Washburn County
Aquatic Invasive Species Strategic Plan
2009

"The future is created first in the mind, then in the will and next in activity. The future is not some place we are going to, but one we are creating."

-John Schaar

Washburn County Aquatic Invasive Species Strategic Plan 2009

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Cover Photo: Land and Water Conservation Department

Glossary of Acronyms

AIS	Aquatic Invasive Species
CBCW	Clean Boats Clean Waters
EWM	Eurasian Water Milfoil
GIS	Geographic Information System
GLIFWC	Great Lakes Indian Fish and Wildlife Commission
LCC	Land Conservation Committee
LWCD	Land and Water Conservation Department
NPS	National Parks Service
UWEX	University of Wisconsin Extension
WAL	Wisconsin Association of Lakes
WCLRA	Washburn County Lakes and Rivers Association
WDNR	Wisconsin Department of Natural Resources

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Mission

The Washburn County Land and Water Department/AIS Advisory Committee's mission is to provide an action plan that will provide individuals the proper direction to help detect, prevent, and control aquatic invasive species in Washburn County.

Washburn County Efforts

In 2006, the Land and Water Department received a small Aquatic Invasive Species (AIS) grant from the Wisconsin Department of Natural Resources (WDNR) to explore the need for a comprehensive program in the county. Purple loosestrife (*Lythrum salicaria)* was the invasive plant chosen to implement the program, and an AIS intern was hired for the summer to begin working on the program. The intern had two major tasks: Complete an inventory of the purple loosestrife within the county, and to establish *Galarucella* beetle populations for rearing stations.

The purpose of the rearing stations was to raise large populations of *Galarucella* beetles, which feed exclusively on loosestrife, helping to control it. In late spring, with the help from the WDNR, purple loosestrife rootstock was planted into pots to begin growing new plants. Small rearing stations consisted of kids swimming pools to hold water and pots. Each pot was covered in a fine mesh netting to prevent predators from getting in. When the loosestrife began flowering in mid summer, beetles were collected from the wild, and 10 were put inside each individual netted pot. Over time, populations of the beetles propagated, and were released primarily on Cable and Cyclone Lake to feed upon the purple loosestrife.

The second major task of the AIS intern was to complete a countywide inventory to identify the locations of purple loosestrife infestations. With the help from members of the Washburn County Lakes and Rivers Association (WCLRA), road and lake inventories throughout the county were recorded. The inventory revealed that there are at least 93 purple loosestrife sites in Washburn County, mainly in the lower half of the county; while the Yellow River served as the primary source of infestation. There are several areas above and below the Yellow River dam in Spooner that are severely infested. This is of great concern not only to Washburn County, but to Burnett County and the National Park Service, considering the Yellow River flows through Burnett County and eventually enters the St. Croix River. The Yellow has proven to be a major seed source for reintroduction and establishment of new populations. In 2006 along the St. Croix River, there were 143 sites found infested heavily with purple loosestrife (Appendix D).

The inventory revealed the extensive nature of the purple loosestrife infestation along the Yellow River, its tributaries, and throughout the county. This threat, along with the continuous threat from Eurasian water-milfoil and other aquatic invasive species, meant a more extensive project would be needed within the department. In 2007, the County Conservationist submitted a two-year Wisconsin DNR AIS Education and Prevention Grant. The county was awarded the grant in April, and a county AIS Coordinator was hired.

A primary objective of the grant included creating an AIS strategic plan. The strategic plan is a vital step towards a comprehensive approach to managing the county's problem with AIS. In recognition for a long term plan, the Land and Water Department formed an AIS Advisory Committee. The committee is credited for providing valuable input toward the development of the AIS strategic plan. The AIS Coordinator's primary focus and the purpose of the strategic plan, is to help educate Washburn County residents, and help manage and control AIS. To strengthen the county's AIS efforts and make future decisions, we need this type of fundamental formation.

Another major task of the AIS coordinator is to continue raising *Galarucella* beetles for release into purple loosestrife infestations within the county. Two enclosed mass rearing cages are used to raise beetles. The frame of the cage consists of 12'x12'x6' aluminum posts. A large net is draped over the frame, small swimming pools are put inside to hold water, and pots are planted with purple loosestrife rootstock. Eventually, beetles are collected and put into the cage to propagate, and each cage can produce up to 100,000 loosestrife-feeding beetles.

Figure 1: Mass Purple Loosestrife Rearing Station

Local Lake Efforts

In Washburn County, lake associations are, and continue to be great leaders in addressing AIS issues and obtaining AIS grant funds. The City of Shell Lake has been doing AIS monitoring and Clean Boats Clean Waters (CBCW), as a condition of their permit for the diversion pipe. The Nancy Lake Association has done a great job of controlling Eurasian Water milfoil (EWM). Herbicide treatment began in 2001, and has continued every year since. They are applying for another AIS control grant during the Feb 1st 2009 grant cycle, and are working in conjunction with the Kimball Lakes Association on CBCW efforts. Gilmore Lake Association has a strong volunteer and educational component, and has been doing CBCW monitoring as well. Island Lake Association received a grant to promote a public awareness sign at their public boat landing and intend to begin a CBCW monitoring program with the help of volunteers. Stone Lake Association will also be implementing a CBCW program and will be educating local schools about AIS issues. Spooner Lake District received a Curly-leaf Pondweed control grant, and has been conducting CBCW efforts at one of their boat landings. During the Feb 1st grant cycle, the Minong Flowage Association will also seek an AIS control grant to manage Eurasian water milfoil and initiate a CBCW monitoring program.

With input from concerned citizens, the Town of Minong formed a Town Lakes Committee. This committee will act as an advisory to the Town Board on lake issues. The committee is composed of residents who own property on lakes in the Minong Township, along with the County AIS Coordinator. Many residents are concerned about AIS, especially EWM, and recognize the lakes are an extremely valuable resource to the township. Members are representatives from Kimball, Horseshoe, Pokegema, Minong Flowage, Gilmore and Nancy Lake Associations. The objective of the committee is to bring residents together to identify and discuss issues, problems, and concerns relating to the lakes. It is likely that addressing these problems jointly could generate common solutions and give the lakes better access to financial resources to help with problems.

Washburn County Water Resources

Washburn County is located in Northwestern Wisconsin, covering 857 square miles (548,840 acres). Surface water covers 31,761 acres (6 percent) and wetlands cover 72, 900 acres (13 percent). It has 964 inland lakes, the third highest behind Vilas County (1,318 lakes) and Oneida County (1,129 lakes). Of the 964 lakes in the county, 697 (3,296 acres) of them are unnamed and 267 (27,339 acres) are named. Washburn county ranks 28th in size, however, ranks 7th in total water acreage for the state. There are approximately 662 linear miles of streams, while lake frontage covers 862 miles. It also consists of 18 impoundments and 60 streams. There are only two lakes that have a surface area greater than 1,000 acres. Long Lake is 3,290 acres and Shell Lake covers 2,580 acres, making it the largest landlocked (seepage) lake in the state.

Seepage lakes make up 72 percent of the natural lakes, and are the most common lakes in Washburn County. Drainage lakes make up 6 percent, spring ponds make up 8 percent, and bog lakes make up to 14 percent of the natural lakes in the county. Drainage lakes have a surface water inlet and/or outlet. Spring ponds are formed by groundwater flowing into shallow basins. The overflow from these basins is the common source of a stream. Bog lakes are usually landlocked or with little outlet flow, and are surrounded by mats of sphagnum moss.

Two of Wisconsin's major river systems drain Washburn County; the Chippewa and St. Croix Rivers. The Yellow, Totogatic, and Namekagon Rivers drain into the St. Croix River. The St. Croix Watershed of Washburn County has a large drainage area of 496 square miles, while the Chippewa River Watershed only has an area of 70 square miles. There are eleven watersheds located completely or partially within Washburn County. Seven are part of the St. Croix River Basin, three drain to the Lower Chippewa River, and one watershed drains to the Upper Chippewa River.

The Wisconsin Department of Natural Resources (WDNR) has designated a handful of "Outstanding Resource Waters" in Washburn County. They are defined as "a lake or stream that has excellent water quality, high recreational and aesthetic value, high quality fishing and is free from point and non-point source pollution." The rivers included are: Namekagon, Beaver Brook, Sawyer Creek, and the South Fork of Bean Brook. The lakes included are: Bass, Long, Middle McKenzie, Shell and Stone Lake.

Considering Washburn County consists of so many small lakes with great fisheries, AIS pose a serious threat to un-infected lakes. Anglers moving from one lake to another on a single day, increase the chances of transferring AIS unknowingly. High tourism, recreation, and lakeshore property owners also account for the majority of lake users. When use of the water resources increases in the county, so does the chances of AIS being spread. Most boat landings in the county don't have inspectors to check boats and trailers coming to and leaving the landing, so it is up to the public to take the proper measures to prevent AIS from spreading to un-infested waters.

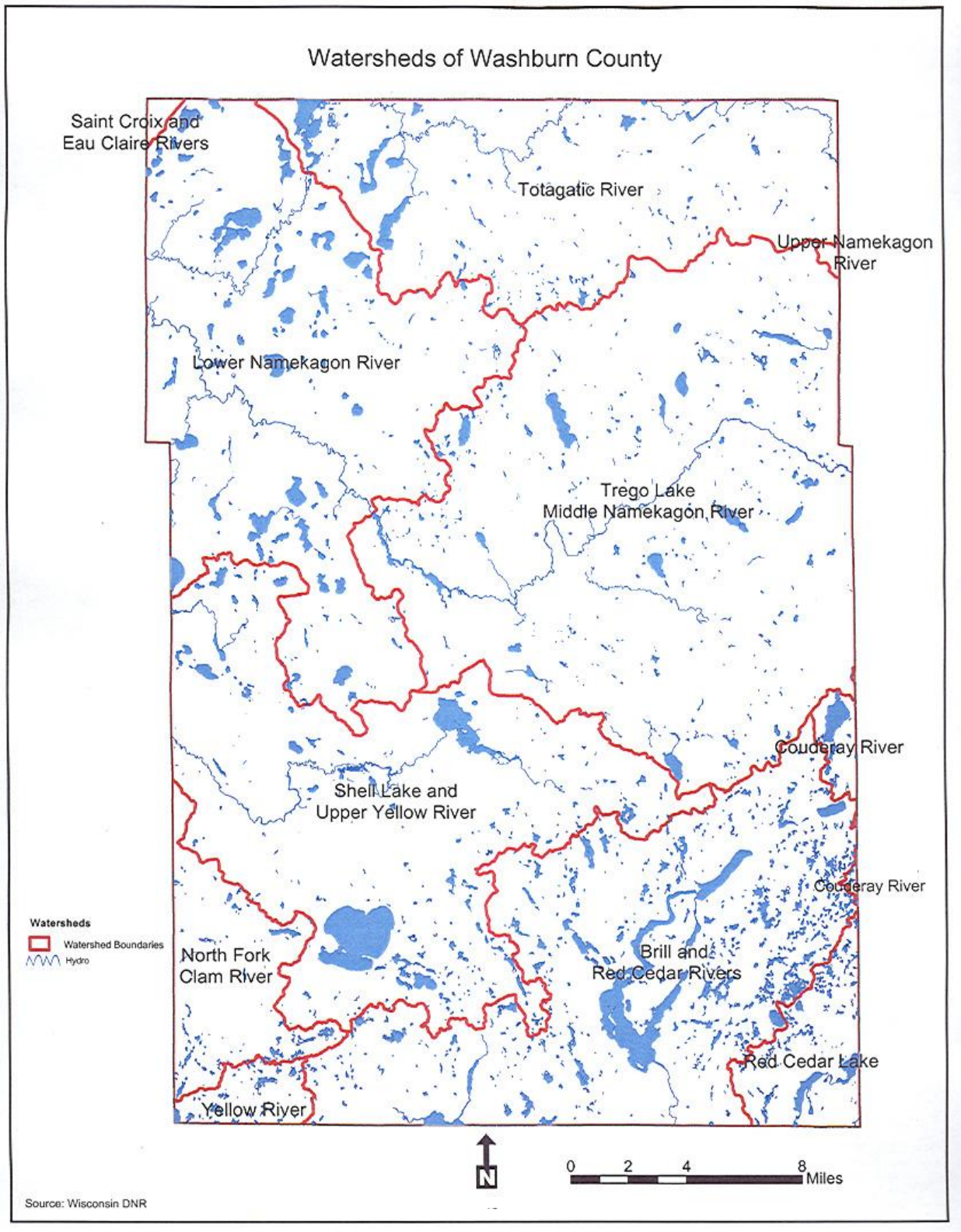


Figure 2: Watersheds of Washburn County

Aquatic Invasive Species and Washburn County

Aquatic invasive species (AIS) are an on-going concern throughout Wisconsin. They have been increasing at a steady rate throughout the past two decades. Aquatic Invasive Species are defined by the Wisconsin Department of Natural Resources (WNDR) as:

Plants, animals and pathogens that are "out of place." A species is regarded as invasive if it has been introduced by human action to a location, area, or region where it did not previously occur naturally(i.e., is not native), becomes capable of establishing a breeding population in the new location without further intervention by humans., and spreads widely throughout the new location.

In Washburn County, many people observe the abundance of lakes, rivers, beautiful landscapes and variety of wildlife the county portrays, however, are unaware of what aquatic invasive species are. Unfortunately, sometimes people overlook the harmful plants, animals and microscopic organisms that also exist in nature, transforming it. This puts Washburn County's biological richness and diversity at risk.

Invasive species can create serious and often irreversible effects on our lakes. Eradication of established infestations is nearly impossible and control measures can become controversial and expensive. Although each species has unique characteristics, they all portray common harmful impacts. They are successful because they have few natural predators, and are aggressive, prolific and mature early. AIS are spread mainly through boaters launching and transporting trailers and equipment, and also through anglers, water garden and aquarium owners, sea planes and natural dispersal. Addressing AIS concerns on a state and local level is essential, considering the potential for them to transfer from one water body to the next is centered around people and their activities.

The following are aquatic invasive species of concern throughout Wisconsin. Refer to Appendices A-C for present Washburn County AIS locations.

Eurasian Water Milfoil (*Myriophyllum spicatum*)

History: Eurasian water milfoil is a submersed aquatic plant originating in Europe, Asia, and North Africa. It was introduced to Wisconsin in the 1960's, and is the only non-native milfoil found in the state. As of April, 2008, it is currently found in 452 Wisconsin lakes and is of the greatest concern in Wisconsin. ***Identifying Characteristics:*** Eurasian water milfoil has feather-like leaves, and lay flat along stem when pulled out of the water. There are usually 12-21 leaflets per leaf, which are arranged in whorls (circles) of three to five around the stem. Native milfoils typically have 7-11 leaflets. It can grow in depths of 6-20 feet deep. The upper part of the plant usually resembles a red or pinkish color, although some native

species of water milfoils also have pink stems. ***Life Cycle:*** Eurasian water milfoil starts growing when the temperature reaches 50^{o} F, and begins growing earlier than the native water milfloils. It produces seeds and runners, although the main method of reproduction is through vegetative fragmentation from boats and wave action. The floating fragments sprout roots, and eventually sink to the lake bed where they will root and start a new colony. Unlike other plants, Eurasian water-milfoil does not produce turions (overwintering vegetative buds). ***Impacts:*** Eurasian water-milfoil poses a serious threat to a lake's native aquatic plant community, and poses a threat to animals that depend on native vegetation. It forms thick vegetative mats that spread horizontally across a lake's surface, and intertwines with native vegetation. It shades out native vegetation used by fish, waterfowl and other animals. It also inhibits recreational uses like fishing, boating, and swimming, and can lead to degraded water quality and algae blooms. Under significant infestations, channels are cut to allow access from the shoreline, out into deeper water. ***Treatment Methods:*** Once Eurasian water milfoil is well established in a lake, it is nearly impossible to eradicate. However, it is important to remember it doesn't cause severe problems in every water body it is found in. Physical, chemical, mechanical and biological measures are available to help control it. When early detection growth occurs in small areas, the best chance to inhibit growth is to hand pull it out when it is first observed. Raking shallow areas of the lake bottom also works well to reduce the spread. For larger infested areas, herbicide treatment is an option, although it can disrupt native vegetation too and become very expensive. *A Wisconsin DNR permit is required for all chemical treatments.* Mechanical harvesting temporarily removes milfoil canopies and increases growth of native plants, however also causes a lot of fragmentation. Biological control occurs from a small weevil that feeds on native milfoils, although it prefers Eurasian. Overtime, weevils can impact the population, but complete eradication is unlikely***. Washburn County Water Bodies with Eurasian Water Milfoil:*** Minong Flowage, Totogatic River, Nancy, and Shallow Lake.

Curly-leaf Pondweed (*Potamogeton crispus*)

History: Curly-leaf pondweed is a submersed aquatic plant originating in Eurasia, Australia and Africa. It was accidentally introduced into the United States when the common carp was brought in during the 1800's, and eventually into Wisconsin in 1905. Before Eurasian water milfoil, curly- leaf pondweed was considered the largest nuisance aquatic plant in the Midwest. ***Identifying Characteristics:*** Curly-leaf pondweed can be recognized by its stiff reddish-green "lasagna- like" looking leaves. They are about 3 inches long, finely toothed along the edge, and alternate along the stem. The stem of the plant is flat and reddish-brown. Like Eurasian water milfoil, curly-leaf pondweed can grow in a variety of water depths, and usually up to 15 feet. ***Life Cycle:*** Curly-leaf pondweed does reproduce and spread by seed, although vegetative buds called *turions* are the primary role. Turions are hard compacted vegetated buds that resemble small pine cones, and are produced along the stem of

the plant. Curly-leaf pondweed is unique because it can start growing under the ice before any other plant, making it one of the first plants to emerge in the spring. A few days after the ice melts, it begins to grow more rapidly. In mid summer, when most aquatic plants are still growing, curly-leaf pondweed begins to die off, dropping its turions on the lake bed to begin new plant growth. It completes its life cycle by late June or early July. It is tolerant of disturbance and can grow in most any type of water condition. ***Impacts:*** Because curly-leaf pondweed can grow so early, it can outcompete native plants in the spring. It forms thick mats across the surface, interfering with aquatic recreation. In the summer when curly-leaf pondweed dies off, the decaying plants release nutrients, such as phosphorus, which cause severe algae blooms and unpleasant smells along shorelines. Plant die-offs also result in a loss of dissolved oxygen, an essential component for all aquatic life forms. ***Treatment Methods:*** Like Eurasian water milfoil, once curly-leaf pondweed is well established in a lake, it is nearly impossible to eradicate, but physical, chemical, and mechanical measures can be taken to help control it. To have the maximum benefit of control, chemical control efforts should be done in the spring or early summer, while the native plants are still dormant. *It is important to remember, a WDNR permit is required for chemical treatments.* ***Washburn County Water Bodies with Curly- Leaf Pondweed:*** Birch***,*** Spooner, Shell, Gilmore, Hointville, Long, McKenzie, Red Cedar, Tozer, Trego Lake, Minong flowage and Yellow River Flowage.

Purple Loosestrife (*Lythrum salicaria)*

History: Purple Loosestrife is an attractive wetland plant originating from Europe. It was first introduced as a garden perennial during the 1800's. The plant was first detected in Wisconsin in the early 1930's, but remained uncommon until the 1970's. Currently, there are about 24 states that have laws prohibiting the import or distribution of purple loosestrife because of its aggressively invasive characteristics. It is now widely dispersed in the state, and has been recorded in 70 of Wisconsin's 72 counties. ***Identifying characteristics:*** Purple loosestrife is a 3-9 foot semi-woody plant that has a square stem with smooth, opposite leaves. It has showy purple to pink flowers with 5-6 petals that are formed into numerous long spikes that bloom from July to September. It also has a large woody taproot with fibrous rhizomes that form a dense underground mat. Its optimal habitat includes marshes, stream and lake edges, and wet prairies, although is also tolerant of moist soil and shallow water sites, such as pastures and road ditches. It has been planted in lawns and gardens, which is often how it is introduced to wetlands, lakes and rivers. ***Life Cycle:*** Purple Loosestrife can germinate in a variety of soil types, although optimum sites for growth include moist soil with neutral to slightly acidic pH. It spreads mainly by seeds, but also by its large underground taproot. A single stalk can produce between 100,000 to 300,000 seeds per year, and seed survival is between 60-70%, resulting in an extensive seed bank. Mature plants can release more than two million seeds in a single year! Even seeds that fall in water, can survive approximately 20 months. Plants may be quite

large and several years old before they begin flowering. It is difficult to look for non-flowering plants, so the best time to spot PL is mid-summer when they are flowering. ***Impacts:*** Purple loosestrife grows faster and taller than most native wetland plants. Once established on a lakeshore or adjacent wetland, it displaces native plants and reduces wildlife habitat. As native vegetation is displaced, rare plants are often the first to disappear. Thick stands of purple loosestrife can choke out recreational waterways, and eventually overrun large acres of wetlands. This can result in a loss of open water habitat. ***Treatment Methods:*** Prevention is the best way to control the spread of purple loosestrife. It is important to look for pioneering or small isolated colonies and target them for control. It is easiest to spot the plant while it is flowering in mid-summer. Mechanical, chemical, and biological methods are used to control purple loosestrife. Small young plants can be hand pulled, while older and taller plants can be dug up with a shovel. It is important to try to dig up as much of the root as you can because it may re-sprout. Plants should be controlled prior to seed dispersal (usually before the first week in August), and flowers should be cut, and tightly bagged. Burning and mowing is not recommended, as the seeds can still disperse and regenerate growth. Chemically, glyphosate (Round Up/Rodeo) is the most commonly used chemical for killing loosestrife. It should be applied in late July or August and should only be sprayed on 25% of each plant's foliage to be effective. It is best used on freshly cut stems. Be aware that glyphosate is non-selective, meaning it will kill any green foliage it comes in contact with. *Any herbicide applied on or near surface water requires a permit from the regional DNR Aquatic Plant Coordinator.* Biological control is considered the most effective and cheapest option for controlling larger-scale infestations of purple loosestrife. Biological control began in WI in 1994, with the release of *Galarucella* beetles. They eat exclusively on loosestrife stems and leaves, and also reduce the height and seed output which enables other native plants to regain control within a few years. Research has shown that these control beetles won't harm native vegetation, nor find their way to windowsills and ceilings. As purple loosestrife diminishes in a wetland, the control beetles fly to a new stand to begin feeding. Biological control takes many years to develop, so combining it with some of the methods mentioned above, may produce both short and long-term control. ***Washburn County Areas with Purple Loosestrife:*** The largest infestation is along the Yellow River and portions of the Namekagon River. Smaller patches of it are mainly found scattered throughout the southern part of the county (See Appendix C and D).

Zebra Mussel *(Dreissena polymorpha)*

History: Zebra mussels were accidentally introduced to North America as larvae through ballast water from boats that traveled across fresh water Eurasian ports. In 1988, they were first discovered in St. Claire Lake, which is located between Ontario, Canada and Michigan. Two years later, they arrived in a Lake Michigan harbor, and by 1999 had expanded to the Gulf of Mexico. ***Identifying***

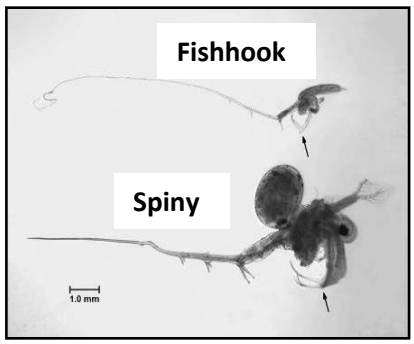
Characteristics: Zebra mussels look like a small D-shaped clam, only reaching a maximum of two inches in length (although most are smaller than an inch). They have yellowish-brown alternating light and dark stripes, hence their name. They are usually found growing in large clusters of individuals in shallow, algae-rich water. ***Life Cyle:*** Zebra mussels reproduce sexually spring to late fall, and form microscopic larvae called veligers. A female zebra mussel can produce 30,000 to 1,000,000 eggs in one year. Veligers stay suspended in water for one to five weeks, where then, they begin to sink and attach to hard surfaces using their adhesive byssal threads. Docks, native mussels, wood, glass, metal, aquatic plants, and each other are a few of the surfaces they attach themselves to. Once attached, they change from free-swimming larvae to anchored mussels. Young zebra mussels reach sexual maturity during their first year and are ready to carry on the cycle. ***Impacts:*** Zebra mussels are filter feeders and can filter up to 1 liter of water per day. They remove plankton from the water, which is an essential food source for young fish, native mussels and other aquatic organisms. Filtered water also leads to clearer water. This can affect light sensitive fish, like walleye, and can lead to more aquatic plant growth in deeper water. This may help smaller fish survive by giving them a place to hide, but makes it harder for larger predatory fish to move around and find food. Thicker plant growth can also cause a problem for anglers and boaters. Zebra mussels also clog water intake pipes for industrial facilities and boat engines, making it very expensive to keep their pipes cleared out. They attach to piers, boat lifts and boats, causing damage and costly repair. They also attach to the shells of native mussels in great masses, eventually smothering them. Their sharp shells wash up on shore, and can cut the feet of beach walkers and swimmers. ***Treatment:*** Currently there are few acceptable treatment methods to control zebra mussels, therefore prevention steps (covered at the end of this species section) are critical. ***Water Bodies with Zebra Mussels:*** Fortunately, there are no zebra mussels present in Washburn County. Nearby, they are found in Lake Superior, Douglas County and in the St. Croix River.

Rusty Crayfish *(Orconectes rusticus)*

History: Rusty crayfish are native to streams in the Ohio River Basin states of Ohio, Kentucky, Illinois, Indiana and Tennessee. They were likely introduced to Wisconsin waters by anglers using them as fishing bait. It is illegal to possess both live crayfish and angling equipment on any inland Wisconsin water (except the Mississippi River). It is also illegal to release crayfish into a water of the sate without a permit. ***Identifying Characteristics:*** Adult rusty crayfish are generally 3-5 inches long (excluding claws). They are identified by their rust-colored spot on each side of their body. Their claws are typically larger and smoother than many other native crayfish, and have black bands on the tips. ***Life Cycle:*** Rusty crayfish inhabit lakes, streams and ponds. They prefer areas that have logs, rocks or other debris for cover, and bottom substrates of silt, clay, sand or rocks. They need fairly clean water, and inhabit both pool and riffle-like areas, and can be prolific, lying from 80-575 eggs. ***Impacts:*** Adult rusty crayfish eat about four times the amount of food a native crayfish eats. It feeds on small fish, insects, fish eggs, and native crayfish eggs. They also feed on aquatic vegetation, damaging habitat for fish spawning, cover

and food. If the rusty crayfish are eating Eurasian water-milfoil, they are making the problem worse by spreading fragments in the water. They are also more aggressive than native crayfish, eventually displacing them from an area. ***Treatment:*** Currently there are few acceptable treatment methods to control rusty crayfish, therefore prevention steps (covered at the end of this species section) are critical. ***Washburn County Water Bodies with Rusty Crayfish:*** Birch and Red Cedar Lake, Minong Flowage, Brill and Yellow River, and Sucker Creek.

Spiny Waterflea *(Bythotrephes cederstoem)*
Fishhook Waterflea *(Cercopagis pengo)*



History: Both species of waterfleas entered the Great Lakes through ballast ship water from Europe. The spiny waterflea arrived in the 1980's, followed by the fishhook during the 1990's. ***Identifying characteristics:*** Both species are about ¼ to ½ inch long. Spiny waterfleas are distinguished by their long tail spines, which usually have one to three barbs. Fishhook waterfleas have smaller barbs on their tails and the end of the tail has a "fishhook" appearance. Both species will appear as a white slimy glob on fishing line. ***Life Cycle:*** Both species reproduce sexually and asexually in the summer. This means that no males are required; therefore a single female can start a new population herself. Eggs can be transferred to new water bodies through boating, fishing and other water recreational equipment. Resting eggs can survive long after the adults are dead, even under extreme environmental conditions. ***Impacts:*** Spiny and fishhook waterfleas reproduce very rapidly, leading to large increased populations. They eat smaller zooplankton, including the native daphnia (native waterfleas) which are an important food source for young fish. Additionally, young fish have trouble eating these waterfleas due to their long spiny tails. Waterfleas also gather in thick globby masses on fishing line and downrigger cables, clog eyelids of fishing rods and damage a reel's drag system, all of which can prevent fish from being landed. ***Treatment:*** Waterfleas spread to inland waters when fishing gear is contaminated with eggs. Make sure to clean all fishing equipment (waders, monofilament line, bait buckets, etc.) before going to another lake. ***Water Bodies with Waterfleas:*** There are no known infestations found in Washburn County. However, one or both species are found in all of the Great Lakes, and in 2003, Spiny water fleas were found in the Gile Flowage, a lake in Iron County near Lake Superior. This was the first time the invasive water fleas have been found in an inland Wisconsin lake. More recently, in 2007, spiny water fleas were also discovered in Stormy Lake, located in Vilas County.

Chinese Mystery Snail *(Cipangopaludina chenesis)*

History: Chinese mystery snails are native to China and other Asian countries. They were introduced to the United States as a food source, and later were distributed through the aquarium industry. ***Identifying characteristics:*** The easiest way to identify a Chinese

mystery snail is by its shell. It is a smooth, cone shaped spiral-shaped shell with uniform light to dark olive-green coloration and 5-7 whorls. It grows upward about two inches in length. ***Life Cycle:*** Chinese mystery snails are found in shallow, slow moving, or stagnant waters, staying partially buried in the mud. Unlike the zebra mussel, Chinese mystery snails have no free-swimming larval stage. Sexual reproduction occurs, and females give birth to crawling live young twice a year. Snails mature after one year, and can live 3 to 5 years. ***Impacts:*** Chinese mystery snails eat native zooplankton, filter feed on suspended matter, and compete for space with native species. They also serve as vectors for the transmission of various parasites and diseases such as flukes, which can infect humans. Unlike native snails, the Chinese mystery snail *will not* serve as a host for swimmers itch. Additionally, their shells clog water intake pipes, inhibiting the flow of water. They have a "trap door" called an operculum which allows them to close the opening of their shell when water conditions are unfavorable. ***Treatment:*** Currently, there are few acceptable treatment methods to control Chinese mystery snails, therefore prevention steps are critical. ***Washburn County Water Bodies with Chinese Mystery Snails:*** Bass, Big and Little Bass, Birch, Cable, Dunn, Fenton, Nancy, Lincoln, Long, McKenzie, Miller, Pear, Pokegema, Round, Silver, Shell, Tozer and Trego Lake.

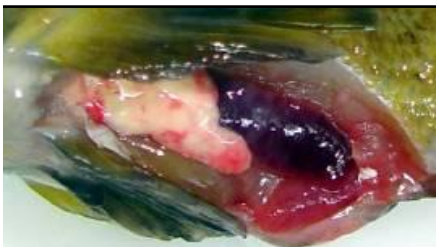
New Zealand Mudsnail *(Potamopyrgus antipodarum)*

History: The New Zealand mudsnail is native to New Zealand. It was accidentally introduced into the Great Lakes with imported rainbow trout in Idaho during the 1980's through ballast water. ***Identifying characteristics:*** Like the Chinese mystery snail, the New Zealand mudsnail is characterized by its shell. The shell is cone shaped, brown to dark brown in color, grows to 3-6 mm in length, and consists of 5 to 6 whorls. ***Life Cycle:*** The New Zealand mudsnail can survive in most aquatic habitats, and can tolerate a range of water temperatures (except freezing), salinity and turbidity, although they do prefer flowing water. They can be found on cobble substrates and pieces of wood, and rarely in sandy or silty areas. They reproduce asexually, meaning a single snail can generate an entire colony. Young are kept within the mantle cavity until maturity at 3 to 6 months old. Twice a year they give birth to between 20 and 120 live young, which are only about 1 mm long. In ideal conditions, New Zealand mudsnails reproduce every three months and can live up to 3 years. In its native habitat, several parasites keep the population in check. ***Impacts:*** As a result of asexual reproduction, New Zealand mudsnails can invade other bottom-dwelling species and eliminate algae from an entire river system. They can become as dense as one-half million per square meter! They compete with native invertebrates, mollusks, and fish for space and food and have no natural predators. When eaten by fish and birds, they shut their operculum and pass through the digestive tract unharmed. On its own, it may move as much as 60 meters in 3 months. At cool temperatures, mudsnails can survive up to 25 days or longer inside waders, laces and tongue of waders, live well or in cooling systems, and mud (therefore, drying gear is ineffective). Fisherman are encouraged not to use felt bottom wading boots, as they are more likely to harbor mudsnails and other invasive species. ***Treatment:*** Currently there are few

acceptable treatment methods to control New Zealand Mudsnails, therefore prevention steps are critical. ***Water Bodies with New Zealand Mudsnails:*** There are no known infestations found in any Wisconsin inland waters, but they are established in Lake Superior, Erie, Ontario and most recently, Michigan.

Viral Hemorrhagic Septicemia Virus *(VHS)*

History: VHS is a deadly fish virus that is threatening Wisconsin's fish. It has mutated from the original virus that was discovered in the 1930's that infected European trout farms. More recently, it has caused large fish kills in several eastern Great Lakes in 2005 and 2006. In 2007, VHS was confirmed to be in Lake Michigan, after first being found in the Lake Winnebago system. The virus infects the internal organs and cells that line the blood vessels, causing severe hemorrhaging (bleeding); this is the main cause of death. Fish can also be infected when they eat an infected fish. ***Identifying Characteristics:*** Fish infected with VHS may have clinical signs of bulging eyes, external and internal hemorrhaging, swollen or pale organs, or bloated abdomens. Infected fish shed the virus through their reproductive fluids and urine. The blood vessels become weak, causing hemorrhaging in the internal organs, muscles and skin. The virus grows best when the water temperature is between 37-54 ^{0}F, and most infected fish die at 37 to 41 ^{0}F, but rarely die above 59 ^{0}F. It can survive in water for at least 14 days. Stress plays a large factor in VHS outbreaks. Stresses such as spawning hormones, lack of food, poor water quality, or excessive handling of fish, can suppress a fish's immune system, causing infected fish to become diseased. Although some infected fish may not show any signs, transporting these fish to new locations could spread the disease to unaffected waters. ***Impacts:*** Presently, there are about 45 species of fish that are known to be susceptible to VHS. Fortunately, studies have shown it is not a threat to people who handle or eat infected fish. The virus can potentially cause massive fish population die offs, and can severely impact the billion dollar fisheries industry. ***Treatment:*** Presently, there is no cure and VHS must be confirmed by lab tests. ***Water Bodies with VHS:*** Currently it is not found in Washburn County, only in the Lake Winnebago system and Lake Michigan.



<u>Symptoms of VHS:</u>

External Hemorrhaging
Internal Hemorrhaging
Swollen or Pale Organs
Bulging Eyes

Prevention Steps

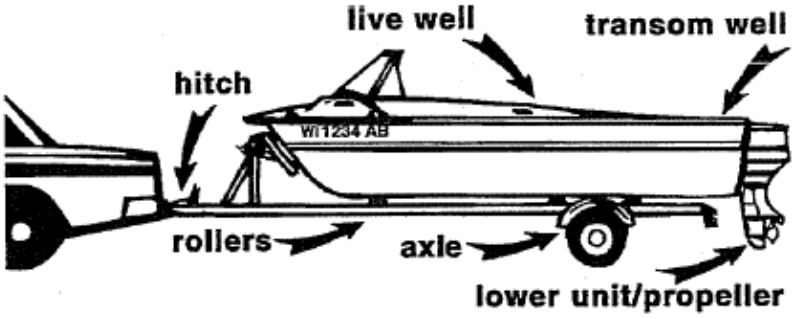
Fortunately, not every lake in Wisconsin has an aquatic invasive species (AIS), nor does the county itself have zebra mussels, water fleas, New Zealand mud snails or VHS. As we move our boats from water body to water body across the state, AIS hitch a ride with us, and can become established in new areas.

Although it will be impossible to prevent all AIS from entering Washburn County and complete eradication is unlikely with those species already here, there are ways to decrease the impacts posed by AIS. It is important for everyone to follow the appropriate prevention steps to stop their spread:

1. ***Inspect*** and ***Remove*** aquatic plants, animals, and mud from boat, trailer, and equipment before leaving a boat landing.
2. ***Drain*** all water from boat, motor, live-wells, bilge, bait buckets, and other containers before leaving a boat landing.
3. ***Ice*** your catch; don't leave the boat landing with any live fish, bait, or fish eggs.
4. ***Dispose*** of unused bait in the trash, not in the water or on land.
5. ***Rinse*** your boat and equipment with hot or high pressure water *or* ***Dry*** your boat for at least five days.

****<u>NOTE</u>: In Wisconsin, it is illegal to launch a boat with any aquatic plants or zebra mussels attached (s. 30.715 WI Statute).***

Watercraft Check Points:



- Anchor
- Axle
- Bait bucket
- Bunks
- Bow line
- Fishing line
- Floor
- Hull
- Intake pipe
- Ladder
- Landing net
- License plate
- Motor
- Wheels
- Live well
- Lights/wiring
- Rollers
- Prop
- Spare tire
- Tackle
- Tow rope
- Trailer
- Transducer
- Transom well
- Trolling motor

Plan Goals, Objectives and Activities

An implementation strategy is provided for each goal in the following section. The objectives are the detailed and readily measurable steps toward reaching each goal. The activities provide the means for reaching the objectives.

Goal 1: **Educate Washburn County residents and visitors regarding the problems posed by aquatic invasive species.**

Objectives

A. Conduct a mass media campaign to inform and educate residents, businesses, and visitors about AIS.
B. Undertake a targeted educational effort on AIS in order to reach specific key audience.
C. Provide information via easily accessible means to the public at large.
D. Provide information regarding grant funding opportunities available.

Activities

1. The AIS Coordinator will provide one AIS monthly article from May through September to the weekly newspapers (Spooner Advocate and Washburn County Register).
2. The AIS Coordinator will provide AIS articles to WCLRA's newsletter.
3. The AIS Coordinator will deliver and check the supply of AIS materials to the Chamber of Commerce and bait shops monthly from April through September.
4. The AIS Coordinator will work with the Basin Educator from UWEX to distribute AIS brochures and other informational materials.
5. The AIS Coordinator will invite the local newspaper reporters to AIS workshops.
6. The AIS Coordinator will conduct a minimum of one AIS informational workshop per year to interested local lake associations, lake districts, towns, and others interested, and more upon request.
7. The AIS Coordinator will assist and provide grant information to interested AIS grant applicants.
8. AIS educational links will be provided and maintained on the Washburn County LWCD website.
9. The AIS Coordinator will continue to attend AIS workshops, meetings and conferences when feasible.
10. The AIS Coordinator will continue efforts to form Town Lake Committees.

Goal 2: **Prevent the introduction of aquatic invasive species into Washburn County.**

Objectives

A. Encourage watercraft inspection programs at boat landings within the county.
B. Report inventory of inadequate AIS signage at boat landings to the WDNR.

C. Encourage AIS monitoring and prevention for special events held on lakes.
D. Maintain a communication line between the county, state, and federal agencies.

Activities

1. The AIS Coordinator will conduct watercraft inspections at infested AIS boat landings when feasible.
2. While conducting watercraft inspections at boat landings, the AIS Coordinator will report any AIS sign problems to the WDNR.
3. The AIS Coordinator will encourage lake associations to contact the WDNR for proper AIS sign placement at their boat landing, if not already present.
4. The AIS Coordinator will work with the WDNR and the UWEX Lakes Program to conduct a minimum of one CBCW workshop per year for lake associations, lake districts, towns and others interested, and more upon request.
5. The LWCD and AIS Coordinator will sustain communication with statewide LWCD's, WDNR, GLIFWC and NPS regarding AIS issues.

Goal 3: **Monitor Washburn County for the presence of aquatic invasive species**

Objectives

A. Encourage and support local efforts to monitor waters for the presence of AIS.
B. Establish programs and/or protocol for county departments and municipalities who work on or near lakes to assist in monitoring and reporting AIS.
C. Maintain an inventory of AIS within the LWCD.

Activities

1. The AIS Coordinator will work with the WDNR and the UWEX-Lakes Program to conduct a minimum of one CLMN workshop per year for lake associations, lake districts, towns and others interested, and more upon request.
2. The AIS Coordinator will provide one AIS article each month from April through September to the weekly newspapers (Spooner Advocate and Washburn County Register).
3. The AIS Coordinator will assist and provide grant information to interested AIS grant applicants.
4. With help from the County Mapping Technician, the CAC and LWCD will coordinate with the WDNR, GLIFWC and NPS to maintain a map of AIS within the county.
5. AIS educational links will be provided and maintained on the Washburn County LWCD website.

Goal 4: **Control the spread of existing aquatic invasive species presently found in Washburn County.**

Objectives

A. Maintain documentation, level of infestation and management of AIS.
B. Provide expertise on the available AIS management options and funding via website or information at easily accessible locations.
C. Implement a watercraft inspection program at boat landings with AIS infested waters.

Activities

1. The LWCD will continue to raise and release purple loosestrife beetles into infested areas.
2. The AIS Coordinator will work with the County Mapping Technician and GLIFWC to maintain a database of purple loosestrife beetle release sites, including maps.
3. The AIS Coordinator will work with the County Mapping Technician to create maps showing locations of AIS infestations.
4. The AIS Coordinator will work with the WDNR and the UWEX Lakes Program to conduct a minimum of one CBCW workshop per year for lake associations, lake districts, towns and others interested, and more upon request.
5. AIS educational links will be provided and maintained on the Washburn County LCWD website.
6. The AIS Coordinator will assist and provide grant information to interested AIS grant applicants.
7. The AIS Coordinator will conduct watercraft inspections at infested AIS boat landings when feasible.

Goal 5: **Engage and support legislative effort for aquatic invasive species in Washburn County and throughout the state.**

Objectives

A. Encourage lake residents to contact their legislators to take action regarding AIS funding and laws.
B. Encourage County and Statewide organizations to contact their legislators to take action regarding AIS funding and laws.

Activities

1. The LCC will encourage the County Board to continue their support for the County-wide *Illegal to Transport Ordinance.*
2. The AIS Coordinator will continue to be aware of AIS legislative actions being taken by reviewing legislative news releases and updates.
3. The AIS Coordinator and WCLRA will write letters of support to the appropriate parties regarding AIS legislative action and concerns.
4. The AIS Coordinator will provide updated legislative information to the WCLRA board for possible inclusion in their newsletter.

Goal 6: **Establish and sustain a county-wide structure to accomplish goals 1-5.**

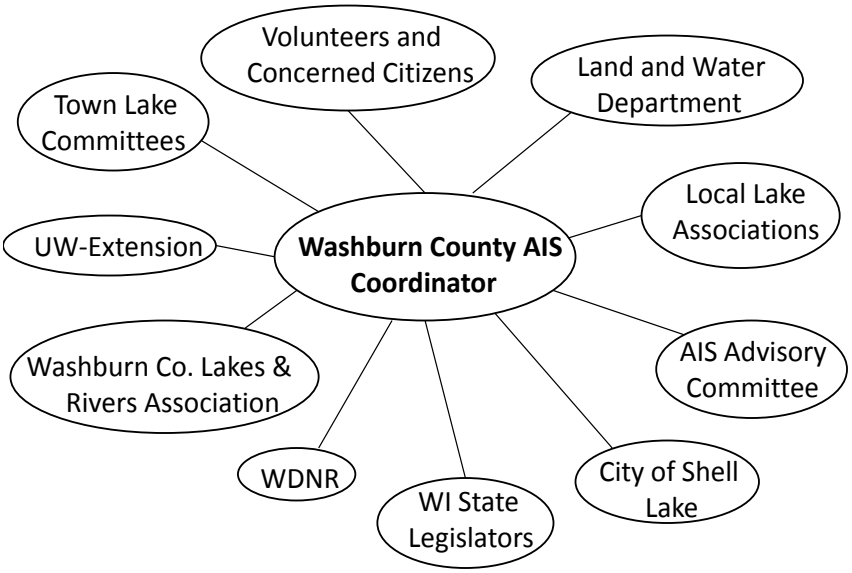
Objectives

A. Continue to seek funding for staff and AIS activities.
B. Seek dedicated AIS staff under the LWCD.
C. Update progresses made within the county.

Activities

1. The LWCD director will continue to apply for WDNR AIS Education and Prevention Grants with approval from the LCC and County Board.
2. The LWCD director will generate an annual report to the LCC and County Board.
3. The LWCD and AIS Coordinator will document and track progresses made.

Cooperating Efforts



This is not a comprehensive list, but illustrates examples of entities coordinating opportunities and efforts together regarding AIS prevention, control and monitoring.

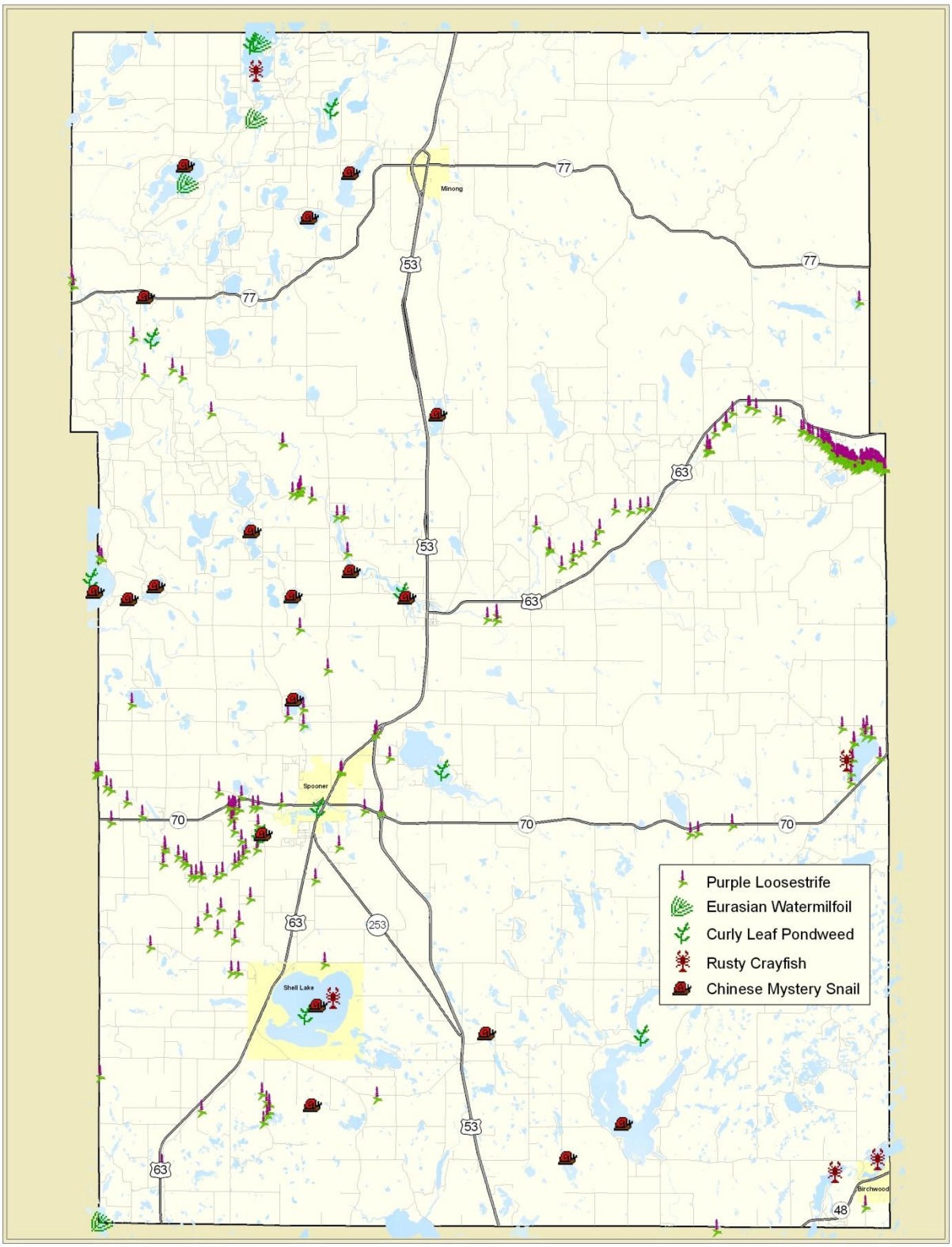
Stakeholders Affected by Aquatic Invasive Species

This list includes some of the many groups and individuals in Washburn County that can be impacted by AIS and who can benefit from the implementation of this plan:

- Lakeshore Property Owners
- Residents and Visitors to the area
- Lake Association Members
- Watercraft Dealers
- Watercraft Rental Businesses
- Baits Shops
- Outdoor Retail Businesses
- Resort and Campground Owners and their Clientele
- Realtors

Appendix A

AIS Found in Washburn County



APPENDIX B

Known Water Bodies in Washburn County with AIS as of April, 2008

Key

EWM: Eurasian Water Milfoil

CLP: Curly-leaf Pondweed

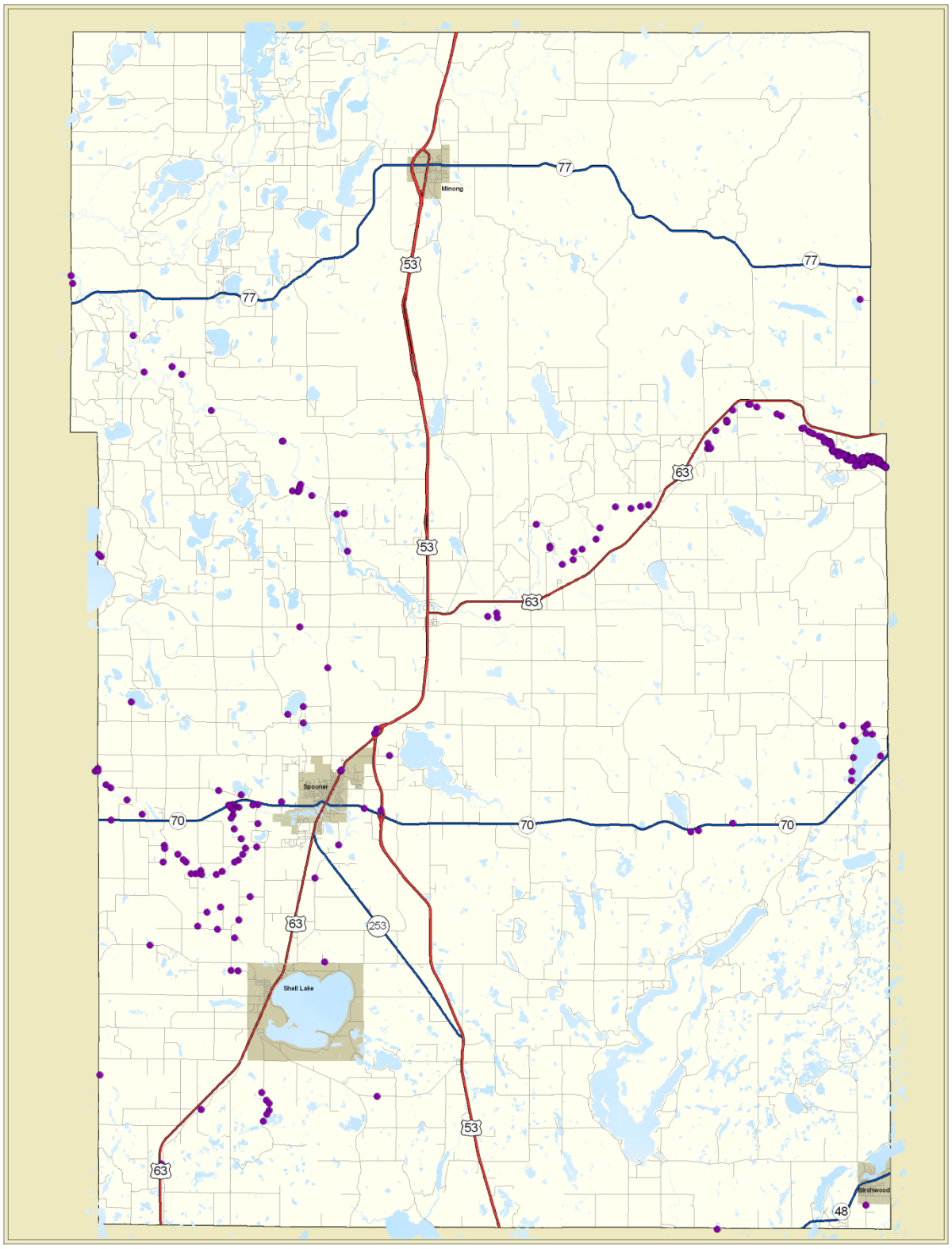
RC: Rusty Crayfish

CMS: Chinese Mystery Snail

Water Body	Township	AIS
Bass Lake	Casey	CMS
Big Bass Lake	Casey	CMS
Birch Lake	Birchwood	CLP, CMS, RC
Brill River		RC
Cable Lake	Evergreen	CMS
Dunn Lake	Casey	CMS
Fenton Lake	Long Lake	CMS
Gilmore Lake	Minong	CLP
Hointville Lake	Chicog	CLP
Lincoln Lake	Casey	CMS
Little Bass Lake	Casey	CMS
Long Lake	Long Lake, Birchwood, Madge	CMS, CLP
McKenzie Lake	Casey, Chicog	CMS, CLP
Miller Lake	Sarona	CMS
Minong Flowage	Minong	CLP, EWM, RC
Lake Nancy	Minong	CMS, EWM
Pear Lake	Chicog	CMS
Pokegema Lake	Minong	CMS
Red Cedar Lake	Birchwood	CLP, RC
Round Lake	City of Shell Lake	CMS
Shallow Lake	Baronette	EWM
Shell Lake	City of Shell Lake	CMS,CLP
Silver Lake	Brooklyn	CMS
Spooner Lake	Spooner	CLP
Sucker Creek	Birchwood	RC
Totogatic River		EWM
Tozer Lake	Evergreen	CMS, CLP
Trego Lake	Trego	CMS, CLP
Yellow River		RC
Yellow River Flowage	Spooner	CLP

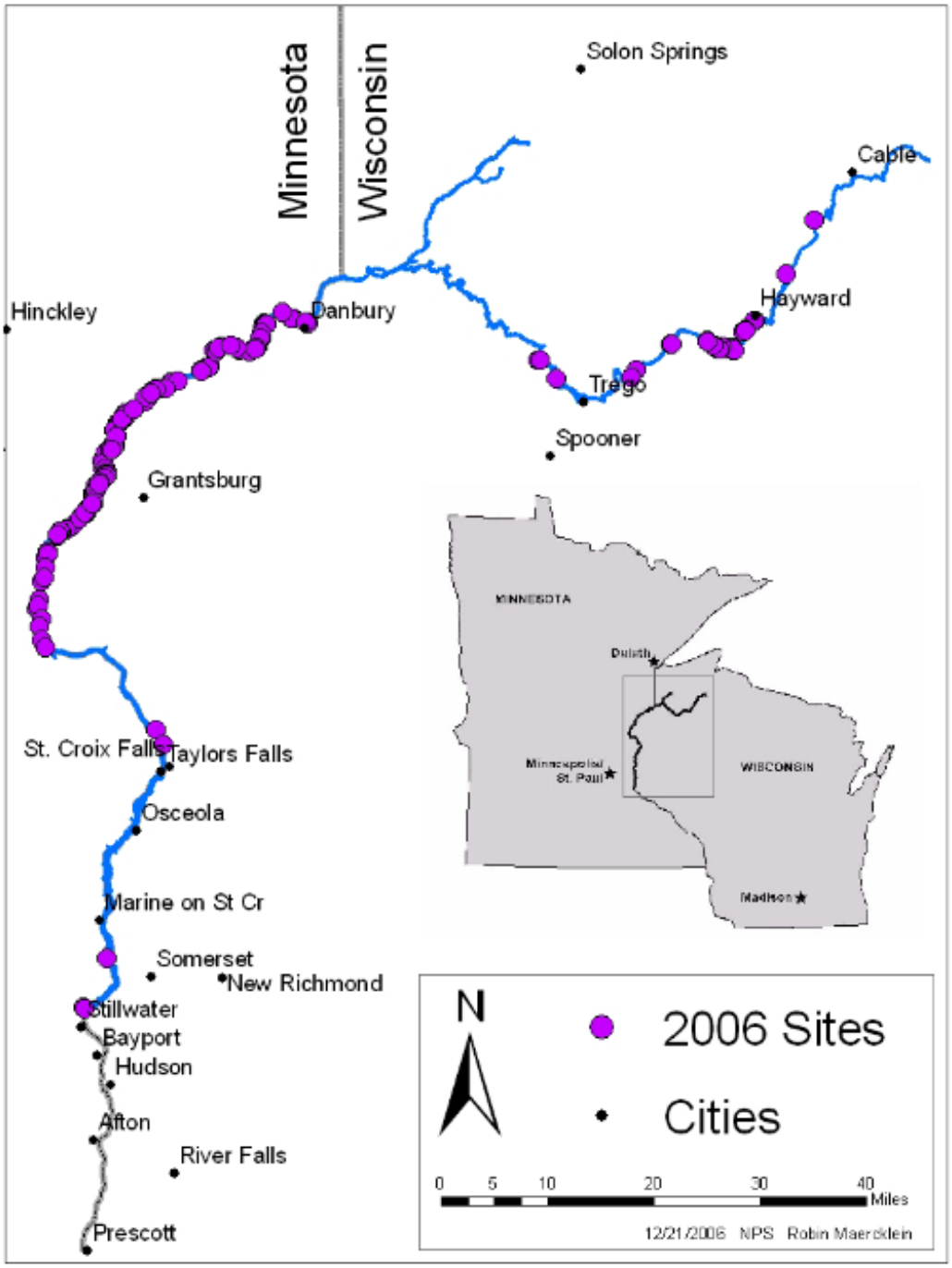
Appendix C

Washburn County Purple Loosestrife Sites



APPENDIX D

2006 National Parks Service Purple Loosestrife Sites along the Namekagon and St. Croix River



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http://www.uwsp.edu/cnr/uwexlakes/cbcw/