continue monitoring in order to keep a long -term trend of lake clarity. The average Secchi depth for Big Trade Lake over the seventeen years it was monitored was 3.4 feet, putting it in the eutrophic category. Secchi depths were measured in Little Trade Lake from 2000 through 2003 and averaged approximately 3 feet.

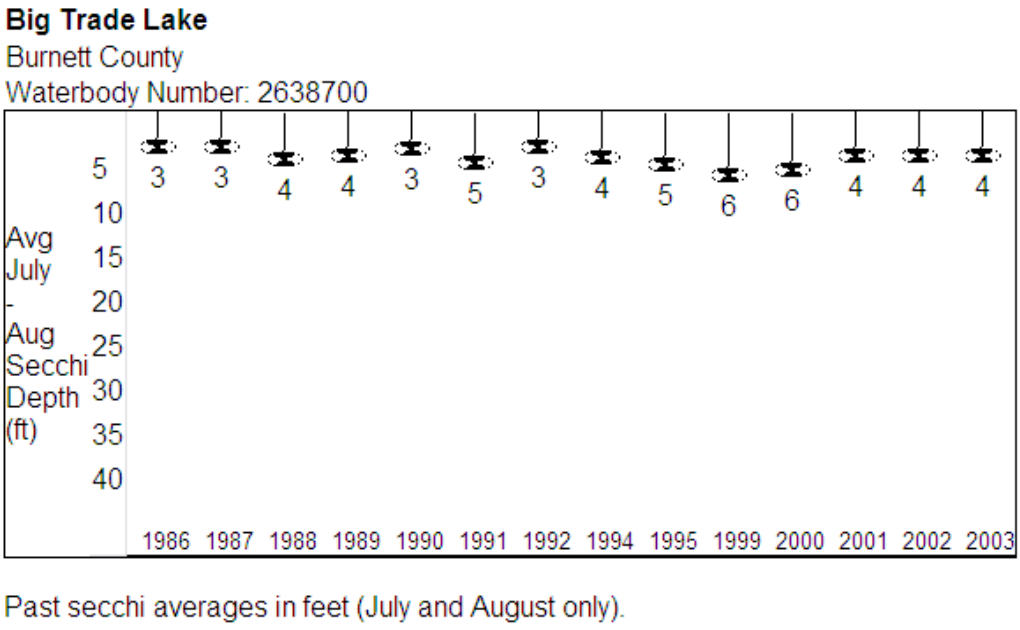


Figure 8. Secchi Depth Trend for Big Trade Lake, 1986-2003

Along with Secchi depth, phosphorous and chlorophyll a are the two parameters generally used to calculate a trophic state index. Using this data collected, lakes can be categorized into three states: oligotrophic, mesotrophic, and eutrophic (Shaw et al., 2000.) The categories are meant to serve as an overall interpretation of a lake's productivity level. Although many factors influence these relationships, the link between Secchi depth, phosphorus, and chlorophyll *a* is the basis of comparison for the Trophic State Index (TSI) (Lillie and Mason, 1983). Three equations for the TSI are used to calculate the trophic state of a lake:

TSI (P) = 14.42 * Ln [TP] + 4.15, where TP is in micrograms per liter (µg/L)
TSI (C) = 30.6 + 9.81 Ln [Chlor-a], where the chlorophyll *a* is in µg/L
TSI (S) = 60-14.41 * Ln [Secchi], where the Secchi depth is in meters (m)

Table 2. Trophic State Index for Long Trade Lake Monitoring Sites, 2007

South Long Trade	Value for Equation	TSI
Total Phosphorus (µg/L)	164	77.7
Chlorophyll *a* (µg/L)	80	73.6
Secchi Depth (m)	0.68	65.5

North Long Trade	Value for Equation	TSI
Total Phosphorus (µg/L)	172	78.4
Chlorophyll *a* (µg/L)	57	70.3
Secchi Depth (m)	0.65	66.2

Although the concentrations and TSI numbers between the north and south basins of Long Trade Lake differ, the range and relative values of the TSI are the same. The trophic state index for total phosphorus is higher than the TSI for chlorophyll *a* which is higher than the TSI for Secchi depth. This indicates that the lake is algae dominated (rather than macrophyte), but the algal biomass is limited by zooplankton grazing or possibly other factors.

Water chemistry data has been collected on Long Trade Lake since 2005 by volunteers. Seasonal total phosphorus has ranged from 102 to 187 µg/L, and chlorophyll *a* has ranged from 60 to 94 µg/L (Figure 9). The trophic state of Long Trade Lake from 1986 through 2009, as determined by Secchi depth and water chemistry is shown, in Figure 10 and a description of the general conditions is in Figure 11.

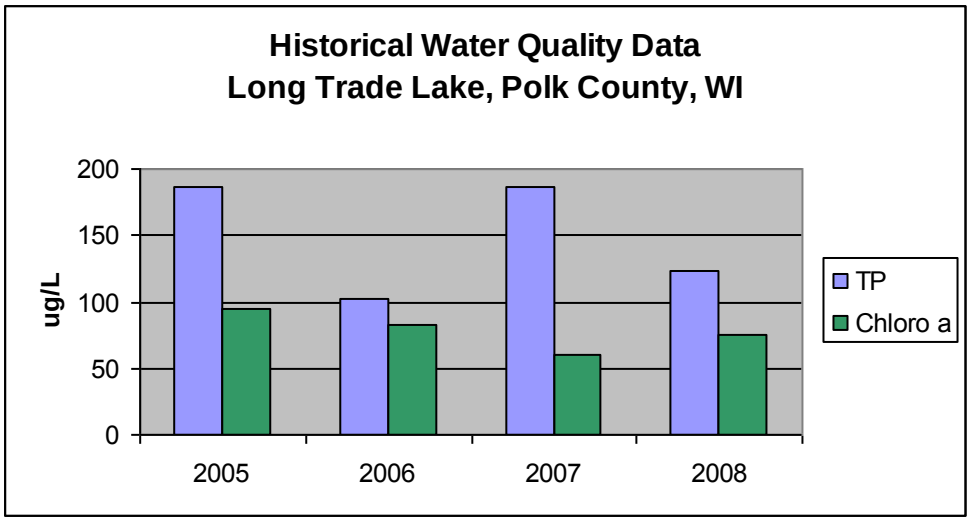
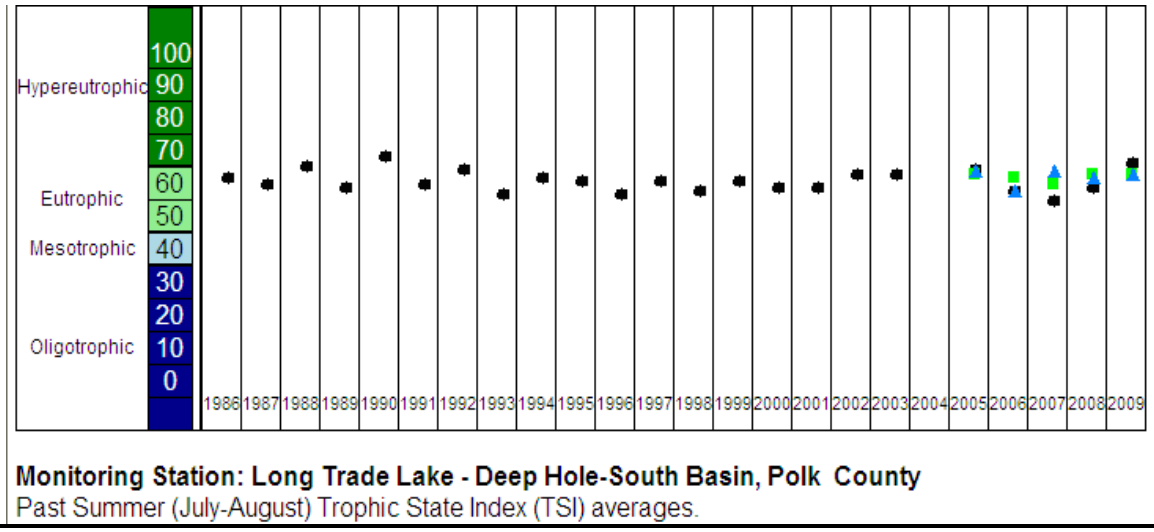


Figure 9. Historic Total Phosphorus (TP) and Chorophyll *a* (Chloro a) in Long Trade Lake



TSI(Chl) = TSI(TP) = TSI(Sec)	It is likely that algae dominate light attenuation.
TSI(Chl) > TSI(Sec)	Large particulates, such as Aphanizomenon flakes dominate
TSI(TP) = TSI(Sec) > TSI(Chl)	Non-algal particulate or color dominate light attenuation
TSI(Sec) = TSI(Chl) >= TSI(TP)	The algae biomass in your lake is limited by phosphorus
TSI(TP) > TSI(Chl) = TSI(Sec)	Zooplankton grazing, nitrogen, or some factor other than phosphorus is limiting algae biomass

Figure 10. Long-term Trophic State Index of Long Trade Lake

TSI	General Description
<30	Oligotrophic; clear water, high dissolved oxygen throughout the year throughout the lake
30-40	Oligotrophic; clear water, possible periods of oxygen depletion in the lower depths of the lake
40-50	Mesotrophic; moderately clear water, increasing change of anoxia near the bottom of the lake in summer, fully acceptable for all recreation/aesthetic uses
50-60	Mildly eutrophic; decreased water clarity, anoxic near the bottom, may have macrophyte problem; warm-water fisheries only.
60-70	Eutrophic; blue-green algae dominance, scums possible, prolific aquatic plant growth. Full body recreation may be decreased
70-80	Hypereutrophic; heavy algal blooms possible throughout the summer, dense algae and macrophytes
>80	Algal scums, summer fish kills, few aquatic plants due to algal shading, rough fish dominate.

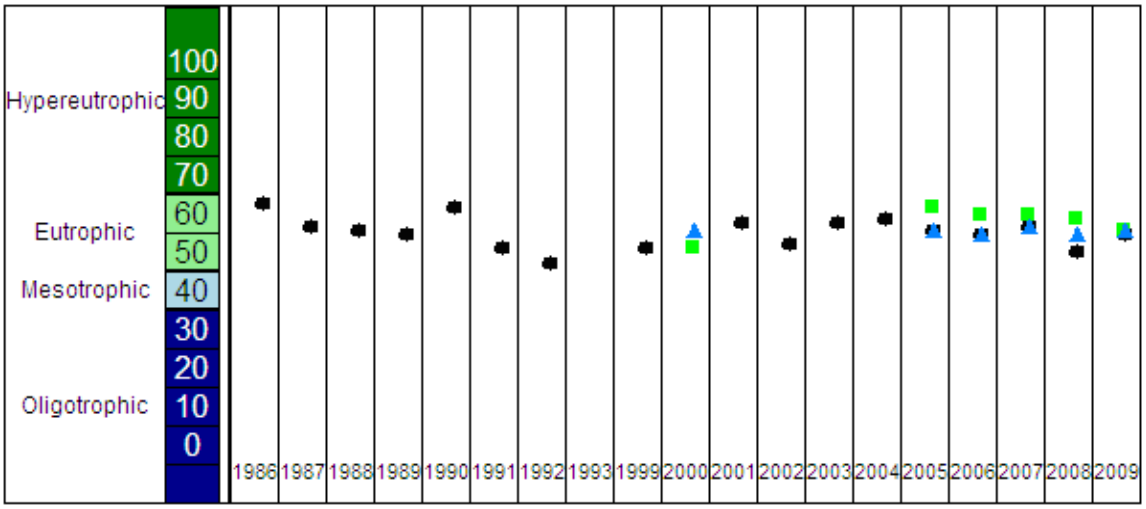
Long Trade TSI Ratings

Figure 11. Description of Long Trade Lake Trophic State Index

Round Lake had an average total phosphorus concentration of 54 µg/L in 2007, indicating eutrophic conditions (Table 3). While this concentration of phosphorus is less than that of Long Trade Lake, there is still enough phosphorus to cause nuisance algal blooms throughout the summer. The trophic state of Round Lake from 1986 through 2009 is shown, in Figure 12.

Table 3. Trophic State Index for Round Lake, 2007

Round Lake	Value for Equation	TSI
Total Phosphorus (µg/L)	54	61.7
Chlorophyll *a* (µg/L)	38	41.4
Secchi Depth (m)	1.17	57.7



Monitoring Station: Round Lake - Deep Hole, Burnett County

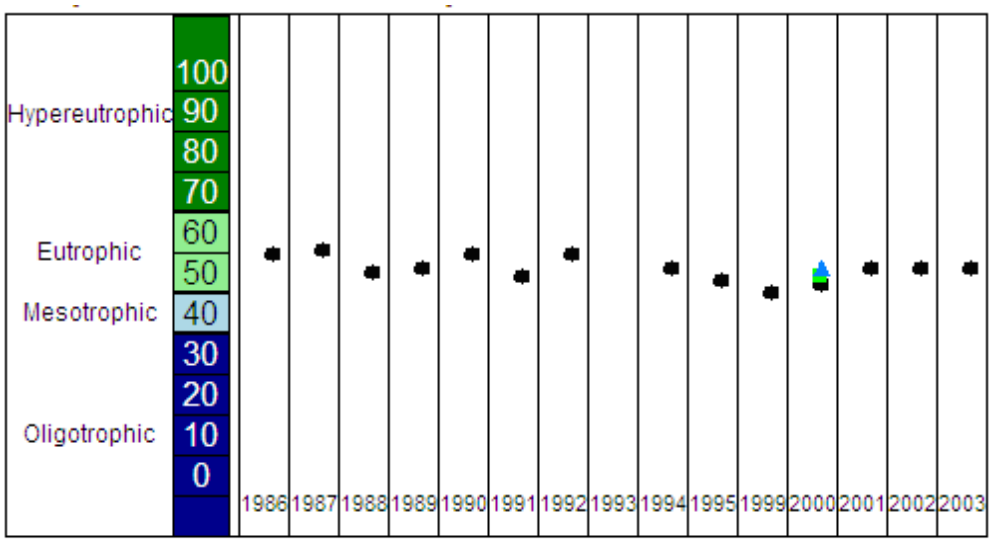
Past Summer (July-August) Trophic State Index (TSI) averages.

◆ = Secchi ■ = Chlorophyll ▲ = Total Phosphorus

TSI(Chl) = TSI(TP) = TSI(Sec)	It is likely that algae dominate light attenuation.
TSI(Chl) > TSI(Sec)	Large particulates, such as Aphanizomenon flakes dominate
TSI(TP) = TSI(Sec) > TSI(Chl)	Non-algal particulate or color dominate light attenuation
TSI(Sec) = TSI(Chl) >= TSI(TP)	The algae biomass in your lake is limited by phosphorus
TSI(TP) > TSI(Chl) = TSI(Sec)	Zooplankton grazing, nitrogen, or some factor other than phosphorus is limiting algae biomass

Figure 12. Long-term Trophic State Index of Round Lake

Although Secchi measurements were taken consistently since 1986 in Big Trade Lake, total phosphorus and chlorophyll *a* concentrations were measured only once near the deep hole in late August 2000 () and once near the center of the lake in late August 2001. In 2000, the total phosphorous measured 36 µg/L and the chlorophyll *a* was 15 µg/L and in 2001 the total phosphorus was 60 µg/L and the chlorophyll *a* was 19 µg/L. As with the other lakes in the Trade River system, the long term Secchi monitoring shows the lake has been eutrophic for some time.



Monitoring Station: Big Trade Lake - Deep Hole, Burnett County

Past Summer (July-August) Trophic State Index (TSI) averages.

◆ = Secchi ■ = Chlorophyll ▲ = Total Phosphorus

TSI(Chl) = TSI(TP) = TSI(Sec)	It is likely that algae dominate light attenuation.
TSI(Chl) > TSI(Sec)	Large particulates, such as Aphanizomenon flakes dominate
TSI(TP) = TSI(Sec) > TSI(Chl)	Non-algal particulate or color dominate light attenuation
TSI(Sec) = TSI(Chl) >= TSI(TP)	The algae biomass in your lake is limited by phosphorus
TSI(TP) > TSI(Chl) = TSI(Sec)	Zooplankton grazing, nitrogen, or some factor other than phosphorus is limiting algae biomass

Figure 13. Long-term Trophic State Index of Big Trade Lake

The high productivity, or eutrophic state, of the lakes can be attributed to both natural characteristics of the lakes and to human impacts. The lakes are relatively shallow and are therefore susceptible to mixing events occurring during the summer after stratification has occurred. When phosphorus is distributed throughout the water column during such mixing events, algae are present to readily use the phosphorus.

The large watersheds of the lakes also contribute to the eutrophic state. Generally, water quality decreases with an increasing ratio of watershed area to lake area. A lake with ratio greater than 20:1 is likely to be naturally eutrophic. This is because as the watershed area increases, there are additional sources of runoff and nutrients to the lake. Also, the soils in this part of Wisconsin, in particular the Trade River Formation, contain elevated levels of plant-available phosphorus which can be delivered to the lakes by either sediment runoff or as dissolved phosphorus in the groundwater.

This naturally-occurring greater nutrient loading rate is compounded by human land use practices such as development and agriculture which puts a greater strain on the system to assimilate nutrients. Leaking or failing septic systems, pollution, and lawn and agricultural fertilizers and runoff are a few of the many probable impacts to water quality in the Trade River system.

Watersheds

A watershed is an area of land from which water drains to a common surface water feature, such as a stream, lake, or wetland. Long Trade, Round, Little Trade and Big Trade Lakes are all part of the Trade River watershed. The Trade River system begins in Polk County near of the Villages of Luck and Frederic, flows west into Long Trade Lake, then into Round Lake (Burnett County) and the rest of the Trade River lakes, eventually returning to Polk County and emptying into the St. Croix River. The results of a water quality study completed in 2007 for the Round and Long Trade Lakes watersheds are summarized below.

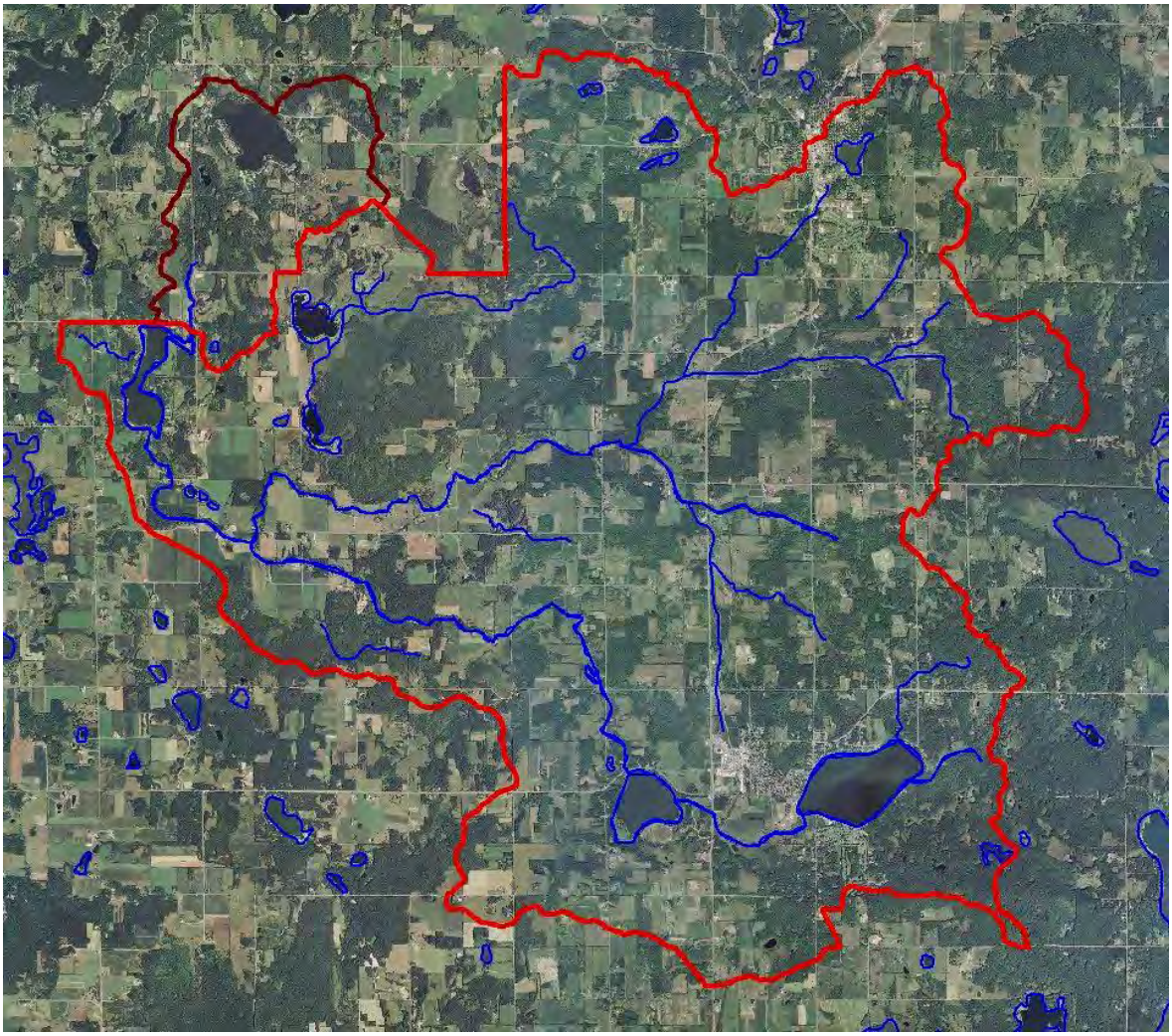


Figure 14. Long Trade Lake and Round Lake Watersheds

The watershed of Long Trade Lake encompasses 32,572 acres (Figure 14). The land use in the watershed is 44% agriculture, 42% forest, 11% wetland, 2% high density (HD) urban, 0.5% rural residential, and 0.5% lake surface (Figure 15). The agricultural land use can be broken further into pasture land or grassland (36% of total watershed), row crops (8% of total watershed), and mixed agriculture (including farmsteads, 0.25% of total watershed).

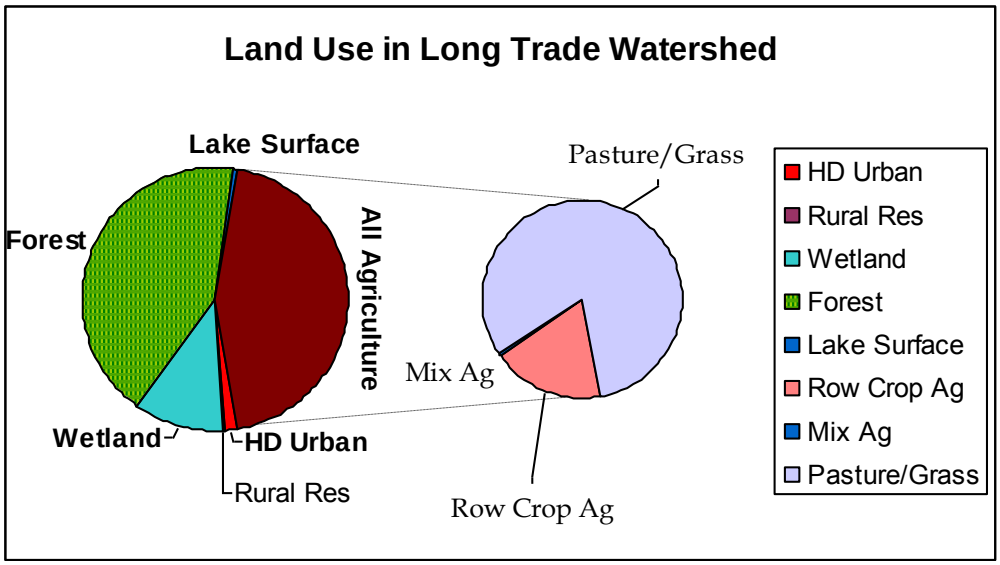


Figure 15. Land Use in the Long Trade Lake Watershed

The round lake watershed includes the Long Trade Lake watershed and 2,382 additional acres downstream of Long Trade Lake (Figure 16). The land use in this additional area is comprised of 39% agriculture, 53% forest, 5% wetland, 2% rural residential, and 9% lake surface. The agricultural land use can be broken further into pasture land or grassland (30% of total watershed) and row crops (8% of total watershed).

Figure 16. Portion of the Round Lake Watershed Downstream of Long Trade Lake

Ground-truthing has not been completed for the Big Trade or Little Trade Lake watersheds (Figure 17). Also, the land use within the Big Trade Lake and Little Trade Lake watersheds

has not been delineated or modeled with current data. Although these lakes in relatively close proximity to Long Trade and Round Lakes, the watershed factors influencing water quality (for example, land use practices, topography, and soils) may vary greatly. As such, the Association should apply for a lake planning grant in order to assess the water quality and watershed condition of the Big Trade Lake and Little Trade Lake.

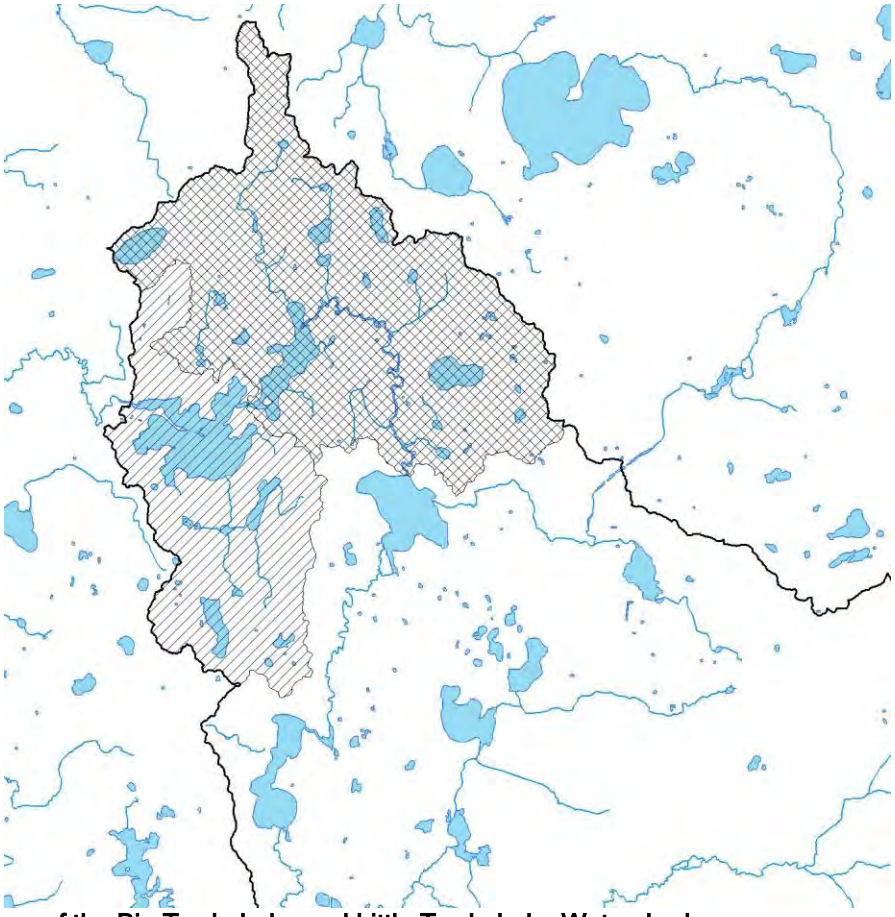


Figure 17. Portions of the Big Trade Lake and Little Trade Lake Watersheds

Phosphorous Loading from Watersheds

Phosphorous is the nutrient that limits algae growth in most Midwestern lakes, affecting water clarity and plant growth. The 2007 study found that 63 % of the phosphorous load to Long Trade Lake comes from non-point sources (Figure 18). Non-point sources include dissolved phosphorous carried by runoff and phosphorus bound to soil particles that are eroded from areas with inadequate vegetation. Only 0.6% of the load is from the atmosphere and, based on default loading coefficients, septic systems provided less than 0.1% of the phosphorus load.

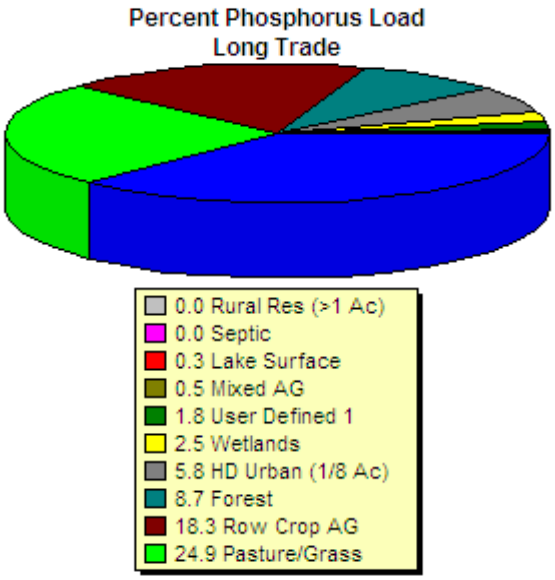


Figure 18. Phosphorus Sources in the Long Trade Lake Watershed

Round Lake has a different situation. 97% of the phosphorous loading is from “point sources”; either the Trade River leaving Long Trade Lake, or to a much lesser degree septic systems around the lake (Figure 19). Approximately 2.5% of the load comes from nonpoint sources directly draining to the lake. However, when the Trade River is taken out of the equation, nonpoint source phosphorous becomes over 89% of the load.

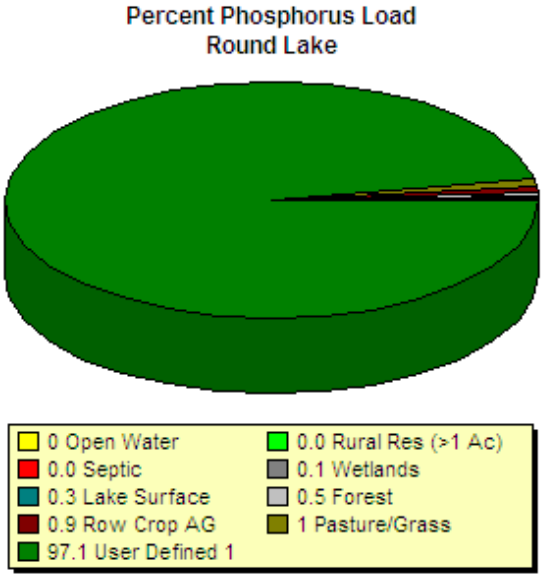


Figure 19. Phosphorus Sources in the Round Lake Watershed

When a watershed incorporates Best Management Practices (BMPs) and is maintained in a state of natural vegetation wherever possible, there is less impact of pollutants on any given lake. Agricultural and residential land-uses contribute a much higher phosphorous load than natural ecosystems, as soil erosion is greatly reduced when there is adequate vegetation cover. Soil erosion is reduces with a good ground cover (be it vegetation of a forest duff layer). Also, native vegetation, forest ground cover, and duff layers slow runoff and allow water to infiltrate into the ground where nutrients are utilized by plants, fungi and bacteria. Anything that reduces runoff will reduce nutrient inputs to a lake. A reduction of the nutrient load will in turn improve water quality and water clarity and thus help enhance the native aquatic plant community.

Shoreland areas are important source areas for nutrients to a lake. As described above, shorelands in a natural state will generally provide less runoff and phosphorus loading to lakes. Reducing soil erosion directly adjacent to the lake will improve the native aquatic plant community which is sensitive to sedimentation and disturbances. Erosion directly affects plants by removing nutrient rich soils, by covering plants in fine sediments and hindering photosynthesis, and via disturbances to the rhizosphere, which is the soil zone surrounding the roots in which complex relations exist between the plant, microorganisms and the soil. Fallen trees also help by protecting sensitive and shallow rooted species from boat wakes and wave action.

Aquatic Ecosystems

Native macrophyte communities provide an abundance of different habitat for many organisms, help to maintain water quality, sustain a healthy fishery, and protect the shoreline and riparian habitat that is utilized by organisms such as frog and nesting waterfowl.

Aquatic plants have many important functions and values to a lake ecosystem. They absorb nutrients from the sediment and the water column, which if not utilized by aquatic macrophytes would be utilized by algae and bacterioplankton. Some macrophytes, especially emergent species, can also remediate other pollutants. The roots of all aquatic macrophytes help deter sediment from re-suspending and emergent and rooted floating-leaf plants do an especially good job of mitigating the impact of wave on adjacent shorelines.

The different habitats that a native aquatic macrophyte community provides food and shelter for both large and small fish, invertebrates living both on the plants and in the sediment directly underneath provide a major food source for many panfish. Zooplankton often congregate in plant stands in shallow lakes, which is a major food source for many young of year fish (panfish will also graze on copepods). For large fish such as Northern Pike (*Esox lucius*), which are sit and wait predators, aquatic vegetation provides camouflage. Some fish, such as bluegill, can simply feed on the plants themselves.

Aquatic vegetation also offers food, shelter, and nesting material for waterfowl. Birds eat the invertebrates on the plants (a female blue-wing teal's diet while nesting may consist of 99% invertebrates), or the plants themselves, especially the seeds and tubers.

Native aquatic plant communities also offer protection from the invasion of aquatic invasive species. Much like lawn and agricultural weeds that germinate in newly disturbed soil, the two invasive species in these lakes (Eurasian Water Milfoil and Curly-leaf pondweed) are opportunistic. This means that as the native community is disturbed or removed (this could be from boat props, hand pulling, etc.) there is a more likely invasion of EWM or CLP in the disturbed area. Allowing native plants to persist may reduce the chance of invasion by invasive species. There may be localized problems with dense native vegetation for recreation, but that pales in comparison the devastation of a lake by invasive species, which often require very expensive annual control programs using herbicides in the lake.

Sensitive Areas

The WDNR has completed Sensitive Area surveys to designate areas within aquatic plant communities that provide important game fish, forage fish, macroinvertebrate, and wildlife habitat as well as important shoreline stabilization functional values. The WDNR is transitioning to designations of *critical habitat areas* that include both *sensitive areas* and *public rights features*. The c*ritical habitat area* designation will provide a holistic approach to ecosystem assessment and protection of those areas within a lake that are most important for preserving the very character and qualities of the lake. These sites are those sensitive and fragile areas that support wildlife and fish habitat, provide the mechanisms that protect the water quality in the lake, harbor quality plant communities, and preserve the places of serenity and aesthetic beauty for the enjoyment of lake residents and visitors.

Critical habitat areas include *sensitive areas* that offer critical or unique fish and wildlife habitat (including seasonal or lifestage requirements) or offer water quality or erosion control benefits to the area (Administrative code 107.05(3)(1)(1)). The Wisconsin Department of Natural Resources is given the authority for the identification and protection of sensitive areas of the lakes. *Public rights features* are areas that fulfill the right of the public for navigation, quality and quantity of water, fishing, swimming, or natural scenic beauty. Protecting these *critical habitat areas* requires the protection of shoreline and in-lake habitat. The *critical habitat area* designation will provide a framework for management decisions that impact the ecosystem of the lake.

The WDNR completed a Sensitive Areas survey for Big Trade and Little Trade Lakes in the summer of 2000. The Sensitive Area survey identified 9 areas that merit special protection of the aquatic habitat (Figure 20 and Figure 21). The aquatic vegetation and make morphology in these areas provide important spawning and nursery habitat for numerous fish species. The report notes CLP as a member of the aquatic plant community and recommends chemical or mechanical treatment methods be approached with caution in the Sensitive Areas. The full WDNR report can be found in Appendix A. The data and recommendations from these reports are always considered in plan implementation.

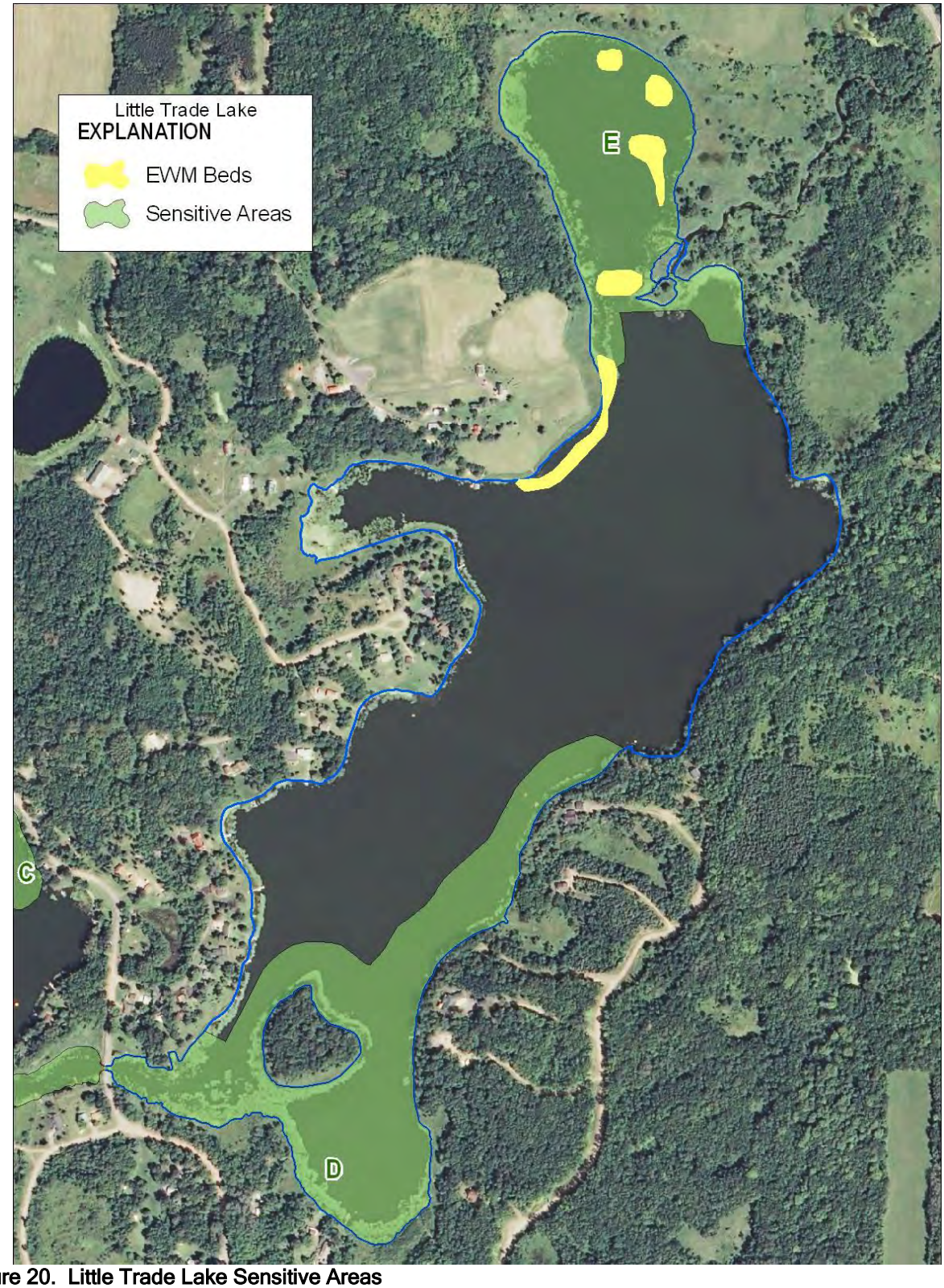


Figure 20. Little Trade Lake Sensitive Areas

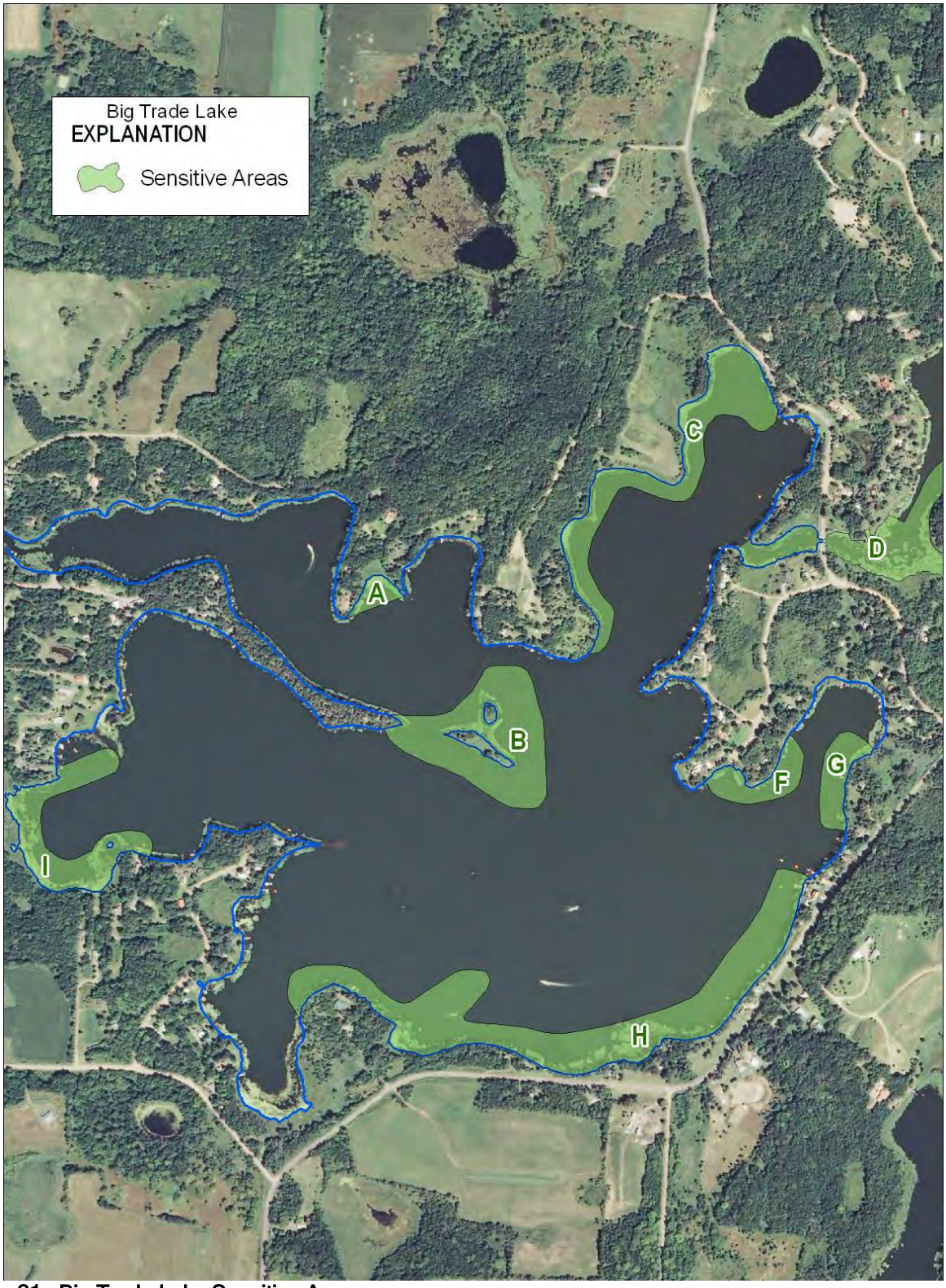


Figure 21. Big Trade Lake Sensitive Areas

Rare and Endangered Species and Habitat

Long Trade Lake is located in the Town of Laketown (T.36N. – R.18W.) in Polk County. Round Lake, Little Trade Lake, and Big Trade Lake are located in the Town of Trade Lake (T.37N. – R.18W.) in Burnett County. The Wisconsin Natural Heritage Inventory lists the following species as having been identified in these areas:

Table 4. Rare and Endangered Species

Genus Species Name	Common Name	State Status
Cygnus buccinator	Trumpeter Swan	END
Fundulus diaphanus	Banded Killfish	SC/N
Haliaeetus leucocephalus	Bald Eagle	SC/P
Opuntia fragilis	Brittle Prickley-pear	THR

THR = Threatened; END = endangered; SC/N = Special Concern (no laws regulating use, possessions, or harvesting); and SC/P = Special Concern (fully protected)

Fisheries

Fish species found in the Trade Lakes system are listed in Table 5. This species list is from the Wisconsin Lakes booklet published by the WDNR (2005) which provides basic information on the relative abundance of game fish. The only known fishery population estimate was completed in 2001 by the WDNR on adult musky. At that time, there were an estimated 77 adult musky in Big Trade Lake and 33 in Little Trade Lake. The Lake Association should work with WDNR fisheries biologists and Tribal officials to assess the fishery and population dynamics. The population of carp, which are known to inhabit the lake, should also be evaluated to assess their impact on the water quality, the native aquatic plant community, and the spread of aquatic invasive species.

Table 5. Fishery Resources in the Trade Lakes System

Fish species	Long Trade	Round	Trade Lakes
Muskie			Present
Northern Pike	Common	Common	Common
Walleye		Common	Present
Large Mouth Bass	Common	Common	Abundant
Small Mouth Bass		Present	
Pan Fish	Common	Common	Common

Wild Rice (*Zizania palustris*)

According to the Great Lakes Indian Fish and Wildlife Commission (GLIFWC), Long Trade, Round, Little Trade and Big Trade Lakes are not wild rice waters. Additionally, wild rice was not found during the aquatic plant surveys of the lakes or during the Sensitive Areas survey. Although wild rice is not present in these lakes, it warrants attention due to its ecologic and cultural significance and its abundance in nearby lakes and streams (for example, the Grettum Flowage, Rice Lake, Spirit Lake, and the Clam Lakes). Any activity included in a comprehensive lake or aquatic plant management plan that could potentially impact the growth of wild rice in any body of water that has in the past, currently has, or potentially could have wild rice in the future requires consultation with the Tribal Nations. This consultation is completed by the Department of Natural Resources during their review of lake management documents. When present in a lake, wild rice is afforded numerous protections due to its ecological and cultural significance and management is therefore focused on harvest goals and protection rather than removal.

Wild rice is an annual aquatic grass that produces seed that is a nutritious source of food for wildlife and people (Figure 22). As a native food crop, it has a tremendous amount of cultural significance to the Wisconsin and Minnesota Native American Nations. Wild rice pulls large amounts of nutrients from the sediment in a single year and the stalks provide a place for filamentous algae and other small macrophytes to attach and grow. These small macrophytes pull phosphorous in its dissolved state directly from the water. Wild rice can benefit water quality, provide habitat for wildlife, and help minimize substrate re-suspension and shoreland erosion.

In Wisconsin, wild rice has historically ranged throughout the state. Declines in historic wild rice beds have occurred statewide due to many factors, including dams, pollution, large boat wakes, and invasive plant species. Renewed interest in the wild rice community has led to large-scale restoration efforts to reintroduce wild rice in Wisconsin's landscape. There is the potential for planting wild rice at shoreline restoration and rehabilitation sites in the Trade Lakes system. Extensive information is available on wild rice from GLIFWC and the WDNR.

Figure 22. Wild Rice on Clam Lake in Burnett County. Photo by John Haack

Aquatic Plant Communities

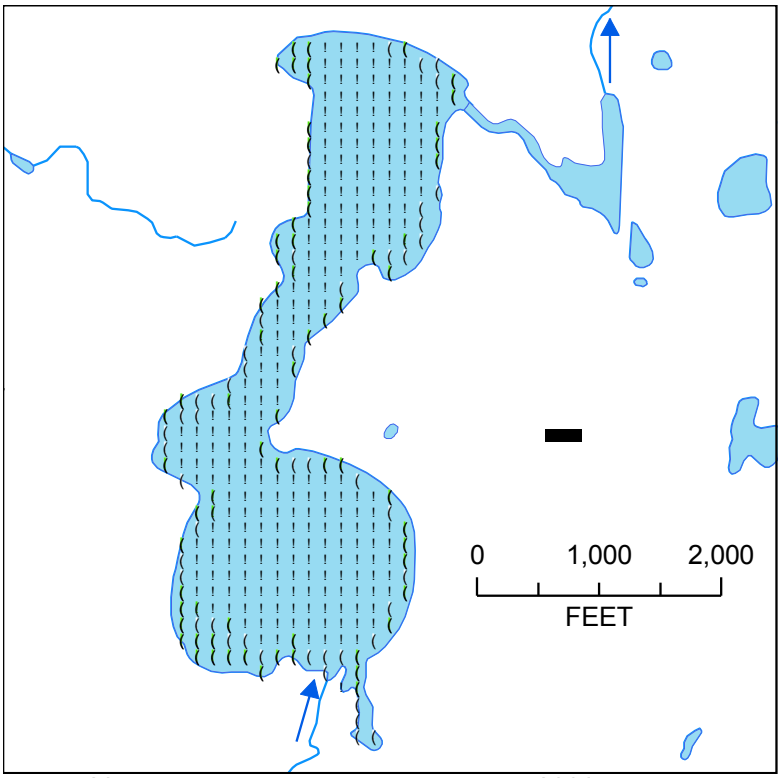
Whole-lake aquatic plant surveys were completed by WDNR staff on Long Trade Lake (July 12, 2006) and on Round Lake (July 17-18, 2007), by Polk County LWRD and Burnett County LWCD staff on Big Trade Lake (August 18 and 20, 2007) and by LWRD staff on Little Trade Lake (September 3 and 30, 2009). Detailed methods and results of the surveys can be found in Appendix B. The surveys, which were completed following a WDNR protocol for a point intercept survey, provide the basis for aquatic plant management discussion in this APM Plan. Summary statistics from each survey are presented in Table 6.

Table 6. Aquatic Plant Survey Summary Statistics

Statistic	Long Trade (2006)	Round (2007)	Little Trade (2009)	Big Trade (2009)
Total number of sample sites	376	1000	336	652
Total number of sites sampled	130	303	329	632
Total number of sites with vegetation	67	105	115	147
Total number of sites shallower than maximum depth of plants	129	223	158	285
Frequency of occurrence at sites shallower than maximum depth of plants	51.9	47.1	72.8	51.6
Simpson Diversity Index	0.9	0.9	0.8	0.9
Maximum depth of plants (ft)	7.5	13.0	8.0	11.0
Number of sites sampled using rake on Rope	0	0	0	10
Number of sites sampled using rake on Pole	129	272	174	201
Average number of all species per site (shallower than max depth)	1.81	1.26	1.73	
Average number of all species per site (veg. sites only)	3.48	2.67	2.37	3.10
Average number of native species per site (shallower than max depth)	1.26	1.03	1.48	1.33
Average number of native species per site (veg. sites only)	3.18	2.30	2.11	2.98
Species Richness	12	22	12	21
Species Richness (including visuals)	14	24	12	22

Aquatic plants were found to be growing to maximum depths ranging from 7.5 feet in Long Trade Lake to 13 feet in Round Lake (Table 6). The maximum depth of plant growth was used to identify the littoral zone, defined as the area where rooted and floating aquatic plants (also called macrophytes) can grow because sufficient sunlight reaches the sediments and lake bottom. The diverse habitat in the littoral zone provides food and habitat for a large number of vertebrates and invertebrates. For example, the littoral zone is key area for fish spawning and cover, typically supports the largest and most diverse populations of invertebrates, and is used by birds and waterfowl for nesting and feeding. Shallow lakes depend on littoral communities to provide sediment stabilization and to offer zooplankton refuge (zooplankton are tiny critters that eat algae).

The littoral zones of Long Trade, Round, Little Trade, and Big Trade Lakes are shown in Figure 23, Figure 24, Figure 25, and Figure 26, respectively. The number of sites with vegetation gives a good indication of the plant coverage of the lake. In Long Trade Lake, 67 of the 376 sites had aquatic plants, so approximately 18% (67/376) of the lake, or roughly 27 acres, has aquatic plants. Using this method, the approximate aquatic plant coverage of Round Lake is 21 acres (11% of the lake), for Little Trade 44 acres (34%) and for Big Trade 75 acres (23%). Using the total number of sites shallower than the maximum depth of plants similarly can provide an estimate of littoral zone area. The absence of plants at such sites indicates some factor (for example, substrate, localized low water clarity, or foraging fish such as carp) is limiting plant growth.



LONG TRADE LAKE

Polk County, WI

EXPLANATION

- Littoral Zone
- Littoral Zone with Plants
- Depth > 7.5 feet

Survey Date: July 12, 2006
Survey By: WDNR

Figure 23. Littoral Zone in Long Trade Lake, 2006

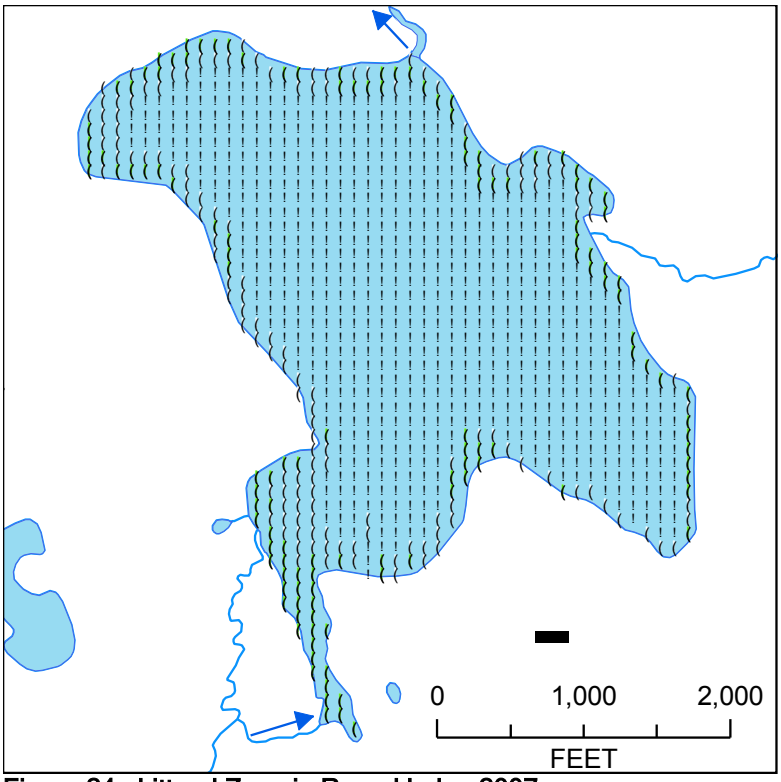


Figure 24. Littoral Zone in Round Lake, 2007

ROUND LAKE

Burnett County, WI

EXPLANATION

- Littoral Zone
- Littoral Zone with Plants
- Depth > 13 feet

Survey Date: July 17-18, 2007
Survey By: WDNR

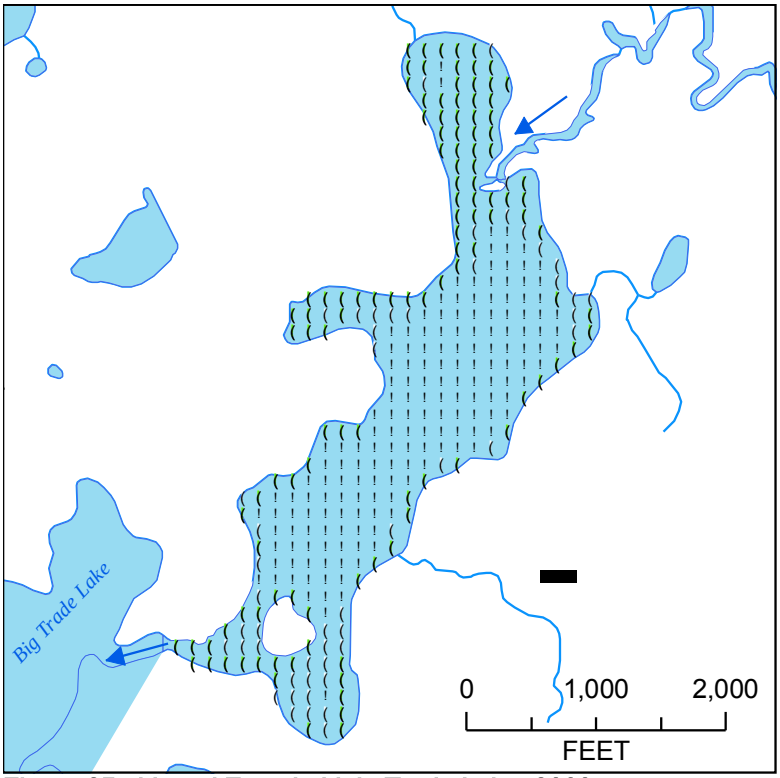


Figure 25. Littoral Zone in Little Trade Lake, 2009

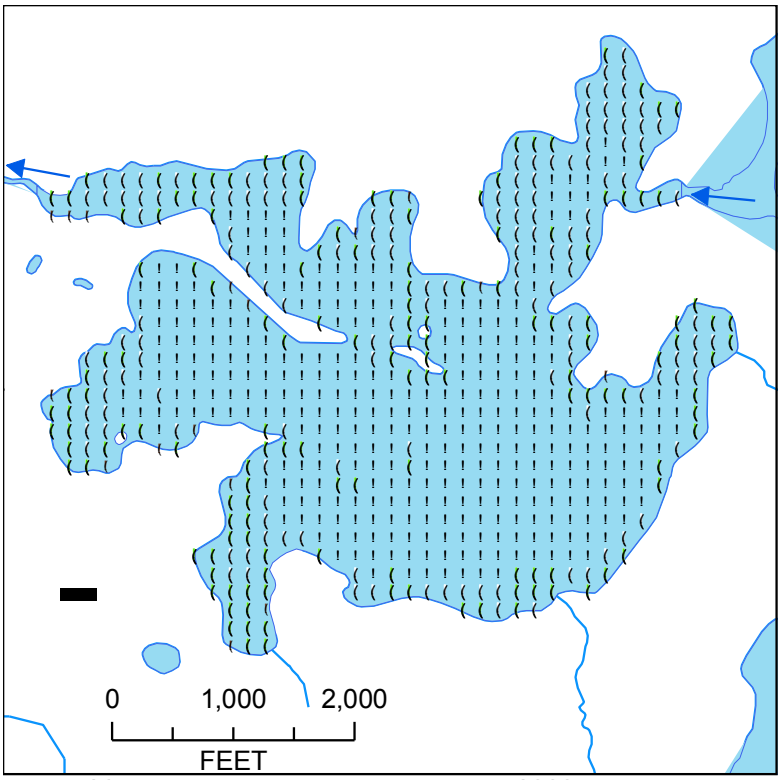
LITTLE TRADE LAKE

Burnett County, WI

EXPLANATION

- Littoral Zone
- Littoral Zone with Plants
- Depth > 8 feet

Survey Date: September 3 and 30, 2009
Survey By: Polk Co LWRD



BIG TRADE LAKE

Burnett County, WI

EXPLANATION

- Littoral Zone
- Littoral Zone with Plants
- Depth > 11 feet
- Dry Land

Survey Date: August 18 and 20, 2009
Survey By: Burnett Co LWCD
Polk Co LWRD

Figure 26. Littoral Zone in Big Trade Lake, 2009

The littoral zone substrate varied throughout the lakes. Muck and sand were the dominant lakebed materials in the Long Trade Lake littoral zone. The substrate in the Round Lake littoral zone is comprised primarily of muck and some rock; however a 1,500-foot portion of the littoral zone along the northern shore (near the outlet) was largely comprised of rock. The substrate in both the Little Trade and Big Trade Lake littoral zone was largely muck.

A Floristic Quality Assessment was performed using the data from each of the aquatic plant surveys. This assessment replaces a subjective measure of quality, such as “high” or “low” with more quantitative measures that allow for comparison of the floristic quality among many sites and for tracking changes over time. A Floristic Quality Assessment is based on calculating an average coefficient of conservatism (mean C) and a floristic quality index (FQI) for a lake. Higher mean C and FQI numbers indicate higher floristic quality and biological integrity and a lower level of disturbance impacts. Non-native plants were not part of the pre-settlement flora, so no coefficient is assigned to them and they are not considered in the calculation of mean C or FQI.

The coefficient of conservatism (C) is the basis of the FQI calculation. Each native species is assigned a value from zero to 10, which represents the probability that a plant species is likely to occur in a lake relatively unaltered from what is believed to be a pre-settlement condition. A C value of zero indicates the probability is almost zero, while a C of 10 indicates the plant is almost certain to be found only in an un-degraded natural community. The mean C value in the Trade Lakes system ranged from 4.8 to 5.1 (Table 7), which is below the North Central Hardwood Forests median mean C of 5.6.

The FQI is calculated by multiplying the mean C by the square root of the total number of native species inventoried, thereby combining the conservatism of the species present with a measure of the species richness. The FQI is commonly used to express the quality of a natural area; a higher FQI indicates a healthier aquatic plant community. Nichols (1999) reported a range of FQI values from 3.0 to 44.6 in Wisconsin Lakes. The FQI of the lakes in the Trade Lakes system ranged from 15.5 to 22.3 (Table 7), with all but Big Trade Lake being lower than both the statewide median of 22.2 and the North Central Hardwood Forests Ecoregion median of 20.9 (Nichols, 1999).

Table 7. Floristic Quality Assessment Variables

Floristic Quality Variable	Long Trade (2006)	Round (2007)	Little Trade (2009)	Big Trade (2009)
Number species assigned C value	11	17	10	19
Mean C	4.8	5.0	4.9	5.1
Floristic Quality Index	16.0	20.6	15.5	22.3

C = coefficient of conservatism

The lower mean C and FQI values indicate lower floristic quality and biological integrity and a higher level of disturbance in the Trade Lakes system compared to other lakes in northwest Wisconsin. Improving the health and quality of the native plant community through protection and education is one goal of this APM Plan.

The plant species with the highest frequency of occurrence varied among the lakes. Filamentous algae and coontail (*Ceratophyllum demersum*) were the two most common aquatic plants found in Round, Little Trade, and Big Trade Lakes whereas filamentous algae and small duckweed were the most common in Long Trade Lake. In fact, algae and free floating aquatic plants made up the top four most common aquatic plants in Long Trade Lake. Further detail on plant occurrences can be found in Appendix B.

Aquatic Invasive Species in the Trade Lakes System

Two species of non-native aquatic invasive plants have been identified in the lakes. These are Eurasian water milfoil (*Myriophyllum spicatum*), or EWM, and curly-leaf pondweed (*Potamogeton crispus*), or CLP. WDNR records indicate that the EWM in Long Trade Lake is Hybrid watermilfoil (*Myriophyllum spicatum x M. sibiricum*), an invasive cross between the native northern watermilfoil and EWM. Further testing would be needed to confirm whether or not it is a hybrid; management will remain the same. To date, the CLP has not been quantified but has been found in each lake. Purple loosestrife (*Lythrum salicaria*) and Japanese knotweed (*Polygonum cuspidatum*), two other non-native plant species classified as aquatic invasive species, are also present within the Trade Lakes watershed.

In 2010 the Polk County Land and Water Resources Department mapped EWM beds in the entire Trade Lakes system. The LWRD found that the Little Trade Lake EWM beds had expanded from 3 acres in 2009 to 5.32 acres in 2010 (Figure 27). The bed mapping identified 15.54 acres of EWM in Round Lake, covering much of the littoral zone (Figure 28). The most expansive EWM beds found in 2010 were in Long Trade Lake, which covered 25.33 acres (Figure 29). The beds were covering much of the littoral zone and many were canopied out, likely shading beneficial native macrophytes (Figure 30).

Figure 27. 2010 Eurasian Watermilfoil Bed Distribution in Little Trade Lake

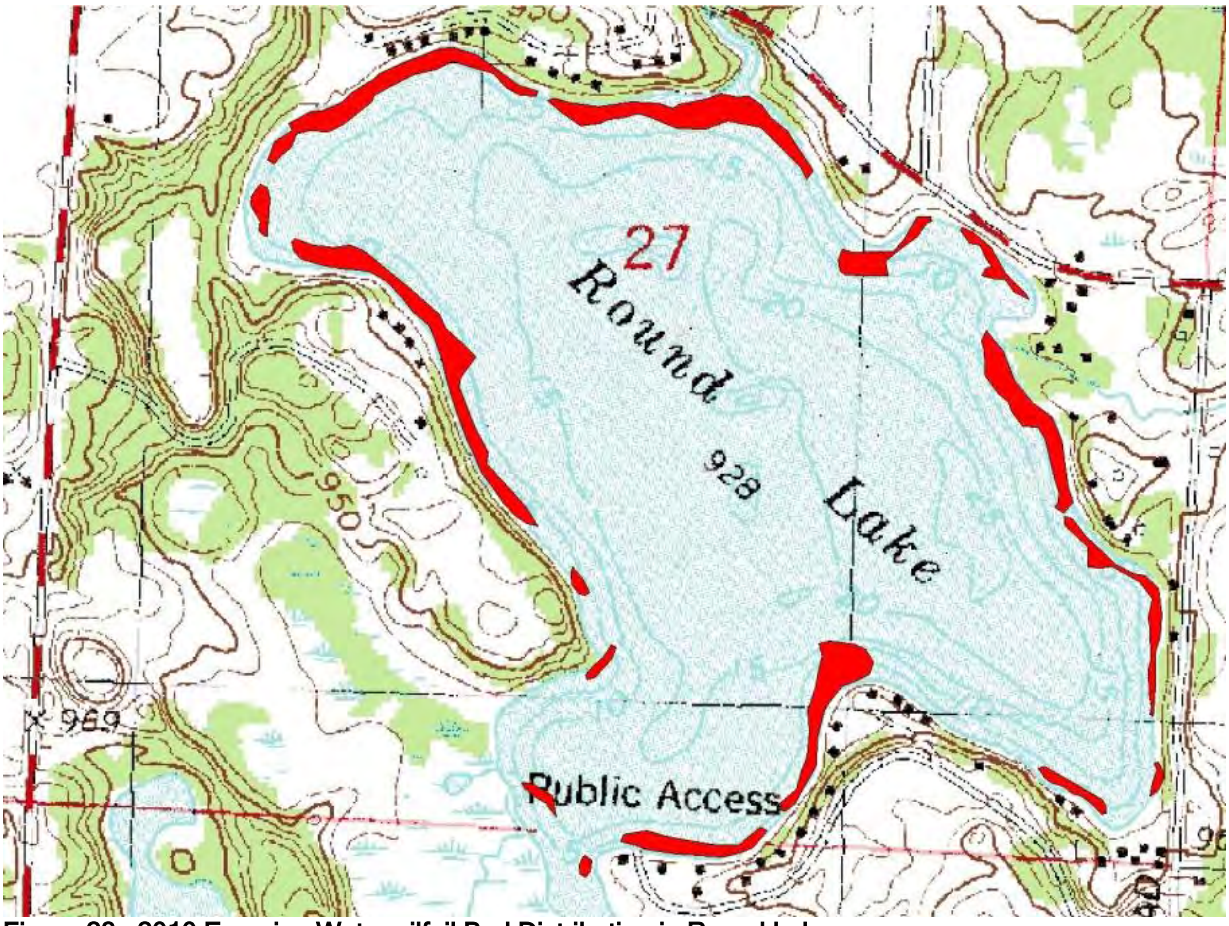


Figure 28. 2010 Eurasian Watermilfoil Bed Distribution in Round Lake

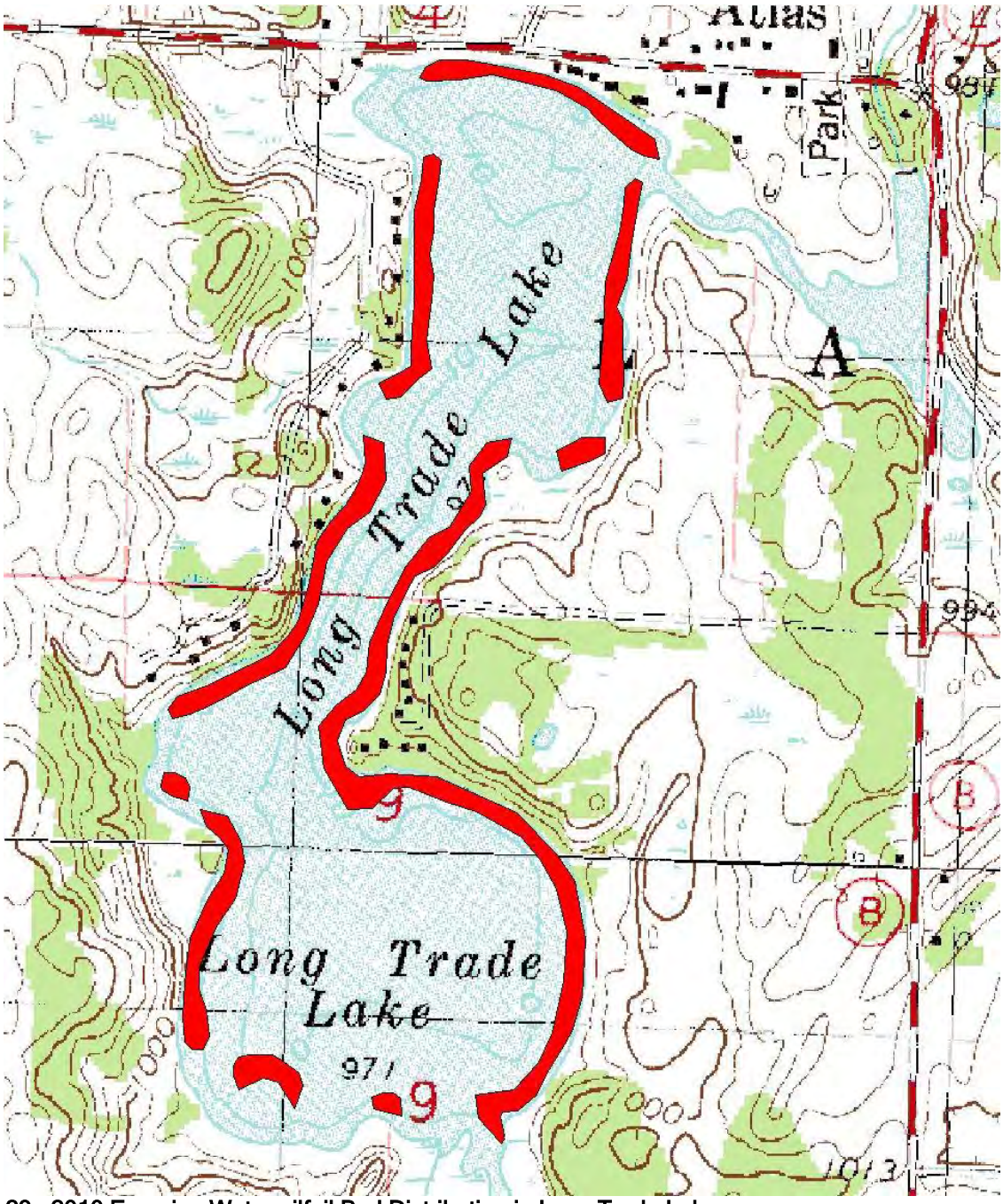


Figure 29. 2010 Eurasian Watermilfoil Bed Distribution in Long Trade Lake

Figure 30. Dense, Canopied Eurasian Watermilfoil Bed in Long Trade Lake in 2010

Eurasian Water Milfoil (*Myriophyllum spicatum)*

The following Eurasian water milfoil information is taken from the Wisconsin DNR website.

Identification

Eurasian water milfoil is a submersed aquatic plant native to Europe, Asia, and northern Africa. It is the only non-native milfoil in Wisconsin. Like the native milfoils, the Eurasian variety has slender stems whorled by submersed feathery leaves and tiny flowers produced above the water surface. The flowers are located in the axils of the floral bracts, and are either four-petaled or without petals. The leaves are threadlike, typically uniform in diameter, and aggregated into a submersed terminal spike. The stem thickens below the inflorescence and doubles its width further down, often curving to lie parallel with the water surface.

The fruits are four-jointed nut-like bodies. Without flowers or fruits, Eurasian water milfoil is difficult to distinguish from Northern water milfoil. Eurasian water milfoil has 9-21 pairs of leaflets per leaf, while Northern milfoil typically has 7-11 pairs of leaflets. Coontail is often mistaken for the milfoils, but does not have individual leaflets.

Characteristics

Eurasian water milfoil grows best in fertile, fine-textured, inorganic sediments. In less productive lakes, it is generally restricted to areas of nutrient-rich sediments. It has a history of becoming dominant in eutrophic, nutrient-rich lakes, although this pattern is not universal. It is an opportunistic species that prefers highly disturbed lakebeds, lakes receiving nitrogen and phosphorous-laden runoff, and heavily used lakes. Optimal growth occurs in alkaline systems with a high concentration of dissolved inorganic carbon. High water temperatures promote multiple periods of flowering and fragmentation.

Reproduction and dispersal

Unlike many other plants, Eurasian water milfoil does not rely on seed for reproduction. Its seeds germinate poorly under natural conditions. It reproduces vegetatively by fragmentation, allowing it to disperse over long distances. The plant produces fragments after fruiting once or twice during the summer. These shoots may then be carried downstream by water currents or inadvertently picked up by boaters. Milfoils is readily dispersed by boats, motors, trailers, bilges, live wells, or bait buckets, and can stay alive for weeks if kept moist.

Once established in an aquatic community, milfoil reproduces from shoot fragments and stolons (runners that creep along the lake bed). As an opportunistic species, Eurasian water milfoil is adapted for rapid growth early in spring.

Ecological impacts

Eurasian water milfoil's ability to spread rapidly by fragmentation and effectively block out sunlight needed for native plant growth often results in monotypic stands. Monotypic stands of Eurasian milfoil provide only a single habitat, and threaten the integrity of aquatic communities in a number of ways. For example, dense stands disrupt predator-prey relationships by fencing out larger fish and reducing the number of nutrient-rich native plants available for waterfowl.

Dense stands of Eurasian water milfoil also inhibit recreational uses like swimming, boating, and fishing. Some stands have been dense enough to obstruct water intakes for industrial and power generation. The visual impact that greets the lake user on milfoil-dominated lakes is the flat yellow-green of matted vegetation, often prompting the perception that the lake is "infested" or "dead". Cycling of nutrients from sediments to the water column by Eurasian water milfoil may also lead to deteriorating water quality and algae blooms in infested lakes.

Control methods

Preventing a Eurasian water milfoil invasion requires various efforts. The first component is public awareness of the necessity to remove aquatic plant fragments at boat landings. Inspection programs should provide physical inspections as well as a direct educational message. The public awareness and inspection programs supported by Wisconsin DNR and UW Extension are called Clean Boats, Clean Waters programs in Wisconsin. Native plant beds must be protected from disturbance caused by boaters and careless plant control methods. A watershed management program should decrease nutrients reaching the lake thereby reducing the likelihood that Eurasian milfoil colonies will establish and spread.

Monitoring is also important so that introduced plants can be controlled immediately. The lake association and lakeshore owners should check for new colonies and control them

before they spread. The plants can be hand pulled or raked. It is imperative that all fragments be removed from the water and the shore. If Eurasian water milfoil is present, additional control methods should be considered including mechanical control, chemical control, and biological control. As always, prevention is the best approach to invasive species management.

A good strategy for a systematic monitoring program is to target areas where the native Northern water milfoil (*Myriophyllum sibiricum)* is found. From a management perspective, the location of northern water milfoil can be important, because EWM and Northern water milfoil grow in similar conditions. This plant is often confused with Eurasian water milfoil, which looks relatively similar. Unlike Eurasian water milfoil (EWM), northern water milfoil is native and a desirable plant to have in the lake. It has very fine leaves that provide habitat for small planktonic organisms, which make up an important part of the food chain.

Status

There are several other lakes in Polk and Burnett Counties as well as nearby Washburn and Barron Counties with Eurasian water milfoil.

Table 8. Eurasian Watermilfoil Infestations in the Surrounding Area

Waterbody	County	Year Identified
Horseshoe Lake	Polk	
Pike Lake	Polk	2010
Long Trade	Polk	
Round	Burnett	2003
Big (Little) Trade	Burnett	2009
Ham Lake	Burnett	2003
Minong Flowage	Washburn	2002
Nancy Lake	Washburn	1991
Totogatic River	Washburn	2003
Shallow Lake	Washburn/Burnett/Barron	2003
Beaver Dam	Barron	1991

Curly-Leaf Pondweed (*Potamogeton crispus*)

The following curly-leaf pondweed information is taken from the Wisconsin DNR website.

Description

Curly-leaf pondweed is an invasive aquatic perennial that is native to Eurasia, Africa, and Australia. It was accidentally introduced to United States waters in the mid-1880s by hobbyists who used it as an aquarium plant. The leaves are reddish-green, oblong, and about 3 inches long, with distinct wavy edges that are finely toothed. The stem of the plant is flat, reddish-brown and grows from 1 to 3 feet long. The plant usually drops to the lake bottom by early July

Distribution and Habitat

Curly-leaf pondweed is commonly found in alkaline and high nutrient waters, preferring soft substrate and shallow water depths. It tolerates low light and low water temperatures. It has been reported in all states but Maine

Life History and Effects of Invasion

Curly-leaf pondweed spreads through burr-like winter buds (turions), which are moved among waterways. These plants can also reproduce by seed, but this plays a relatively small role compared to the vegetative reproduction through turions. New plants form under the ice in winter, making curly-leaf pondweed one of the first nuisance aquatic plants to emerge in the spring.

It becomes invasive in some areas because of its tolerance for low light and low water temperatures. These tolerances allow it to get a head start on and outcompete native plants in the spring. In mid-summer, when most aquatic plants are growing, curly-leaf pondweed plants are dying off. Plant die-offs may result in a critical loss of dissolved oxygen. Furthermore, the decaying plants can increase nutrients which contribute to algal blooms, as well as create unpleasant stinking messes on beaches. Curly-leaf pondweed forms surface mats that interfere with aquatic recreation.

Control Methods

Turions and plant fragments can be carried on boats, trailers, motors and fishing gear from one water body to another, thus proper prevention techniques are essential to curb the spread of this aquatic invasive. An effective prevention and remediation program also addresses the overall health of a waterbody: Maintaining a healthy ecosystem with diverse native aquatic plants and animals as well as minimizing nutrient and ollutant inputs will deter invasions. Once introduced, curly-leaf pondweed spreads rapidly. Long-term management requires the reduction or elimination of turions to interrupt the lifecycle.

WDNR permits are required for chemical treatments, mechanical treatments, some manual treatments, biological control, bottom screening, and buoy/barrier placement.
Manual/Mechanical Control: To have the maximum benefit, manual/mechanical control efforts should be undertaken in the spring or early summer. Mechanical control includes raking, hand-cutting or harvesting vegetation. Raking and hand cutting remove plants at

the sediment surface, and there is some evidence that early season cutting of pondweed can prevent turion production. Harvesting generally removes the top 5 feet of the plant. Curly-leaf pondweed can spread from plant fragments, so it is important to clean all vegetation off boats and equipment before leaving water access.

Chemical control: There are a small number of aquatic herbicides that can be used to control curly-leaf pondweed. In Minnesota, good to excellent control was obtained using formulations of diquat (Reward) and endothall (Aquathall K). These chemicals can be used in small areas and will usually knock down curly-leaf pondweed within 2 weeks. The best time for treatment is in spring or early summer when natives are still dormant and temperatures are low enough for endothall be effective. In early experiments with fluridone (Sonar), production of turions was completely inhibited following early season treatments. Fluridone usually has to be applied to an entire lake and requires 30 days to knock down curly-leaf pondweed.

Habitat manipulation: Habitat manipulation such as drawdowns and dredging can also be used to manage curly-leaf pondweed. Fall drawdown can kill the plants by exposing them to freezing temperatures and dessication. Dredging can be used as a control by increasing the water depth. In deep water, the plants do not receive enough light to survive. This method can be detrimental to desired plants, as all macrophytes would be prevented from growing for many years. This high level of disturbance may also create favorable conditions for the invasion of other invasive species.

Purple Loosestrife (*Lythrum salicaria*)

Purple loosestrife is a perennial herb 3-7 feet tall with a dense bushy growth of 1-50 stems (Figure 31). The stems, which range from green to purple, die back each year. Showy flowers vary from purple to magenta, possess 5-6 petals aggregated into numerous long spikes, and bloom from July to September. By law, purple loosestrife is a nuisance species in Wisconsin. It is illegal to sell, distribute, or cultivate the plants or seeds, including any of its cultivars. This plant's optimal habitat includes marshes, stream margins, alluvial flood plains, sedge meadows, and wet prairies. It is tolerant of moist soil and shallow water sites such as pastures and meadows, although established plants can tolerate drier conditions. Purple loosestrife has also been planted in lawns and gardens, which is often how it has been introduced to many of our wetlands, lakes, and rivers.

Figure 31. Purple Loosestrife Flower Head and Stems

Purple loosestrife spreads mainly by seed, but it can also spread vegetatively from root or stem segments. A single stalk can produce from 100,000 to 300,000 seeds per year. Seed survival is up to 60-70%, resulting in an extensive seed bank. Mature plants with up to 50 shoots grow over 2 meters high and produce more than two million seeds a year. Purple loosestrife displaces native wetland vegetation and degrades wildlife habitat. As native vegetation is displaced, rare plants are often the first species to disappear. Eventually, purple loosestrife can overrun wetlands thousands of acres in size, and almost entirely eliminate the open water habitat. The plant can also be detrimental to recreation by choking waterways. (Taken in its entirety from WDNR, 2010: http://www.dnr.state.wi.us/invasives/fact/loosestrife.htm)

Purple loosestrife is widely dispersed throughout the Trade River system (Figure 32). Purple loosestrife essentially lines the banks of the Trade River in many places through the Long Trade, Round, Trade Lakes' area. It is well-established in the wetlands adjacent to the lakes and the river and can be found in many places along the shoreline as single plants, small patches, or in large beds. It is relatively easy to distinguish in late July and August by its very distinctive flowering head (Figure 31).

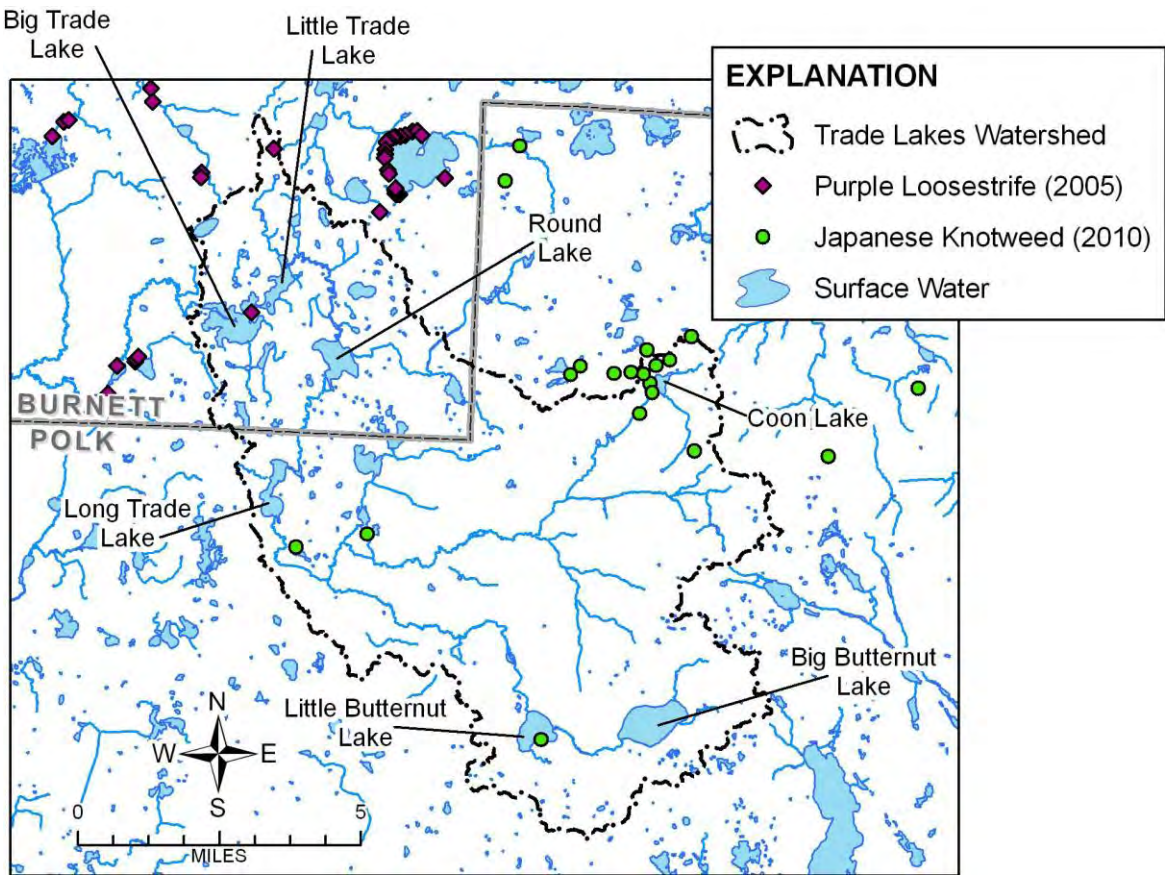


Figure 32. Purple Loosestrife and Japanese Knotweed Locations Mapped in the Trade Lakes Area

Control Methods

Purple loosestrife can be effectively controlled by physically removing new or isolated individual plants and small beds of plants. Pulling and digging are both effective but can leave root parts in the ground the will often grow new plants. Small-scale herbicide use is also effective. A foliar application or dabbing of cut stems with Glyphosate can be effective, but a permit is required for its use over, in, or near water. There is a very effective and well tested biological control in the form of a beetle that can be easily reared and distributed by interested parties (). The Polk County LWRD, the Burnett County LWCD, and several volunteers on the Trade Lakes have released biological controls on the river system and on Big and Little Trade Lake in the past. There is a known established population of beetles along the Trade River downstream of the Trade Lakes, and it is assumed that there are beetles in areas of where purple loosestrife is found on the Trade Lakes, but it is not know the extent of the existing population.

Purple loosestrife control work should continue in the Trade Lakes area, with volunteers or some other designated authority raising and releasing beetles into larger infestations (Figure 33). Small beds or isolated plants should be monitored for and pulled or dug if found. Herbicide application could be used if those applying the herbicide are formally trained and recognized as treatment specialists. A survey of the existing beds should be completed to track future expansion and to track the presence or absence of reproducing beetles populations.

Figure 33. Galerucella Beetle Rearing Station and Galerucella Beetle

Japanese Knotweed (*Polygonum cuspidatum*)

Knotweeds are robust, bamboo-like perennials introduced from Asia that are spreading throughout the Great Lakes states. The main species is Japanese Knotweed. Knotweed grows in dense stands 6-12-ft tall. Its stems are hollow, green to reddish in color and bamboo-like. Its leaves are bright green, broad, egg or heart shaped, with a pointed tip. Small white flowers in branched spray appear July through August. Dormant in winter, the dead reddish brown stems often remain standing. It emerges from root crowns in April and reaches full height in June. The heaviest concentrations of knotweed are usually along rivers and roads, but are also found in parks, backyards, along lake shore, in forests and on farms. Japanese knotweed spreads primarily by extensive networks of underground rhizomes, which can reach 6 feet deep, 60 feet long, and become strong enough to damage pavement and penetrate building foundations. Controlling Japanese knotweed is difficult and requires persistence and diligence. It can be dug, cut, covered, chemically sprayed, or have herbicide injected into individual stems.

At this time, Japanese knotweed has not been found in or around Long Trade, Round, Little Trade or Big Trade Lake, but is known to be scattered throughout the Trade Lakes area (Figure 32).

Figure 34. Japanese Knotweed along a Northern Wisconsin Lakeshore

Aquatic Plant Management

This section reviews the potential management methods available to reach plan goals, reports existing management activities, and presents aquatic plant management goals and strategies for the Trade Lakes System.

Discussion of Management Methods

Techniques to control the growth and distribution of aquatic plants are discussed in Appendix D. Permitting requirements and herbicide use to manage invasive species are discussed below. The application, location, timing, and combination of techniques must be considered carefully.

Permitting Requirements

The WDNR regulates the removal of aquatic plants when chemicals are used, when plants are removed mechanically, and when plants are removed manually from an area greater than thirty feet in width along the shore. The requirements for chemical plant removal are described in Administrative Rule NR 107 – Aquatic Plant Management. A permit is required for any aquatic chemical application in Wisconsin.

The requirements for manual and mechanical plant removal are described in NR 109 – Aquatic Plants: Introduction, Manual Removal & Mechanical Control Regulations (Appendix E). A permit is required for manual and mechanical removal except for when a riparian (waterfront) landowner manually removes or gives permission to someone to manually remove plants, (with the exception of wild rice) from his/her shoreline up to a 30-foot corridor. A riparian landowner may also manually remove the invasive plants Eurasian water milfoil, curly leaf pondweed, and purple loosestrife along his or her shoreline without a permit. Manual removal means the control of aquatic plants by hand or hand-held devices without the use or aid of external or auxiliary power.

WDNR Northern Region Aquatic Plant Management Strategy

All APM Plans and the associated management permits (chemical or harvesting) are reviewed by the WDNR. It has become increasingly important for new and existing APM Plans to at a minimum include yearly monitoring and assessment to document impacts on water quality, fish and wildlife, native plants, and control results for the targeted species. It is equally important for new APM Plans to evaluate the potential for restoring the natural plant community within a lake. If needed, shifting the plant community toward more native species through a reduction of targeted aquatic invasive species can prevent plant management from becoming endless, routine maintenance.

The WDNR has a Northern Region Aquatic Plant Management Strategy (Appendix C) that went into effect in 2007. All aquatic plant management plans developed for northern Wisconsin lakes are evaluated according to the following goals:

- Preserve native species diversity which, in turn, fosters natural habitat for fish and other aquatic species, from frogs to birds;
- Prevent openings for invasive species to become established in the absence of the native species;

- Concentrate on a whole-lake approach for control of aquatic plants, thereby fostering systematic documentation of conditions and specific targeting of invasive species as they exist;
- Prohibit removal of wild rice. WDNR-Northern Region will not issue permits to remove wild rice unless a request is subjected to the full consultation process via the Voigt Tribal Task Force. The WDNR discourages applications for removal of this ecologically and culturally important native plant.
- To be consistent with WDNR Water Division Goals (work reduction-disinvestment), established in 2005, to "not issue permits for chemical or large scale mechanical control of native aquatic plants – develop general permits as appropriate or inform applicants of exempted activities." This process is similar to work done in other WDNR Regions, although not formalized as such.

Native plant management under this plan will follow the policy recommended in the Northern Region Aquatic Plant Management Strategy (Appendix C). Under this APM Plan, riparian access lanes (lanes from the shore that are normally used by an individual shoreland property owner) will be maintained via boat traffic and manual removal methods. Other management strategies will only be considered if severe nuisance or impaired navigation conditions are documented and if non-native aquatic invasive species are present. The Association will assist to determine if navigation is impaired or nuisance conditions exist (following the guidelines on page 6 of Appendix C), but will defer a permit decision to the WDNR.

Herbicide Use to Manage Eurasian Water Milfoil

The Army Corps of Engineers Aquatic Plant Information System (APIS) identifies the following herbicides for control of Eurasian water milfoil: 2,4-D, diquat, endothall, fluridone, and Triclopyr. All of these herbicides with the exception of diquat have granular and liquid formulations. It is possible to target invasive species by using the appropriate herbicide and timing. The herbicide 2,4-D is most commonly used to treat EWM in Wisconsin. This herbicide kills dicots including native aquatic species such as northern water milfoil, coontail, water lilies, spatterdock, and watershield. Early season (April to May) treatment of Eurasian water milfoil is recommended to limit the impact on native aquatic plant populations because EWM tends to grow before native aquatic plants.

Granular herbicide formulations are more expensive than liquid formulations (per active ingredient). However, granular formulations release active ingredient over a longer period of time. Granular formulations, therefore, may be more suited to situations where herbicide exposure time will likely be limited such as in small bands or blocks. In large, shallow lakes with widespread EWM, a whole lake treatment with a low rate of liquid herbicide may be most cost effective because exposure time is greater. Factors that affect exposure time are size and configuration of treatment area, water flow, and wind.

Application rates for liquid and granular formulations are not interchangeable. A rate of 1 to 1.5 mg/L 2,4-D applied as a liquid is a middle rate that will require a contact time of 36 to

48 hours. Application rates recommended for Navigate (granular 2,4-D) are 100 pounds per acre for depths of 0 to 5 feet, 150 pounds per acre for 5 to 10 feet, and 200 pounds per acre for greater than 10 foot depths.

Physical methods to control Eurasian Water Milfoil

This includes bottom plant barriers and water drawdown. These methods are used only in special circumstances. Because they involve placing structure on the bed of a lake and(or) affect lake water level, a Chapter 30 or 31 permit will most likely be needed. Barriers would likely not be permitted. Drawdown activities have been used in Wisconsin to control Eurasian water milfoil.

The effectiveness of milfoil control by drawdown is determined by several factors including the amount of the waterbody bottom exposed, duration of exposure, presence of springs, and the weather at the time of drawdown. The success or failure of drawdowns in controlling milfoil can be highly variable from lake to lake and from year to year within the same waterbody It is recommended lake level drawdown for macrophyte control in situations where prolonged (one month or more) dewatering of lake sediments is possible under rigorous conditions of cold or heat; a key factor being desiccation. Conditions suitable for macrophyte control may not occur with heavy snowfall or during milder winters.

Current and Past Plant Management Activities

Eurasian Water Milfoil Management

EWM was officially confirmed in Long Trade Lake in 2009, Round Lake in 2003, and Little Trade Lake in 2009. Hybrid watermilfoil (HWM), a cross between Eurasian watermilfoil and the native northern watermilfoil, was identified in Long Trade Lake in 1995. Hybrid watermilfoil is an invasive plant species that is managed the same as EWM. Since 2009, the Long Trade, Round, and Trade Lakes Association actively sought to control the EWM population beginning with seeking an AIS Rapid Response Grant for treatment in Little Trade lake in the early 2009. EWM was treated in 2009 and 2010 in Little Trade Lake.

Figure 35. 2010 Eurasian Watermilfoil Treatment Areas in Little Trade Lake

Curly-Leaf Pondweed Management

There has been no targeted CLP treatment in the Trade Lakes system to date.

Plan Goals and Strategies

This section of the plan lists goals for aquatic plant management for the Trade Lakes system. It also presents a detailed strategy of actions to reach Aquatic Plant Management Plan goals. Educational strategies that outline audience, messages, and methods are included under each goal. A three-year Aquatic Invasive Species Control Grant should be pursued in 2011 to begin implementation of this APM Plan.

Overall Purpose

Preserve the Trade Lakes ecosystem for future generations.

Aquatic Plant Management Plan Goals

Goal 1) Prevent the spread of Eurasian water milfoil.

Goal 2) Prevent the spread of Curly-leaf pondweed.

Goal 3) Prevent the spread and introduction of other aquatic invasive species.

Goal 4) Preserve, protect, and enhance the lakes' native plant communities.

Goal 5) Minimize the runoff of pollutants, nutrients, and sediment from the Trade Lake watershed.

Goal 1) Prevent the spread of Eurasian water milfoil (EWM).

Objective: Total growth of EWM in The Trade Lake system is reduced by 75% over time.

Objective: EWM does not spread and establish in Big Trade Lake

Objective: EWM from the Trade Lake system does not spread to other lakes.

Objective: Lakeshore owners and visitors understand appropriate actions to take to control EWM growth in the Trade Lake system

Action: Map EWM beds to establish treatment areas.
(Note beds and treatment areas for 2010 are mapped in Figure 27, Figure 28, Figure 29, and Figure 35)

Action: Use DNR pre- and post-monitoring protocol to monitor effectiveness of treatment efforts and re-emergence of native plant species.

Action: Place bright colored milfoil buoys around significant areas of EWM infestation in Little Trade Lake.
Action: Train shoreland property owners to recognize EWM and encourage manual removal.

Action: Treat EWM beds according to plan standards discussed below.

Action: Consider new treatment methods based upon experience from other Wisconsin and Minnesota lakes.

Action: Regularly monitor shallow areas of the Little and Big Trade Lakes for EWM. (Note: board members should initially take on this responsibility. Consultants may be hired to complete this survey periodically.)

Action: Carry out a standard of no-tolerance if EWM is found in shallow areas of the lakes.

Action: Participate in and support The Burnett and Polk County Land Conservations Committees and the county-wide lake associations in either county.

Action: Inform the Trade Lake system residents and visitors about EWM programs.

Audience
Lake owners
Lake renters
Visitors

Message
AIS identification: pictures and information
Contact a Lake board member if you find suspected EWM.
Describe EWM control program and effectiveness
Bright colored buoys indicate areas of EWM infestation. Avoid these areas when using watercraft on Little Trade Lake.

Methods
Distribute new shoreline homeowner packets
Post boat landing signs
Produce and mail AIS educational materials to residents.
Present information at lake association meetings

EWM Treatment Standards and Methods for the Trade Lakes system

Standards for treatment

High Density Growth in Deep and Big Lake Basins

- Herbicide treatment will occur in EWM beds of 80 percent and greater density.

Scattered Growth in un-infested shallow lake areas and Big Trade Lake

- No tolerance standard for EWM growth
- Diver pulling and/or hand pulling will be used to remove all scattered plants.
- Herbicide treatment may be used if beds of EWM become greater than 200 square feet with a density of at least 25%.

Treatment Methods

Herbicide treatment

- Treat Eurasian water milfoil beds early in the season when new EWM growth is from 1 -3 inches (late May to early June).
- Use granular 2,4-D at a rate of 100 pounds per acre (lbs/ac) at depths < 5 feet, 150-175 lbs/ac at depths from 5-10 feet, and 200 lbs/ac at depths >10 feet, or as modified by best available information.
- Treat EWM early in the day when the winds are calm.
- Consider expanding treatment areas beyond the boundaries of the mapped bed of high density growth an additional 10 to 20 ft. beginning in 2011 if plan objectives are not being met and funds are available.
- Use these expanded treatment areas for no-tolerance zones of Big Trade Lake.

Manual removal

- Train shoreland property owners to distinguish EWM from native plant species and encourage manual removal of EWM and preservation of native species.
- All plant fragments (to the greatest extent practical) must be removed from the lake and disposed of in an upland area, such as a garden or compost pile.

Drawdown for Long Trade Lake

- Assess dewatering potential of sediments for EWM control
- Assess the impact on Long Trade Lake's fishery
- Assess impacts to Trade River System

Divers

- Seek volunteer divers or hire divers to hand pull EWM
- All EWM plant fragments will be removed from the lake and disposed on an upland area (to the greatest extent practical).

Schedule and roles for herbicide treatments

February/March preceding treatment
Contract with herbicide applicator

Apply for aquatic plant management permit from DNR. Permit will be based upon potential acreage mapped in late summer of preceding year using standards for treatment of EWM areas listed previously.

Spring preceding treatment (First three weeks of May)
Residents to notify Board EWM lead of potential EWM locations via email or telephone. Board member or designee checks for presence of EWM in suspected locations and records boundaries of EWM beds using GPS equipment. This mapping will focus in and near areas where EWM has been found previously.

Prior to treatment (late May)
Consultant will map treatment areas and provide specific treatment area and location to contractor, lake association, and DNR permit staff.

Early season treatment (late May to early June)
Contractor to apply herbicide according to permit conditions when new EWM growth is from 1-3 inches. Use granular 2,4-D at a rate of 100 lbs./acre at depths < 5 feet, 150-175 lbs./acre at depths from 5-10 feet, and 200 lbs./acre at depths >10 feet – or as modified by best available information.

Board member or designee will supervise contractor, notifying contractor and DNR when new EWM growth reaches one inch and overseeing permit conditions such as location and timing of treatment, and wind conditions that preclude treatment.

Measure effectiveness of treatment according to DNR monitoring protocol (Four weeks following treatment or late June to early July)
Sample EWM beds noting species rake fullness for EWM and native species at each sample point. Compare results to treatment standard and prepare potential treatment area for next season. Assess whether total acres meet treatment threshold. There will be no treatment if the total acreage is less than two.

Late Summer/Early Fall
Identify additional potential EWM treatment locations using a map of previous EWM locations-note where EWM is present/suspected with GPS equipment.

Goal 2) Prevent the spread of curly-leaf pondweed (CLP).

Objective: Identify the extent of CLP infestation within the lake system.

Objective: Develop a CLP management strategy to coincide with EWM management.

Action: Train volunteers and seek expert volunteers to identify and survey for curly-leaf pondweed within the system through bed mapping and turion density surveys.

Action: Coordinate contracted early season bed mapping survey for curly-leaf pondweed in May.

Action: Conduct June surveys for curly-leaf pondweed in the years that whole lake point-intercept surveys are completed.

Action: Train shoreland property owners to recognize CLP and encourage manual removal.

Action: Follow Department of Natural Resources recommended treatment methods for the management of curly-leaf pondweed.

Action: Implement an education strategy to prevent CLP spread as outlined below.

Audience
Lake monitors
Lake residents
Transient boaters

Messages
CLP is present in the Trade Lakes system.
Trained volunteers can help identify CLP.
Call lake monitors (and other trained volunteers) for help with CLP identification.
Collect and bag suspected plant before you call for help.
Call a LTRTA Board member for help.

Methods
Lake monitor training
Standard methods: newsletters, brochures, posters, boat landing signs, annual meetings

Goal 3) Prevent the spread and introduction of other aquatic invasive species.

Other aquatic invasive species may include aquatic plants such as flowering rush or animals like zebra mussels, among many others.

Objective: Monitor and control purple loosestrife and Japanese knotweed already present in the Trade Lakes system

Objective: Residents, renters, and visitors understand the impacts of AIS and the actions they can take to prevent their introduction.

Objective: AIS introductions are prevented

Objective: If introduced, aquatic invasive species are discovered early

Action: Continue purple loosestrife control work with volunteers or some other designated authority raising and releasing beetles into larger infestations

Action: Carry out Clean Boats, Clean Waters program at boat landings using volunteer and/or paid monitors.

Action: Conduct surveys for other invasive species as information and methods become available.

Action: Consider and potentially implement new methods for AIS prevention, such as remote camera monitoring, as they become available.

Action: Carry out a comprehensive AIS prevention education program as outlined below.

Audience
Lake residents
Renters
Visitors
Town of Laketown (Polk) & Trade Lake (Burnett)

Messages
Report status of existing and potential Aquatic Invasive Species
The State of Wisconsin, Polk County, and Burnett County all have “do not transport ordinances”

Methods
Monitor training, raising Galerucella beetles, active communication with AIS coordinators and Polk LWRD and Burnett LWCD.
Standard methods: newsletters, brochures, posters, boat landing signs, annual meetings

Goal 4) Preserve, protect, and enhance the lakes' native plant communities.

Objective: Prevent disturbance of native plants from watercraft

Objective: Limit disturbance of native plants from homeowner removal

Objective: Educate people regarding functions and values of native plants

Action: Implement recommendations from the WDNR Sensitive Areas report and Northern Region Management Strategy.

Action: Consider establishing no-wake zones to prevent the disturbance of native plants and to prevent the spread of EWM and CLP.

Action: Implement an education strategy aimed at preserving native plants in the Trade Lake system.

Audience
Lake residents
Renters
Visitors
Town of Laketown (Polk) & Trade Lake (Burnett)

Messages
Shallow bays are important for wildlife diversity.
Healthy populations of native plants help to prevent introduction and spread of invasive species.
Diverse native plants provide diverse habitat for wildlife.
Invasive plants reduce plant and animal diversity.
Abundant plants keep the water clear, especially in shallow areas of the lake.
Native plant removal is discouraged because disturbance provides areas for invasive species to grow.
If you believe you have EWM, please call a board member to confirm identification.
Request/suggest that boaters and personal watercraft operators travel at no wake in certain areas to prevent plant removal and introduction of EWM and other invasive aquatic plants.
Manage waterfront properties with minimal plant removal.
If you need to remove plants in front of your property, rake to a maximum opening of no more than thirty feet. Less is better.

Methods
Standard methods: newsletters, brochures, posters, boat landing signs, annual meetings

Goal 5) Minimize the runoff of pollutants, nutrients, and sediment from the Trade River watershed.

Objective: Lake residents restore and preserve shoreline buffers of native vegetation.

Objective: Implement recommendations from the Long Trade and Round Lakes management plan prepared by Polk County LWRD.

Objective: Develop a nutrient budget and watershed management plan for Big and Little Trade Lakes

Action: Implement a shoreland property owners education program.

Audience
Waterfront property owners

Messages
Shoreline buffers protect water quality and provide fish and wildlife habitat.
Describe ways to restore shoreline buffers (natural recovery, stop mowing, plant natives).
Describe the County shoreline buffer requirements and how to report violations of these requirements.
Highlight good examples of shoreline buffers on private waterfront property.

Methods
Standard methods: newsletters, brochures, posters, boat landing signs, annual meetings

Measurement
Ask who has changed buffer zones or other shoreline practices as a result of educational efforts.

Action: Work with Burnett and Polk County Land and Water Resources Departments to utilize cost sharing of Best Management practices

Action: Apply for Wisconsin DNR Lake Planning Grant(s) to develop a nutrient budget and watershed management plan for Big & Little Trade Lakes.

Adaptive Management Approach

The EWM treatment areas, standards, and methods will be reviewed each year to see if they are effective and cost efficient. Changes may be made to the treatment approach based upon project results, the experience of other lake groups, and/or recommendations from the WDNR, the Polk County LWRD, or the Burnett County LWCD. Significant changes will be documented as brief addendums to the aquatic plant management plan to be reviewed by the Long Trade, Round, and Trade Lakes Association Board, the APM Committee, and the WDNR.

Implementation Plan

Action Items	Time Line	2012	2013	2014	Responsible Parties
Prevent Spread of EWM					
Map EWM treatment areas	Late summer	Infested lakes	Infested lakes	Infested lakes	Association, LWRD, Consultant
Pre and post treatment protocols	May and summer	Infested lakes	Infested lakes	Infested lakes	LWRD, Consultant, Association
Place bright colored milfoil buoys	Early Summer	Infested lakes	Infested lakes	Infested lakes	Association
Treat EWM beds according to APM	May	Infested lakes	Infested lakes	Infested lakes	Association, Treatment Contractor
Monitor un-infested shallow areas and Big Trade Lake	Spring/Summer	All lakes	All lakes	All lakes	Association, Contractor
Hand pull or diver pull areas where EWM is discovered	Summer	All lakes	All lakes	All lakes	Association, Residents
Participate in County Government and county-wide lake association meetings	On-going	All lakes	All lakes	All lakes	Association
Apply for APM permits	December	All lakes	All lakes	All lakes	Association, Consultant
Work with treatment applicator	May	All lakes	All lakes	All lakes	Association, Treatment Contractor

Implementation Plan (continued)

Action Items	Time Line	2012	2013	2014	Responsible Parties
Prevent Spread of CLP					
Train volunteers to identify and survey CLP	Spring	All lakes	All lakes		LWRD, DNR, Association, Consultant
Early season PI/ bed survey	Late May	All lakes	All lakes	All lakes	Consultant, Association
Volunteer CLP surveys	June	All lakes	All lakes	All lakes	Association
CLP Treatment	May	Infested Lakes	Infested Lakes	Infested Lakes	Association, Treatment Contractor, Consultant
Prevent introduction of other AIS					
Carry out Clean Boats Clean Waters	Ongoing	All lakes	All lakes	All lakes	Association
Conduct other AIS surveys (as available)	Ongoing	All lakes	All lakes	All lakes	Association
Preserve Native Plant Communities					
Implement Critical Habitat Area Study	Ongoing	Round	Long Trade	Little Trade, Big Trade	DNR
Consider no-wake zone	Ongoing	All lakes			Association, LWRD, DNR

Implementation Plan (continued)

Action Items	Time Line	2012	2013	2014	Responsible Parties
Minimize runoff pollutants					
Develop runoff survey for homeowners	Winter	All lakes			Association, LWRD, UWEX
Conduct survey	Spring		All lakes		Association
Utilize cost sharing for BMPs	Ongoing	All lakes	All lakes	All lakes	Association
Apply for Lake Planning Grants	February, August	As Needed	As Needed	As Needed	Association, Consultant, LWRD
Educational Activities					
Produce AIS materials	Ongoing	All lakes	All lakes	All lakes	Association, DNR, UWEX
Update signs at boat landings	Ongoing	All lakes	As Needed	As Needed	Association
Newsletters & AIS mailings	Ongoing	All lakes	All lakes	All lakes	Association & others
Runoff education	Ongoing	All lakes	All lakes	All lakes	Association, DNR
Education at Assoc. meetings	Ongoing	All lakes	All lakes	All lakes	Association, LWRD, etc.
Critical habitat education	Ongoing	All lakes	All lakes	All lakes	LWRD, DNR
Association board shoreline program	Ongoing	All lakes	All lakes	All lakes	Association, LWRD

Implementation Plan (continued)

Action Items	Time Line	2012	2013	2014	Responsible Parties
Administration					
Ensure funding is available to implement plan	Ongoing	All Lakes	All Lakes	All Lakes	Association
Apply for grant funding	Planning: Feb., Aug. Protection: May	As Needed	As Needed	As Needed	Association, Consultant, LWRD
Grant Reporting	Annual and as required	As Needed	As Needed	As Needed	Association, Consultant, LWRD
Update point intercept survey and APM plan	As Needed	Long Trade (PI)		Little Trade (PI) Big Trade (PI)	Association, LWRD, Consultant, DNR

Monitoring and Assessment

Aquatic Plant Surveys

Aquatic plant (macrophyte) surveys are the primary means to track achievement toward plan goals.

Action: Conduct whole lake aquatic plant surveys approximately every five years to track plant species composition and distribution.
The whole lake surveys will be conducted in accordance with the guidelines established by the Wisconsin DNR. Any new species sampled will be saved, pressed, and mounted for voucher specimens.

Aquatic Invasive Species Grants

Department of Natural Resources Aquatic Invasive Species Grants are available to assist in funding the action items in the implementation plan. Currently, grants provide up to 75 percent funding. Applications are accepted twice each year with postmark deadlines of February 1 and August 1. With completion and approval of the aquatic plant management plan funds will be available not only for education and planning, but also for control of aquatic invasive species.

Appendix A

Big Trade and Little Trade Lakes Sensitive Area Survey Report and Management Guidelines

Appendix B

Aquatic Plant Survey Methods and Results

Appendix C

WDNR Northern Region Aquatic Plant Management Strategy

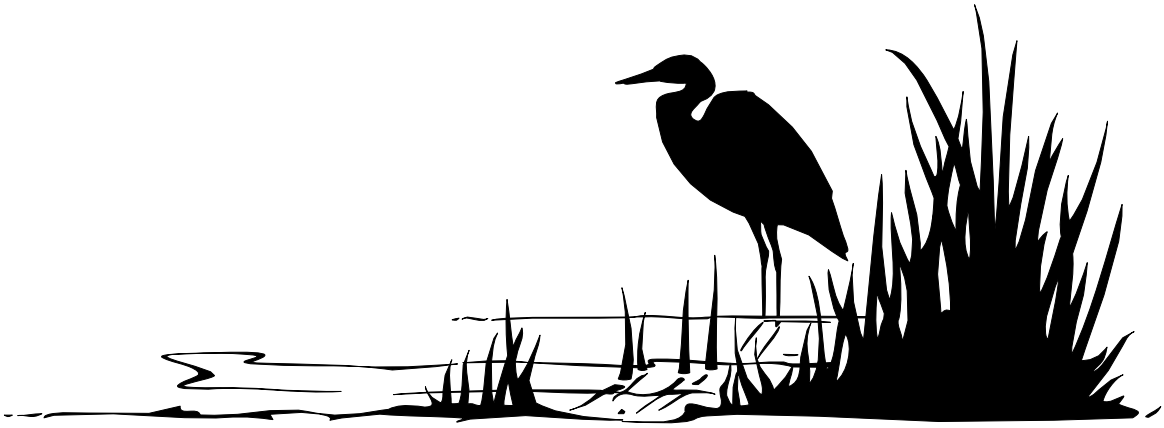
Appendix D

Aquatic Plant Management Options

Appendix E

NR 109 – Aquatic Plants: Introduction, Manual Removal & Mechanical Control Regulations

BIG TRADE AND LITTLE TRADE LAKES SENSITIVE AREA SURVEY REPORT AND MANAGEMENT GUIDELINES



This document is to be used with its companion document "Guidelines for protecting, maintaining, and understanding lake sensitive areas"

Big Trade & Little Trade Lakes (Burnett Co)
Integrated Sensitive Area Survey Report

Date of Survey: 28 August 2000 Number of Sensitive Areas: 9

Site Evaluators: Larry Damman, Fisheries Biologist
Kurt Roblek, Water Resources Biologist

Lake Sensitive Area Survey results identified 9 areas that merit special protection of the aquatic habitat.

The reader should consider that any buffer that does not extend back from the waters edge at least 35' is not providing adequate protection for water quality and should be expanded to at least 35'. Local zoning ordinances and lakes classification systems have tried to provide better guidelines pertaining to buffer widths and set backs based on lake type. Landowners are encouraged to go beyond the minimum requirements laid out by zoning and consider extending buffer widths to beyond 35' and integrating other innovative ways to capture and reduce the runoff flowing off from their property while improving critical shoreline habitat. Berms and low head retention areas can greatly increase the effective capture rate from developed portions in addition to that portion captured within the buffer.

Site conditions may dictate that a buffer has to be much wider than 35' to be effective at capturing the sediments and nutrients running off the developed portions of the shoreline. If the shoreline is steeply sloped (>7%slope) greater widths should definitely be used.

No mowing should take place within the buffer area (with the exception of a narrow access trail and small picnic area), and trees and shrubs should not be cut down even when they become old and die; because they provide important woody debris habitat within the buffer zone as well as aquatic habitat when they fall into the lake.

The following is a brief summary of the BigTrade and Little Trade Lakes sensitive area sites and the management guidelines. Also, the "Guidelines for Protecting, Maintaining, and Understanding Sensitive Areas" provides

management guidelines and considerations for different lake sensitive areas (Attached).

I. Aquatic Plant Sensitive Areas

The following sensitive areas contain aquatic plant communities, which provide important fish and wildlife habitat as well as important shoreline stabilization functional values. Sensitive areas provide enough important habitat for the Trade and Little Trade Lake ecosystem that conservation easements, deed restrictions, or zoning should be used to protect it. Management guidelines for aquatic plant sensitive areas are (unless otherwise specifically stated):

1. Limit aquatic vegetation removal to navigational channels no greater than 25 feet wide where necessary, the narrower the better. These channels should be kept as short in length as possible and it is recommended that people do not completely eliminate aquatic vegetation within the navigation channel; but instead only remove what is necessary to prevent fouling of propellers to provide access to open water areas. Chemical treatments should be discouraged and if a navigational channel must be cleared, pulling by hand is preferable over mechanical harvesters where practical.
2. Prohibit littoral zone alterations covered by Wisconsin Statutes Chapter 30, unless there is clear evidence that such alterations would benefit the lake's ecosystem. Rock riprap permits should not be approved for areas that already have a healthy native plant community stabilizing the shoreline and property owners should not view riprap as an acceptable alternative in these situations.
3. Leave large woody debris, logs, trees, and stumps, in the littoral zone to provide habitat for fish, wildlife, and other aquatic organisms.
4. Leave an adequate shoreline buffer of un-mowed natural vegetative cover and keep access corridors as narrow as possible (preferable less than 30 feet or 30% of any developed lot which ever is less).
5. Prevent erosion, especially at construction sites. Support the development of effective county erosion control ordinances. The proper use of Best Management Practices (BMP's) will greatly

reduce the potential of foreign materials entering the waterway (i.e. silt, nutrients).

6. Strictly enforce zoning ordinances and support development of new zoning regulations where needed.
7. Eliminate nutrient inputs to the lake caused by lawn fertilizers, failing septic systems, and other sources.
8. Control exotic species such as purple loosestrife. Exotic species are marked with an *.

Resource Value of Site A

Sensitive area A is located in a small bay on the Northwestern shore of Big Trade Lake and covers approximately 400 feet of shoreline extending out as far as 100' to 150' in shallower shoreline areas.

This area provides important habitat for centrarchid (bass and panfish) spawning and nursery for young. Esocid (northern pike) will also use this area for spawning and as a nursery. This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area A includes: **Emergents;** common bur-reed (*Sparganium eurycarpum*). **Floating leafed**; yellow pond lily (*Nuphar advena*). **Submergents;** coontail (*Ceratophyllum demersum*), northern milfoil (*Myriophyllum sibiricum*), elodea and fern leaf pondweed (*Potamogeton robbinsii*).

Chemical treatments should be strongly discouraged. Minimal hand pulling or mechanical removal should be sufficient for any necessary control.

Resource Value of Site B

Sensitive area B is located in the Northcentral portion of BigTrade Lake. Specifically this sensitive area surrounds the two State owned islands. Most of this length is dominated by a deep marsh of soft stem bulrush.

This area provides important spawning and nursery habitat for northern pike (esocid) and spawning habitat for centrarchid (bass and panfish). This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area B includes: **Emergents;** soft stem bulrush (*Scirpus validus*), common bur-reed (*Sparganium eurycarpum*), jewel weed (*Impatiens capensis*), reed canary grass (*Phalaris arudinacea*) and giant reed grass (Phragmites australis). **Floating leafed**; yellow pond lily (*Nuphar advena*) and white water lily (*Nymphaea odorata*). **Submergents;** sago pondweed (*Potamogeton pectinatus*), northern milfoil (*Myriophyllum sibiricum*) and coontail (*Ceratophyllum demersum*).

No chemical treatments or mechanical harvesting should be allowed in this area.

Resource Value of Site C

Sensitive area C is located at the Northeastern end of Big Trade Lake and covers approximately 3,000 feet of shoreline extending out 150 feet. Most of this length is dominated by a deep marsh and shallow or open water wetland with large amounts of submersed woody debris.

This area provides important spawning and nursery habitat for northern pike (esocid) and centrarchid (bass and panfish). This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians benefit from this valuable habitat.

Sensitive area C has a diverse community structure of emergent and submergent aquatic plants including: **Emergents;** common bur-reed (*Sparganium eurycarpum*) and soft stem bulrush (*Scirpus validus*) **Floating leafed**; yellow pond lily (*Nuphar advena*) and white water lily (*Nymphaea odorata*). **Submergents;** elodea, flat stem pondweed (*Potamogeton*

zosteriformis), fern leaf pondweed (*P. robbinsii*), sago *pondweed (P. pectinatus*), coontail (*Ceratophyllum demersum*), eel grass (*Vallisneria americana*) and northern milfoil (*Myriophyllum sibiricum*).

Chemical treatments and mechanical removal efforts should only be allowed for navigation channels in this area. All other removal efforts should be strongly discouraged.

Resource Value of Site D

Sensitive area D is located at the channel connecting Big Trade Lake and Little Trade Lake and extends into the southern portion of Little Trade Lake, surrounding the large island. Most of the length is dominated by a deep marsh and shallow or open water wetland. Development near the channel has created unsuitable buffers of mowed lawn to within 10 feet of the waters edge. Property owners should consider extending their buffers to 35 feet in width. The southern bay of Little Trade Lake is considered a "wild shoreline" with high scenic beauty.

This area provides important spawning and nursery habitat for northern pike (esocid) and spawning habitat for centrarchid (bass and panfish). This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area D includes: **Emergents;** soft stem bulrush (*Scirpus validus*), common bur-reed (*Sparganium eurycarpum*) and speckled alder (*Alnus sp.*). **Floating leafed**; yellow pond lily (*Nuphar advena*). **Submergents;** elodea, coontail (*Ceratophyllum demersum*), northern milfoil *(Myriophyllum sibiricum*), sago pondweed (*Potamogeton pectinatus*), *curly leaf pondweed (*P. crispus*) and narrow leaf pondweed (*P. zosteriformis*).

No chemical treatments should be allowed in this area and all mechanical removal efforts should be strongly discouraged.

Resource Value of Site E

Sensitive area E is located in the Northern bay of Little Trade Lake and covers approximately 2,500 feet of shoreline extending out to 150 feet. Most of this length is dominated by a shallow and deep marsh wetland, which have helped protect it from the negative impacts that can be associated with improperly developed shorelines.

This area provides important habitat for centrarchid (bass and panfish) spawning and nursery areas and as an esocid (northern pike) nursery area. This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area E includes: **Emergents;** soft stem bulrush (*Scirpus validus*), *reed canary grass (*Phalaris arudinacea*), common bur-reed (*Sparganium eurycarpum*) and cattails (*Typha sp.*). **Floating leafed;** yellow pond lily (*Nuphar advena*) and white water lily (*Nymphaea odorata*). **Submergents;** narrow leaf pondweed (*Potamogeton zosteriformis*), floating leaf pondweed (*P. natans*), *curly leaf pondweed (*P. crispus*), coontail (*Ceratophyllum demersum*) and northern milfoil (*Myriophyllum sibiricum*).

Chemical treatments and/or mechanical harvesting are strongly discouraged. Historical chemical treatments and mechanical harvesting should be limited to navigational channels only. All other interests in chemical treatments and mechanical harvesting should be scrutinized.

Resource Value of Site F

Sensitive area F is located near the Eastern end of Big Trade Lake and covers approximately 400 feet of shoreline extending out to 150 feet. Most of this length is dominated by a shallow and deep marsh wetland. Shoreline buffers along this sensitive area are less than 5 feet in width from the

waters edge. Riparian owners should consider widening their buffers to 35 feet.

This area provides important habitat for esocid (muskellunge and northern pike) as a nursery for the young and spawning habitat. This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area F includes: **Emergents;** soft stem bulrush (*Scirpus validus*). **Floating leaf;** yellow water lily (*Nuphar advena*) and yellow pond lily (*Nymphaea odorata*). **Submergents;** narrow leaf pondweed (*Potamogeton zosteriformis*), coontail (*Ceratophyllum demersum*) and pipewort (*Eriocaulon aquaticum*).

Chemical treatments and/or mechanical harvesting are strongly discouraged. Historical chemical treatments and mechanical harvesting should be limited to navigational channels only. All other interests in chemical treatments and mechanical harvesting should be scrutinized.

Resource Value of Site G

Sensitive area G is located on the Eastern shore of Big Trade Lake at the confluence of a small tributary entering the lake and a larger wetland complex to the east. This are covers approximately 600 feet of shoreline. Most of this length is dominated by a deep marsh and shallow or open water wetland, which have helped protect it from the negative impacts that can be associated with improperly developed shorelines.

This area provides important habitat for centrarchid (bass and panfish) and esocid (northern pike and muskellunge) spawning and nursery for the young. This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians also benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area G includes: **Emergents;** cattails (*Typha sp.*), common bur-reed (*Sparganium eurycarpum)* and soft stem bulrush (*Scirpus validus*). **Floating leafed**; yellow pond lily (*Nuphar advena*) and white water lily (*Nymphaea odorata*). **Submergents;** elodea, coontail (*Ceratophyllum demersum*), northern milfoil (*Myriophyllum sibiricum*) and eelgrass (*Vallisneria americana*).

Chemical treatments or mechanical harvesting should be limited to navigation channels only.

Resource Value of Site H

Sensitive area H is located on the Southern shoreline of Big Trade Lake and covers approximately 3,200 feet of shoreline extending out 100 to 300 feet. Most of this length is dominated by a deep marsh and shallow or open water wetland. Portion of this shoreline are developed with vegetative buffers less 10 feet wide. Property owners should consider extending their buffers to 35 feet in width.

This area provides important habitat for centrarchid (bass and panfish) and esocid (northern pike and muskellunge) spawning and nursery for the young. This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians also benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area H includes: **Emergents;** reed canary grass (*Phalaris arudinacea*), jewel weed (*Impatiens capensis*), giant reed grass (*Phragmites sp.*), cattails (*Typha sp.*), common bur-reed (*Sparganium eurycarpum*) and soft stem bulrush (*Scirpus validus*). **Floating leafed**; yellow pond lily (*Nuphar advena*) and white water lily (*Nymphaea odorata*). **Submergents;** coontail (*Ceratophyllum demersum*), northern milfoil (*Myriophyllum sibiricum*) and eelgrass (*Vallisneria americana*), slender naiad (*Najas flexilis*), musk grass (*Chara sp.*), narrow leafed pondweed (*Potamogeton zosteriformis*), sago

pondweed (*P. pectinatus*), *curly leaf pondweed (*P. crispus*), ribbon leaf pondweed (*P. epihydrus*) and fern pondweed (*P. robbinsii*),

Chemical treatments or mechanical harvesting should be limited to navigation channels only.

Resource Value of Site I

Sensitive area I is located on the Western shore of Big Trade Lake covering approximately 1,400 feet of shoreline. Most of this length is dominated by a deep marsh and shallow or open water wetland, which have helped protect it from the negative impacts that can be associated with improperly developed shorelines.

This area provides important habitat for centrarchid (bass and panfish) and esocid (northern pike) spawning and nursery for the young. This area also provides important habitat for forage species. Wildlife are reliant upon this area for habitat. Eagles, loons, herons, waterfowl, songbirds, furbearers, turtles, and amphibians also benefit from this valuable habitat.

The emergent, floating and submergent plant community structure of Sensitive area I includes: **Emergents;** cattails (*Typha sp.*), common bur-reed (*Sparganium eurycarpum*), soft stem bulrush (*Scirpus validus*), reed canary grass (*Phalaris arudinacea*), arrowhead (*Saggitaria sp.*) and jewelweed (*Impatiens capensis*). **Floating leafed**; yellow pond lily (*Nuphar advena*), white water lily (*Nymphaea odorata*), duckweed (*Lemna sp.*) and watermeal (*Wolffia sp.*). **Submergents;** elodea, coontail (*Ceratophyllum demersum*), northern milfoil (*Myriophyllum sibiricum*), eelgrass (*Vallisneria americana*), sago pondweed (*Potamogeton pectinatus*) and flat stem pondweed (*P. zosteriformis*).

Chemical treatments or mechanical harvesting should be limited to navigation channels only.

Aquatic Plant Survey Methods and Results

Whole-lake aquatic plant surveys were completed by WDNR staff on Long Trade Lake (July 12, 2006) and on Round Lake (July 17-18, 2007), by Polk County LWRD and Burnett County LWCD staff on Big Trade Lake (August 18 and 20, 2007) and by LWRD staff on Little Trade Lake (September 3 and 30, 2009). Sample points were established in and around the lake using a standard formula that takes into account the shoreline shape and distance, islands, water clarity, depth and total lake acres. Points were generated in ArcView (a GIS program) and downloaded to a GPS unit. These points were then sampled in field. The sample points for each lake can be found below in Figures 1-4.

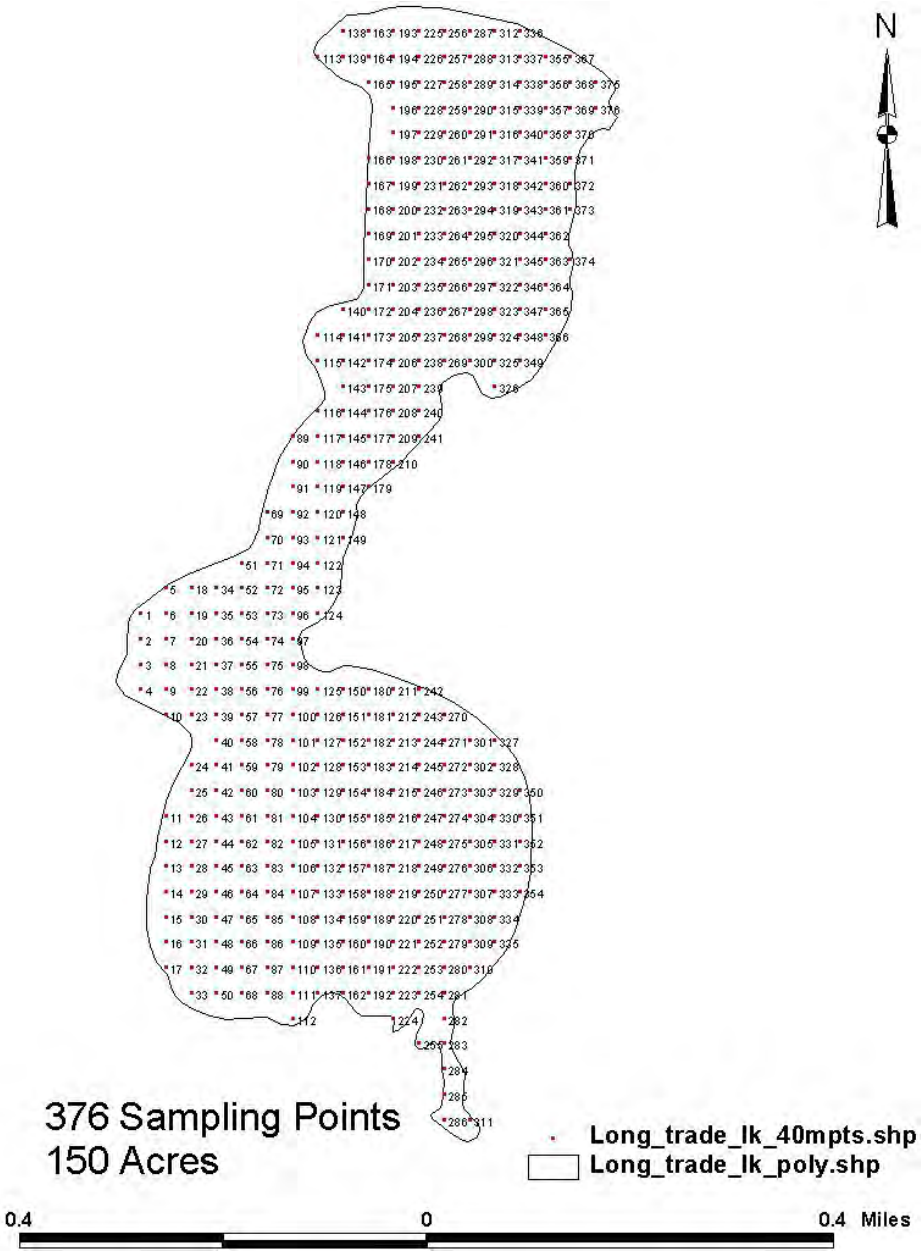


Figure 1. Long Trade Lake Point Intercept Aquatic Plant Survey Sample Points

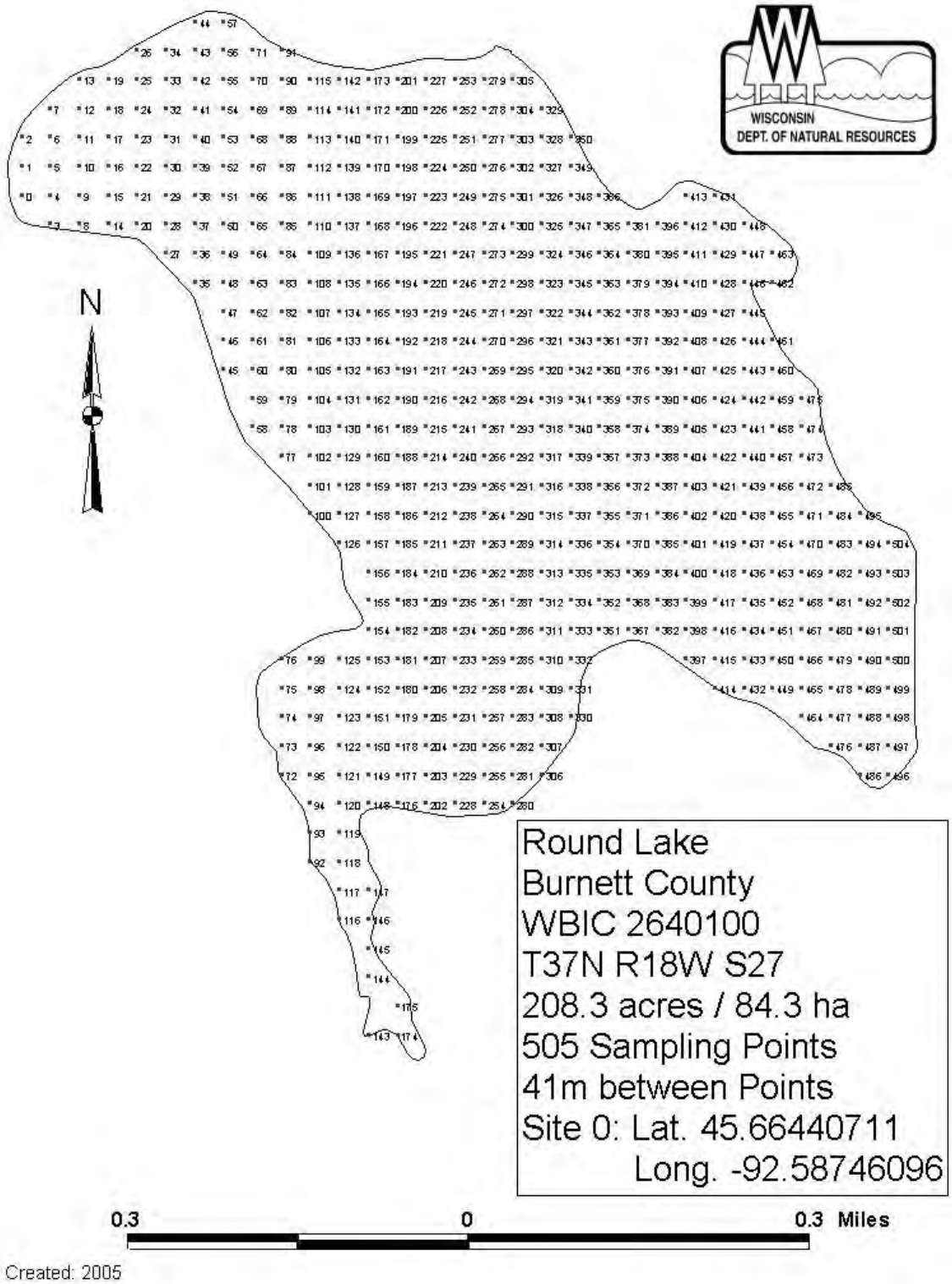


Figure 2. Round Lake Point Intercept Aquatic Plant Survey Sample Points

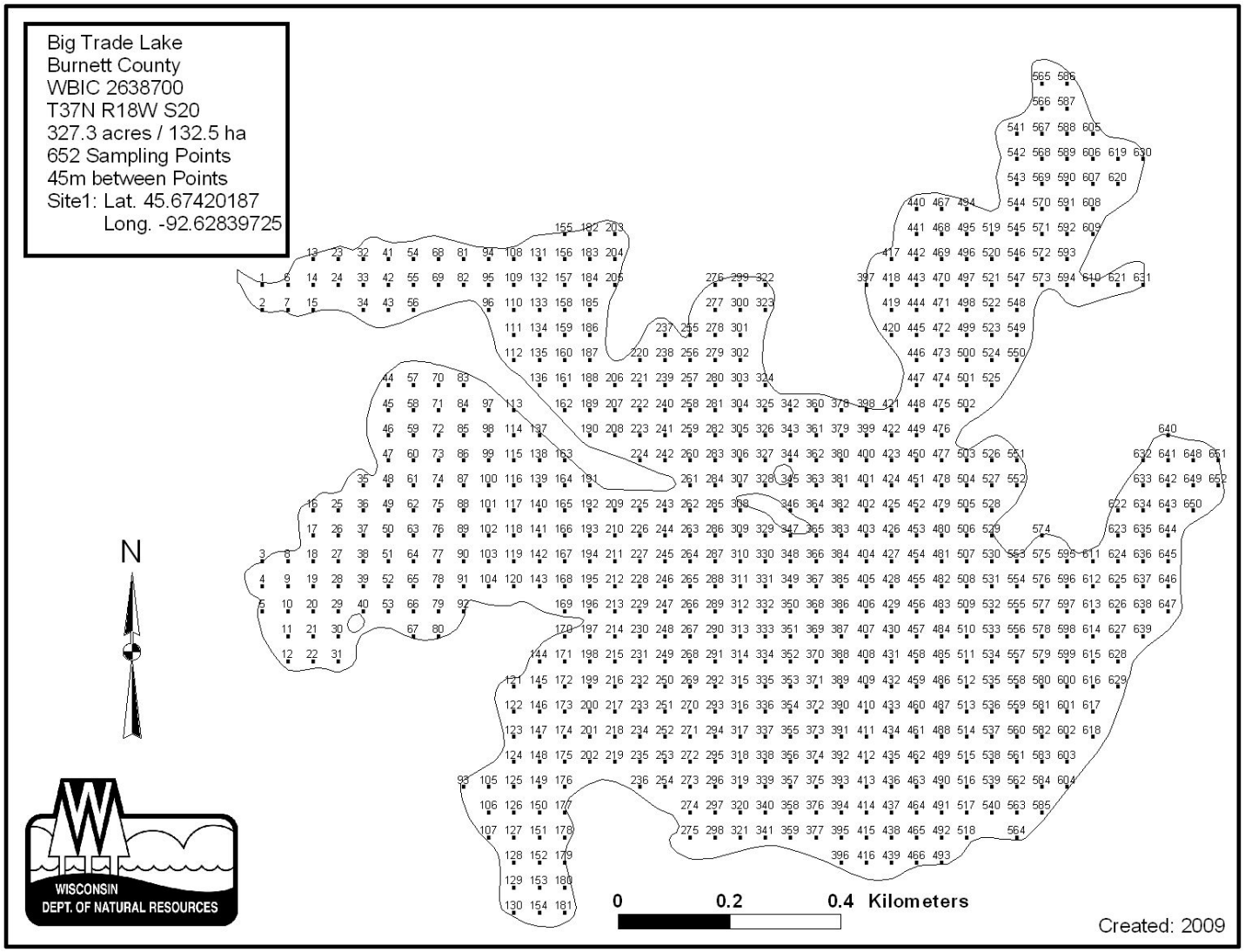


Figure 3. Big Trade Lake Point Intercept Aquatic Plant Survey Sample Points

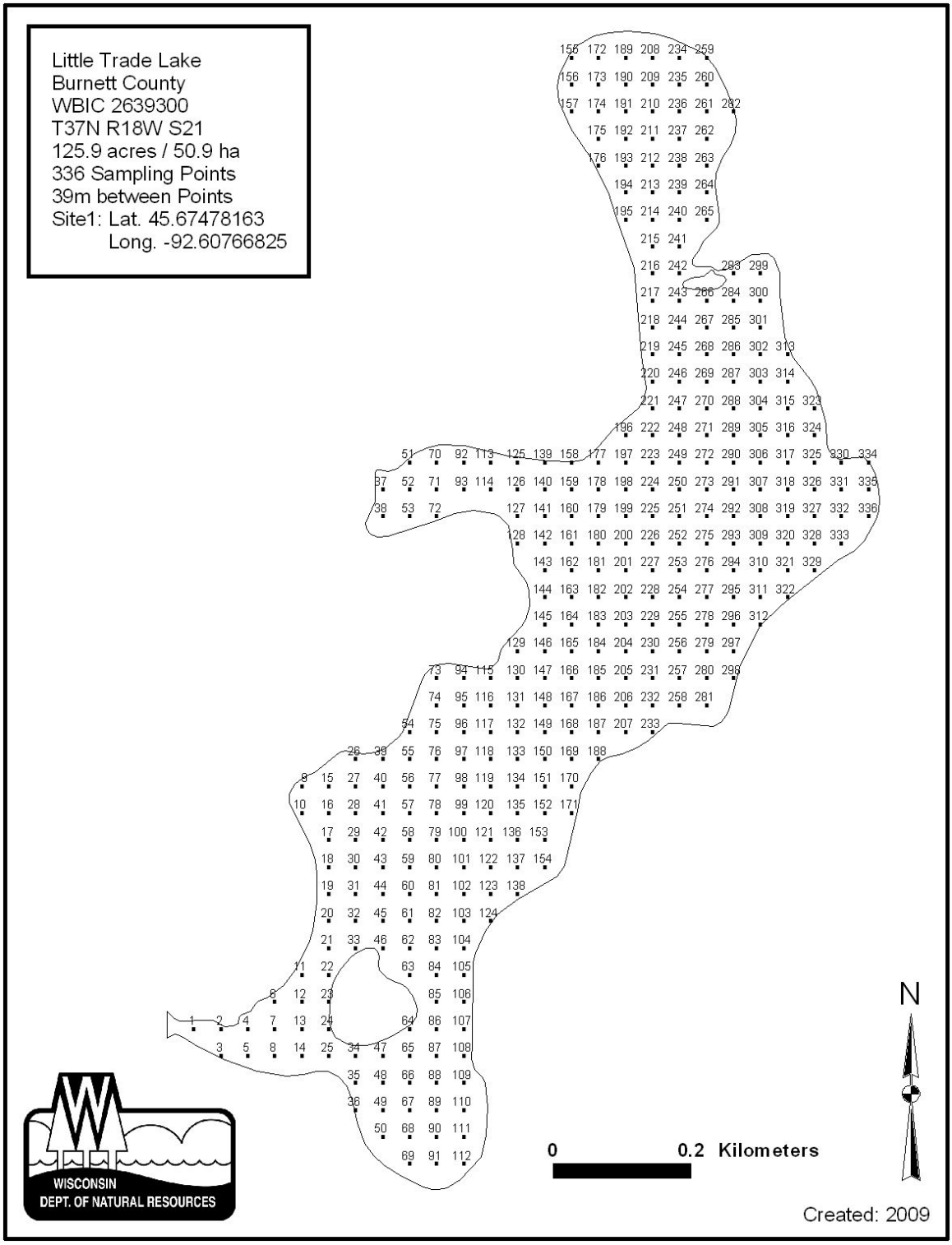


Figure 4. Little Trade Lake Point Intercept Aquatic Plant Survey Sample Points

All plants found were identified to species. During the point intercept survey, we located each survey point using a mapping-grade handheld GPS unit, and at each point, depth was recorded. Every point that was not too shallow or terrestrial was sampled (shallow communities were characterized visually). At each of these points, we used a rake (either on a pole or a throw line depending on depth) to sample an approximately 1 meter section of the benthos. All plants on the rake, as well as any that were dislodged by the rake were identified, and assigned a rake fullness value of 1 to 3 as an estimation of abundance (figure below). We also recorded visual sightings of plants within six feet of the sample point. Substrate (lake-bottom) type was assigned at each site where the bottom was visible or it could be reliably determined using the rake.

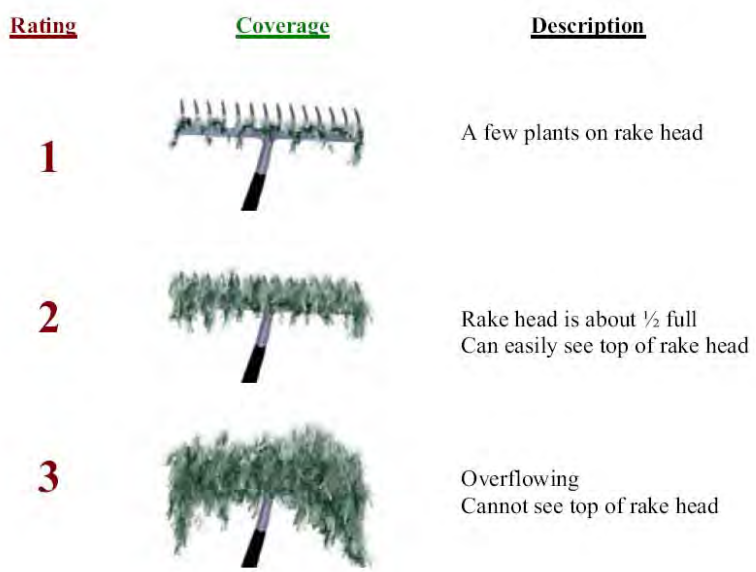


Figure 5. Rake Fullness Rating (UW Extension, 2007)

Data collected was entered into a spreadsheet for analysis. The following statistics were generated from the spreadsheet:

- Frequency of occurrence for all sample points in lake
- Relative frequency
- Total sample points
- Sample points with vegetation
- Simpson's diversity index
- Maximum plant depth
- Species richness
- Floristic Quality Index

The following are explanations of the various analysis values:

Frequency of occurrence for each species- Frequency of occurrence is expressed as a percentage and there are two values for this. The first is the percentage of all sample points that this plant was sampled. The second is the percentage of littoral sample points that the plant was sampled. The first value shows how often the plant would be

encountered everywhere in the lake, while the second value shows if only within the depths plants potentially grow. In either case, the greater this value, the more frequent the plant is in the lake. If one wants to compare to the whole lake, we look at the frequency of all points and if one wants to focus only where plants are more probable, then one would look at frequency in the littoral zone.

Frequency of occurrence example:
Plant A sampled at 35 of 150 total points = 35/150 = 0.23 = 23%
Plant A's frequency of occurrence = 23% considering whole lake sample.
This frequency can tell us how common the plant was sampled in the entire lake.

Relative frequency-This value shows, as a percentage, the frequency of a particular plant relative to other plants. This is not dependent on the number of points sampled. The relative frequency of all plants will add to 100%. This means that if plant A had a relative frequency of 30%, it occurred 30% of the time compared to all plants sampled or makes up 30% of all plants sampled. This value allows us to see which plants are the dominant species in the lake. The higher the relative frequency the more common the plant is compared to the other plants.

Sample sites with vegetation- The number of sites where plants were actually collected. This gives a good idea of the plant coverage of the lake. If 10% of all sample points had vegetation, it implies that about 10% of the lake is covered with plants.

Relative frequency example:
Suppose we were sampling 10 points in a very small lake and got the following results:
Frequency sampled
Plant A present at 3 sites 3 of 10 sites
Plant B present at 5 sites 5 of 10 sites
Plant C present at 2 sites 2 of 10 sites
Plant D present at 6 sites 6 of 10 sites
One can see that Plant D is the most frequent sampled at all points with 60% (6/10) of the sites having plant D. However, the relative frequency allows us to see what the frequency is compared the other plants, without taking into account the number of sites. It is calculated by dividing the number of times a plant is sampled by the total of all plants sampled. If we add all frequencies (3+5+2+6), we get a sum of 16. We can calculate the relative frequency by dividing by the individual frequency.
Plant A = 3/16 = 0.1875 or 18.75%
Plant B = 5/16 = 0.3125 or 31.25%
Plant C = 2/16 = 0.125 or 12.5%
Plant D = 6/16 = 0.375 or 37.5%
Now we can compare the plants to one another. Plant D is still the most frequent, but the relative frequency tells us that of all plants sampled at those 10 sites, 37.5% of them are Plant D. This is much lower than the frequency of occurrence (60%) because although we sampled Plant D at 6 of 10 sites, we were sampling many other plants too, thereby giving a lower frequency when compared to those other plants. This then gives a true measure of the dominant plants present.

Table 1. Species List and Frequency Values for Long Trade Lake

Species	Common Name	Relative Frequency (%)	Frequency of Occurrence %
Ceratophyllum demersum	Coontail	9.90	34.03
Elodea canadensis	Common waterweed	3.90	13.43
Lemna minor	Small duckweed	15.50	53.73
Najas flexilis	Bushy Pondweed	0.40	1.49
Myriophyllum spicatum	Eurasian water milfoil	Not in 2006 survey entry sheet	Not in 2006 survey entry sheet
Nymphaea odorata	White water lily	10.70	37.31
Potamogeton crispus	Curly-leaf pondweed	11.20	38.81
Potamogeton foliosus	Leafy pondweed	1.30	4.48
Potamogeton richardsonii	Clasping-leaf pondweed	0.90	2.99
Potamogeton zosteriformis	Flat-stem pondweed	0.40	1.49
Sagitaria sp.		Visual	Visual
Schoenoplectus tabernaemontani	Softstem bulrush	Visual	Visual
Spirodela polyrhiza	Large duckweed	14.60	50.75

Table 2. Species List and Frequency Values for Round Lake

Species	Common Name	Relative Frequency (%)	Frequency of Occurrence %
Ceratophyllum demersum	Coontail	12.40	28.00
Elodea canadensis	Common waterweed	5.30	12.00
Lemna minor	Small duckweed	4.40	10.00
Najas flexilis	Bushy Pondweed	1.80	4.00
Myriophyllum spicatum	Eurasian water milfoil	12.40	28.00
Nuphar variagata	Yellow water lily	Visual	Visual
Nymphaea odorata	White water lily	3.50	8.00
Potamogeton crispus	Curly-leaf pondweed	Not in 2006 survey entry sheet	Not in 2006 survey entry sheet
Potamogeton friesii	Frie's pondweed	2.70	6.00
Potamogeton nodosus	Long-leaf pondweed	2.70	6.00
Potamogeton pusillus	Small pondweed	2.70	6.00
Potamogeton richardsonii	Clasping-leaf pondweed	5.30	12.00
Potamogeton zosteriformis	Flat-stem pondweed	2.70	6.00
Spirodela polyrhiza	Large duckweed	4.40	10.00
Stuckenia pectinata	Sago pondweed	1.80	4.00
Vallisneria americana	Wild celery	2.70	6.00
Wolffia columbiana	Common watermeal	0.90	2.00

Table 3. Species List and Frequency Values for Big Trade Lake

Species	Common Name	Relative Frequency (%)	Frequency of Occurrence %
Ceratophyllum demersum	Coontail	28.10	87.07
Chara sp.	Muskgrass	2.00	6.12
Elodea canadensis	Common waterweed	7.50	23.13
Heteranthera dubia	Water star-grass	0.70	2.04
Lemna minor	Small duckweed	2.60	8.16
Myriophyllum sibiricum	Northern water milfoil	7.30	22.45
Najas flexilis	Bushy Pondweed	0.40	1.36
Nuphar variagata	Yellow water lily	1.30	4.08
Nymphaea odorata	White water lily	4.40	13.61
Potamogeton crispus	Curly-leaf pondweed	3.70	11.56
Potamogeton pusillus	Small pondweed	0.70	2.04
Potamogeton richardsonii	Clasping-leaf pondweed	2.20	6.80
Potamogeton zosteriformis	Flat-stem pondweed	9.50	29.25
Ranunculus aquatilis	Stiff water crowfoot	3.70	11.56
Sagitaria latfolia	Common arrowhead	Visusal	Visual
Schoenoplectus tabernaemontani	Softstem bulrush	1.50	4.76
Sparganium eurycarpum	Common bur-reed	0.20	0.07
Spirodela polyrhiza	Large duckweed	2.40	7.48
Stuckenia pectinata	Sago pondweed	1.80	5.44
Vallisneria americana	Wild celery	4.60	14.29
Wolffia columbiana	Common watermeal	2.40	4.48

Table 4. Species List and Frequency Values for Little Trade Lake

Species	Common Name	Relative Frequency (%)	Frequency of Occurrence %
Ceratophyllum demersum	Coontail	33.70	80.00
Elodea canadensis	Common waterweed	11.00	26.09
Lemna minor	Small duckweed	8.40	20.00
Myriophyllum sibiricum	Northern water-milfoil	4.00	9.57
Myriophyllum spicatum	Eurasian water milfoil	1.10	2.61
Nymphaea odorata	White water lily	7.70	18.26
Potamogeton crispus	Curly-leaf pondweed	13.20	31.30
Potamogeton richardsonii	Clasping-leaf pondweed	0.40	0.87
Potamogeton zosteriformis	Flat-stem pondweed	4.80	11.30
Spirodela polyrhiza	Large duckweed	7.70	18.26
Vallisneria americana	Wild celery	0.40	0.87
Vallisneria americana	Wild celery	11.60	40.30
Wolffia columbiana	Common watermeal	7.70	18.26

Species richness-The number of different individual species found in the lake. There is a number for the species richness of plants sampled, and another number that takes into account plants viewed but not actually sampled during the survey. None of the Lakes are highly diverse; Long Trade Lake had 12 species (14 with visuals), Round Lake had 16 species (20 with visuals), Big Trade Lake had 21 species (22 with visuals), and Little Trade Lake had 12 species including the visuals.

Simpson's diversity index- Simpson's Index **(**D**)** measures the probability that two individuals randomly selected from a sample will belong to the same species (or some category other than species).

$$D = \frac{\sum n(n-1)}{N(N-1)}$$

Where D = Simpson's Diversity, n= the total number of organisms of a particular species, N=the total number of organisms of all species.
To measure how diverse the plant community is, Simpson's index is calculated. This value can range from 0 to 1.0. The greater the value, the more diverse the plant community is in a particular lake. In theory, the value is the chance that two species sampled are different. An index of "1" means that the two will always be different (very diverse) and a "0" would indicate that they will never be different (only one species found). In theory, the more diverse the plant community is, the better the lake ecosystem.

Simpson's diversity example:

If one went into a lake and found just one plant, the Simpson's diversity would be "0." This is because if we went and sampled randomly two plants, there would be a 0% chance of them being different, since there is only one plant.
If every plant sampled were different, then the Simpson's diversity would be "1." This is because if two plants were sampled randomly, there would be a 100% chance they would be different since every plant is different.
These are extreme and theoretical scenarios, but they do make the point. The greater the Simpson's index is for a lake, the greater the diversity since it represents a greater chance of two randomly sampled plants being different.

The Simpson's diversity index on Long Trade Lake was calculated to be 0.87, Round Lake was 0.84, Big Trade was 0.87, and Little Trade was 0.83. So although the species richness may not be as high as some other area lakes, there are likely to be two or more species at each site.

Maximum depth of plants-This depth indicates the deepest that plants were sampled. Generally more clear lakes have a greater depth of plants while lower water clarity limits light penetration and reduces the depth at which plants are found. The maximum rooting depth on Long Trade Lake was tent feet, Round Lake was 16.5 feet, Big Trade was 11 feet, and Little Trade Lake was eight feet.

Floristic Quality Index- The Floristic Quality Index is designed to evaluate the closeness of the flora in an area to that of an undisturbed condition. It can be used to identify natural areas, compare the quality of different sites or locations within a single lake, monitor long-term floristic trends, and monitor habitat restoration efforts. This is an important assessment in Wisconsin because of the demand by the Department of Natural Resources (DNR), local governments, and riparian landowners to consider the integrity of lake plant communities for planning, zoning, sensitive area designation, and aquatic plant management decisions.
It takes into account the species of aquatic plants found and their tolerance for changing water quality and habitat modification using the equation $I = \overline{C}\sqrt{N}$ (where *I* is the floristic quality, $\overline{C}$ is the average coefficient of conservation (obtainable from http://www.botany.wisc.edu/wisflora/FloristicR.asp) and $\sqrt{N}$ is the square root of the number of species). The index uses a conservatism value assigned to various plants ranging from 1 to 10. A high conservatism value indicates that a plant is intolerant of change while a lower value indicates tolerance. Those plants with higher values are more apt to respond adversely to water quality and habitat changes. The FQI is calculated using the number of species and the average conservatism value of all species used in the index. Therefore, a higher FQI, indicates a healthier lake plant community. It should be noted that invasive species of a value of 0.

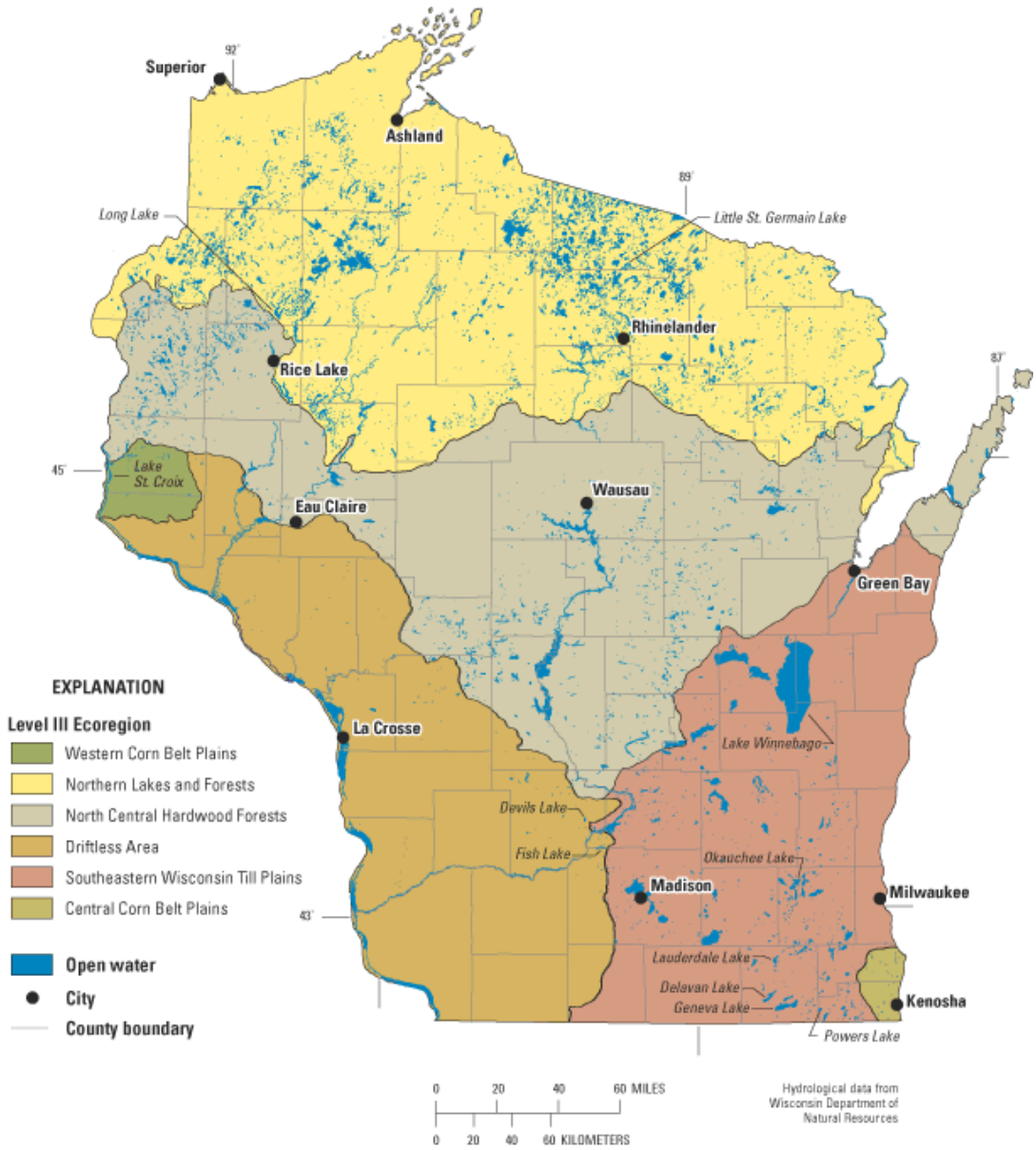


Figure 6. Ecoregions of Wisconsin (USGS, 2003)

All four lakes fall within the North Central hardwood Forest ecoregion of Wisconsin (Figure 6). A summary of North Central Harwood Forest Values for Floristic Quality Index are as Follows:
Mean species richness = 14
Mean average conservatism = 5.6
Mean Floristic Quality = 20.9*
*Floristic Quality has a significant correlation with area of lake (+), alkalinity(-), conductivity(-), pH(-) and Secchi depth (+). In a positive correlation, as that value rises so will FQI, while with a negative correlation, as a value rises, the FQI will decrease and vice versa.

Table 5. Floristic Quality Metrics

Species observed for FQI Long Trade Lake = **9**
Species observed for FQI Round Lake = **14**
Species observed for FQI Big Trade Lake = **19**
Species observed for FQI Little Trade Lake = **10**
Average conservatism Long Trade Lake = **5**
Average conservatism Round Lake = **5.36**
Average conservatism Big Trade Lake = **5.37**
Average conservatism Little Trade Lake = **4.9**
Floristic Quality Long Trade Lake = **15**
Floristic Quality Round Lake = **20.04**
Floristic Quality Big Trade Lake = **23.40**
Floristic Quality Little Trade Lake = **15.49**

AQUATIC PLANT MANAGEMENT STRATEGY

Northern Region WDNR
Summer, 2007

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

ISSUES

- Protect desirable native aquatic plants.
- Reduce the risk that invasive species replace desirable native aquatic plants.
- Promote "whole lake" management plans
- Limit the number of permits to control native aquatic plants.

BACKGROUND

As a general rule, the Northern Region has historically taken a protective approach to allow removal of native aquatic plants by harvesting or by chemical herbicide treatment. This approach has prevented lakes in the Northern Wisconsin from large-scale loss of native aquatic plants that represent naturally occurring high quality vegetation. Naturally occurring native plants provide a *diversity of habitat* that *helps maintain water quality*, helps *sustain the fishing* quality known for Northern Wisconsin, supports common lakeshore wildlife from loons to frogs, and helps to provide the *aesthetics* that collectively create the "up-north" appeal of the northwoods lake resources.

In Northern Wisconsin lakes, an inventory of aquatic plants may often find 30 different species or more, whereas a similar survey of a Southern Wisconsin lake may often discover less than half that many species. Historically, similar species diversity was present in Southern Wisconsin, but has been lost gradually over time from stresses brought on by cultural land use changes (such as increased development, and intensive agriculture). Another point to note is that while there may be a greater variety of aquatic vegetation in Northern Wisconsin lakes, the vegetation itself is often *less dense*. This is because northern lakes have not suffered as greatly from nutrients and runoff as have many waters in Southern Wisconsin.

The newest threat to native plants in Northern Wisconsin is from invasive species of aquatic plants. The most common include Eurasian Water Milfoil (EWM) and CurlyLeaf Pondweed (CLP). These species are described as *opportunistic invaders*. This means that these "invaders" benefit where an opening occurs from removal of plants, and without competition from other plants may successfully become established in a lake. Removal of native vegetation not only diminishes the natural qualities of a lake, it *may increase the risk that an invasive species can successfully invade onto the site where native plants have been removed*. There it may more easily establish itself without the native plants to compete against. This concept is easily observed on land where bared soil is quickly taken over by replacement species (often weeds) that crowd in and establish themselves as new occupants of the site. While not a providing a certain guarantee against invasive plants, protecting and allowing the native plants to remain may reduce the success of an invasive species becoming established on a lake. Once established, the invasive species cause far more inconvenience for all lake users, riparian and others included; can change many of the natural features of a lake; and often lead to *expensive annual control plans*. Native vegetation may cause localized concerns to some users, but as a natural feature of lakes, they generally do not cause harm.

To the extent we can maintain the normal growth of native vegetation, Northern Wisconsin lakes can continue to offer the water resource appeal and benefits they've historically provided. A regional position on removal of aquatic plants that carefully recognizes how native aquatic plants benefit lakes in Northern Region can help prevent a gradual decline in the overall quality and recreational benefits that make these lakes attractive to people and still provide abundant fish, wildlife, and northwoods appeal.

GOALS OF STRATEGY:

1. Preserve native species diversity which, in turn, fosters natural habitat for fish and other aquatic species, from frogs to birds.
2. Prevent openings for invasive species to become established in the absence of the native species.
3. Concentrate on a" whole-lake approach" for control of aquatic plants, thereby fostering systematic documentation of conditions and specific targeting of invasive species as they exist.
4. Prohibit removal of wild rice. WDNR – Northern Region will not issue permits to remove wild rice unless a request is subjected to the full consultation process via the Voigt Tribal Task Force. We intend to discourage applications for removal of this ecologically and culturally important native plant.
5. To be consistent with our WDNR Water Division Goals (work reduction/disinvestment), established in 2005, to "not issue permits for chemical or large scale mechanical control of native aquatic plants – develop general permits as appropriate or inform applicants of exempted activities." This process is similar to work done in other WDNR Regions, although not formalized as such.

BASIS OF STRATEGY IN STATE STATUTE AND ADMINISTRATIVE CODE

State Statute 23.24 (2)(c) states:

"The requirements promulgated under par. (a) 4. may specify any of the following:

1. The **quantity** of aquatic plants that may be managed under an aquatic plant management permit.
2. The **species** of aquatic plants that may be managed under an aquatic plant management permit.
3. The **areas** in which aquatic plants may be managed under an aquatic plant management permit.
4. The **methods** that may be used to manage aquatic plants under an aquatic plant management permit.
5. The **times** during which aquatic plants may be managed under an aquatic plant management permit.
6. The **allowable methods** for disposing or using aquatic

plants that are removed or controlled under an aquatic plant management permit.

7. The requirements for plans that the department may require under sub. (3) (b). "

State Statute 23.24(3)(b) states:
"The department may require that an application for an aquatic plant management permit contain a plan for the department's approval as to how the aquatic plants will be introduced, removed, or controlled."

Wisconsin Administrative Code NR 109.04(3)(a) states:
"The department may require that an application for an aquatic plant management permit contain an aquatic plant management plan that describes how the aquatic plants will be introduced, controlled, removed or disposed. Requirements for an aquatic plant management plan shall be made in writing stating the reason for the plan requirement. In deciding whether to require a plan, the department shall consider the potential for effects on protection and development of diverse and stable communities of native aquatic plants, for conflict with goals of other written ecological or lake management plans, for cumulative impacts and effect on the ecological values in the body of water, and the long-term sustainability of beneficial water use activities."

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

APPROACH

1. After January 1, 2009* no individual permits for control of native aquatic plants will be issued. Treatment of native species may be allowed under the auspices of an approved lake management plan, and only if the plan clearly documents "impairment of navigation" and/or "nuisance conditions". Until January 1, 2009, individual permits will be issued to previous permit holders, only with adequate documentation of "impairment of navigation" and/or "nuisance conditions". No new individual permits will be issued during the interim.

2. Control of aquatic plants (if allowed) in documented sensitive areas will follow the conditions specified in the report.

3. Invasive species must be controlled under an approved lake management plan, with two exceptions (these exceptions are designed to allow sufficient time for lake associations to form and subsequently submit an approved lake management plan):
   a. Newly-discovered infestations. If found on a lake with an approved lake management plan, the invasive species can be controlled via an amendment to the approved plan. If found on a lake without an approved management plan, the invasive species can be controlled under the WDNR's Rapid Response protocol (see definition), and the lake owners will be encouraged to form a lake association and subsequently submit a lake management plan for WNDR review and approval.
   b. Individuals holding past permits for control of *invasive* aquatic plants and/or "mixed stands" of native and invasive species will be allowed to treat via individual permit until January 1, 2009 if "impairment of navigation" and/or "nuisance conditions" is adequately documented, unless there is an approved lake management plan for the lake in question.

4. Control of invasive species or "mixed stands" of invasive and native plants will follow current best management practices approved by the Department and contain an explanation of the strategy to be used. Established stands of invasive plants will generally use a control strategy based on Spring treatment. (typically, a water temperature of less than 60 degrees Fahrenheit, or approximately May 31st, annually).

5. Manual removal (see attached definition) is allowed (Admin. Code NR 109.06).

---

* *Exceptions to the Jan. 1, 2009 deadline will be considered only on a very limited basis and will be intended to address unique situations that do not fall within the intent of this approach.*

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

DOCUMENTATION OF IMPAIRED NAVIGATION AND/OR NUISANCE CONDITIONS

Navigation channels can be of two types:

- Common use navigation channel. This is a common navigation route for the general lake user. It often is off shore and connects areas that boaters commonly would navigate to or across, and should be of public benefit.

- Individual riparian access lane. This is an access lane to shore that normally is used by an individual riparian shore owner.

Severe impairment or nuisance will generally mean vegetation grows thickly and forms mats on the water surface. Before issuance of a permit to use a regulated control method, a riparian will be asked to document the problem and show what efforts or adaptations have been made to use the site. (This is currently required in NR 107 and on the application form, but the following helps provide a specific description of what impairments exist from native plants).

Documentation of *impairment of navigation* by native plants must include:

a. Specific locations of navigation routes (preferably with GPS coordinates)
b. Specific dimensions in length, width, and depth
c. Specific times when plants cause the problem and how long the problem persists
d. Adaptations or alternatives that have been considered by the lake shore user to avoid or lessen the problem
e. The species of plant or plants creating the nuisance (documented with samples or a from a Site inspection)

Documentation of the *nuisance* must include:

a. Specific periods of time when plants cause the problem, e.g. when does the problem start and when does it go away.
b. Photos of the nuisance are encouraged to help show what uses are limited and to show the severity of the problem.
c. Examples of specific activities that would normally be done where native plants occur naturally on a site but can not occur because native plants have become a nuisance.

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

DEFINITIONS

Manual removal:	Removal by hand or hand-held devices without the use or aid of external or auxiliary power. Manual removal cannot exceed 30 ft. in width and can only be done where the shore is being used for a dock or swim raft. The 30 ft. wide removal zone cannot be moved, relocated, or expanded with the intent to gradually increase the area of plants removed. Wild rice may not be removed under this waiver.
Native aquatic plants:	Aquatic plants that are indigenous to the waters of this state.
Invasive aquatic plants:	Non-indigenous species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
Sensitive area:	Defined under s. NR 107.05(3)(i) (sensitive areas are areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the body of water).
Rapid Response protocol:	This is an internal WDNR document designed to provide guidance for grants awarded under NR 198.30 (Early Detection and Rapid Response Projects). These projects are intended to control pioneer infestations of aquatic invasive species before they become established.

Management Options for Aquatic Plants

Updated Oct 2006

Option	Permit Needed?	How it Works	PROS	CONS
No management	N	Do not actively manage plants	Minimizing disturbance can protect native species that provide habitat for aquatic fauna, reduce shoreline erosion, may improve water clarity, and may limit spread of invasive species	May allow small population of invasive plants to become larger, more difficult to control later
			No financial cost	Excessive plant growth can hamper navigation and recreational lake use
			No system disturbance	May require modification of lake users' behavior and perception
			No unintended effects of chemicals	
			Permit not required	
Mechanical Control	May be required under NR 109	Plants reduced by mechanical means	Flexible control	Must be repeated, often more than once per season
		Wide range of techniques, from manual to highly mechanized	Can balance habitat and recreational needs	Can suspend sediments and increase turbidity and nutrient release
a. Handpulling/Manual raking	Y/N	SCUBA divers or snorkelers remove plants by hand or plants are removed with a rake	Little to no damage done to lake or to native plant species	Very labor intensive
		Works best in soft sediments	Can be highly selective	Needs to be carefully monitored
			Can be done by shoreline property owners without permits within an area <30 ft wide OR where selectively removing exotics	Roots, runners, and even fragments of some species, particularly Eurasian watermilfoil (EWM) will start new plants, so all of plant must be removed
			Can be very effective at removing problem plants, particularly following early detection of an invasive exotic species	Small-scale control only

Management Options for Aquatic Plants

Updated Oct 2006

Option	Permit Needed?	How it Works	PROS	CONS
b. Harvesting	Y	Plants are "mowed" at depths of 2-5 ft, collected with a conveyor and off-loaded onto shore	Immediate results	Not selective in species removed
		Harvest invasives only if invasive is already present throughout the lake	EWM removed before it has the opportunity to autofragment, which may create more fragments than created by harvesting	Fragments of vegetation can re-root
			Usually minimal impact to lake ecology	Can remove some small fish and reptiles from lake
			Harvested lanes through dense weed beds can increase growth and survival of some fish	Initial cost of harvester expensive
			Can remove some nutrients from lake	
Biological Control	Y	Living organisms (e.g. insects or fungi) eat or infect plants	Self-sustaining; organism will over-winter, resume eating its host the next year	Effectiveness will vary as control agent's population fluctates
			Lowers density of problem plant to allow growth of natives	Provides moderate control - complete control unlikely
				Control response may be slow
				Must have enough control agent to be effective
a. Weevils on EWM	Y	Native weevil prefers EWM to other native water-milfoil	Native to Wisconsin: weevil cannot "escape" and become a problem	Need to stock large numbers, even if some already present
			Selective control of target species	Need good habitat for overwintering on shore (leaf litter) associated with undeveloped shorelines
			Longer-term control with limited management	Bluegill populations decrease densities through predation

Management Options for Aquatic Plants

Updated Oct 2006

	Option	Permit Needed?	How it Works	PROS	CONS
b.	Pathogens	Y	Fungal, bacterial, or viral pathogen introduced to target species to induce mortalitiy	May be species specific May provide long-term control Few dangers to humans or animals	Largely experimental; effectiveness and longevity unknown Possible side effects not understood
c.	Allelopathy	Y	Aquatic plants release chemical compounds that inhibit other plants from growing	May provide long-term, maintenance-free control Spikerushes (*Eleocharis* spp.) appear to inhibit Eurasian watermilfoil growth	Initial transplanting slow and labor-intensive Spikerushes native to WI, and have not effectively limited EWM growth Wave action along shore makes it difficult to establish plants; plants will not grow in deep or turbid water
d.	Native plantings	Y	Diverse native plant community established to compete with invasive species	Native plants provide food and habitat for aquatic fauna Diverse native community more repellant to invasive species	Initial transplanting slow and labor-intensive Nuisance invasive plants may outcompete plantings Transplants from another lake or nursery may unintentionally introduce invasive species Largely experimental; few well-documented cases

Management Options for Aquatic Plants

Updated Oct 2006

Option	Permit Needed?	How it Works	PROS	CONS
Physical Control	Required under Ch. 30 / NR 107	Plants are reduced by altering variables that affect growth, such as water depth or light levels		
a. Fabrics/ Bottom Barriers	Y	Prevents light from getting to lake bottom	Reduces turbidity in soft-substrate areas Useful for small areas	Eliminates all plants, including native plants important for a healthy lake ecosystem May inhibit spawning by some fish Need maintenance or will become covered in sediment and ineffective Gas accumulation under blankets can cause them to dislodge from the bottom Affects benthic invertebrates Anaerobic environment forms that can release excessive nutrients from sediment
b. Drawdown	Y, May require Environmental Assessment	Lake water lowered with siphon or water level control device; plants killed when sediment dries, compacts or freezes Season or duration of drawdown can change effects	Winter drawdown can be effective at restoration, provided drying and freezing occur. Sediment compaction is possible over winter Summer drawdown can restore large portions of shoreline and shallow areas as well as provide sediment compaction Emergent plant species often rebound near shore providing fish and wildlife habitat, sediment stabilization, and increased water quality Success demonstrated for reducing EWM, variable success for curly-leaf pondweed (CLP) Restores natural water fluctuation important for all aquatic ecosystems	Plants with large seed bank or propagules that survive drawdown may become more abundant upon refilling May impact attached wetlands and shallow wells near shore Species growing in deep water (e.g. EWM) that survive may increase, particularly if desirable native species are reduced Can affect fish, particularly in shallow lakes if oxygen levels drop or if water levels are not restored before spring spawning Winter drawdawn must start in early fall or will kill hibernating reptiles and amphibians Navigation and use of lake is limited during drawdown

Management Options for Aquatic Plants

Updated Oct 2006

	Option	Permit Needed?	How it Works	PROS	CONS
c.	Dredging	Y	Plants are removed along with sediment Most effective when soft sediments overlay harder substrate For extremely impacted systems Extensive planning required	Increases water depth Removes nutrient rich sediments Removes soft bottom sediments that may have high oxygen demand	Severe impact on lake ecosystem Increases turbidity and releases nutrients Exposed sediments may be recolonized by invasive species Sediment testing may be necessary Removes benthic organisms Dredged materials must be disposed of
d.	Dyes	Y	Colors water, reducing light and reducing plant and algal growth	Impairs plant growth without increasing turbidity Usually non-toxic, degrades naturally over a few weeks.	Appropriate for very small water bodies Should not be used in pond or lake with outflow Impairs aesthetics Effects to microscopic organisms unknown
e.	Non-point source nutrient control	N	Runoff of nutrients from the watershed are reduced (e.g. by controlling construction erosion or reducing fertilizer use) thereby providing fewer nutrients available for plant growth	Attempts to correct source of problem, not treat symptoms Could improve water clarity and reduce occurrences of algal blooms Native plants may be able to better compete with invasive species in low-nutrient conditions	Results can take years to be evident due to internal recycling of already-present lake nutrients Requires landowner cooperation and regulation Improved water clarity may increase plant growth

Management Options for Aquatic Plants

Updated Oct 2006

Option	Permit Needed?	How it Works	PROS	CONS
Chemical Control	Required under NR 107	Granules or liquid chemicals kill plants or cease plant growth; some chemicals used primarily for algae	Some flexibility for different situations	Possible toxicity to aquatic animals or humans, especially applicators
		Results usually within 10 days of treatment, but repeat treatments usually needed	Some can be selective if applied correctly	Often affect desirable plant species that are important to lake ecology and compete with invasive species
		Chemicals must be used in accordance with label guidelines and restrictions	Can be used for restoration activities	Treatment set-back requirements from potable water sources and/or drinking water use restrictions after application, usually based on concentration
				May cause severe drop in dissolved oxygen causing fish kill, depends on plant biomass killed, temperatures and lake size and shape
				Often controversial
a. 2,4-D (e.g. Weedar, Navigate)	Y	Systemic[1] herbicide selective to broadleaf[2] plants that inhibits cell division in new tissue	Moderately to highly effective, especially on EWM	May cause oxygen depletion after plants die and decompose
		Applied as liquid or granules during early growth phase	Monocots, such as pondweeds (e.g. CLP) and many other native species not affected.	May affect native dicots such as water lilies and coontail
			Can be used in synergy with endotholl for early season CLP and EWM treatments	Cannot be used in combination with copper herbicides (used for algae)
			Can be selective depending on concentration and seasonal timing	Toxic to fish
			Widely used aquatic herbicide	

Management Options for Aquatic Plants

Updated Oct 2006

	Option	Permit Needed?	How it Works	PROS	CONS
b.	Endothall (e.g. Aquathol)	Y	Broad-spectrum[3], contact[4] herbicide that inhibits protein synthesis Applied as liquid or granules	Especially effective on CLP and also effective on EWM May be effective in reducing reestablishment of CLP if reapplied several years in a row in early spring Can be selective depending on concentration and seasonal timing Can be combined with 2,4-D for early season CLP and EWM treatments, or with copper compounds Limited off-site drift	Affects many native pondweeds Not as effective in dense plant beds; heavy vegetation requires multiple treatments Not to be used in water supplies; post-treatment restriction on irrigation Toxic to aquatic fauna (to varying degrees)
c.	Diquat (e.g. Reward)	Y	Broad-spectrum, contact herbicide that disrupts cellular functioning Applied as liquid, can be combined with copper treatment	Mostly used for water-milfoil and duckweed Rapid action Limited direct toxicity on fish and other animals	May affect non-target plants, especially native pondweeds, coontail, elodea, naiads Toxic to aquatic invertebrates Must be reapplied several years in a row Ineffective in muddy or cold water (<50°F)

Management Options for Aquatic Plants

Updated Oct 2006

	Option	Permit Needed?	How it Works	PROS	CONS
d.	Fluridone (e.g. Sonar or Avast)	Y; special permit and Environmental Assessment may be required	Broad-spectrum, systemic herbicide that inhibits photosynthesis	Effective on EWM for 1 to 4 years with aggressive follow-up treatments	Affects native milfoils, coontails, elodea, and naiads, even at low concentrations
			Must be applied during early growth stage	Some reduction in non-target effects can be achieved by lowering dosage	Requires long contact time: 60-90 days
			Available with a special permit only; chemical applications beyond 150 ft from shore not allowed under NR 107	Slow decomposition of plants may limit decreases in dissolved oxygen	Often decreases water clarity, particularly in shallow eutrophic systems
			Applied at very low concentration at whole lake scale	Low toxicity to aquatic animals	Demonstrated herbicide resistance in hydrilla subjected to repeat treatments
					Unknown effect of repeat whole-lake treatments on lake ecology
e.	Glyphosate (e.g. Rodeo)	Y	Broad-spectrum, systemic herbicide that disrupts enzyme formation and function	Effective on floating and emergent plants	RoundUp is often illegally substituted for Rodeo; surfactants in RoundUp believed to be toxic to reptiles and amphibians
			Usually used for purple loosestrife stems or cattails	Selective if carefully applied to individual plants	Cannot be used near potable water intakes
			Applied as liquid spray or painted on loosestrife stems	Non-toxic to most aquatic animals at recommended dosages	Ineffective in muddy water
				Effective control for 1-5 years	No control of submerged plants

Management Options for Aquatic Plants

Updated Oct 2006

	Option	Permit Needed?	How it Works	PROS	CONS
f.	Triclopyr (e.g. Renovate)	Y	Systemic herbicide selective to broadleaf plants that disrupts enzyme function	Effective on many emergent and floating plants	Impacts may occur to some native plants at higher doses (e.g. coontail)
			Applied as liquid spray or liquid	Most effective on dicots, such as purple loosestrife; may be more effective than glyphosate	May be toxic to sensitive invertebrates at higher concentrations
				Control of target plants occurs in 3-5 weeks	Retreatment opportunities may be limited due to maximum seasonal rate (2.5 ppm)
				Low toxicity to aquatic animals	Sensitive to UV light; sunlight can break herbicide down prematurely
				No recreational use restrictions following treatment	Relatively new management option for aquatic plants (since 2003)
g.	Copper compounds (e.g. Cutrine Plus)	Y	Broad-spectrum, systemic herbicide that prevents photosynthesis	Reduces algal growth and increases water clarity	Elemental copper accumulates and persists in sediments
			Used to control planktonic and filamentous algae	No recreational or agricultural restrictions on water use following treatment	Short-term results
			Wisconsin allows small-scale control only	Herbicidal action on hydrilla, an invasive plant not yet present in Wisconsin	Long-term effects of repeat treatments to benthic organisms unknown
					Toxic to invertebrates, trout and other fish, depending on the hardness of the water
					Clear water may increase plant growth

[1]Systemic herbicide - Must be absorbed by the plant and moved to the site of action. Often slower-acting than contact herbicides.
[2]Broadleaf herbicide - Affects only dicots, one of two groups of plants. Aquatic dicots include waterlilies, bladderworts, watermilfoils, and coontails.
[3]Broad-spectrum herbicide - Affects both monocots and dicots.
[4]Contact herbicide - Unable to move within the plant; kills only plant tissue it contacts directly.

This document is intended to be a guide to available aquatic plant control techniques, and is not necessarily an exhaustive list.
References to registered products are for your convenience and not intended as an endorsement or criticism of that product versus other similar products.
Specific effects of herbicide treatment contingent on usage within label guidelines and in accordance with all applicable laws.
Please contact your local Aquatic Plant Management Specialist when considering a permit.

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

Chapter NR 109

AQUATIC PLANTS: INTRODUCTION, MANUAL REMOVAL AND MECHANICAL CONTROL REGULATIONS

NR 109.01 Purpose.
NR 109.02 Applicability.
NR 109.03 Definitions.
NR 109.04 Application requirements and fees.
NR 109.05 Permit issuance.
NR 109.06 Waivers.
NR 109.07 Invasive and nonnative aquatic plants.
NR 109.08 Prohibitions.
NR 109.09 Plan specifications and approval.
NR 109.10 Other permits.
NR 109.11 Enforcement.

NR 109.01 Purpose. The purpose of this chapter is to establish procedures and requirements for the protection and regulation of aquatic plants pursuant to ss. 23.24 and 30.07, Stats. Diverse and stable communities of native aquatic plants are recognized to be a vital and necessary component of a healthy aquatic ecosystem. This chapter establishes procedures and requirements for issuing aquatic plant management permits for introduction of aquatic plants or control of aquatic plants by manual removal, burning, use of mechanical means or plant inhibitors. This chapter identifies other permits issued by the department for aquatic plant management that contain the appropriate conditions as required under this chapter for aquatic plant management, and for which no separate permit is required under this chapter. Introduction and control of aquatic plants shall be allowed in a manner consistent with sound ecosystem management, shall consider cumulative impacts, and shall minimize the loss of ecological values in the body of water. The purpose of this chapter is also to prevent the spread of invasive and non−native aquatic organisms by prohibiting the launching of watercraft or equipment that has any aquatic plants or zebra mussels attached.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03; **correction made under s. 13.92 (4) (b) 7., Stats., Register March 2011 No. 663.**

NR 109.02 Applicability. A person sponsoring or conducting manual removal, burning or using mechanical means or aquatic plant inhibitors to control aquatic plants in navigable waters, or introducing non−native aquatic plants to waters of this state shall obtain an aquatic plant management permit from the department under this chapter.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.03 Definitions. In this chapter:

(1) "Aquatic community" means lake or river biological resources.

(2) "Beneficial water use activities" mean angling, boating, swimming or other navigational or recreational water use activity.

(3) "Body of water" means any lake, river or wetland that is a water of this state.

(4) "Complete application" means a completed and signed application form, the information specified in s. NR 109.04 and any other information which may reasonably be required from an applicant and which the department needs to make a decision under applicable provisions of law.

(5) "Department" means the Wisconsin department of natural resources.

(6) "Manual removal" means the control of aquatic plants by hand or hand−held devices without the use or aid of external or auxiliary power.

(7) "Navigable waters" means those waters defined as navigable under s. 30.10, Stats.

(8) "Permit" means aquatic plant management permit.

(9) "Plan" means aquatic plant management plan.

(10) "Wetlands" means an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.04 Application requirements and fees. (1) Permit applications shall be made on forms provided by the department and shall be submitted to the regional director or designee for the region in which the project is located. Permit applications for licensed aquatic nursery growers may be submitted to the department of agriculture, trade and consumer protection.

Note: Applications may be obtained from the department's regional headquarters or service centers. DATCP has agreed to send application forms and instructions provided by the department to aquatic nursery growers along with license renewal forms. DATCP will forward all applications to the department for processing.

(2) The application shall be accompanied by all of the following unless the application is made by licensed aquatic nursery growers for selective harvesting of aquatic plants for nursery stock. Applications made by licensed aquatic nursery growers for harvest of nursery stock do not have to include the information required by par. (d), (e), (h), (i) or (j).

(a) A nonrefundable application fee. The application fee for an aquatic plant management permit is:

1. $30 for a proposed project to manage aquatic plants on less than one acre.

2. $30 per acre to a maximum of $300 for a proposed project to manage aquatic plants on one acre or larger. Partial acres shall be rounded up to the next full acre for fee determination. An annual renewal of this permit may be requested with an additional application fee of one−half the original application fee, but not less than $30.

(b) A legal description of the body of water including township, range and section number.

(c) One copy of a detailed map of the body of water with the proposed introduction or control area dimensions clearly shown. Private individuals doing plant introduction or control shall provide the name of the owner riparian to the management area, which includes the street address or block, lot and fire number where available and local telephone number or other pertinent information necessary to locate the property.

(d) One copy of any existing aquatic management plan for the body of water, or detailed reference to the plan, citing the plan references to the proposed introduction or control area, and a description of how the proposed introduction or control of aquatic plants is compatible with any existing plan.

(e) A description of the impairments to water use caused by the aquatic plants to be managed.

(f) A description of the aquatic plants to be controlled or removed.

(g) The type of equipment and methods to be used for introduction, control or removal.

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

(h) A description of other introduction or control methods considered and the justification for the method selected.

(i) A description of any other method being used or intended for use for plant management by the applicant or on the area abutting the proposed management area.

(j) The area used for removal, reuse or disposal of aquatic plants.

(k) The name of any person or commercial provider of control or removal services.

(3) (a) The department may require that an application for an aquatic plant management permit contain an aquatic plant management plan that describes how the aquatic plants will be introduced, controlled, removed or disposed. Requirements for an aquatic plant management plan shall be made in writing stating the reason for the plan requirement. In deciding whether to require a plan, the department shall consider the potential for effects on protection and development of diverse and stable communities of native aquatic plants, for conflict with goals of other written ecological or lake management plans, for cumulative impacts and effect on the ecological values in the body of water, and the long−term sustainability of beneficial water use activities.

(b) Within 30 days of receipt of the plan, the department shall notify the applicant of any additional information or modifications to the plan that are required. If the applicant does not submit the additional information or modify the plan as requested by the department, the department may dismiss the aquatic plant management permit application.

(c) The department shall approve the aquatic plant management plan before an application may be considered complete.

(4) The permit sponsor may request an annual renewal in writing from the department under s. NR 109.05 if there is no change proposed in the conditions of the original permit issued.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.05 Permit issuance. (1) The department shall issue or deny issuance of the requested permit within 15 working days after receipt of a completed application and approved plan as required under s. NR 109.04 (3).

(2) The department may specify any of the following as conditions of the permit:

(a) The quantity of aquatic plants that may be introduced or controlled.

(b) The species of aquatic plants that may be introduced or controlled.

(c) The areas in which aquatic plants may be introduced or controlled.

(d) The methods that may be used to introduce or control aquatic plants.

(e) The times during which aquatic plants may be introduced or controlled.

(f) The allowable methods used for disposing of or using aquatic plants that are removed or controlled.

(g) Annual or other reporting requirements to the department that may include information related to pars. (a) to (f).

(3) The department may deny issuance of the requested permit if the department determines any of the following:

(a) Aquatic plants are not causing significant impairment of beneficial water use activities.

(b) The proposed introduction or control will not remedy the water use impairments caused by aquatic plants as identified as a part of the application in s. NR 109.04 (2) (e).

(c) The proposed introduction or control will result in a hazard to humans.

(d) The proposed introduction or control will cause significant adverse impacts to threatened or endangered resources.

(e) The proposed introduction or control will result in a significant adverse effect on water quality, aquatic habitat or the aquatic community including the native aquatic plant community.

(f) The proposed introduction or control is in locations identified by the department as sensitive areas, under s. NR 107.05 (3) (i) 1., except when the applicant demonstrates to the satisfaction of the department that the project can be conducted in a manner that will not alter the ecological character or reduce the ecological value of the area.

(g) The proposed management will result in significant adverse long−term or permanent changes to a plant community or a high value species in a specific aquatic ecosystem. High value species are individual species of aquatic plants known to offer important values in specific aquatic ecosystems, including Potamogeton amplifolius, Potamogeton Richardsonii, Potamogeton praelongus, Stuckenia pectinata (Potamogeton pectinatus), Potamogeton illinoensis, Potamogeton robbinsii, Eleocharis spp., Scirpus spp., Valisneria spp., Zizania spp., Zannichellia palustris and Brasenia schreberi.

(h) If wild rice is involved, the stipulations incorporated by *Lac Courte Oreilles v. Wisconsin*, 775 F. Supp. 321 (W.D. Wis. 1991) shall be complied with.

(i) The proposed introduction or control will interfere with the rights of riparian owners.

(j) The proposed management is inconsistent with a department approved aquatic plant management plan for the body of water.

(4) The department may approve the application in whole or in part consistent with the provisions of sub. (3). A denial shall be in writing stating the reasons for the denial.

(5) (a) The department may issue an aquatic plant management permit on less than one acre in a single riparian area for a 3−year term.

(b) The department may issue an aquatic plant management permit for a one−year term for more than one acre or more than one riparian area. The permit may be renewed annually for up to a total of 3 years in succession at the written request of the permit holder, provided no modifications or changes are made from the original permit.

(c) The department may issue an aquatic plant management permit containing a department−approved plan for a 3 to 5 year term.

(d) The department may issue an aquatic plant management permit to a licensed nursery grower for a 3−year term for the harvesting of aquatic plants from a publicly owned lake bed or for a 5−year term for harvesting of aquatic plants from privately owned beds with the permission of the property owner.

(6) The approval of an aquatic plant management permit does not represent an endorsement of the permitted activity, but represents that the applicant has complied with all criteria of this chapter.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03; reprinted to restore dropped language from rule order, Register October 2003 No. 574.

NR 109.06 Waivers. The department waives the permit requirements under this chapter for any of the following:

(1) Manual removal or use of mechanical devices to control or remove aquatic plants from a body of water 10 acres or less that is entirely confined on the property of one person with the permission of that property owner.

Note: A person who introduces native aquatic plants or removes aquatic plants by manual or mechanical means in the course of operating an aquatic nursery as authorized under s. 94.10, Stats., on privately owned non−navigable waters of the state is not required to obtain a permit for the activities.

(2) A riparian owner who manually removes aquatic plants from a body of water or uses mechanical devices designed for cutting or mowing vegetation to control plants on an exposed lake bed that abuts the owner's property provided that the removal meets all of the following:

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

(a) 1. Removal of native plants is limited to a single area with a maximum width of no more than 30 feet measured along the shoreline provided that any piers, boatlifts, swimrafts and other recreational and water use devices are located within that 30−foot wide zone and may not be in a new area or additional to an area where plants are controlled by another method; or

2. Removal of nonnative or invasive aquatic plants as designated under s. NR 109.07 when performed in a manner that does not harm the native aquatic plant community; or

3. Removal of dislodged aquatic plants that drift on−shore and accumulate along the waterfront.

(b) Is not located in a sensitive area as defined by the department under s. NR 107.05 (3) (i) 1., or in an area known to contain threatened or endangered resources or floating bogs.

(c) Does not interfere with the rights of other riparian owners.

(d) If wild rice is involved, the procedures of s. NR 19.09 (1) shall be followed.

(4) Control of purple loosestrife by manual removal or use of mechanical devices when performed in a manner that does not harm the native aquatic plant community or result in or encourage re−growth of purple loosestrife or other nonnative vegetation.

(5) Any aquatic plant management activity that is conducted by the department and is consistent with the purposes of this chapter.

(6) Manual removal and collection of native aquatic plants for lake study or scientific research when performed in a manner that does not harm the native aquatic plant community.

Note: Scientific collectors permit requirements are still applicable.

(7) Incidental cutting, removal or destroying of aquatic plants when engaged in beneficial water use activities.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.07 Invasive and nonnative aquatic plants. (1) The department may designate any aquatic plant as an invasive aquatic plant for a water body or a group of water bodies if it has the ability to cause significant adverse change to desirable aquatic habitat, to significantly displace desirable aquatic vegetation, or to reduce the yield of products produced by aquaculture.

(2) The following aquatic plants are designated as invasive aquatic plants statewide: Eurasian water milfoil, curly leaf pondweed and purple loosestrife.

(3) Native and nonnative aquatic plants of Wisconsin shall be determined by using scientifically valid publications and findings by the department.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.08 Prohibitions. (1) No person may distribute an invasive aquatic plant, under s. NR 109.07.

(2) No person may intentionally introduce Eurasian water milfoil, curly leaf pondweed or purple loosestrife into waters of this state without the permission of the department.

(3) No person may intentionally cut aquatic plants in public/navigable waters without removing cut vegetation from the body of water.

(4) (a) No person may place equipment used in aquatic plant management in a navigable water if the person has reason to believe that the equipment has any aquatic plants or zebra mussels attached.

(b) This subsection does not apply to equipment used in aquatic plant management when re−launched on the same body of water without having visited different waters, provided the re−launching will not introduce or encourage the spread of existing aquatic species within that body of water.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.09 Plan specifications and approval. (1) Applicants required to submit an aquatic plant management plan, under s. NR 109.04 (3), shall develop and submit the plan in a format specified by the department.

(2) The plan shall present and discuss each of the following items:

(a) The goals and objectives of the aquatic plant management and protection activities.

(b) A physical, chemical and biological description of the waterbody.

(c) The intensity of water use.

(d) The location of aquatic plant management activities.

(e) An evaluation of chemical, mechanical, biological and physical aquatic plant control methods.

(f) Recommendations for an integrated aquatic plant management strategy utilizing some or all of the methods evaluated in par. (e).

(g) An education and information strategy.

(h) A strategy for evaluating the efficacy and environmental impacts of the aquatic plant management activities.

(i) The involvement of local units of government and any lake organizations in the development of the plan.

(3) The approval of an aquatic plant management plan does not represent an endorsement for plant management, but represents that adequate considerations in planning the actions have been made.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.10 Other permits. Permits issued under s. 30.12, 30.20, 31.02 or 281.36, Stats., or under ch. NR 107 may contain provisions which provide for aquatic plant management. If a permit issued under one of these authorities contains the appropriate conditions as required under this chapter for aquatic plant management, a separate permit is not required under this chapter. The permit shall explicitly state that it is intended to comply with the substantive requirements of this chapter.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.11 Enforcement. (1) Violations of this chapter may be prosecuted by the department under chs. 23, 30 and 31, Stats.

(2) Failure to comply with the conditions of a permit issued under or in accordance with this chapter may result in cancellation of the permit and loss of permit privileges for the subsequent year. Notice of cancellation or loss of permit privileges shall be provided by the department to the permit holder.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

Appendix B

2011 Update: Purple Loosestrife Monitoring in Polk County

Amy Kelsey, Eric Wojchik, Katelin Holm, and Lisa LaBlanc

2011 Update Purple Loosestrife Monitoring in Polk County

Amy Kelsey, Eric Wojchik, and Katelin Holm
Lisa LaBlanc - Intern 2006
Polk County Land and Water Resources Department
100 Polk County Plaza, Suite 120
Balsam Lake, WI 54810
715-485-8699
ericw@co.polk.wi.us

Purple loosestrife has been present in Polk County for many years. An elaborate inventory was conducted in 2000 to understand its presence and try to reduce its spread. Sites were also prioritized for control of the infestations. Several sites were re-evaluated in 2005 to see if control had been effective and to re-attempt control measures.

Galerucella beetles were reared at two stations in 2005 to release at various sites. Density counts were conducted at sites that were known to previously have purple loosestrife.

There were 9 major problematic areas in the county according to the 2001 report. In 2005, there were also 9 known sites with purple loosestrife. We found 2 new purple loosestrife infestations. Three sites inventoried that were previously known to have purple loosestrife did not have loosestrife found. Four sites had no documented change. Further inspection is needed at three of the sites to determine the status of the infestation. Beetles were released at 4 infested sites. Chemicals were used for removal at 2 sites.

Monitoring in 2006 took place by LWRD intern Lisa LaBlanc. Findings for this year are listed according to site. Not all sites listed were evaluated in 2006. Ten sites were evaluated. One new location was documented on Horseshoe Lake, this site was not mapped with GPS it was just listed in her field notes.

An AIS grant in 2009 allowed for additional monitoring of known Purple Loosestrife sites and identification and control of new Purple Loosestrife infestations countywide. There were 20 new locations of loosestrife mapped (18 in 2010 and 2 in 2011). Most of the new locations in 2010 and 2011 were pioneer plants. These plants were controlled immediately by cutting the flowers, bagging them and treating with either Habitat or Rodeo herbicide. A listing of the new sites identified in 2010 and 2011 can be found on page 14.

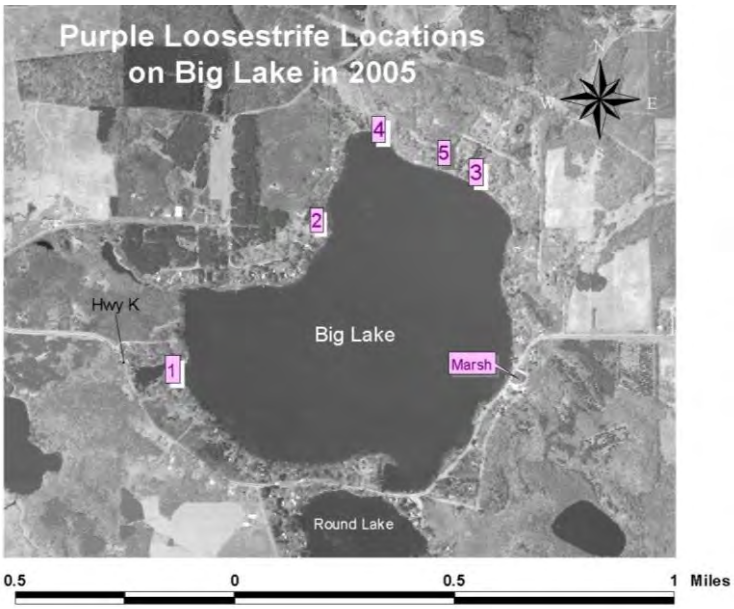
16 SITES INSPECTED IN 2005
10-16 NEW SITES FOUND IN 2010
11-16 NEW SITES FOUND IN 2011
N
W
E
S
11-1
10-15
10-11
9
10
7
11-2
11
8
12
10-12
10-13
6
10-16
10-17
10-1
10-2
5
10-4
3
10-5
4
13
10-18
10-14
2
1
10-9
10-3

Description of Sites and Enumeration

Site 1 – Big Lake - 2005

Big Lake has several areas of infestation around the lake. The 2000 survey documented 7 different locations, with two locations (southeast and south) being removed because of successful biocontrol. Beetles were released in the north adjacent to the channel flowing through the marsh.

Areas of infestation on Big Lake include the west, south hook, east, and east at County K. On the west side of the lake (on the south end of the bay), four clumps of loosestrife were observed at Location 1. The stem density was 34 plants per square meter with herbivory at 20%. Ten beetles were seen at the west site although none were released in 2005. A few stalks were also observed on the north end of the bay.



Location 2 at the west end was not enumerated because the plant species needed to be determined. It did turn out to be purple loosestrife, but the stems were reddish with 3 whorled leaves.

Location 4 on the north end of the lake had several clumps of loosestrife. On the west side of the channel, 19 stems per square meter were counted with herbivory at 10% and 25%. The east side of the channel had 37 stems per square meter with herbivory estimated at 10-20%.

Location 5 had smaller clumps every 3 to 5 feet with 10-15% herbivory.

Location 3 on the east end had 7 stalks per square meter. One beetle was seen with 5% herbivory. The difficult-to-distinguish loosestrife was also present.

The south hook did not allow access because of the dense macrophytes, but purple was observed. Further observation is warranted. Purple loosestrife infestation was

observed in the marsh south of Highway K in the southeast edge of the lake. This will be a release site for 2006.

Progress Report 2006-LL

Big Lake

-The north wetland has approximately three huge clumps of P.L. by the dock or bridge.
-On the east side of the lake, there is P.L. in front of a new or remodeled red house in the wetlands. There are approximately 30-40 plants there. There is beetle damage on the leaves.
-By the boat landing on big lake, south of the road in the wetlands there are approximately one to two small clumps.

Progress Report 2010-EW

Big Lake infestations continue to expand. New locations were observed on Round Lake on the north, west and south shorelines. Most of these were single plants. However the fact remains Purple Loosestrife is expanding in this area in spite of lake association efforts to manage it.

Beetles were reared privately by a Big Lake resident to be released at the Marsh location on Cty Rd K. This site was fall sprayed in 2009. The herbicide treatment was funded by the lake association. This landowner elected to raise beetles in an effort to suppress new growth following the herbicide treatment. Much of the stand returned in 2010 and little success could be observed in the season of beetle introduction.

Progress Report 2011-KH

Landowners reared and released beetles in 2011 and also sprayed wetland.

Site 2 – Magnor Lake - 2005

Magnor Lake also has a volunteer who raised beetles. Work dates were arranged to cut and apply chemicals. The purple loosestrife is present in wetlands along the roadside. Three sites were evaluated. The sites were along the north end of the lake on Magnor Lake Lane, but the exact position is not known. Location 1 had a density of 10 stalks per square meter with minimal to moderate herbivory (10-25%). One beetle was found. Plants were flowering, but not as much as plants without herbivory. Several loner plants were found in the immediate area.

Location 2 (east of Location 1 by the telephone pole) had an average density of 6 stalks per square meter. Plants near the road had greater herbivory (50%) than plants towards the middle of the marsh (10%). No beetles were found, but bumblebees were pollinating the flowers. Several loner plants were in the immediate area.

Location 3 at the east corner of the marsh was a 30'x60' area of very healthy plants. The density is about 20+ stalks per square meter. Very little herbivory was present with tall, healthy flowers. Some plants were spreading to the nearby woods.

Progress Report 2006-LL

Magnor Lake

-There were no P.L. in the sites from last year, but on 20th St., there was one moderate size plant in the middle of the wetland area.

Progress Report 2010-EW

Approximate Loosestrife location on 85th Ave was visited. No loosestrife was obvious. However it was a little early for flowering. Wetland was investigated and no plants were found. It is not known if Magnor lake residents are still raising beetles for release in this area.

One plant was found in a large marsh on the west side of 20th Street. This plant was not flowering and appeared to be a young plant. No purple flowers were observed in that marsh, however it is very likely to be in this wetland due to finding one plant. In the interest of time and due to property access difficulties this area was not thoroughly investigated in 2010.

Site 3 – Highway intersection at Turtle Lake – 2005

New Site in 2005. Barron County Soil and Water Conservation Department has been active in removing purple loosestrife in the Turtle Lake area in Barron County. Many of their small ponds and wetland areas have been disturbed and grow loosestrife. Several locations along the highway were found to have new establishments of purple loosestrife scattered along the ditches. These plants were removed and sprayed with Rodeo. Plants ranged from 1-20 stalks per plant. It was noted that on the east side of the fence along Hwy 63 [by the race car track] that plants were large and healthy with about 50+ stalks. No herbivory was noted. This will be a site for biocontrol in 2006.

Progress Report 2006-LL

<u>Hwy 8 & 63, Turtle Lake</u>

-3 small plants found in the median on the corner of 8 and 63.

Progress Report 2010-EW

This site has expanded significantly. In 2010 Purple Loosestrife was observed, mapped and intensely treated at this location. The 2010 infestation included all the points located on the map from 2005 (located above) but also extended East in the north ditch of Hwy 8 from Cty Rd T to the Barron County line. All plants flowers in the Right-of-Way were cut and bagged and treated with herbicide. The infestation was seen to be encroaching on the shoreline of the un-named pond on the North side of Hwy 8 west of the implement dealer. This will be a site of interest in the future.

Site 4 – Amery and Apple River - 2005

Several sites were listed in Amery and along the Apple River in the 2000 survey. However, addresses and descriptions were scarce. Lack of information did not allow us to return to these sites. Five sites were removed from the original list because of control. One site is listed as active, described as "north of the red house on the stumps". This site was found in 2002 and treated with Rodeo. Volunteers are active along the Apple River with purple loosestrife removal. Careful inspection will be given to the Apple River in the summer of 2006.

Progress Report 2010-EW

This site was not evaluated in 2010.

Site 5 – Intersection of Hwy 8 and Hwy 46 - 2005

New Site in 2005. A few plants were noticed during inspections, two plants with three stalks each. Plants were cut and sprayed with Rodeo. No other loosestrife was found in the area.

Progress Report 2006-LL

Hwy 8 & 46

-No P.L. found in this area

Progress Report 2010-EW

No plants were observed at this location in 2010.

Site 6 – White Ash Lake Channel - 2005

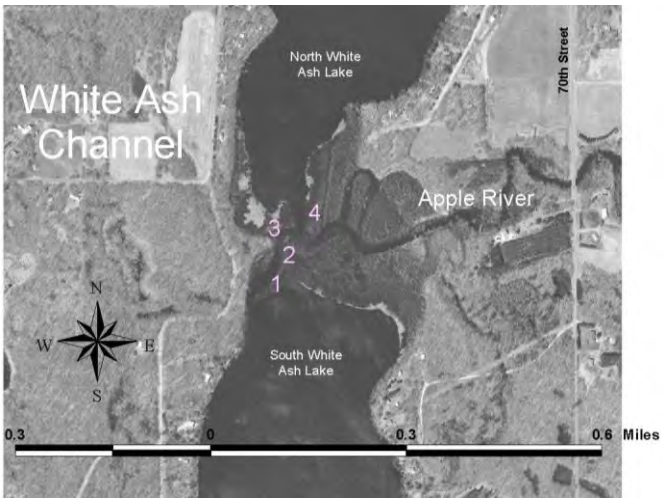
This site was found in 2000 and beetles were released in 2003. Four locations were surveyed near the channel.

Location 1 was on the east side of the channel half way up. Six stalks were in bloom with no herbivory. There were 14 stalks per square meter; no other loosestrife was visible in the immediate area. Beetles were released in 2005.

Location 2 was in the northern half of the south-part of the channel on the east side. Stem density was 36 stalks per square meter. Most of the stalks were in bloom with no herbivory. Smaller clumps of loosestrife were in the immediate area.

Location 3 was on the west side of the channel just before the 90-degree turn. Forty-plus stalks were found per square meter with no herbivory. Most stalks were in bloom with the surrounding area (25'x25') densely filled with loosestrife. Beetles were released in 2005.

Location 4 was just around the bend on the east side of the channel. The stem density was 12 stalks per square meter. Three to found stalks were in bloom with no herbivory. The area was a 20' by 10' section with scattered loosestrife.

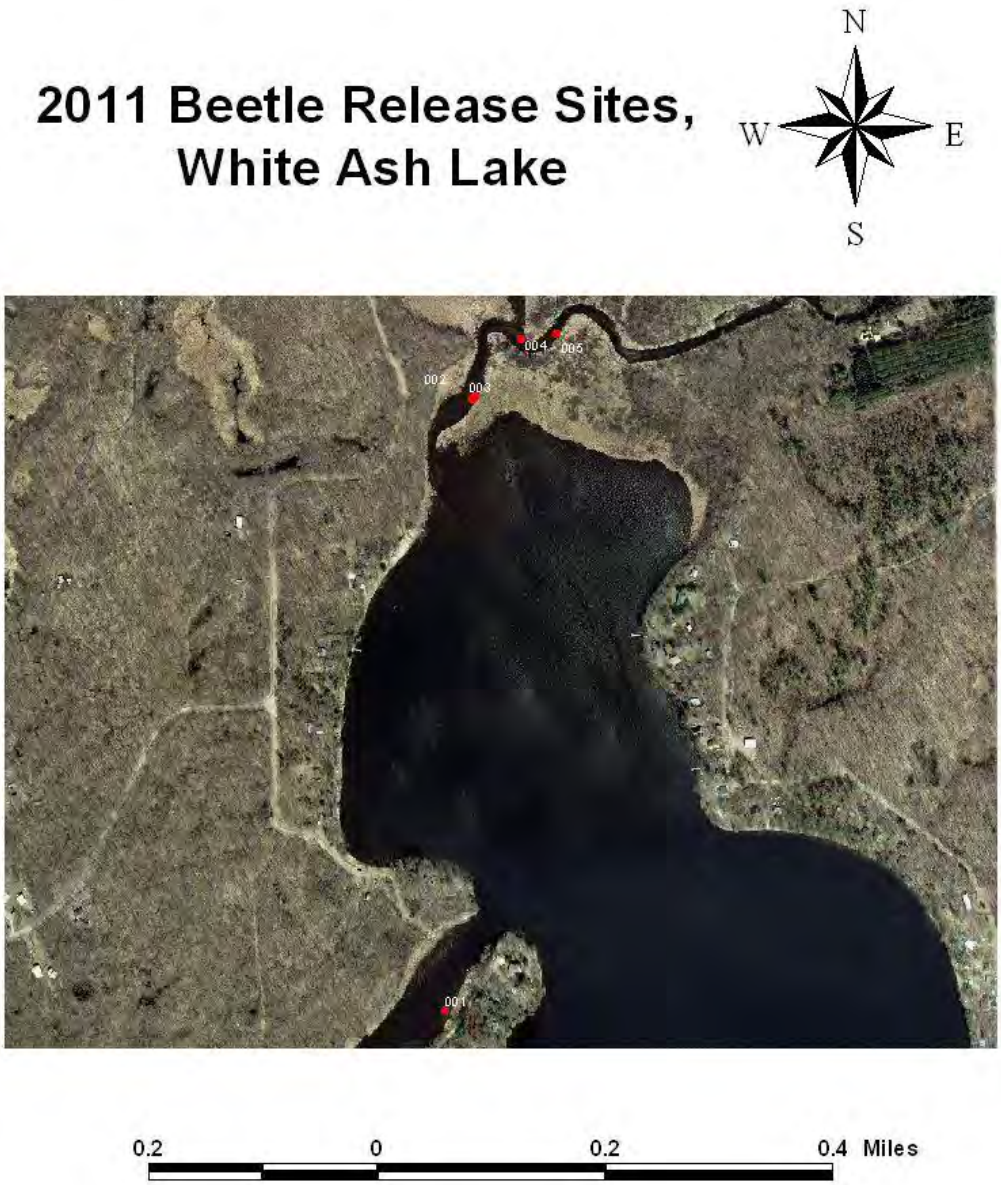


Progress Report 2010-EW

This site was not evaluated in 2010. However, this site is a target for beetle release in 2011.

Progress Report 2011-KH

Loosestrife acreage in the channel was estimated at ½-1 acre with 51-75% coverage (Sites 2-5 below). Purple loosestrife at site 1 on the channel was estimated as less than ¼ acre with 0-25% coverage. Beetles were released in 2011 although extensive herbivory was noted on parts of the site.



Site 7 – Johnstown Township, 233rd Ave

Two locations were initially found to have purple loosestrife in 2000, east in the wetland and west by the driveway. The east wetland location was removed from the active list in 2002, and no loosestrife was found in 2005. The West location was removed in 2003. No control method was used in 2005.

Progress Report 2006-LL

-4 plants found along driveway in low area. Landowners will take care of the problem. No P.L. found in the original sites on the property.

Progress Report 2010-EW

A few plants are still showing up in their small wetlands and in their garden. The landowners still pull new plants as they emerge. In 2010 there was a handful of plants in the wetland west of their driveway and in their garden. They will continue to control them as they emerge and report what germinates in the summer of 2011.

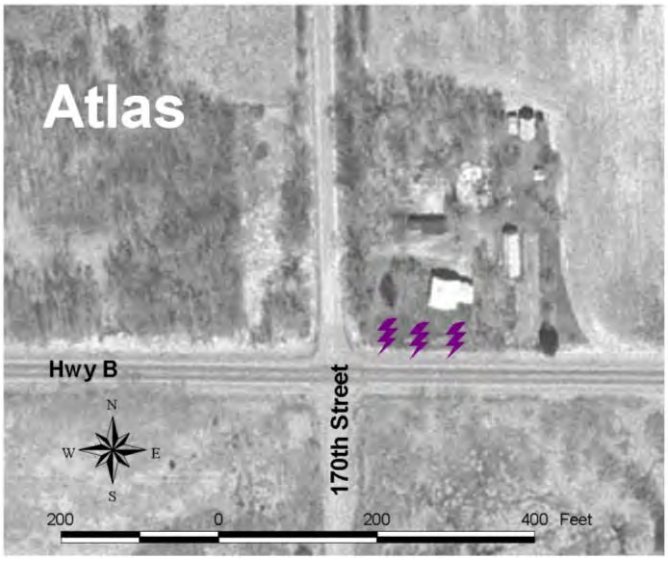
Site 8 – 5 Flags Golf Course, Balsam Lake - 2005

This site was found in 2002. The area of infestation was estimated at 1 sq meter in 2002. Rodeo was applied, and the site was removed in 2003. This site was not inspected in 2005.

Progress Report 2010-EW

This site was not evaluated in 2010.

Site 9 – Atlas, Hwy B and 170th St - 2005



This site on the north side of Hwy B was found in 2000, and the control method used has been Rodeo. NRCS staff cut and sprayed the length of the ditch in 2001. The estimated area of infestation was 2532 sq meters in 2002. Hand cutting and Rodeo were used in 2004. The stem density was 11 stems per square meter in 2005. The infestation area stretches along the ditch about 125 feet. No other areas or ditches were found to contain loosestrife. A handful of beetles were released in 2005.

Progress Report 2006-LL

<u>Along County B</u>

-Right in from of the house on the corner of County B and 170th St. there are nine smaller clumps of P.L. in the ditch. The plants are not very tall, but they are blooming.

Progress Report 2010-EW

This site was visited in 2010 to evaluate the presence of Purple Loosestrife. It appears to be staying contained to the ditch. Stem density does not appear to be increasing. This site was not treated in 2010.

Site 10 - Luck, Hwy 35 - 2005

This site was found in 2000, and beetles were released in 2001. Three permanent sites were established in the marsh. All three sites were checked and no purple loosestrife was found, only fireweed and swamp milkweed. Dave Blumer (DNR) also visited this site in spring to harvest rootstock for beetle larva, but with no success. Loosestrife seems to have been overrun. We will re-evaluate the site in 2006.

Progress Report 2006-LL

<u>Luck</u>

-Right in front of the grocery store, the wetlands are basically purple. Approximately 50 clumps on P.L. are there.
-P.L. is at the corner of Duncan St. and 3rd St. and there are way to many to count. This area is being taken over by P.L. Also, across the road there are many more plants that are overtaking the native plants.
-It is next to the big Luck sign on Hwy 35 and along that ditch until the gas station. It was pretty easy to see from the road

Progress Report 2010-EW

In 2010 Beetles were released at this location. Purple Loosestrife is still very apparent in this wetland and has moved to the west side of Hwy 35. Beetles were released at four different locations in this wetland. The figure below depicts the infestation area and the four release locations.

Site 11 – St. Croix Falls, 230th Street and 205th Ave - 2005

This site was found in 2000. Beetles were released in 2002. Boy scouts also made an attempt to cut and spray purple loosestrife from the site in 2000 or 2001. There is still a large amount of purple loosestrife present. On the east side of 230th Street on the north side of the dirt road, 3-4 smaller sized plants were found. On the south side of the dirt road, purple loosestrife was even dispersed along the pond. Plants were medium sized with 10-20 stalks per plant. Loosestrife was present in the emergent vegetation within the pond.

On the west side of 230th Street, purple loosestrife was thickly dispersed within the north half of the wetland. There was minimal herbivory, and the plants were flowering. Ten plants were sighted on the south side of the wetland, but more spaced out. The connecting pond had about 10 plants dispersed along the shoreline. Beetles should be released at this site in 2006.

Progress Report 2006-LL

<u>230th St.</u>

-Many plants found on 205th Ave in the north wetland and the south pond. Too many to count in the north wetland, but there are 5 plants along the pond to the south of the road. These plants are moderate size and they are surrounded by water.

Progress Report 2010-EW

This site was not evaluated in 2010.

Site 12 – Balsam Lake - 2005

Two sites were described in the original survey, west by the Highway Department and north of the bank in town. These sites were found in 2000 and removed by 2002 after control with Rodeo. No loosestrife was noted in these locations in 2005.

Progress Report 2010-EW

The location north of the Bank was not evaluated in 2010. However, the site west of the Highway department was and no Purple loosestrife was present. There were two new locations in the area documented and are outlined in the New Infestation portion of this document. One location was near the Balsam Lake beach the other was near the millpond dam.

Site 13 – Dresser - 2005

Two sites are noted in Dresser with having purple loosestrife. One is located in a garden at 240th St and 100th Ave. This site was found in 2001. Rodeo was applied, but the site remains active. The second site in Dresser is the acreage north of Lotus Lake on the DNR state property. Biocontrol was used here in 2002. However, the area of infestation and density remains large, 4888 square meters with a density of 36 stems per square meter (2003 data). Purple loosestrife was noted at Lotus Lake on all sides of the lake in 2005, but the density was not enumerated. These two sites will be further investigated in 2006.

Progress Report 2006-LL

<u>Lotus Lake</u>

-Take the hiking trail back to the wetland pond and there is one big clump right out in the middle of the pond.

Progress Report 2010-EW

These locations were not evaluated in 2010.

New Infestation in 2010-EW with 2011 additions-KH

The table below describes the location and treatment of the 20 new sites addressed in 2010 and 2011.

ID	LAT	LONG	COMMENT	NOTES	DESCRIPTION
10-1	45.39721210	-92.60514722	04-AUG-10 12:35	1 plant, cut flowers and Habitat applied	Wetland across from Walmart on hwy8
10-2	45.38702482	-92.63675069	04-AUG-10 13:15	1 plant, cut flowers and Habitat applied	W side of 35 south of Int Park Entrance
10-3	45.29051366	-92.53968104	04-AUG-10 14:11	No control in water on shoreline	Pl on Round Lake box culv
10-4	45.39552315	-92.21037358	04-AUG-10 14:53	Cut flowers, bagged and Habitat applied	E of Int of Hwy 8 & 125th Ave
10-5	45.39589422	-92.20543320	04-AUG-10 15:51	Cut flowers, bagged and Habitat applied	Wetland North side of 8 near Keppers
10-6	45.39559758	-92.15839430	05-AUG-10 13:38	Cut flowers, bagged and Habitat applied	Hwy 8 Turtle Lake
10-7	45.39556431	-92.16081298	05-AUG-10 14:23	Cut flowers, bagged and Habitat applied	More on hwy 8 on Turtle Lake
10-8	45.39399622	-92.16655475	05-AUG-10 15:04	Cut flowers, bagged and Habitat applied	And More on hwy 8 on Turtle Lake
10-9	45.30198086	-92.36214353	10-AUG-10 15:28	Treated with Habitat an cut n bagged flowers	Schumacher Park Amery
10-10	45.30202805	-92.36210145	10-AUG-10 15:28	Treated with Habitat an cut n bagged flowers	Schumacher Park Amery
10-11	45.64312650	-92.25799209	12-AUG-10 13:28	1 plant cut flowers, bagged & Rodeo application	Cty Rd O Town of Lorain
10-12	45.45261112	-92.45158631	12-AUG-10 15:51	2 plant cut flowers, bagged & Rodeo application	West of Beach on Balsam lk near beach
			3-AUG-11	5 plants cut flower, bagged, & Rodeo. 2 plants (not rooted) entirely removed & bagged	
10-13	45.44820869	-92.44970650	12-AUG-10 16:42	1 plant no treatment	Near Dam on Millpond Balsam lk
10-14	45.30672954	-92.35460032	16-AUG-10 15:51	Multiple plants not treated	Private Res on Apple River Amery
10-15	45.67435076	-92.50186549	19-AUG-10 15:48	Multiple plants not treated	Cty Rd W in wetland
10-16	0.00000000	0.00000000		New 2010 location, GPS point later	N Shore on Silver Lake
10-17	0.00000000	0.00000000		New 2010 location, GPS point later	N Shore on Silver Lake
10-18	0.00000000	0.00000000		New 2010 loc, no GPS when cut & treated,	West shore on South Twin
11-1	45.71948000	-92.50908900	25-AUG-11 14:26	Hand pulled entire plants	Grhims Lake private residence
11-2	45.49656900	-92.25523200	30-AUG-11 14:28	1 plant, cut flowers, bagged & treated	Site on Cty Rd G by 200th Ave intersection

Future Control Measures

This inventory recorded progress made on previous areas for control. Beetles will be reared and released as well as chemical control in the future. Education will also be a component of purple loosestrife control. Education efforts in 2010 and 2011 include passing brochures to interested citizens, presenting identification information at lake association meetings and PCALR (Polk County Association of Lakes and Rivers) meetings, and communicating with volunteers participating in purple loosestrife control. Displays were exhibited at the 2010 Polk County Fair, Amery Cattail trail Days, and Coon Lake Fair. Native look-alikes were highlighted as well as life history on the plant. A two page spread of invasive species including Purple Loosestrife and agency contact information was developed for the 2010 Polk County Tourism guide. In addition, this report will be posted on our website. We hope to make people aware of the danger of exotic species and to protect and enhance the biological integrity of our wetlands and roadways for years to come.

Preventing Further Spread

Prevention is the best way to stop the purple loosestrife invasion. The Department of Natural Resources recommends the following steps to prevent its further spread:

1. Be on the lookout for pioneering plants or isolated small colonies, especially in areas otherwise free of purple loosestrife. Remove pioneering plants immediately.
2. Rinse off equipment, boats and trailers, clothing, and footwear used in infested areas before moving into uninfested areas.
3. Remove and destroy purple loosestrife planted in lawns and gardens. It is illegal to cultivate purple loosestrife in Wisconsin.

Although purple loosestrife in gardens may seem harmless, its seeds eventually will spread to favorable moist soil or wash into nearby waters and wetlands. Some plant producers claim to have sterile varieties of purple loosestrife. Research has shown, however, that all cultivars are capable of producing seeds if they cross-pollinate with another loosestrife plant. And, plants don't have to be near each other for pollination to occur. Honeybees, the main pollinators of loosestrife, commonly travel one to two miles during their foraging.

As of 1987, state law bans the sale, offering for sale, distribution, planting, or cultivation of purple loosestrife. This ban covers both *Lythrum salicaria* and *L. virgatum*. There are no exceptions for cultivars, hybrids, or so-called sterile varieties. Sale violations of purple loosestrife should be reported to the Department of Agriculture, Trade and Consumer Protection at Bureau of Plant Industry, P.O. Box 8911, Madison, WI 53708-8911 or phone at (608)-224-4571. Cultivation violations should be reported to county or municipal law enforcement officials. Each violation is subject to a $100 fine [sec. 66.955(2)(5)].

For further information, contact the Land and Water Resources Department or

Brock Woods
WDNR Biocontrol Program
1350 Femrite Drive
Monona, WI 53717
608-221-6349
Brock.Woods@dnr.state.wi.us

Though purple loosestrife will probably never disappear completely from Wisconsin or Polk County, we may be able to restore health to our wetland ecosystems efficiently by simply restoring some of the natural checks and balances necessary in maintaining a diverse, healthy environment.

Appendix C

Wisconsin DNR Aquatic Invasive Species Early Detection Monitoring Standard Operating Procedures

Draft June 5, 2011

Wisconsin Department of Natural Resources
Aquatic Invasive Species (AIS) Early Detection Monitoring

Standard Operating Procedures

Draft June 5, 2011

Before leaving the office:

- Each Monday - Email Tom Joestgen – DNR Risk Management if you will have a non-state employee or volunteer with you in a state vehicle or boat during a given week.
    - Leave person's name, business purpose, where and when they will be with you

- Check SWIMS for recent (within last five years) summer phosphorus and conductivity data → collect surface water samples if no recent data exists.

- Check SWIMS or the Statewide AIS list to determine which AIS are already present. Do not collect specimens of already listed species.

- Check mussel suitability data. If the lake is listed as suitable, borderline suitable or unknown collect veliger samples. If listed as not suitable do not collect veliger samples.

- Print datasheets
    - Early Detection Form
    - Veliger Tow Form(s)
    - Spiny Waterflea Tow Form(s)
    - Specimen labels

- Print bathymetric lake maps (these will be made available on a common drive)
    - Select five search sites where AIS are likely to be present (inlets, plant filled bays, rocky bars/points, developed shorelines, shorelines downwind of boat landings)

- Check equipment list

At the Lake:

Boat Landing Search(es):

- Each public or commercial boat landing is searched by snorkeling for 30 minutes (15 minutes if two people snorkeling, 30 minutes if one person). Covering an area of shoreline 200' long out to the maximum depth of plant growth or 100' from shore whichever comes first.

    - Staff snorkeling should spend the first half of their time working on the shallow section of the site and then switch to the deep half of the site for the rest of the time.
    - Look for snails, mussels and aquatic plants in the water and snails on any emergent macrophytes.
    - If visibility or safety is a concern then rakes should be used to collect aquatic plants and a D-net should be used to look for snails and mussels for 30 minutes.
- Collect specimens of each AIS found for verification.
- Record the location (center of site at shoreline) of each boat landing on GPS.

Mid-lake samples:

Water Quality

- Take Secchi depth and conductivity reading and record on early detection form.
- Collect integrated sample for phosphorus if no data exists within the last five years.

Waterflea Tows

- Collect three waterflea tows (using 254 um net) from the open water area of the lake (at least 15-20 feet depth). One sample should come from the deep hole and other basins should also be covered.
    - Drop net to within 2 meters of the lake bottom and then pull behind the boat for two minutes or 100 meters (measured using GPS), whichever comes first, at lowest idling speed.
    - Rinse samples into bottle and label with lake name, county, WBIC, collector and date.
    - Add ethanol to samples for at least a 4/5 ratio of ethanol:water.
    - All samples can be placed in the same jar unless distinct bays of the lake are searched and specific sample location is needed for the separate samples.
    - Complete the Water Flea Tow Monitoring Form (Form 3200-128).

Lake Searches:

Snorkel Search Sites

- Stop at each search site and conduct 10 minute snorkel searches.
    - Look for snails, mussels and aquatic plants in the water and snails on the above water stems of any emergent macrophytes.
    - Collect specimens of each AIS found for verification.
    - Record the site number and location (center of site at shoreline) of each site on GPS and datasheet.
    - Record the name of any species found and density rating for invasive plants.
- If you find additional appropriate search sites as you are driving around the lake, you can add additional 10 minute searches or replace the sites that you pre-selected.

Veliger Tows

- Collect vertical zebra mussel veliger net tows (using the 54 um net) off shore from three of the search sites in 5-10 feet of water.

    - The depth of the plankton tow will depend on the on the Secchi depth of the lake.
        - If Secchi depth is > 4 meters, collect two 2 m tows. Consolidate into one jar.
        - If Secchi depth is 2-4 meters, collect one 2 m tow.
        - If Secchi depth is < 2 meters, collect one 1 m tow.
    - Complete the Mussel Veliger Tow Monitoring Form (Form 3200-135).

- Stop at any additional public or commercial boat landings and complete the boat landing snorkel search above. Do not include small backyard boat ramps for 30 minute snorkel searches.

Meander Survey

- Drive boat slowly between boat sites and look for aquatic invasive plants in the water and along the shoreline. Meander between shallow water and maximum rooting depth or 100' from shore whichever comes first.
- Stop at 50 haphazard locations while boating around the lake and take rake pulls and D-net sweeps. Check rake and net contents for AIS.
    - Collect specimens of each AIS found for verification.
    - Record the location of each AIS found on GPS.
        - Only collect separate GPS points from discretely different beds of invasive plants.
        - Once five specimens of a species have been collected at any site (boat landing, search site or meander survey) there is no need to collect additional specimens at other sites.
        - If three discrete locations of a certain species are found either at snorkel search sites and/or during the meander survey stop recording new locations during the meander survey. Three discrete locations of one species will indicate that the species is established in the lake.

Back at the Boat Landing:

- Inspect and remove any aquatic plants and animals from the boat and trailer.
- Drain all water from the boat and motor.
- Disinfect boat and trailer (per DNR disinfection protocol)
- Place plankton nets in disinfection solution (bleach solution per DNR disinfection protocol) in tubs for 10 minutes.
- If traveling to another lake, rinse veliger net with water and place in tub with vinegar for 10 minutes.
- Scrub wetsuit with or place in disinfection solution (bleach solution per DNR disinfection protocol) for at least 10 minutes.

Appendix D

Education and Outreach Campaign: Example Materials

Jeremy Williamson, Eric Wojchik, and Katelin Holm

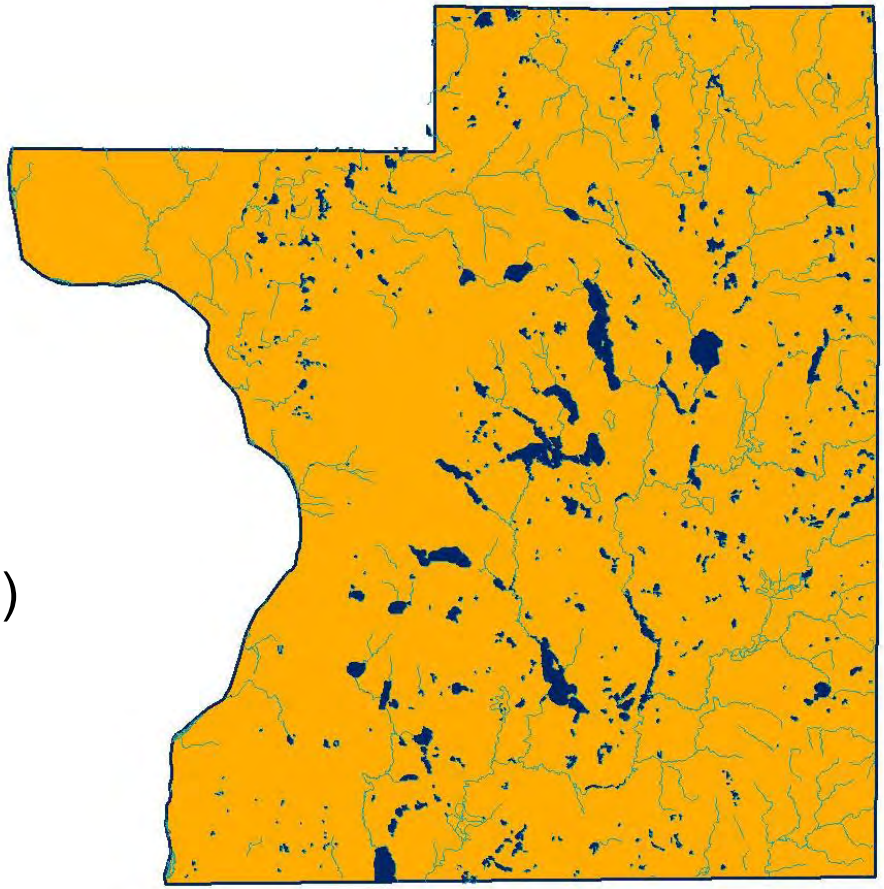
Illegal to Transport Ordinance

Jeremy Williamson
Water Quality Specialist
Polk County Land & Water Resources Department
jeremyw@co.polk.wi.us
715-485-8639

Amery City Council

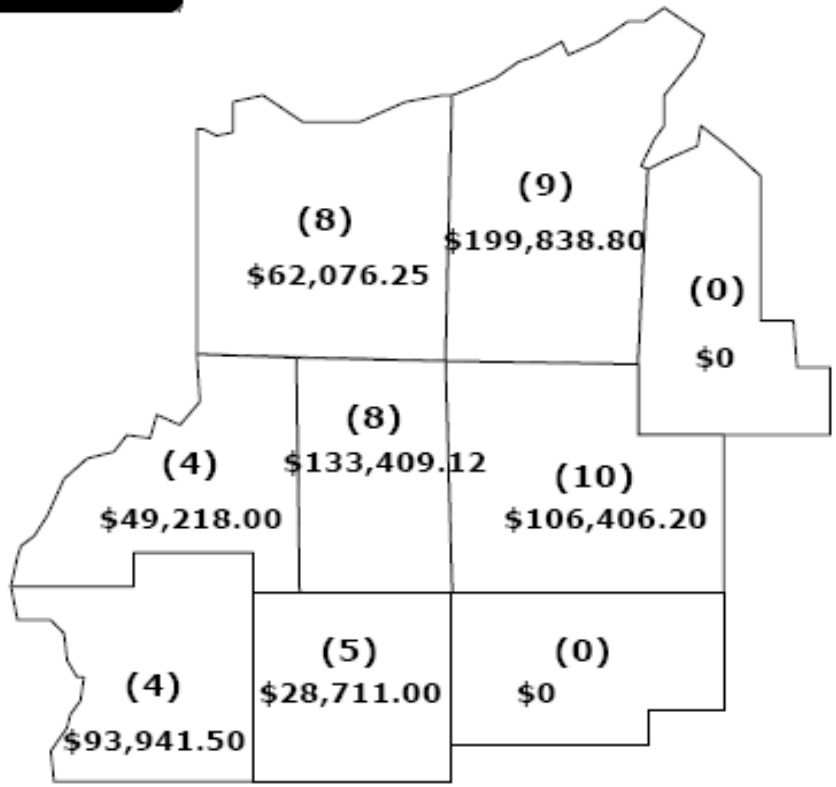
Why develop a new ordinance?

- 437 lakes (Polk ranks 13th for most lakes)
- 365 miles of stream
- 4,740,000 feet of shoreline
- 25,500 fishing licenses issued in Polk County 2003 (Res: 12,316, Non: 13,184)
- Over 50% of tax base comes from lake homes
- Our economy is based on tourism



AQUATIC INVASIVE SPECIES GRANTS

2006-2007

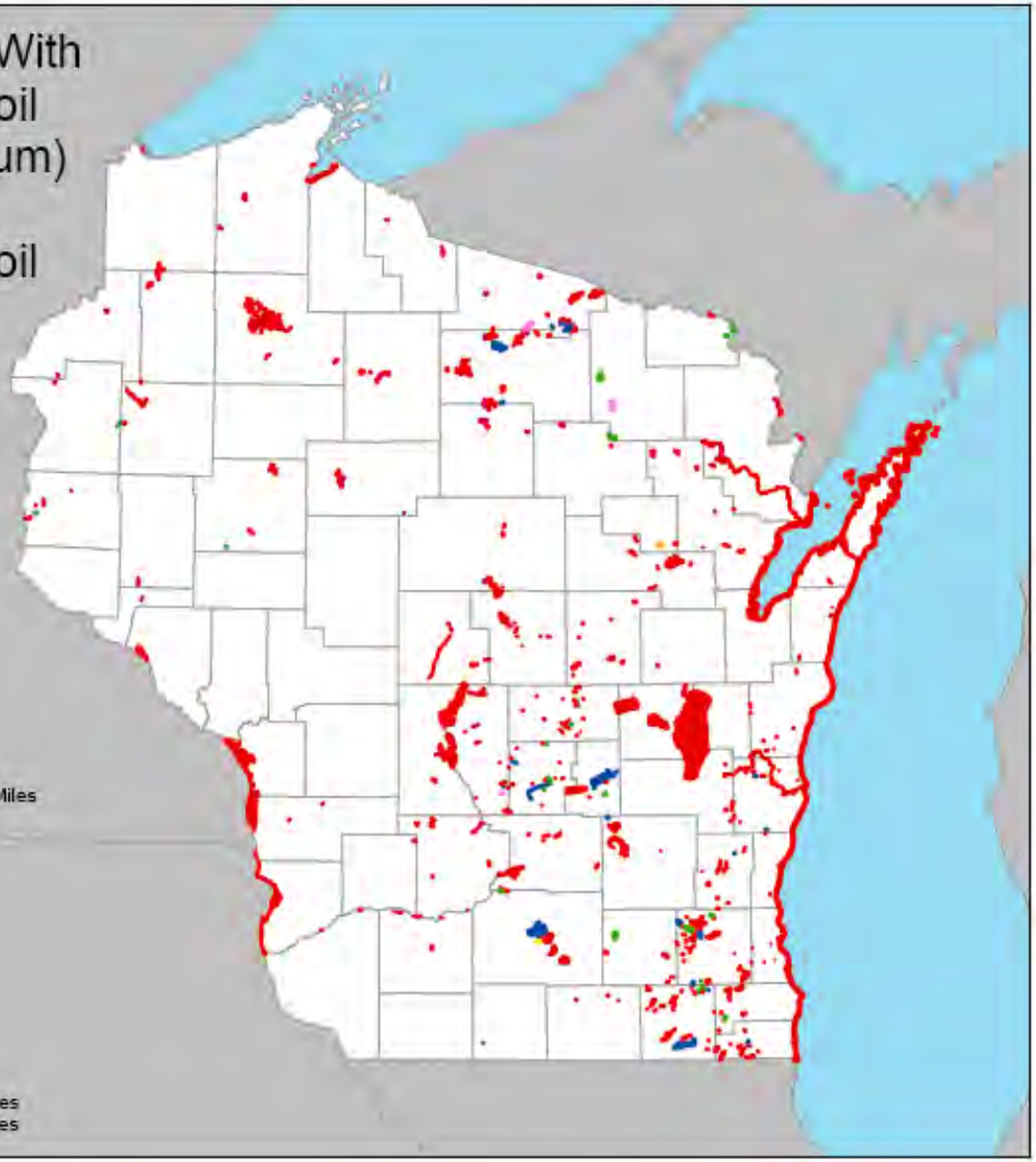


Number of Grants per County ( )
and state share awarded

Totals: 48 Grants for $673,598.87

40% of grants and 27% of funds statewide

Waterbodies Infested With Eurasian Water-Milfoil (Myriophyllum Spicatum) or a Hybrid of Eurasian Water-Milfoil December 2006



- Hybrid by DNA
- EWM and Hybrid by DNA
- EWM by DNA
- EWM and NWM by DNA*
- EWM, NWM, WWM by DNA*
- EWM by Voucher

N

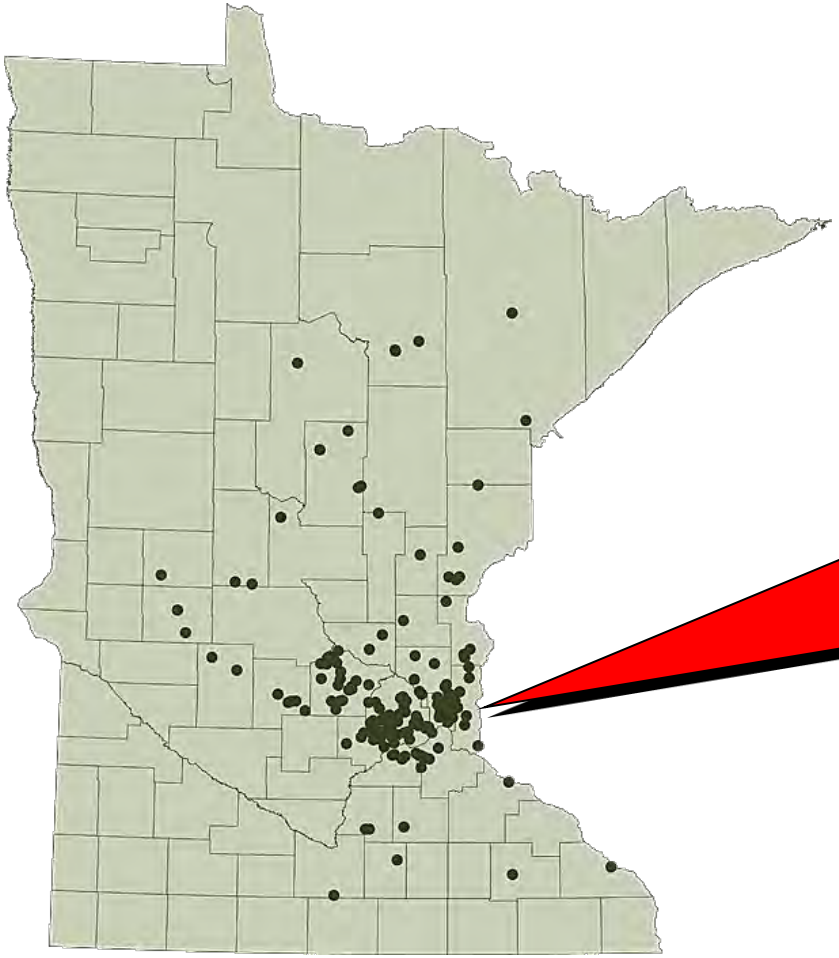
0 30 60 120 Miles

WISCONSIN DEPT. OF NATURAL RESOURCES

WI Dept. of Natural Resources
Bureau of Watershed Management
January 2007

*NWM = Northern Water-Milfoil, a native species
WWM = Whorled Water-Milfoil, a native species

Eurasian water milfoil infestation in Minnesota



128 lakes in the 7-county metro area are infested with EWM

Why develop a new ordinance?

- Ch. 30.715 *Wis. Stats* – Illegal to launch a boat, boating equipment, or trailer in navigable water if the person has reason to believe that the boat, boat trailer, or boating equipment has any aquatic plants or zebra mussels attached.
- It is not illegal to leave a lake with weeds or ZM attached, just launch.

Clean Boats Clean Water

2007 – Data from 4 Polk County Lakes

<u>1210 Boats Inspected</u>

66% from WI

34% from another state

75% fishing boats

Clean Boats Clean Water

- 115 Boats entered the landing with vegetation attached
- 40 Boats were last used in a water body known to be infested
- 245 Boats were used within last 5 days
- 71 Boaters reported they used no prevention methods

What is the Risk of AIS?

Eurasian Water Milfoil

- Make lakes/rivers unusable by boaters and swimmers
- Reduce native species
- Degrade ecosystems
- Affect human health
- Reduce property values
- Ruin boat engines and steering equipment

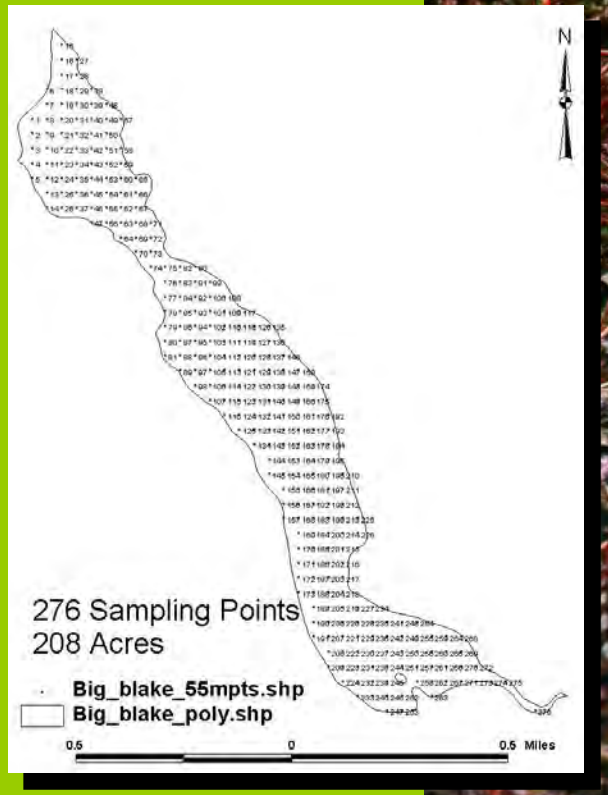
Myriophyllum sibiricum Kom.

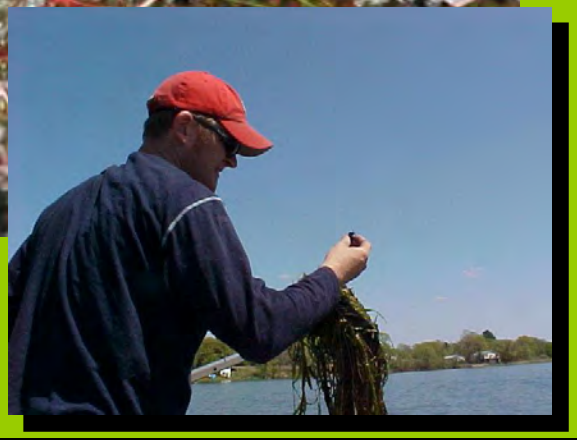
Myriophyllum verticillatum L.

Myriophyllum farwellii Morong

Myriophyllum heterophyllum Michx.

Curly-leaf Pondweed





Hydrilla at Wakulla Springs, Florida
Hydrilla verticillata
Photo by Vic Ramey
Copyright 1998 Univ. Florida

Zebra Mussels

Methods of Transport

- Boaters use their boats in several places without cleaning them with hot water.
- Kids, mucking in a lake, slosh over to a different lake and empty out their boots.
- Anglers take their bait buckets from lakes to rivers and empty them into the waters.
- Someone gets bored with a pet zebra mussel and releases it in a new home.
- Ducks, with muddy feet, fly off to new watery homes.
- Water plants get stuck on boats or other equipment and are carried to different bodies of water.

Quagga Mussels

So far in Wisconsin, the quagga has been found in Lake Michigan - not in any inland lakes. But because they prefer silt- and sand-bottomed lakes, quagga mussels may be able to successfully invade inland lakes, including some that are not good habitat for zebra mussels. Because they are extreme water/food filters, they eat up the food source of fish and can change the food web in a lake. They also take in lots of pollutants (at levels higher than the surrounding area), which can harm wildlife that eat them.

Rusty Crayfish

Apple River

Osceola Creek

Horse Creek

St. Croix River

Trade River

Lake Wapogasset

Rusty crayfish can reproduce in large numbers and reduce lake and stream vegetation, depriving native fish and their prey of cover and food. Their size and aggressive nature keeps many fish species from feeding on them. Rusty crayfish may also reduce native crayfish populations by out-competing them for food and habitat.

Spiny Water Flea

Because spiny water fleas eat zooplankton like Daphnia, they compete directly with small fish that also need to eat zooplankton. Research shows that perch aren't growing like they should and some young can't survive because of the lack of food. A decrease in small fish populations could also take away a food source for larger sport fish in Lake Michigan.

Spiny water flea clogging gill net, Lake Superior, Minnesota

Please take the following steps to prevent the transport of aquatic invasive species to new waters:

- **Inspect** and **remove** aquatic plants, animals, and mud from your boat, trailer, and equipment.
- **Drain** all water from your motor, livewell, bilge, transom, etc.
- **Dispose** of unused bait in the trash.
- **Wash** your boat and equipment with hot and/or high pressure water, particularly if moored for more than one day, OR
- **Dry** your boat and equipment thoroughly (in the sun) for five days.

What else can we do to prevent the spread of invasive species?

- Know your native plant and animal species
- Inform others of the risk
- Take prevention steps to clean and disinfect your equipment
- Increase your time between lakes or borrow equipment that stays on the lake
- Decrease your footprint on native vegetation

The County Board of Supervisors of the County of Polk does ordain as follows:

ILLEGAL TRANSPORT OF AQUATIC PLANTS AND INVASIVE ANIMALS ORDINANCE

Section 1. Purpose.
The purpose of this ordinance is to prevent the spread of aquatic invasive species in Polk County and surrounding water bodies in order to protect property values and the property tax base and ensure quality recreational opportunities.
Statutory Authority. This ordinance is adopted under authority of Section 59.03 Wisconsin Statutes.

Section 2. Definition of Aquatic Plants and Invasive Animals.

(a) "Aquatic plant" means a non-woody submergent, emergent, free-floating, or floating-leaf plant that normally grows in or near water and includes any part thereof. "Aquatic plant" does not mean wild rice when being harvested with a permit issued under NR 19.09 or any rights proffered by the Treaty of 1838.

(b) "Invasive animal" means all vertebrate and invertebrate species including zebra mussel, quagga mussel, rusty crayfish, spiny water flea, or any other aquatic invasive animal prohibited by the state.

Section 3. Prohibited Transport of Aquatic Plants and Invasive Animals.

No person may operate a vehicle or transport any boat, boat trailer, personal watercraft and its associated trailer, canoe, kayak, or boating equipment, fishing equipment, hunting and/or trapping equipment including but not limited to personal floatation devices, nets, anchors, fishing lines, decoys, and waders, from navigable waters onto any roadway open to the public if aquatic plants or invasive animals are attached.

All aquatic plants or invasive animals shall be removed before entering a roadway open to the public or before launching a boat or equipment or trailer in navigable water.

Section 4. Exceptions to Transport of Aquatic Plants and Invasive Animals.

Unless otherwise prohibited by law, a person may transport aquatic plants:

(a) for disposal as part of a harvest or control activity conducted under an aquatic plant management permit issued under ch. NR 109.

(b) when transporting commercial aquatic plant harvesting equipment away from any water body to a suitable location for purposes of cleaning any remaining aquatic plants or animals.

(c) when conducting an aquatic plant study for the purposes of vouchering specimen or conducting an educational workshop and in a closed container.

Section 4. Exceptions to Transport of Aquatic Plants and Invasive Animals.

Unless otherwise prohibited by law, a person may transport aquatic plants:

(d) when harvested for personal or commercial use, such as to be used as compost or mulch, and in a closed container.

(e) for purposes of shooting or observation blinds for waterfowl hunting during the waterfowl season, if the aquatic plants used for these blinds are emergent, cut above the waterline, and contain no aquatic invasive species. All other equipment shall have aquatic plants and invasive animals removed before entering a roadway open to the public.

Section 5. Citation and Enforcement

Any person who violates a provision of this ordinance shall be subject to a forfeiture of not less than $200 and not more than $500 for the first offense and each subsequent offense. Said person shall be also subject to court costs for such violation.

Purpose of Ordinance

- Protect our water resources of Polk County & Amery
- Educate the people that use our water resources
- Send a message to the State to be more proactive

Questions?

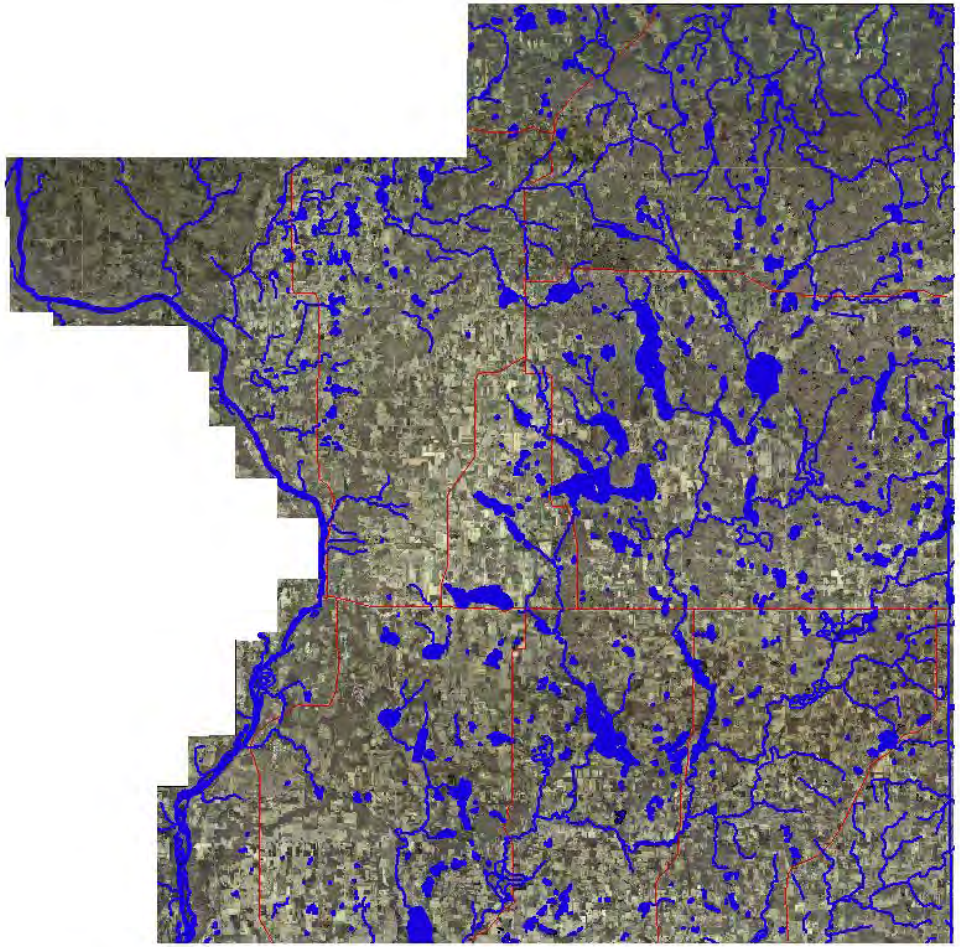
Potamogeton crispus
curly pondweed growing in
Bone Lake, Wisconsin
Photo by Frank Koshere

2011 Polk County Land and Water Resources Department

Presentation for PCALR byKatelin Holm

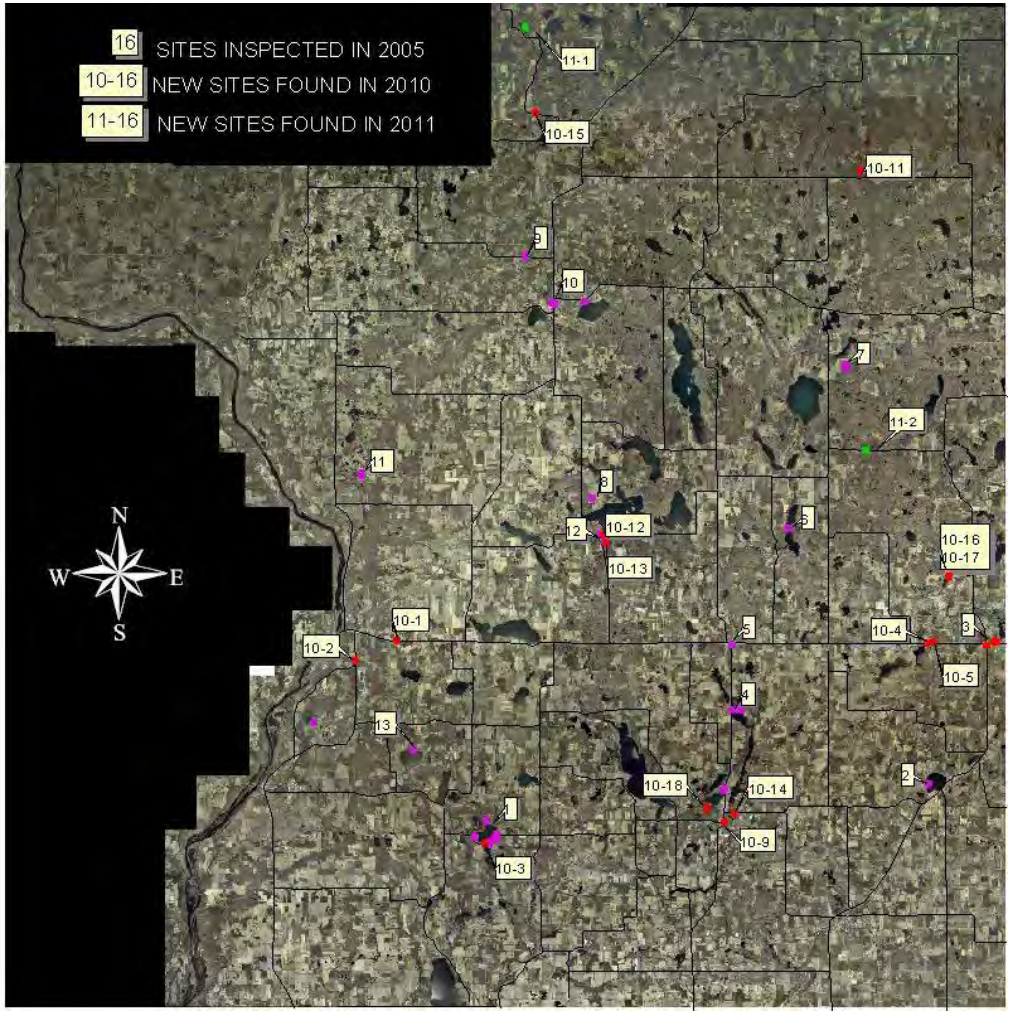
Polk County

- Water rich
  - 437 lakes
  - 300 miles of river



Purple loosestrife in Polk County

- Big Lake
- Round Lake
- Magnor Lake
- Amery/Apple River
- White Ash Lake
- Lotus Lake
- Ghrims Lake
- Silver Lake
- Balsam Lake
- South Twin Lake

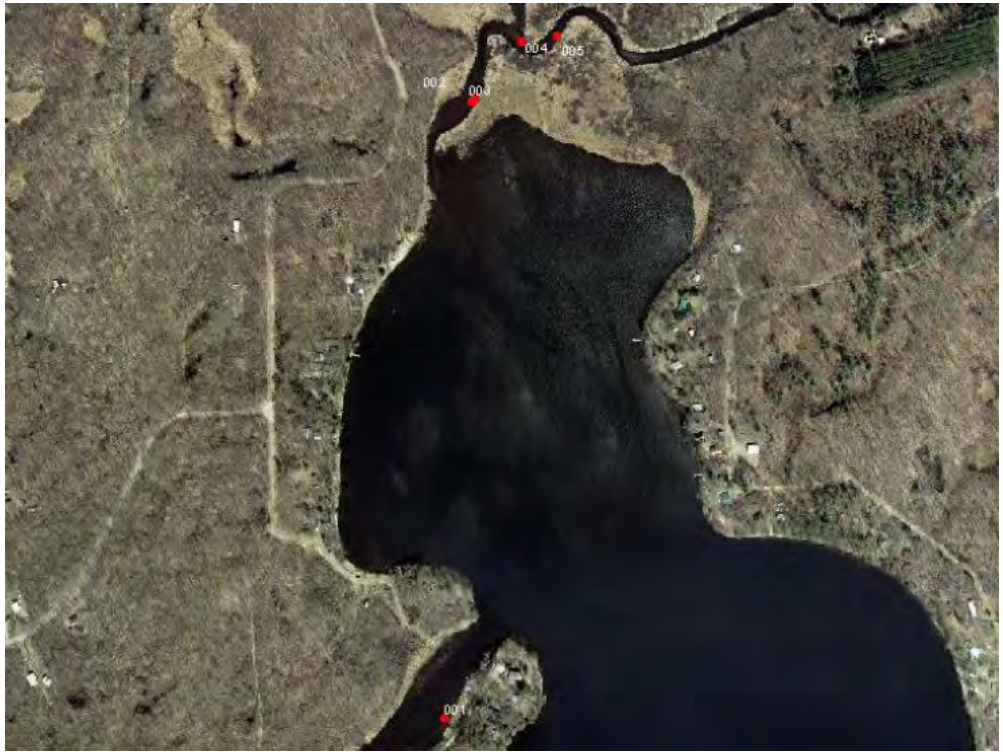


Management for purple loosestrife

- Foliage removal and spraying
- Raising *Galerucella* beetles

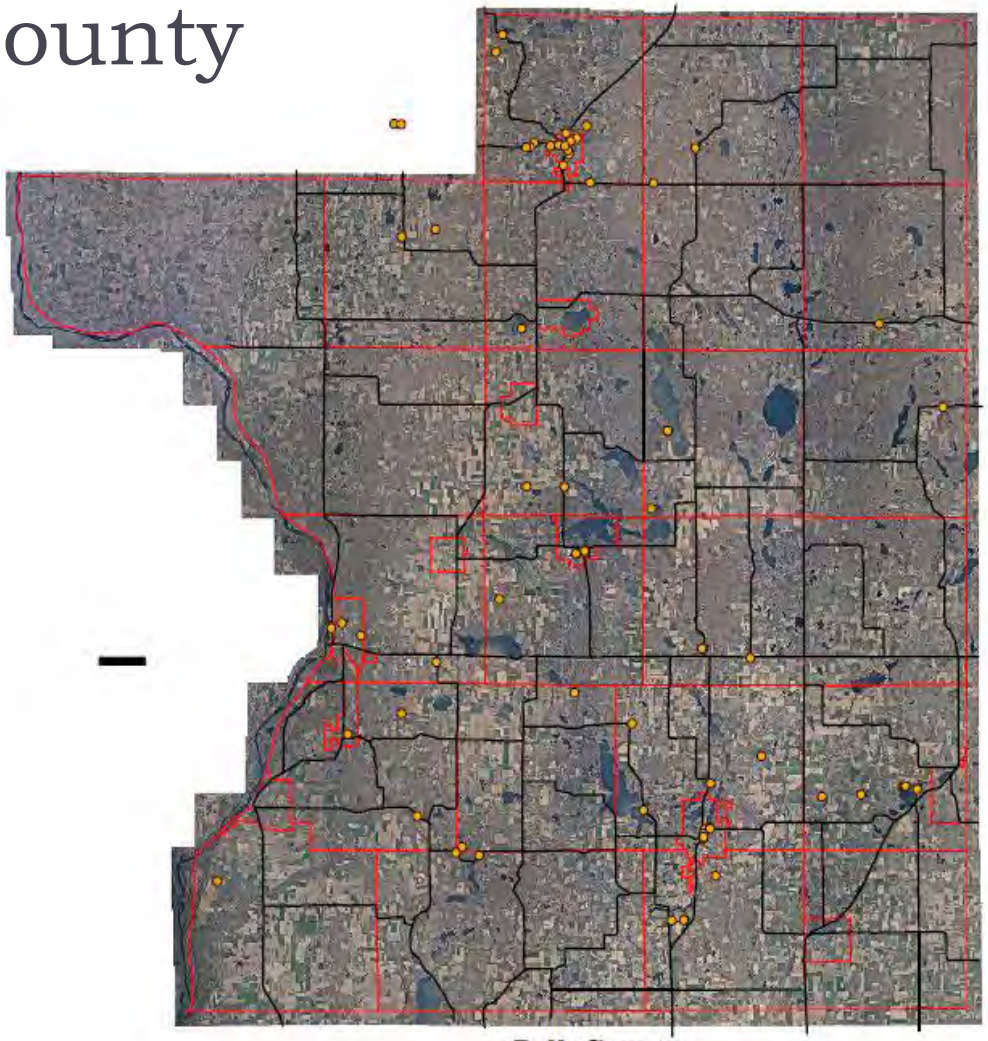
Releasing *Galerucella* beetles

- 2010 → Luck Wetland
- 2011 → White Ash Lake Channel



Impacts of herbivory

Japanese and giant knotweed in Polk County



Polk County
Japanese & Giant Knotweed location Map
July, 2011

Legend

- Polk Knotweed Locations
- Major Roads
- Polk Municipalities

Miles
0 1.5 3 6 9 12

Prepared By: Polk County LWRD 2011

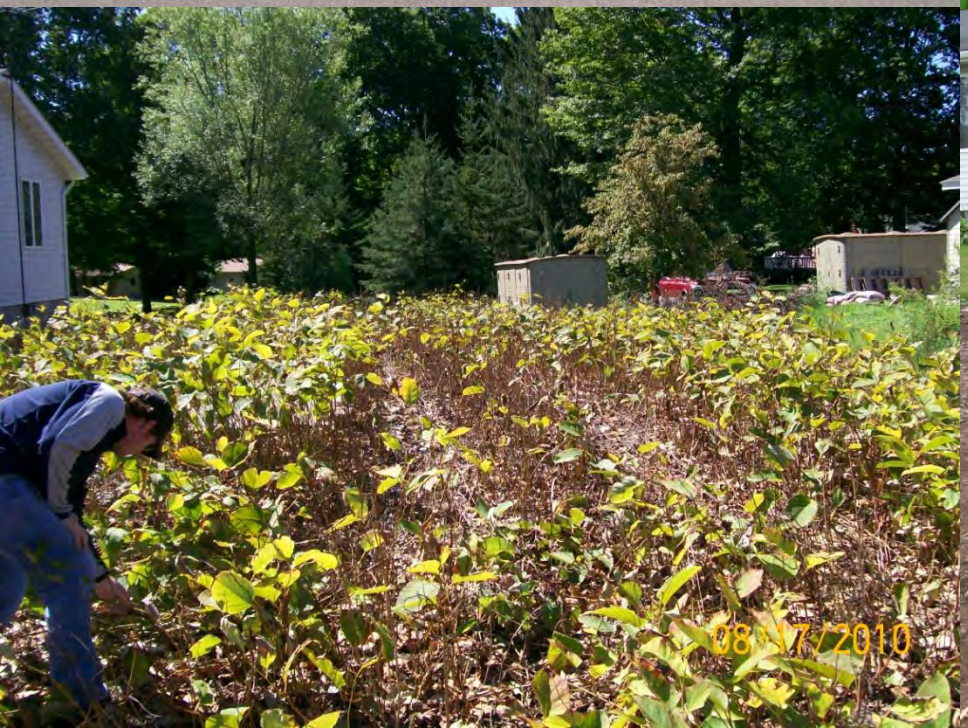
Japanese and giant knotweed

Management for Japanese Knotweed

- Foliar application
- Stem injection

08/03/2009

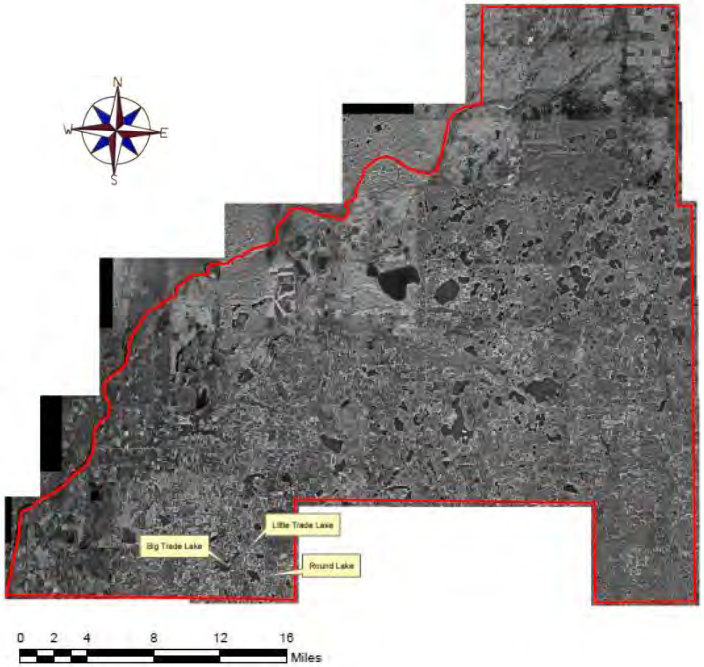
08/04/2009

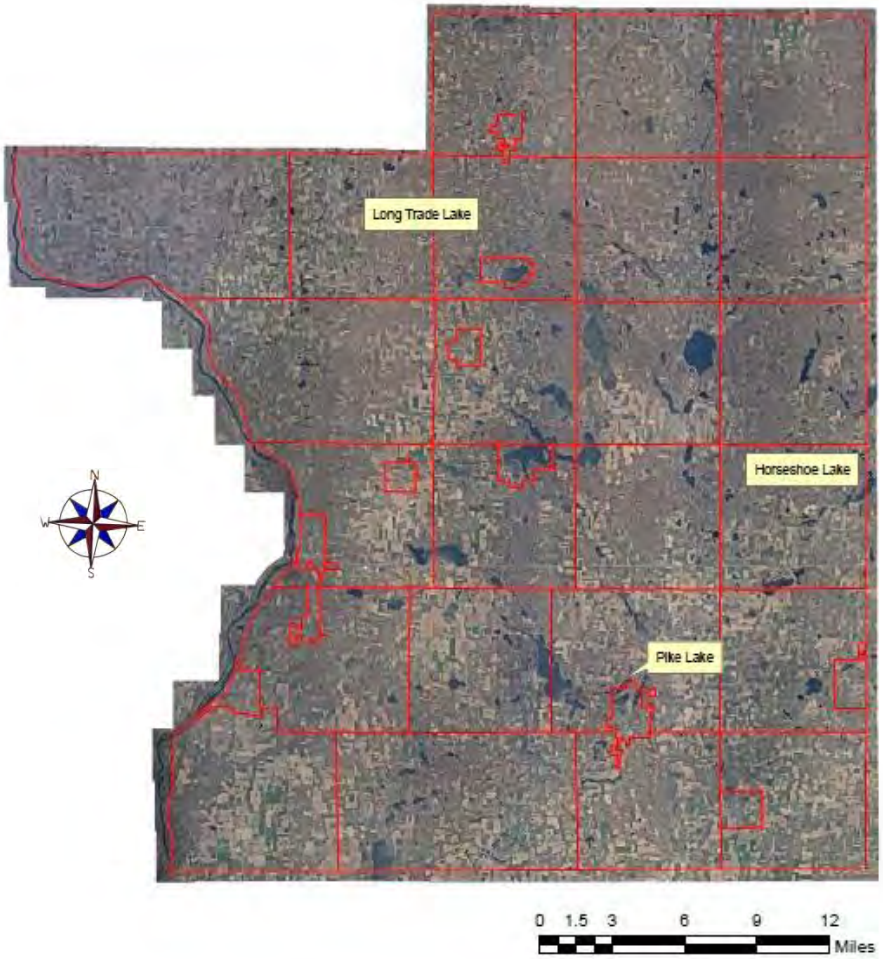

08/17/2010

07/12/2011

Eurasian water milfoil in Polk County

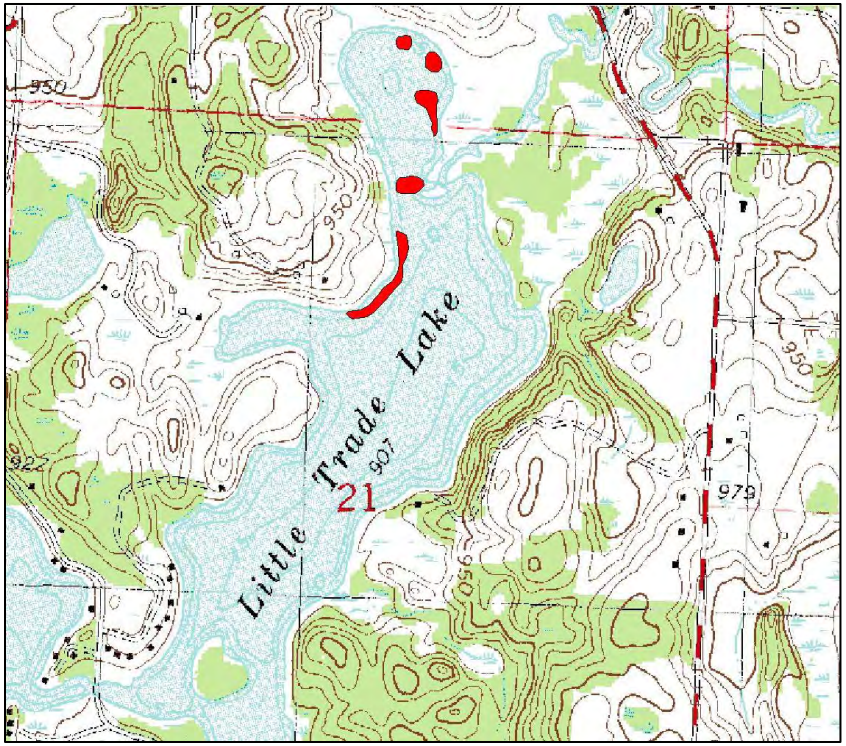
- Long Trade Lake
- Horseshoe Lake
- Pike Lake



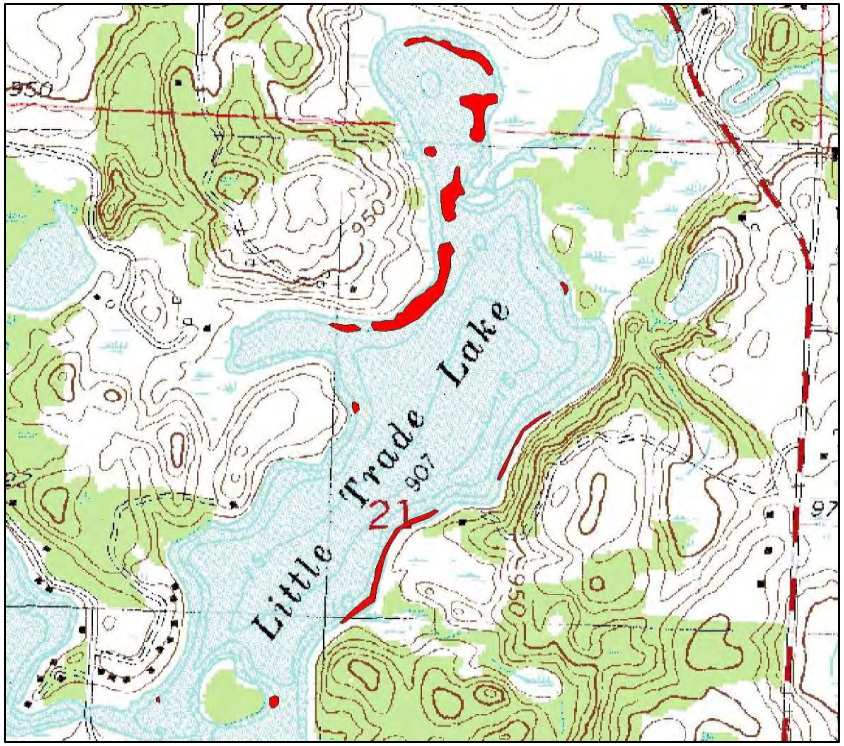


Spread of EWM in Little Trade, Burnett

- Spring 2010



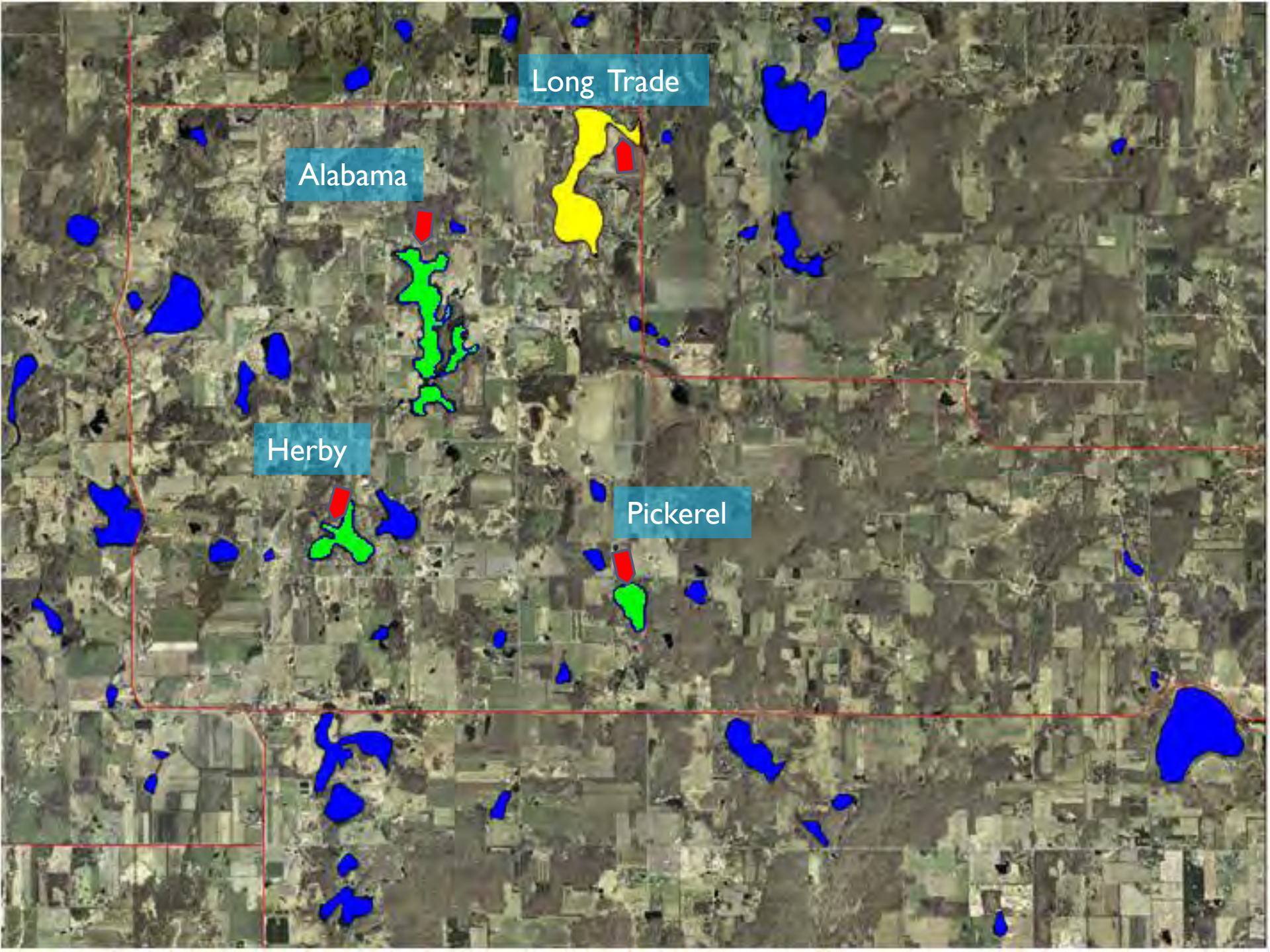
- Spring 2011

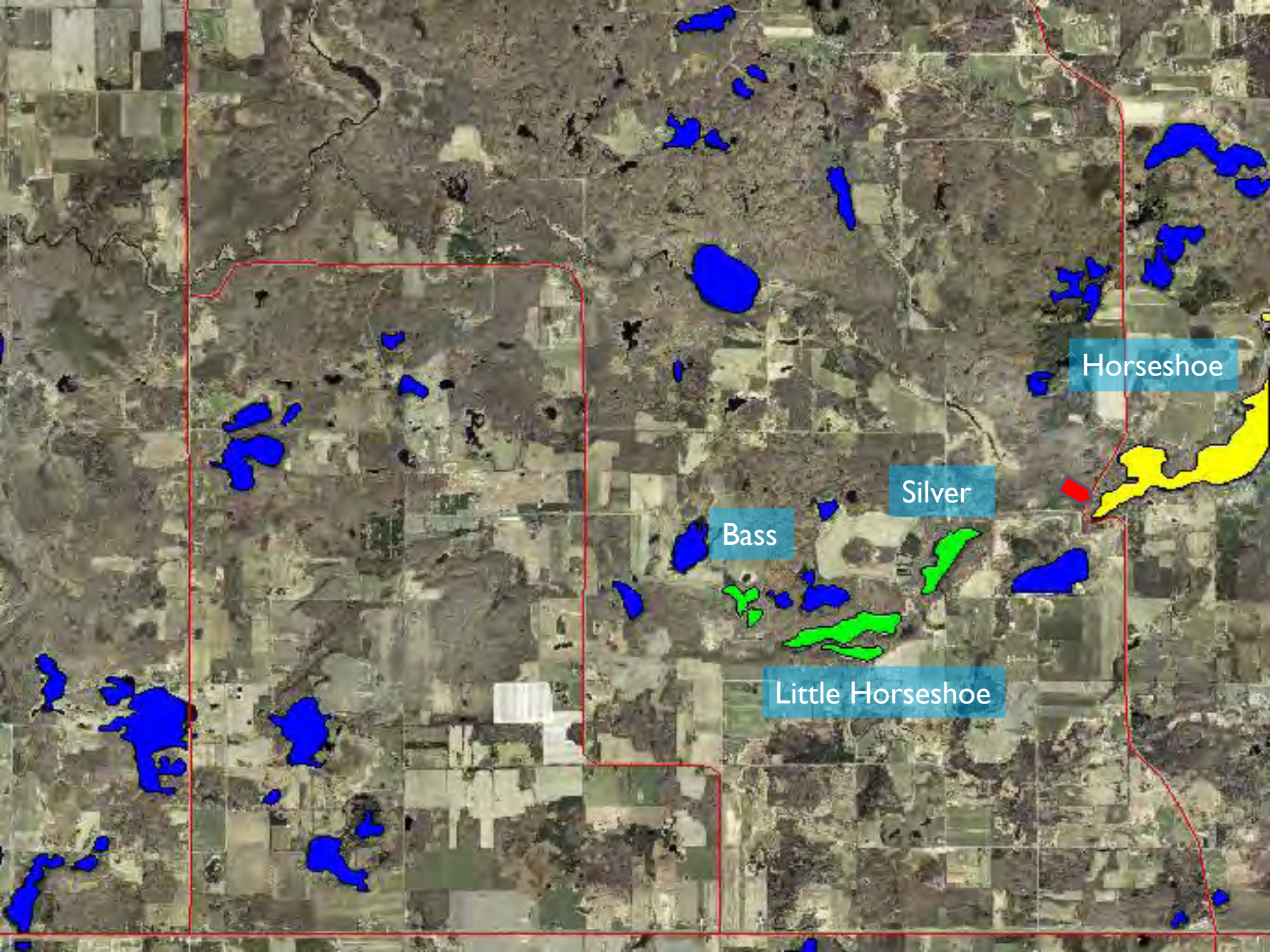


Eurasian water milfoil management

- Spray in early season before water hits 65°F
  - Little Trade (RR grant, along with Big Trade)
  - Horseshoe
  - Pike
- Hand removal

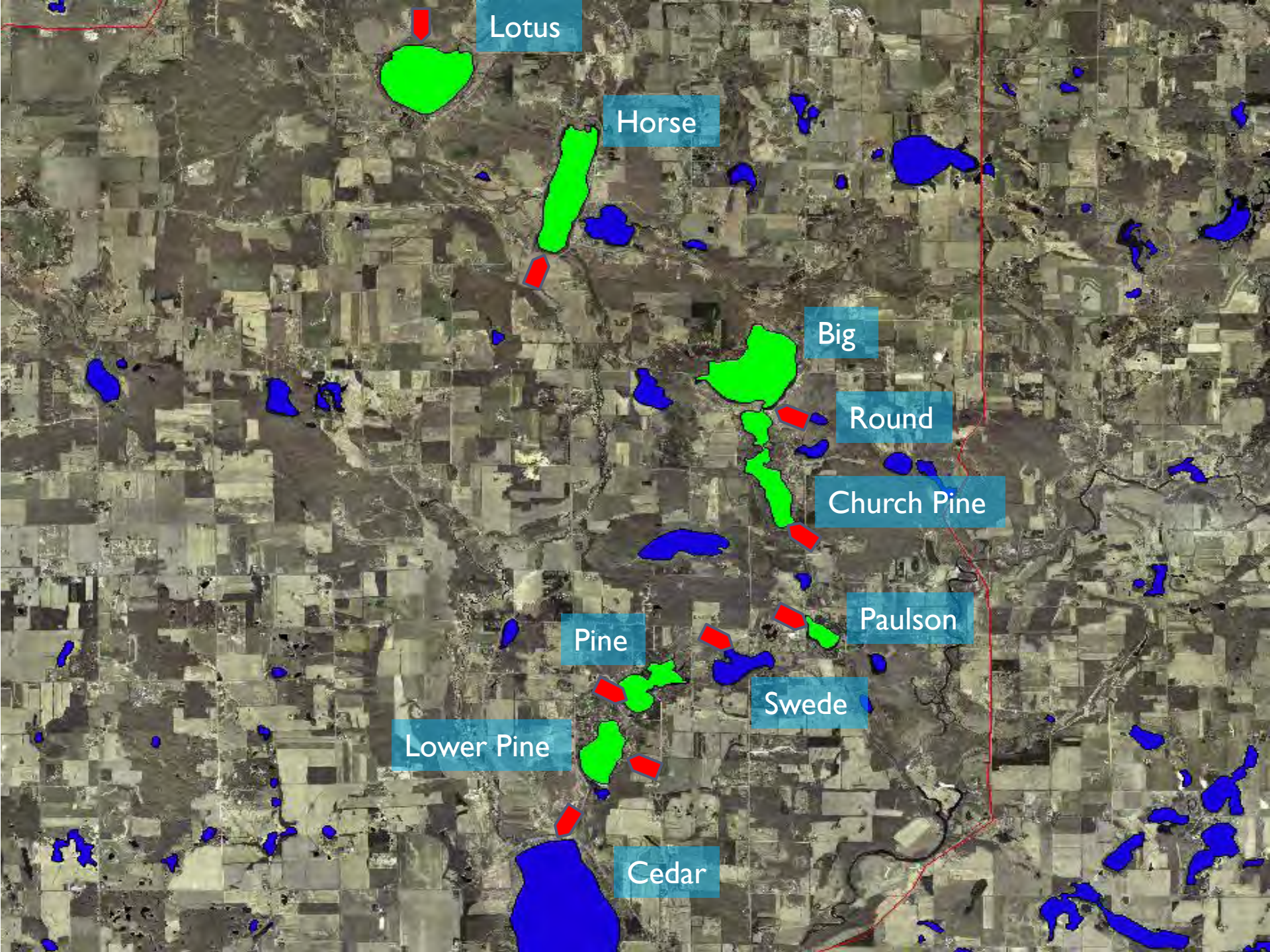
- 2011 monitoring within 5 mile radius
  - No new populations found


Long Trade
Alabama
Herby
Pickerel


Horseshoe
Silver
Bass
Little Horseshoe

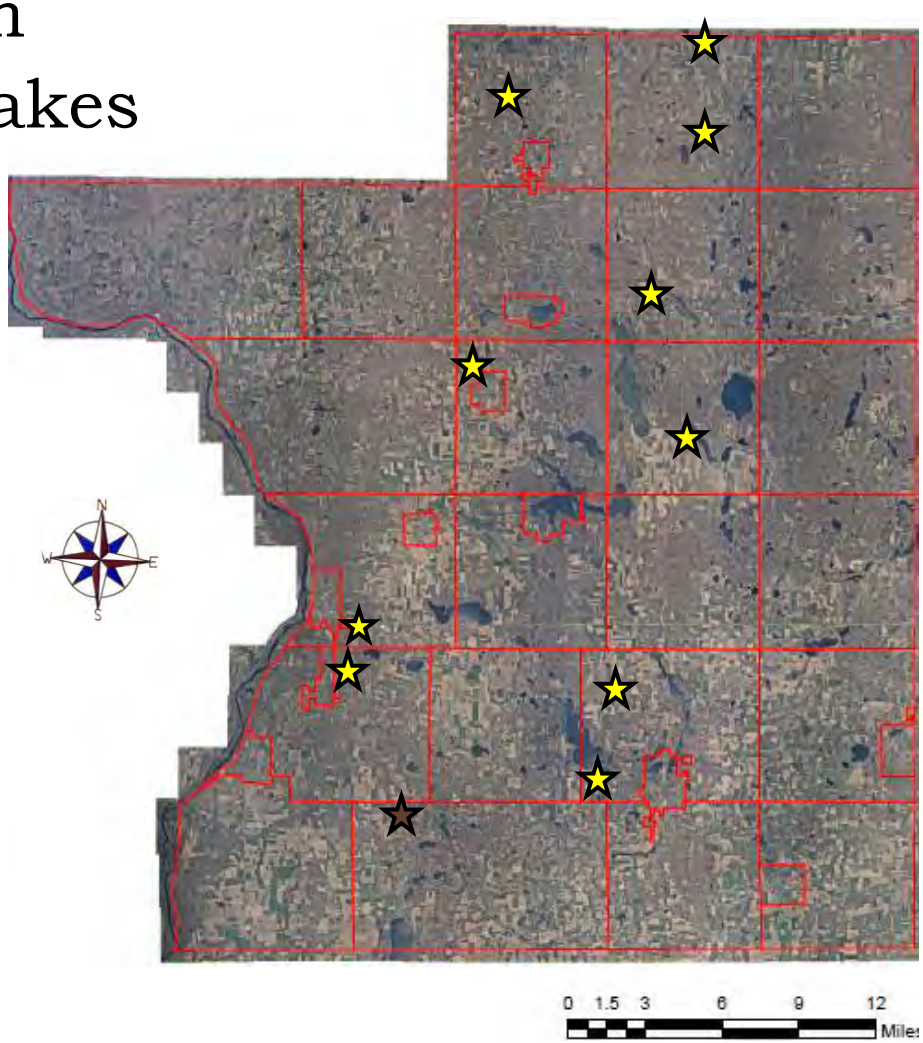
Zebra Mussels

- Found in 2010 in Bass Lake, St. Croix County
  - Confirmed in 2011
- Monitoring within Horse Creek Watershed


Lotus
Horse
Big
Round
Church Pine
Paulson
Pine
Swede
Lower Pine
Cedar

Early detection monitoring

- DNR statewide program
- 10 randomly selected lakes
  - North White Ash
  - Clam Falls Flowage
  - Black Brook Flowage
  - Lake O' the Dalles
  - McKenzie
  - Rice
  - Lotus
  - Pike
  - Coon
  - Vincent
  - Swede*



Early detection monitoring

- Meander survey
- 50 rake throws
- Plankton tows
  - Zebra mussels
  - Spiny water fleas
- Snorkel sites
  - Boat landing
    - 30 minutes
  - 5 sites in lake
    - 20 minutes
- Secchi
- Conductivity

Results of AIS monitoring

- Curly leaf pondweed
  - Black Brook Flowage*
  - Clam Falls Flowage*
  - Lake O' the Dalles*
- Chinese mystery snails
  - North White Ash Lake
  - Clam Falls Flowage
  - Pike Lake
  - McKenzie Lake*
  - Black Brook Flowage*
- Purple loosestrife
  - Lotus
  - North White Ash Lake
- Eurasian water milfoil
  - Pike Lake
- Lakes without invasives
  - Coon Lake
  - Vincent Lake
  - Rice Lake

Lakes WITHOUT Chinese mystery snails 2010

- Blake
- Coon
- Diamond
- Dwight
- Horse
- King
- Little Butternut
- Long Trade
- Lotus
- Pickerel
- Rice
- Somers
- Twin
- Vincent
- Ward
- Wild Goose

Lakes WITH Chinese mystery snails

- Apple River
- Balsam
- Bass
- Bear Trap
- Big Butternut
- Big
- Big Round
- Bone
- Bridget
- Camelia
- Cedar
- Church Pine
- Clam Falls Flowage
- Clear
- Deer
- Godfrey
- Half Moon
- Horseshoe
- Little Mirror
- Long (Cty Rd T)
- Long (Cty Rd I)
- Loveless
- Lower Pine
- Magnor Lake
- McKenzie
- North Twin
- Paulsen
- Pike
- Pine
- Pipe
- Poplar
- Sand
- Sandhill
- South Twin
- Wapogasset
- White Ash

AIS and ordinance signs at boat landings

Educational displays

- Amery Trail Days
- Dairy Breakfast at Peper Farm
- White Ash Lakes Fair
- Half Moon Annual Meeting
- Polk County Fair
- Lake Wapo/Bear Trap 100 Year Celebration
- Loveless Lake Fall Meeting
- Hunters Night Out

Youth education 2011

- Amery school 1st graders
- Mr. Y's 5th Grade Camp St. Croix Falls
- St. Croix Falls 2nd graders
- Clear Lake Summer Reading Program
- Amery Summer Reading Program

Media campaign 2011

- WPCA radio every other Thursday
  - Zebra mussels
  - Eurasian water milfoil
  - Spiny water fleas
  - Japanese and giant knotweed
  - Purple loosestrife
  - Rusty crayfish
  - Silver carp

- Budget for media campaign equipment
  - Videos
  - Camera (underwater)
- Passed LCC committee
  - Finance
  - County board

Clean Boats, Clean Waters training

- Balsam Lake
- Big Butternut
- Big, Round, Church Pine (2010)
- Apple River Flowage (upcoming)

Aquatic plant management plans

- Authors of plans
  - Round
  - Big Trade
  - Little Trade
  - Long Trade
  - Big Butternut
- Point intercept surveys
- Serve as an advisor

Invasive Species Prevention for Polk County

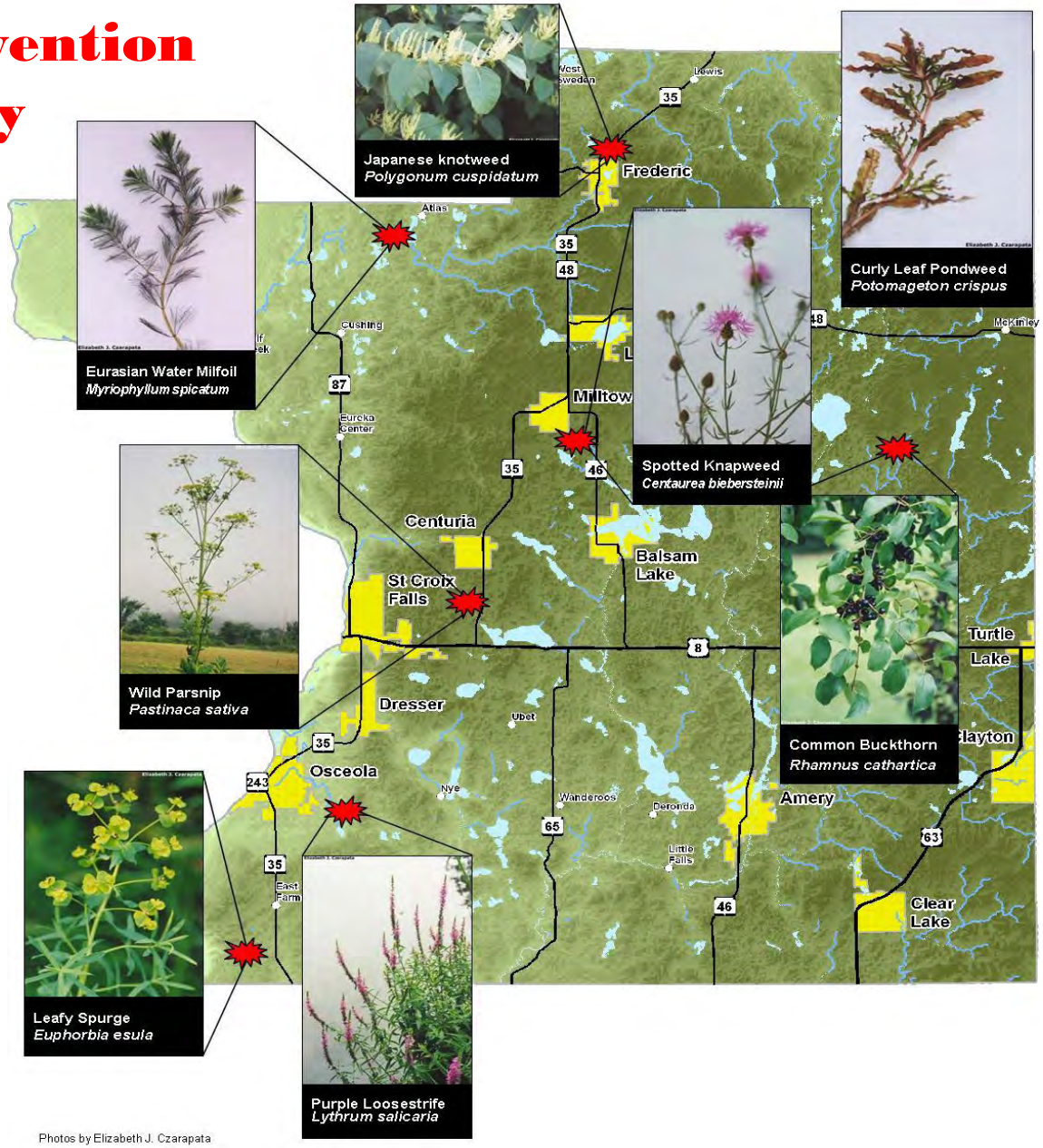
Eric Wojchik

Conservation Planner

Rotary Club

Polk County

LWRD



Photos by Elizabeth J. Czarapata

Types of Invasives

Terrestrial

Aquatic

Includes Animals

(Mammals, Fish, Reptiles, Amphibians, Insects and Crustaceans)

Japanese Knotweed, Polk County 2009

Hydrilla, Wakulla Springs Florida

What is the Risk of Terrestrial Invasives?

Common Buckthorn

- Make forest understory impenetrable.
- Reduce native species
- Degrade ecosystems
- Limit recreational opportunities
- Reduce property values
- Decrease productivity of agricultural lands
- Complicate property maintenance operations
- Continuous Expense

What is the Risk of Aquatic Invasives?

Eurasian Water Milfoil

- Make lakes/rivers unusable by boaters and swimmers
- Reduce native species
- Degrade ecosystems
- Limit Recreation Opp.
- Affect human health
- Reduce property values
- Ruin boat engines and steering equipment
- Constant Expense

Control Measures

Chemical

- Foliar
- Stem Treatments
- Soil treatment

Mechanical

- Mowing
- Tillage
- Hand Pulling
- Cutting

NOTE: Very Species Specific

PREVENTION!

- The BEST control measure

Works for any invasive species!

STATE & LOCAL PREVENTION EFFORTS

1. Polk County elected to address the concern for future spread of aquatic and terrestrial invasive species by adopting an Illegal to Transport Ordinance (No. 10-08) in April 2008.
   Polk County Illegal to Transport Ordinance can be viewed at:
   http://www.co.polk.wi.us/landwater/Ordinances.asp

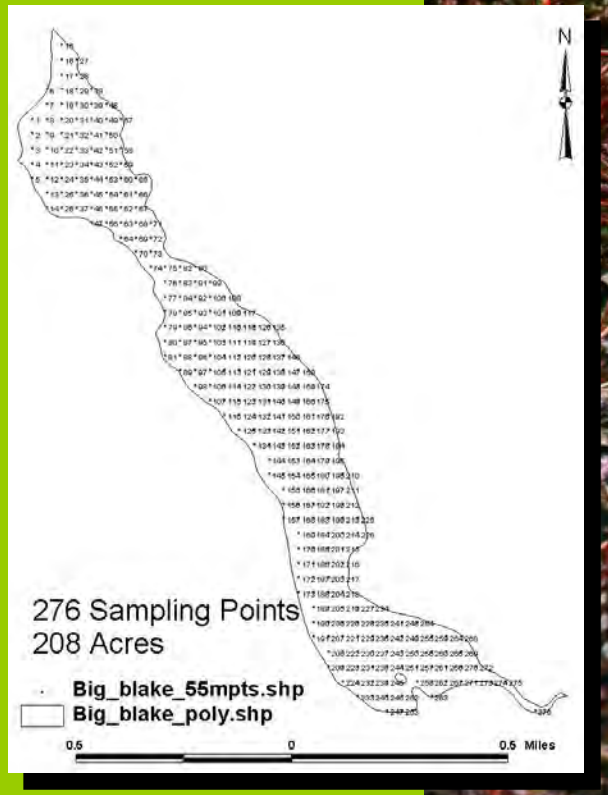
2. In an effort to prevent invasives and enable quick action to control or eradicate infestations the Wisconsin Department of Natural Resources has established:
   Chapter NR 40

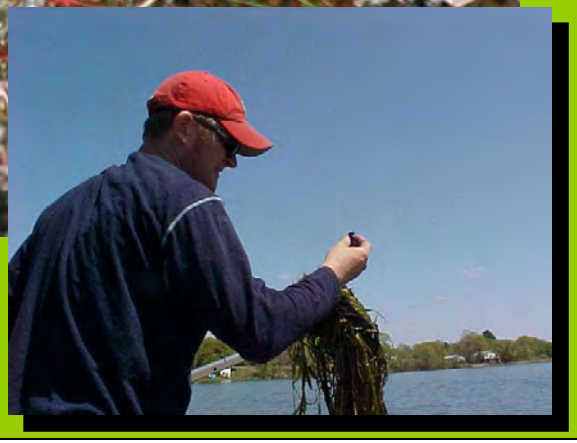
Wisconsin's Invasive Species Identification, Classification and Control Rule

Chapter NR 40 regulates the transport, transfer, possession of many listed species of exotic plants and animals.

The Chapter NR 40 Rule and Invasive Species list can be viewed at:
http://dnr.wi.gov/invasives/classification/

Curly-leaf Pondweed





Zebra Mussels

Methods of Transport

- Boaters use their boats in several places without cleaning them with hot water.
- Kids, mucking in a lake, slosh over to a different lake and empty out their boots.
- Anglers take their bait buckets from lakes to rivers and empty them into the waters.
- Someone gets bored with a pet zebra mussel and releases it in a new home.
- Ducks, with muddy feet, fly off to new watery homes.
- Water plants get stuck on boats or other equipment and are carried to different bodies of water.

Rusty Crayfish

Apple River

Osceola Creek

Horse Creek

St. Croix River

Trade River

Lake Wapogasset

Rusty crayfish can reproduce in large numbers and reduce lake and stream vegetation, depriving native fish and their prey of cover and food. Their size and aggressive nature keeps many fish species from feeding on them. Rusty crayfish may also reduce native crayfish populations by out-competing them for food and habitat.

Spiny Water Flea

Because spiny water fleas eat zooplankton like Daphnia, they compete directly with small fish that also need to eat zooplankton. Research shows that perch aren't growing like they should and some young can't survive because of the lack of food. A decrease in small fish populations could also take away a food source for larger sport fish in Lake Michigan.

Spiny water flea clogging gill net, Lake Superior, Minnesota

Please take the following steps to prevent the transport of aquatic invasive species to new waters:

- **Inspect** and **remove** aquatic plants, animals, and mud from your boat, trailer, and equipment.
- **Drain** all water from your motor, livewell, bilge, transom, etc.
- **Dispose** of unused bait in the trash.
- **Wash** your boat and equipment with hot and/or high pressure water, particularly if moored for more than one day, OR
- **Dry** your boat and equipment thoroughly (in the sun) for five days.

Invasive Species Jeopardy

The study of…

Who are the people that work with invasive species?

Ichthyology

Mammology

Limnology

Entomology

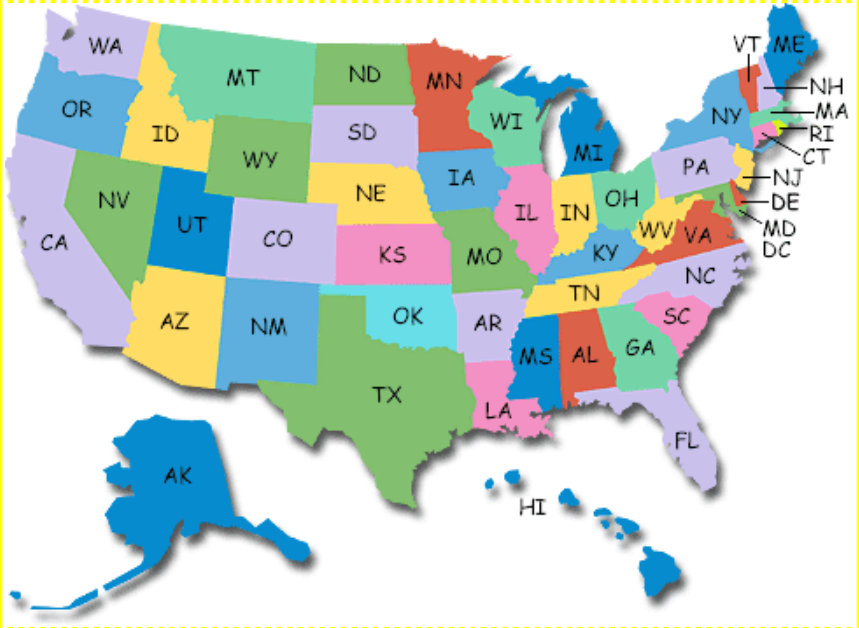
Botany

What can YOU do to prevent invasive species?

- Do not transport fire wood
- Keep ***native*** plants in place
- Only buy from trustworthy stores
- Do not release aquarium pets

- Give a report in class on invasive species
- Follow Laws
- Volunteer at a local park
- Clean your boat, trailer, and outdoor equipment

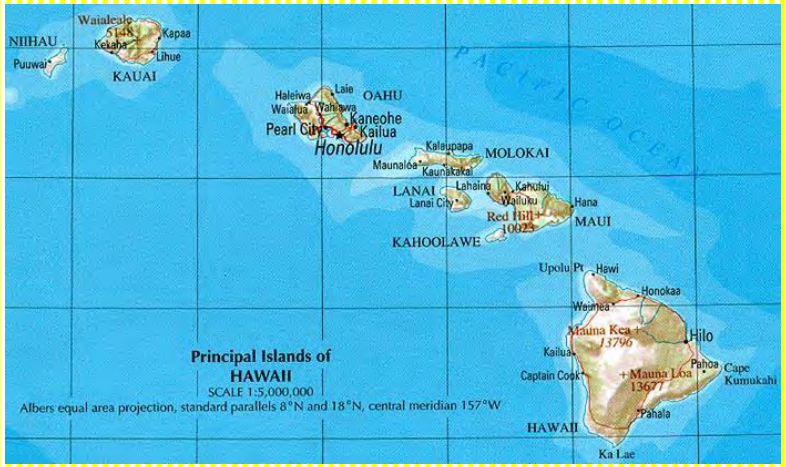
Domestic Animals



- Cats
- Pigs
- Snakes
- Camels
- Goats

IRELAND
0 100 km
0 60 miles
SCOTLAND
ENGLAND
WALES
UNITED KINGDOM
NORTHERN IRELAND
IRELAND
ATLANTIC OCEAN
IRISH SEA
CELTIC SEA
Donegal
Derry
Omagh
Belfast
Donegal
Easkey
Sligo
Mayo
Connemara
Galway
Clonmacnois
Dublin
Aran Islands
Galway
The Burren
Wicklow
Limerick
Thurles
Tipperary
Wexford
Wexford
Killorglin
Waterford
Killarney
Kerry
Cork
Beara Peninsula
Cork
Mizen Head

Jacksonville
Tallahassee
Orlando
Tampa
St Petersburg
Sarasota
Cape Coral
Coral Springs
Hialeah
Key West
FLORIDA


NIIHAU
Puuwai
Waialeale 5148
Kekaha
Kapaa
Lihue
KAUAI
Haleiwa
Waialua
Wahiawa
Laie
OAHU
Pearl City
Kaneohe
Kailua
Honolulu
PACIFIC OCEAN
Kalaupapa
MOLOKAI
Maunaloa
Kaunakakai
LANAI
Lanai City
Lahaina
Kahului
Wailuku
Hana
Red Hill 1062
MAUI
KAHOOLAWE
Upolu Pt
Hawi
Honokaa
Waimea
Mauna Kea 13796
Hilo
Kailua
Pahoa
Cape Kumukahi
Captain Cook
Mauna Loa 13677
Pahala
HAWAII
Ka Lae
Principal Islands of HAWAII
SCALE 1:5,000,000
Albers equal area projection, standard parallels 8°N and 18°N, central meridian 157°W

AUSTRALIA

How Do Invasive Species Get Here?

Natural vs. human caused

Intentional vs. non-intentional

APL

•Wooly Mammoth

Russia
Alaska
Bering Sea
Pacific Ocean

- Boats
- Ballast Water
- Shoes and Waders
- Anchors and equipment
- Sea Planes
- Cargo
- Wind

How Can Invasive Species Hurt You?

- Sea Lamprey – commercial fisheries and native fish population
- Eurasian Water Milfoil – swimming and boating opportunities
- Zebra Mussels – intake pipes for industries and water treatment plants, bioaccumulation of pollution
- Death or replacement of native species (Freshwater shellfish and American chestnut)

- Purple Loosestrife – loss of wildlife value
- Spotted knapweed – poisonous compound making less forage for cattle
- Water hyacinth – higher taxes If these mats cover the entire surface of the pond they can cause oxygen depletions and fish kills

Ontario Ministry of Natural Resources

- Purple Loosestrife – loss of wildlife value
- Spotted knapweed – poisonous compound making less forage for cattle
- Water hyacinth – higher taxes If these mats cover the entire surface of the pond they can cause oxygen depletions and fish kills

What makes a good invasive specie?

- Reproduce fast
- Several reproduction methods
- Fast grower
- Similar climate, but different growing cycle
- Generalist to any environment (sun and shade, low nutrient and high, sparse and crowded conditions)
- Opportunistic – adapt to disturbance (multi-tier disturbance)
- Come in to areas with low diversity and are able to fill a niche

Climate change may help the spread of invasive species.

Species -- Organisms capable of interbreeding

Intrinsic Value

- The value something has just for being around. For its own sake.

Ecosystem

A natural unit consisting of all plants, animals and micro-organisms in an area functioning together with all of the non-living physical factors of the environment (Climate, landscape, soil)

Clean Boats, Clean Waters

- Invasive plants and animals threaten Wisconsin's water and land by outcompeting native plants and animals and disrupting natural habitat systems.
- Boats, trailers, fishing nets, personal watercraft, and other equipment can act as transportation devices for aquatic invasive species, allowing invasive species to become established in new areas.
- Clean Boats, Clean Waters is a program designed to provide an opportunity for volunteers to help stop the spread of invasive species throughout the state by using the "Stop Aquatic Hitchhikers" message.
- Through Clean Boats, Clean Waters volunteers are trained to organize and conduct a boater education campaign in their community.
- At Clean Boats, Clean Waters training sessions volunteers learn how to:

1. Identify aquatic invasive species
2. Report potential new invasive species
3. Perform boat and trailer checks
4. Set up a boat launch monitoring program
5. Record pertinent data
6. Spread the Clean Boats, Clean Waters message

Clean Boats, Clean Waters at Wapogasset Bear Trap

- Every year volunteers and paid inspectors work approximately 300 hours at the boat landings on Wapogasset Bear Trap Lake spreading the Clean Boats, Clean Waters message.
- In 2010, over 1400 people received the Clean Boats, Clean Waters message to "Stop Aquatic Hitchhikers."
- We would like to thank our neighbors who are currently volunteering their time for this project:
  - Dave and Vi Nelson, John Mahoney, George Scott, Dick Armbruster, Dick and Dodie Scholz, Jerry Haug, JoAnn Hallquist, Mary Lou Stanley, Mark and Marge Jacobson, Paul and Marilyn Collins, Steve and Pat Ruble, Jerry and Steve Moehnke, Bruce Regan, and the Fenner Family, Al, Julie, Nathan, Annie

Clean Boats ,Clean Waters paid inspectors Kevin Rodke, James Ziglinski, Ashley Norlund, and Dani Edin at training

Clean Boats, Clean Waters volunteer Steven Moenke and Chairman Rick Bazille

Volunteers Needed!

If you have as little as 3 hours a month you can help protect our waters by volunteering with the Clean Boats, Clean Waters Program

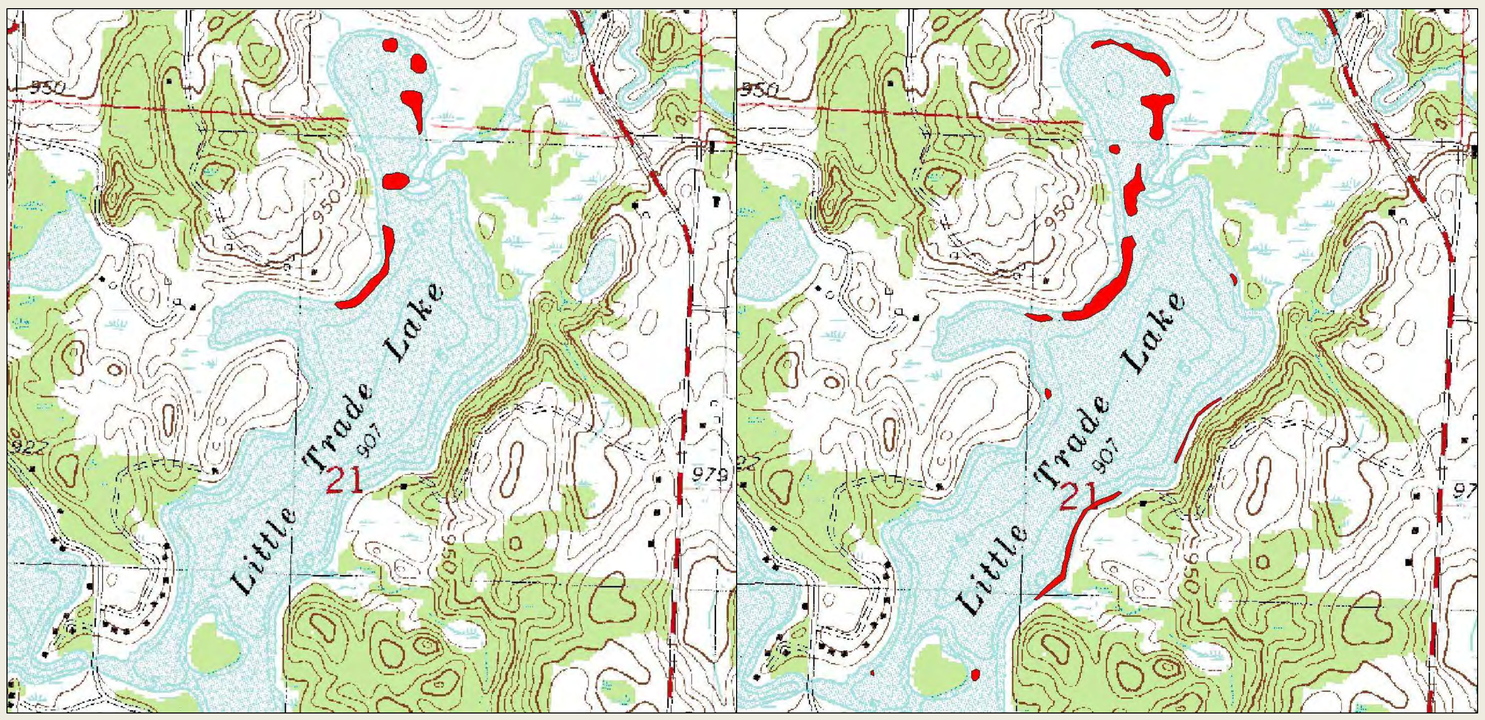
For more information please call Rick Bazille at 268-2916

Polk County Aquatic Invasive Species Monitoring

Eurasian Water Milfoil

monitoring and control on Pike Lake in Amery, Long, Little and Big Trade Lake and Round Lake in Burnett County.

Spring 2010 Spring 2011



The spread of Eurasian Water Milfoil from Spring 2010- Spring 2011 is mapped in red.

Purple Loosestrife

inventory and chemical and biological control with *Galerucella* beetles

Zebra Mussel and Quagga mussel traps

Chinese Mystery Snail and New Zealand Mud snail traps

EFFORTS SPORTSMEN CAN TAKE TO PREVENT THE SPREAD OF INVASIVE SPECIES

• Wash vehicles after recreational use to remove plant material and mud that may hold weed seeds.

•Remove all "hitchhikers" from your clothing and dog following your hunt or hike.

• Remove all plants from boat trailers and water from live wells before leaving boat landings.

•Report any new invasives to local conservation departments.

• Wash waders and the soles of wader boots before entering another stream while trout fishing.

• Deposit unused live bait in trash receptacles after fishing.

• Do not transport firewood farther than 25 miles from where it originated.

•Learn to identify common invasive species.

AQUATIC INVASIVE SPECIES

are plants and animals that don't naturally occur in Polk County waters and cause ecological or economic harm. Below are examples of invasives found in Polk County

Purple loosestrife

Is 3-9 feet tall, has spikes of purple/pink flowers, opposite leaf arrangement, and a four sided stem

Japanese Knotweed

Is a semi-woody shrub that can grow 10 feet tall, resembles bamboo, and has small greenish white sprays of flowers

Eurasian Water-Milfoil

Has delicate feather-like leaves arranged in whorls (circles) around the stem, is usually limp when out of water, and has 12-21 leaflets

Curly Leaf Pondweed

Has reddish-green leaves that are 3 inches long with distinct finely toothed wavy edges. The plant itself grows from 1-3 feet long and usually drops to the lake bottom by early July

Zebra Mussel

Shells have alternating dark and light colored stripes and are black to brownish in color and range from ¼ to 1 ½ inches long

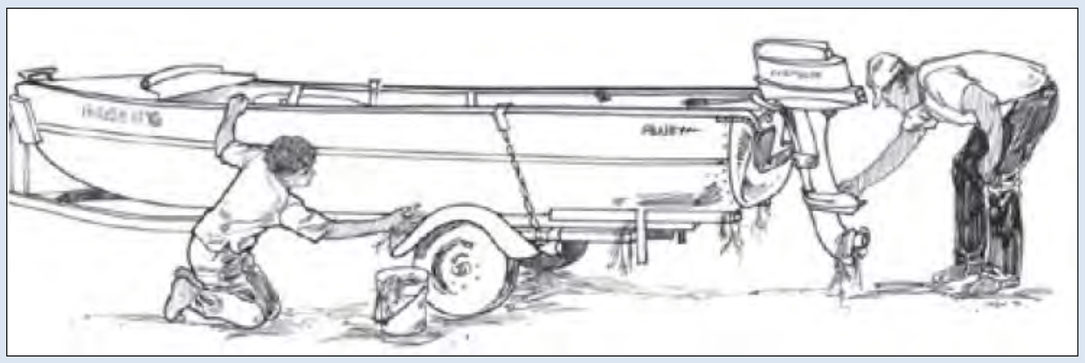
**Zebra Mussels have not yet been found in Polk County but have been found in St. Croix County*

Chinese and Banded Mystery Snail

Are large snails that are olive in color

STEPS YOU CAN TAKE TO STOP AQUATIC HITCHHIKERS

INSPECT boats, trailers and equipment for plant and animal material.



REMOVE all attached aquatic plants, animals, and mud before launching and before leaving the water access.

DRAIN all water from your boat, motor, live wells, bait containers, and all equipment before leaving the water access.

NEVER MOVE plants or live fish away from a waterbody.

BUY minnows from a Wisconsin licensed bait dealer.

DISPOSE of unwanted bait and other animals or aquatic plants in the trash.

REPORT any new sightings to the Polk County Land and Water Resources Department 715-485-8699.

Polk County has elected to address the concern for future spread of aquatic and terrestrial invasive species by adopting an Illegal to Transport Ordinance.

Appendix E

Information Provided Through Packets and Displays

Polk County Land and Water Resource Department

- Help stop aquatic hitchhikers brochure WT-801
- Japanese knotweed: A new threat to Wisconsin's waterways lakeshores and wetlands brochure ER-657
- Purple loosestrife: A major threat to Wisconsin's wetlands and waterways WT-799
- Regulated aquatic invasive plants in Wisconsin fact sheet WT-925
- Wetlands invasive species ID fact sheet WT-930
- Regulated aquatic invasive plants in Wisconsin fact sheet WT-960
- VHS kids card FH-243
- Stop aquatic hitchhikers sticker WT-747
- Clean Boats, Clean Waters sticker WT-828
- Zebra mussel boaters guide WT-383
- Minnows as bait: What Wisconsin anglers need to know to prevent spreading the VHS fish virus FH-240
- A field guide to terrestrial invasive plants in Wisconsin FR-436
- Stop aquatic hitchhikers tattoo
    - Zebra mussel WT-912
    - Asian carp WT-912A
    - Euraisn water milfoil (WT-912B
    - Spiny water flea WT-912C
- Eurasian water milfoil/northern water milfoil ID cards WT-394
- Watch Card
    - Zebra mussel WT-730
    - Purple loosestrife WT-744
    - Eurasian water milfoil WT-745
    - Rusty crayfish WT-752
    - Spiny and fishhook waterflea WT-753
- Wisconsin Wildcard
    - Japanese knotweed ER-106V
    - Zebra mussel WT738
    - Rusty crayfish WT-739
    - Purple loosestrife WT-740
    - Eurasian water milfoil WT-741
    - Curly leaf pondweed WT-759
    - VHS FS-930ww
- PCALR designed Stop Aquatic Hitchhiker stickers
- Who's Who: Contacts for your waterfront property questions: Polk County, Wisconsin
- Polk County local ordinance brochure

Appendix F

Polk County Visitors Guide

Polk County Land and Water Resources Department

Exotic Invasive Prevention

Enjoying the outdoors involves a new responsibility for those recreating in Polk County, Wisconsin. Exotic aquatic and terrestrial invasive species are a growing concern and a costly inconvenience for visitors and permanent residents of Polk County. Polk County has elected to address the concern for the prevention of future spread of aquatic and terrestrial invasive species by adopting an Illegal to Transport Ordinance (No. 10-08) in April, 2008.

***Polk County Illegal to Transport Ordinance** can be viewed at: www.co.polk.wi.us/landwater/Ordinances.asp*

Polk County Cares About Our Water Resources!

LOCAL ORDINANCE

Boaters must remove all aquatic plants and invasive animals before launching and leaving the landing. FINES: $200-$500

Polk County Ordinance 10/08

TIPS FOR TRANSPORTATION PREVENTION

Inspect
your boat or equipment trailer and remove all visible aquatic plants, animals and mud before leaving the water access.

Drain
water from your boat and other recreational vehicles to remove or kill species that are not visible before transporting to other water bodies.

Spray, Rinse or Dry
boats and other recreational vehicles to remove or kill species that are not visible before transporting to other water bodies.

Report
any new sightings or infections to the Polk County Land and Water Resources Department: 715-485-8699

Chapter NR 40

In an effort to prevent invasives and enable quick action to control or eradicate infestations, the Wisconsin Department of Natural Resources has established:

Chapter NR 40–Wisconsin's Invasive Species Identification, Classification and Control Rule

Chapter NR 40 regulates the transport, transfer, possession of many listed species of exotic plants and animals. The Chapter NR 40 Rule and Invasive Species list can be viewed at www.dnr.wi.gov/invasives/classification/

Know Your Polk County
Exotic Invasive Species

Japanese knotweed
Polygonum cuspidatum

Eurasian Water Milfoil
Myriophyllum spicatum

Curly Leaf Pondweed
Potomageton crispus

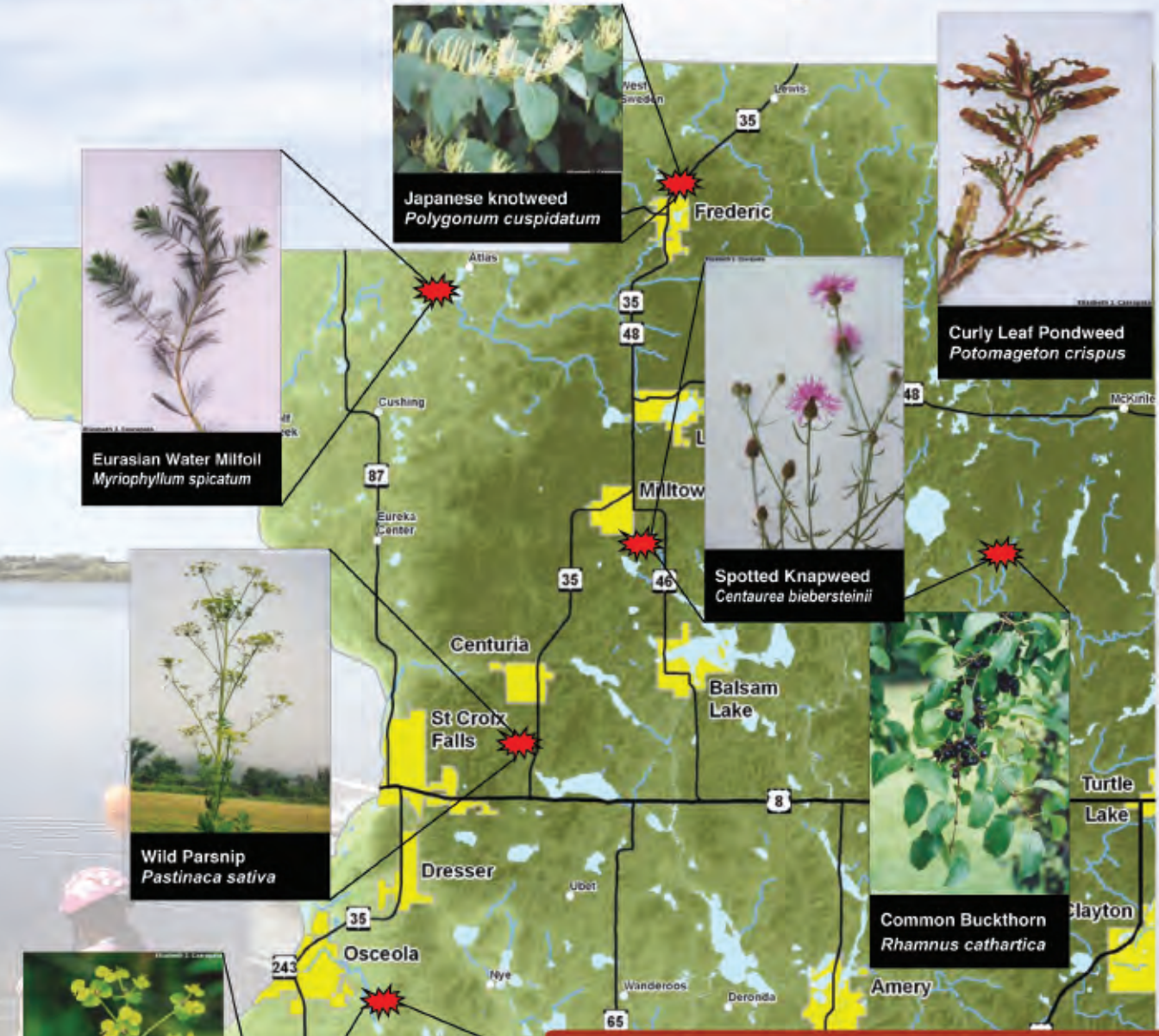
Spotted Knapweed
Centaurea biebersteinii

Wild Parsnip
Pastinaca sativa

Common Buckthorn
Rhamnus cathartica

Leafy Spurge
Euphorbia esula

Purple Loosestrife
Lythrum salicaria



Many exotic invasive species are colonizing Polk County. Polk County needs your help in their prevention and control. Properly identifying invasive species is the first step in effectively managing current infestations and the future spread of harmful invasives.

For More Information on Invasive Identification and Control Please Contact:

Polk County Land & Water Resources Department
715-485-8699

Wisconsin Department of Natural Resources
www.dnr.state.wi.us

Photos by Elizabeth J. Czarapata

Appendix G

Inter-County Leader Outdoor AIS section

Greg Marsten with information from Land and Water Resources Department

Chasing Invasives

Part one - Tracking the new, old and exotic threats

by Greg Marsten
Leader staff writer

BALSAM LAKE – The Polk County Land and Water Resources Department is under the gun. Water quality specialist Jeremy Williamson, who also carries the title of aquatic invasive species coordinator, is leading a charge against numerous threats to woods, land, water and the environment as it is known in Polk County.

Those threats sound like a Darwinian short story of supervillains. And in many cases, that's exactly what they are: Eurasian water milfoil, Chinese knotweed, toxic algae, Chinese mystery snails, rusty crayfish, all the evils of a quickly shrinking planet of threats.

The species that invade us are truly threatening to our current way of life, be it in lakes and rivers or in the woods and backyards of the region. While we've long known of many foreign invaders, many of which we've grown accustomed to over the years, like earthworms, Eurasian beetles and dandelions, they pale in comparison to some of the invasives that show up in our waters and soil. Many of the new "predators" of sorts are loose in our environment without any natural enemies, except for people like Williamson and cohorts in the LWD office.

Williamson has become used to battling a growing number of seemingly unchecked invasive enemies like buckthorn, zebra mussels and the like. But for many people in his line of work, it wasn't until purple loosestrife became such a scourge locally that the term "invasive species" became so common. In fact, the purple loosestrife battle has actually been one of the few relative successes.

"Actually, that's turned out pretty well," Williamson stated in an interview earlier, detailing how an innovative beetle-introduction program has "made great strides" in keeping the beautiful purple plant in check and from flowering into an even greater threat across the region.

But now the LWRD battles are easily tenfold what they were a decade ago. The growing threat of waterborne invasives is "much, much worse" than first thought, and much more extensive.

We've known about the pending threat of Eurasian water milfoil for decades, and evidence shows it was in Madison lakes as long ago as the late '60s, marching west on boats and trailers and between lakes and rivers. Eradication efforts have slowed its march, and the issue became quite noteworthy several years ago as EWM was discovered is several Twin Cities lakes, including Lake Minnetonka, where hundreds of watercraft go in and out daily during the warm months, potentially spreading it to countless lakes and water bodies.

Jeremy Williamson of the Polk County Land and Water Resource Department holds up an example of one of the new threats facing the waters of the region: Chinese mystery snails. – *Photo by Greg Marsten*

The battle against spreading waterborne invasives has included some rather innovative approaches, from volunteer monitors at busy boat launches to video cameras located at those same launches to keep track of boaters who may not adhere to recent rules regarding bilge draining, rinsing or live-well dumping, to keep those invasives in check.

But that was then, and EWM is a relatively easy opponent compared to some of the new "supervillains," according to Williamson.

Recent, eye-opening research and water-quality assessments have revealed a growing catalog of deceptively small, innocuous offenders, while media reports of some rather obvious threats - such as the carp noted for flying from the water when agitated, bouncing off boat hulls and even injuring passengers - have put a strange face to the enemies, and have made the battle broad, difficult and hardly ever completed. The phrase "mission accomplished" will never be associated with the battles of the invasives.

As Williamson stated, we now have many more plants, critters and insects threatening pristine waters, woods, yards and even native trees and animals.

And sadly, that list of environmental terrorists keeps growing - spreading the virtual "front lines" even wider, and forcing land and water specialists to forego some battles, while concentrating their efforts on others that may pose greater threats.

Those invasive species threats do have an occasional scar to show for it, as anyone who recalls the towering canopies of elm trees that used to create tunnels of shade in many urban areas. The invasive battle became prominent three decades ago when those centuries-old giants were gutted by the crippling Dutch elm sweep, forcing many cities to spend thousands of dollars to remove and destroy some of their biggest assets or lose them all.

For many people in the Deep South, the battle has been waged for decades as kudzu vines quickly choked out entire yards, homes and forests with a carpeted mass of bright-green flora. That kudzu has spread as far north as Wisconsin, and while it doesn't take well to local winters, it's a very visible example of just one of many enemies with no natural defenders to keep them in check.

In the coming weeks, articles will outline not only some of those invasive threats, but also detail how and where those battle are being waged, where they may be going, and outline why taxpayer money is being spent to battle plants and insects in a time of red ink, economic recession and difficult employment.

Also detailed will be the potential future, a world of no environmental boundaries, where predators have no enemies and battles go unfought.

In other words: Why should we care?

Lorain Township Fire Departments 26th-Annual Tractor and Truck Pull

Held on July 3

Tractor Pull Results

4500 Farm Stock: 1st Andy Johnson, Cumberland, John Deere A, 191.4; 2nd James White, South Range, John Deere A, 177.6; 3rd Scott Bierbrauer, Osceola, John Deere A, 175.6.

5500 Farm Stock: 1st Lloyd Eastel, Isanti, Minn., Farmall 460, Full Pull (246.5); 2nd Jimmy Larson, Lindstrom, Minn., Ford 500, Full Pull (241.2); 3rd Andy Johnson, Cumberland, John Deere A, Full Pull (231.2).

7000 Farm Stock: 1st Mike Holub, Rice Lake, 1984 Allis 6070, 273.4; 2nd Ryan Brown, Cumberland, 1961 John Deere 4010, 259.4; 3rd Kayla Wirth, Ridgeland, 1963 John Deere 4010, 253.5.

9000 Farm Stock: 1st Paul Furchtenicht, Sarona, John Deere 4320, Full Pull; 2nd John Mangelson, Indian Creek, IH 686, 256; 3rd Mark Hilden, River Falls, McCormick WD 9, 246.9.

12000 Farm Stock: 1st Greg Bechel, Plum City, Minn., Oliver 283.7; 2nd Todd Eggers, Cumberland, IH 1066, 277.3.

15000 Farm Stock: 1st Todd Eggers, Cumberland, IH 1066, 246.1; 2nd Greg Bechel, Plum City, Minn., 1950 Oliver, 242.1.

Unlimited (4x4): 1st Harold Sommerfeld w/Brandon Riley, Clam Falls, John Deere 8650, 3 Full Pulls; 2nd Gene Simons, Turtle Lake, New Holland 8970, 2 Full Pulls (243.7); 3rd Shorty Crosby, Shell Lake, 135 White, 218.8.

6500 Super Farm: 1st Ray Glases, Ridgeland, "JustaCase", 286.2; 2nd Kayla Wirth, Ridgeland, John Deere 4010, 284.5.

8000 Super Farm: 1st Ryan Brown, Cumberland, 1961 John Deere 4010, 322.1; 2nd Mike Holub, Rice Lake, 1984 Allis 6070, 279.1.

10000 Super Farm: 1st Buckshot Balut, Willow River, Minn., Farmall 1206, Full Pull.

12000 Super Farm: 1st Buckshot Balut, Willow River, Minn., Farmall 1206, 323.11; 2nd Dennis Fehn, Albertsville, Minn., IH 1486, 272.1; 3rd Nate CutsForth, Rice Lake, IH 1066, 244.1.

9000 Hot Farm: 1st Tyler Moore, Indian Creek, John Deere 4430, 290.9; 2nd Mike Fehn, Albertville, Minn., IH 1486, 250.4.

10000 Hot Farm: 1st Bradd Mlaskoch, Willow River, Minn., Farmall 1206, Full Pull (332.6); 2nd Bill Delander, Roberts, John Deere 4430, Full Pull (290.3); 3rd Tyler Moore, Indian Creek, John Deere 4430, 301.

12000 Hot Farm: 1st Bradd Mlaskoch, Willow River, Minn., Farmall 1206, 307.11; 2nd Dennis Fehn, Albertsville, Minn., Farmall 1486, 294.3.

6000 Super Mods: 1st Josh Swanson, Siren, Functional Junk, Full Pull.

Truck Pull Results

5500 Carb Stock: 1st Albert Betterly, New Richmond, '77 Ford 370, 320.2; 2nd Hank Smith, New Richmond, '77 Ford 429, 317.11; 3rd Kenny King, Pepin, '87 Chevy 454, 303.1.

5500 EFI Stock: 1st Forest Davis, Luck, '08 Chevy 5.3, 288.8; 2nd John Solander, '99 Mopar 360, 279.2; 3rd Richard Anderson, Frederic, '01 Chevy, 266.40.

5500 Street Legal: 1st Charles Biltorf, Amery, 1970 Chev 283, 300.7.

5500 Open Mods: 1st Charles Biltorf, Amery, 1970 Chev 283, 311.2.

6500 Carb Stock: 1st Brian Betterly, New Richmond, '77 Ford, 304.9; 2nd Greg Bechel, Plum City, Minn., Ford 460, 299.3; 3rd Kenny King, Pepin, '87 Chevy 454, 298.6.

6500 EFI Stock: 1st Travis Kuhnly, Belle Plaine, Minn., '04 Chevy 6.0, 263.1; 2nd Richard Anderson, Frederic, '01 Chevy, 247.40.

6500 Street Legal: 1st Charles Biltorf, Amery, 1970 Chev 283, 308.11; 2nd Joshua Raffesberger, Turtle Lake, '77 Chevy 283, 304.5.

6500 Open Mods: 1st Charles Biltorf, Amery, 1970 Chev 283, 308.9.

7000 Under Diesel: 1st Chris Perterson, Baldwin, '01 Dodge Cummins, 292.4; 2nd Eric Pfifer, Minnetonka, Minn., '02 Chevy 2500HD, 291; 3rd Brandon Schmidt, Luck, '02 GMC 2500HD, 285.11.

7000 Over Diesel: 1st Chris Perterson, Baldwin, '01 Dodge Cummins, 305; 2nd Scott Stocherl, Turtle Lake, '04 Ford, 299.6; 3rd Don Stark, Osceola, '07 GMC, 297. – *submitted*

Chasing Invasives

Part two - one not-so-exotic threat people are OK with

by Greg Marsten
Leader staff writer

BALSAM LAKE – The concentration of efforts by local land and water resource officials in recent years have been to focus on real and emerging threats, many of which will be outlined in the coming weeks.

But in reality, we've had dozens, if not hundreds of species that have "invaded" the region and the nation over the past decades, and some of them we've grown to either accept, adapt to, modify and on occasion even appreciate.

One of those threats, believe it or not, is the little earthworm.

For instance, approximately one-third of all species of earthworm in the U.S. are invasives, or imported. And there are many, if not all of those species here in northern Wisconsin.

They may seem pretty harmless, slow and sort of interesting in their ways and bizarre ability to regenerate lost or cut segments. It's not uncommon for children to study the creatures in school, and learn of that strange quality, which can lead to cutting the bodies in two, in essence "creating a friend" for the creature(s).

But earthworms are indeed changing the way forests evolve, and can threaten in ways we're only beginning to understand, as the impact is still unclear and may take decades or centuries to evaluate. Scientists do believe that with the earthworm "invasion," forestland decomposition can change dramatically - something any gardener or farmer will heartily understand.

The worms do what they do very well: They process decomposed leaves, which upsets the natural balance of the forest floor, making the forest floor "unsurvivable" for certain trees and plants. It leads to less stable forest floors, as well, giving trees and plants less "traction" for tall growth. It may also make them more vulnerable to wind and other natural influences, and certain species of plants - such as ferns - are less likely to survive with the "tilled" soil.

There is also recent research indicating that larger earthworms, like the local nightcrawler, can affect the salamander future in both good and bad ways: The larger earthworms are good for adults and may make them more prolific and more likely to breed. But, conversely, the big worms are too large for the young salamanders to eat, meaning they may starve - creating a bizarre cycle of higher numbers but fewer surviving offspring.

But we've grown to love earthworms in many ways, and for good reason: They've become a major commodity for anglers and we almost expect them to grace our streets and driveways after a rainstorm. Their value in internal earth tilling is a gift to gardeners and farmers, and one area where you can see the affect on small scales in your own yards. Their ability to aerate the soil is truly unique and important.

But it is that very usefulness that has led to their explosion into areas they never existed prior - and hence the threat.

According to many sources, nonnative earthworms have been around in this region longer than they have in most parts of the U.S. - and like many invasives, can be traced back to the mighty Great Lakes.

'They came over in the ballast on the old ships," stated Jeremy Williamson, of the Polk County Land and Water Resources Department. "In the old days, they used soil for ballast."

The Great Lakes have been not only one of the oldest, most reliable and affordable "highways" of commerce, growth and expansion, but also one of the major ways that all flavors of invasives have entered the region, and the U.S. as a whole.

Williamson and others in his field have pretty well had to look the other way on earthworms, as they concentrate on species that are either earlier in their invasive cycles or pose greater, more immediate threats. But agencies, states and even angling organizations have taken efforts in recent years to limit the spread of the worms. Anglers may have noticed campaigns to dispose of unused worms not in the yard, but in the trash.

Construction, gardening and other earth-moving activities can speed up the cycle of invasion for the worms, but their spread is typically quite slow.

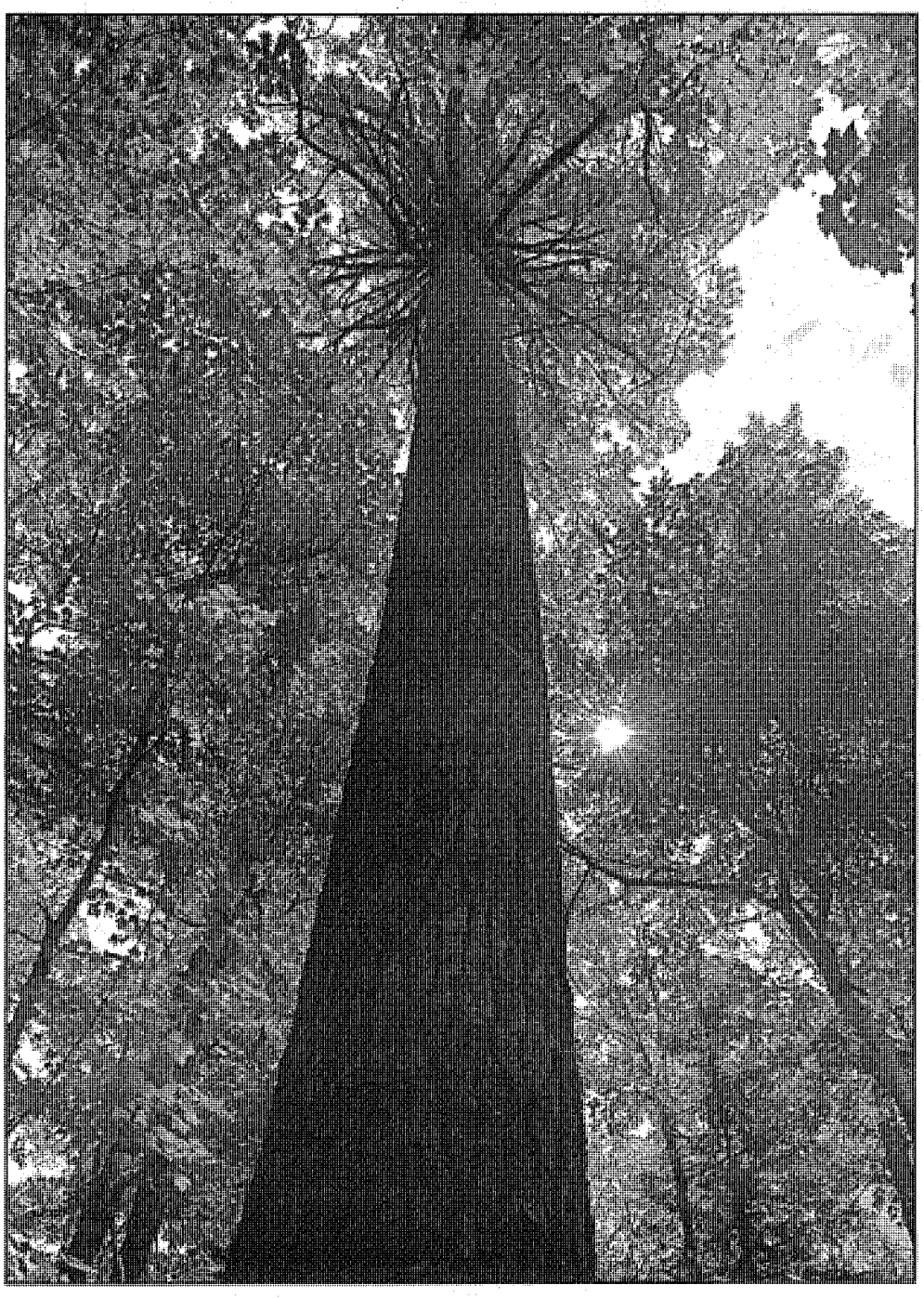
Other groups note that earthworms are a true commodity, and make up more than $50 million in North American sales - and not just as bait. They are also sold for "vermiculture" or composting, as they are, indeed, one of the great recyclers.

That use of primarily "red wiggler" worms is also one of the great dichotomies, or contrasts of good and bad: The worms are amazing recyclers of food wastes, and a true alternative to landfills - or at least a way to reduce the volume of food and yard wastes.

Like many invasive species, the threat can be minimized, even if it cannot be halted or eradicated altogether. But the little critters are one of the few invasives that have truly positive uses to offset the negative impact.

"Awareness is the key," Williamson said, which is something to note on any and all of the future spotlights on invasives.

However, it might not help to double their numbers by cutting them in half - even if it does create a "friend."



Invasive earthworms are changing the makeup of our forest floors, and may make it so towering, old-growth trees are unable to climb as high in northern forests. These massive trees are part of the ancient Estivant Pines Reserve in the Upper Peninsula of Michigan. – *Photo by Greg Marsten*

Swans continued

Collaborative effort

The general public and caring volunteers are a big portion of the success of the trumpeter swan, and an important tool for tracking swans across the state and beyond. The yellow bands around the swan's long necks are noticeable and easy to read through a set of binoculars, and Manthey encourages anyone to contact her with basic information about the birds. All she needs is the collar number, a location and a general observation of the swan's behavior.

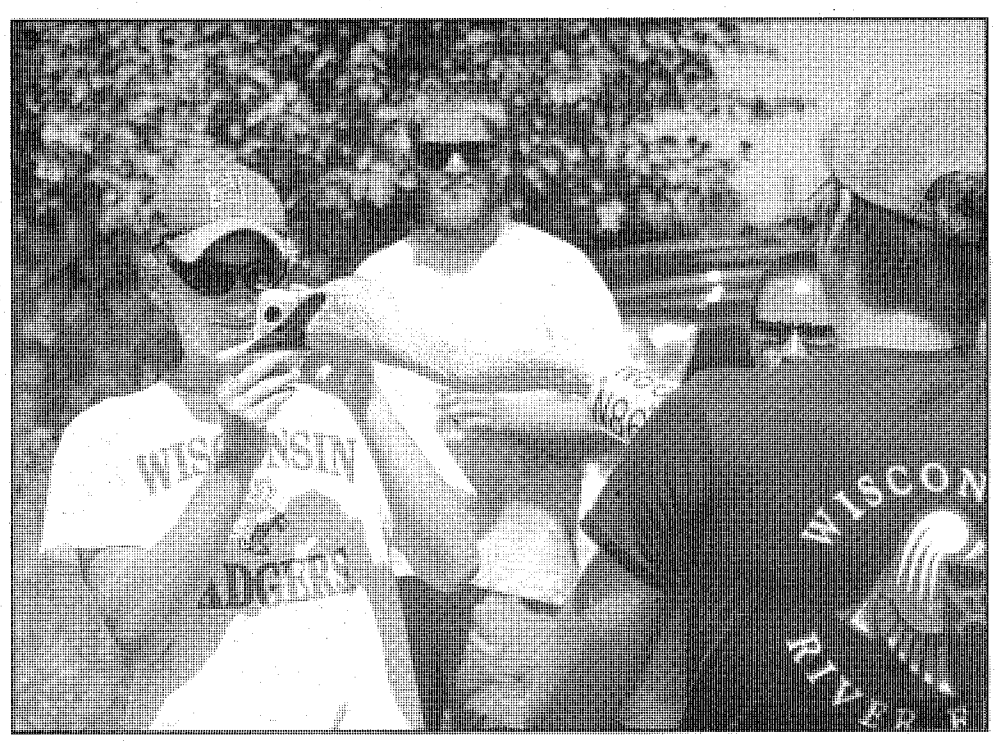
"Once people get really interested in a bird, and hear something about it, they're more inclined to help care for it," Manthey said.

There are several more swan roundups planned this summer starting in central Wisconsin, and back to Burnett, Douglas, Vilas and other counties. Manthey hopes to band about 100 birds this year, yet isn't sure how much longer the roundups will continue. She does know, however, that there's no shortage of help out there from those passionate about keeping the trumpeter swan around for generations to come.

"Everyone who comes out to do it is so good natured and good about it. They're getting dirty, they're getting wet, they're working hard and yet people are always just really happy to be helping with the swans."

To contact Manthey about a swan sighting, e-mail her at: Patricia.Manthey@Wisconsin.gov, or call 608-792-7207.

The trumpeter swan is a unique species to the state, and its recovery has been a true success story.



One of 26 trumpeter swans that were captured on Townline Lake gets its photo taken by one of several volunteers last week as part of the swan roundups organized in part by the DNR. Smiling faces were a common theme throughout the day. – *Photo by Marty Seeger*

INTER-COUNTY LEADER
OUTDOORS
ATVs • BIRDING • BOATING • CAMPING • FISHING • HIKING • HUNTING • RECREATIONAL VEHICLES

Chasing Invasives

Part three - the good, the really bad and the stinky

by Greg Marsten
Leader staff writer

BALSAM LAKE – When in full blossom, the vivid wash of yellow ochre can bring the rods and cones of anyone's eyes to life, and yes, children shuffle to poems of their "heads popping off." Of course, some innovative folks make a mean vino out of their flowers, but really, dandelions are not supposed to be here.

They are just another of the invasive species we have grown to accept, and take advantage of when we can. They've had a field day with the lack of new development, as the many thousands of dancing, lighter-than-air seeds are perfectly mated for the untended earth of an ignored yard, or the "many lots open" development that never matured.

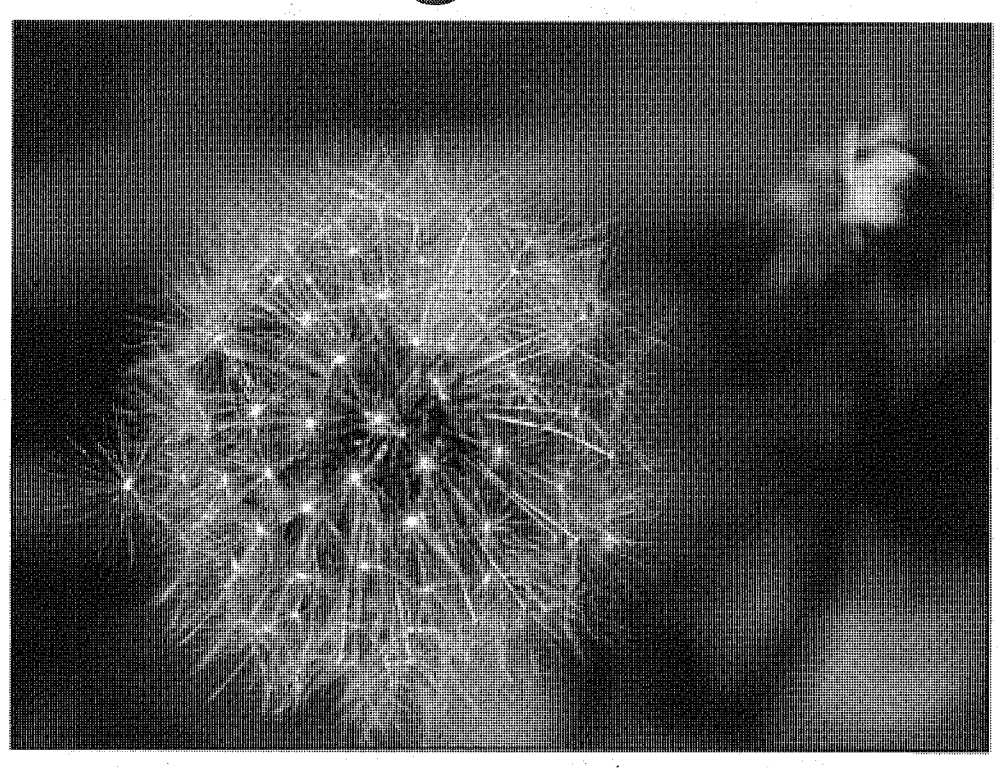
Dandelions - technically Taraxacum - are believed to have been native to Eurasia, and evolved solidly over the last 30 million years. They stayed away until the early European settlers, who used them both medicinally and as a food, brought them to our shores. Ironically, evidence of that use can be found with recipes for wine that reach back well beyond the founding fathers.

Many now considerer the plant an adjusted native, since it has become so ingrained in the continent.

The dandelion technically poses few threats except to persnickety gardeners and wedding photographers, and may in fact be a good companion plant for some garden items like tomatoes, since they can both protect from army worms and pull nutrients up to the surface. Other plant invasives are on the fence, and may indeed change our landscape forever in many bad ways, as will be seen in the coming weeks.

Some of the invasives may change forever how you see the world, the waterways and woods of the region, and may also lead to an appreciation of an invasive-free area. While invasive plants have many effects, some insect invasives may change even more of lives, or homes and even housecleaning.

One of those examples of late is the little Harlequin ladybug - technically Harmonia axyridis - but going by many names here and across the world, including the Eurasian lady beetle. They have moved into the region at full strength,



Dandelions are believed to have been native to Eurasia and evolved solidly over the last 30 million years. – *Photo by Brenda Sommerfeld*

decimating or eliminating altogether the native flavors of ladybug. While the Harlequins started innocently enough a decade ago, often with similar stories of the cute little ladybugs coming indoors that fall - one local elected official even admitted that his family was naming the few that heartily "survived" the cold winter - that charm didn't last long.

The Harlequin/lady beetle story has its roots locally to the fall of 2000, and even earlier to the south and east. By 2002-2003, the critters were seemingly everywhere in the Midwest. Reports of construction projects and siding jobs included bizarre, almost Stephen King-worthy stories of finding colonies of tens of thousands of the colorful invasives, heartily adapting by surviving the cold weather in every nook, cranny, attic and slightly heated space throughout the region. No building was safe, and reports of finding large colonies under piles of old leaves even became common.

Going backward, Harlequin "invasions" were noted in Kentucky in early 1992, central Pennsylvania a year later, and Champaign, Ill., in the late summer of 1994. They've slowly marched north during the warm weather, adapting remarkably to the climate along the way.

It is also uncommon, in part, because we tried, many times it seems, to introduce them over the past century. They were brought here as a control agent for aphids and other pests as early as 1916, without success. According to some accounts, the U.S. Department of Agriculture attempted massive releases of the spherical "love bugs" several times in the late '70s and early '80s, in hopes that the multicolored Asian lady beetle would help with specific pest control along the East Coast. The target then was the dreaded hemlock woolly adelgid, another voracious invasive pest that has single-handedly threatened most flavors of hemlock tree, and has no real enemies - except the little Harlequin and its families.

In many parts of the Northeast U.S., the future for hemlock trees remains grim at best, thanks to the woolly adelgid. The USDA effort was to cut or slow the losses years ago, and tried - unsuccessfully, it seems - to introduce the ladybug as a last-ditch way to save the trees.

But the true genetic tracings of the Harlequins is surprising, and may be a sort of Darwinian example of random success: Recent reports have entomologists tracing the U.S. infestation genetically, and it seems they may all have come from one initial batch, probably about two decades ago, in an accidental release from a New Orleans cargo ship, where they were noted in late 1988, possibly from a Japanese cargo vessel or cruise liner at port in Louisiana. Many people note that the bugs were never released in the areas in which they were spotted back then, so the fingers point away from USDA, and may lean toward a new source - possibly as a private attempt to help control aphids on pecan and apple crops in the Deep South.

Those small-scale Harlequin invasions may have caught on and spread fast; warmer weather allowing them many times their usual four to five generations per year, and their slow adaption to the cold - with a sort of antifreeze hibernation quality - allowing them to go from "snowbird" to year-round invasive resident.

The Harlequins are generally thought of as a positive invader, because of their aphid appetite: The Mall of America continues planned releases to assist in bug control on their several hundred indoor trees.

But many people think they have gone too far – they stink, bite and die in all the wrong places.

The shop vacuum seems to be the bugs' only local enemy, and they apparently have a form of communication via smell called an aggregate pheromone. When one of the little beasts discovers a safe, warm place to chill out when the weather cools, they broadcast that comfort with a smell – a kind of stinky smiley face - and all their buddies pay attention and flock to that spot.

Experts know they tend to favor the south and west side of buildings, especially areas warmed by late day or afternoon sun. They also like sharp color contrasts, and light colors of siding, where they easily slide behind. However, the beetles probably don't want to be trapped in your home, hence their love of lights and windows.

Best way to eliminate them? Keep them outdoors. Sealing entry points with weatherstripping and caulking helps dramatically. Only use pesticides as a last resort, and even then, only in the early fall or late summer, to keep them from overwintering. Would you want thousands of dead ladybugs in your attic or in your walls?

They have recently been targeted by officials in the Northwest and much of California for vineyards, with extensive and enhanced inspections of Christmas trees expected in coming years, due to the ease of transporting the formerly cute beasts. It seems that it only takes a few Harlequins to taint a whole batch of grapes.

Just like the dandelion - it all goes back to the wine.

Polk County participating in UTV Pilot Program

POLK COUNTY – On Tuesday, July 20, the Polk County Board of Supervisors passed a resolution allowing Polk County to participate in the state of Wisconsin Utility Terrain Vehicle Pilot Program. The UTV Pilot Program allows UTVs to operate on any designated ATV trail or route in Polk County until June 30, 2012, when the program expires.

UTVs participating in the pilot program must register for public-use ATV registration. Decals will have to be displayed the same as ATVs. Also, UTVs will obey and adhere to all of the same trail signs, markings and speed limits as ATVs.

To meet the basic specifications to qualify as a UTV, the machine must be manufactured with the following:

- Weigh between 900-1,999 lbs.
- Four or more low-pressure tires
- Cargo or dump box
- Steering wheel, taillight, brake light, two headlights, seat belts or similar device
- Maximum width of 65 inches
- Seating for at least two occupants, nonstraddled seats
- A roll bar or similar device
- Golf carts are not UTVs.

For additional information contact Polk County Parks, Forestry, Buildings and Solid Waste at 715-485-9294 or 715-485-9265 or the Wisconsin DNR at dnr.wi.gov/. – *submitted*

Aug. 2 deadline reminder

STATEWIDE – Monday, Aug. 2, is the deadline to submit applications for the fall turkey hunting season, Horicon zone goose hunt, sharp-tailed grouse season and the deadline to apply for bobcat, fisher and otter permits. – *Marty Seeger*

Great Northern Outdoors Bass Fishing League Standings

Co-sponsored by BLC Well Drilling in Milltown

Standings

1. Wiehl/Long, 90 lbs., 6 oz.
2. Laqua/Allee, 89 lbs., 13 oz.
3. Olson/Strizik, 79 lbs., 14 oz.
4. Luck Sport & Marine, 78 lbs., 6 oz.
5. Bistram Boys, 73 lbs. 0 oz.
6. Cory/Jamie, 70 lbs., 10 oz.
7. Grumpy Grandpas, 60 lbs., 13 oz.
8. A1 Construction, 57 lbs., 10 oz.
9. BLC Well Drilling, 52 lbs., 8 oz.
10. Harry/Leroy, 46 lbs., 12 oz.
11. Milltown Dock Marine, 43 lbs. 0 oz.
12. Mosseys, 41 lbs., 11 oz.
13. Jenell's Main Dish, 38 lbs. 11 oz.
14. Struck/Lonetti, 37 lbs., 2 oz.
15. Ones/Roberts, 36 lbs., 13 oz.
16. GNO, 34 lbs., 4 oz.
17. Sinkers, 25 lbs., 3 oz.
18. Hutton/Erickson, 24 lbs., 4 oz.
19. Team Top Water, 23 lbs., 5 oz.

Big bass weekly winner

Week 12:
Wiehl/Long, 90 lbs., 6 oz.

INTER-COUNTY LEADER
OUTDOORS
ATVs • BIRDING • BOATING • CAMPING • FISHING • HIKING • HUNTING • RECREATIONAL VEHICLES

Chasing Invasives

Part four - Buckthorn, the quiet plant that is beginning to rule the woods

by Greg Marsten
Leader staff writer

BALSAM LAKE – We've probably all taken note of some amazing buckthorn art, somewhere along the line, and not realized that the plant is a major threat to our woods, forests and even backyards.

The invasive buckthorn plants first became noted around here nearly a decade ago, with actual eradication efforts starting several years ago.

While buckthorn was actually beginning to thrive in many local forests - and especially under power lines and areas where birds gather - the hearty invader has been in topiaries and front yards for over a century, and until quite recently, was even sold by some big box retailers as an ornamental.

Most folks trace the buckthorn invasion back to the mid-1800s. The plant was always known for its toughness and ability for even bad gardeners to not be able to kill it. It was used for many of the exotic topiaries on the elite front yards and ornamental gardens of the East Coast, and could even be found at many of the mansions and playgrounds of the rich and famous for the past 100 years. Ironically, many of the same universities and other institutions that have studied ways of killing the plant have indeed paid to have it planted in front of the same buildings over the decades.

But going back in time, it has gone from ornamental to slowly marching invader, marching its way across the U.S. into the Midwest unchecked for decades, literally choking out vast portions of the forest understory, for a unique reason we'll discuss in a moment.

The plant has two noted "flavors" that have taken over many areas of the region: common buckthorn - Rhamnus cathartica - and the so-called glossy buckthorn - Frangula alnus. Neither variety is legal to sell in either Minnesota or Wisconsin, and according to some people, common buckthorn has been categorized as a "noxious weed" for decades, and was illegal to sell in many places since the 1930s, when it was also noted as a host of oat crown rust, which was spread by birds.

Hungry birds are to thank for the expansion since, as the berries are sweet and tasty yet have diuretic qualities, which leads to "deposits" where the birds reside - hence their dominance near power lines and tree branches. It is through that roundabout, bizarre hosting quality that the plant has spread through much of the nation, and is now quite common in most of our region, as well.

The invasive buckthorn has made its way from an ornamental plant to a real threat to native plants, forests and even backyards. – *Photo courtesy of the WI DNR*

Buckthorn is native to many areas of Europe, including Russia, Sweden, Siberia; even China and some portions of Asia have had it for centuries. Again, it had its use to gardeners and even in holding up fragile hillsides, due to its ability to survive almost everything thrown at it – cold weather, insects, lack of rainfall, even herbicides.

That is one of the reasons it is such a tough invader, and remains not only a formidable opponent, but an invader that has thrived in spite of eradication efforts, often in bizarre locations.

While attending a local media conference several years ago in the late fall, after the first snowfall, a speaker was addressing the threat of buckthorn and it's ability to thrive even in the cold weather, when he paused and looked out the window of the conference room, only to note that the plant was taking over the woodlands right outside the window.

One main reason buckthorn is such a unique threat is because of its unusual ability to spread via birds; but also because of an extended growing season: It has several weeks of "extra time" in both the spring and the fall.

"Yeah buckthorn's tough," stated Polk County Land and Water specialist Jeremy Williamson in an earlier interview. "It's especially tough because we've got a lot of it."

While Williamson and others admit buckthorn is a real and very common problem, it is indeed quite controllable, according to many local efforts.

But as Williamson later noted, and as will be covered in the coming weeks, there are other, even more exotic threats that have taken much of the spotlight, for a number of reasons.

As dominating as it is, there is some good news in the battle. Mentioning one of buckthorn's most common reasons it is a threat - that added hardiness for an extended growing season, which allows it to take over wooded areas other plants may normally try to occupy - that can also be used as an asset for fighting the problem.

That added time as either the first or last green thing in the woods makes identifying it, and hence controlling it, much easier than most invasives.

Several agencies have used that to great effect, and have had great success. The National Park Service has used buckthorn control for parts of community service days in lands they control near Dresser and Osceola, with great results. Others municipalities, groups and private organizations have taken it upon themselves to utilize those "windows" of added green weeks to mount their attack, and it works.

There has also been focused research on controlling agents in recent years, especially in Minnesota, where a Minnesota Department of Natural Resources commission with a Swiss study group has tried to go back to its beginnings, in effect, and find those long-forgotten natural predators for the plant. Several long-range programs have identified over a dozen potential insect control agents, many of which have been included in nearly decadelong studies to weigh the feasibility.

As mentioned earlier, herbicide treatments are difficult and expensive, and should only be used in its dormancy periods, the early winter or late fall, when it's easiest to identify. It is a real waste of product when the plant is in full bloom in the spring or all leafed out in the summer.

The plant is extremely hardy and resistant to usual methods of chemical control. However, multifaceted approaches do work, where you first cut the plant off low and apply chemical weed killers, or use a leverage-style weed puller that yanks the whole show from the roots. Others have used shovels to dig out as much as possible after cutting, but they can be "angered," some people say, and the sprouting base can make control even more difficult. Some have tried efforts to stop that spreading regrowth by using a coffee can nailed over the top of the stump, and others have tired burning, but neither approach is a sure thing.

It is an expensive and hugely time-consuming plant to eliminate, and local stories of huge, fruit-bearing trees being cut down only to lead to hundreds of smaller trees the next season are common. The control must be constant and consistent, even in areas where it's been eliminated, because it almost never really goes away.

Left unchecked, it will turn previously wooded areas with wide varieties of trees and brush into a so-called monoculture, of almost exclusively buckthorn plants.

You can identify the plant by its leaves, which resemble deer hoofprints, with a "thorn" between the two terminal buds. It can have either red or dark red, almost black, berries, and is easier to identify as, again, being the "last green thing" in the fall. But also note that when a stem is cut, the interior bark has a sort of golden color to the inside wood.

Another interesting note is that because the plant is so strong, some local folks have even attempted to find creative uses for the plant, such as art or even furniture.

And yes, some folks do appreciate the plant - such as topiary artists - and other at least appreciate the sticky, sloppy berries and the birds that spread it: Car wash owners may take note, as the bird droppings leave a messy, red splash of seeds that can stain even the best waxed paint job.

Hunters with disabilities should contact sponsors soon

Deadline to apply is Sept. 1, for special October deer hunt

MADISON – Qualified hunters with disabilities have until Wednesday, Sept. 1, to line up a sponsor so they can participate in a special gun deer hunt this October.

A sponsor list for the 2010 gun Deer Hunt for Hunters with Disabilities is now available. Hunters with disabilities must contact sponsors directly and get signed up by Sept. 1.

Hunters with a valid Class A permit, a long-term Class B permit that authorizes shooting from a vehicle, or a Class C Disabled Hunting permit are eligible to participate in this special hunt, which will take place Oct. 2-10.

The disabled hunt is the first gun deer hunt of the season and is scheduled to provide hunters with disabilities easier access and fewer weather-related difficulties. The only other deer hunters in the woods during the Oct. 2-8 time period are archery deer hunters. There will be a statewide youth gun deer hunt on Oct. 9-10.

Find more information on the 2010 gun deer hunt for hunters with disabilities Web page at dnr.wi.gov/, or contact Linda Olver 608-261-7588. For sponsors in Barron and Polk counties contact Jesse Ashton at 715-472-2253 or 715-338-6433. In Burnett County contact Steven Schaefer 715-327-4965 or 715-485-8370. – *Marty Seeger with information from the DNR*

Great Northern Outdoors Bass Fishing League Standings

Co-sponsored by BLC Well Drilling in Milltown

Standings

1. Laqua/Allee, 92 lbs., 0 oz.
2. Wiehl/Long, 90 lbs., 6 oz.
3. Olson/Strizik, 89 lbs., 6 oz.
4. Luck Sport & Marine, 88 lbs., 6 oz.
5. Bistram Boys, 81 lbs. 6 oz.
6. Cory/Jamie, 80 lbs., 12 oz.
7. Grumpy Grandpas, 64 lbs., 14 oz.
8. A1 Construction, 57 lbs., 10 oz.
9. BLC Well Drilling, 52 lbs., 8 oz.
10. Harry/Leroy, 50 lbs., 10 oz.
11. Milltown Dock Marine, 48 lbs. 10 oz.
12. Struck/Lonetti, 48 lbs., 7 oz.
13. Mosseys, 41 lbs., 11 oz.
14. Jenell's Main Dish, 38 lbs. 11 oz.
15. Ones/Roberts, 36 lbs., 13 oz.
16. GNO, 34 lbs., 4 oz.
17. Team Top Water, 29 lbs., 2 oz.
18. Sinkers, 26 lbs., 15 oz.
19. Hutton/Erickson, 24 lbs., 4 oz.

Big bass weekly winner

Week 13:
Struck/Lonetti, 3 lbs., 13 oz.

INTER-COUNTY LEADER
OUTDOORS
ATVs • BIRDING • BOATING • CAMPING • FISHING • HIKING • HUNTING • RECREATIONAL VEHICLES

Chasing Invasives

Part five - EWM - the lake plant that motivated the masses

by Greg Marsten
Leader staff writer

BALSAM LAKE – Unlike most land-based invasive species, the reality of waterborne invasive species is that we are really just now realizing the potential of the threats, and how serious the effects have become.

The most obvious offender for years has been the prominent Eurasian water milfoil, a stringy, encapsulating plant that chokes off still, freshwater lakes for almost all recreational activity, if left unchecked.

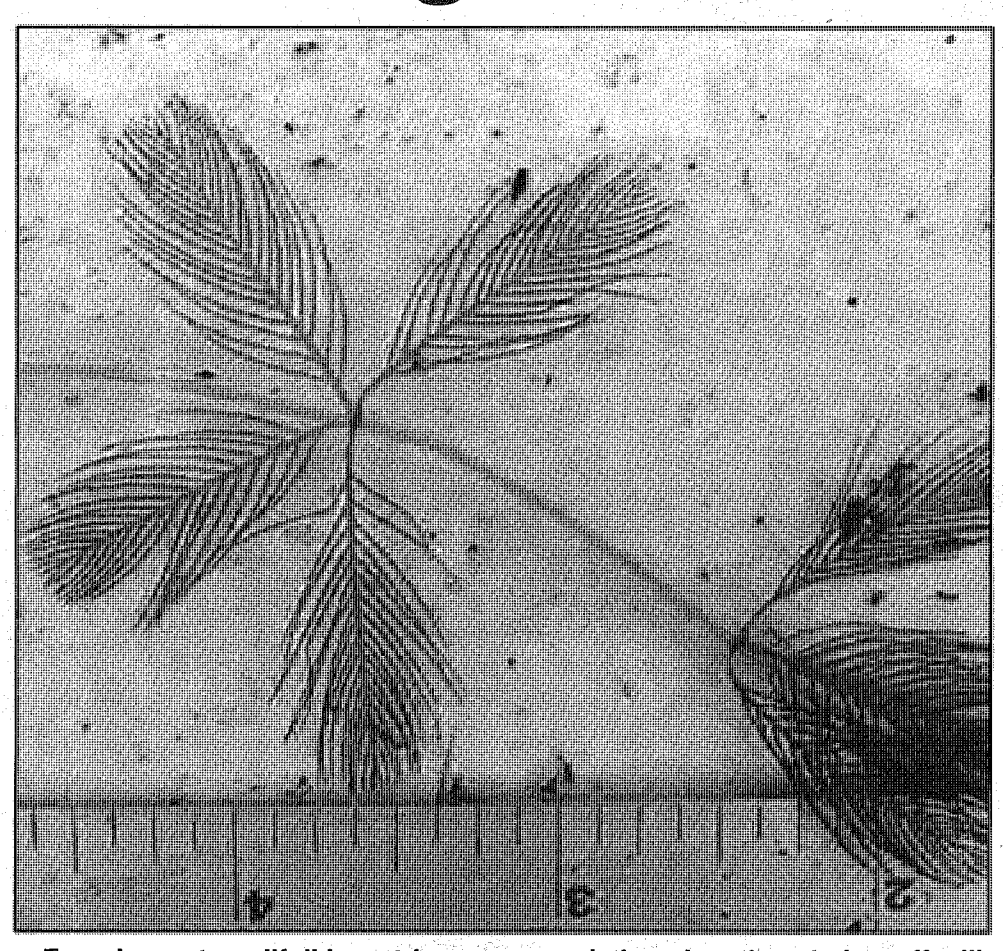
The plant was apparently first introduced to North America in the 1950s and has quickly spread across the U.S., with infestations noted in almost every state, save a few mountainous western areas, such as Montana and Wyoming.

EWM is especially dangerous and prolific because of how it can spread through broken pieces of a full plant with sprigs harboring on boats, motors, live wells, even in equipment and clothing. It is due to that easy spread that eyebrows and attention have been focused on stopping it in its tracks.

The spread became especially noteworthy several years ago when it began to appear on several "high-end" lakes in the Twin Cities Metro area, such as Lake Minnetonka. While the plant had been noted in many central and eastern Wisconsin lakes for decades, it wasn't until it hit some of those prominent Twin Cities bodies of water that awareness spread much past Madison.

Locally, EWM has become a prominent player in land and water resource time, with massive and extensive eradication efforts taking place on several lakes in both Polk and Burnett counties.

Just last year it was discovered in Little Trade Lake of Burnett County, which includes several lakes in a chain that goes between counties, such as Long Trade and Round Lake. The EWM beds were part of a mapping project this year and are a solid example of a partnership between both counties on water quality concerns.



Eurasian water milfoil is a stringy, encapsulating plant that chokes off still, freshwater lakes for almost all recreational activity, if left unchecked. – *Leader file photo*

Polk County Land and Water specialist Jeremy Williamson has noted that a particularly tough EWM hybrid was identified recently on Horseshoe Lake in Polk County. He also noted that the EWM fight has become an solid example of combined efforts between the two counties, the Wisconsin Department of Natural resources and even with local lakes associations and groups with specific interests.

"We went to a countywide approach," he said. "We're trying to be smart about it!"

Awareness is one of the major ways to fight EWM, and Williamson and others have been instrumental in making people aware of the plant and its impact, but also how to keep it from advancing on, which can seriously affect certain water bodies. Depending on water clarity and depth, EWM can be a choking carpet of water-quality problems, and some smaller ponds and lakes with the plant can be deemed almost unusable if not treated or harvested.

"The key really is awareness," he said, noting several variations of Clean Boat, Clean Water programs instituted by various organizations and meant to keep the EWM beast at bay.

Several lakes have instituted innovative volunteer-based monitoring programs at boat launches, and some have even gone as far as to install video camera to catch people who do not clean off their boats or trailer undercarriages.

Williamson was optimistic on the awareness efforts as he cited a survey where 92 percent of people surveyed were aware of the aquatic transients.

"That's a good start," he said, "and an important beginning."

Several local lakes have felt the impact of EWM infestations, and the weed has become the poster child for people who might question the need to spend tax money to fight or eradicate the pesky invasive.

Not fighting the weed, just ask a realtor or assessor as to the difference in property values between a home on an infested lake and a non-EWM lake. Property values directly affect property tax rates, which of course has a direct impact on every other homeowner or taxpayer in the county, municipality or region.

Lake property is already among the highest valued land in the area and shoulders a great bulk of tax impact. By decreasing that value, it can severely alter the general impacts.

Williamson said the issue of EWM is ongoing, and because it has such awareness, control has become a much more realistic possibility. He noted ways that some European nations, like Denmark and Sweden, have dealt with the plant in very shallow lakes, and how some lake associations have taken it upon themselves to not only monitor launches, but raise awareness across the board for future battles.

"Citizen monitoring is key," he said. "Lake people are well aware of the impact."

The sad part, he said, is that infestations are oftentimes brought to their attention by concerned citizens and homeowners.

"By that time, well, it may be too late," he said.

There are ways to treat EWM lakes, but they can be hugely expensive, such as chemical treatments, and also very time-consuming and ongoing, such as harvesting using elaborate pontoon boat contraptions that literally rip the plant from the water.

Many noted specialists bring to light the vast sums of money that some lake associations and groups have spent to treat EWM, but could have spent a fraction of that initially on keeping the infestation in check.

Williamson said that nearly 130 lakes in the Twin Cities Metro area have

See Invasives/ page 17

Over 3,400 subscribe to wolf caution alert service

Burnett, Dunn and Barron counties see dogs killed or attacked

MADISON – More than 3,400 dog trainers, pet owners and others interested in keeping track of recent wolf activity have signed up for an e-mail or wireless service that sends out an alert when wolves attack hunting dogs or pets in Wisconsin.

Records show 3,462 subscribers now receive e-mail alerts of new caution areas and recent wolf depredations through GovDelivery, a e-mail notification service provided by the Department of Natural Resources.

Signup is simple and only takes a few minutes. Use the search function on the DNR Web site to search for "dog depredation by wolves" and follow the simple instructions for subscribing to the alerts. It is possible to unsubscribe at any time.

The alert will be sent to a subscriber's e-mail and/or wireless addresses of choice and will include a link to details of 2010 depredations and a caution map based on the location of any attacks.

Alerts on other topics are also available through the GovDelivery feature. At the DNR home page select Subscribe to DNR Updates and select the topics you want to follow.

Caution areas

"When wolves attack dogs in hunting or training situations, the DNR creates 'wolf caution areas' to warn hunters that a specific pack has attacked a dog or group of dogs," explains Adrian Wydeven, DNR biologist and wolf expert. "We encourage bear hunters to exercise greater caution if they plan to train hounds or hunt bear with hounds near any caution area, especially if they are near an actual kill site and for pet owners near a kill site to keep close tabs on their pets."

Details of wolf attacks on dogs and caution area maps are available on the DNR Web site along with additional wolf information and suggestions for avoiding unwanted contact with wolves.

Since Jan. 1, wolves have killed 12 and injured seven dogs. Eight of the fatal attacks have been on trailing hounds since opening of the bear trailing hound-training season on July 1. Predation on livestock has also been a problem. Livestock and pet owners have been compensated by the DNR.

On July 31, a female Walker was killed in Burnett County. In March, a 12-year-old Brittany spaniel was killed in Dunn County, and a Lab/collie mix was injured by a wolf attack in the Blue Hills area of Barron County on June 6.

For more information contact Adrian Wydeven, DNR mammalian ecologist, 715-762-1363. – *from the DNR*

Youth learn to fish event on Big Wood Lake

GRANSBURG – A youth fishing clinic is being offered on Saturday, Aug. 28, beginning at 8 a.m., at Thorson Park, on Big Wood Lake. Youth will have the opportunity to learn tips and techniques from experienced anglers in the morning, and have a chance to put those skills to use on the water in the afternoon.

The Wisconsin DNR will provide all of the equipment needed. For more information and to sign up contact conservation Warden Chris Spaight at 715-463-2900, or Dustin at 715-566-1057. – *Marty Seeger with submitted information*

Great Northern Outdoors Bass Fishing League Standings

Co-sponsored by BLC Well Drilling in Milltown

Standings

1. Wiehl/Long, 99 lbs., 11 oz.
2. Laqua/Allee, 97 lbs., 6 oz.
3. Olson/Strizik, 95 lbs., 9 oz.
4. Luck Sport & Marine, 94 lbs., 4 oz.
5. Bistram Boys, 85 lbs. 0 oz.
6. Cory/Jamie, 80 lbs., 12 oz.
7. Grumpy Grandpas, 67 lbs., 6 oz.
8. BLC Well Drilling, 61 lbs., 13 oz.
9. A1 Construction, 61 lbs., 12 oz.
10. Struck/Lonetti, 54 lbs., 6 oz.
11. Harry/Leroy, 52 lbs., 12 oz.
12. Milltown Dock Marine, 50 lbs. 2 oz.
13. Mosseys, 48 lbs., 12 oz.
14. Jenell's Main Dish, 43 lbs. 12 oz.
15. Ones/Roberts, 42 lbs., 11 oz.
16. GNO, 38 lbs., 2 oz.
17. Team Top Water, 29 lbs., 2 oz.
18. Sinkers, 28 lbs., 10 oz.
19. Hutton/Erickson, 24 lbs., 12 oz.

Big bass weekly winner

Week 14:
Wiehl/Long, 5 lbs., 1 oz.

INTER-COUNTY LEADER
OUTDOORS
ATVs • BIRDING • BOATING • CAMPING • FISHING • HIKING • HUNTING • RECREATIONAL VEHICLES

Chasing Invasives

Part six - Fleas and snails, the water devils

by Greg Marsten
Leader staff writer

BALSAM LAKE – The battles against invasive species have taken a decidedly sci-fi twist in recent years.

The battles prior had usually been against things easy to see or track or either cut down, burn, smother or find something to eat it. But fairly recent turns in those battles have gone to the miniature, as bifocals and even microscopes became necessary.

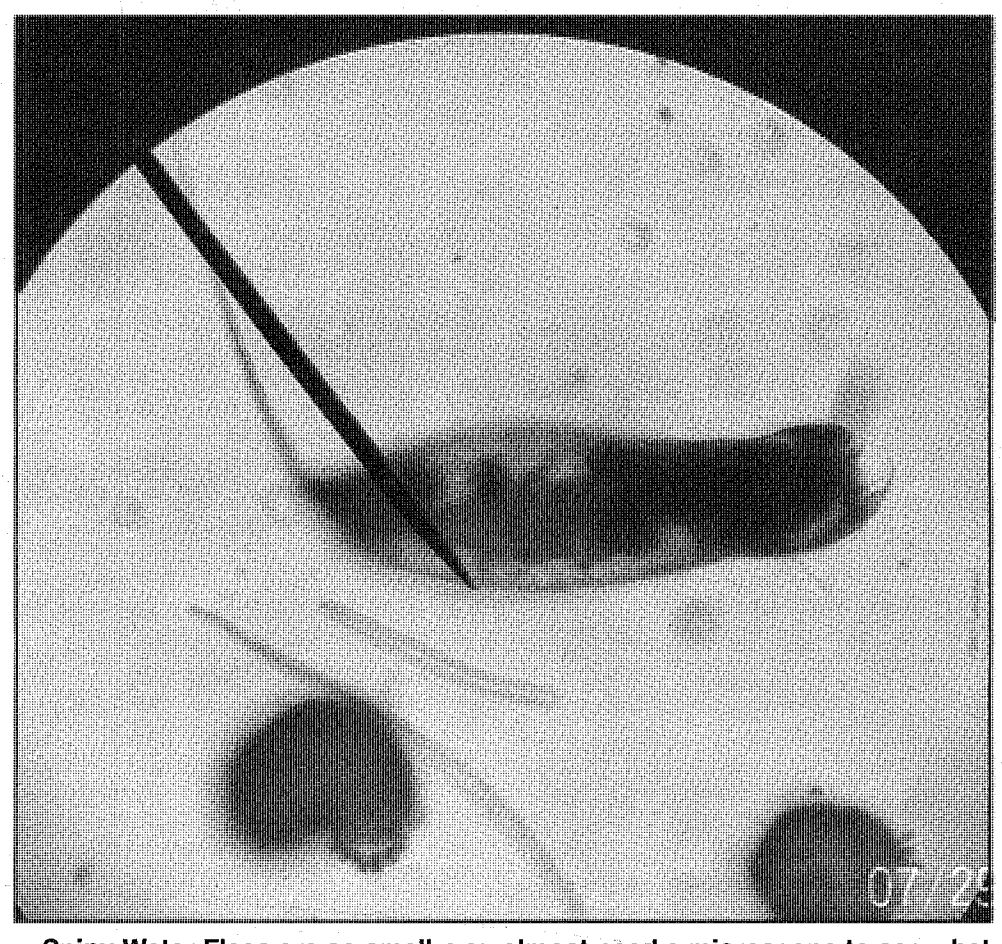
Yes, we're now facing off against stuff we really can barely even see with the naked eye.

The growing threat of waterborne invasives is "much, much worse than first thought," according to Polk County Land and Water Resources Department water quality specialist Jeremy Williamson - who also carries the flag of the battle with the additional title of aquatic invasive species coordinator. He's been tossed a whole new set of enemies in the war, and unlike typical foes, these are still being understood and assessed.

The invasions are much more extensive than first thought, and include some of the broadest swath of taxonomy imagined, from fleas to snails to mussels to carp and algae. This is literally "the kitchen sink" of invasive species, and they are all a threat where we live.

Sir Antony van Leeuwenhoek's early microscopic discoveries, and horrors, as he first saw the active world of spermatozoa in action - his very own - and later microbes and other sorts of tiny critters, is similar to the recent shock of the hidden truths within some of our waters.

Invaders with names like Spiny Water Fleas or Chinese Mystery Snail – that may be carrying other invaders in their systems, shells or bloodstreams - have turned the battlefields from giant swaths of lake or forest acreage to tiny volumes of water and vials. The microbial, small and flea-sized world of nature just became known as another area where we're outflanked - for the moment. Let's look at two of these waterborne threats:



Spiny Water Fleas are so small, you almost need a microscope to see what they look like, but their effect on water quality is still being understood. – *Photos submitted*

Chinese Mystery Snails

Yes, they have a funny name, but their scientific name is even more weird: *Cipangopaludina chinensis*, and they may look familiar, but the goofy-sounding snails are a real issue.

"The snails are everywhere!" Williamson said. "There are very few lakes [in either Polk or Burnett counties] without them."

One of the main issues with the snails is their impact, which is still relatively unknown.

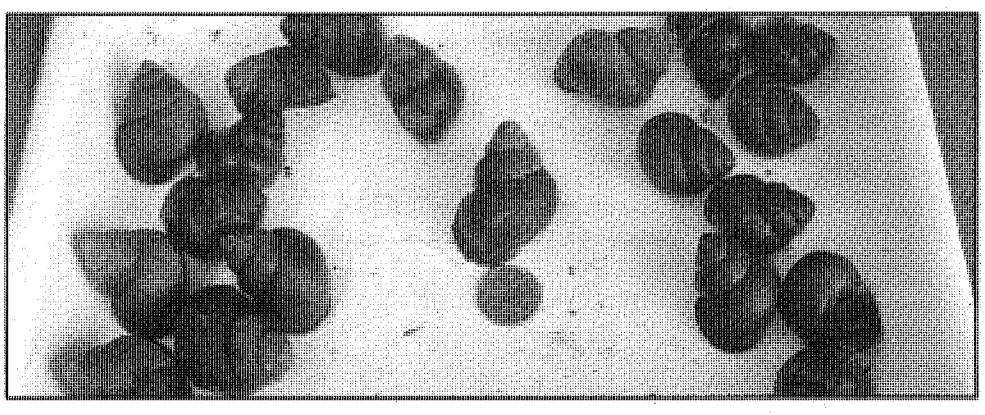
This snail species is primarily an algae eater, and native to Asia and, as their name implies, China.

They have been popular in fish tanks and aquariums for decades, because they do not eat fish eggs or plants, and don't overpopulate. They are also known for closing up if there is a water pH problem, giving aquarium owners an early indication that something is wrong a few weeks before the fish would start to die.

But Williamson noted that while they are relatively new in the battle, we really don't know what the consequence of these little invasives will be. They almost surely have spread through aquarium "dumps" or cleaning, and have showed up in recent years in so many bodies of freshwater, but the concerns are just now being investigated.

"Yeah, the problem is that we don't really know what the consequences of that are yet," he said. "I think the University of Wisconsin - Madison is working that out right now."

Hopefully, the news on their impacts is good, and if not good, at least not as bad as some of the other potential water threats, which we know to be a real problem.



Chinese Mystery Snails are one of the latest invasive species to taint local waters.

Spiny Water Fleas

This is the invasive that is small enough - less than a half-inch long - that it is hard to find. It also looks weird enough - they have one black eye and are mainly several barbs and spines on their tails - that the fear may be from the sci-fi appearance more than from the impact.

But the impact is real and just now being understood more fully.

Williamson noted the discovery of the fleas fairly recently in Pipe Lake, and while the news was shocking, it also left them scratching their heads.

"Really, how do we deal with that?" he stated in an earlier interview.

The fleas - scientifically called *Bythotrephes longimanus* - are native to Northern Europe and were likely distributed across the Great Lakes through the now-controversial ballast dumping sometime in the 1980s. They are well suited for many water conditions, and can fight off predators with the spiny barbs on their spine and tail. They are zooplankton eaters, which means they are suddenly in a food chain that is already taxed for sustainability for creatures later consumed up the line by larger game fish.

They are prolific breeders, and even their eggs can survive in very cold waters, which means winters are not the answer.

Due to their odd bodies, they may get caught up in fishing apparatus, like lines, poles and hooks, and not be noticed. That can also lead to their inland spread to smaller bodies of water, and is probably how they got here lately.

The critters compete indirectly for prey with several local fish species, including panfish and perch. These small, local fish can't feed on the spiny water flea itself because of their painful barbs. The flea's diet of what are referred to primarily as Daphnia zooplankton means it is also in competition with baby fish, and native water flea species - yes, some fleas are normal and native.

Williamson noted the concerns that many aquatic specialists have on Daphnia zooplankton population declines in recent years, and are concerned that the "downstream effects" of the flea's spread and the zooplankton reductions could be devastating.

"You can tell also [about a water body] by its chemistry," Williamson said, noting that reduced zooplankton populations are "never a good sign."

The spiny water flea is also causing serious concerns in many parts of Canada, where researcher have noted dramatic reductions in zooplankton - attributed directly to the fleas - and a few Canadian lakes have had almost complete zooplankton species elimination. Taking that essential food element out of a freshwater lake is devastating, and zooplankton are the virtual base in the aquatic food chains.

The tiny crustacean with the funny name and the one eye really does pose a serious risk to local ecosystems, and again shows the importance of diligent, managed boat, trailer and tackle cleaning and general water-sport "hygiene," although sadly, new evidence suggest that spiny water flea eggs survive even after being dried out or eaten by other, larger fish.

So the typical methods of cleaning a boat using high pressure, passage of time or even sunlight - don't necessarily work on these guys, proving again that the battles against invasives are never easy, convenient or expected, and as Jeanette Ranking - the first-ever U.S. congresswoman - once said: "You can no more win a war than you can win an earthquake."

Let's hope she was wrong ... or at least jumped the gun.

Women and youth invited to outdoor event at South Fork

FREDERIC – The South Fork Sporting Club, Polk County Sportsmen's Club and Wisconsin DNR have partnered together to bring women and youth ages 17 and under an opportunity to experience various outdoor activities.

On Saturday, Aug. 28, from 10 a.m. to 3 p.m., women and youth will have an opportunity to shoot trap, rifle, pellet guns, muzzleloader and archery. Outdoor cooking demonstrations and an opportunity to build a wood duck house or bluebird house will also be taking place, along with seminars on Pope and Young scoring, police dog tracking, shed hunting, trapping and turkey calling and hunting. Youth must be age 10 or older to shoot the firearms.

This free event is held at the South Fork Sporting Club grounds, located east of Lewis on CTH E. Heading toward Clam Falls, turn north on 78th Street. A lunch will be provided. For more information contact Warden Jesse Ashton at 715-472-2253 or Dennis O'Donnell at 715-327-4954. – *Marty Seeger with submitted information*

Great Northern Outdoors Bass Fishing League Standings

Co-sponsored by BLC Well Drilling in Milltown

Standings

1. Wiehl/Long, 99 lbs., 11 oz.
2. Luck Sport & Marine, 98 lbs., 6 oz.
3. Laqua/Allee, 97 lbs., 6 oz.
4. Olson/Strizik, 95 lbs., 9 oz.
5. Bistram Boys, 89 lbs. 3 oz.
6. Cory/Jamie, 80 lbs., 12 oz.
7. A1 Construction, 72 lbs., 5 oz.
8. Grumpy Grandpas, 67 lbs., 6 oz.
9. BLC Well Drilling, 61 lbs., 13 oz.
10. Struck/Lonetti, 61 lbs., 4 oz.
11. Harry/Leroy, 57 lbs., 4 oz.
12. Milltown Dock Marine, 54 lbs. 4 oz.
13. Jenell's Main Dish, 52 lbs. 3 oz.
14. Mosseys, 48 lbs., 12 oz.
15. Ones/Roberts, 44 lbs., 9 oz.
16. GNO, 38 lbs., 2 oz.
17. Sinkers, 30 lbs., 2 oz.
18. Team Top Water, 29 lbs., 2 oz.
19. Hutton/Erickson, 24 lbs., 12 oz.

Big bass weekly winner

Week 14:
Jenell's Main Dish, 4 lbs., 12 oz.

INTER-COUNTY LEADER
OUTDOORS
ATVs • BIRDING • BOATING • CAMPING • FISHING • HIKING • HUNTING • RECREATIONAL VEHICLES

Chasing Invasives

Part 7 - Zebra mussels - the tagalongs that have spread for centuries

by Greg Marsten
Leader staff writer

ST. CROIX FALLS – The local battle probably began in a Duluth, Minn., harbor over two decades ago, in 1989. Hidden on the rocks and hulls of ships at the end of the line in the Great Lakes, the tiny zebra mussel - technically *Dreissena polymorpha* - went unnoticed. The little mussels from the Caspian Sea are about the size of a large fingernail, and while they can be colorfully pretty with their brilliant striped shells, they pose a huge risk to local water bodies. They kill native mussels, massively disrupt ecosystems, damage boats and motors, as well as various intake systems on engines, negatively affect fisheries and municipal water supplies through clogging industrial intakes, and generally impair water recreation at several levels.

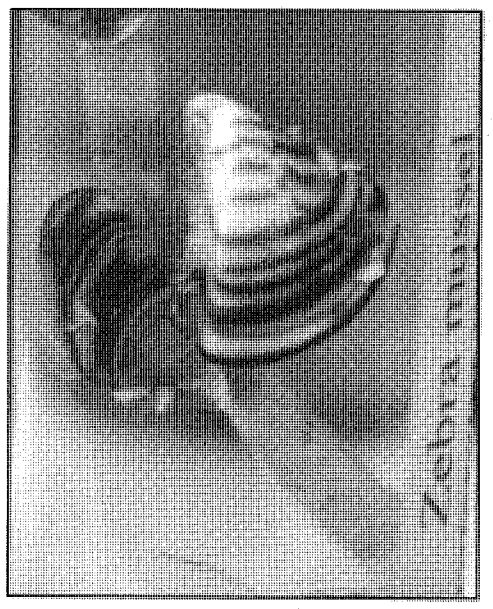
Once they are established, there really are no environmentally safe control methods.

Thankfully, the zebra mussel - and the similar and related quagga mussel - have not technically been found in any Polk or Burnett county water bodies yet, according to specialist Jeremy Williamson of the Polk County Land and Water Resources Department.

"We're crossing our fingers on zebra mussels," Williamson said. "But really, they're tough to find. It's kind of like trying to find a needle in 8,000 haystacks!"

The major concerns over zebra mussels involves their effect on native mussels, and the well-documented infestations that can wreak havoc on every hard surface in the water, as the mussels attach using stringy threads and don't let go. They do have predators, including types of crayfish, some muskrats and even some flavors of fish, like smallmouth bass. But the mussels are prolific breeders, and their numbers get so great, so fast, the predators seem to have no major impact on their spread or reproduction, although research is ongoing to try and control populations once infestations are confirmed.

Zebra mussel infestations have been a major focus of local National Park Service employees along the St. Croix River since their discovery downstream. While this mussel-encased container may look "artsy," the tiny critters pose a major threat all along the riverway. – *Photo by Greg Marsten*



Zebra mussels get their name from their dark and light, zebralike shell coloring.

The zebra mussel spread has been well-documented, going back to the late 18th century in parts of Europe, and as recently as the 1980s in the eastern Great Lakes, where they likely hitched rides aboard freighter hulls. The concern began to grow when freshwater intakes became so clogged with the mussels they needed nearly constant attention - with very high costs. By some estimates, utility companies in the North America likely spend over half a billion dollars annually on mussel controls in water and cooling intakes, and that number will only grow as the spread continues. They have been confirmed in almost half the states in the Union, and several Canadian provinces, and every year, more and more lake infestations are confirmed.

While they have not been confirmed in any local lakes, the battle lines are indeed visible to the west, where the tiny critter made recent news with its discovery in several popular bays on Lake Minnetonka, in the west Twin Cities Metro. That lake is one of the most highly traveled transient boat lakes in the region. Traditionally, efforts get focused and money gets earmarked when any invasive species is found in that body of water. When Eurasian water milfoil was discovered there years ago, it suddenly became a worthy battle. With the confirmation of the mussel infestation, in at least three different bays, Minnetonka's battle became familiar, along with 17 other Minnesota inland lakes, including Mille Lacs, Prior, Pelican and parts of the Mississippi and St. Croix rivers.

That's where the story takes a twist, and the battle suddenly has a new and formidable foe: The National Park Service.

Since 1992, the NPS has recognized the threat they face and formed a task force to deal specifically with the monitoring and control, hopefully, of the critter. That task force has since changed name and focus, casting a broader net and expanding the battle to take on several other potential invasives, such as Asian carp, but as discoveries of the zebra mussels began to grow around the region in the 1990s, the NPS began to seriously instigate measures to control their spread.

Once they were confirmed in the lower St. Croix River, the battle became intense and moved into one of the more controversial control moves, including localized boating restrictions on the St. Croix River, north of Arcola. The NPS even used a donated houseboat, nicknamed the Skinny Dipper, as a base of operations to make sure upstream traffic restrictions were upheld.

The discovery of juvenile zebra mussels in those last 16 miles of the Lower St. Croix River - now north of the Stillwater Bridge - suggests that reproduction has moved north. The last 10 years have been a constant battle to keep them from spreading farther upstream and into other water bodies or interconnecting rivers.

The NPS has been at the forefront of mussel control and has moved to involve local agencies of both states, as well as numerous federal agencies and even Native American Tribal organizations to assist in the battle and to limit the spread. To some effect, those limitation and control methods have worked, and the spread has likely been slowed through growing awareness and public promotional programs. They've also incorporated numerous collegiate agencies to assist in the monitoring and control programs, hoping to at least try to understand where they are now, so their spread can be controlled.

Part of the NPS plans to tackle the problem involves awareness and strict methods of boat, engine, bait live well and machinery cleaning. That cleaning and treating of boats and equipment that have been in the water is becoming more routine for many boaters. Extensive advertisements, volunteer monitoring personnel and signage have also helped raise awareness of the problems of tagalongs. Restrictions include using high-pressure hull cleaning with hot water, and complete, extensive drying of vessels, which have become accepted practice to stop zebra mussel spreads.

Locally, the Polk County LWRD has been on board with those battles for some time, and have looked hard to find any infestations locally. They have used monitoring discs - simple, multilayer fiberboard contraptions - to try and find them. Williamson noted how their department bought one for $45 and had it in Pipe Lake, but it was stolen.

"So I made my own," he said, showing off the contraption that is meant to draw the mussels in for a better idea where they may have taken up residence.

"Right now we're monitoring on Big Round and Wapogassett [lakes], just based on boat traffic and calcium levels. In fact, the Tribe [St. Croix Chippewa] are helping me out," Williamson said, noting how the St. Croix Chippewa are using nine different monitoring stations on Big Round Lake to assist in the battle.

Williamson let out a long sigh, and shook his head on what, if anything, has been found locally.

"Like I said, nothing yet ... not yet," he said. "But, unfortunately, it's probably just a matter of time."

Great Northern Outdoors Bass Fishing League Standings

Co-sponsored by BLC Well Drilling in Milltown

Standings

1. Wiehl/Long, 109 lbs., 15 oz.
2. Olson/Strizik, 106 lbs., 13 oz.
3. Luck Sport & Marine, 103 lbs., 12 oz.
4. Bistram Boys, 99 lbs. 1 oz.
5. Laqua/Allee, 98 lbs., 12 oz.
6. Cory/Jamie, 91 lbs., 4 oz.
7. A1 Construction, 76 lbs., 14 oz.
8. BLC Well Drilling, 73 lbs., 11 oz.
9. Grumpy Grandpas, 67 lbs., 6 oz.
10. Struck/Lonetti, 61 lbs., 4 oz.
11. Harry/Leroy, 59 lbs., 6 oz.
12. Milltown Dock Marine, 56 lbs. 1 oz.
13. Jenell's Main Dish, 54 lbs. 6 oz.
14. Mosseys, 52 lbs., 13 oz.
15. Ones/Roberts, 48 lbs., 2 oz.
16. GNO, 41 lbs., 3 oz.
17. Sinkers, 31 lbs., 12 oz.
18. Team Top Water, 29 lbs., 2 oz.
19. Hutton/Erickson, 24 lbs., 12 oz.

Big bass weekly winner

Week 16:
Bistram Boys, 3 lbs., 6 oz.

Mysterious animals and rare fungi

GRANTSBURG – The public is invited to discover rare animals, plants and fungi that make up Crex Meadows unique natural ecosystems during the area's Rare Species of the Barrens Conference on Saturday, Sept. 18. Experts in the fields of mushrooms, plants, turtles, birds and butterflies will share their knowledge during a daylong conference.

"Crex Meadows is a combination of ecosystems, including pinebarrens, brush prairies and wetlands," said natural resources educator Ali Cordie, "and these ecosystems have become rare throughout the state due to land alteration and development." As the Crex area has been protected for years, Cordie explained, it is a haven for wildlife and plants.

The conference starts at 9 a.m. and runs until 5 p.m. A $30 fee pays for a catered lunch and a field trip. Fees collected also help pay for wildlife education and management at the Crex center.

Attendees should dress for the weather, which can be cool and windy in mid-September. Binoculars should be brought along as the field trip goes into the heart of the wildlife area.

Crex Meadows headquarters is north of Grantsburg near the intersections of CTH F and D. For more information and to register, please contact Cordie, natural resources educator, at Alison.Cordie@wisconsin.gov, information@crexmeadows.org or call 715-463-2739. – *submitted*

INTER-COUNTY LEADER
OUTDOORS
ATVs • BIRDING • BOATING • CAMPING • FISHING • HIKING • HUNTING • RECREATIONAL VEHICLES

Chasing Invasives

Part eight - Sleeping beside a giant: Giant and Japanese Knotweed

by Greg Marsten
Leader staff writer

TOWN OF WEST SWEDEN – As invasive species run, there are several levels of threatening critters and plants. From the lesser types that are more of a hassle and nuisance, like Eurasian lady beetles or even earthworms, to the moderately threatening type, such as purple loosestrife or even buckthorn are another matter. They are plants or critters that can be controlled but have a soft-enough underbelly or tough natural predators to be controlled at a moderate or affordable cost.

But now we get to the heavy hitters, the invasive species that even those "in the know" are truly concerned about, like the two varieties of knotweed - technically called *Fallopia japonica* or *Polygonum cuspidatum* - both of which were discovered recently in the area ... or so they thought.

Meet the "Goliath" of invasives species: Giant and Japanese knotweed are among the largest, most threatening invasives in the world and are routinely listed as the being one of those plants or critters that is mutually feared across the planet. And even scarier is that we are just now waking up to its presence, after years of it being traded, gifted and sold as a pretty ornamental.

This giant has been slowly crawling into our bed, possibly for as long as 75 years.

"I talked to a gal on Lake Wapogasset who recalled her mom planting it in the '50s. She got it from someone north of the Country Dam ... so, yeah, it's probably been here a long, long time!" stated Polk County Land and Water Resources conservation planner Eric Wojchik, who has taken the knotweed battle to heart. Wojchik has become the regional "go-to guy" on knotweed and following him around for an afternoon as he surveys and fights the giant weed is both interesting and frankly, a little scary.

Knotweed may not be the devil, but it's close.

Wojchik is the person who discovered the extent of the knotweed problem over the last two years, and has since noted over three dozen sites, he calls them "parent colonies," of the plant across Polk and Burnett counties.

"It's way worse than buckthorn," stated Jeremy Williamson, the Polk County LWRD water quality specialist who also is a soldier in the invasives "battle." He concurs with Wojchik that the knotweed threat is among the scariest challenge their department, and landowners across the region, may face yet as far as invasive species go.

"Deer can't even walk through the patches," Williamson said in an earlier interview. "It's a major, major problem."

Two flavors, one threat

Giant and Japanese Knotweed are directly related, and so far, Wojchik says he's discovering mainly the giant variety, which has heart-shaped leaves up to a foot wide, while the smaller, Japanese variety has leaves about half that size. But the characteristics of the plant are identical, otherwise. They have numbers that are almost surreal when it comes to potential: The plant can spread through horizontal runners up to 60 feet from the base, and as deep as nine feet into the earth, looking for water. They can tower as high as 15 feet and their bamboo-like stalks are jungle-thick even when dead.

Polk County Land and Water Resources conservation planner Eric Wojchik stands amongst a grove of invasive knotweed along Polk County Road W, in the Town of West Sweden. – *Photos by Greg Marsten*

The biggest concerns are when it gets near waterways. It can take over a riverbed to the point where the erosion can alter the river path and make the shoreline literally unusable, even for deer to walk through, as mentioned. The worst part is how easily it can spread, as tiny stem pieces can then wash downstream, taking it even farther from that point of origin.

In some parts of the country, the knotweed infestation has literally altered the course of rivers, affected flood control and made property values plummet.

That last line - plummeting property values - is where it becomes a concern for people who otherwise couldn't care less about invasive species and may question why it costs so much to control and spend taxpayer money on plant control. That one, goofy little species of plant from the Far East, can dramatically have a negative effect on land values, and hence everyone's tax rates, which is a wake-up call for elected officials, landowners, realtors and even landscapers, gardeners and as you'll see in a moment, even snowplow drivers and highway workers.

Knotweed is the "poster child" for why we should all be concerned about some invasives.

On the battle lines

Following Wojchik to a colony on CTH W in the Town of West Sweden, we stop on the roadway and the plant is obvious. The stand has both tall brittle stalks that are dead or dying, looking like bamboo, and many fresh, green plant faces beside it, in a swath as long as a mobile home and wider than the road right of way. It is a stand of knotweed that Wojchik is familiar with, and which has been treated with herbicide twice already, to some effect.

"But I'm a little disappointed," he admits. "I was hoping it would look a little more haggard!"

The CTH W stand can be traced back, as all colonies can, to a general point of origin. This stand probably originated on a nearby property. Wojchik traces the lineage through a series of hand gestures as he explains.

"They had it at several residences round here," he said. "They plowed their roads, with a little bit of it in that soil and, well, here we are ... all it takes is a quarter-inch root graft in a shovel full of dirt to start a new colony."

Yes, Goliath may be a giant, but his babies are tiny, cute and mobile.

We then head to a nearby, private residence, where a man solicited Wojchik's help last year after seeing him treat a stand of the plant in Burnett County. As Wojchik first rolled into the man's rural property, he was stunned, he said, by the extent of the infestation. The knotweed is so thick on some parts of the man's land, you almost need machinery to get through or around it.

"I could use a machete, actually!" Wojchik jokes. But his tone is serious and a little dour. The reality is, the knotweed invasion has been at this spot for at least half a century and likely even longer.

"Yeah, maybe 50 to 75 years," Wojchik said with a sigh as he struggles to both fend off mosquitoes and 12-foot tall bamboo-like plants so thick you have to step on them to fold them over and walk. "No, this didn't happen overnight!"

The threats to the home

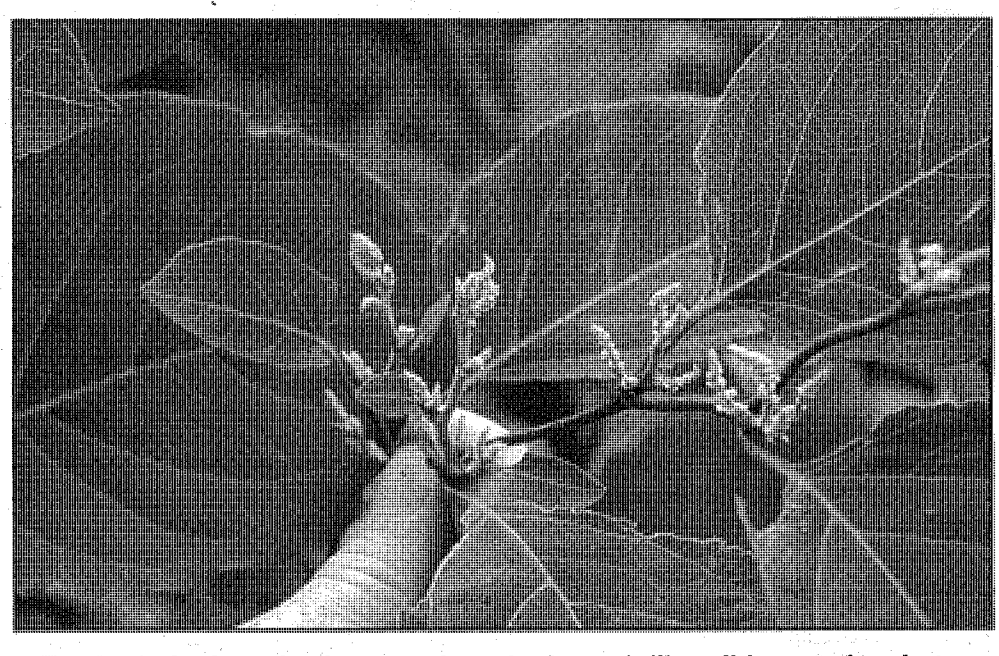
At the private residence, the name and location is being withheld because of the herbicide treatment and possible effect on property values, literally, the colony is everywhere. It stretches from the man's garden several hundred yards into the woods. He has tried to mow it, to little avail and probably only made it worse as it comes back with new shoots.

There are well-documented accounts of knotweed going under parking lots, basements, buildings and even roadways, rippling them up and forcing major excavation work. This plant is so tenacious it can literally wreck a home by destroying the foundation.

Wojchik walks across the yard and points out the tiny, scarlet-tinted stalks, creeping ever closer to the man's back porch.

"That's what concerns me, it's getting pretty close to their house," Wojchik said as he begins a treatment, noting that the man's extensive landscape work has also compounded the problem, as the fresh soil has probably spread it far past the point of origin.

See Invasives/ page 27



The buds for invasive knotweed can look much like wild cucumber, but are distinguished by their leaves, which become sort of heart-shaped as the plant matures, unlike the cucumber, which has a more starlike pattern.

Great Northern Outdoors Bass Fishing League Standings

Co-sponsored by BLC Well Drilling in Milltown

Standings

1. Wiehl/Long, 120 lbs., 9 oz.
2. Olson/Strizik, 111 lbs., 13 oz.
3. Luck Sport & Marine, 108 lbs., 2 oz.
4. Bistram Boys, 102 lbs. 15 oz.
5. Laqua/Allee, 102 lbs., 12 oz.
6. Cory/Jamie, 96 lbs., 3 oz.
7. A1 Construction, 83 lbs., 0 oz.
8. BLC Well Drilling, 77 lbs., 13 oz.
9. Grumpy Grandpas, 73 lbs., 11 oz.
10. Harry/Leroy, 65 lbs., 0 oz.
11. Struck/Lonetti, 64 lbs., 8 oz.
12. Jenell's/Main Dish, 61 lbs. 0 oz.
13. Milltown Dock Marine, 58 lbs. 3 oz.
14. Mosseys, 56 lbs., 13 oz.
15. Ones/Roberts, 51 lbs., 10 oz.
16. GNO, 47 lbs., 3 oz.
17. Sinkers, 33 lbs., 7 oz.
18. Team Top Water, 29 lbs., 2 oz.
19. Hutton/Erickson, 26 lbs., 13 oz.

Big bass weekly winner

Week 17:
Wiehl/Long, 4 lbs., 2 oz.

INTER-COUNTY LEADER
OUTDOORS
ATVs • BIRDING • BOATING • CAMPING • FISHING • HIKING • HUNTING • RECREATIONAL VEHICLES

Chasing Invasives

Part nine - Luminescent hitchhikers: Emerald Ash Borer

by Greg Marsten
Leader staff writer

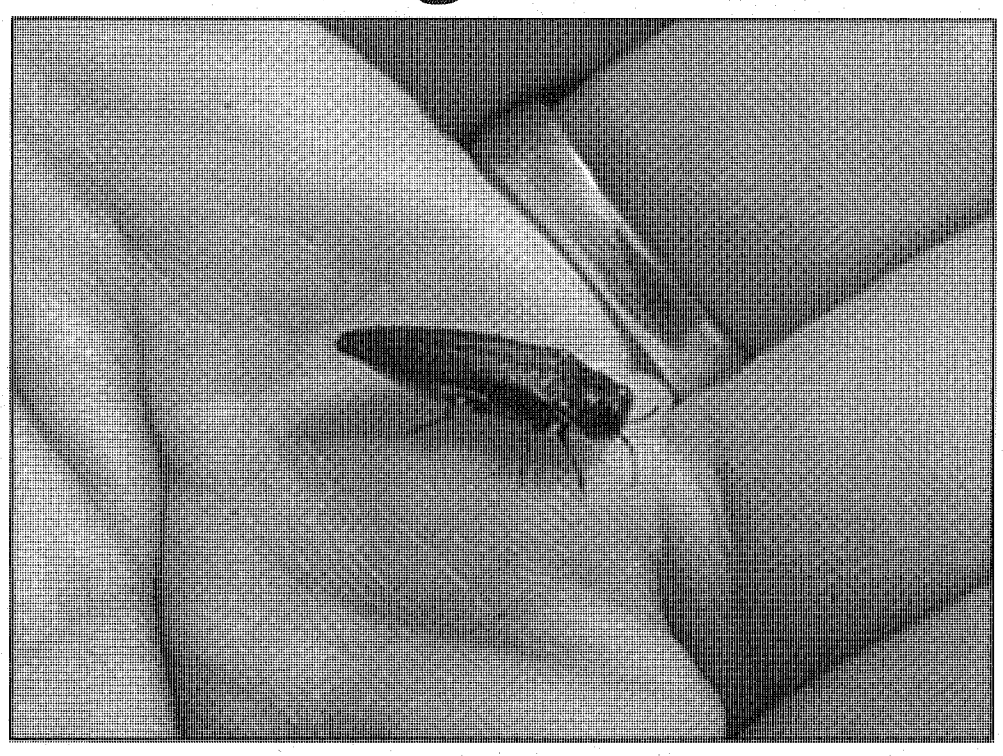
BALSAM LAKE – If you want to see the need for controlling invasive specie, look no further than Michigan.

A few years ago, the Wolverine State prided itself on being free of laws regarding invasive controls, fervently hunkering down against sweeping big government efforts to control what people buy, sell, import, grow or carry with them. It was considered "good business" to not step in the way of commerce.

Luckily, that attitude has changed in recent years, as invasive species of all flavors began to show up and be noted. But those changes weren't in time to prevent a bizarre, pretty little hitchhiking green bug from killing trees near Detroit, and spreading to the rest of North America, seemingly overnight.

It seems that invasive species tend to ignore the interstate commerce clause, maritime law and business treaties.

Not to pick on Michigan, but literally all of the evidence of the North American Emerald Ash Borer infestation lies squarely on their shoulders and can go back to a loosely inspected batch of shipping containers delivered to a Canton, Mich., supply warehouse in the early summer of 2002. As the apex of hard industry, Michigan's EAB woes very quickly became the scourge of New England, Canada, and the states of Illinois, Indiana, Ohio, Wisconsin, Missouri, West Virginia and most recently, Minnesota, where they were discovered a year ago in St. Paul, marking a concerted drive west. In all, at least 14 states have confirmed evidence of EAB infestations, and those numbers are decidedly low. One Wisconsin state wildlife official conceded last year that we can probably double that number, unofficially, with other Appalachian states, likely all of New England, much of southern and central Canada and probably many areas in between that are anywhere close to either recreational campfires, the Great Lakes, cargo ports or realistically, anywhere with ash trees.



The early discovery of the Emerald Ash Borer is extremely important because of their unique way of inflicting damage. – *Photo from www.emeraldashborer.wi.gov/*

And that spread has likely occurred in less than a decade.

Because in spite of fast-acting, and frankly, remarkably impressive efforts by several state governments, natural resources agencies and the federal government, mainly through the U.S. Department of Agriculture, the EAB infestation has spread far quicker than anyone ever thought possible, with nearly weekly confirmation of new regions playing accidental host to the beautiful, iridescent green and copper-colored bug that kills ash trees mercilessly, but accidentally.

"They're probably here already. You can almost bet on it," stated Jeremy Williamson of the Polk County Land and Water Department. His realistic approach is not uncommon by an invasive species specialist, and since their discovery just over two years ago in the Badger State,

See Invasives/ page 22

Bear hunters hitting the woods this week

Two take part in Learn to Hunt Bear program in Polk County

by Marty Seeger
Leader staff writer

STATEWIDE – The sights and smells of fall hit hard last week as low pressure swathed the region with wind and cooler temperatures. It was a welcomed sight for bear hunters who will have comfortable weather conditions for the opener that began Wednesday, Sept. 8.

Bait sitters and those pursuing bear using methods other than the use of hounds, will get the first week of hunting to themselves this year. Those wishing to kill a bear with the use of hounds will need to wait until Wednesday, Sept. 15, before their season begins. Each year, the season dates alternate, so those wishing to hunt bear with hounds will get the first week to themselves in 2011.

Although bear hunting began this week for successful applicants statewide, the Learn to Hunt Bear program officially kicked off the 2010 bear-hunting season, with two successful hunters taking bear with the use of hounds on Saturday and Sunday, Aug. 28-29, in Polk County.

Six tags were issued in northwestern Wisconsin according to conservation Warden Jesse Ashton, who helped coordinate a hunt in Polk County, and all six were successful in killing their first bear. Other tags were issued throughout the rest of the state, and Ashton said that several others were successful as well.

"They try to target the people who normally wouldn't get this opportunity," Ashton said, noting that two first-time hunters shot bears in Polk County.

Jenny Schultz of Beaver Dam was a first-time hunter who shot her bear on the first morning of the two-day hunt. Schultz, who was accompanied by her husband, shot a 301-pound bear with the aid of hounds, which were provided by Mike Sogge, Sanci Hulett, Mike Monpetit, Todd Olson and Alana Larson. Despite being from as far away as Beaver Dam, Shultz and her husband elected to stay the entire weekend and learn even more about bears and bear hunting.

The photo on the left shows the bear taken by Jenny Schultz, who is pictured left of the bear, along with local houndsmen and women. The photo at right is 11-year-old Logan Walker with his first bear. – *Photos submitted*

"They stuck around and kind of saw what it was to go out and bait, run the baits and work the dogs," Ashton said. They were also able to participate in a hunt with 11-year old Logan Walker of Door County.

"Ideally, I wanted to do one over bait and one with dogs," Ashton said.

With help from the Luck Feed Mill in donating bait, Walker tried hunting over a bait site on his first Saturday of the hunt. Unfortunately, nothing progressed, and mosquitoes were relentless, so they decided on working a hunt with hounds the following day. Walker was successful in bagging a 221-pound bear.

The tagging of both bears was made possible through leftover tags that weren't claimed by yearly applicants.

"There's always a certain percentage that draw their kill tag and never purchase it," Ashton said, adding that since those tags are already part of the yearly kill quota, it doesn't affect the actual quota numbers, or anyone else's chance at drawing a tag.

Both Schultz and Walker were also required to write an essay and fill out an application to be considered for the hunt. The applications are then sent to Madison, where hunters are then chosen for the limited amount of tags. Ashton says that fewer people seemed interested in the Learn to Hunt Bear program this year, at least from this area, which may explain why hunters from Door County and Beaver Dam drove the distance to hunt in the Polk County area.

Either way, the hunts were very successful, as they, and several others were treated to a crash course in bear hunting the evening before the two-day hunt at the Rice Lake Rod and Gun Club, where they sighted-in guns, listened to presentations on the laws of bear hunting, tagging, the history of the bear and bear biology. Houndsmen and women also brought in hounds and tracking equipment to prepare first-time hunters with what to expect the following day.

More information on the Learn to Hunt Bear program, as well as other Learn to Hunt opportunities can be found on the DNR Web site at www.dnr.state.wi.us.

Hunter ed offered at Fishbowl Sportsman's Club

WEBSTER – A hunter education course is being offered at the Fishbowl United Sportsman's Club on Monday through Thursday, Sept. 13-16, from 6 to 9 p.m. The cost is $10, and you may sign up on the first day of class at the gun club. The Fishbowl United Sportsman's Club is located on 25940 Hwy. 35. – *submitted*

Appendix H

Illegal Transport of Aquatic Plants and Invasive Animals Ordinance

Passed in 2008 and amended in 2011

Ordinance No. 10-08

ILLEGAL TRANSPORT OF AQUATIC PLANTS AND INVASIVE ANIMALS ORDINANCE

The County Board of Supervisors of the County of Polk does ordain the Illegal Transport of Aquatic Plants and Invasive Animals Ordinance, as follows:

Section 1 Purpose and Statutory Authority.

The purpose of this ordinance is to prevent the spread of aquatic invasive species in Polk County and surrounding water bodies in order to protect property values and the property tax base and ensure quality recreational opportunities.

This ordinance is adopted under authority of Section 59.03 of the Wisconsin Statutes.

Section 2 Definition of Aquatic Plants and Invasive Animals.

A. "Aquatic plant" means a non-woody submergent, emergent, free-floating, or floating-leaf plant that normally grows in or near water and includes any part thereof. "Aquatic plant" does not mean wild rice when being harvested with a permit issued under NR 19.09 or any rights proffered by the Treaty of 1838.

B. "Invasive animal" means all vertebrate and invertebrate species including zebra mussel, quagga mussel, rusty crayfish, spiny water flea, or any other aquatic invasive animal prohibited by the state.

Section 3 Prohibited Transport of Aquatic Plants and Invasive Animals.

No person may operate a vehicle or transport any boat, boat trailer, personal watercraft and its associated trailer, canoe, kayak, or boating equipment, fishing equipment, hunting and/or trapping equipment including but not limited to personal floatation devices, nets, anchors, fishing lines, decoys, and waders, from navigable waters onto any roadway open to the public if aquatic plants or invasive animals are attached.

All aquatic plants or invasive animals shall be removed before entering a roadway open to the public or before launching a boat or equipment or trailer in navigable water.

If in the course of removing a boat from water, the temporary existence of a boat and trailer creates a safety hazard if not immediately transported along a public roadway, a person may transport without violation of this ordinance to the first suitable and safe location and there clean and remove any remaining aquatic plants or invasive animals consistent with this ordinance.

<u>Section 4</u> **Exceptions to Transport of Aquatic Plants and Invasive Animals.**

Unless otherwise prohibited by law, a person may transport aquatic plants:

A. for disposal as part of a harvest or control activity conducted under an aquatic plant management permit issued under ch. NR 109.

B. when transporting commercial aquatic plant harvesting equipment away from any water body to a suitable location for purposes of cleaning any remaining aquatic plants or animals.

C. when conducting an aquatic plant study for the purposes of vouchering specimen or conducting an educational workshop and in a closed container.

D. when harvested for personal or commercial use, such as to be used as compost or mulch, and in a closed container.

E. for purposes of shooting or observation blinds for waterfowl hunting during the waterfowl season, if the aquatic plants used for these blinds are emergent, cut above the waterline, and contain no aquatic invasive species. All other equipment shall have aquatic plants and invasive animals removed before entering a roadway open to the public.

<u>Section 5</u> **Citation and Enforcement.**

A. Any person who violates a provision of this ordinance shall be subject to a forfeiture of not less than $200 and not more than $500 for the first offense and each subsequent offense. Said person shall be also subject to court costs for such violation.

B. Each violation shall be considered a separate offense.

C. Legal action may be initiated against a violator by the issuance of a citation pursuant to Sec. 66.0113(1)(a)(2005). Said citation may be issued by a law enforcement officer of Polk County.

D. The citation shall contain the following:
   (1) The first, middle, and last name, address, and date of birth of the alleged violator.
   (2) Factual allegations describing the alleged violation.
   (3) The date, time and place of the offense.
   (4) The ordinance and section of the violation.
   (5) A description of the offense in such a manner as can be readily understood by a person making a reasonable effort to do so.
   (6) The date and time at which the alleged violator may appear in court.
   (7) A statement which, in essence, informs the alleged violator:

(a) That a cash deposit based on the schedule established by this section may be made which shall be delivered to the Clerk of Courts prior to the time of the scheduled court appearance.

(b) That if a deposit is made, no appearance in court is necessary unless subsequently summoned.

(c) That if a cash deposit is made and the alleged violator does not appear in court, they will be deemed to have entered a plea of no contest or, if the court does not accept the plea of no contest, a summons will be issued commanding them to appear in court to answer the complaint.

(d) That if no cash deposit is made and the alleged violator does not appear in court at the time specified, an action may be commenced to collect the forfeiture.

(e) A direction that if the alleged violator elects to make a cash deposit, the statement which accompanies the citation shall be signed to indicate that the statement required under Paragraph D.(7), above, has been read. Such statement shall be brought with the cash deposit.

(f) Such other information as the County deems necessary.

E. Any person who receives a citation shall be subject to the penalty provision under Section 35.50 (3).

F. Section 66.0113(3), Wis. Stats. relating to violator's options and procedure on default, is hereby adopted and incorporated herein by reference.

Funding Amount: $0 Funding Source: None
Date Finance Committee Advised: Not Applicable
Finance Committee Recommendation: Not Applicable

APPROVED AS TO FORM: /S/ Jeffrey B. Fuge
Jeffrey B. Fuge, Corporation Counsel

DATE SUBMITTED TO COUNTY BOARD: March 11, 2008

COUNTY BOARD ACTION: Resolution 10-08 - adopted

EFFECTIVE DATE. Upon passage and publication
Published: April 2, 2008 Inter-County Leader

SUBMITTED BY:

Land Conservation Committee

/S/ Rodney Littlefield
Rodney Littlefield, Chairman

Public Protection and Judicial Committee

/S/ Bryan Beseler 2/27/08
Bryan Beseler, Chairman

Ordinance No. 29 -11

Amended Illegal Transport of Aquatic Plants and Invasive Animals Ordinance

TO THE HONORABLE SUPERVISORS OF THE COUNTY BOARD OF THE COUNTY OF POLK:

WHEREAS, the Polk County Board of Supervisors adopted Ordinance No. 10-08, the Illegal Transport Of Aquatic Plants And Invasive Animals Ordinance, to prevent the spread of aquatic invasive species in Polk County and surrounding water bodies; to protect property values and the property tax base; and to ensure quality recreational opportunities; and

WHEREAS, the ordinance placed the responsibility of preventing the spread of aquatic plants and invasive animals on persons who operate or use a vehicle or transport any boat, boat trailer, personal watercraft and its associated trailer, canoe, kayak, or boating equipment, fishing equipment, hunting and/or trapping equipment to and from a navigable waterway;

WHEREAS, it is in the interest of Polk County that the owners and lessors of vehicles, watercraft and equipment share in the responsibility so that effort of preventing the spread of aquatic invasive species is comprehensive.

WHEREAS, the Polk County Board of Supervisors has held a public hearing for the purpose of receiving commentary on an amendment of Ordinance No. 10-08, the Illegal Transport Of Aquatic Plants And Invasive Animals Ordinance, to provide for liability of owners and lessors of vehicles, watercraft, trailers or equipment that is operated or used contrary to the ordinance.

NOW, THEREFORE, the Polk County Board of Supervisors does ordain to Amended Illegal Transport of Aquatic Plants and Invasive Animals Ordinance, as follows:

Section 1 Purpose and Statutory Authority.

A. The purpose of this ordinance is to prevent the spread of aquatic invasive species in Polk County and surrounding water bodies in order to protect property values and the property tax base and ensure quality recreational opportunities.

B. This ordinance is adopted under authority of Section 59.03 of the Wisconsin Statutes.

Section 2 Definition~~s of Aquatic Plants and Invasive Animals~~.

A. "Aquatic plant" means a non-woody submergent, emergent, free-floating, or floating-leaf plant that normally grows in or near water and includes any part thereof. "Aquatic plant" does not mean wild rice when being harvested with a permit issued under NR 19.09 or any rights proffered by the Treaty of 1838.

B. "Invasive animal" means all vertebrate and invertebrate species including zebra mussel, quagga mussel, rusty crayfish, spiny water flea, or any other aquatic invasive animal prohibited by the state.

C. "Equipment" mean plant harvesting equipment, boating equipment, fishing equipment, hunting and/or trapping equipment including but not limited to personal floatation devices, nets, anchors, fishing lines, decoys, and waders.

Section 3 Prohibited Transport of Aquatic Plants and Invasive Animals.

A. No person may operate a vehicle or transport any boat, boat trailer, personal watercraft and its associated trailer, canoe, kayak, or boating equipment, fishing equipment, hunting and/or trapping equipment including but not limited to personal floatation devices, nets, anchors, fishing lines, decoys, and waders, from navigable waters onto any roadway open to the public if aquatic plants or invasive animals are attached.

B. All aquatic plants or invasive animals shall be removed before entering a roadway open to the public or before launching a boat or equipment or trailer in navigable water.

C. If in the course of removing a boat from water, the temporary existence of a boat and trailer creates a safety hazard if not immediately transported along a public roadway, a person may transport without violation of this ordinance to the first suitable and safe location and there clean and remove any remaining aquatic plants or invasive animals consistent with this ordinance.

Section 4 Liability of Owner or Lessor

A. If a vehicle, watercraft, trailer, or equipment that is the subject of a violation Section 3, the owner or lessee of the vehicle, watercraft, trailer or equipment shall pay forfeiture in accordance with the penalty provisions contained in Section 6, notwithstanding any forfeiture that may be required to be paid by the person operating or using a vehicle, watercraft, trailer or equipment in violation of Section 3. An owner or lessee may not be penalized as set forth above if either of the following apply:

1. Another person was cited for or convicted of a violation of Section 3 arising out of the same incident; or
2. The vehicle, watercraft, trailer or equipment was stolen.

B. Paragraph A does not apply to a lessor of a vehicle, watercraft, trailer or equipment if the lessor keeps a record of the name and address of the lessee and provides the same to law enforcement upon request.

C. Paragraph A does not prohibit or limit the prosecution of the operator of a vehicle, watercraft, trailer or equipment for violations of Section 3.

Section 5 Exceptions to Transport of Aquatic Plants and Invasive Animals.

Unless otherwise prohibited by law, a person may transport aquatic plants:

A. for disposal as part of a harvest or control activity conducted under an aquatic plant management permit issued under ch. NR 109.

B. when transporting commercial aquatic plant harvesting equipment away from any water body to a suitable location for purposes of cleaning any remaining aquatic plants or animals.

C. when conducting an aquatic plant study for the purposes of vouchering specimen or conducting an educational workshop and in a closed container.

D. when harvested for personal or commercial use, such as to be used as compost or mulch, and in a closed container.

E. for purposes of shooting or observation blinds for waterfowl hunting during the waterfowl season, if the aquatic plants used for these blinds are emergent, cut above the waterline, and contain no aquatic invasive species. All other equipment shall have aquatic plants and invasive animals removed before entering a roadway open to the public.

Section 6 Citation and Enforcement.

A. Any person who violates a provision of this ordinance shall be subject to a forfeiture of not less than $200 and not more than $500 for the first offense and each subsequent offense. Said person shall be also subject to court costs for such violation.

B. Each violation shall be considered a separate offense.

C. Legal action may be initiated against a violator by the issuance of a citation pursuant to Sec. 66.0113(1)(a)(2005). Said citation may be issued by a law enforcement officer of Polk County.

D. The citation shall contain the following:
(1) The first, middle, and last name, address, and date of birth of the alleged violator.
(2) Factual allegations describing the alleged violation.
(3) The date, time and place of the offense.
(4) The ordinance and section of the violation.
(5) A description of the offense in such a manner as can be readily understood by a person making a reasonable effort to do so.
(6) The date and time at which the alleged violator may appear in court.
(7) A statement which, in essence, informs the alleged violator:

(a) That a cash deposit based on the schedule established by this section may be made which shall be delivered to the Clerk of Courts prior to the time of the scheduled court appearance.
(b) That if a deposit is made, no appearance in court is necessary unless subsequently summoned.
(c) That if a cash deposit is made and the alleged violator does not appear in court, they will be deemed to have entered a plea of no contest or, if the court does not accept the plea of no contest, a summons will be issued commanding them to appear in court to answer the complaint.
(d) That if no cash deposit is made and the alleged violator does not appear in court at the time specified, an action may be commenced to collect the forfeiture.
(e) A direction that if the alleged violator elects to make a cash deposit, the statement which accompanies the citation shall be signed to indicate that

the statement required under Paragraph D.(7), above, has been read. Such statement shall be brought with the cash deposit.

(f) Such other information as the County deems necessary.

E. Any person who receives a citation shall be subject to the penalty provision under Section 35.50 (3).

F. Section 66.0113(3), Wis. Stats. relating to violator's options and procedure on default, is hereby adopted and incorporated herein by reference.

Funding Amount: Not Applicable Funding Source: Not Applicable
Date Finance Committee Advised: Not Applicable
Finance Committee Recommendation: Not Applicable
Effective Date: Upon Passage and Publication
Date Submitted to County Board: May 17, 2011
Submitted and Sponsored By the Public Protection and Judicial Committee Board:

B.R. Moster 5/3/11

Review By County Administrator:

- ☒ Recommended
- ☐ Not Recommended
- ☐ Reviewed Only

Dana Frey, County Administrator

Review By Corporation Counsel:

- ☒ Approved as to Form
- ☐ Recommended
- ☐ Not Recommended
- ☐ Reviewed Only

Jeffrey B. Fuge, Corporation Counsel

At its regular business meeting on June 21, 2011, the Polk County Board of Supervisors adopted the above-entitled ordinance, Ordinance No. 29-11: Amended Illegal Transport of Aquatic Plants and Invasive Animals Ordinance, by a simple majority vote of ___in favor and ___ against. Unanimous voice vote

Dated: 06.24.2011
William Johnson, IV, County Board Chair

Attest: Carole Y. Wondra Dated: 6-24-11
Carole Wondra, Polk County Clerk

STATE OF WISCONSIN)
) SS
COUNTY OF POLK)

I, Carole T. Wondra, Clerk for Polk County, do hereby certify that the attached is a true and correct copy of Resolution No. 29-11 that was adopted by the Polk County Board of Supervisors on June 21, 2011.

Carole T. Wondra 6-24-11
Carole T. Wondra Date
Polk County Clerk

ORDINANCE 10-08

ILLEGAL TRANSPORT OF AQUATIC PLANTS AND INVASIVE ANIMALS ORDINANCE

The County Board of Supervisors of the County of Polk does ordain the Illegal Transport of Aquatic Plants and Invasive Animals Ordinance, as follows:

Section 1 Purpose and Statutory Authority.

The purpose of this ordinance is to prevent the spread of aquatic invasive species in Polk County and surrounding water bodies in order to protect property values and the property tax base and ensure quality recreational opportunities.

This ordinance is adopted under authority of Section 59.03 of the Wisconsin Statutes.

Section 2 Definition of Aquatic Plants and Invasive Animals.

A. "Aquatic plant" means a nonwoody submergent, emergent, free-floating, or floating leaf plant that normally grows in or near water and includes any part thereof. "Aquatic plant" does not mean wild rice when being harvested with a permit issued under NR 19.09 or any rights proffered by the Treaty of 1838.

B. "Invasive animal" means all vertebrate and invertebrate species including zebra mussel, quagga mussel, rusty crayfish, spiny water flea or any other aquatic invasive animal prohibited by the state.

Section 3 Prohibited Transport of Aquatic Plants and Invasive Animals.

No person may operate a vehicle or transport any boat, boat trailer, personal watercraft and its associated trailer, canoe, kayak, or boating equipment, fishing equipment, hunting and/or trapping equipment including but not limited to personal floatation devices, nets, anchors, fishing lines, decoys, and waders, from navigable waters onto any roadway open to the public if aquatic plants or invasive animals are attached.

"If in the course of removing a boat from water, the temporary existence of a boat and trailer creates a safety hazard if not immediately transported along a public roadway, a person may transport without violation of this ordinance to the first suitable and safe location and there clean and remove any remaining aquatic plants or invasive animals consistent with this ordinance."

All aquatic plants or invasive animals shall be removed before entering a roadway open to the public or before launching a boat or equipment or trailers in navigable water.

Section 4 Exceptions to Transport of Aquatic Plants and Invasive Animals.

Unless otherwise prohibited by law, a person may transport aquatic plants:

A. for disposal as part of a harvest or control activity conducted under an aquatic plant management permit issued under ch. NR 109.

B. when transporting commercial aquatic plant harvesting equipment away from any water body to a suitable location for purposes of cleaning any remaining aquatic plants or animals.

C. when conducting an aquatic plant study for the purposes of vouchering specimen or conducting an educational workshop and in a closed container.

D. when harvested for personal or commercial use, such as to be used as compost or mulch, and in a closed container.

E. for purposes of shooting or observation blinds for waterfowl hunting during the waterfowl season, if the aquatic plants used for these blinds are emergent, cut above the waterline, and contain no aquatic invasive species. All other equipment shall have aquatic plants and invasive animals removed before entering a roadway open to the public.

Section 5 Citation and Enforcement.

A. Any person who violates a provision of this ordinance shall be subject to a forfeiture of not less than $200 and not more than $500 for the first offense and each subsequent offense. Said person shall be also subject to court costs for such violation.

B. Each violation shall be considered a separate offense.

C. Legal action may be initiated against a violator by the issuance of a citation pursuant to See. 66.0113(1)(a)(2005). Said citation may be issued by a law enforcement officer of Polk County.

D. The citation shall contain the following:
   (1) The first, middle, and last name, address, and date of birth of the alleged violator.
   (2) Factual allegations describing the alleged violation.
   (3) The date, time and place of the offense.
   (4) The ordinance and section of the violation.
   (5) A description of the offense in such a manner as can be readily understood by a person making a reasonable effort to do so.
   (6) The date and time at which the alleged violator may appear in court.
   (7) A statement which, in essence, informs the alleged violator:
      (a) That a cash deposit based on the schedule established by this section may be made which shall be delivered to the Clerk of Courts prior to the time of the scheduled court appearance.
      (b) That if a deposit is made, no appearance in court is necessary unless subsequently summoned.
      (c) That if a cash deposit is made and the alleged violator does not appear in court, they will be deemed to have entered a plea of no contest or, if the court does not accept the plea of no contest, a summons will be issued commanding them to appear in court to answer the complaint.
      (d) That if no cash deposit is made and the alleged violator does not appear in court at the time specified, an action may be commenced to collect the forfeiture.
      (e) A direction that if the alleged violator elects to make a cash deposit, the statement which accompanies the citation shall be signed to indicate that the statement required under Paragraph D.(7), above, has been read. Such statement shall be brought with the cash deposit.
      (f) Such other information as the County deems necessary.

E. Any person who receives a citation shall be subject to the penalty provision under Section 35.50 (3).

F. Section 66.0113(3), Wis. Stats. relating to violator's options and procedure on default, is hereby adopted and incorporated herein by reference.

Funding amount: $0.00.
Funding Source: None.
Date Finance Committee Advised: N/A.
Finance Committee Recommendation: N/A.
Effective date: Upon passage and publication.
Approved as to form: Jeffrey B. Fuge, Corporation Counsel.
Date Submitted to County Board: March 11, 2008.
Submitted by Land Conservation Committee: Rodney Littlefield; Public Protection and Judicial Committee: Bryan Beseler.

Res. 10-08 - Illegal Transport Of Aquatic Plants And Invasive Animals Ordinance. Motion (Stoneking/Hughes) to adopt Res. 10-08. A presentation regarding the need of the resolution was given by Land and Water Resources Director, Tim Ritten, and Information and Educator Coordinator, Amy Kelsey. Motion (Beseler/Littlefield) to amend the resolution by adding to Section 3 "If in the course of removing a boat from water, the temporary existence of a boat and trailer creates a safety hazard if not immediately transported along a public roadway, a person may transport without violation of this ordinance to the first suitable and safe location and there clean and remove any remaining aquatic plants or invasive animals consistent with this ordinance." Amendment carried by a unanimous voice vote. Res. 10-08 was adopted as amended by a unanimous voice vote.

Chair called a 5-minute break. Meeting resumed.