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Ceratophyllum demersum — Coontail

Native

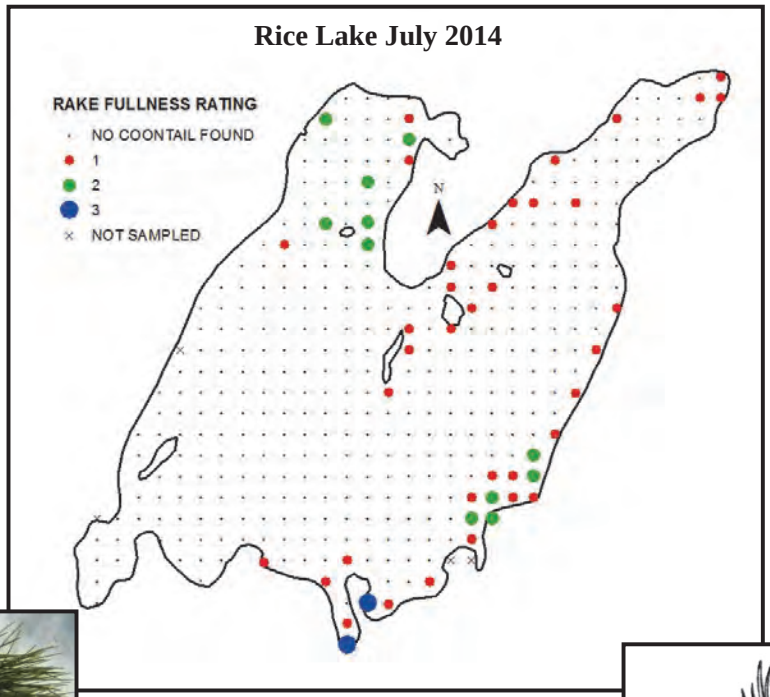
Identifying Features

- Often bushy near tips of branches, giving the raccoon tail-like appearance (“coontail”)
- Whorled leaves with one to two orders of branching and small teeth on their margins
- Flowers (rare) small and produced in leaf axils

Coontail is similar to spiny hornwort (*C. echinatum*) and muskgrass (*Chara* spp.), but spiny hornwort has some leaves with three to four orders of branching, and coontail does not produce the distinct garlic-like odor of muskgrass when crushed

Ecology

- Common in lakes and streams, both shallow and deep
- Tolerates poor water quality (high nutrients, chemical pollutants) and disturbed conditions
- Stores energy as oils, which can produce slicks on the water surface when plants decay
- Anchors to the substrate with pale, modified leaves rather than roots
- Eaten by waterfowl, turtles, carp, and muskrat

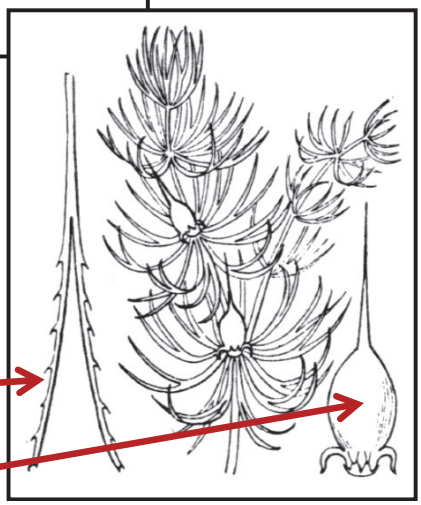


Second-Order Leaf Branching

First-Order Leaf Branching

Toothed Leaf Margins

Fruit (rare)



Chara spp.
Native

Muskgrasses
Algae (not vascular plants)

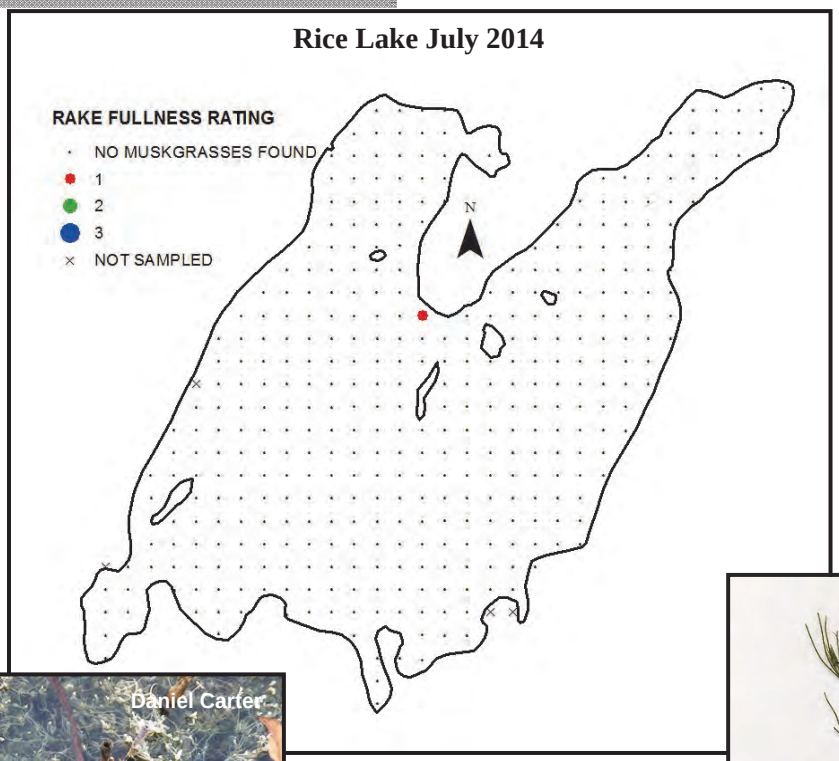
Identifying Features

- Leaf-like, ridged side branches develop in whorls of six or more
- Often encrusted with calcium carbonate, which appears white upon drying (see photo on left, below)
- Yellow reproductive structures develop along the whorled branches in summer
- Emits a garlic-like odor when crushed

Stoneworts (*Nitella* spp.) are similar large algae, but their branches are smooth rather than ridged and more delicate

Ecology

- Found in shallow or deep water over marl or silt, often growing in large colonies in hard water
- Overwinters as rhizoids (cells modified to act as roots) or fragments
- Stabilizes bottom sediments, often among the first species to colonize open areas
- Food for waterfowl and excellent habitat for small fish




Daniel Carter


Christian Fischer

Elodea canadensis — Common Waterweed

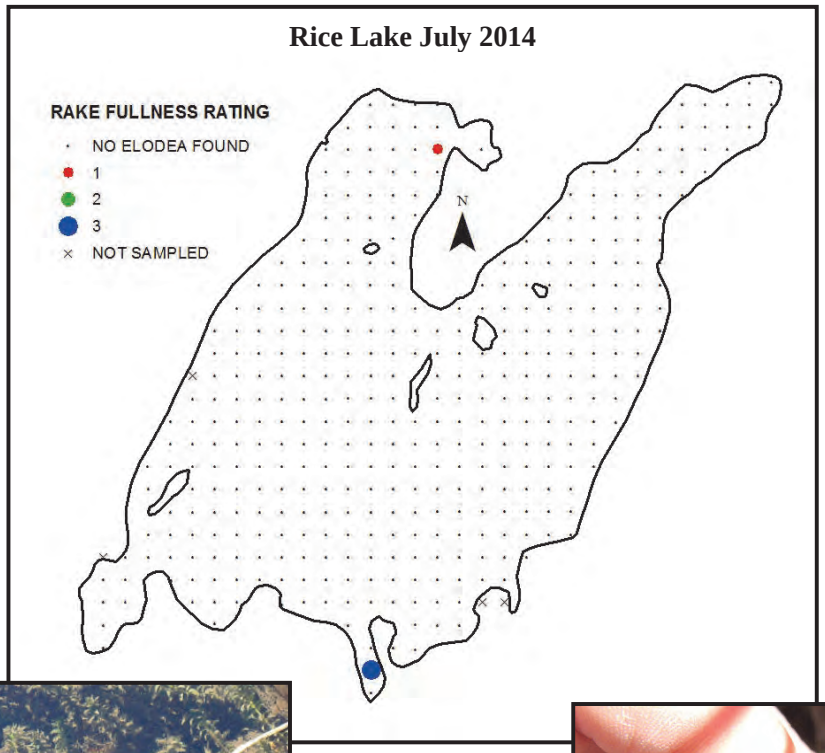
Native

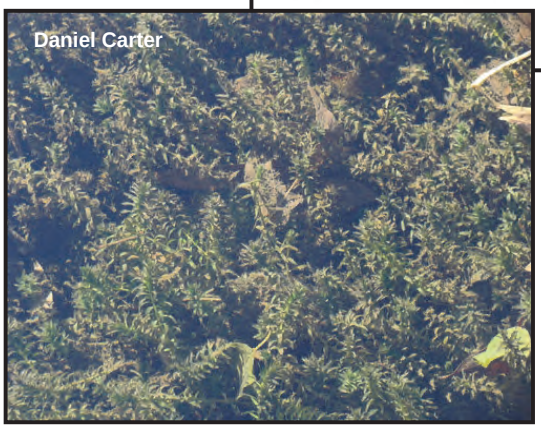
Identifying Features

- Slender stems, occasionally rooting
- Leaves lance-shaped, in whorls of three (rarely two or four), 6.0 to 17 mm long and averaging 2.0 mm wide
- When present, tiny male and female flowers on separate plants (females more common), raised to the surface on thread-like stalks

Ecology

- Found in lakes and streams over soft substrates tolerating pollution, eutrophication and disturbed conditions
- Often overwinters under the ice
- Produces seeds only rarely, spreading primarily via stem fragments
- Provides food for muskrat and waterfowl
- Habitat for fish or invertebrates, although dense stands can obstruct fish movement





Myriophyllum spicatum — Eurasian Water Milfoil

Nonnative/Exotic

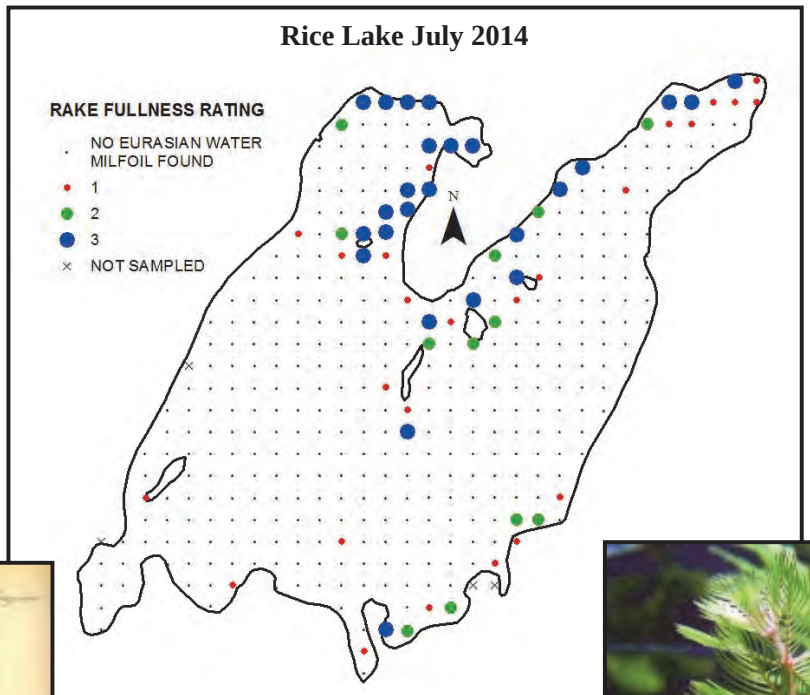
Identifying Features

- Stems spaghetti-like, often pinkish, growing long with many branches near the water surface
- Leaves with 12 to 21 pairs of leaflets
- Produces no winter buds (turions)

Eurasian water milfoil is similar to northern water milfoil (*M. sibiricum*). However, northern water milfoil has five to 12 pairs of leaflets per leaf and stouter white or pale brown stems

Ecology

- Hybridizes with northern (native) water milfoil, resulting in plants with intermediate characteristics
- Invasive, growing quickly, forming canopies, and getting a head-start in spring due to an ability to grow in cool water
- Grows from root stalks and stem fragments in both lakes and streams, shallow and deep; tolerates disturbed conditions
- Provides some forage to waterfowl, but supports fewer aquatic invertebrates than mixed stands of aquatic vegetation



Polygonum amphibium (Persicaria amphibian) — Water Smartweed

Native

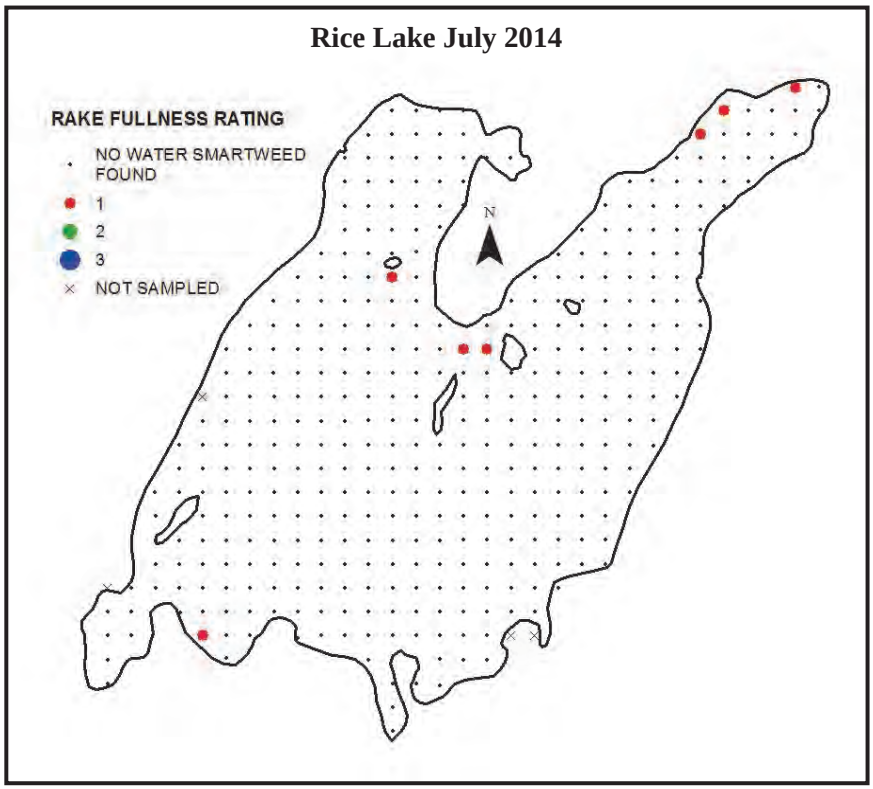
Identifying Features

- Occurs in both floating and upright, land adapted forms
- Floating leaves smooth, elliptical, and with a rounded tip and emergent leaves hairy with pointed tips
- Swollen leaf nodes along stems
- Pink, cylindrical clusters of small flowers

The floating forms of water smartweed could be mistaken for pondweeds (*Potamogeton spp.*) but water smartweed can be easily distinguished by its lack of submersed leaves and its swollen leaf nodes.

Ecology

- Very widespread and common in areas with saturated soils and in shallows of backwaters, ponds, and lakes
- Reproduces by seed and overwinters via perennial rhizomes
- Seeds consumed by waterfowl and *particularly important for migratory waterfowl*
- Provides habitat for fish and aquatic invertebrates



Potamogeton crispus — Curly-Leaf Pondweed

Nonnative/Exotic

Identifying Features

- Stems slightly flattened and both stem and leaf veins often somewhat pink
- Leaf margins very wavy and finely serrated
- Stipules (3.0 to 8.0 mm long) partially attached to leaf bases, disintegrating early in the season
- Produces pine cone-like overwintering buds (turions)

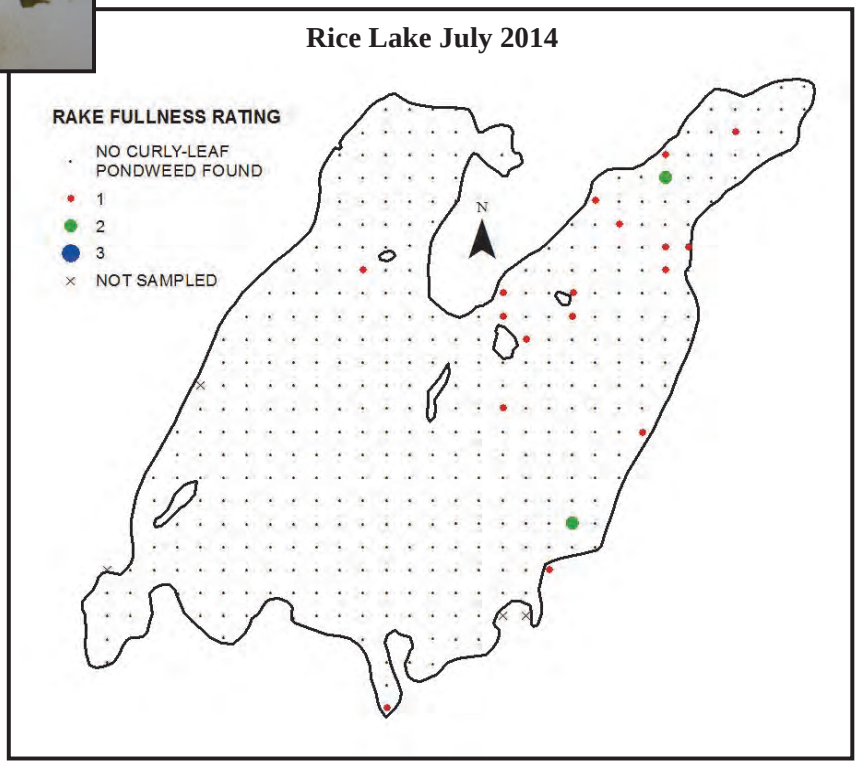
Curly-leaf pondweed may resemble clasping-leaf pondweed (*P. richardsonii*), but the leaf margins of the latter are not serrated

Ecology

- Found in lakes and streams, both shallow and deep
- Tolerant of low light and turbidity
- Disperses mainly by turions
- Adapted to cold water, growing under the ice while other plants are dormant, but dying back during mid-summer in warm waters
- Produces winter habitat, but mid-summer die-offs can degrade water quality and cause algal blooms
- Maintaining or improving water quality can help control this species, because it has a competitive advantage over native species when water clarity is poor

Zofia Noe

Zofia Noe



Ranunculus aquatilis — White Water Crowfoot

Native

Identifying Features

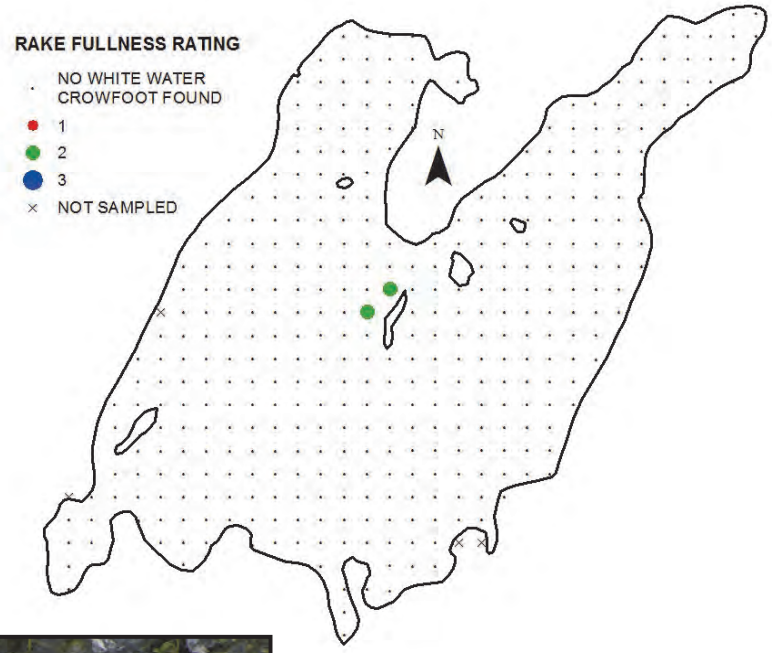
- Submersed leaves finely divided into thread-like sections, and arranged alternately along the stem
- Flowers white, with five petals
- May or may not produce floating leaves

White water crowfoot is similar to other aquatic *Ranunculus* spp. However, the latter have yellow flowers and leaf divisions that are flat, rather than thread-like

Ecology

- Shallow water in lakes or streams, often with high alkalinity
- Often forms dense patches near springs or sand bars
- Emerges from rhizomes in the spring
- Fruit and foliage consumed by waterfowl and upland birds alike
- Habitat for invertebrates that are food for fish like trout

Rice Lake July 2014



Stuckenia pectinata — Sago Pondweed

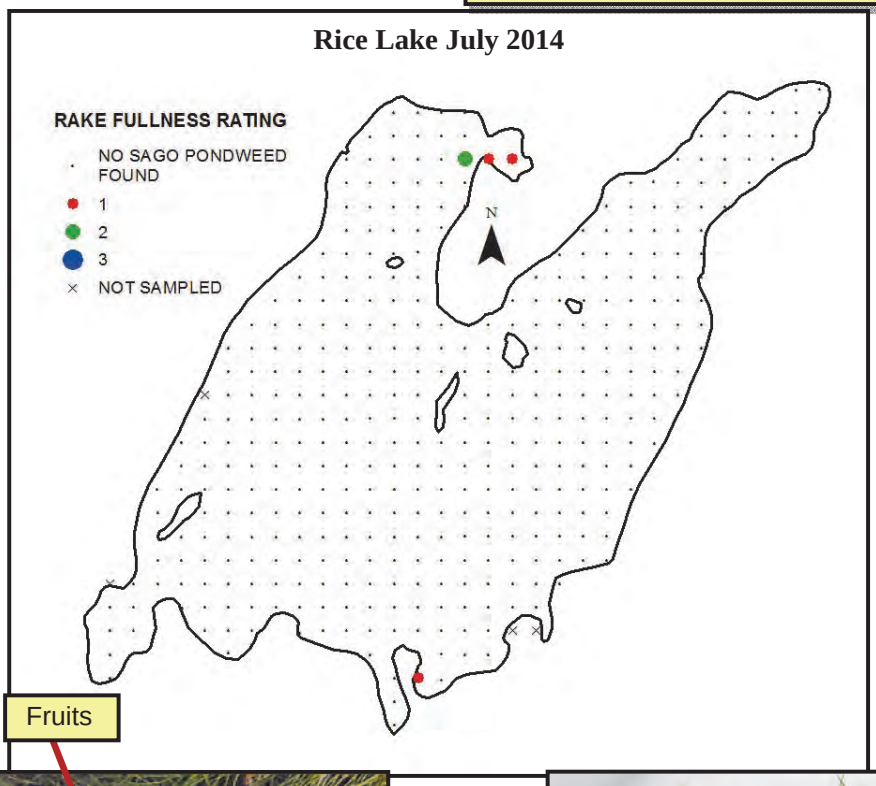
Native

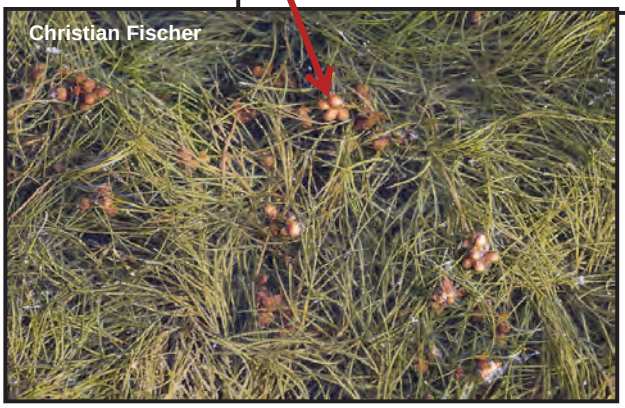
Identifying Features

- Stems often *slightly zig-zagged* and forked multiple times, yielding a fan-like form
- Leaves one to four inches long, very thin, and ending in a sharp point
- Whorls of fruits spaced along the stem may appear as beads on a string

Ecology

- Lakes and streams
- Overwinters as rhizomes and starchy tubers
- Tolerates murky water and disturbed conditions
- Provides abundant fruits and tubers, which are an *important food for waterfowl*
- Provides habitat for juvenile fish





Appendix B

WISCONSIN DEPARTMENT ON NATURAL RESOURCES DESIGNATED SENSITIVE AREAS ON WHITEWATER LAKE

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WISCONSIN
DEPT. OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

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Milwaukee, Wisconsin 53212
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AQUATIC PLANT MANAGEMENT
SENSITIVE AREA DESIGNATION FOR **AREA 1**
WHITEWATER LAKE, WALWORTH COUNTY, WISCONSIN

Date of Designation: July 7, 1992

Sensitive Area Site Description

Sensitive area 1 is located within the northwestern lobe of Whitewater Lake. It begins on the lobe's west side at the peninsula north of the developed shoreline. The area extends north to the tip of the bay and continues south to a point before the developed shoreline (see map). Substrate in sensitive area 1 is 50 percent sand and 50 percent gravel near shore gradating to muck at the end of the bay. This area contains approximately 3800 feet of shoreline.

Four plant species were identified within this sensitive area. The area currently supports Coontail (Ceratophyllum demersum), Eurasian Water Milfoil (Myriophyllum spicatum), Curly-Leaf Pondweed (Potamogeton crispus), and Cattail (Typha).

The cattails are located primarily along the northern tip and create a wetland that is regulated by the Wisconsin Department of Natural Resources.

Table 1 lists the aquatic plants found in sensitive area 1 and identifies the benefits each provides.

Why is this area a sensitive area?

Following an inspection of Whitewater Lake, Department of Natural Resources personnel concluded this area was particularly valuable to the water quality and biological integrity of the lake. Each biologist considered the qualities of this area unique and valuable for the following reasons:

Water Resource Manager Dan Helsel noted the aquatic vegetation benefits the water quality and clarity of Whitewater Lake. He also recognized the undeveloped shoreline as relatively unique to the lake as well as other lakes in southeastern Wisconsin.

variety of gamefish throughout their life cycle. Loss of this habitat could result in a negative impact upon the sport fishery.

The aquatic plants in this sensitive area supply valuable wildlife habitat for waterfowl, songbirds, and furbearers. Wildlife Biologist Mark Anderson states the area offers a variety of habitat that needs to be protected due to its wildlife value.

The important role of the aquatic plants, proximity of the adjacent cattail wetland, and extent of undeveloped shoreline warrants protection of this area. Whitewater Lake will benefit as a result of this sensitive area designation and subsequent aquatic plant protection.

How will the lake benefit from this area?

Water quality of Whitewater Lake will benefit as a result of protection of the aquatic plant community in this area. Water Resources Manager Dan Helsel noted the vegetation is valuable for erosion control as well as sediment and nutrient retention. The aquatic plants and cattails act as a buffer against waves to protect the shoreline from erosion. Rooted aquatic plants also trap suspended soil particles, stabilize bottom sediment, and prevent resuspension from waves caused by wind and boating activities. Furthermore, the aquatic plants compete for the nutrients, space, and sunlight that could otherwise support nuisance algae.

The plants' resource value for gamefish and panfish populations in Whitewater Lake has been highly rated. Department of Natural Resource's Fish Manager Doug Welch identified 100 percent of the vegetation present necessary for the feeding habits of bluegill, largemouth bass and northern pike. The habitat supplied by the vegetation and substrate is also very valuable for fish spawning and as a nursery. The plants provide protection for young fish and support insect populations, which in turn are eaten by the young fish.

Department of Natural Resources Biologist Mark Anderson rated the wildlife habitat in this area as essential for a variety of reptiles, furbearers, and birds. This site provides habitat for frogs, turtles, muskrats, raccoons, opossum, and deer. Mark also identified seasonal habitat valuable for ducks, geese, great blue herons, kingfishers, sandpipers, and songbirds. Many of the aquatic plants and insects associated with the plants provide a valuable food source for these animals. This sensitive area provides habitat necessary for feeding, roosting, nesting, raising broods, and resting during migration. A muskrat was observed in the area feeding on the Eurasian Water Milfoil. Protection of the aquatic vegetation will continue to benefit and attract wildlife.

Certain lake management activities are restricted based upon the Department's inspection, evaluation, and classification of this sensitive area. These restrictions are intended to protect the area's aforementioned aquatic vegetation, water quality, fish, and wildlife.

Management Restrictions

The following **in-lake activities** will be restricted as follows:

Piers and boardwalks are allowed for public benefit only.

Pea gravel and sand blankets are restricted to the existing beach.

Mechanical plant harvesting is not recommended except to open access lanes.

Chemical control is not allowed.

Aquatic plant screens are not allowed.

Dredging is not allowed.

Filling is not allowed.

The following **riparian activities** will be restricted as follows:

Boardwalks are allowed for public benefit only.

Wetland alterations are not allowed. Wetlands are protected under shoreline wetland ordinances.

The protection of Whitewater Lake will require cooperation and understanding by everyone that uses the lake. Positive actions today will help protect the lake for future generations. If you have any questions regarding the identification of Whitewater Lake as a sensitive area or the management implications, please feel free to contact any o of the identification team members listed below:

Identification Team
Mark Anderson, Wildlife Manager - (414)594-2135
Doug Welch, Fish Manager - (414)878-5229
Liesa Nesta, Water Regulation and Zoning - (414)263-8678
Dan Helsel, Water Resources Manager - (414)263-8714

Table 1. Aquatic Plants Found in Sensitive Area 1.

Submergent Plants	
Eurasian Water Milfoil *Myriophyllum spicatum*	Exotic species, supports insects eaten by fish, provides some cover for bluegills, waterfowl occasionally eat its seeds, stabilizes bottom sediments
Curly-Leaf Pondweed *Potamogeton crispus*	Exotic species, supports insects eaten by fish provides some cover for bluegills, largemouth bass, and northern pike
Coontail *Ceratophyllum demersum*	Native species, supports insects eaten by fish, provides cover for young bluegills, largemouth bass, and northern pike
Emergent/Wetland Plants	
Cattails *Typha*	Provide cover for fish and spawning areas for northern pike, good food source for waterfowl and stabilizes shoreline and protects against erosion

WISCONSIN
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Carroll D. Besadny
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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TELEFAX # : 414-263-8483

AQUATIC PLANT MANAGEMENT
SENSITIVE AREA DESIGNATION FOR **AREA 2**
WHITEWATER LAKE, WALWORTH COUNTY, WISCONSIN

Date of Designation: July 7, 1992

Sensitive Area Site Description

Sensitive area 2 is located within the northeastern lobe of Whitewater Lake. It encompasses two floating islands, one upland island, and the shoreline west of the islands (see map). This area contains approximately 1500 feet of mainland shoreline. The shoreline in sensitive area 2 is 75 percent sand, 20 percent gravel, and 5 percent muck. Substrate from the shoreline to five feet of water is 90 percent muck and ten percent sand.

Several plant species were identified within this sensitive area. Submergent aquatic vegetation includes Coontail (Ceratophyllum dermersum), Eurasian Water Milfoil (Myriophyllum spicatum), Curly-Leaf Pondweed (Potamogeton crispus), and Sago Pondweed (Potamogeton pectinatus). Emergent/wetland species include Cattail (Typha), Tamarack (Larix laricina), Sumac (Rhus), Willow (Salix), and Dogwood (Cornus).

Table 1 lists the aquatic plants found in sensitive area 2 and identifies the benefits each provides.

Why is this area a sensitive area?

Following an inspection of Whitewater Lake, Department of Natural Resources personnel concluded this area was particularly valuable to the water quality and biological integrity of the lake. Each biologist considered the qualities of this area unique and valuable for the following reasons:

Water Resource Manager Dan Helsel noted the aquatic vegetation benefits the Whitewater Lake's water quality and clarity. He also stated the species richness and diversity of the area was possibly the best he observed during the entire inspection.

Department Fishery Biologist Doug Welch notes the islands provide important fish habitat. This site is extensively used by a variety of gamefish throughout their life cycle. Loss of this habitat could result in a negative impact upon the sport fishery.

The islands and aquatic vegetation in this sensitive area supply valuable wildlife habitat for waterfowl, predatory birds, songbirds, reptiles, and furbearers. Wildlife Biologist Mark Anderson states the area offers a variety of habitat that needs to be protected due to its wildlife value.

The important role of the aquatic plants and value of the islands warrants protection of this area. Whitewater Lake will benefit as a result of this sensitive area designation and subsequent aquatic plant protection.

How will the lake benefit from this area?

The undeveloped shoreline supplied by the islands in sensitive area 2 is relatively unique to Whitewater Lake and Southeastern Wisconsin. This sensitive area also includes valuable aquatic plants. Water Resources Manager Dan Helsel observed what he noted was possibly the best aquatic plant species diversity in the lake. He believes this plant reservoir has the potential to reestablish native aquatic plant species throughout Whitewater Lake. Protection of this area will help preserve the natural integrity of the islands. Protection of the native plant species will help preserve and enhance the biological integrity and diversity of Whitewater Lake.

Water quality of Whitewater Lake will also benefit as a result of aquatic plant protection in this area. Water Resources Manager Dan Helsel noted the vegetation is valuable for erosion control as well as sediment and nutrient retention. The aquatic plants act as a buffer against waves to protect the shoreline from erosion. Rooted aquatic plants also trap suspended soil particles, stabilize bottom sediment, and prevent resuspension from waves caused by wind and boating activities. Furthermore, the aquatic plants compete for the nutrients, space, and sunlight that could otherwise support nuisance algae.

The plants' resource value for gamefish and panfish populations in Whitewater Lake has been highly rated. Department of Natural Resource's Fish Manager Doug Welch identified 100 percent of the vegetation present necessary for the feeding habits of bluegill, largemouth bass, northern pike, and walleye. The habitat supplied by the vegetation and substrate is also very valuable for fish spawning and as a nursery. The plants provide protection for young fish and support insect populations, which in turn are eaten by the young fish.

Department of Natural Resources Biologist Mark Anderson rated the wildlife habitat in this area as essential for a variety of reptiles, furbearers, and birds. This site provides habitat for frogs, turtles, muskrats, beaver, raccoons, and opossum. Mark also identified seasonal habitat valuable for ducks, geese, egrets, great blue herons, kingfishers, sandpipers, and songbirds. Many of the aquatic plants and insects associated with the plants provide a valuable food source for these animals.

This sensitive area provides habitat necessary for feeding, roosting, nesting, raising broods, and resting during migration. A great blue heron was observed in this area as well as a beaver lodge and redtail hawk nest. Protection of the islands and aquatic vegetation in this sensitive area will continue to benefit and attract wildlife.

Certain lake management activities are restricted based upon the Department's inspection, evaluation, and classification of this sensitive area. These restrictions are intended to protect the area's aforementioned aquatic vegetation, water quality, fish, and wildlife.

Management Restrictions

The following **in-lake activities** will be restricted as follows:

Chemical control is allowed for control of exotic aquatic plants only. Chemical control will not be allowed if potential of damage to native species exists.

Piers and boardwalks are allowed along the mainland shoreline within WDNR guidelines. No piers or boardwalks are allowed on the islands.

Mechanical plant harvesting is recommended only within 30 feet of the developed shoreline and no less than 100 feet from the islands.

Pea gravel and sand blankets are not allowed.

Aquatic plant screens are not allowed.

Dredging is not allowed.

Filling is not allowed.

The following **riparian activities** will be restricted as follows:

Boardwalks are not allowed.

Wetland alterations are not allowed. Wetlands are protected under shoreline wetland ordinances.

The protection of Whitewater Lake will require cooperation and understanding by everyone that uses the lake. Positive actions today will help protect the lake for future generations. If you have any questions regarding the identification of Whitewater Lake as a sensitive area or the management implications, please feel free to contact any of the identification team members listed on the other side.

Identification Team
Mark Anderson, Wildlife Manager - (414)594-2135
Doug Welch, Fish Manager - (414)878-5229
Liesa Nesta, Water Regulation and Zoning - (414)263-8678
Dan Helsel, Water Resources Manager - (414)263-8714

Table 1. Aquatic Plants Found in Sensitive Area 2.

Submergent Plants	
Eurasian Water Milfoil *Myriophyllum spicatum*	Exotic species, supports insects eaten by fish, provides some cover for bluegills, waterfowl occasionally eat its seeds, stabilizes bottom sediments
Curly-Leaf Pondweed *Potamogeton crispus*	Exotic species, supports insects eaten by fish provides some cover for bluegills, largemouth bass, and northern pike
Coontail *Ceratophyllum demersum*	Native species, supports insects eaten by fish, provides cover for young bluegills, largemouth bass, and northern pike
Sago Pondweed *Potamogeton pectinatus*	Native species, supports insects eaten by fish, provides some cover for bluegill, northern pike, and walleye, excellent food source for waterfowl
Emergent/Wetland Plants	
Cattails *Typha*	Provide cover for fish and spawning areas for northern pike, good cover for waterfowl and marsh birds, stabilizes shoreline and protects against erosion
Tamarack *Larix laricina*	Provide cover, protection, feeding, roosting, and nesting habitat for a variety of aquatic and terrestrial wildlife species, overhanging vegetation provides protection and cover for fish
Sumac *Rhus*	
Dogwood *Cornus*	
Willow *Salix*	

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AQUATIC PLANT MANAGEMENT
SENSITIVE AREA DESIGNATION FOR **AREA 3**
WHITEWATER LAKE, WALWORTH COUNTY, WISCONSIN

Date of Designation: July 7, 1992

Sensitive Area Site Description

Sensitive area 3 is located within the northeastern lobe of Whitewater Lake. It encompasses one floating island approximately 20 by 40 feet in length. The area does not include the mainland (see map). Substrate in sensitive area 3 is 100 percent muck. This area contains approximately 120 feet of island shoreline.

Three plant species were identified within this sensitive area. This site currently supports Eurasian Water Milfoil (Myriophyllum spicatum), Floating-Leafed Pondweed (Potamogeton natans), and Spiked Rush (Eleocharis).

Table 1 lists the aquatic plants found in sensitive area 3 and identifies the benefits each provides.

Why is this area a sensitive area?

Following an inspection of Whitewater Lake, Department of Natural Resources personnel concluded this area was particularly valuable to the physical and biological integrity of the lake. Each biologist considered the qualities of this area unique and valuable for the following reasons:

Water Resource Manager Dan Helsel noted the aquatic vegetation may benefit Whitewater Lake's water quality. He also stated the species richness and diversity of the area was relatively high compared to the other areas inspected during the investigation.

Department Fishery Biologist Doug Welch notes the island provides important fish habitat. This site is extensively used by a variety of gamefish throughout their life cycle. Loss of this habitat could result in a negative impact upon the sport fishery.

The island and aquatic vegetation in this sensitive area supplies valuable wildlife habitat for waterfowl, reptiles, and furbearers. Wildlife Biologist Mark Anderson states the area

offers a variety of habitat that needs to be protected due to its wildlife value.

The important role of the aquatic plants and value of the island warrants protection of this area. Whitewater Lake will benefit as a result of this sensitive area designation and subsequent aquatic plant protection.

How will the lake benefit from this area?

The undeveloped shoreline supplied by the island in sensitive area 3 is relatively unique to Whitewater Lake and Southeastern Wisconsin. This sensitive area also includes valuable aquatic plants. Water Resources Manager Dan Helsel observed what he noted was among the best aquatic plant species diversity in the lake. He believes this plant reservoir has the potential to reestablish native aquatic plant species in other parts of Whitewater Lake. Protection of this area will help preserve the natural integrity of the island. Protection of the native plant species will help preserve and enhance the biological integrity and diversity of Whitewater Lake.

Water quality of Whitewater Lake may also benefit as a result of aquatic plant protection in this area. Water Resources Manager Dan Helsel noted the vegetation may assist with internal sediment and nutrient retention. Aquatic plants trap suspended soil particles, stabilize bottom sediment, and prevent resuspension from waves caused by wind and boating activities. Furthermore, the aquatic plants compete for the nutrients, space, and sunlight that could otherwise support nuisance algae.

The plants' resource value for gamefish and panfish populations in Whitewater Lake has been highly rated. Department of Natural Resource's Fish Manager Doug Welch identified 100 percent of the vegetation present necessary for the feeding habits of bluegill, largemouth bass, northern pike, and walleye. The habitat supplied by the vegetation and substrate is also very valuable for fish spawning and as a nursery. The plants provide protection for young fish and support insect populations, which in turn are eaten by the young fish.

Department of Natural Resources Biologist Mark Anderson rated the wildlife habitat in this area as essential for a variety of reptiles, furbearers, and birds. This site provides habitat for frogs, turtles, and muskrats. Mark also identified seasonal habitat valuable for ducks, geese, egrets, great blue herons, and sandpipers. Many of the aquatic plants and insects associated with the plants provide a valuable food source for these animals. This sensitive area provides habitat necessary for feeding, roosting, nesting, raising broods, and resting during migration. Protection of the islands and aquatic vegetation in this sensitive area will continue to benefit and attract wildlife.

Certain lake management activities are restricted based upon the Department's inspection, evaluation, and classification of this sensitive area. These restrictions are intended to protect the area's aforementioned aquatic vegetation, water quality, fish, and wildlife.

Management Restrictions

The following **in-lake activities** will be restricted as follows:

Piers and boardwalks are not allowed.

Mechanical plant harvesting is not recommended within 100 feet of the floating island.

Pea gravel and sand blankets are not allowed.

Chemical control is not allowed.

Aquatic plant screens are not allowed.

Dredging is not allowed.

Filling is not allowed.

The following **riparian activities** will be restricted as follows:

Boardwalks are not allowed.

Wetland alterations are not allowed. Wetlands are protected under shoreline wetland ordinances.

The protection of Whitewater Lake will require cooperation and understanding by everyone that uses the lake. Positive actions today will help protect the lake for future generations. If you have any questions regarding the identification of Whitewater Lake as a sensitive area or the management implications, please feel free to contact any o of the identification team members listed below:

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Doug Welch, Fish Manager - (414)878-5229
Liesa Nesta, Water Regulation and Zoning - (414)263-8678
Dan Helsel, Water Resources Manager - (414)263-8714

Table 1. Aquatic Plants Found in Sensitive Area 3.

Submergent Plants	
Eurasian Water Milfoil *Myriophyllum spicatum*	Exotic species, supports insects eaten by fish, provides some cover for bluegills, waterfowl occasionally eat its seeds, stabilizes bottom sediments
Floating-Leaf Pondweed *Potamogeton natans*	Native species, supports insects eaten by fish, provides cover for bluegill, largemouth bass, and northern pike, stabilizes bottom sediments
Emergent/Wetland Plants	
Spiked Rush *Eleocharis*	Provides cover, protection, and roosting habitat for a variety of aquatic and terrestrial wildlife species, overhanging vegetation provides protection and cover for fish

WISCONSIN
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Carroll D. Besadny
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Southeast District
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AQUATIC PLANT MANAGEMENT
SENSITIVE AREA DESIGNATION FOR **AREA 4**
WHITEWATER LAKE, WALWORTH COUNTY, WISCONSIN

Date of Designation: July 7, 1992

Sensitive Area Site Description

Sensitive area 4 is located within the northwestern lobe of Whitewater Lake. It encircles the island immediately northwest of the narrows (see map). Substrate in sensitive area 4 is 60 percent gravel, 20 percent sand, and 20 percent muck. This area contains approximately 500 feet of shoreline.

The aquatic plant Eurasian Water Milfoil (Myriophyllum spicatum) was the predominant species identified in this area. No other species were observed.

Why is this area a sensitive area?

Following an inspection of Whitewater Lake, Department of Natural Resources personnel concluded this area was particularly valuable to the biological integrity of the lake. Each biologist considered the qualities of this area unique and valuable for the following reasons:

The aquatic plants in this sensitive area supply valuable wildlife habitat for waterfowl, songbirds, and furbearers. Wildlife Biologist Mark Anderson states the area offers a variety of habitat that needs to be protected due to its wildlife value.

Department Fishery Biologist Doug Welch notes this area offers important fish habitat. This site is extensively used by a variety of gamefish throughout their life cycle. Loss of this habitat could result in a negative impact upon the sport fishery.

Water Resource Manager Dan Helsel noted the aquatic vegetation benefits the water quality and clarity of Whitewater Lake. He also recognized the undeveloped island shoreline as relatively unique to the lake as well as other lakes in southeastern Wisconsin.

The extent of undeveloped shoreline and subsequent benefits to wildlife warrants protection of this area. Whitewater Lake will benefit as a result of this sensitive area designation.

How will the lake benefit from this area?

Department of Natural Resources Biologist Mark Anderson rated the wildlife habitat in this area as essential for a variety of reptiles, furbearers, and birds. This site provides habitat for frogs, turtles, muskrats, raccoons, and opossum. Mark also identified seasonal habitat valuable for ducks, geese, great blue herons, egrets, sandpipers, and songbirds. This sensitive area provides habitat necessary for feeding, roosting, nesting, raising broods, and resting during migration. Protection of the aquatic vegetation will continue to benefit and attract wildlife.

Eurasian Water Milfoil is the predominant aquatic species of Whitewater Lake. It is an exotic plant native to Europe, Asia, and North Africa. Because Eurasian Water Milfoil is so prevalent, fish must utilize it to survive. It's resource value for gamefish and panfish populations in Whitewater Lake has therefore been highly rated. Department of Natural Resource's Fish Manager Doug Welch identified 100 percent of the vegetation present necessary for the feeding habits of bluegill, largemouth bass and northern pike. The habitat supplied by the vegetation and substrate is also valuable for fish spawning and as a nursery. The plants provide protection for young fish and support insect populations, which in turn are eaten by the young fish.

Water Resources Manager Dan Helsel noted the vegetation helps control erosion and stabilize bottom sediments. The Eurasian Water Milfoil acts a buffer against waves to protect the island from erosion. Milfoil's roots also anchor bottom sediment. This helps prevent resuspension from waves caused by wind and boating activities.

Certain lake management activities are restricted based upon the Department's inspection, evaluation, and classification of this sensitive area. These restrictions are intended to protect the area's aforementioned water quality, fish, and wildlife.

<u>Management Restrictions</u>

The following **in-lake activities** will be restricted as follows:

Piers are allowed on the island within WDNR guidelines.

Mechanical plant harvesting is not recommended within 100 feet of the sensitive area except to open access lanes.

Hand harvesting is not recommended.

Piers are not allowed from the mainland to the island as they would create an obstruction to navigation.

Boardwalks are not allowed.

Pea gravel and sand blankets are not allowed,

Chemical control is not allowed.

Aquatic plant screens are not allowed.

Dredging is not allowed.

Filling is not allowed.

The following **riparian activities** will be restricted as follows:

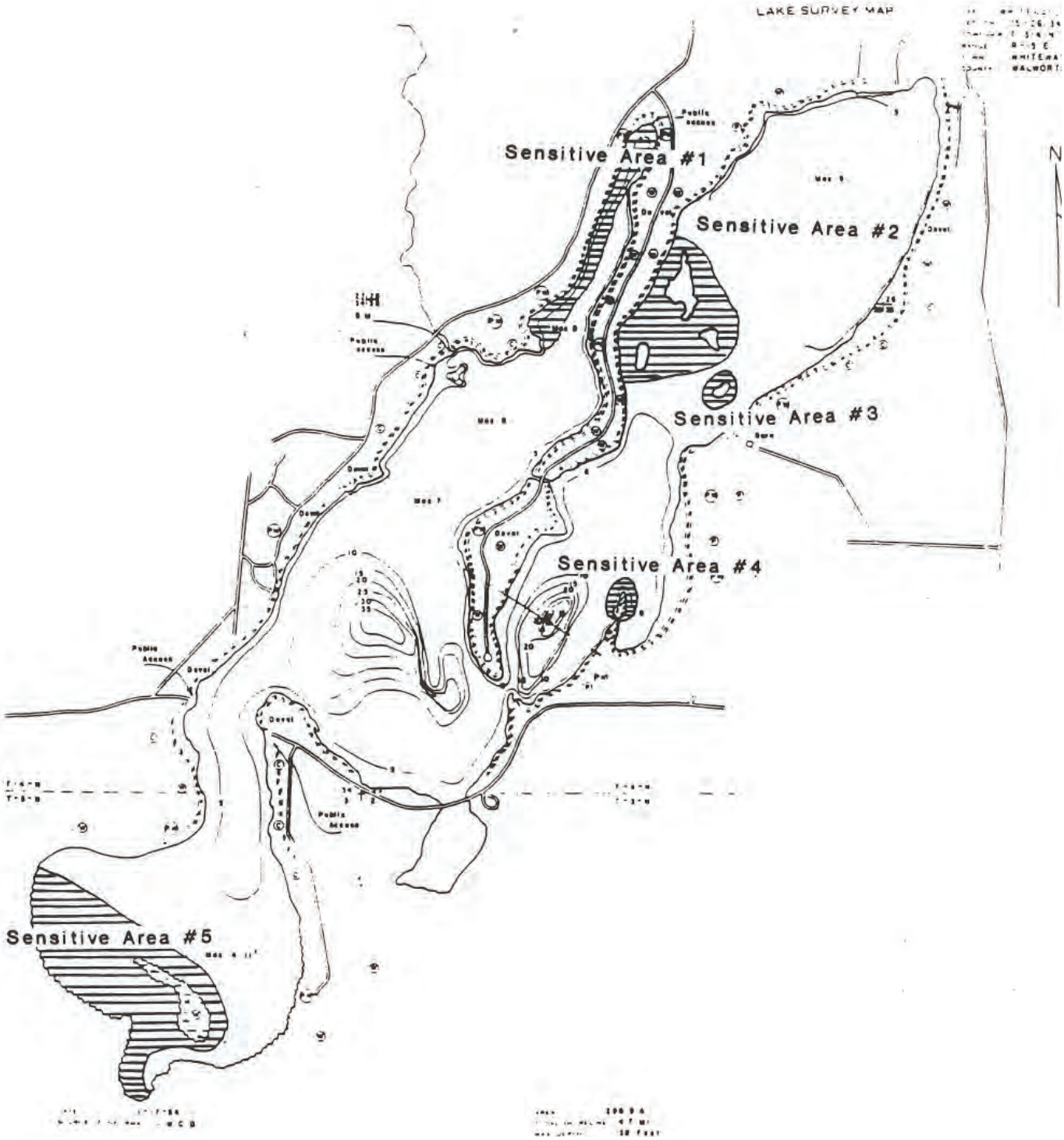
Boardwalks are not allowed.

Wetland alterations are not allowed. Wetlands are protected under shoreline wetland ordinances.

The protection of Whitewater Lake will require cooperation and understanding by everyone that uses the lake. Positive actions today will help protect the lake for future generations. If you have any questions regarding the identification of Whitewater Lake as a sensitive area or the management implications, please feel free to contact any o of the identification team members listed below:

<u>Identification Team</u>
Mark Anderson, Wildlife Manager - (414)594-2135
Doug Welch, Fish Manager - (414)878-5229
Liesa Nesta, Water Regulation and Zoning - (414)263-8678
Dan Helsel, Water Resources Manager - (414)263-8714

Whitewater Lake
Sensitive Areas



WISCONSIN
DEPT. OF NATURAL RESOURCES

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AQUATIC PLANT MANAGEMENT
SENSITIVE AREA DESIGNATION FOR **AREA 5**
WHITEWATER LAKE, WALWORTH COUNTY, WISCONSIN

Date of Designation: July 7, 1992

Sensitive Area Site Description

Sensitive area 5 is located in the southern part of Whitewater Lake. It begins on the western shore at N7180 Brown Road, extends around and includes the island, and ends past the southern tip of the lake (see map). Substrate in sensitive area 5 is 100 percent muck. The maximum depth in the area is six feet, average depth is three feet. This area contains approximately 3300 feet of mainland shoreline, and 2800 feet of island shoreline.

Seven aquatic and wetland plant species were identified within this sensitive area. The area currently supports Coontail (Ceratophyllum demersum), Eurasian Water Milfoil (Myriophyllum spicatum), Curly-Leaf Pondweed (Potamogeton crispus), Duckweed (Lemna), and Filamentous Algae (Cladophora, Spirogyra), Cattail (Typha), and Bulrush (Scirpus americanus), .

A portion of the shoreline adjacent to the sensitive area has been mapped and classified as an E2/4H wetland. This type of wetland is Emergent/wet meadow, Narrow-leaved persistent, Nonpersistent, Standing water, Palustrine. This wetland is regulated by the U.S. Army Corps of Engineers, Walworth County, and the Wisconsin Department of Natural Resources.

Table 1 lists the aquatic plants found in sensitive area 5 and identifies the benefits each provides.

Why is this area a sensitive area?

Following an inspection of Whitewater Lake, Department of Natural Resources personnel concluded this area was particularly valuable to the water quality and biological integrity of the lake. Each biologist considered the qualities of this area unique and valuable for the following reasons:

Water Resource Manager Dan Helsel noted the aquatic vegetation benefits the water quality and clarity of Whitewater Lake. He also recognized the undeveloped shoreline as relatively unique to the lake as well as other lakes in southeastern Wisconsin.

Department Fishery Biologist Doug Welch notes this area offers important fish habitat. This site is extensively used by a variety of gamefish throughout their life cycle. Loss of this habitat could result in a negative impact upon the sport fishery.

The aquatic plants in this sensitive area supply valuable wildlife habitat for waterfowl, songbirds, and furbearers. Wildlife Biologist Mark Anderson states the area offers a variety of habitat that needs to be protected due to its wildlife value.

The important role of the aquatic plants, proximity of the adjacent wetland, and extent of undeveloped shoreline warrants protection of this area. Whitewater Lake will benefit as a result of this sensitive area designation and subsequent aquatic plant protection.

How will the lake benefit from this area?

Water quality of Whitewater Lake will benefit as a result of protection of the aquatic plant community in this area. Water Resources Manager Dan Helsel noted the vegetation is valuable for erosion control as well as sediment and nutrient retention. The vegetation helps trap sediment and nutrients that are delivered from the surrounding hillsides. The aquatic plants and wetland also act as a buffer against waves to protect the shoreline from erosion. Furthermore, rooted aquatic plants trap suspended soil particles, stabilize bottom sediment, and prevent resuspension from waves caused by wind and boating activities.

The plants' resource value for gamefish and panfish populations in Whitewater Lake has been highly rated. Department of Natural Resource's Fish Manager Doug Welch identified 100 percent of the vegetation present necessary for the feeding habits of bluegill, largemouth bass and northern pike. The habitat supplied by the vegetation and substrate is also very valuable for fish spawning and as a nursery. The plants provide protection for young fish and support insect populations, which in turn are eaten by the young fish.

Department of Natural Resources Biologist Mark Anderson rated the wildlife habitat in this area as essential for a variety of reptiles, furbearers, and birds. This site provides habitat for frogs, turtles, muskrats, raccoons, opossum, and deer. Mark also identified seasonal habitat valuable for ducks, geese, great blue herons, kingfishers, sandpipers, and songbirds. Many of the aquatic plants and insects associated with the plants provide a valuable food source for these animals. This sensitive area provides habitat necessary for feeding, roosting, nesting, raising broods, and resting during migration. Protection of the aquatic vegetation will continue to benefit and attract wildlife.

Certain lake management activities are restricted based upon the Department's inspection, evaluation, and classification of this sensitive area. These restrictions are intended to protect the

area's aforementioned aquatic vegetation, water quality, fish, and wildlife.

Management Restrictions

The following **in-lake activities** will be restricted as follows:

Piers allowed within WDNR guidelines.

Boardwalks allowed for public interest/educational purposes.

Mechanical plant harvesting is not recommended except to open access and fishing lanes.

Chemical control restricted to exotic plant species. Chemical control will not be permitted if the potential of damage to native species exists.

Aquatic plant screens are not allowed.

Pea gravel and sand blankets are not allowed.

Dredging is not allowed.

Filling is not allowed.

The following **riparian activities** will be restricted as follows:

Boardwalks are allowed for public benefit only.

Wetland alterations are not allowed. Wetlands are protected under shoreline wetland ordinances.

The protection of Whitewater Lake will require cooperation and understanding by everyone that uses the lake. Positive actions today will help protect the lake for future generations. If you have any questions regarding the identification of Whitewater Lake as a sensitive area or the management implications, please feel free to contact any o of the identification team members listed below:

Identification Team
Mark Anderson, Wildlife Manager - (414)594-2135
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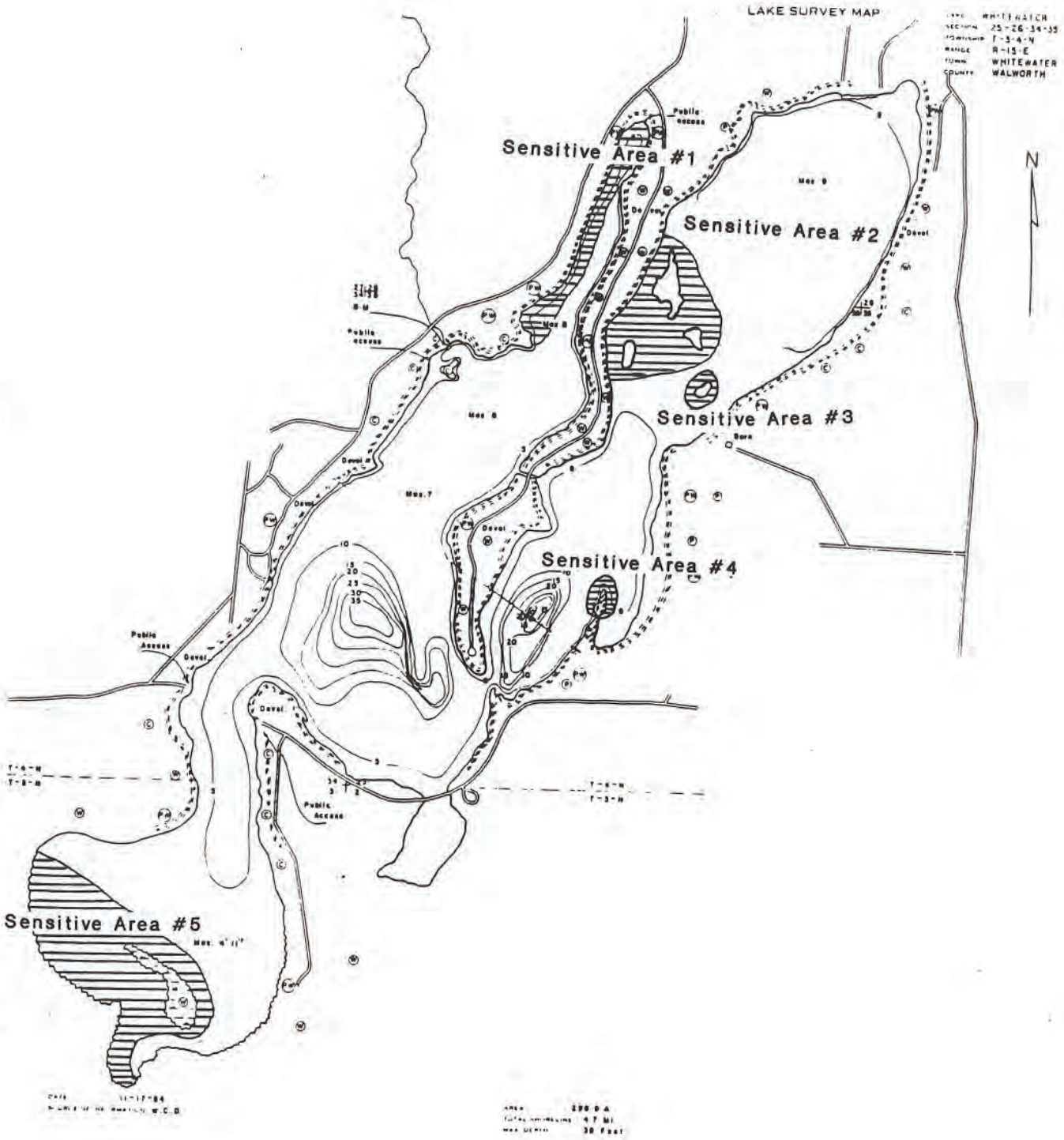
Liesa Nesta, Water Regulation and Zoning - (414)263-8678
Dan Helsel, Water Resources Manager - (414)263-8714

Table 1. Aquatic Plants Found in Sensitive Area 5.

Submergent Plants	
Eurasian Water Milfoil *Myriophyllum spicatum*	Exotic species, supports insects eaten by fish, provides some cover for bluegills, waterfowl occasionally eat its seeds, stabilizes bottom sediments
Curly-Leaf Pondweed *Potamogeton crispus*	Exotic species, supports insects eaten by fish provides some cover for bluegills, largemouth bass, and northern pike
Coontail *Ceratophyllum demersum*	Native species, supports insects eaten by fish provides cover for young bluegills, largemouth bass, and northern pike
Floating Vegetation	
Duckweed *Lemna*	Provides cover for largemouth bass and northern pike, provides food for waterfowl and marsh birds, supports insects valuable as food for fish
Filamentous Algae *Cladophora* *Spirogyra*	Provides cover for insects valuable as fish food
Emergent/Wetland Plants	
Cattails *Typha*	Provide cover for fish and spawning areas for northern pike, good food source for waterfowl and stabilizes shoreline and protects against erosion
Bulrush *Scirpus americanus*	

Whitewater Lake
Sensitive Areas



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Appendix C

2,4-D CHEMICAL FACT SHEET

2,4-D Chemical Fact Sheet

Formulations

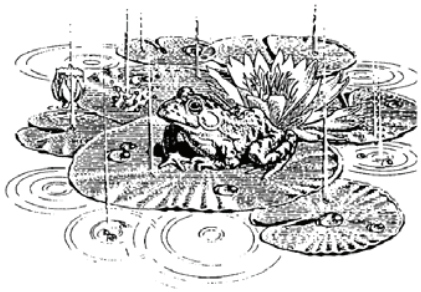
2,4-D is an herbicide that is widely used as a household weed-killer, agricultural herbicide, and aquatic herbicide. It has been in use since 1946, and was registered with the EPA in 1986 and re-reviewed in 2005. The active ingredient is 2,4-dichloro-phenoxyacetic acid. There are two types of 2,4-D used as aquatic herbicides: dimethyl amine salt and butoxyethyl ester. Both liquid and slow-release granular formulations are available. 2,4-D is sold under the trade names Aqua-Kleen, Weedar 64 and Navigate (product names are provided solely for your reference and should not be considered endorsements nor exhaustive).

Aquatic Use and Considerations

2,4-D is a widely-used herbicide that affects plant cell growth and division. It affects primarily broad-leaf plants. When the treatment occurs, the 2,4-D is absorbed into the plant and moved to the roots, stems, and leaves. Plants begin to die in a few days to a week following treatment, but can take several weeks to decompose. Treatments should be made when plants are growing.

For many years, 2,4-D has been used primarily in small-scale spot treatments. Recently, some studies have found that 2,4-D moves quickly through the water and mixes throughout the waterbody, regardless of where it is applied. Accordingly, 2,4-D has been used in Wisconsin experimentally for whole-lake treatments.

2,4-D is effective at treating the invasive Eurasian watermilfoil (*Myriophyllum spicatum*). Desirable native species that may be affected include native milfoils, coontail (*Ceratophyllum demersum*), naiads (*Najas* spp.), elodea (*Elodea canadensis*) and duckweeds (*Lemna* spp.). Lilies (*Nymphaea* spp. and *Nuphar* spp.) and bladderworts (Utricularia spp.) also can be affected.



Post-Treatment Water Use Restrictions

There are no restrictions on eating fish from treated water bodies, human drinking water or pet/livestock drinking water. Following the last registration review in 2005, the ester products require a 24-hour waiting period for swimming. Depending on the type of waterbody treated and the type of plant being watered, irrigation restrictions may apply for up to 30 days. Certain plants, such as tomatoes and peppers and newly seeded lawn, should not be watered with treated water until the concentration is less than 5 parts per billion (ppb).

Herbicide Degradation, Persistence and Trace Contaminants

The half-life of 2,4-D (the time it takes for half of the active ingredient to degrade) ranges from 12.9 to 40 days depending on water conditions. In anaerobic lab conditions, the half-life has been measured up to 333 days. After treatment, the 2,4-D concentration in the water is reduced primarily through microbial activity, off-site movement by water, or adsorption to small particles in silty water. It is slower to degrade in cold or acidic water, and appears to be slower to degrade in lakes that have not been treated with 2,4-D previously.

There are several degradation products from 2,4-D: 1,2,4-benzenetriol, 2,4-dichlorophenol, 2,4-dichloroanisole, chlorohydroquinone (CHQ), 4-chlorophenol and volatile organics.

Impacts on Fish and Other Aquatic Organisms

Toxicity of aquatic 2,4-D products vary depending on whether the formulation is an amine or an ester 2,4-D. The ester formulations are toxic to fish and some important invertebrates such as water fleas (*Daphnia*) and midges at application rates; the amine formulations are not toxic to fish or invertebrates at application rates. Loss of habitat following treatment may cause reductions in populations of invertebrates with either formulation, as with any herbicide treatment. These organisms only recolonize the treated areas as vegetation becomes re-established.

Available data indicate 2,4-D does not accumulate at significant levels in the bodies of fish that have been tested. Although fish that are exposed to 2,4-D will take up some of the chemical, the small amounts that accumulate are eliminated after exposure to 2,4-D ceases.

On an acute basis, 2,4-D is considered moderately to practically nontoxic to birds. 2,4-D is not toxic to amphibians at application rates; effects on reptiles are unknown. Studies have shown some endocrine disruption in amphibians at rates used in lake applications, and DNR is currently funding a study to investigate endocrine disruption in fish at application rates.

As with all chemical herbicide applications it is very important to read and follow all label instructions to prevent adverse environmental impacts.

Human Health

Adverse health effects can be produced by acute and chronic exposure to 2,4-D. Those who mix or apply 2,4-D need to protect their skin and eyes from contact with 2,4-D products to minimize irritation, and avoid inhaling the spray. In its consideration of exposure risks, the EPA believes no significant risks will occur to recreational users of water treated with 2,4-D.

Concerns have been raised about exposure to 2,4-D and elevated cancer risk. Some (but not all) epidemiological studies have found 2,4-D associated with a slight increase in risk of non-Hodgkin's lymphoma in high exposure populations (farmers and herbicide applicators). The studies show only a possible association that may be caused by other factors, and do not show that 2,4-D causes cancer. The EPA determined in 2005 that there is not sufficient evidence to classify 2,4-D as a human carcinogen.

The other chronic health concern with 2,4-D is the potential for endocrine disruption. There is some evidence that 2,4-D may have estrogenic activities, and that two of the break-down products of 2,4-D (4-chlorophenol and 2,4-dichloroanisole) may affect male reproductive development. The extent and implications of this are not clear and it is an area of ongoing research.

For Additional Information

Environmental Protection Agency
Office of Pesticide Programs
www.epa.gov/pesticides

Wisconsin Department of Agriculture, Trade, and Consumer Protection
http://datcp.wi.gov/Plants/Pesticides/

Wisconsin Department of Natural Resources
608-266-2621
http://dnr.wi.gov/lakes/plants/

Wisconsin Department of Health Services
http://www.dhs.wisconsin.gov/

National Pesticide Information Center
1-800-858-7378
http://npic.orst.edu/

Wisconsin Department of Natural Resources
Box 7921
Madison, WI 53707-7921

DNR PUB-WT-964 2012

Appendix D

SEWRPC RIPARIAN BUFFER GUIDE NO. 1
"MANAGING THE WATER'S EDGE"

Managing the Water's Edge

Making Natural Connections

Problem Statement:

Despite significant research related to buffers, there remains no consensus as to what constitutes optimal riparian buffer design or proper buffer width for effective pollutant removal, water quality protection, prevention of channel erosion, provision of fish and wildlife habitat, enhancement of environmental corridors, augmentation of stream baseflow, and water temperature moderation.

Southeastern Wisconsin Regional Planning Commission

Our purpose in this document is to help protect and restore water quality, wildlife, recreational opportunities, and scenic beauty.

This material was prepared in part with funding from the U.S. Environmental Protection Agency Great Lakes National Program Office provided through CMAP, the Chicago Metropolitan Agency for Planning.

Introduction

Perhaps no part of the landscape offers more variety and valuable functions than the natural areas bordering our streams and other waters.

These unique "riparian corridor" lands help filter pollutants from runoff, lessen downstream flooding, and maintain stream baseflows, among other benefits. Their rich ecological diversity also provides a variety of recreational opportunities and habitat for fish and wildlife. Regardless of how small a stream, lake, or wetland may be, adjacent corridor lands are important to those water features and to the environment.

Along many of our waters, the riparian corridors no longer fulfill their potential due to the encroachment of agriculture and urban development. This publication describes common problems encountered along streamside and other riparian corridors, and the many benefits realized when these areas are protected or improved. It also explains what landowners, local governments, and other decision-makers can do to capitalize on waterfront opportunities, and identifies some of the resources available for further information. While much of the research examined here focuses on stream corridors, the ideas presented also apply to areas bordering lakes, ponds, and wetlands throughout the southern Lake Michigan area and beyond. This document was developed as a means to facilitate and communicate important and up-to-date general concepts related to riparian buffer technologies.

Riparian corridors are unique ecosystems that are exceptionally rich in biodiversity

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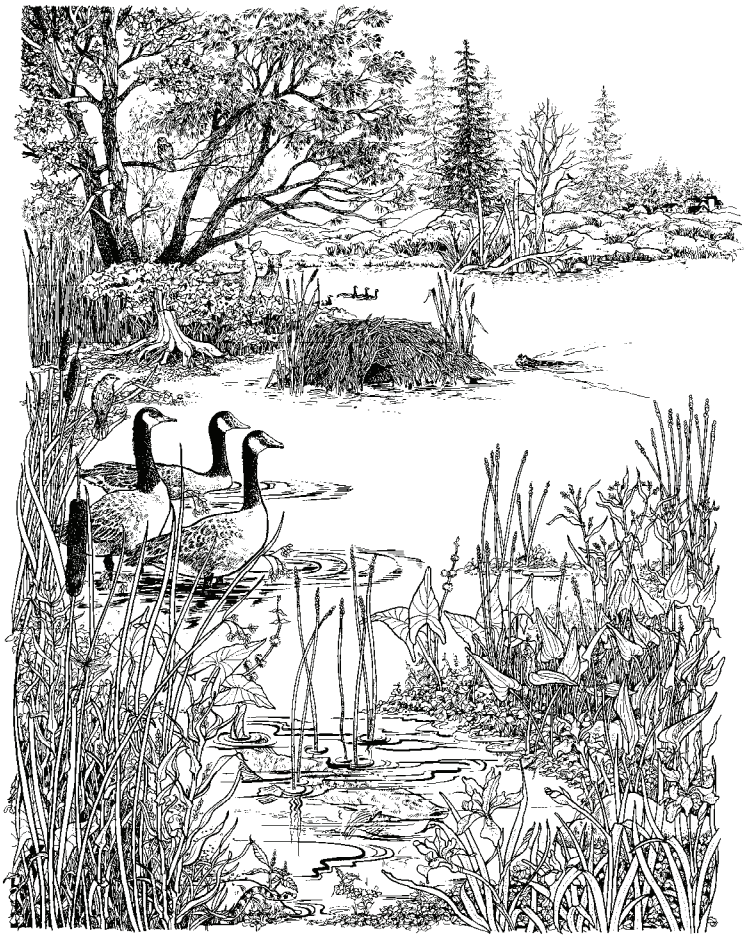
What Are Riparian Corridors? Riparian Buffer Zones?

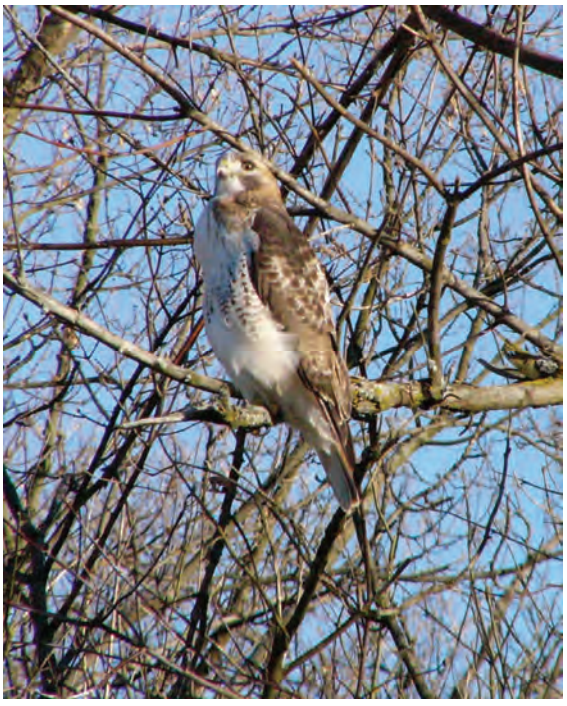
The word riparian comes from the Latin word *ripa*, which means bank. However, in this document we use riparian in a much broader sense and refer to land adjoining any water body including ponds, lakes, streams, and wetlands. This term has two additional distinct meanings that refer to 1) the "natural or relatively undisturbed" corridor lands adjacent to a water body inclusive of both wetland and upland flora and fauna and 2) a buffer zone or corridor lands in need of protection to "buffer" the effects of human impacts such as agriculture and residential development.



University of Wisconsin—Extension

The word buffer literally means something that cushions against the shock of something else (noun), or to lessen or cushion that shock (verb). Other useful definitions reveal that a buffer can be something that serves to separate features, or that is capable of neutralizing something, like filtering pollutants from stormwater runoff. Essentially, buffers and buffering help protect against adverse effects.

Riparian buffer zones function as core habitat as well as travel corridors for many wildlife species.



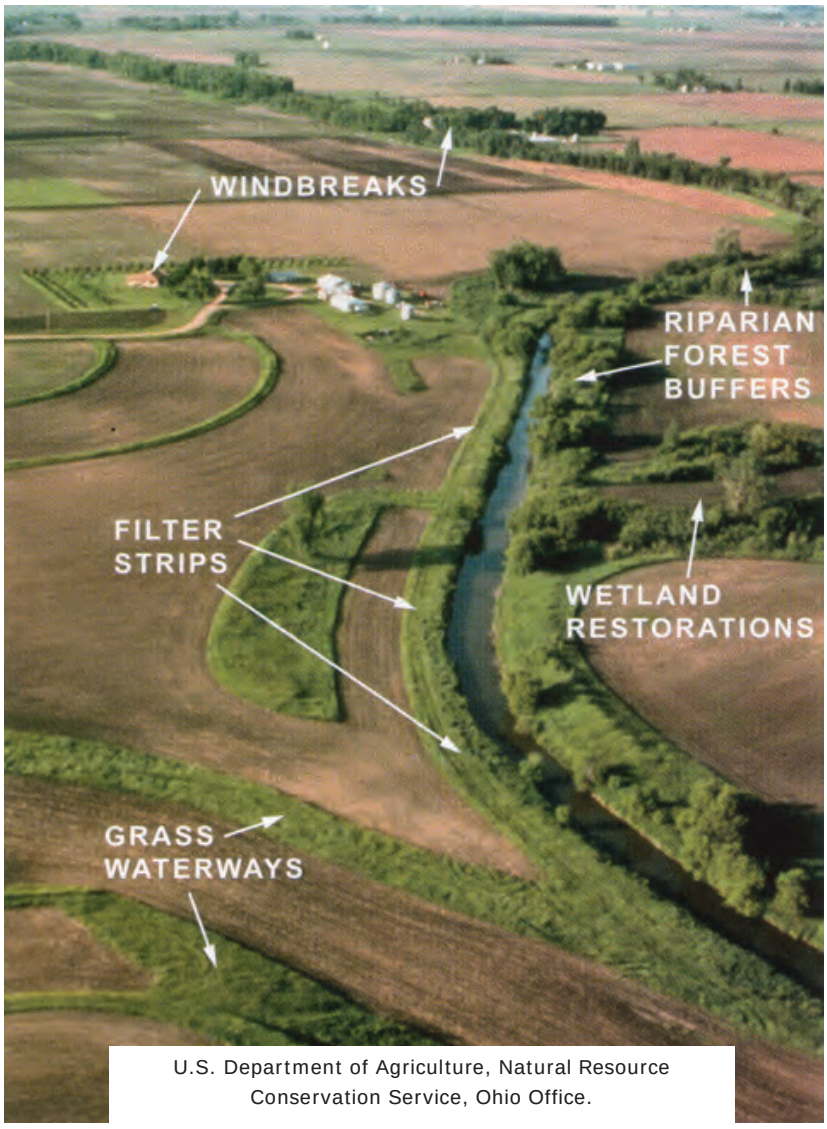
Riparian buffers are zones adjacent to waterbodies such as lakes, rivers, and wetlands that simultaneously protect water quality and wildlife, including both aquatic and terrestrial habitat. These zones minimize the impacts of human activities on the landscape and contribute to recreation, aesthetics, and quality of life. **This document summarizes how to maximize both water quality protection and conservation of aquatic and terrestrial wildlife populations using buffers.**

What Are Riparian Corridors? Riparian Buffer Zones?

Buffers **can** include a range of complex vegetation structure, soils, food sources, cover, and water features that offer a variety of habitats contributing to diversity and abundance of wildlife such as mammals, frogs, amphibians, insects, and birds. Buffers can consist of a variety of canopy layers and cover types including ephemeral (temporary-wet for only part of year) wetlands/seasonal ponds/spring pools, shallow marshes, deep marshes, wetland meadows, wetland mixed forests, grasslands, shrubs, forests, and/or prairies. Riparian zones are areas of transition between aquatic and terrestrial ecosystems, and they can potentially offer numerous benefits to wildlife and people such as pollution reduction and recreation.

In the water resources literature, riparian buffers are referred to in a number of different ways. Depending on the focus and the intended function of a buffer, or a buffer-related feature, buffers may be referred to as stream corridors, critical transition zones, riparian management areas, riparian management zones, floodplains, or green infrastructure.

It is important to note that within an agricultural context, the term buffer is used more generally to describe filtering best management practices most often at the water's edge. Other practices which can be interrelated may also sometimes be called buffers. These include grassed waterways, contour buffer strips, wind breaks, field border, shelterbelts, windbreaks, living snow fence, or filter strips. These practices may or may not be adjacent to a waterway as illustrated in the photo to the right. For example, a grassed waterway is designed to filter sediment and reduce erosion and may connect to a riparian buffer. These more limited-purpose practices may link to multipurpose buffers, but by themselves, they are not adequate to provide the multiple functions of a riparian buffer as defined here.



U.S. Department of Agriculture, Natural Resource Conservation Service, Ohio Office.

Beyond the Environmental Corridor Concept

The term "environmental corridors" (also known as "green infrastructure") refers to an interconnected green space network of natural areas and features, public lands, and other open spaces that provide natural resource value. Environmental corridor planning is a process that promotes a systematic and strategic approach to land conservation and encourages land use planning and practices that are good for both nature and people. It provides a framework to guide future growth, land development, and land conservation decisions in appropriate areas to protect both community and natural resource assets.

Environmental corridors are an essential planning tool for protecting the most important remaining natural resource features in Southeastern Wisconsin and elsewhere. Since development of the environmental corridor concept, there have been significant advancements in landscape ecology that have furthered understanding of the spatial and habitat needs of multiple groups of organisms. In addition, advancements in pollutant removal practices, stormwater control, and agriculture have increased our understanding of the effectiveness and limitations of environmental corridors. In protecting water quality and providing aquatic and terrestrial habitat, there is a need to better integrate new technologies through their application within riparian buffers.

SEWRPC has embraced and applied the environmental corridor concept developed by Philip Lewis (Professor Emeritus of Landscape Architecture at the University of Wisconsin-Madison) since 1966 with the publication of its first regional land use plan. Since then, SEWRPC has refined and detailed the mapping of environmental corridors, enabling the corridors to be incorporated directly into regional, county, and community plans and to be reflected in regulatory measures. The preservation of environmental corridors remains one of the most important recommendations of the regional plan. Corridor preservation has now been embraced by numerous county and local units of government as well as by State and Federal agencies. The environmental corridor concept conceived by Lewis has become an important part of the planning and development culture in Southeastern Wisconsin.

Beyond the Environmental Corridor Concept

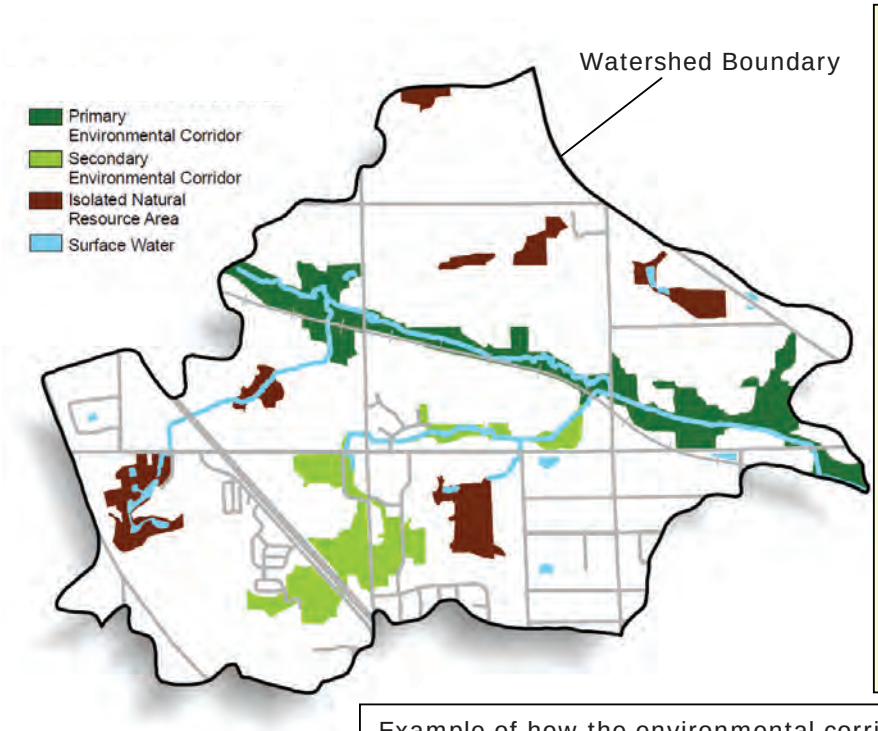
Environmental corridors are divided into the following three categories.

- **Primary environmental corridors** contain concentrations of our most significant natural resources. They are at least 400 acres in size, at least two miles long, and at least 200 feet wide.
- **Secondary environmental corridors** contain significant but smaller concentrations of natural resources. They are at least 100 acres in size and at least one mile long, unless serving to link primary corridors.
- **Isolated natural resource areas** contain significant remaining resources that are not connected to environmental corridors. They are at least five acres in size and at least 200 feet wide.

Key Features of Environmental Corridors

- Lakes, rivers, and streams
- Undeveloped shorelands and floodlands
- Wetlands
- Woodlands
- Prairie remnants
- Wildlife habitat
- Rugged terrain and steep slopes
- Unique landforms or geological formations
- Unfarmed poorly drained and organic soils
- Existing outdoor recreation sites
- Potential outdoor recreation sites
- Significant open spaces
- Historical sites and structures
- Outstanding scenic areas and vistas

Beyond the Environmental Corridor Concept

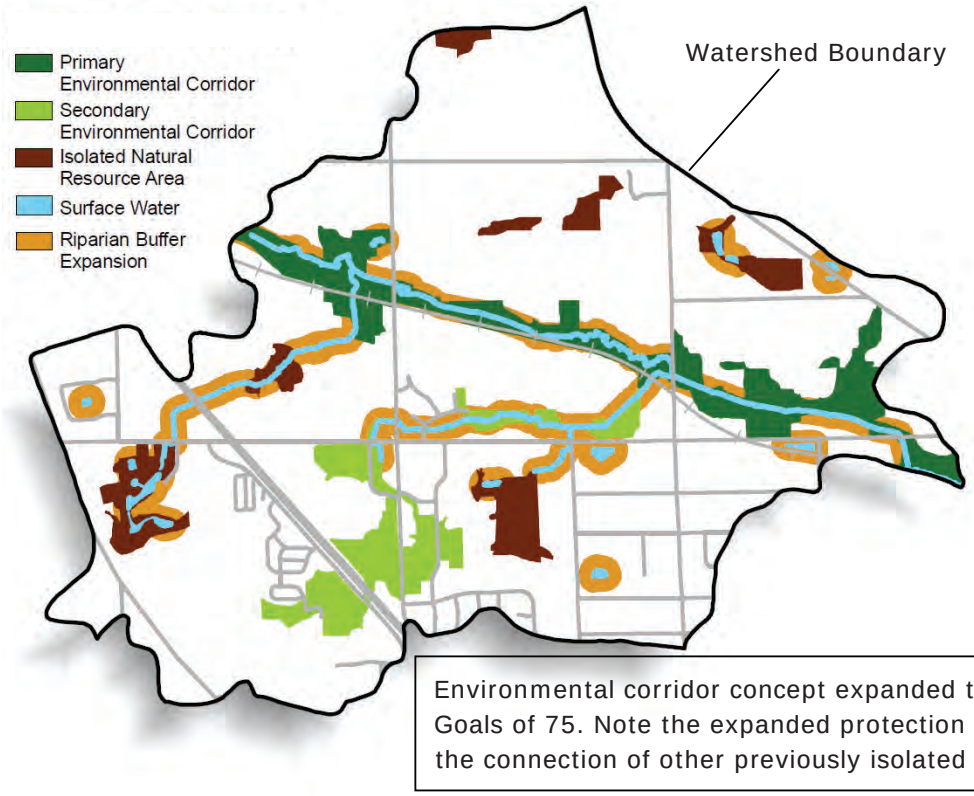


The Minimum Goals of **75** within a Watershed

75% minimum of total stream length should be naturally vegetated to protect the functional integrity of the water resources. (Environment Canada, How Much Habitat is Enough? A Framework for Guiding Habitat Rehabilitation in Great lakes Areas of Concern, Second Edition, 2004)

75 foot wide minimum riparian buffers from the top edge of each stream bank should be naturally vegetated to protect water quality and wildlife. (SEWRPC Planning Report No 50, A Regional Water Quality Management Plan for the Greater Milwaukee Watersheds, December 2007)

Example of how the environmental corridor concept is applied on the landscape. For more information see "Plan on It!" series **Environmental Corridors: Lifelines of the Natural Resource Base** at http://www.sewrpc.org/SEWRPC/LandUse/EnvironmentalCorridors.htm



Environmental corridor concept expanded to achieve the Goals of 75. Note the expanded protection in addition to the connection of other previously isolated areas.

Habitat Fragmentation—The Need for Corridors

Southeastern Wisconsin is a complex mosaic of agricultural and urban development. Agricultural lands originally dominated the landscape and remain a major land use. However, such lands continue to be converted to urban uses. Both of these dominant land uses fragment the landscape by creating islands or isolated pockets of wetland, woodland, and other natural lands available for wildlife preservation and recreation. By recognizing this fragmentation of the landscape, we can begin to mitigate these impacts.

New developments should incorporate water quality and wildlife enhancement or improvement objectives as design criteria by looking at the potential for creating linkages with adjoining lands and water features.

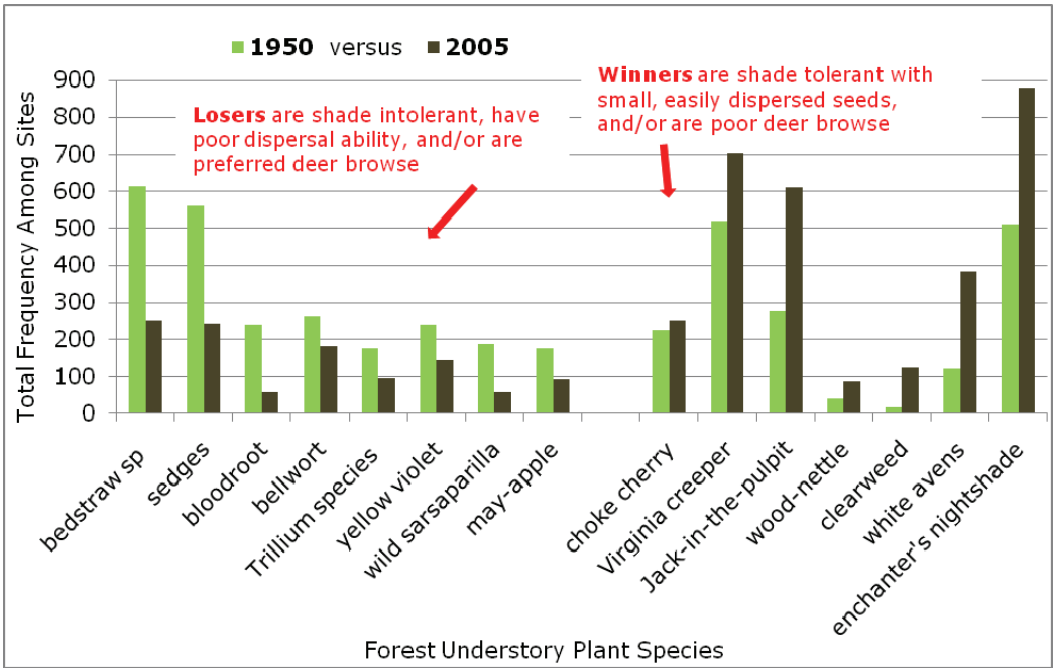
At the time of conversion of agricultural lands to urban uses, there are opportunities to re-create and expand riparian buffers and environmental corridors reconnecting uplands and waterways and restoring ecological integrity and scenic beauty locally and regionally. For example, placement of roads and other infrastructure across stream systems could be limited so as to maximize continuity of the riparian buffers. This can translate into significant cost savings in terms of reduced road maintenance, reduced salt application, and limited bridge or culvert maintenance and replacements. This simple practice not only saves the community significant amounts of money, but also improves and protects quality of life. Where necessary road crossings do occur, they can be designed to provide for safe fish and wildlife passage.

Overland travel routes for wildlife are often unavailable, discontinuous, or life endangering within the highly fragmented landscapes of Southeastern Wisconsin and elsewhere.

State Threatened Species: Blanding's turtle

Habitat Fragmentation—The Need for Corridors

Forest understory plant species abundance among stands throughout Southern Wisconsin



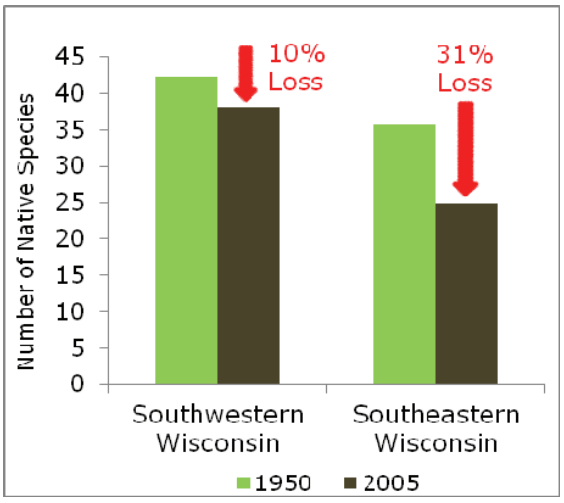
Forest fragmentation has led to significant plant species loss within Southern Wisconsin

(Adapted from David Rogers and others, 2008, Shifts in Southern Wisconsin Forest Canopy and Understory Richness, Composition, and Heterogeneity, Ecology, 89 (9): 2482-2492)

"...these results confirm the idea that large intact habitat patches and landscapes better sustain native species diversity. It also shows that people are a really important part of the system and their actions play an increasingly important role in shaping patterns of native species diversity and community composition. Put together, it is clear that one of the best and most cost effective actions we can take toward safeguarding native diversity of all types is to protect, enhance and create corridors that link patches of natural habitat."
Dr. David Rogers, Professor of Biology at the University of Wisconsin-Parkside

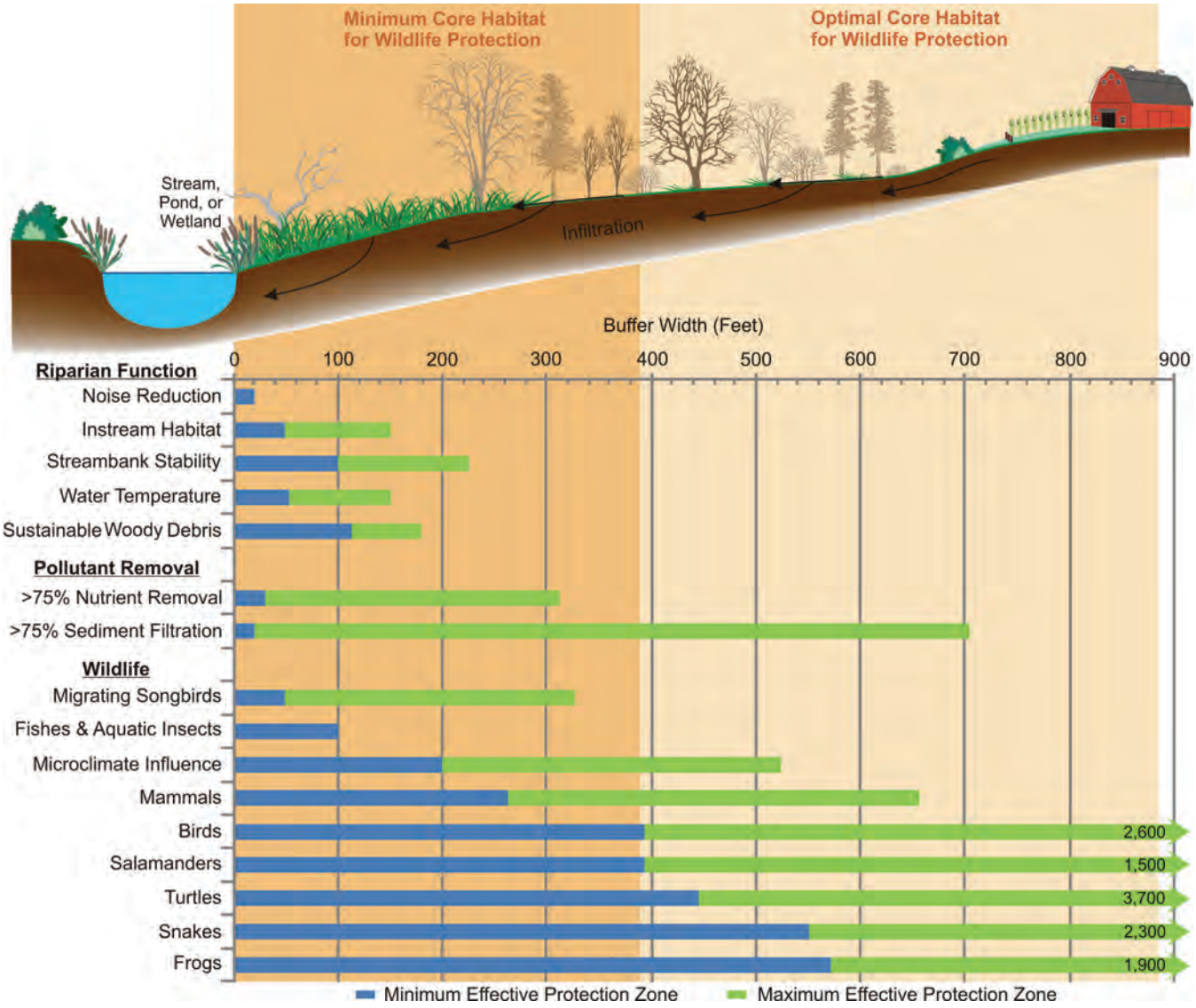
Since the 1950s, forests have increasingly become more fragmented by land development, both agricultural and urban, and associated roads and infrastructure, which have caused these forests to become isolated "islands of green" on the landscape. In particular, there has been significant loss of forest understory plant species over time (shrubs, grasses, and herbs covering the forest floor.) It is important to note that **these forests lost species diversity even when they were protected as parks or natural areas**.

One major factor responsible for this decline in forest plant diversity is that routes for native plants to re-colonize isolated forest islands are largely cut-off within fragmented landscapes. For example, the less fragmented landscapes in Southwestern Wisconsin lost fewer species than the more fragmented stands in Southeastern Wisconsin. In addition, the larger-sized forests and forests with greater connections to surrounding forest lands lost fewer species than smaller forests in fragmented landscapes.



Wider is Better for Wildlife

Why? Because buffer size is the engine that drives important natural functions like food availability and quality, access to water, habitat variety, protection from predators, reproductive or resting areas, corridors to safely move when necessary, and help in maintaining the health of species' gene pools to prevent isolation and perhaps extinction.



One riparian buffer size does not fit all conditions or needs. There are many riparian buffer functions and the ability to effectively fulfill those functions is largely dependent on width. Determining what buffer widths are needed should be based on what functions are desired as well as site conditions. For example, as shown above, water temperature protection generally does not require as wide a buffer as provision of habitat for wildlife. Based on the needs of wildlife species found in Wisconsin, the minimum core habitat buffer width is about 400 feet and the optimal width for sustaining the majority of wildlife species is about 900 feet. Hence, the value of large undisturbed parcels along waterways which are part of, and linked to, an environmental corridor system. The minimum effective buffer width distances are based on data reported in the scientific literature and the quality of available habitats within the context of those studies.

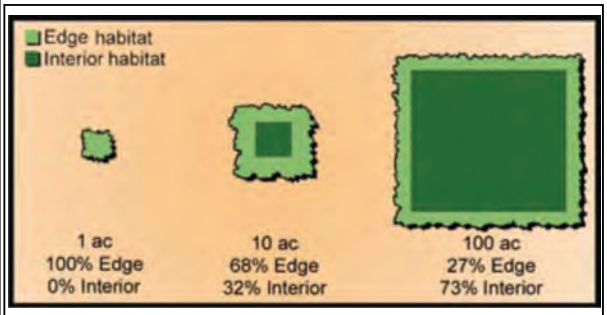
Wider is Better for Wildlife

Wildlife habitat needs change within and among species. **Minimum Core Habitat and Optimum Core Habitat distances were developed from numerous studies to help provide guidance for biologically meaningful buffers to conserve wildlife biodiversity.** These studies documented distances needed for a variety of biological (life history) needs to sustain healthy populations such as breeding, nesting, rearing young, foraging/feeding, perching (for birds), basking (for turtles), and overwintering/dormancy/hibernating. These life history needs require different types of habitat and distances from water, for example, one study found that Blanding's turtles needed approximately 60-foot-wide buffers for basking, 375 feet for overwintering, and up to 1,200 feet for nesting to bury their clutches of eggs. Some species of birds like the Blacked-capped chickadee or white breasted nuthatch only need about 50 feet of buffer, while others like the wood duck or great blue heron require 700-800 feet for nesting. Therefore, **understanding habitat needs for wildlife species is an important consideration in designing riparian buffers.**

Although *Ambystoma* salamanders require standing water for egg laying and juvenile development, most other times of the year they can be found more than 400 feet from water foraging for food.

Wisconsin Species	Mimimum Core Habitat (feet)	Optimum Core Habitat (feet)	Number of Studies
Frogs	571	1,043	9
Salamanders	394	705	14
Snakes	551	997	5
Turtles	446	889	27
Birds	394	787	45
Mammals	263	No data	11
Fishes and Aquatic Insects	100	No data	11
Mean	388	885	

This approach was adapted from *R.D. Semlitsch and J.R. Bodie, 2003, Biological Criteria for Buffer Zones around Wetlands and Riparian Habitats for Amphibian and Reptiles, Conservation Biology, 17(5):1219-1228*. These values are based upon studies examining species found in Wisconsin and represent mean linear distances extending outward from the edge of an aquatic habitat. The Minimum Core Habitat and Optimum Core Habitat reported values are based upon the mean minimum and mean maximum distances recorded, respectively. Due to a low number of studies for snake species, the recommended distances for snakes are based upon values reported by *Semlitsch and Bodie.*



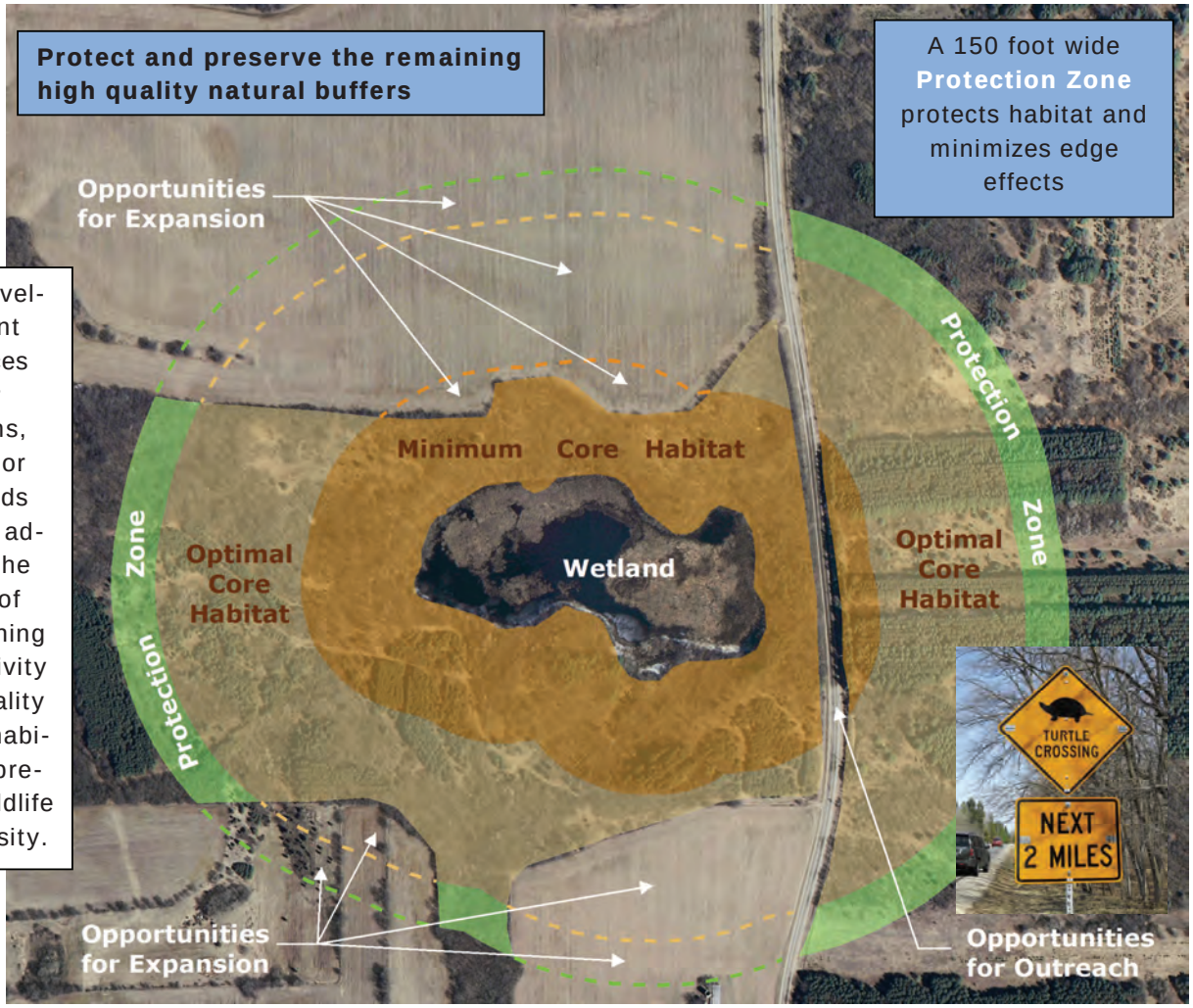
"***Large patches typically conserve a greater variety and quality of habitats, resulting in higher species diversity and abundance."*** *Larger patches contain greater amounts of interior habitat and less edge effects, which benefits interior species, by providing safety from parasitism, disease, and invasive species.*

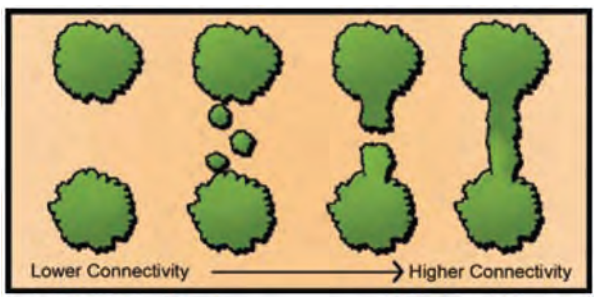
(Bentrup, G. 2008. Conservation buffers: design guidelines for buffers, corridors, and greenways. Gen. Tech. Rep. SRS-109. Asheville, NC: Department of Agriculture, Forest Service, Southern Research Station)

Maintaining Connections is Key

Like humans, all forms of wildlife require access to clean water. Emerging research has increasingly shown that, in addition to water, more and more species such as amphibians and reptiles cannot persist without landscape connectivity between quality wetland and upland habitats. Good connectivity to upland terrestrial habitats is essential for the persistence of healthy sustainable populations, because these areas provide vital feeding, overwintering, and nesting habitats found nowhere else. Therefore, both aquatic and terrestrial habitats are essential for the preservation of biodiversity and they should ideally be managed together as a unit.

Land development practices near streams, lakes, or wetlands need to address the issue of maintaining connectivity with quality upland habitats to preserve wildlife biodiversity.

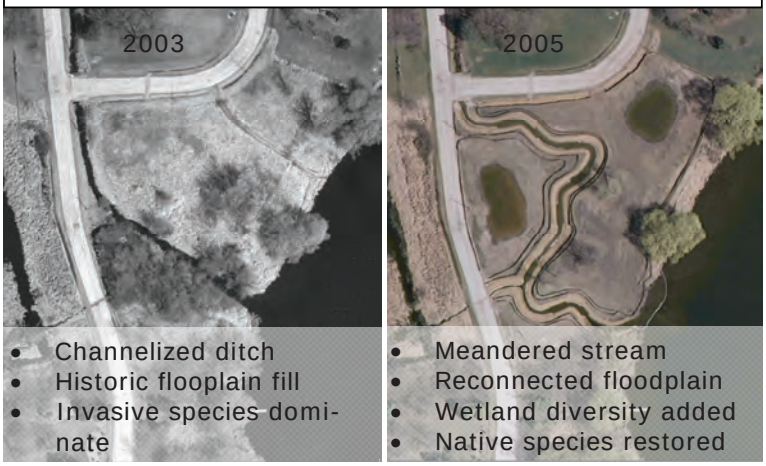




Increasing connectivity among quality natural landscapes (wetlands, woodlands, prairies) can benefit biodiversity by providing access to other areas of habitat, increasing gene flow and population viability, enabling recolonization of patches, and providing habitat (Bentrup 2008).

Basic Rules to Better Buffers

There are opportunities to improve buffer functions to improve water quality and wildlife habitat, even in urban situations



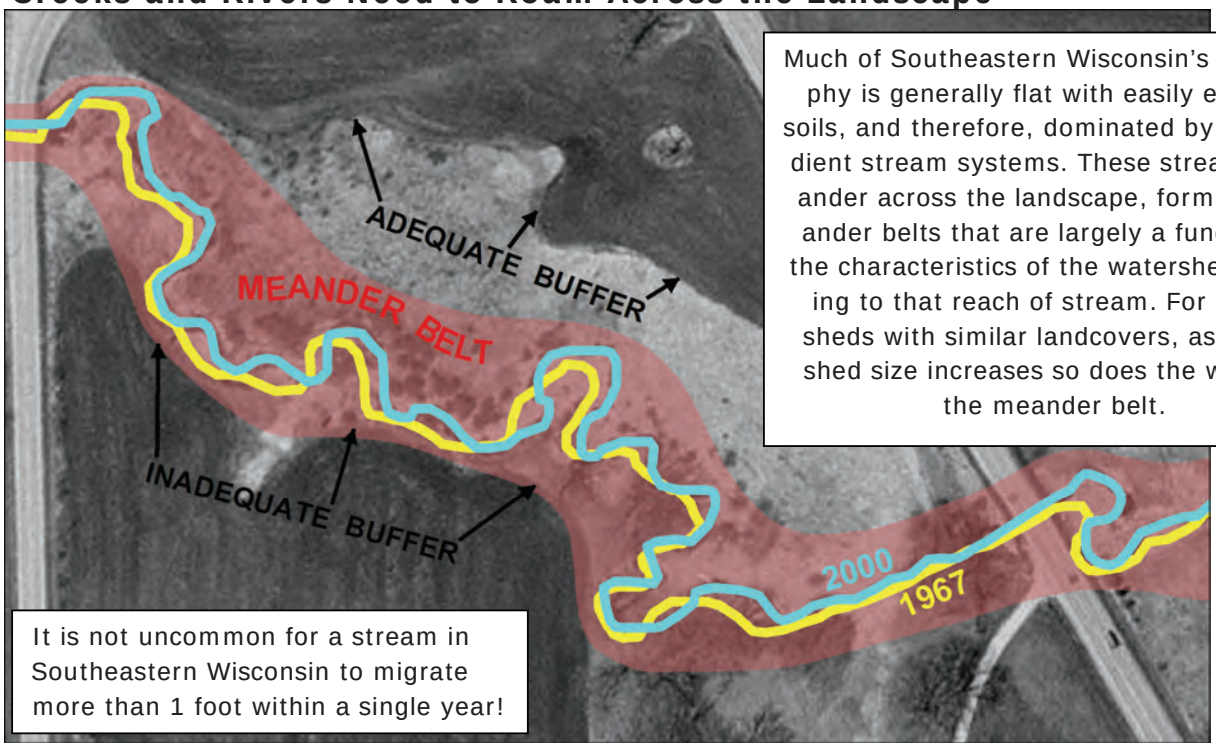
Protecting the integrity of native species in the region is an objective shared by many communities. The natural environment is an essential component of our existence and contributes to defining our communities and neighborhoods. Conservation design and open space development patterns in urbanizing areas and farm conservation programs in rural areas have begun to address the importance of maintaining and restoring riparian buffers and connectivity among corridors.

How wide should the buffer be? Unfortunately, there is no one-size-fits all buffer width adequate to protect water quality, wildlife habitat, and human needs. Therefore, the answer to this question depends upon the predetermined needs of the landowner and community objectives or goals. As riparian corridors become very wide, their pollutant removal (buffering) effectiveness may reach a point of diminishing returns compared to the investment involved. However, the prospects for species diversity in the corridor keep increasing with buffer width. For a number of reasons, 400- to 800-foot-wide buffers are not practical along all lakes, streams, and wetlands within Southeastern Wisconsin. Therefore, communities should develop guidelines that remain flexible to site-specific needs to achieve the most benefits for water resources and wildlife as is practical.

Key considerations to better buffers/corridors:

- Wider buffers are better than narrow buffers for water quality and wildlife functions
- Continuous corridors are better than fragmented corridors for wildlife
- Natural linkages should be maintained or restored
- Linkages should not stop at political boundaries
- Two or more corridor linkages are better than one
- Structurally diverse corridors (e.g., diverse plant structure or community types, upland and wetland complexes, soil types, topography, and surficial geology) are better than corridors with simple structures
- Both local and regional spatial and temporal scales should be considered in establishing buffers
- Corridors should be located along dispersal and migration routes
- Corridors should be located and expanded around rare, threatened, or endangered species
- Quality habitat should be provided in a buffer whenever possible
- Disturbance (e.g. excavation or clear cutting vegetation) of corridors should be minimized during adjacent land use development
- Native species diversity should be promoted through plantings and active management
- Non-native species invasions should be actively managed by applying practices to preserve native species
- Fragmentation of corridors should be reduced by limiting the number of crossings of a creek or river where appropriate
- Restoration or rehabilitation of hydrological function, streambank stability, instream habitat, and/or floodplain connectivity should be considered within corridors.
- Restoration or retrofitting of road and railway crossings promotes passage of aquatic organisms

Creeks and Rivers Need to Roam Across the Landscape



Much of Southeastern Wisconsin's topography is generally flat with easily erodible soils, and therefore, dominated by low gradient stream systems. These streams meander across the landscape, forming meander belts that are largely a function of the characteristics of the watershed draining to that reach of stream. For watersheds with similar landcovers, as watershed size increases so does the width of the meander belt.

It is not uncommon for a stream in Southeastern Wisconsin to migrate more than 1 foot within a single year!

Healthy streams naturally meander or migrate across a landscape over time. Streams are transport systems for water and sediment and are continually eroding and depositing sediments, which causes the stream to migrate. When the amount of sediment load coming into a stream is equal to what is being transported downstream—and stream widths, depths, and length remain consistent over time—it is common to refer to that stream as being in a state of **"dynamic equilibrium."** In other words the stream retains its physical dimensions (equilibrium), but those physical features are shifted, or migrate, over time (dynamic).

Room to Roam

Riparian buffer widths should take into account the amount of area that a stream needs to be able to self-adjust and maintain itself in a state of dynamic equilibrium. … These are generally greater than any minimum width needed to protect for pollutant removal alone.

Streams are highly sensitive, and they respond to changes in the amounts of water and sediment draining to them, which are affected by changing land use conditions. For example, streams can respond to increased discharges of water by increased scour (erosion) of bed and banks that leads to an increase in stream width and depth—or "degradation." Conversely, streams can respond to increased sedimentation (deposition) that leads to a decrease in channel width and depth—or "aggradation."

Why Should You Care About Buffers?

Economic Benefits:

- Increased value of riparian property
- Reduced lawn mowing time and expense
- Increased shade to reduce building cooling costs
- Natural flood mitigation protection for structures or crops
- Pollution mitigation (reduced nutrient and contaminant loading)
- Increased infiltration and groundwater recharge
- Prevented loss of property (land or structures) through erosion
- Greater human and ecological health through biodiversity

Recreational Benefits:

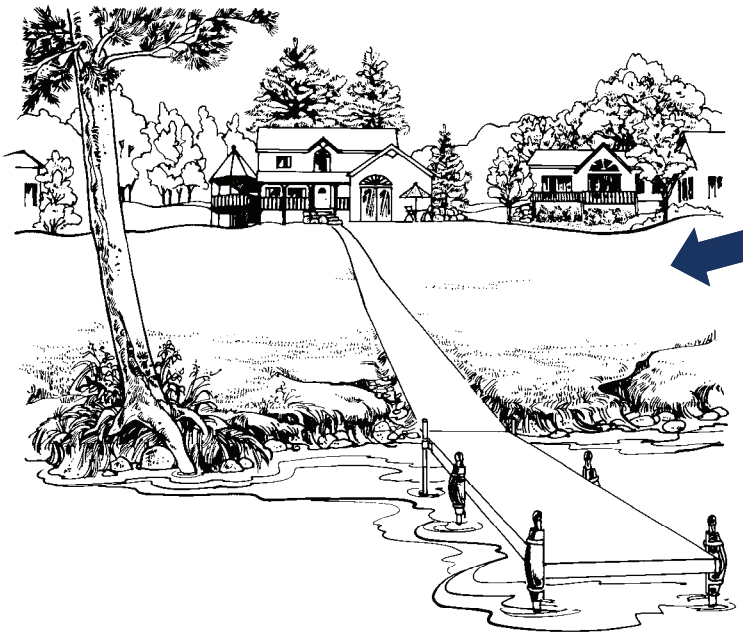
- Increased quality of the canoeing/kayaking experience
- Improved fishing and hunting quality by improving habitat
- Improved bird watching/wildlife viewing quality and opportunities
- Increased potential for expansion of trails for hiking and bicycling
- Opportunities made available for youth and others to locally reconnect with nature

Riparian buffers make sense and are profitable monetarily, recreationally, and aesthetically!

Social Benefits:

- Increased privacy
- Educational opportunities for outdoor awareness
- Improved quality of life at home and work
- Preserved open space/balanced character of a community
- Focal point for community pride and group activities
- Visual diversity
- Noise reduction

A Matter of Balance



University of Wisconsin—Extension

Although neatly trimmed grass lawns are popular, these offer limited benefits for water quality or wildlife habitat. A single house near a waterbody may not seem like a "big deal," but the cumulative effects of many houses can negatively impact streams, lakes, and wetlands.

All the lands within Southeastern Wisconsin ultimately flow into either the Mississippi River or the Great Lakes systems. The cumulative effects of agriculture and urban development in the absence of mitigative measures, ultimately affects water quality in those systems. Much of this development causes increases in water runoff from the land into wetlands, ponds, and streams. This runoff transports water, sediments, nutrients, and other pollutants into our waterways that can lead to a number of problems, including flooding that can cause crop loss or building damage; unsightly and/or toxic algae blooms; increased turbidity; damage to aquatic organisms from reduced dissolved oxygen, lethal temperatures, and/or concentrations of pollutants; and loss of habitat.

Riparian buffers are one of the most effective tools available for defending our waterways. Riparian buffers can be best thought of as forming a living, self-sustainable protective shield. This shield protects investments in the land and all things on it as well as our quality of life locally, regionally, and, ultimately, nationally. Combined with stormwater management, environmentally friendly yard care, effective wastewater treatment, conservation farming methods, and appropriate use of fertilizers and other agrichemicals, **riparian buffers complete the set of actions that we can take to minimize impacts to our shared water resources.**

Lakeshore buffers can take many forms, which require a balancing act between lake viewing, access, and scenic beauty. Lakeshore buffers can be integrated into a landscaping design that complements both the structural development and a lakeside lifestyle. Judicious placement of access ways and shoreline protection structures, and preservation or reestablishment of native vegetation, can enhance and sustain our use of the environment.

University of Wisconsin—Extension

Case Study—Agricultural Buffers

Agricultural nonpoint source pollution runoff continues to pose a threat to water quality and aquatic ecosystems within Wisconsin and elsewhere. In an effort to address this problem, the Wisconsin Buffer Initiative was formed with the goal of designing a buffer implementation program to achieve science-based, cost-effective, water quality improvements (report available online at http://www.soils.wisc.edu/extension/nonpoint/wbi.php).

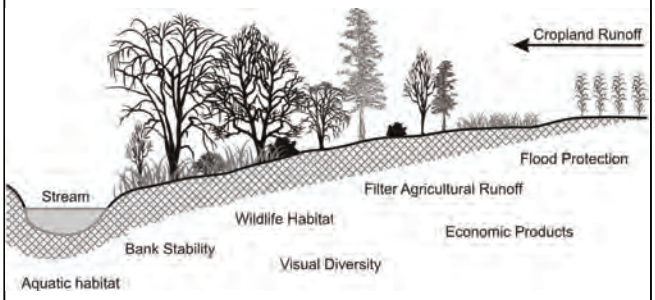
Challenge:
Buffers may take land out of cultivated crop production and require additional cost to install and maintain. Cost sharing, paid easements, and purchase of easements or development rights may sometimes be available to offset costs.

Benefits:
Buffers may offset costs by producing perennial crops such as hay, lumber, fiber, nuts, fruits, and berries. In addition, they provide visual diversity on the landscape, help maintain long-term crop productivity, and help support healthier fish populations for local enjoyment.

While it is true that riparian buffers alone may not always be able to reduce nutrient and sediment loading from agricultural lands, WBI researchers found that "…***riparian buffers are capable of reducing large percentages of the phosphorus and sediment that are currently being carried by Wisconsin streams. Even in watersheds with extremely high loads (top 10%), an average of about 70% of the sediment and phosphorus can be reduced through buffer implementation***." (*Diebel, M.J. and others, 2009, Landscape planning for agricultural nonpoint source pollution reduction III: Assessing Phosphorus and sediment reduction potential, Environmental Management, 43:69-83.*).

Federal and state natural resource agencies have long recognized the need to apply a wide range of Best Management Practices on agricultural lands to improve stream water quality. Although there are many tools available in the toolbox to reduce pollutant runoff from agricultural lands, such as crop rotations, nutrient and manure management, conservation tillage, and contour plowing, riparian buffers are one of the most effective tools to accomplish this task. Their multiple benefits and inter-connectedness from upstream to downstream make riparian buffers a choice with watershed-wide benefits.

Determine what benefits are needed.



The USDA in *Agroforestry Notes* (AF Note-4, January 1997) outlines a four step process for designing riparian buffers for Agricultural lands:

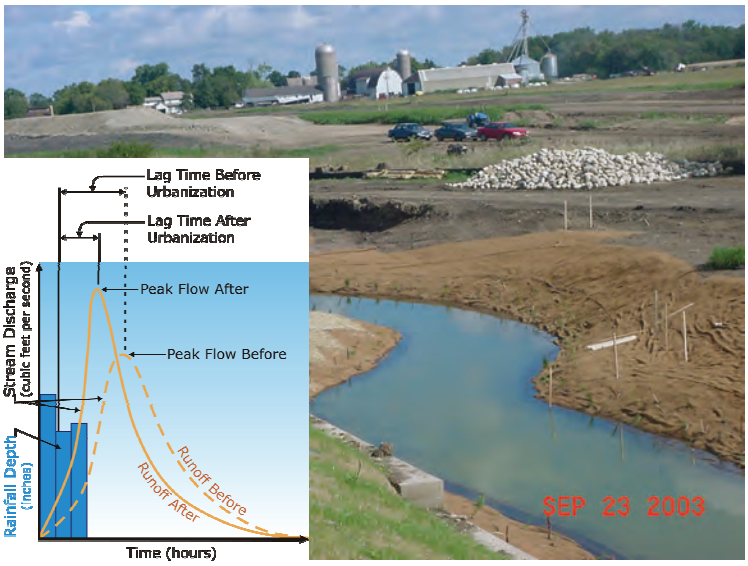
1-Determine what buffers functions are needed
2-Identify the best types of vegetation to provide the needed benefits
3-Determine the minimum acceptable buffer width to achieve desired benefits
4-Develop an installation and maintenance plan

Drain tiles can bypass infiltration and filtration of pollutants by providing a direct pathway to the water and "around" a buffer. This is important to consider in design of a buffer system which integrates with other agricultural practices.

Case Study—Urbanizing Area Buffers

When development occurs near a waterbody, the area in driveways, rooftops, sidewalks, and lawns increases, while native plants and undisturbed soils decrease. As a result, the ability of the shoreland area to perform its natural functions (flood control, pollutant removal, wildlife habitat, and aesthetic beauty) is decreased. In the absence of mitigating measures, one the consequences of urban development is an increase in the amount of stormwater, which runs off the land instead of infiltrating into the ground. Therefore, **urbanization impacts the watershed, not only by reducing groundwater recharge, but also by changing stream hydrology** through increased stormwater runoff volumes and peak flows. This means less water is available to sustain the baseflow regime. The urban environment also contains increased numbers of pollutants and generates greater pollutant concentrations and loads than any other land use. This reflects the higher density of the human population and associated activities, which demand measures to protect the urban water system.

Mitigation of urban impacts may be as simple as not mowing along a stream corridor or changing land management and yard care practices, or as complex as changing zoning ordinances or widening riparian corridors through buyouts.

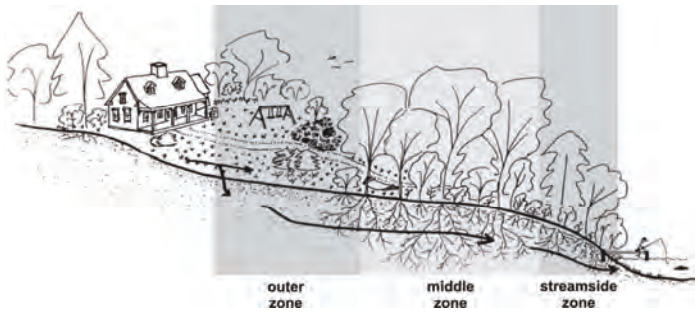


Comparison of hydrographs before and after urbanization. Note the rapid runoff and greater peak streamflow tied to watershed development. (Adapted from Federal Interagency Stream Restoration Working Group (FISRWG), Stream Corridor Restoration: Principles, Processes, and Practices, October 1998)

Challenge:
Urban development requires balancing flood protection, water quality protection, and the economic viability of the development.

Opportunities:
Buffers may offset costs by providing adequate space for providing long-term water quantity and water quality protection. In addition, they provide visual diversity on the landscape, wildlife habitat and connectedness, and help maintain property values.

Anatomy of an urban riparian buffer



The most effective urban buffers have three zones:

Outer Zone-Transition area between the intact buffer and nearest permanent structure to capture sediment and absorb runoff.

Middle Zone-Area from top of bank to edge of lawn that is composed of natural vegetation that provides wildlife habitat as well as improved filtration and infiltration of pollutants.

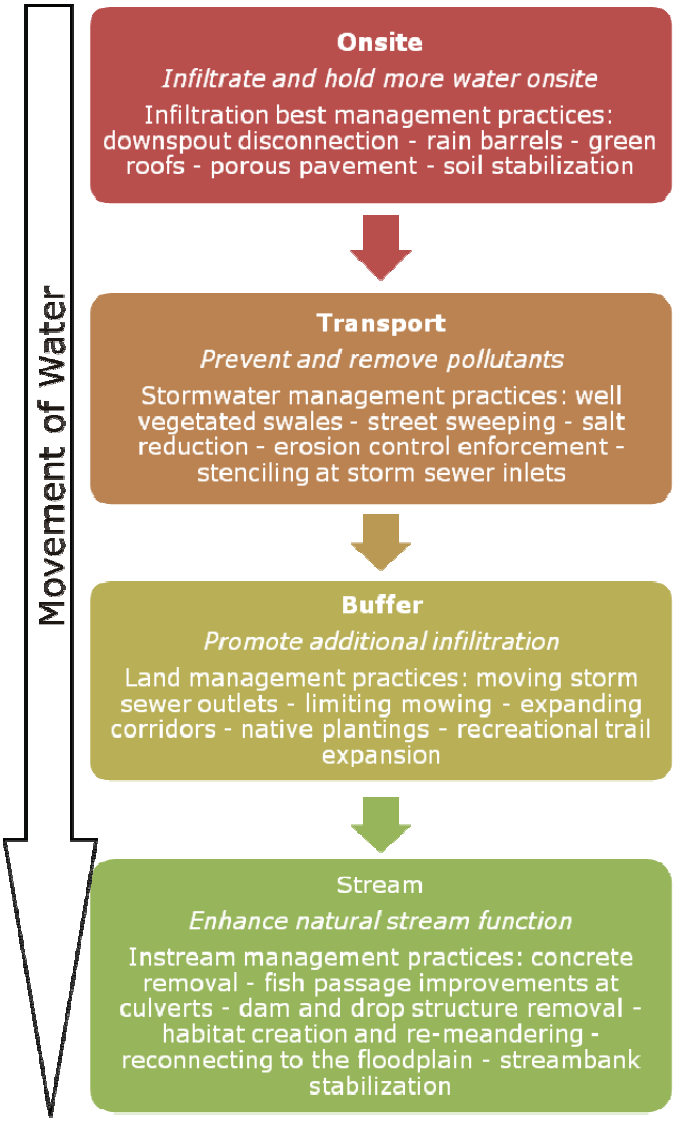
Streamside Zone-Area from the water's edge to the top of the bank or uplands that provides critical connection between water, wetland, and upland habitats for wildlife as well as protect streams from bank erosion

(Fact sheet No. 6 Urban Buffer in the series Riparian Buffers for Northern New Jersey)

Case Study—Urban Buffers

Placement of riparian buffers in established urban areas is a challenge that requires new and innovative approaches. In these areas, historical development along water courses limits options and requires balancing flood management protection versus water quality and environmental protection needs. Consequently, some municipalities have begun to recognize the connections between these objectives and are introducing programs to remove flood-prone structures and culverts from the stream corridors and allow recreation of the stream, restoring floodplains, and improving both the quality of life and the environment.

In urban settings it may be necessary to limit pollution and water runoff before it reaches the buffer.



Challenge:
There are many potential constraints to establishing, expanding, and/or managing riparian buffers within an urban landscape. Two major constraints to establishment of urban buffers include:

1) **Limited or confined space to establish buffers** due to encroachment by structures such as buildings, roadways, and/or sewer infrastructure;
2) **Fragmentation of the landscape** by road and railway crossings of creeks and rivers that disrupt the linear connectedness of buffers, limiting their ability to provide quality wildlife habitat.

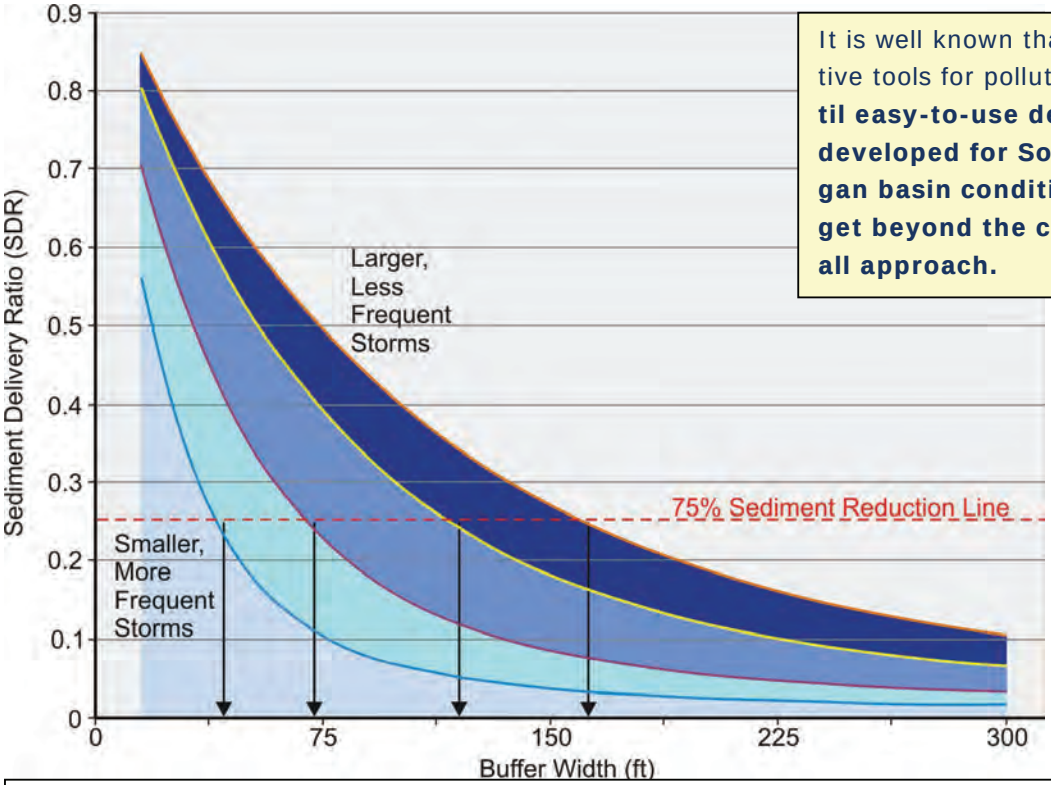
Much traditional stormwater infrastructure intercepts runoff and diverts it directly into creeks and rivers, bypassing any benefits of buffers to infiltrate or filter pollutants. This is important to consider in design of a buffer system for urban waterways, which begin in yards, curbsides, and construction sites, that are figuratively as close to streams as the nearest storm sewer inlet.

A Buffer Design Tool

Design aids are needed to help municipalities, property owners, and others take the "guesswork" out of determining adequate buffer widths for the purpose of water resource quality protection. While there are various complex mathematical models that can be used to estimate sediment and nutrient removal efficiencies, they are not easily applied by the people who need them including homeowners, farmers, businesses and developers.

To fill this gap, design aid tools are being developed using factors such as slope, soils, field length, incoming pollutant concentrations, and vegetation to allow the user to identify and test realistic buffer widths with respect to the desired percent pollutant load reduction and storm characteristics. By developing a set of relationships among factors that determine buffer effectiveness, the width of buffer needed to meet specific goals can be identified.

In the example below, 50-foot-wide buffers are necessary to achieve 75 % sediment removal during small, low intensity storms, while buffers more than 150 feet wide are necessary to achieve the same sediment reduction during more severe storms. Based on this information, decision-makers have the option of fitting a desired level of sediment removal into the context of their specific conditions. Under most conditions, a 75-foot width will provide a minimum level of protection for a variety of needs (SEWRPC PR No. 50, Appendix O.)



It is well known that buffers are effective tools for pollutant removal, but **until easy-to-use design aid tools are developed for Southern Lake Michigan basin conditions, we can never get beyond the current one size fits all approach.**

This generalized graph depicts an example of model output for an optimal buffer width to achieve a 75% sediment reduction for a range of soil and slope, vegetation, and storm conditions characteristic of North Carolina. *(Adapted from Muñoz-Carpena R., Parsons J.E.. 2005. VFSMOD-W: Vegetative Filter Strips Hydrology and Sediment Transport Modeling System v.2.x. Homestead, FL: University of Florida. http://carpena.ifas.ufl.edu/vfsmod/citations.shtml)*

Buffers Are A Good Defense

Today's natural resources are under threat. These threats are immediate as in the case of chemical accidents or manure spills, and chronic as in the case of stormwater pollution carrying everything from eroded soil, to fertilizer nutrients, to millions of drips from automobiles and other sources across the landscape. Non-native species have invaded, and continue to invade, key ecosystems and have caused the loss of native species and degradation of their habitats to the detriment of our use of important resources.

> ***"Riparian ecosystems are naturally resilient,*** *provide linear habitat connectivity, link aquatic and terrestrial ecosystems, and create thermal refugia for wildlife: all characteristics that can contribute to ecological adaptation to climate change."*
>
> *(N. E. Seavy and others, Why Climate Change Makes Riparian Restoration More Important Than Ever: Recommendations for Practice and Research, 2009, Ecological Restoration 27(3):330-338)*

A more subtle, but growing, concern is the case of stresses on the environment resulting from climate change. Buffers present an opportunity for natural systems to adapt to such changes by providing the space to implement protective measures while also serving human needs. **Because riparian buffers maintain an important part of the landscape in a natural condition, they offer opportunities for communities to adjust to our changing world.**

Well-managed riparian buffers are a good defense against these threats. In combination with environmental corridors, buffers maintain a sustainable reserve and diversity of habitats, plant and animal populations, and genetic diversity of organisms, all of which contribute to the long-term preservation of the landscape. Where they are of sufficient size and connectivity, riparian buffers act as reservoirs of resources that resist the changes that could lead to loss of species.

Refuge or protection from increased water temperatures as provided by natural buffers is important for the preservation of native cold-water, cool-water, and warm-water fishes and their associated communities.

Buffers Provide Opportunities

River, lake, and wetland systems and their associated riparian lands form an important element of the natural resource base, create opportunities for recreation, and contribute to attractive and well-balanced communities. These resources can provide an essential avenue for relief of stress among the population and improve quality of life in both urban and rural areas. Such uses also sustain industries associated with outfitting and supporting recreational and other uses of the natural environment, providing economic opportunities. Increasing access and assuring safe use of these areas enhances public awareness and commitment to natural resources. Research has shown that property values are higher adjoining riparian corridors, and that such natural features are among the most appreciated and well-supported parts of the landscape for protection.

We demand a lot from our riparian buffers!

Sustaining this range of uses requires our commitment to protect and maintain them.

Summary

The following guidance suggestions highlight key points to improve riparian corridor management and create a more sustainable environment.

Riparian corridors or buffers along our waters may contain varied features, but all are best preserved or designed to perform multiple important functions.

Care about buffers because of their many benefits. Riparian buffers make sense and are profitable monetarily, recreationally, aesthetically, as well as environmentally.

Enhance the environmental corridor concept. Environmental corridors are special resources which deserve protection. They serve many key riparian corridor functions, but in some cases, could also benefit from additional buffering.

Avoid habitat fragmentation of riparian corridors. It is important to preserve and link key resource areas, making natural connections and avoiding habitat gaps.

Employ the adage "wider is better" for buffer protection. While relatively narrow riparian buffers may be effective as filters for certain pollutants, that water quality function along with infiltration of precipitation and runoff and the provision of habitat for a host of species will be improved by expanding buffer width where feasible.

Allow creeks and rivers room to roam across the landscape. Streams are dynamic and should be buffered adequately to allow for natural movement over time while avoiding problems associated with such movement.

Consider and evaluate buffers as a matter of balance. Riparian buffers are a living, self-sustainable shield that can help balance active use of water and adjoining resources with environmental protection.

Agricultural buffers can provide many benefits. Riparian buffers in agricultural settings generally work well, are cost-effective, and can provide multiple benefits, including possibly serving as areas to raise certain crops.

Urban buffers should be preserved and properly managed. Though often space-constrained and fragmented, urban buffers are important remnants of the natural system. Opportunities to establish or expand buffers should be considered, where feasible, complemented by good stormwater management, landscaping, and local ordinances, including erosion controls.

A buffer design tool is needed and should be developed. Southeastern Wisconsin and the Southern Lake Michigan Basin would benefit from development of a specific design tool to address the water quality function of buffers. Such a tool would improve on the currently available general guidance on dimensions and species composition.

Buffers are a good defense. Combined with environmental corridors, riparian buffers offer a good line of defense against changes which can negatively impact natural resources and the landscape.

MORE TO COME

Future editions in a riparian buffer planning series are being explored with the intent of focusing on key elements of this critical land and water interface. Topics may include:

- Information sharing and development of ordinances to integrate riparian buffers into existing land management plans and programs
- Integration of stormwater management practices and riparian buffer best management practices
- Application of buffers within highly constrained urban corridors with and without brownfield development
- Installation of buffers within rural or agricultural lands being converted to urban uses
- Utilization of buffers in agricultural areas and associated drainage systems
- Integration of riparian buffers into environmental corridors to support resources preservation, recreation and aesthetic uses
- Preservation of stream courses and drainageways to minimize maintenance and promote protection of infrastructure
- Guidance for retrofitting, replacement, or removal of infrastructure such as dams and road crossings, to balance transportation, recreation, aesthetic, property value, and environmental considerations.
- Protection of groundwater recharge and discharge areas
- Protection of high quality, sensitive coastal areas, including preservation of recreational potential

MORE INFORMATION

This booklet can be found at http://www.sewrpc.org/RBMG-no1 . Please visit the website for more information, periodic updates, and a list of complementary publications.

* * *

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May 7, 2010

Appendix E

WISCONSIN'S HEALTHY LAKES IMPLEMENTATION PLAN

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Green Lake, Green Lake County - Lisa Reas

WISCONSIN'S HEALTHY LAKES IMPLEMENTATION PLAN

2014-2017

WISCONSIN
DEPT. OF NATURAL RESOURCES

Wisconsin
Lakes
Partnership

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The statewide Healthy Lakes initiative is a true, collaborative team effort. The Healthy Lakes Implementation Plan describes relatively simple and inexpensive best practices that lakeshore property owners can implement. The Plan also includes funding/accountability, promotion, and evaluation information so we can grow and adapt the Plan and our statewide strategy to implement it into the future. Working together, we can make Healthy Lakes for current and future generations.

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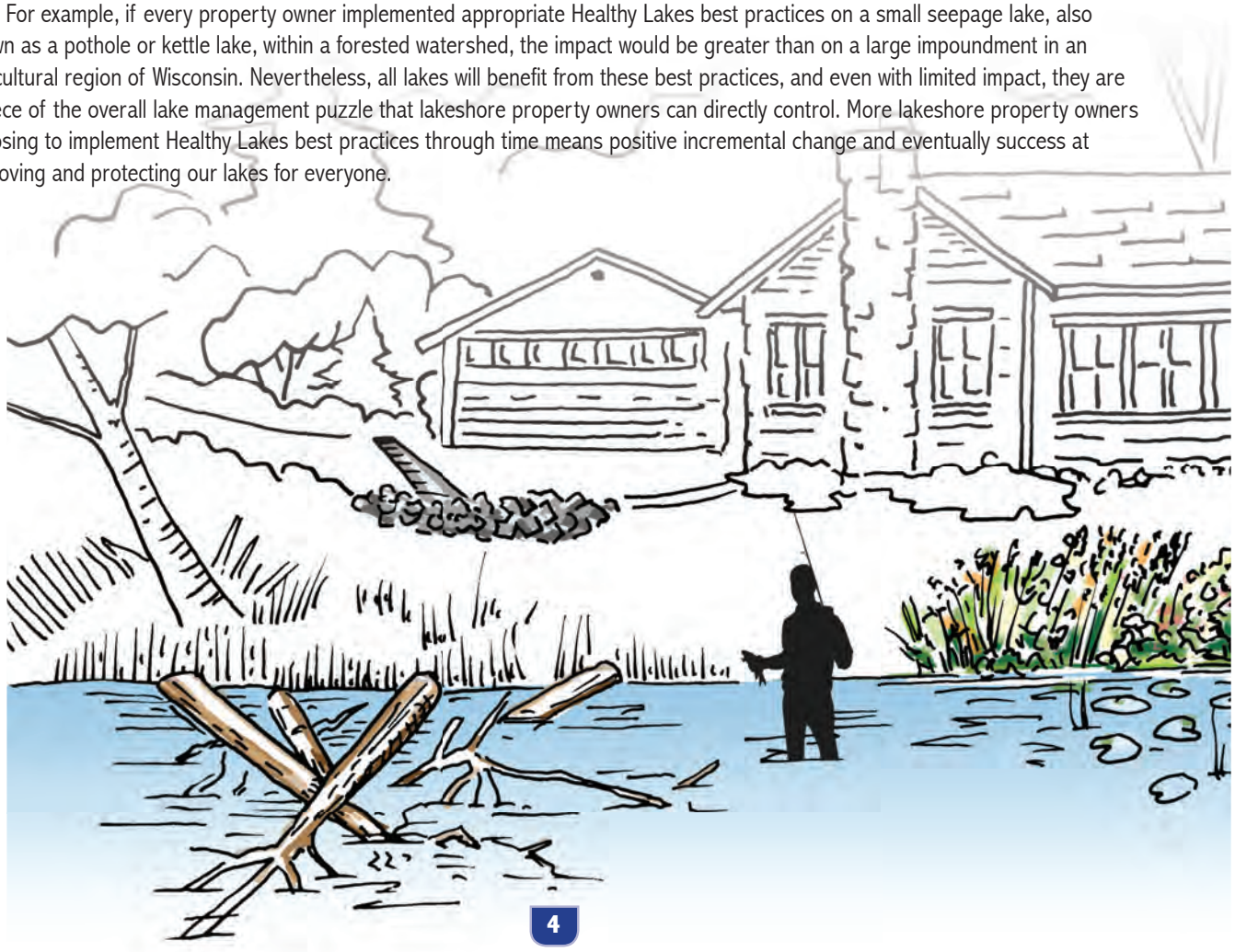
Design and layout by Amy Kowalski, UWEX Lakes

INTRODUCTION

Wisconsin's lakes define our state, local communities, and our own identities. Fond memories of splashing in the water, seeing moonlight reflect off the lake, and catching a lunker last a lifetime. With over 15,000 lakes dotting the landscape, it's no surprise that fishing alone generates a $2.3 billion economic impact each year , and the majority of property tax base rests along shorelines in some of our counties. Unfortunately, we've learned through science that our love for lakes causes management challenges, including declines in habitat and water quality. In fact, the loss of lakeshore habitat was the number one stressor of lake health at a national scale. Lakes with poor lakeshore habitat tend to have poor water quality. Working together to implement *Wisconsin's Healthy Lakes Implementation Plan* (Plan), we can improve and protect our lakes for future generations to enjoy, as well.

This Plan identifies relatively simple habitat and water quality best practices that may be implemented on the most typical lakeshore properties in Wisconsin. We encourage do-it-yourselfers to use these practices but have also created a Wisconsin Department of Natural Resources (DNR) Lake Classification and Protection Grant *Healthy Lakes* sub-category for funding assistance. Furthermore, local partners like lake groups and counties may choose to integrate the Plan into their lake management, comprehensive planning, and shoreland zoning ordinance efforts.

It's important to consider this plan in the context of the lake and local community's management complexity. The best practices' effectiveness will increase cumulatively with additional property owner participation and depend on the nature and location of the lake. For example, if every property owner implemented appropriate Healthy Lakes best practices on a small seepage lake, also known as a pothole or kettle lake, within a forested watershed, the impact would be greater than on a large impoundment in an agricultural region of Wisconsin. Nevertheless, all lakes will benefit from these best practices, and even with limited impact, they are a piece of the overall lake management puzzle that lakeshore property owners can directly control. More lakeshore property owners choosing to implement Healthy Lakes best practices through time means positive incremental change and eventually success at improving and protecting our lakes for everyone.



GOALS AND OBJECTIVES

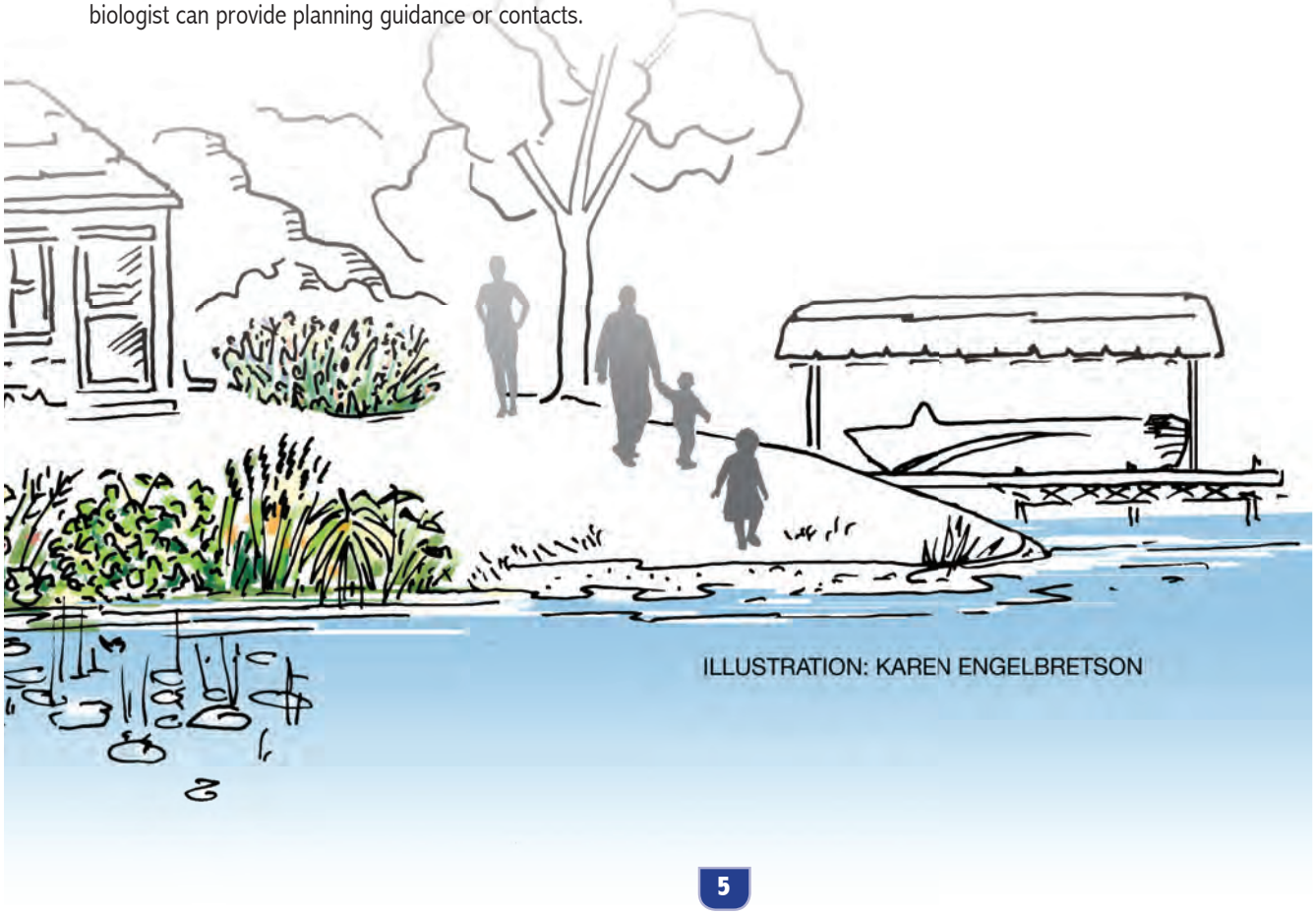
Wisconsin's Healthy Lakes Implementation Plan goal is to protect and improve the health of our lakes by increasing lakeshore property owner participation in habitat restoration and runoff and erosion control projects.

- Statewide objective: single-parcel participation in Healthy Lakes will increase 100% in 3 years (i.e. 2015 to 2017).
- Individual lake objective: lake groups or other partners may identify their own habitat, water quality, and/or participation goal(s) through a local planning and public participation process.
  - Partners may adopt this Plan, as is by resolution, or integrate the Plan into a complimentary planning process such as lake management or comprehensive planning.

Wisconsin's Healthy Lakes Implementation Plan, and the diversion and rock infiltration practices in particular, are not intended for heavily developed parcels, sites with large volumes of runoff, or sites with complex problems that may require engineering design. Technical assistance and funding are still available for these sites; contact your county land and water conservation department or local DNR lakes biologist for more information.

The target audience for this Plan and implementation of the associated practices is lakeshore property owners, including: permanent and seasonal homeowners, municipalities, and businesses.

It will be necessary to do additional planning work to implement Wisconsin's Healthy Lakes Plan and, again, the level of effort will depend on the complexity of the lake and its local community. Planning could be as simple as site-specific property visits and development of design plans, to integrating the Plan into a broader and more comprehensive effort. Your lake group, county land and water conservation department, non-profit conservation association, UW-extension lakes specialist or local educator, and/or DNR lake biologist can provide planning guidance or contacts.



DEFINITIONS

Best practice: a working method, described in detail, which has consistently shown results.

Divert: redirect runoff water.

Habitat: where a plant or animal lives.

Infiltrate: soak into the ground.

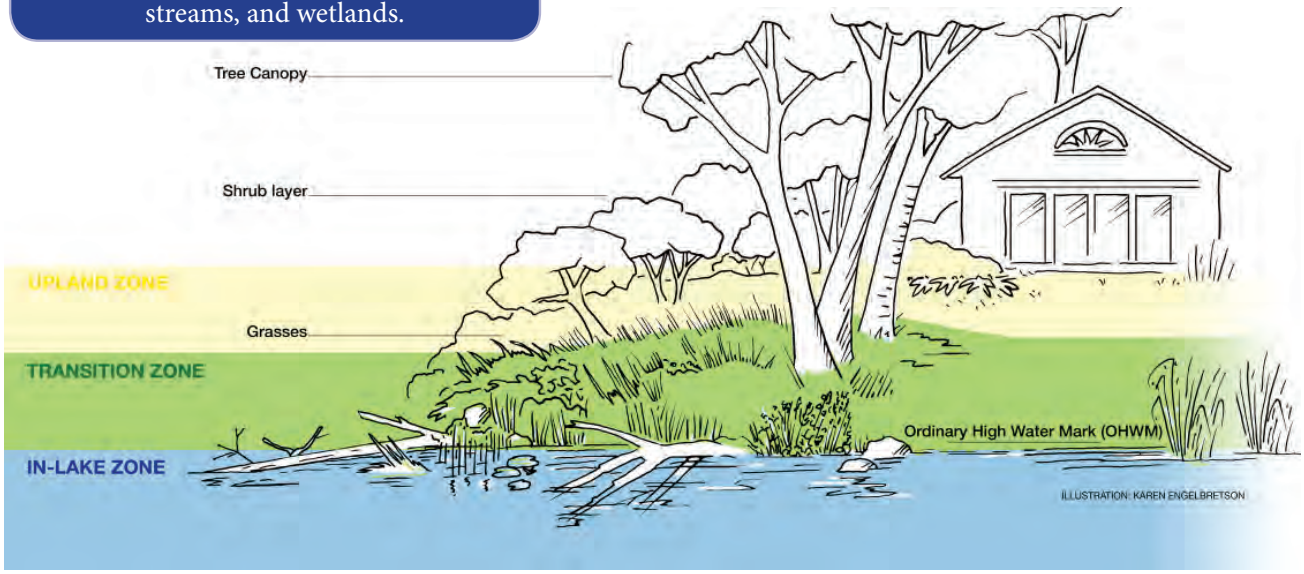
Installed: project cost that includes all materials, labor, and transportation.

Runoff: rain and snowmelt that doesn't soak into the ground and instead moves downhill across land and eventually into lakes, streams, and wetlands.

Wisconsin's Healthy Lakes Implementation Plan divides a typical lakeshore parcel into the following 3 management zones: 1) in-lake, 2) transition, and 3) upland (see illustration below). Best practices are identified for each zone. A team selected these practices based on customer feedback. These practices are:

- relatively simple and inexpensive to implement,
- appropriate for typical lakeshore properties, and
- beneficial to lake habitat and/or water quality.

The Plan also provides cost ranges and averages and technical, regulatory, and funding information for each practice. Fact sheets for each best practice support the Plan and provide more technical detail, and additional guidance is referenced if it currently exists. There is also a funding and administration FAQ fact sheet for those considering pursuing Healthy Lakes grants.



HEALTHY LAKES PLAN

Best practice descriptions follow. Each description defines the practice, identifies lake health benefits, provides cost ranges and averages based on recent projects, and identifies additional technical and regulatory information. The costs provided are installed costs, which include all materials, labor, and transportation but do not include technical assistance, including design and project management/administration work. Cost ranges are a result of geographic location, property conditions like soils and slopes, and contractor supply and proximity to the project site.

PRACTICE 1 | FISH STICKS

...large woody habitat structures that utilize whole trees grouped together resulting in the placement of more than one tree per 50 feet of shoreline. Fish Sticks structures are anchored to the shore and are partially or fully submerged.

Bony Lake, Bayfield County - Pamela Toshner

LAKE HEALTH BENEFITS	Improve fish and wildlife habitat Prevent shoreline erosion
COSTS	Range - $100-$1000 per cluster (3-5 trees), installed Average - Cost per unit (3-5 trees) averages $500, installed
TECHNICAL REQUIREMENTS	Healthy Lakes Fact Sheet Series: *Fish Sticks* http://tinyurl.com/healthylakes DNR Fish Sticks Best Practices Manual http://dnr.wi.gov (search for *Fish Sticks best practices*)
REGULATORY INFORMATION	DNR: **Habitat Structure - Fish Sticks General Permit** ($303 fee unless DNR grant-funded) Fish Sticks must comply with the local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
HEALTHY LAKES GRANT FUNDING	Maximum of $1000/cluster of 3-5 trees Fish Sticks may be a stand-alone grant activity only if the vegetation protection area (i.e. buffer) complies with local shoreland zoning. If not, the property owner must commit to leaving a 350 ft^2 area un-mowed at the base of the cluster(s) or implement native plantings (Practice 2).

PRACTICE 2 | 350 FT² NATIVE PLANTINGS

...template planting plans with corresponding lists of native plants suited to the given function of the plan. The 350 ft² area should be planted adjacent to the lake and include a contiguous area, rather than be planted in patches. Functions are based on the goals for the site. For example, one property owner may want to increase bird and butterfly habitat while another would like to fix an area with bare soil. Native planting functions include the following: lakeshore, bird/butterfly habitat, woodland, low-growing, deer resistant, and bare soil area plantings.

Green Lake, Green Lake County - Lisa Reas

LAKE HEALTH BENEFITS	Improve wildlife habitat Slow water runoff Promote natural beauty
COSTS	Range - $480-$2400 for 350 ft² area, installed Average - $1000 per 350 ft², installed
TECHNICAL REQUIREMENTS	Healthy Lakes Fact Sheet Series: *350 ft² Native Plantings* http://tinyurl.com/healthylakes 350 ft² Native Plantings Best Practices Manual
REGULATORY INFORMATION	DNR: an aquatic plant chemical control permit may be necessary if using herbicides in or adjacent to the lakeshore. Native plantings must comply with the local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
HEALTHY LAKES GRANT FUNDING	Maximum of $1000/350 ft² native plantings installed and implemented according to the technical requirements. Only one 350 ft² native planting per property per year is eligible for funding. The native plantings dimension must be 350 ft² of contiguous area at least 10 feet wide and installed along the lakeshore. Final shape and orientation to the shore are flexible.

PRACTICE 3 | DIVERSION PRACTICE

...includes a water bar, diverter, and broad-based dip. These practices use a berm or shallow trench to intercept runoff from a path or road and divert it into a dispersion area. Depending on the site, multiple diversion practices may be necessary.

http://awwatersheds.org

LAKE HEALTH BENEFITS	Divert runoff water.
COSTS	Range - $25-$3750, installed Average - $200, installed
TECHNICAL REQUIREMENTS	Healthy Lakes Fact Sheet Series: *Diversion Practice* http://tinyurl.com/healthylakes
REGULATORY INFORMATION	DNR: none. Diversion practices must comply with the local shoreland and floodplain zoning ordinance. Consult with your county or municipal zoning staff.
HEALTHY LAKES GRANT FUNDING	Maximum of $1000/diversion practice installed and implemented according to the technical requirements. Healthy Lakes diversion practice grant funding is not intended for large, heavily developed parcels, sites with large volumes of runoff, or sites with complex problems that may require engineering design.

PRACTICE 3 | DIVERSION PRACTICE

...includes a water bar, diverter, and broad-based dip. These practices use a berm or shallow trench to intercept runoff from a path or road and divert it into a dispersion area. Depending on the site, multiple diversion practices may be necessary.

http://awwatersheds.org

LAKE HEALTH BENEFITS	Divert runoff water.
COSTS	Range - $25-$3750, installed Average - $200, installed
TECHNICAL REQUIREMENTS	Healthy Lakes Fact Sheet Series: *Diversion Practice* http://tinyurl.com/healthylakes
REGULATORY INFORMATION	DNR: none. Diversion practices must comply with the local shoreland and floodplain zoning ordinance. Consult with your county or municipal zoning staff.
HEALTHY LAKES GRANT FUNDING	Maximum of $1000/diversion practice installed and implemented according to the technical requirements. Healthy Lakes diversion practice grant funding is not intended for large, heavily developed parcels, sites with large volumes of runoff, or sites with complex problems that may require engineering design.

ZONE 3: UPLAND

PRACTICE 4 | ROCK INFILTRATION PRACTICE

...ian excavated pit or trench filled with rock that reduces runoff by storing it underground to infiltrate. A catch basin and/or perforated pipe surrounded by gravel and lined with sturdy landscape fabric may be integrated into the design to capture, pre-treat, and redirect water to the pit or trench. Pit and trench size and holding capacity are a function of the area draining to it and the permeability of the underlying soil.

Deer Lake, Polk County - Cheryl Clemens

LAKE HEALTH BENEFITS	Divert runoff water. Clean runoff water. Infiltrate runoff water.
COSTS	Range - $510-$9688 per rock infiltration practice, installed Average - $3800 per rock infiltration practice, installed
TECHNICAL REQUIREMENTS	Healthy Lakes Fact Sheet Series: *Rock Infiltration Practice* http://tinyurl.com/healthylakes
REGULATORY INFORMATION	DNR: none. Rock infiltration practices must comply with the local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
HEALTHY LAKES GRANT FUNDING	Maximum of $1000/rock infiltration practice installed and implemented according to the technical requirements. Healthy Lakes rock infiltration practice grant funding is not intended for heavily developed parcels, sites with large volumes of runoff, or sites with complex problems that may require engineering design.

ZONE 3: UPLAND

PRACTICE 5 | RAIN GARDEN

...a landscaped shallow depression with loose soil designed to collect roof and driveway runoff.

Shell Lake, Washburn County - Brent Edlin

LAKE HEALTH BENEFITS	Improve wildlife habitat. Divert runoff water. Clean runoff water. Infiltrate runoff water. Promote natural beauty.
COSTS	Range - $500-$9000 per rain garden, installed Average - $2500 per rain garden, installed
TECHNICAL REQUIREMENTS	Healthy Lakes Fact Sheet Series: *Rain Garden* http://tinyurl.com/healthylakes *Rain Gardens: A How-to Manual for Homeowners* http://dnr.wi.gov/topic/Stormwater/documents/RgManual.pdf
REGULATORY INFORMATION	DNR: none. Rain gardens must comply with the local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
HEALTHY LAKES GRANT FUNDING	Maximum of $1000/rain garden installed and implemented according to the technical requirements. Healthy Lakes rain garden grant funding is not intended for heavily developed parcels, sites with large volumes of runoff, or sites with complex problems that may require engineering design.

FUNDING AND ACCOUNTABILITY

Administrative details and the application process are described in detail in the DNR's Water Grant Application and Guidelines (http://dnr.wi.gov/ search for surface water grants) and the Healthy Lakes website (http://tinyurl/healthylakes) and *Administration and Funding FAQ* fact sheet.

Healthy Lakes grant funding highlights:

- 75% state share grant with a maximum award of $25,000, including up to 10% of the state share available for technical assistance and project management. Technical assistance and project management do not include labor and are based on the entire state share of the grant, not the best practice caps.
- 25% match from sponsors, participating property owners or other partners. The grant sponsor may determine individual property owner cost share rates, provided the state's share of the practice caps ($1000) and total grant award (75%) are not exceeded. The grant sponsor's match may include technical assistance and project management costs beyond the state's 10% share.
- Sponsor may apply on behalf of multiple property owners, and the property owners do not have to be on the same lake.
- Standard 2-year grant timeline to encourage shovel-ready projects.
- Landowners may sign a participation pledge to document strong interest in following through with the project.
- Standard deliverables, including a signed Conservation Commitment with operation and maintenance information and 10-year requirement to leave projects in place. Also:
  - Native plantings must remain in place according to local zoning specs if within the vegetation protection area (i.e. buffer).
  - Fish Sticks projects require a 350 ft^2 native planting at shoreline base or commitment not to mow, if the property does not comply with the shoreland vegetation protection area (i.e. buffer) specifications described in the local shoreland zoning ordinance.
- Standardized application and reporting forms and process.
- 10% of projects randomly chosen each year for self-reporting and/or professional site visits.

PROMOTION

Wisconsin's Healthy Lakes Implementation Plan will be supported and promoted as a statewide program. Lake groups, counties, towns, villages, cities, and other partners may choose to adopt and implement the Plan as is or to integrate into their own planning processes. Statewide promotion, shared and supported by all partners, includes the following:

- A Healthy Lakes logo/brand.
- A website with plan, practice, and funding detail to be housed on the Wisconsin Department of Natural Resources' and University of Wisconsin-Extension Lakes' websites. It may also include the following:
  - Link to science and supporting plans.
  - Shoreline restoration video.
  - How-to YouTube clips.
  - Tips on how to communicate and market healthy lakeshores.
  - Maps with project locations without personally identifiable information.

EVALUATION OF RESULTS

Wisconsin's Healthy Lakes Implementation Plan and results will be evaluated annually and updated in 2017, if warranted. Best practices may be modified, removed, or added depending on the results evaluation.

Lime Lake, Portage County - Robert Korth

The following information will be collected to support an objective evaluation:

- County and lake geographic distribution and participation in Healthy Lakes projects.
- Lakeshore property owner participation in Healthy Lakes projects, including numbers and locations of best practices implemented.
- Standardized Healthy Lakes grant project deliverable report including:
  - Numbers of Fish Sticks trees and clusters.
  - Dimensional areas restored.
  - Structure/floral diversity (i.e. species richness).
  - Impervious surface area and estimated water volumes captured for infiltration.

The results may be used to model nutrient loading reductions at parcel, lake, and broader scales and to customize future self-reporting options, like plant mortality and fish and wildlife observations, for lakeshore property owners.

ACKNOWLEDGEMENTS

Amy Kowalski

L to R: Patrick Goggin, Jane Malischke, Pamela Toshner, Carroll Schaal, Tom Onofrey, Dave Ferris

Wisconsin's Healthy Lakes Implementation Plan and corresponding technical information and grant funding are the results of a collaborative and participatory team effort. We would like to thank the staff, agency, business, and citizen partners, including *Advanced Lake Leaders*, who provided feedback for our team, including the many partners who completed a customer survey and provided valuable comments during the public review of proposed DNR guidance. We would like to express our gratitude to the following contributors and information sources, respectively: Cheryl Clemens, John Haack, Dave Kafura, Amy Kowalski, Jesha LaMarche, Flory Olson, Tim Parks, Bret Shaw, Shelly Thomsen, Scott Toshner, Bone Lake Management District, Maine Lake Smart Program, and Vermont Lake Wise Program.

We appreciate your continued feedback as our Healthy Lakes initiative evolves into the future. Please contact DNR Lake Biologist Pamela Toshner (715) 635-4073 or pamela.toshner@wisconsin.gov if you have comments or questions.

Appendix F

ALUM TREATMENT INFORMATIONAL BROCHURE

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ALUM TREATMENTS TO CONTROL PHOSPHORUS IN LAKES

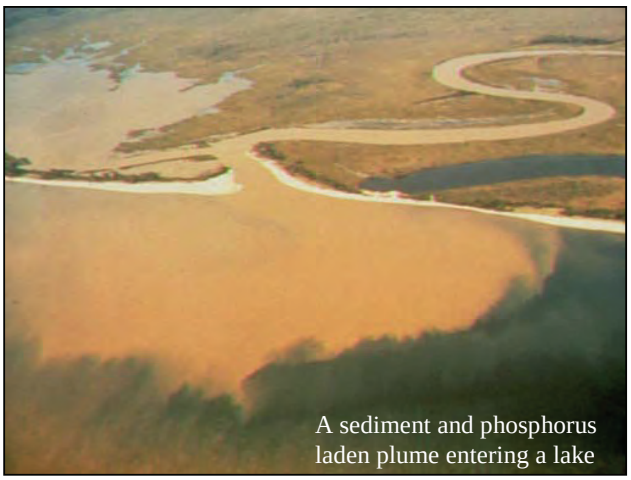
March 2003

What is alum and how does it work?

ALUM (aluminum sulfate) is a nontoxic material commonly used in water treatment plants to clarify drinking water. In lakes alum is used to reduce the amount of the nutrient **phosphorus** in the water. Reducing phosphorus concentrations in lake water can have a similar clarifying effect by limiting the availability of this nutrient for algae production. Phosphorus enters the water either **externally**, from run-off or ground water, or **internally**, from the nutrient rich sediments on the bottom of the lake. Phosphorus is released from the sediments under anoxic conditions that occur when the lake stratifies and oxygen is depleted from the lower layer. Even when external sources of phosphorus have been curtailed by best management practices, the internal recycling of phosphorus can continue to support explosive algal growth. Alum is used primarily to control this internal recycling of phosphorus from the sediments of the lake bottom. On contact with water, alum forms a fluffy aluminum hydroxide precipitate called **floc**. Aluminum hydroxide (the principle ingredient in common antacids such as Maalox) binds with phosphorus to form an aluminum phosphate compound. This compound is insoluble in water under most conditions so the phosphorus in it can no longer be used as food by algae organisms. As the floc slowly settles, some phosphorus is removed from the water. The floc also tends to collect suspended particles in the water and carry them down to the bottom, leaving the lake noticeably clearer. On the bottom of the lake the floc forms a layer that acts as a phosphorus barrier by combining with phosphorus as it is released from the sediments.

Why treat a lake with alum?

Increased nutrient loading, particularly phosphorus has accelerated eutrophication of lakes and consequently reduced their ecological health and recreational value. Frequent and pervasive algal blooms, low water transparency, noxious odors, depletion of dissolved oxygen, and fish kills frequently accompany cultural eutrophication. External sources of phosphorus delivered in run-off from the watershed are often the main contributor of excessive phosphorus to lakes.



A sediment and phosphorus laden plume entering a lake

Typically, the first steps taken in a lake rehabilitation effort target the control the external sources of phosphorus and can include: encouraging the use of phosphorus free fertilizers; improving agricultural practices, reducing urban run-off; and restoring vegetation buffers around waterways.

Lake researchers have learned that lakes are very slow to recover after excessive phosphorus inputs have been eliminated. Furthermore, it's extremely difficult to achieve recovery of lake conditions without additional in-lake management. This is due to the fact that lake sediments become phosphorus rich and can deliver excessive amounts of phosphorus to the overlying water. When dissolved oxygen levels decrease in the bottom waters of the lake (anaerobic conditions), large amounts of phosphorus trapped in the bottom sediments are released into the overlying water. This process is often called **internal** nutrient loading or recycling.

Is alum toxic to aquatic life?

Some studies have been conducted to determine the toxicity of aluminum for aquatic biota. Freeman and Everhart (1971) used constant flow bioassays, to determine that concentrations of dissolved aluminum below 52 µg Al/L had no obvious effect on rainbow trout. Similar results have been observed for salmon. Cooke, et al (1978) adopted 50 mg Al/L as a safe upper limit for post-treatment dissolved aluminum concentrations. Kennedy and Cooke (1982) indicate that: Since, based on solubility, dissolved aluminum concentrations, regardless of dose, would remain below 50 µg Al/L in the pH range 5.5 to 9.0, a dose producing post treatment pH in this range could also be considered environmentally safe with respect to aluminum toxicity. Guidelines for alum application require that the ph remain with the 5.5-9.0 range.

According to Cooke et al (1993) the most detailed study of the impact of alum treatments on benthic insects was that of Narf (1990). He assessed the long term impacts on two soft water and three hardwater Wisconsin lakes. He found that benthic insect populations either increased in diversity or remained at the same diversity after treatment. The treatment of lakes with alkalinities above 75 mg/L as $CaCO_3$ are not expected to have chronic or acute effects to biota. Fish related problems associated with alum treatments have been primarily documented in soft water lakes. However, many softwater lakes have been successfully treated with alum, when the treatments are ph buffered.

Health concerns for people?

Concerns about a connection between aluminum and Alzheimer's have been debated for some time. More recent research points to a gene rather than aluminum as the cause. In addition, aluminum is found naturally in the environment. Some foods, such as tea, spinach and other leafy green vegetables, are high in aluminum. Use of aluminum cookware has not been found to contaminate food sources.

How much does an alum treatment cost?

Costs of alum application are primarily dependent on the form of alum used (wet or dry), dosage rate, area treated, equipment rental or purchase, and labor. Liquid alum has been used when large alum doses were needed. Treatment costs range from $280/acre to $700/acre ($450=approximate average) depending on the dosage requirements and costs to mobilize equipment.

How effective are alum treatments, and how long do they last?

A number of case studies have been conducted on lakes that have undergone nutrient inactivation with alum. Eugene Welch and Dennis Cooke (1995) evaluated the effectiveness and longevity of treatments on twenty one lakes across the United States. They concluded that the treatments were effective in six of the nine shallow lakes, controlling phosphorus for at least eight years on average. Applications in stratified lakes were highly effective and long lasting. Percent reduction in controlling internal phosphorus loading has been continuously above eighty percent. The study did however find that alum treatment of lakes with high external loading was not effective.

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Appendix G

BOATING ORDINANCE FOR TOWN OF WHITEWATER

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Chapter 30

PARKS AND RECREATION*

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*__Cross references__—Town water patrol, § 1-161 et seq.; law enforcement, ch. 26; snowmobiles, § 46-161 et seq.

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Sec. 30-93. Bond.

ARTICLE I. IN GENERAL

Secs. 30-1—30-29. Reserved.

ARTICLE II. WHITEWATER LAKE AND RICE LAKE*

DIVISION 1. GENERALLY

Sec. 30-30. Applicability and enforcement.

The provisions of this article shall apply to the waters of Whitewater Lake and adjoining channels and lying within the corporate limits of the Towns of Richmond and Whitewater, Walworth County, Wisconsin. The provisions of this article shall be enforced under the jurisdiction of the Town of Richmond and Whitewater, Walworth County, Wisconsin.
(Ord. of 4-11-01, art. I-A; Ord. No. 031010, § 5, 3-10-10)

Sec. 30-31. State boating and water safety laws adopted.

The statutory provisions describing and defining regulations with respect to water traffic, boats, boating and related water activities in the following enumerated sections of the Wisconsin Statutes, exclusive of any provisions therein relating to the penalties to be imposed or the punishment for violation of the statutes, are hereby adopted and by reference made a part of this article as if fully set forth. Any act required to be performed or prohibited by the provisions of the statutes incorporated by reference in this article is required or prohibited by this article as follows:

30.51(1)	Operate boat without valid certificate of number
30.51(1)	Give permission to operate boat without valid certificate of number
30.523(1)	Fail to have certificate of number on boat
30.523(2) or (3)	Failure to display registration number or decal on boat
30.549(1)	Fail to transfer certificate of number or title
30.549(2)	Fail of purchaser to apply for registration or title
30.55(1)	Fail to notify of abandonment or destruction of boat
30.55(2)	Fail to notify of change of address
30.61	Operate boat between sunset and sunrise without required lights
30.61(6)(a)	Moored boats and structures beyond 200 feet from shore without lights
30.61(10)	Operate a personal watercraft from sunset to sunrise
30.62(1)	Operate without proper equipment

*__Editor's note__—Ordinances adopted April 11, 2001, and April 14, 2004, amended art. II to read as herein set out. Former art. II, §§ 30-31—30-35, 30-56—30-60, 30-76—30-86, and 30-101—30-109, pertained to boating, and were derived from Ord. No. 20, adopted Aug. 14, 1973; Ord. No. 7WR, §§ I-A, II, III, VII, XI, and XII, adopted May 10, 1976; Ord. No. 7WRA, §§ II—VI, VIII—XI, XIA, XIB, and XII, adopted July 11, 1983; Ord. No. 24, §§ 2—10, adopted June 21, 1984; and Res. No. 873, adopted Dec. 9, 1987.

30.62(2)	Operate without proper muffler or in excess of maximum noise levels
30.62(3)	Failure to provide proper number of personal floatation devices (PFD)
30.62(3)(b)	Fail to wear a PFD on a personal watercraft
30.62(3m)	Required safety devices
30.62(4)	Failure to have required fire extinguishing equipment aboard
30.635	Operate at speed greater than slow-no-wake on lakes 50 acres or less
30.64(2)	Reducing speed and yielding right-of-way to patrol boats
30.64(3)	Fail to stop for officer
30.65(1)(a)	Improper passing when meeting "head to head"
30.65(1)(b)	Failure to yield right-of-way
30.65(1)(d)	Failure to yield right-of-way to sailboat or rowboat
30.65(1)(e)	Failure to yield right-of-way when overtaking or passing
30.65(1)(f)	Duty of boat granted right-of-way
30.66(1)	Unreasonable or imprudent speed
30.66(2)	Operate at speed in excess of posted notice
30.66(3)	Operate motorboat within 100 feet of dock, raft or pier at a speed in excess of slow-no-wake speed
30.66(3)(b)	Operate a PWC greater than slow-no-wake speed within 100 feet of another boat
30.67	Duty to report accidents
30.67(1)	Fail to render aid at boating accident
30.675	Falsifying distress signal
30.68(2)	Negligent operation
30.68(3)	Operation by incapacitated person or minor
30.68(4)	Creating hazardous wake or wash
30.68(4m)	Facing backward while operating a PWC
30.68(5)	Operating in circular course
30.68(5m)	Creating wake while towing with a PWC
30.68(6)	Riding on decks or gunwales
30.68(7)	Restricted areas
30.68(8)	Anchoring in traffic lanes
30.68(8m)	Illegal mooring buoys (Daily)
30.68(9)	Overloading
30.68(11)	Unnecessary sounding whistles
30.68(12)	Molesting or destroying aids to navigation and regulatory markers
30.681(1)(a)	Operate a motorboat while intoxicated
30.681(1)(b)	Operate motorboat with alcohol concentration above 0.10 percent
30.681(2)	Cause injury by intoxicated operation of motorboat
30.684(5)	Refusal to take chemical test, intoxicated motorboat operation
30.69(1)(a)	Operating boat towing water skier without observer
30.69(1)(a)	Operating boat towing water skier between sunset and sunrise

30.69(1m)(c)	Operate a personal watercraft not designed for 3 people while towing a water skier
30.69(3)	Water skiing, within 100 feet of restricted area
30.69(3)(b)	Water skiing, within 100 feet of a personal watercraft
30.69(4)	Intoxicated skier or aquaplaner
30.70	Unlawfully engage in skin diving
30.71(2)	Operate boat with improperly sealed toilet
30.71(3)	Inadequate onshore disposal facilities

(Ord. of 4-11-01, art. I-A)

Sec. 30-32. Forfeitures and deposits.

Forfeitures or violation of any of the above provisions shall be assessed in accordance with W.S.A. § 30.80.
(Ord. of 4-11-01, art. I-A)

Secs. 30-33—30-55. Reserved.

DIVISION 2. ADDITIONAL REGULATIONS

Sec. 30-56. Intent.

It is the intent of this division to provide free access to Whitewater and Rice Lakes for all users and further provide safe and healthful conditions for the enjoyment of aquatic recreation consistent with public needs and the capacity of the water resource. To this end, the Towns of Whitewater and Richmond set forth the additional provisions set out in this division.
(Ord. of 4-11-01, art. I-A)

Sec. 30-57. Applicability and enforcement.

(a) This division shall apply to the waters of Rice Lake and Whitewater Lake lying within the corporate limits of the Towns of Whitewater and Richmond. The provisions of this division shall be enforced under the jurisdiction of the towns.

(b) Officers patrolling the waters may stop and board any boat for the purpose of enforcing W.S.A. §§ 30.50 to 30.80, and for conducting search and rescue operations, if the officers have reasonable cause to believe there is a violation of the sections, rules or ordinances or the stopping and boarding of any boat is essential to conduct a search and rescue operation.
(Ord. of 4-11-01, art. I-A; Ord. No. 031010, § 5, 3-10-10)

Sec. 30-58. Traffic lane.

(a) A traffic lane is hereby established embracing the surface of Rice and Whitewater Lakes, Walworth County, Wisconsin, in their entirety, excepting therefrom that portion of the waters thereof lying between the shoreline and a line parallel to 150 feet distant from the

shoreline, and excepting therefrom the northwest, northeast and southwest bays. These exceptions are designated "slow-no wake" areas. All channels shall be deemed "slow-no wake" areas.

(b) No pier shall extend further into the lakes from the shoreline than 50 feet, no raft shall be anchored or moored where it extends into a traffic lane, no private buoy shall be located in a traffic lane, and no boat shall be moored where it can drift into a traffic lane. All provisions of this section shall be consistent with W.S.A. § 30.13.
(Ord. of 4-11-01, art. I-A)

Sec. 30-59. Water skiing.

(a) *Prohibited at certain times; exceptions.*

(1) Except as provided in subsection (a)(2) of this section, no person may operate a motorboat towing a person on water skis, aquaplane or similar device unless there is in the boat a competent person in addition to the operator in a position to observe the progress of the person being towed. An observer shall be considered competent if they in fact can observe such person being towed and relay any signals to the operator. This observer requirement does not apply to motorboats classified as class A motorboats by the department actually operated by the person being towed and so constructed as to be incapable of carrying the operator in or on the motorboat. No person shall operate a boat for the purpose of towing a water skier or engage in water skiing except between the hours of 9:00 a.m. and 7:00 p.m., or sunset, whichever is earlier, Friday, Saturday, holidays, and the day preceding a holiday. Water skiing and boat wakes are permitted Sunday, Monday, Tuesday, Wednesday and Thursday from 9:00 a.m. to sunset, except if one of these days would be a legal holiday or the day preceding a holiday.

(2) Subsection (a)(1) of this section does not apply to duly authorized water ski tournaments, competitions, exhibitions or trials therefor, where adequate lighting is provided.

(b) *Careful and prudent operation.* A person operating a motorboat having in tow a person on water skis, aquaplane or similar device shall operate such a boat in a careful and prudent manner and at a reasonable distance from the persons and property so as not to endanger the life or property of any person.

(c) *Restriction.* No boat towing persons engaged in water skiing, aquaplaning or similar activity on any lake shall engage in such activity within 100 feet of any occupied anchored boat or marked swimming area or public boat landing except where pickup and drop are established and marked with regulatory markers.

(d) *Tow lines.* There shall be no more than two tow lines and only two persons using the tow lines as a means of water skiing or similar sport. The persons being towed must be equipped with a coast guard approved personal flotation device. No tow line shall exceed 75 feet in length.

(e) *Observance of rules.* Any boat engaged in towing a person or water skis, aquaplane or similar device must conform to all sections of this division and, in addition must operate in a counterclockwise pattern on both lakes and inlet and outlet in the traffic lane.

(f) *Towed or untowed flight banned.* No water skier behind any boat will be permitted to be lifted into the air by any means including parasailing, hang gliding or other means, whether the tow remains in place or not, after the skier is aloft.

(g) *Authority to conduct tournaments.* To become duly authorized to conduct water ski tournaments, competitions, exhibitions or trials, the applicant must do the following:

(1) Appear before the Town Boards of Richmond and Whitewater with a practice and show schedule and present a plan with all dates and times including the length of each event, before the stare of the season, or not less than 30 days in advance of a single event. Both town boards will be required to approve and authorize any practice and show schedule.

(2) Have a parking plan as to handle the parking of vehicles the event participants and the spectators.

(3) Have a commitment from an insurance company for liability insurance that indemnifies and holds harmless the Towns of Richmond and Whitewater in an amount as directed by each board.

(4) Have in place a representative living in Walworth County who can be contacted at any time during the water ski season regarding any problems by either the Town of Whitewater or Richmond, as related to water ski tournaments, competitions, exhibitions or trials, parking, insurance, zoning, noise or the equipment used in that activity. The applicant shall also present a listing of the names addresses and phone numbers of all officers or managers of the organization that is applying to conduct water ski tournaments, competitions, exhibitions or trial.

(5) At the appearance before the town boards the applicant for authorization should be prepared to answer questions related to the zoning of the property that is proposed for the water ski tournaments, competitions, exhibitions or trials, and have in writing a signed document from any land owner, where the event is proposed, that they have authorized the use of the property for that purpose. The board may direct that authorization be obtained from adjacent landowners before the event is authorized.

(6) The authorization granted by the town's for water ski tournaments, competitions, exhibitions or trials is conditional upon performance of all items as stated above, and additional conditions as may be imposed by each board, and is not a license.

(Ord. of 4-11-01, art. I-A; Ord. of 4-14-04, § 1)

Sec. 30-60. Speed restrictions.

(a) All boats shall operate at a slow-no wake speed after 7:00 p.m. or sunset, whichever is earlier, on Fridays, Saturdays, holidays and the day preceding a holiday, to 9:00 a.m. the following day. All other days, water skiing will be permitted from 9:00 a.m. until sunset. The maximum speed outside the traffic lane shall be "slow-no wake" at all times every day of the week.

(b) The provisions in subsection (a) shall not apply to boats participating in duly authorized races, water ski tournaments or exhibitions, or over a course laid out, plainly marked and adequately patrolled.

(c) In the event the water level on Whitewater Lake exceeds an elevation of 892.56 feet above sea level, which is the same as 1.60 feet on the ruler bolted to the left upstream wall of the dam at the northerly end of Whitewater Lake, or in the event of a catastrophe, disaster, riot or civil commotion upon the waters of either Whitewater or Rice Lake, which impair transportation, medical services, fire, health or police protection on the waters, either the Town Chairperson of the Town of Whitewater or the Town Board of the Town of Whitewater can declare an emergency and impose upon the entire body or bodies of waters of either Whitewater or Rice Lakes a "slow-no-wake" speed restriction on watercraft operating on the waters of the lake or lakes, to last until the waters recede below 1.60 feet on the ruler, or until the particular emergency situation is resolved.

(d) On top of this dam there is a Wisconsin Railroad Commission metal circular benchmark, set at 895.63 feet above sea level. The top of the ruler bolted to the left upstream wall of the dam is 1.33 feet below the benchmark. 1.60 feet on the ruler is 1.74 feet below the top of the ruler.

(e) "Slow-no-wake" is the speed at which a boat moves as slowly as possible while still maintaining steerage control.

(f) The slow-no-wake restriction will be posted at all public watercraft access locations on Whitewater and Rice Lakes when in effect.
(Ord. of 4-11-01, art. I-A; Ord. No. 051408, 5-14-08)

Sec. 30-61. Swimming regulations.

(a) Swimming from boats prohibited. No person shall swim from any boat unless such boat is anchored and unless the swimmers stay within 25 feet of the boat. Boats used as bases for swimmers shall be adequately supplied with coast guard approved flotation devices to be used in emergencies.

(b) No person shall swim more than 150 feet from the shore, nor shall any person do any distance swimming unless he or she is accompanied by a boat containing a ring buoy or coast guard approved personal flotation device and person trained in life saving technique. For this type of swimming, if there be more than one swimmer, each shall be accompanied by a boat. No person shall swim in a traffic lane from sunset to sunrise.
(Ord. of 4-11-01, art. I-A)

Sec. 30-62. Aircraft prohibited.

It is hereby prohibited for any aircraft to land upon the surface of Rice or Whitewater Lakes covered by this division. The surface shall include ice as well as water. All provisions of this section shall be consistent with W.S.A. § 114.105.
(Ord. of 4-11-01, art. I-A)

Sec. 30-63. Mooring of boats.

No person, firm or corporation shall dock or moor any boat on the waters or along the shores of Rice and Whitewater Lakes for the purpose of living, sleeping or camping.
(Ord. of 4-11-01, art. I-A)

Sec. 30-64. Organized events and displays.

(a) No person, persons or corporations shall organize or participate in any event or display upon the surface of Whitewater or Rice Lakes without first obtaining a permit for such activity from the town board of the town in which the activity shall be held.

(b) Request for a permit for organized events or displays shall be presented to the town board in triplicate before the second Monday of the month preceding the event.

(c) Request for a permit shall describe the event, time of the event, and area of the lake to be used.

(d) Upon action by the proper town board, one copy of the permit shall be returned to the applicant, and one copy to be retained by the town clerk.

(e) It is unlawful for any person or persons, during an organized event or display approved by either of the town boards, to anchor any boat within the designated area for the organized event or to in any way interfere with the participants or the organized event in any manner.
(Ord. of 4-11-01, art. I-A)

Sec. 30-65. Additional traffic rules.

In addition to the foregoing, the following rules shall apply to boats using the waters of Rice and Whitewater Lakes:

(1) Mooring lights required. No person shall moor or anchor any boat, raft, buoy or other floating object or permit it to drift in the traffic lane described in section 30-58, between sunset and sunrise unless there is prominently displayed thereon a white light of sufficient size and brightness to be visible from any direction (360 degrees) for a distance of one mile on a dark night with clear atmosphere. This subsection does not apply to duly authorized water ski tournaments, competition exhibits, or displays or trials thereof where adequate lighting is provided.

(2) The drivers or operators of all boats by means of which aquaplanes, water skis or similar objects are being towed, and the riders of such aquaplanes, water skis or similar objects, must conform to the same rules and clearances as provided for in this division.

(Ord. of 4-11-01, art. I-A)

Sec. 30-66. Forfeitures.

Any person who shall violate the provisions of division 2 [sections 30-56—30-65] shall forfeit not less than $10.00, nor more than $200.00, together with costs imposed by law.
(Ord. of 4-11-01, art. I-A)

Secs. 30-67—30-75. Reserved.

DIVISION 3. LAKE ACCESSES

Sec. 30-76. Intent.

It is the intent of this division to provide for safe public use of the accesses held in trust by the Towns of Whitewater and Richmond, Walworth County, Wisconsin and to preserve the natural resources in these areas.
(Ord. of 4-11-01, art. I-A)

Sec. 30-77. Citations.

Citations for violations of any of the following provisions shall follow the procedure listed in W.S.A. §§ 66.119 and 66.12. Cash deposit for violation shall be a minimum of $35.00 for the first violation and shall not exceed $200.00 for succeeding offenses.
(Ord. of 4-11-01, art. I-A)

Sec. 30-78. Improvements on accesses.

As provided in W.S.A. § 236.16, nothing in this division shall require either of the towns to improve the land provided for public access.
(Ord. of 4-11-01, art. I-A)

Sec. 30-79. General use of accesses.

The general public may use the accesses for getting fishing, boating and recreational equipment to the lake on those accesses where terrain and soil conditions make possible safe and reasonable movement of such equipment from the nearest public highway to the lake. No use of the lake access that is in violation of state, federal or county statutes shall be permitted.
(Ord. of 4-11-01, art. I-A)

Sec. 30-80. Special uses of accesses.

Special uses of the lake accesses shall include, but not be limited to: Research groups, weed harvesting and chemical treatment operators, sea wall construction operators, heavy equipment operators.
(Ord. of 4-11-01, art. I-A)

Sec. 30-81. Special use permits.

(a) Special use operators shall file with the town clerk in which the work is to be done an application for a special lake access use permit. Such application shall describe the date of the beginning and ending of the operation, the special equipment to be used, provisions for public safety provided, evidence of liability insurance adequate to cover all possible accidents or damage to other persons, equipment or to terrain or vegetation on the access, provision for restoring the access to its condition at the start of the operation, evidence of state, county or federal permits required, an agreement to cease operation and remove equipment within 48 hours of an order of that town board, and the nature of and length of time any materials will be stored on the access. That town board may require a bond to be posted by the applicant for possible costs in restoring the site to its condition prior to the special use. The town may require the applicant to sign a statement freeing the town from liability to other users while the special use is in progress or as a result of that special use.

(b) The town board in which the work is to be done shall, in open meeting, review the application for special use of the access or accesses. That town board shall approve or disapprove the application. In the event of approval, the town board will designate which access or accesses may be used, the time of each use and shall direct the clerk to issue the permit. This permit must be displayed on the access or accesses while the work is in progress. As the work progresses, the town board may inspect or cause to be inspected, the operation. If upon inspection the operation is not deemed to be in the public interest or violates any town ordinance or any of the terms or conditions of the permit, it may require the operator to cease and desist in the operation and restore the access or accesses to the condition that existed at the start of the operation. The board may require the operator to surrender his permit for the operation.
(Ord. of 4-11-01, art. I-A)

Sec. 30-82. Parking on accesses.

(a) Parking shall be permitted on the access in designated areas only between the hours of 6:00 a.m. to 11:00 p.m. If parking areas are not designated, all parking shall be done in such a manner that the public may have unimpeded access to the lake at all times. The town boards, in their respective jurisdiction, may designate no parking areas when such areas are in the best public interest. Stopping or standing a vehicle on the access shall be only for short periods of time and shall be done in a sharing manner with other access users.

(b) Any person who shall violate the provisions of this section, if a sign stating the parking rule for that access has been posted by the town board, shall forfeit not less than $10.00, nor more than $200.00, together with costs imposed by law.
(Ord. of 4-11-01, art. I-A; Ord. of 4-14-04, § 2)

Sec. 30-83. Storage of items on lake accesses.

(a) Storage of any material or materials, equipment, weeds or bog material shall be for a minimal length of time. Any storage shall be allowed only after a special use permit has been issued to the person or persons needing to store materials on the access in order to perform

lake-oriented services. Such permit shall be for the shortest possible storage period. Materials stored on the lake accesses shall be only of those materials necessary for lake projects such as, but not limited to, weed harvesting, bog removal, chemicals for authorized treatment of aquatic nuisances, materials for erosion and eutrophication control, and navigation and traffic control devices and research equipment.

(b) Any person who shall violate the provisions of this section, shall forfeit not less that $10.00, nor more than $200.00, together with costs imposed by law.
(Ord. of 4-11-01, art. I-A; Ord. of 4-14-04, § 3)

Sec. 30-84. Alteration and encroachment of accesses.

(a) No person shall alter the natural terrain of the access by drainage, planting or cultivating vegetation without special permit issued by the town board after acquiring assurance in writing from state and county agencies that such alteration is not in violation of state and county statutes and ordinances. No person shall encroach upon any access by alteration of boundaries, construction of buildings, drainage of liquids, or deposition of solid waste materials.

(b) Any person who shall violate the provisions of this section, shall forfeit not less than $10.00, nor more than $200.00, together with costs imposed by law.
(Ord. of 4-11-01, art. I-A; Ord. of 4-14-04, § 4)

DIVISION 4. TOWN ROAD ACCESS TO LAKE AREAS

Sec. 30-85. Intent of division.

It is the intent of this division to provide for safe public use of the roadways held in trust by the Towns of Whitewater and Richmond, Walworth County, Wisconsin, and to preserve the natural resources of lakes in these areas. Control of contiguous roadways and safe usage of the lakes are interrelated. Both towns have had problems with the use of piers from areas of town roads including parked vehicles, roadway obstruction, unsafe fishing activities, picnics and placement of personal property on town roads.
(Ord. of 4-14-04, § 6)

Sec. 30-86. Citations.

Citations for violations of any of the following provisions shall follow the procedure listed in W.S.A. §§ 66.119 and 66.12. Cash deposit for violation shall be a minimum of $100.00 for the first violation, $200.00 for the second violation, and $300.00 for the third and each succeeding offenses. Each day of placement of a pier or boat lift in the right-of-way or to the right-of-way is a separate violation.
(Ord. of 4-14-04, § 6)

Sec. 30-87. Piers and boat lifts in or to town roadways prohibited.

No one shall be allowed to place a pier or boat lift in the right-of-way, or connected to the right-of-way of a town road. This is applicable to town roads laid out as public highways under W.S.A. § 80.01(1), or unrecorded highways under W.S.A. § 80.01(2). This is applicable to any land accreted to a town road right-of-way that is laid out as public highways.
(Ord. of 4-14-04, § 6)

Sec. 30-88. Presumptions.

The town boards presume that the piers are being placed from town roadways at the direction and request of any owners who moor watercraft to them. Unless there is clear evidence to the contrary (i.e., that someone other than the boat owner placed the pier or lift in the roadway), the citation shall be issued to the registered owner of any boat moored to the pier or placed in the boat lift.
(Ord. of 4-14-04, § 6)

Sec. 30-89. Storage of items on lake accesses.

(a) No one shall be allowed to place any item, in a roadway contiguous to the lake, or in the right-of-way of a town road.

(b) Any person who shall violate the provisions of this section, shall forfeit not less that $10.00, nor more than $200.00, together with costs imposed by law.
(Ord. of 4-14-04, § 6)

Sec. 30-90. Parking on town roadways contiguous to lakes prohibited.

(a) Parking on either side of a roadway that is contiguous to any lake in either the Town of Richmond or the Town of Whitewater is prohibited if the roadway has been posted with no parking signs.

(b) Any person who shall violate the provisions of this section if a sign stating the parking rule for that access has been posted by the town board, shall forfeit not less than $10.00, nor more than $200.00, together with costs imposed by law.
(Ord. of 4-14-04, § 6)

DIVISION 5. ENFORCEMENT PROCEDURE*

Sec. 30-91. Citation; nature, issuance, release of accused.

(a) *Nature.* A citation under this article is a directive, issued by a law enforcement officer, that a person appear in court and answer charges. A citation is not a criminal complaint and may not be used as a substitute for a criminal complaint.

***Editor's note**—Section 5 of an ordinance adopted April 14, 2004, renumbered div. 4 as div. 5 to facilitate the inclusion of new provisions designated as div 4.

(b) *Authority to issue; effect.* A law enforcement officer may issue a citation to any person whom he or she has reasonable grounds to believe has committed a violation of any provisions of article II of this chapter. A citation may be issued in the field or at the headquarters or precinct station of the officer instead of or subsequent to a lawful arrest. If a citation is issued, the person cited shall be released on his or her own recognizance unless the law enforcement officer requires the person cited to past a bond. In determining whether to require a bond, the law enforcement officer may consider whether:

(1) The accused has given proper identification.

(2) The accused is willing to sign the citation.

(3) The accused appears to represent a danger of harm to himself or herself, another person or property.

(4) The accused can show sufficient evidence of ties to the community.

(5) The accused has previously failed to appear or failed to respond to a citation.

(6) Arrest or further detention appears necessary to carry out legitimate investigative action in accordance with law enforcement agency policies.

(c) *Contents.* The citation shall do all of the following:

(1) Identify the offense and section which the person is alleged to have violated, including the date, and if material, identify the property and other persons involved.

(2) Contain the name and address of the person cited, or other identification if that cannot be ascertained.

(3) Identify the officer issuing the citation.

(4) Direct the person cited to appear for his or her initial appearance in a designated court, at a designated time and date.

(d) *Service.* A copy of the citation shall be delivered to the person cited, and the original must be filed with the circuit court.

(e) *Citation no bar to criminal summons or warrant.* The prior issuance of a citation does not bar the issuance of a criminal summons or a warrant for the same offense, provided the citation is dismissed after the criminal summons or warrant is issued.

(f) *Preparation of form.* The judicial conference shall prescribe the form and content of the citation under W.S.A. § 758.171.
(Ord. of 4-11-01, art. I-A)

Sec. 30-92. Failure of defendant to appear.

(a) If the person so arrested for violation of this article and released fails to appear personally or by an authorized attorney or agent before the court at the time fixed for the hearing, the money deposited by the accused pursuant to the provisions of this article shall be retained and used for the payment of the forfeiture, which forfeiture may be imposed either

with or without cost as determined by the court after the ex parte hearing upon the accused. The excess, if any, shall be returned to the person who makes the deposit upon his making application for the same. If the accused is found not guilty, then the entire amount of the deposit shall be returned to the depositor.

(b) Any person violating any of the terms of this article shall be subject to arrest whether at the time of the arrest he is on the waterways or upon the shore, and any water patrol office may pursue the offender ashore to enforce the terms of this article.
(Ord. of 4-11-01, art. I-A)

Sec. 30-93. Bond.

The law enforcement officer or any town police officer may accept money or bond deposits from any person charged with a violation of this article, and upon receipt of the bond shall issue a receipt for the bond received to the person. The law enforcement officer or town police officer or the county court shall deliver forfeited bond deposits to the town treasurer upon order of the county court and within seven days after the court issues the order.
(Ord. of 4-11-01, art. I-A)

(d) *Tow lines.* There shall be no more than two tow lines and only two persons using the tow lines as a means of water skiing or similar sport. The persons being towed must be equipped with a Coast Guard approved personal flotation device. No tow line shall exceed 75 feet in length.

(e) *Observance of rules.* Any boat engaged in towing a person on water skis, aquaplane or similar device must conform to all sections of this division and, in addition must operate in a counterclockwise pattern on both lakes and inlet and outlet in the traffic lane.

(f) *Towed or untowed flight banned.* No water skier behind any boat will be permitted to be lifted into the air by any means including parasailing, hang gliding or other means, whether the tow remains in place or not, after the skier is aloft.
(Ord. No. 7WRA, § IV, 7-11-83)

Sec. 30-80. Speed restrictions.

(a) All boats shall operate at a slow—no wake speed, from 7:00 p.m. or sunset, whichever is earlier, on Fridays, Saturdays and holidays, to 9:00 a.m. the following day. All other days, water skiing will be permitted from 9:00 a.m. until sunset. The maximum speed outside the traffic lane shall be "slow—no wake" at all times every day of the week.

(b) The provisions in subsection (a) shall not apply to boats participating in duly authorized races, water ski tournaments or exhibitions, or over a course laid out, plainly marked and adequately patrolled.
(Ord. No. 7WRA, § V, 7-11-83)

Sec. 30-81. Swimming regulations.

(a) Swimming from boats prohibited. No person shall swim from any boat unless such boat is anchored and unless the swimmers stay within 25 feet of the boat. Boats used as bases for swimmers shall be adequately supplied with Coast Guard approved flotation devices to be used in emergencies.

(b) No person shall swim more than 150 feet from the shore nor shall any person do any distance swimming unless he or she is accompanied by a boat containing a ring buoy or Coast Guard approved personal flotation device and person trained in life saving technique. For this type of swimming, if there be more than one swimmer, each shall be accompanied by a boat. No person shall swim in a traffic lane from sunset to sunrise.
(Ord. No. 7WRA, § VI, 7-11-83)

Sec. 30-82. Aircraft prohibited.

It is hereby prohibited for any aircraft to land upon the surface of Rice Lake covered by this division. The surface shall include ice as well as water. All provisions of this section shall be consistent with W.S.A. § 114.105.
(Ord. No. 7WRA, § VII, 7-11-83)

Sec. 30-83. Mooring of boats.

No person, firm or corporation shall dock or moor any boat on the waters or along the shores of Rice Lake, Walworth County, Wisconsin, for the purpose of living, sleeping or camping.
(Ord. No. 7WRA, § VIII, 7-11-83)

Sec. 30-84. Organized events and displays.

(a) No person, persons or corporations shall organize or participate in any event or display upon the surface of Rice Lake without first obtaining a permit for such activity from the town board of the Town of Whitewater, Walworth County, Wisconsin.

(b) Request for a permit for organized events or displays shall be presented to the town board of Whitewater in triplicate before the second Monday of the month preceding the event.

(c) Request for a permit shall describe the event, time of the event, and area of the lake to be used.

(d) Upon action by the town board of Whitewater, one copy of the permit shall be returned to the applicant, and one copy to the water safety patrol or law enforcement officer designated by the town board, and one copy to be retained by the town clerk.

(e) It is unlawful for any person, persons or corporations during an organized event or display approved by the town board of Whitewater to anchor any boat within the designated area for the organized event or to in any way interfere with the participants or the organized event in any manner.
(Ord. No. 7WRA, § IX, 7-11-83)

Sec. 30-85. Additional traffic rules.

In addition to the traffic rules in W.S.A. § 30.65 adopted in section 30-31 the following rules shall apply to boats using the waters covered by this division:

(1) Mooring lights required. No person shall moor or anchor any boat, raft, buoy or other floating object or permit it to drift in the traffic lane described in section 30-31 between sunset and sunrise unless there is prominently displayed thereon a white light of sufficient size and brightness to be visible from any direction (360 degrees) for a distance of one mile on a dark night with clear atmosphere. This subsection does not apply to duly authorized water ski tournaments, competition exhibits, or displays or trials thereof where adequate lighting is provided.

(2) The drivers or operators of all boats by means of which aquaplanes, water skis or similar objects are being towed, and the riders of such aquaplanes, water skis or similar objects, must conform to the same rules and clearances as provided for in this division.

(Ord. No. 7WRA, § X, 7-11-83)

Sec. 30-86. Forfeitures and deposits.

Forfeitures for violation of any part or parts of this division shall be assessed in accordance with W.S.A. § 30.80.
(Ord. No. 7WRA, § XIA, 7-11-83)

Secs. 30-87—30-100. Reserved.

DIVISION 4. LAKE ACCESSES

Sec. 30-101. Intent.

It is the intent of this division to provide for safe public use of the accesses held in trust by the Town of Whitewater, Walworth County, Wisconsin and to preserve the natural resources in these areas.
(Ord. No. 24, § 2, 6-21-84)

Sec. 30-102. Penalties.

Citations for violations of this division shall follow the procedure listed in W.S.A. §§ 66.119 and 66.12. Cash deposit for violation shall be a minimum of $35.00 for the first violation and shall not exceed $200.00 for succeeding offenses.
(Ord. No. 24, § 10, 6-21-84)

Sec. 30-103. Improvements.

As provided in W.S.A. § 236.16, nothing in this division shall require the Town of Whitewater, Walworth County, Wisconsin to improve the land provided for public access.
(Ord. No. 24, § 3, 6-21-84)

Sec. 30-104. General use.

The general public may use the accesses for getting fishing, boating and recreational equipment to the lake on those accesses where terrain and soil conditions make possible safe and reasonable movement of such equipment from the nearest public highway to the lake. No use of the lake access that is in violation of state, federal or county statutes shall be permitted.
(Ord. No. 24, § 4, 6-21-84)

Sec. 30-105. Special uses.

Special uses of the lake accesses shall include but not be limited to: research groups, weed harvesting and chemical treatment operators, sea wall construction operators, heavy equipment operators.
(Ord. No. 24, § 5, 6-21-84)

Sec. 30-106. Special use permits.

(a) Special use operators shall file with the town clerk an application for a special lake accesses use permit. Such application shall describe the date of the beginning and ending of the operation, the special equipment to be used, provisions for public safety provided, evidence of liability insurance adequate to cover all possible accidents or damage to other persons, equipment or to terrain or vegetation on the access, provision for restoring the access to its condition at the start of the operation, evidence of state, county or federal permits required, an agreement to cease operation and remove equipment within 48 hours of an order of the town board, and the nature of and length of time any materials will be stored on the access. The town board may require a bond to be posted by the applicant for possible costs in restoring the site to its condition prior to the special use. The town may require the applicant to sign a statement freeing the town from liability to other users while the special use is in progress or as a result of that special use.

(b) The town board in open meeting shall review the application for special use of the access or accesses. The town board shall approve or disapprove the application. In the event of approval, the town board will designate which access or accesses may be used, the time of each use and shall direct the clerk to issue the permit. This permit must be displayed on the access or accesses while the work is in progress. As the work progresses, the town board may inspect or cause to be inspected, the operation. If upon inspection the operation is not deemed to be in the public interest or violates any town ordinance or any of the terms or conditions of the

permit, it may require the operator to cease and desist in the operation and restore the access or accesses to the condition that existed at the start of the operation. The board may require the operator to surrender his permit for the operation.
(Ord. No. 24, § 6, 6-21-84)

Sec. 30-107. Parking.

Parking shall be permitted on the access in designated areas only between the hours of 6:00 a.m. to 11:00 p.m. If parking areas are not designated, all parking shall be done in such a manner that the public may have unimpeded access to the lake at all times. The town may designate no parking areas when such areas are in the best public interest. Stopping or standing a vehicle on the access shall be only for short periods of time and shall be done in a sharing manner with other access users.
(Ord. No. 24, § 7, 6-21-84)

Sec. 30-108. Storage.

Storage of any material or materials, equipment, weeds or bog material shall be for a minimal length of time. Any storage shall be allowed only after a special use permit has been issued to the person or persons needing to store materials on the access in order to perform lake-oriented services. Such permit shall be for the shortest possible storage period. Materials stored on the lake accesses shall be only of those materials necessary for lake projects such as, but not limited to, weed harvesting, bog removal, chemicals for authorized treatment of aquatic nuisances, materials for erosion and eutrophication control, and navigation and traffic control devices and research equipment.
(Ord. No. 24, § 8, 6-21-84)

Sec. 30-109. Alteration and encroachment.

No person shall alter the natural terrain of the access by drainage, planting or cultivating vegetation without special permit issued by the town board after acquiring assurance in writing from state and county agencies that such alteration is not in violation of state and county statutes and ordinances. No person shall encroach upon any access by alteration of boundaries, construction of buildings, drainage of liquids, or deposition of solid waste materials.
(Ord. No. 24, § 9, 6-21-84)

ORDINANCE NO. 041404

AN ORDINANCE AMENDING THE WHITEWATER AND RICE LAKE ORDINANCE

The Town Board of the Town of Whitewater, Walworth County, Wisconsin Ordains That:

Section 1.

Sec. 30-59. Water Skiing is hereby amended by adding paragraphs (g) (1) – (6), as follows:

(g) To become duly authorized to conduct water ski tournaments, competitions, exhibitions or trials, the applicant must do the following:

(1) Appear before the Town Boards of Richmond and Whitewater with a practice and show schedule and present a plan with all dates and times including the length of each event, before the stare of the season, or not less than 30 days in advance of a single event. Both Town Boards will be required to approve and authorize any practice and show schedule.

(2) Have a parking plan as to handle the parking of vehicles the event participants and the spectators.

(3) Have a commitment from an insurance company for liability insurance that indemnifies and holds harmless the Towns of Richmond and Whitewater in an amount as directed by each Board.

(4) Have in place a representative living in Walworth County who can be contacted at any time during the water ski season regarding any problems by either the Town of Whitewater or Richmond, as related to water ski tournaments, competitions, exhibitions or trials, parking, insurance, zoning, noise or the equipment used in that activity. The applicant shall also present a listing of the names addresses and phone numbers of all officers or managers of the organization that is applying to conduct water ski tournaments, competitions, exhibitions or trial.

(5) At the appearance before the Town Boards the applicant for authorization should be prepared to answer questions related to the zoning of the property that is proposed for the water ski tournaments, competitions, exhibitions or trials, and have in writing a signed document from any land owner, where the event is proposed, that they have authorized the use of the property for that purpose. The Board may direct that authorization be obtained from adjacent land owners before the event is authorized.

(6) The authorization granted by the Town's for water ski tournaments, competitions, exhibitions or trials is conditional upon performance of all items as stated above, and additional conditions as may be imposed by each Board, and is not a license.

Section 2.

Sec. 30-82. Parking on accesses is hereby amended by adding the following paragraph:

Any person who shall violate the provisions of this ordinance, if a sign stating the parking rule for that access has been posted by the Town Board, shall forfeit not less than $10.00 nor more than $200.00, together with costs imposed by law.

Section 3.

Sec. 30-83. Storage of items on lake accesses is hereby amended by adding the following paragraph:

Any person who shall violate the provisions of this ordinance, shall forfeit not less that $10.00 nor more than $200.00, together with costs imposed by law.

Section 4.

Sec. 30-84. Alternate and encroachment of accesses is hereby amended by adding the following paragraph:

Any person who shall violate the provisions of this ordinance, shall forfeit not less than $10.00 nor more than $200.00, together with costs imposed by law.

Section 5.

DIVISION 4. PROCEDURE, consisting of sections 30-91 - 30-93 is hereby re-numbered to "DIVISION 5."

Section 6.

DIVISION 4. TOWN ROAD ACCESS TO LAKE AREAS
is hereby added to the ordinance, as follows:

"DIVISION 4. TOWN ROAD ACCESS TO LAKE AREAS

Sec. 30-85. Intent.

It is the intent of the division to provide for safe public use of the roadways held in trust by the Town of Whitewater and Richmond, Walworth County, Wisconsin and to preserve the natural resources of lakes in these areas. Control of contiguous roadways and safe usage of the Lakes are interrelated. Both Towns have had problems with the use of piers from areas of Town

Roads including parked vehicles, roadway obstruction, unsafe fishing activities, picnics and placement of personal property on Town Roads.

Sec. 30-86. Citations.

Citations for violations of any of the following provisions shall follow the procedure listed in W.S.A. §§ 66.119 and 66.12. Cash deposit for violation shall be a minimum of $100.00 for the first violation, $200.00 for the second violation, and $300.00 for the third and each succeeding offenses. Each day of placement of a pier or boat lift in the right of way or to the right of way is a separate violation.

Sec. 30-87. Piers & Boat Lifts in or to Town Roadways Prohibited.

No one shall be allowed to place a pier or boat lift in the right of way, or connected to the right of way of a Town Road. This is applicable to Town Roads laid out as public highways under W.S.A. §80.01 (1) or unrecorded highways under W.S.A. §80.01 (2). This is applicable to any land accreted to a town road right of way that is laid out as public highways.

Sec. 30-88. Presumptions.

The Town Boards presume that the piers are being placed from Town roadways at the direction and request of any owners who moor watercraft to them. Unless there is clear evidence to the contrary (i.e that someone other than the boat owner placed the pier or lift in the roadway), the citation shall be issued to the registered owner of any boat moored to the pier or placed in the boat lift.

Sec. 30-89. Storage of items on lake accesses.

No one shall be allowed to place any item, in a roadway contiguous to the lake, or in the right of way of a Town Road.

Any person who shall violate the provisions of this ordinance, shall forfeit not less that $10.00 nor more than $200.00, together with costs imposed by law.

Sec. 30-90. Parking on Town Roadways contiguous to Lakes prohibited.

Parking on either side of a roadway that is contiguous to any lake in either the Town of Richmond or the Town of Whitewater is prohibited if the roadway has been posted with no parking signs.

Any person who shall violate the provisions of this ordinance if a sign stating the parking rule for that access has been posted by the Town Board, shall forfeit not less than $10.00 nor more than $200.00, together with costs imposed by law.

Section 7.

Except as modified above, the Whitewater and Rice Lake Ordinance shall remain unchanged.

Section 8.

Effective Date. This Ordinance shall be effective on April 14, 2004, upon passage and publication as provided by law.

Adopted this 14th day of April, 2004.

Ronald Fero, Chairman

Norman Prusener, Supervisor

Ralph Goessling, Supervisor

Attest:
Jayne Haskey, Town Clerk

AMENDED ORDINANCE NO. 042215

WHITEWATER-RICE LAKES BOAT LAUNCH ORDINANCE

The Town Board of the Town of Whitewater, Walworth County, Wisconsin, hereby approves amended Ordinance No. 042215, the Whitewater-Rice Lakes Boat Launch Ordinance, and Ordains, as follows:

STATE OF WISCONSIN
Town of Whitewater,
Walworth County

SECTION I – TITLE AND PURPOSE

This ordinance is entitled the Whitewater-Rice Lakes Boat Launch Ordinance. The rules and regulations set forth in this ordinance shall apply in and are adopted for the management and control of the three public boat launch facilities in the Town of Whitewater.

SECTION II – DEFINITIONS

a. Town means the Town of Whitewater.
b. District means the Whitewater-Rice Lakes Management District.
c. Public launch facilities mean the three town launch sites:
    1. Cruse Lane
    2. RW Townline Road and Chapel Drive
    3. RW Townline Road and Krahn Drive
d. Watercraft means any device used and/or designed for navigation on the water.

SECTION III – FEES

a. The daily fee shall be $4.00 for residents of the Whitewater-Rice Lakes Management District and $6.00 for non-residents. The annual fee shall be $20.00 for residents of the Whitewater-Rice Lakes Management District and $30.00 for non-residents. (Pursuant with Wisconsin Department of Natural Resources Board Policy NR 1.91 (11) (g)).
b. The user fees posted apply to the public launch sites under the jurisdiction of the Town of Whitewater.
c. The daily fee, information on the annual pass, and reference to this ordinance shall be posted at all public launch sites.
d. Fees collected shall be used for the purpose of operating and maintaining access sites.
e. The town shall have an agreement with the district to address the collection of fees and the maintenance of the public launch sites.

SECTION IV – FORFEITURES

a. The owner and / or operator of a watercraft involved in a violation of this ordinance shall be liable for the violation. It shall be of no defense to a violation of this ordinance that the owner was not operating the watercraft at the time of violation.

b. The forfeiture associated with a citation for violating this ordinance will be $50 for the first offense and $100 for each offense thereafter.

SECTION V – LIABILITY

Users of the public launch facilities do so at their own risk and, by allowing use of the these sites, the town and district do not assume responsibility for damage to persons or property caused or contributed by use of the public launch facilities.

SECTION VII – EFFECTIVE DATE

This amended ordinance is effective on publication or posting.

The town clerk shall properly post or publish this ordinance as required under s. 60.80, Wis. stats.

Adopted this 8 day of July, 2015.

Lowell Hagen, Chair

Robert Strand, Supervisor

Norman Prusener, Supervisor

Attest: Carrie Hintz

Carrie Hintz, Town Clerk

Appendix H

MECHANICAL HARVESTING OPERATIONS WITHIN WHITEWATER LAKE

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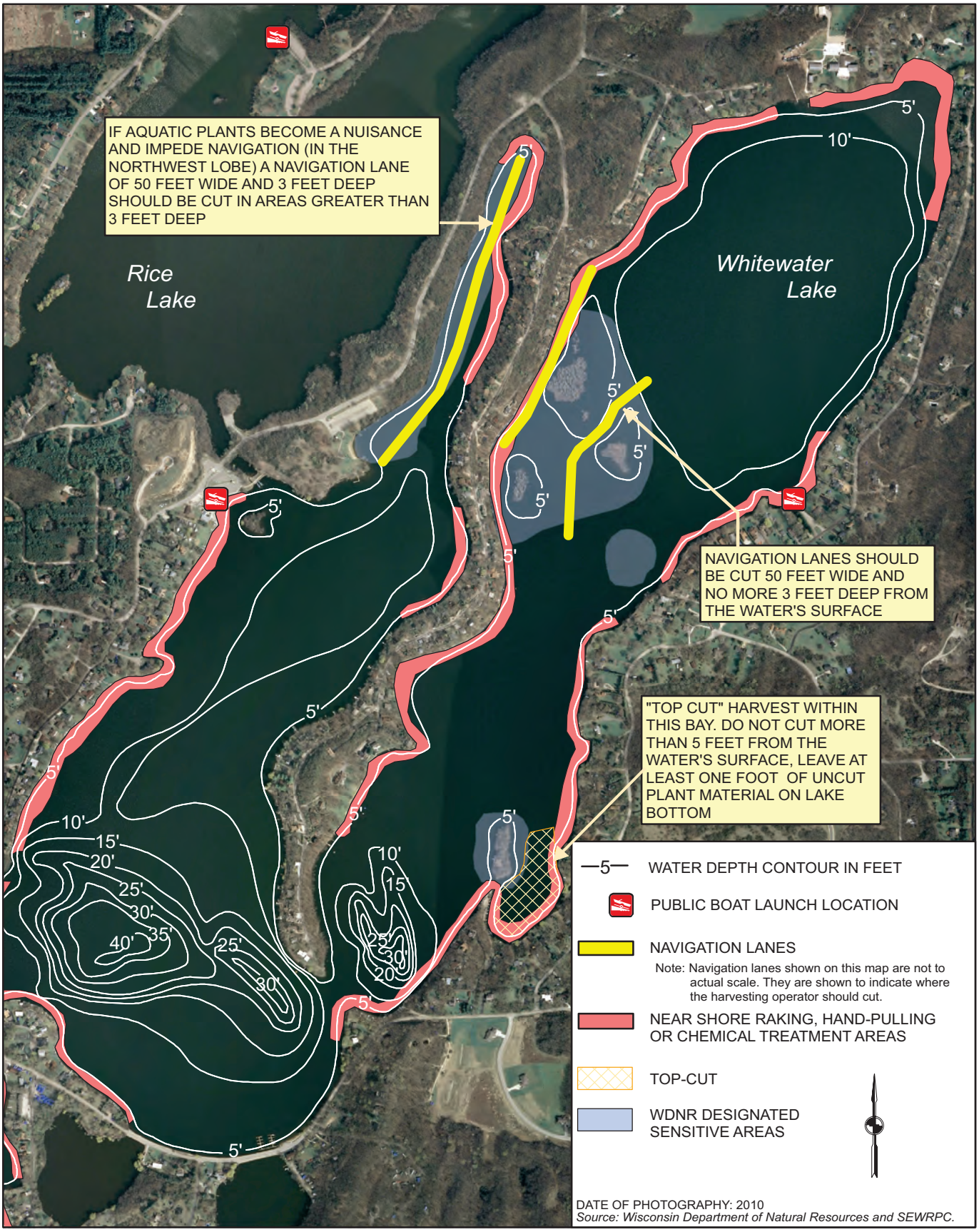
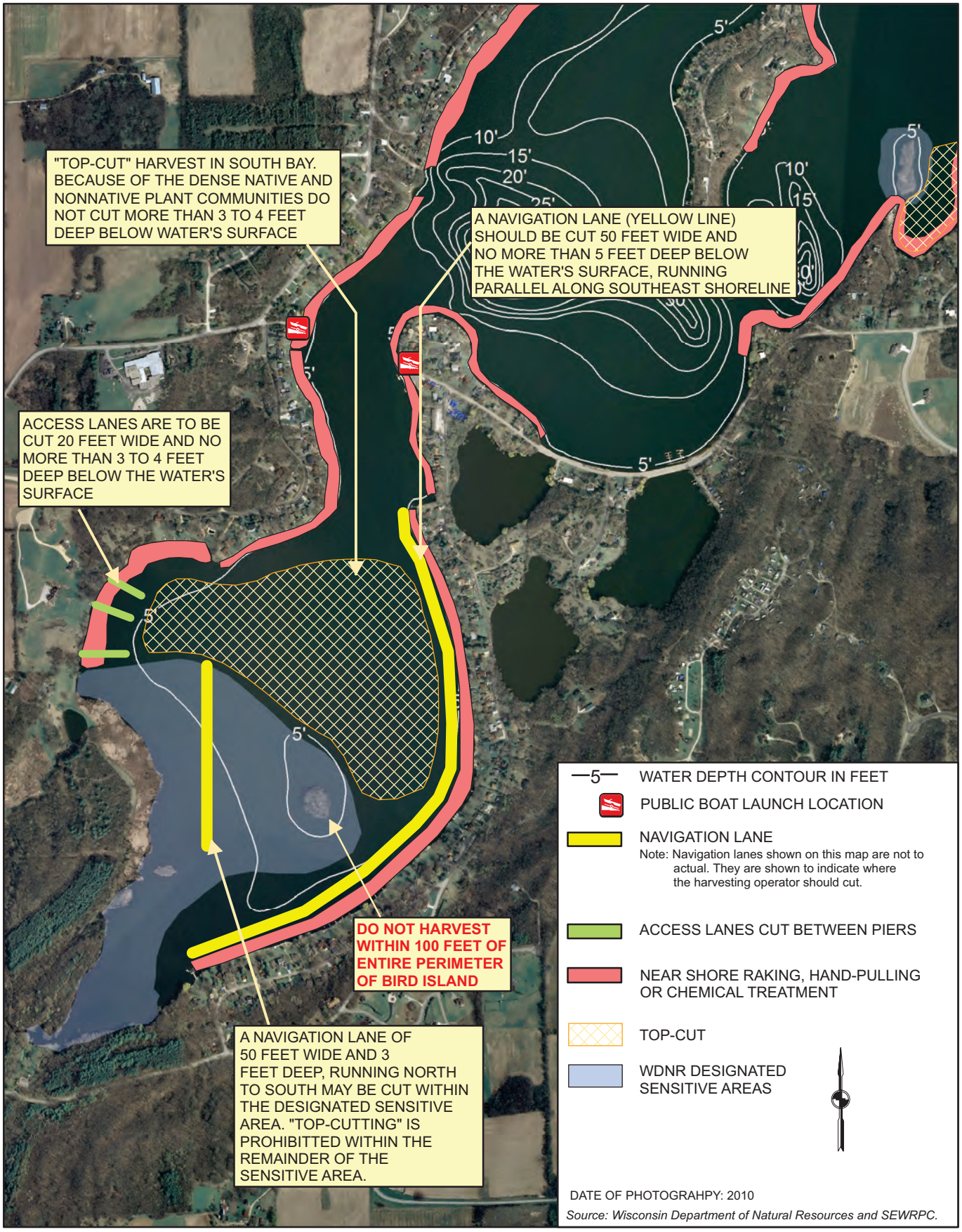
MECHANICAL HARVESTING OPERATIONS WITHIN WHITEWATER LAKE (NORTH PORTION): 2015



MECHANICAL HARVESTING OPERATIONS WITHIN WHITEWATER LAKE (SOUTH PORTION): 2015



Appendix I

FB-120 SERIES SKIMMERS/HARVESTERS INFORMATIONAL BROCHURE

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FB-120 series skimmers / harvesters

The FB-120 Series Skimmer / Harvester is a shallow draft machine designed to pick up floating aquatic plants and debris along shorelines. Stern mounted paddle wheels give this machine a narrow profile and precision steering in confined areas.

The standard FB-120 features a 4’ 0” (1,24 meters) wide horizontal swath, *(cutter bars not shown on the unit above)*, and can store 130 cubic feet (3,68 cubic meters) of collected vegetation on board. Perforated sheet material under the pick up conveyor flat wire belting allows for more efficient collection of smaller debris and aquatics such as duckweed *(lemna minor)* and algae.

AQUARIUS SYSTEMS
A Division of D&D Products Inc.

PO Box 215 | 200 N Harrison Street | North Prairie | Wisconsin | 53153 USA
| P 262-392-2162 | T 800-328-6555 | F 262-392-2984
info@aquarius-systems.com | www.aquarius-systems.com

fb-120 skimmers / harvesters

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FB-120 Series - Skimmer Harvester

Specifications		Imperial	Metric
Dimensions	Operating Length	32' 7"	9,93 meters
	Operating Width	10' 10"	3,30 meters
	Operating Height	4' 6"	1,37 meters
	Shipping Length	32' 7"	9,93 meters
	Shipping Width	8' 6"	2,59 meters
	Shipping Height	5' 7"	1,70 meters
	Overall Weight	5,500 lb	2,495 kgs.
Flotation	Pontoon Length, each	22' 9"	6,93 meters
	Pontoon Width, each	25"	63 cm
	Pontoon Height, each	26"	66 cm
	Draft, Empty	13"	33 cm
	Draft, Fully Loaded	17"	43 cm
Power Source	Standard Engine	Gasoline	Gasoline
	Engine Rating	Minimum 24 HP	Minimum 17,9 kW
	Engine Protection	Low oil & high temp shutdown	Low oil & high temp shutdown
	Fuel Tanks, Quantity / Description	2 portable tanks, 6 gallons each	2 portable tanks, 22 liters each
Hydraulics	Hydraulic System	Gear pump	Gear pump
	Hydraulic Oil	Clarion 46 - environmentally safe, marine grade	Clarion 46 - environmentally safe, marine grade
	Hydraulic Reservoir Capacity	18 gallons w/ temp & level gauge	68 liters w/ temp & level gauge
	Hydraulic System Protection	Relief valves, low oil & clogged filter sensors	Relief valves, low oil & clogged filter sensors
Control Bridge	Location	Starboard side next to storage hold container	Starboard side next to storage hold container
	Instrumentation & Controls	Levers, gauges, warning lights & alarms	Levers, gauges, warning lights & alarms
	Operator Amenities	Padded vinyl lean-to seat, sun/rain canopy	Padded vinyl lean-to seat, sun/rain canopy
	Operator Protection	All hydraulic lines/valves enclosed & shielded	All hydraulic lines/valves enclosed & shielded
Harvesting Head	Harvesting Width	4'	1,22 meters
	Harvesting Depth	0 to 4' deep	0 to 1,22 meters deep
	Cutter Knives	Reciprocating 3" stroke, chrome plated	Reciprocating 76 mm stroke, chrome plated
	Conveyor Belting	1" x 1" standard duty galvanized mesh	25 mm x 25 mm standard duty galvanized mesh
Storage Container	Length x Width	20' 4" x 4' 7"	6,20 meters x 1,40 meters
	Capacity, Volume / Weight	130 cubic feet / 1800 lb	3,68 cubic meters / 816 kgs.
	Conveyor Belting	1" x 1" standard duty galvanized mesh	25 mm x 25 mm standard duty galvanized mesh
	Discharge Height, from water surface	4' 2"	1,27 meters
Propulsion	Propulsion System & Location	Twin paddle wheels, side mounted	Twin paddle wheels, side mounted
	Operation & RPM Speed	Independent, forward & reverse, 0 to 50 RPM	Independent, forward & reverse, 0 to 50 RPM
Fabrication	Hull Material	Carbon steel	Carbon steel
	Frame Material	Carbon steel	Carbon steel
	Fasteners	Stainless steel 18/8 throughout	Stainless steel 18/8 throughout
Finish	Preparation	Abrasive sandblast, epoxy primer	Abrasive sandblast, epoxy primer
	Paint Type, above the waterline	High quality polyurethane	High quality polyurethane
	Paint Type, below the waterline	High quality marine epoxy	High quality marine epoxy
	Color, Manufacturer's Standard	Light blue	Light blue

General Arrangement Drawing # 2411

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Appendix J

WATERCRAFT INSPECTION

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FOR MORE INFORMATION

If you would like more information about aquatic invasive species, the problems they cause, regulations to prevent their spread, or methods and permits for their control, contact one of the following offices:

Wisconsin Department Of Natural Resources
888-WDNRINFO
DNR.WI.GOV search "Aquatic Invasives"

University of Wisconsin- Extension
(715) 346-2116
WWW.UWSP.EDU/CNR/UWEXLAKES

Wisconsin Sea Grant
(608) 262-0905
WWW.SEAGRANT.WISC.EDU
WWW.PROTECTYOURWATERS.NET

Thanks to the following for supporting educational efforts on aquatic invasive species:

- *U.S. Fish and Wildlife Service*
- *Great Lakes Indian Fish and Wildlife Commission*
- *National Park Service*

PUB WT-801 2011

Graphic Design by Amy Torrey, Environmental Resources Center, UW-Extension

Photo Credits: Sea Grant, UW-Extension, DNR

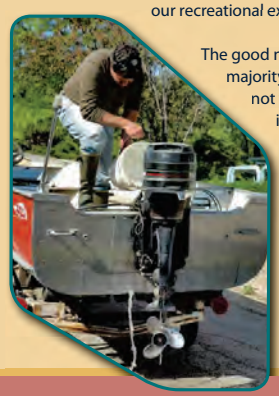
STOP Aquatic HITCHHIKERS

ENJOYING THE GREAT OUTDOORS

Enjoying the great outdoors is important to many of us. Boating, fishing, hunting, and wildlife watching are traditions that we want to preserve for our children and their children. Today, these traditions are at risk. Aquatic invaders such as zebra mussels, purple loosestrife, Eurasian water-milfoil, bighead and silver carp, threaten our valuable waters and recreation. These and other non-native, or exotic, plants and animals do not naturally occur in our waters and are called invasive species because they cause ecological or economic harm.

These invasive species can get into lakes, rivers, and wetlands by "hitching" rides with anglers, boaters, and other outdoor recreationists, who transport them from one waterbody to another.

Once established, these "aquatic hitchhikers," can harm native fisheries, degrade water quality, disrupt food webs and reduce the quality of our recreational experiences.



The good news is that the majority of waters are not yet infested with invasive species and by taking the necessary steps you can help protect our valuable waters.

If you think you have found an INVASIVE SPECIES:

REPORT NEW SIGHTINGS

If you suspect a new infestation of an invasive plant or animal, save a specimen and report it to a local Department of Natural Resources or Sea Grant office. Wisconsin has "ID" cards, websites, and volunteer monitoring networks to help you identify and report invasive species.

CONSULT YOUR NATURAL RESOURCE AGENCY

Do-it-yourself control treatments may be illegal and can make matters worse by harming native fish, wildlife, and plants. Before attempting to control an invasive species or add new plants along your shoreline, contact your local Department of Natural Resources office. DNR staff can provide recommendations and notify you what permits are required.

DNR.WI.GOV search "Aquatic Invasives"

STOP AQUATIC HITCHHIKERS

IS A NATIONAL CAMPAIGN THAT HELPS RECREATIONAL USERS TO BECOME PART OF THE SOLUTION TO STOP THE TRANSPORT AND SPREAD OF AQUATIC INVASIVE SPECIES.

IN WISCONSIN IT IS THE LAW...

Aquatic hitchhikers can spread in many ways such as on recreational equipment, and in water. Fortunately, there are a few simple actions you can take to prevent them from spreading.

INSPECT boats, trailers, and equipment

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

Many invasive species spread by attaching themselves to boats, trailers, and equipment and "hitching a ride" to another waterbody. Therefore, Wisconsin law requires that you remove these aquatic hitchhikers before you launch your boat or leave the access area.

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

Many types of invasive species are very small and easily overlooked. In fact, some aquatic hitchhikers, like zebra mussel larvae, are invisible to the naked eye. To prevent the transport of these aquatic hitchhikers drain water from all equipment before you leave the access area.

For more information visit:
DNR.WI.GOV and search "bait laws"

Draining ballast water and lake or river water can prevent the spread of aquatic invasive species and fish diseases, like VHS.

NEVER MOVE plants or live fish away from a waterbody.

In Wisconsin, it is illegal to transport any aquatic plants, mud, live fish or live fish eggs away from any state waterbody. This includes live gamefish and roughfish, like gizzard shad. There are exceptions for minnows obtained from a Wisconsin licensed bait dealer or registered fish farm, which may be transported away live and used again:

- ***On the same waterbody, or***
- ***On any other waterbody if no lake or river water, or other fish were added to their container***

BUY minnows from a Wisconsin licensed bait dealer.

For more information on collecting your own minnows visit:
DNR.WI.GOV and search "VHS Prevention"

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

When possible, dispose of unwanted bait in the trash at access points. Never release them into the environment.

If possible, dispose of ALL unwanted bait (including earthworms) in a trash can at the boat landing or access point. Otherwise, take them home and dispose of them by placing them in the trash, composting them, or using them in a garden as fertilizer. Likewise, other aquatic plants or animals that you collect, or buy in a pet store, should NEVER be released into the wild.

WISCONSIN REGULATION

Wisconsin has several laws to prevent the spread of aquatic invasive species and the fish disease Viral Hemorrhagic Septicemia (VHS). Failure to follow Wisconsin law can result in fines up to or exceeding **$2000**. Don't be caught unaware!

ADDITIONAL STEPS:

Although not required by WI law, additional steps are highly recommended, particularly if you are transporting a boat and/or equipment from one waterbody to another. Additional steps include:

SPRAY, RINSE, or DRY boats and recreational equipment to remove or kill species that were not visible when leaving a waterbody. Before transporting to another water: ***Spray/rinse with high pressure, and/or hot tap water (above 104° F or 40° C), especially if moored for more than a day. OR Dry for at least five days.***

DISINFECT boats and recreational equipment to kill species and fish diseases that were not visible when leaving a waterbody. Many aquatic hitchhikers can survive out of water for some period of time. ***To prevent their spread, you can sanitize your boat, trailer or equipment by washing it with a mixture of 2 Tbs of household bleach per 1 gallon of water.***

OTHER WATER USES:

Don't get caught spreading aquatic invasive plants or animals! Wisconsin laws, as highlighted above, can apply to many types of water activities, not just boating and fishing. Although these activities might not seem dangerous, they CAN establish and spread invasive species. It is important you follow the steps above for all water activities in order to prevent the spread of aquatic invasive species. These activities include:

- ***Using personal watercraft***
- ***Shore and fly-fishing***
- ***Sailing***
- ***Scuba Diving***
- ***Waterfowl hunting***

FAILURE TO FOLLOW WISCONSIN LAWS CAN LEAD TO FINES.

For additional information contact your local DNR staff or visit:
DNR.WI.GOV

Protect Your Boat

Zebra mussels attach to a variety of materials, including fiberglass, aluminum, wood, and steel and may damage a boat's finish. Veligers are extremely small and can be drawn into engine passages. Once they settle out in the engine cooling system, they can grow into adults and may block intake screens, internal passages, hoses, seacocks, and strainers. The best ways for boat owners to avoid these types of damage are:

- **Use a boatlift** to completely remove the watercraft from the water when not in use.

- **Run your boat regularly** if it is moored in zebra mussel infested waters. Run the engine at least twice a week at slow speeds (about 4-½ mph) for 10 to 15 minutes. Monitor engine temperatures – if you notice an increase, it may mean that zebra mussels are clogging your cooling system. Immediately inspect the system and remove any zebra mussels. The end of boating season is also a good time to inspect and clean the cooling system.
- **Lift the motor out of the water between uses if mooring.** Fully discharge any water that may still remain in the lower portion of the cooling system.
- **Tip down the motor and discharge the water when leaving a waterbody** to reduce the likelihood of transporting veligers (in water) to another waterbody.
- **Clean your boat and equipment.** Physically remove (scrape) adult mussels from your boat, trailer, and equipment by hand. Young zebra mussels and veligers may be too small to see. Wash your boat with high-pressure hot water (use water >104°F if possible). Use high-pressure cold water if hot water is not available. *(Avoid pressure washing classic wooden boats or others not made of metal.)*
- **Apply anti-fouling paints or coatings to the hull and the engine's cooling system** to prevent zebra mussel attachment. It is best to purchase these from an area boat dealer or your local marina. Anti-fouling paints that are copper based can be used in Wisconsin, and typically need to be reapplied every one to two years. In-line strainers can also be installed in the engine's cooling system.
- **Use motor "muffs", also known as motor flushers, to remove zebra mussels and other materials from your boat engine or personal watercraft.** Clamp the motor flusher onto the lower unit over the cooling inlets on either side of the motor, and screw the nozzle of your garden hose into it. Run the boat engine for approximately 10 minutes or as suggested by the manufacturer.

Amy Bellows, WI DNR

Special note of caution for anglers

Dispose of unwanted bait in the trash - do not transfer bait or water from one waterbody to another. Larval zebra mussels or other invasive species could be present in the water with the bait.

Help prevent aquatic hitchhikers from catching a ride on your boat or equipment:

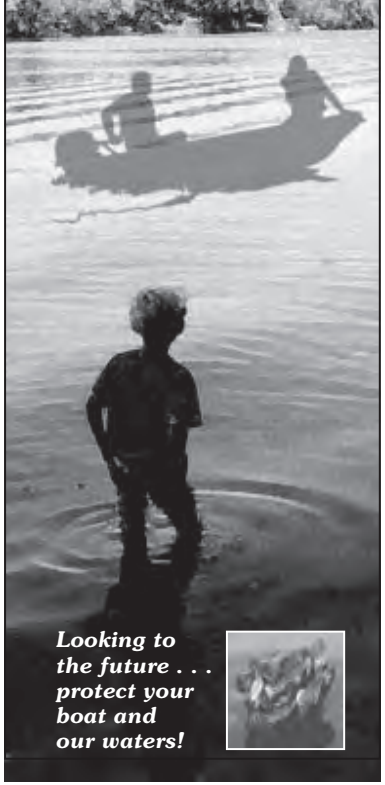
- ✓ **Inspect** and **remove** aquatic plants and animals,
- ✓ **Drain** water,
- ✓ **Dispose** of unwanted bait in the trash,
- ✓ **Rinse** with hot and/or high-pressure water, OR
- ✓ **Dry** for 5 days.

Clean Boats . . . Clean Waters

For a list of known zebra mussel infested waters, visit:
www.dnr.wi.gov/org/water/wm/GLWSP/exotics/zebra.html

Cover photo: L. Pohlod. Inset: Great Lakes Sea Grant Network
Designed by L. Pohlod, Blue Sky Design, LLC *PUB-WT-383 2004*

Zebra Mussel Boater's Guide



Looking to the future . . . protect your boat and our waters!

Zebra mussel identification and life cycle

Mature zebra mussels look like small D-shaped clams. Their yellowish-brown shells have alternating light and dark stripes.

Ohio Sea Grant

Zebra mussels can reach a maximum of 2 inches in length, though most are smaller than an inch. They are typically found attached to solid objects, often growing in large clusters.

Ontario Ministry of Natural Resources

Amy Bellows, WI DNR

Zebra mussels begin as eggs, then develop into free-swimming larvae (called **veligers**), which are microscopic. The veliger photos shown above were taken with the aid of a microscope. Veligers are spread by currents; after about three weeks, they settle out and firmly attach themselves to hard surfaces, where they grow into adults. Their lifespan is typically three to five years. They begin to reproduce after a year or two - females can release up to one million eggs per year!

James Lubner, University of Wisconsin Sea Grant

What do zebra mussels do?

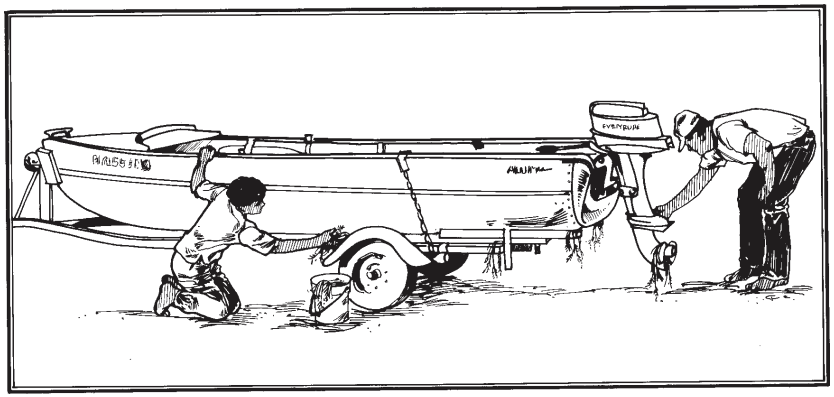
Zebra mussels are **filter feeders** that can filter large volumes of water (up to 1 Liter/day). In some cases they can filter the whole volume of a lake in a few months. They remove plankton – tiny plants and animals – from the water. What they eat (and what they don't eat) ultimately ends up on the lake or river bottom. Plankton is an important food source for young fish, native mussels, and other aquatic organisms. Zebra mussels may concentrate this food at the bottom, leaving open water species with **less to eat**!

Because they are so good at filtering, zebra mussels often **make water clearer**. This may force **light-sensitive fish**, like salmon and walleye, into deeper water to seek shelter from the sun. Increased light penetration allows aquatic plants to grow in deeper water and spread to a larger area. This may help smaller fish to survive by giving them places to hide, but makes it harder for large, predatory fish to find food. **Thicker plant growth** may also cause problems for boaters and anglers.

Don Schloesser, Great Lakes Science Center, National Biological Services

Zebra mussels cause people additional problems. They **clog water intakes and pipes** – large water users on the Great Lakes spent $120 million from 1989 to 1994 to combat zebra mussels. They also **attach to piers, boatlifts, boats, and motors**, which can cause damage requiring costly repair and maintenance. Even when they die, their **sharp shells** wash up on beaches, creating foul odors and cutting the feet of swimmers.

How can I help prevent the spread of zebra mussels?



Microscopic veligers may be carried in livewells, bait buckets, bilge water – any water that's transported to another waterbody. They can also travel in currents to downstream waters. Adults can attach to boats or boating equipment that are moored in the water. They frequently attach to aquatic plants, which themselves may hitch a ride on boats and equipment. For these reasons, it is important to take the following steps to prevent the spread of zebra mussels and other aquatic invasive species while boating:

Before moving your boat from one water body to another:

- ✓ **Inspect** and **remove** aquatic plants, animals, and mud from your boat, trailer, and equipment,
- ✓ **Drain** all water from your equipment (boat, motor, bilges, transom wells, live wells, etc.),
- ✓ **Dispose** of unwanted bait in the trash, not in the water,
- ✓ **Rinse** your boat and equipment with hot (> 104˚F) 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.

Pressure washing note:

Avoid pressure washing classic and wooden boats, along with canoes and kayaks that are not made of metal. These types of boats should be drained, cleared of all plant and animal materials, and left in the sun to dry completely.

Effective May 2002, Section 30.715, WI Act 16 prohibits launching a boat or placing a boat or trailer in navigable waters if it has aquatic plants or zebra mussels attached.

Watercraft Inspector Handbook

2014 Edition

Wisconsin Lakes Partnership

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Acknowledgments:

The *Watercraft Inspector Handbook* is a guide for people who are passionate about "their" lake and who have a vision for future generations. The "Clean Boats, Clean Waters" program is sponsored and promoted by the Wisconsin Department of Natural Resources, UW-Extension, and Wisconsin Lakes.

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Welcome to the Clean Boats, Clean Waters Watercraft Inspection Program!

Aquatic invasive species have long been recognized as a serious threat to the United States. According to Cornell University, in 1999, introduced species of animals, plants, and microbes cost the U.S. economy at least $138 billion a year. In 2001, Wisconsin spent over $600,000 on aquatic and terrestrial plants and exotic birds, thousands more for sea lamprey control and hundreds of thousands for control of zebra mussels. These facts make folks a little nervous about the future of Wisconsin inland water bodies.

Wisconsin's 15,081 lakes are fortunate to have volunteers who monitor water clarity, water chemistry, aquatic plants, and invasive plants. Since 1986, these folks have functioned as the "eyes" of aquatic biologists. With the arrival of aquatic invasive species, now more than ever citizens are needed to help preserve and protect Wisconsin's water bodies. The "Clean Boats, Clean Waters" program is an opportunity for citizens to help stop the spread of invasive species across the state.

Through "Clean Boats, Clean Waters," inspectors are trained to organize and conduct a watercraft inspection and education program in their community. This program originated in northern Wisconsin as a middle school project. The "Milfoil Masters" program alerted adults and youth that citizen volunteers can make a difference in helping prevent the spread of invasive species.

To continue statewide volunteer efforts, the **"Clean Boats, Clean Waters" Watercraft Inspection Program** was created in the fall of 2003. The mission of this program is to promote water resource stewardship by actively involving individuals in preventing the spread of harmful aquatic invasive species. To accomplish this goal, the program sponsors statewide training workshops and has developed resource handbooks, tool kits, and educational information; a statewide coordinator now supports inspection efforts.

Wisconsin realizes that passionate citizens are the keys to reaching hundreds of recreationalists visiting the state. Inspectors who instruct boaters on how to perform watercraft inspections are helping to prevent new invasions and are helping to maintain Wisconsin's valuable water resource.

Thank you for taking the time to learn, act, and protect Wisconsin's waters from invasive species! The rewards of these efforts will be appreciated by many generations to come.

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Section 1:
What is the program all about?

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Wisconsin's Comprehensive Management Plan

To Prevent Further Introductions and Control Existing Populations of Aquatic Invasive Species, created in 2003

Aquatic invasive species (AIS) have long been recognized as a serious problem in Wisconsin. The Department of Natural Resources, in cooperation with the University of Wisconsin Sea Grant and the Great Lakes Indian Fish and Wildlife Commission, has prepared a plan to coordinate responses to the problems associated with AIS. This plan is one component of a comprehensive state effort to control invasive species that involves all affected state agencies and tribal governments working together to prevent the further introductions of invasive species (both aquatic and terrestrial) into Wisconsin's ecosystems. This plan focuses on prevention as the key strategy for limiting the impacts of aquatic invasive species by controlling the initial introduction and subsequent transfer from one water body to another. Prevention strategies rely heavily on information, education, and communication. Therefore, this plan includes the full range of those activities in order to implement an effective prevention program.

However, prevention techniques alone are inadequate for limiting the negative impacts caused by aquatic invasive species. This plan also suggests that control, mitigation, or elimination strategies must be considered. It incorporates information and education/ outreach activities, watercraft inspection efforts, and policy, and legislative initiatives as key components of the overall program.

The goals of Wisconsin's comprehensive management plan are designed to address different stages of the AIS invasion:

1. The initial introductions of AIS into Wisconsin waters from other parts of the continent or world;
2. The spread of AIS populations to previously unaffected state waters; and
3. The colonization of self-sustaining AIS populations within water bodies, including the harmful impacts resulting from such colonization.

Goal 1:

Implement procedures and practices to prevent new introductions of AIS into Lakes Michigan and Superior, Wisconsin's boundary waters (the Mississippi and St. Croix Rivers), and the inland waters of the state.

Because of the limited experience with most AIS, the long-term consequences of their impacts are not yet known. With a more robust global economy, it is anticipated that without a new prevention program, new introductions are highly likely. For that reason, prevention actions at the national and regional level, as well as at the individual jurisdictional level, are critical. The highest prevention priority is the control of ballast water discharges.

Several other potential transport mechanisms could result in releases of AIS into the Great Lakes and inland state waters. Some of these vectors are: the transportation and rearing systems related to the aquaculture industry, commercial barge traffic, and recreational boating; inter-Great Lake boating associated with research or

management activities; scuba diving; the sale and distribution of fishing bait; the transfer and disposal of nonindigenous pets; plant nurseries; fish stocking activities and individual releases by anglers.

Three of the potential AIS transport mechanisms have been selected for specific actions: the sale and distribution of bait, aquaculture and aquarium industries, and ballast water discharges.

Specific actions related to this goal are: work with the bait industry, agriculture, and aquarium industries and transoceanic shipping to collect information about vectors and AIS transport mechanisms in general, and evaluate new technologies or management practices for effective control of AIS.

Goal 2:

Establish management strategies to limit the spread of established populations of AIS into inland waters of the state.

The introduction of AIS into the Great Lakes has resulted in the spread of AIS to inland waters. The spread of established populations of AIS is primarily caused by human activities such as transfer of boats, bait handling, and water transport. Water resource user groups are frequently not aware of which waters are infested with AIS, the problems associated with AIS and the precautions they should take to limit the spread of AIS.

Specific actions related to this goal are: determine which species pose the greatest problems; determine the level of monitoring needed to document AIS distribution; assess the sampling and monitoring programs for priority invasive species; implement education and outreach programs to increase public awareness and improve coordination efforts on AIS by encouraging cooperation with partner organizations, agencies, and volunteers.

Goal 3:

Abate harmful ecological, economic, social, and public health impacts resulting from infestation of AIS and, where possible, eliminate those impacts.

Appropriate strategies to control AIS and abate their impacts may not be technically, economically, or environmentally feasible. Control strategies must always be designed so as not to cause significant environmental impacts.

Specific actions related to this goal are: assess the public health, social, economic, and ecological impacts of AIS to Wisconsin waters; determine control actions that are appropriate to limit impacts, that are cost-effective approaches, and that provide long-term solutions; evaluate the effectiveness of the control strategies after they have been implemented.

This plan provides the generalized approaches that must be followed to protect indigenous species and the socioeconomic benefits that are threatened by aquatic invasive species. It is likely that management plans for individual species, such as zebra mussels and Eurasian water-milfoil, will be developed as a result of this plan.

For detailed information about this plan, visit: http://dnr.wi.gov/topic/Invasives/documents/compstateansplanfinal0903.pdf.

Wisconsin's comprehensive state management plan was approved by the National Aquatic Nuisance Species Task Force at their November 2003 meeting. Their approval qualifies the state for federal funding to implement the specific actions as detailed in the plan.

The Aquatic Invasive Species Volunteer Program Vision

The Aquatic Invasive Species Volunteer Program promotes water resource stewardship by actively involving individuals in preventing the spread of aquatic invasive species that can harm Wisconsin's ecosystems, economy, and recreational opportunities.

Citizen involvement in watercraft inspections and monitoring for invasives increases public awareness about the potential impacts of aquatic invasive species. Volunteers serve to inform and educate the public about how people can help prevent the spread of invasives by inspecting their watercraft and removing aquatic plants and animals from their boats and equipment before leaving an access site.

To accomplish these objectives, the volunteer program supports:

- Watercraft inspections for aquatic invasive species.
- Communication with the public about the laws and issues surrounding the existence, spread, and effects of invasives to Wisconsin's waters.
- Distribution of educational resources and publications.
- Collection of data to evaluate the potential spread of invasive species, public awareness of invasive species issues, and the effectiveness of the invasive species program.
- Response to technical inquiries from the public concerning invasive species.

"If there is magic on this planet, it is contained in water."

- Loren Eiseley

The Immense Journey, 1957

Section 2:

What do watercraft inspections involve?

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Getting Started

Recreational boating is a significant corridor for the spread of invasive species between water bodies in Wisconsin. This pathway is a concern because of the more than 610,000 registered boaters moving around Wisconsin's 15,081 lakes. Inspecting watercraft for invasive species offers a frontline defense at the lake landing to prevent further destruction of lake ecosystems. Watercraft inspections are designed to increase public awareness about invasive species and to assist boaters in taking preventive steps to avoid further spreading of critters.

Attending a "Clean Boats, Clean Waters" training workshop provides you with all the tools you need to start a watercraft inspection program in your community. Developing an effective program requires patience, time, and an eye for organizing a working schedule. A group that consists of a inspection cooordinator and a committee of several people is the best way to distribute the tasks equally and prevent volunteer burnout. When planning a watercraft program, consider the five Ws: Whom, What, When, Where, and Why.

WHOM will you recruit for the watercraft inspection team?

Volunteers, both adults and youth, can be recruited through your lake association newsletter, local schools, 4-H, or Boy and Girl Scout groups. Many service organizations are looking for community involvement opportunities. We recommend at least two people at the landing. Ideally, an adult should work with a youth volunteer. Boaters are very cooperative when a young person is giving the message: "Clean Boats, Clean Waters, please."

WHAT are the duties of a watercraft inspector?

Before you build a watercraft inspection team, decide what skills and tasks volunteers need for an effective interaction with the public at the boat landings. Generally, inspectors perform three duties: verbally share educational materials and information about aquatic invasive species and how they're spread, visually check boats and recreational equipment for any hitchhiking plants or animals, and demonstrate how to clean recreational equipment and what prevention steps boaters need to take every time they leave the water.

Additional duties, such as recording data on the Watercraft Inspection Report Form (see Section 3), assist us in collecting information about the recreational use of the lake, traveling patterns of boaters, and whether the boaters are performing the prevention steps. Inspectors should also be ready to collect, accurately label, and store any suspect plant or animal that is attached to any recreational equipment.

Here are some specific skills to consider:

- **Congenial**: able to meet new people courteously at the landings.
- **Communicative**: effectively educate the public on invasive species.
- **Flexible**: be willing to work weekends and holiday hours.
- **Informed**: understand the harmful impacts of aquatic invasive species.
- **Physically able**: able to inspect watercraft and trailers for invasive species.

- **Accurate**: document verbal surveys, record, and submit any suspect invasive species specimens to local/regional DNR service station.
- **Computer knowledgeable**: able to submit watercraft inspection data to DNR Web site at http://dnr.wi.gov/lakes/cbcw-data.

To identify the watercraft inspection team at the boat landing, all volunteers should have their own royal blue "Clean Boats, Clean Waters" T-shirt. Inspectors need to wear this T-shirt to signify that they are working for a specific program, "Clean Boats, Clean Waters," and not harassing boaters at the landings. Two T-shirts are included in each of the resource kits and more may be purchased by calling UW Extension-Lakes at 715-346-2116. As an added bonus, 'Clean Boats, Clean Waters' logo stickers are included in the resource kit to use when the weather is inclement and short-sleeve T-shirts just won't work. Just peel off the protective backing on the logo, and place the sticker on your sweatshirt or coat. No matter what the weather, boaters will be able to identify the watercraft inspection team at a glance.

WHEN is the best time to inspect at the boat landing?

When recruiting volunteers, be specific about the amount of time you want them to work. For example, a volunteer is more likely to agree to a three-hour shift once or twice a month rather than an open invitation to volunteer all summer on the weekends and holidays. Volunteers will more readily step up if they know the expectations and how much time is realistically needed.

To get the most "bang for your buck," become acquainted with the activity on your lake and when the lake is the busiest. Are the weekends a flurry of activity from Friday night at 4 p.m. until 8 p.m. Sunday? Or is Saturday morning from 6 a.m. until 10 a.m. the active time at the landings? Usually, holiday weekends during the summer are the busiest times at the landings. Anglers are usually up and on the lake by dawn and always out on opening day of fishing season. Recreational boaters usually use the lake in the afternoon, and sunny, warm days draw lots of people to the lake! Do not forget about fishing tournaments and special lake events that draw many boats at the landings. Remember, the boat landing is the first place an aquatic invasive species takes hold.

WHERE will the watercraft inspection process take place?

It is a good idea to find out who owns the boat landing before you begin to schedule work shifts for your inspectors. The landing may be owned and maintained by one of several entities: the federal government, state, township, lake association, or a private individual. To check ownership, you might need to contact several organizations, such as the Wisconsin Department of Natural Resources, county zoning offices, town halls, or local businesses. Knowing ownership will be helpful if you are thinking about installing signage, waste disposal containers, or boat washing facilities (see Section 4).

If you have limited inspection resources and many public and private landings, determine which landings receive the most boat traffic. Think about which landing is most likely to be the first place a hitchhiking invasive will appear.

WHY is this inspection program necessary?

Be prepared to answer this question. Often lake owners are frustrated with the public trust doctrine that mandates public use of all waters in Wisconsin. Lake owners feel it is unfair that they bare the brunt of the cost of managing an aquatic invasive species. The Wisconsin Department of Natural Resources is allocating some money toward the management of invasive species, but not nearly enough for 15, 081 lakes. Therefore, any proactive steps in preventing the

introduction and spread of invasive species are more cost-effective than waiting for them to arrive.

Preventing aquatic invasive species is a better management option than the expensive alternative. For example, treating Eurasian water-milfoil infestations with chemicals on average costs around $300 to $500 per acre. Eurasian water-milfoil can grow two inches per day and can fragment into hundreds of new plants within hours, so it would not take long for Eurasian water-milfoil to cover hundreds of acres. If this fact does not impress you, contact members of a lake organization struggling with an invasive species. They would be happy to discuss the tremendous impact that one invasive species caused in their community. Remember, prevention is worth a pound of cure.

Online Resources

There are tons of useful online resources available to aid you in your aquatic invasive species (AIS) outreach efforts! Many of these resources are available on either the UW-Extension Lakes website or the WI Department of Natural Resources (DNR) website.

UW-Extension Lakes: http://www.uwsp.edu/uwexlakes

DNR Invasive Species: http://dnr.wi.gov/topic/invasives

AIS Publications

Many AIS-specific resource materials (such as brochures, stickers, etc.) are available to assist you in your outreach efforts. A list of the publications currently available can be found at http://dnr.wi.gov/lakes/invasives/AISPubList.pdf.

These free publications can be ordered by e-mailing DNRAISinfo@wisconsin.gov or calling 608-267-9868.

AIS Contacts

We have numerous AIS staff available to assist you – with general questions, trainings, grant applications, and more! You can search our online database of AIS contacts by their location in the state or by their role/specialty.

AIS Contact List: http://dnr.wi.gov/lakes/invasives/topics.aspx

AIS Distribution Information

Find out what lakes and rivers have AIS in your area! You can view lists of AIS waters by county, region, or Great Lakes basin, or see a statewide list.

View Distribution Info by Waterbody: http://dnr.wi.gov/lakes/invasives/AISByWaterbody.aspx

You can also search by species, selecting a specific aquatic invasive and viewing all of the waterbodies in which it is present.

View Distribution Info by Species: http://dnr.wi.gov/lakes/invasives/BySpecies.aspx

AIS Control Grants

Grant funding is available for AIS projects conducted on any waters of the state. They can be used for education, prevention, planning, early detection, rapid response, and established invasives control projects. Check out the DNR's AIS Grants webpage for more information and details on eligibility, the application process, and more.

AIS Grants: http://dnr.wi.gov/Aid/AIS.html

CBCW Supplies & More!

For all things CBCW, visit the UWEX-Lakes CBCW website. You can check out the CBCW supplies and ordering info, view the current workshop schedule, download the CBCW Handbook, and more.

CBCW Watercraft Inspection: http://www.uwsp.edu/uwexlakes/cbcw

Liability

Watercraft inspections are Wisconsin's main aquatic invasive species containment and prevention tool! More and more lake communities are organizing watercraft inspection teams for youth and adults interested in preventing the spread of aquatic invasive species. Inspection teams that perform watercraft inspections at boat landings can often find themselves in the midst of heavy boat launching activity.

So, can there be liability risks associated with sponsoring a volunteer watercraft inspections program?

The answer is yes. The purpose of this information is to summarize some of the basic issues that lake associations, lake districts, and individuals should keep in mind when deciding to sponsor a watercraft inspection program. This information addresses the issues associated with accident liability. *The following is not meant to be a substitute for legal advice; organizations should seek assistance from an attorney for answers to specific questions.*

Liability Risks for Organization and Individuals

A number of parties may be held responsible for an accident occurring on the boat landing. The **individual** who may be most directly connected to the incident may be held responsible as well as the **lake association**, **lake district,** and **any other entity** that may be hosting the event.

Liability Risks of Organizations:

- **Nonprofit corporations organized under chapter 181** may be held liable if an accident occurs. However, incorporation insulates the individual members' assets from liability in the event of a lawsuit. Only the assets of the corporation, not those of individual members, will become available to satisfy a court judgment.

- **Nonprofit associations not organized under chapter 181** may also take advantage of a law passed in 1997 that insulates the assets of individual members from being used to satisfy a judgment against the association (Chapter 184, Wis. Stats.). According to the law, a nonprofit association is an entity with three or more members that mutually agree to pursue a nonprofit purpose. A "member" under the law is an individual who may take part in the selection of persons to manage the operation of the association. According to state law, in the case of an unincorporated association with three or more "members," only the assets of the association will be used to satisfy a judgment.

- **Public inland lake and rehabilitation districts** organized under chapter 33 of the state statutes may also be subject to a lawsuit. A judgment against a lake district cannot exceed $50,000 (§ 893.80 Wis. Stats.), but any judgment against a lake district must be added to the next tax levy.

- **Workers' compensation** laws come into play when an employee of a lake association or a lake district commissioner is injured while performing the duties of his or her position. If a lake association has three or more paid employees and pays in any one-calendar quarter compensation in excess of $500.00, the association or

employer may be required to pay the medical bills incurred for an injury that occurred while the person was on the job (Chapter 102, Wis. Stats.). If the association relies on volunteers, these laws may be avoided. A lake management district may be held responsible for a job-related injury of an elected commissioner regardless of whether or not compensation is received.

Liability Risks for Individuals:

- **If lake district officers, board members,** or **employees** are held personally responsible for an injury while acting within the scope of their duties as officers, board members, and employees, the lake district must pay the cost of any judgment rendered against them (§§ 895.46 Wis. Stats).- Incorporated lake associations must indemnify directors or officers in most cases (§181.0872 Wis. Stats.)

- **Individuals who provide services** to nonprofit corporations organized under chapter 181 for free, in other words volunteers, cannot be sued in most cases. However, volunteers who operate a motor vehicle or other vehicle that requires a license or operator's permit may be held personally liable should an accident occur (§181.0670 Wis. Stats.)

- **Federal law also protects volunteers of nonprofit corporations, associations, and governmental entities from liability** provided no compensation, aside from reimbursement for expenses, is received.–This law, however, does not protect individuals who are operating a motorized vehicle or vessel that requires an operator's license or permit (42 U.S.C. § 14501, Volunteers Protection Act of 1997).

Insurance

All insurance policies are different. The following points are intended to cover the most basic issues:

- Lake districts and incorporated and unincorporated associations can purchase insurance to protect against the risk of personal injury.

- Homeowner and automobile policies typically protect the owner of the policy against accidents that occur when the individual is acting as a volunteer. Coverage, however, is often not provided when the individual is an employee or employer or when an admission or rental fee is charged. Any volunteer who is operating a boat should be required to have homeowner's, automobile, or boat insurance. The policy should be checked to make sure volunteer work is covered.

Prepared by Tamara A. Dudiak, University of Wisconsin Extension-Lakes

For additional discussion on liability issues for lake organizations, see T. Mentkowski, 1999, *Liability Risks and Protections for Wisconsin Lake Organizations.*

Materials to Have When Working at a Boat Landing

Not all your materials need to be taken to the boat landings. It's better to sort through the materials and decide what educational information is best suited for your area. The "Clean Boats, Clean Waters" program provides a tote bag in which to store all the educational materials in the resource kit. We recommend at least one resource kit for every landing you are monitoring. By using multiple resource kits, each inspection team can have all the materials they need at hand.

A key brochure to distribute to all boaters is "Help Stop Aquatic Hitchhikers" (WT-801). This brochure not only has pictures of the different aquatic invasive species, but also describes the prevention steps that boaters need to take every time they leave the water. In addition, the brochure describes Wisconsin's illegal-to-launch law and the penalties that can occur if an invasive species is not removed before the boat is launched. This brochure is a good reminder to all boaters, whether or not they have talked with a watercraft inspector.

When talking with anglers or when questions regarding Wisconsin's live bait laws come up, the "Fishing with Bait" brochure and "Wisconsin anglers remember" sticker are excellent to have on hand. These two publications clearly outline Wisconsin's rules on the use of live bait and are excellent resources to share with folks who are confused by the detailed regulations.

Select other materials to take to the boat launch based on which aquatic invasive is most threatening in your area. Perhaps Eurasian water-milfoil is really a pressing issue for your lake; then it makes sense to give boaters an EWM/NWM identification card in addition to the "Help Stop Aquatic Hitchhikers" brochure. Resist the temptation to give the boater one of every card in the resource kit because boaters will often discard them. It's best to start by handing out a little bit of information and have additional brochures available if the boaters want to learn more about a particular invasive species.

Boat landings can be very busy during the summer, and you may need more materials before the end of boating season. It's easy to order more of these free publications! The Aquatic Invasive Species Publication List and instructions on how to order more materials are available online. Refer to your "AIS Online Resources" handout or visit: http://dnr.wi.gov/lakes/invasives/AISPubList.pdf

Additional boat launch items to consider:

- Clipboard and pencil.
- Copy of the boat landing script (see Section 2).
- Watercraft Inspection Report Form and Watercraft Inspection Prompts Handout (see Section 3).
- Listing of lakes with AIS presence in your area.
- Wisconsin map.
- "Stop Aquatic Hitchhikers" stickers.
- "WI Anglers: Minnow Use Reminder" stickers.
- "Fishing with Bait" brochures.
- Other selected (free!)AIS publications.
- Cell phone and local contact phone numbers for emergencies.
- Digital camera.
- Plastic bags, permanent marker, and cooler to collect and store any suspect specimens.

Watercraft Inspection Tips

Use the following DO and DON'T lists to prepare your boat landing message.

The DO List

- ✓ Wear the "Clean Boats, Clean Waters" T-shirt to promote the message. This message gives credibility to the program and to the efforts that inspectors are making across the state.
- ✓ Always introduce yourself and mention the organization you are working for and why you are at the landing.
- ✓ Try to approach boat owners before they are on the ramp.
- ✓ Always ask if the boater would mind answering a few questions.
- ✓ Be polite and courteous to all boaters you encounter.
- ✓ Listen to a boater's concerns. Remember that you are encouraging boaters to take an interest in invasive species.
- ✓ Make sure boaters know that they can make a difference!

The DON'T List

- ✗ Don't begin asking questions immediately upon approaching boaters, because as they might be confused about who you are and why they should give you their time.
- ✗ Avoid delaying boaters too much or causing a backup.
- ✗ Never preach to a boater; your mission is to educate, not alienate.
- ✗ Do not emphasize the idea that fines are involved, because this approach can make people hostile or defensive.
- ✗ If the boater is reluctant to cooperate, hand out educational material and record whatever information you can.

An effective watercraft inspection team is prepared to raise boater awareness and to encourage and demonstrate the necessary steps to avoid spreading invasive species. On very rare occasions, you may be uncomfortable about a situation or person. Always back away from a potentially dangerous or violent situation. Never encourage confrontation, no matter how strongly you might feel about the subject. **Remember, you are not enforcers of rules and should never jeopardize your own safety**. If you are suspicious of someone (for example, a loiterer or someone who is not intending to go boating), do not hesitate to leave the launch site. You are better to be safe than sorry. If you feel that a boat launch site is unsafe in any way, please notify the organization you are working for.

Boat Landing Message

Getting out and speaking to the public can be intimidating. New inspectors can feel a little anxious and nervous. This prepared script will help inspectors practice and role-play before their first boater shows up at the landing. Practicing with other folks will give them the confidence it takes to greet a boater. If new inspectors really want to watch a "pro," they just need to ask a few kids to get involved. Are kids intimidated? No way!

This prepared script is only one example of the many methods of addressing boaters at the landings and performing watercraft inspections. Each inspector should develop his or her own style and learn how to adapt in a variety of boat landing experiences. Try to approach boaters before they are on the ramp, and use the Watercraft Inspection Report form to record the information about the boater (see Section 3). At times you may have only 30 seconds to talk to the boater; other times, long lines at the landings may provide you with lots of time to talk. Remember, if the boater is not interested, just hand out educational material and record whatever information you can.

No matter what style you use to approach boaters, any watercraft inspection process should include these points:

1. Tell them who you are, whom you represent, and why you are there.
2. Ask if they have a short time to answer some questions.
3. Use the Watercraft Inspection Report form to assist you in your conversation and record boater responses.
4. Ask if they are familiar with the AIS prevention steps that are required by law, such as draining all water from boats, livewells, and equipment before leaving the landing. Briefly explain why these steps are important, using the Prompts to assist you. Be sure to share your local concerns and highlight what species are found in (or nearby) your area.
5. Ask if they will join you in an inspection of their boat and equipment.
6. Talk while inspecting, and point out watercraft checkpoints. If they do not want to assist you in the inspection, continue to talk about invasive species as you inspect.
7. Give your final message, the prevention steps:
   - Inspect your boat, trailer and equipment and
   - Remove any attached aquatic plants, animals, and mud.
   - Drain all water from boats, vehicles, and equipment (including live wells and containers holding your catch).
   - Never move live fish away from a waterbody.
8. Offer them the "Stop Aquatic Hitchhikers" brochure and sticker, along with any other educational materials pertinent to their questions or your lake.
9. Thank them for their time and cooperation!

Sample Script

As the boat approaches, write down the time of the boat inspection and if the boat is entering or leaving the water.

Introduce yourself:

Good Morning / Afternoon. I am from _____. We are working with state agencies and local groups to talk with boaters about invasive species and help them check their boats for Eurasian water-milfoil (EWM) and zebra mussels (ZM). We are trying to keep EWM/ZM and other harmful invasives from spreading from lake to lake. I have a few quick questions I would like to ask you, and then I would like to walk around your watercraft with you and point out a few places where these species can attach to boats and trailers.

Ask the questions and record on the Watercraft Inspection Report Form:

1. Have you been contacted by a watercraft inspector this season?
2. Are you willing to answer a few questions?
3. Was boat used during the past 5 days on a different waterbody?

   (If the answer is yes) Where?

Use conversational approach to discuss the AIS prevention steps listed on the form with the boater, asking the follow-up questions to engage the boater. Use the educational prompts on the "Prompts" handout as needed to explain the importance of each step and discuss local AIS concerns.

Wisconsin law requires boaters to take the following steps when leaving a boat landing:

Steps 1 & 2: **Inspect** boat, trailers, and equipment and **remove** any attached plants/animals.

Have you heard of this before? (see prompt)

Step 3: **Drain** all water from **boats**, vehicles, and equipment.

Do you have any questions? (see prompt)

If angler, state the following steps:

Step 4: **Drain** water from **livewells** and containers holding your catch.

This is a relatively new law. Were you aware that this is required? (see prompt)

Do you use live bait? (If YES, share message below.)

Bait Message: If live bait comes in contact with lake/river water, it can only be used on that same waterbody or discarded in trash. (bait=minnows/leeches/worms)

Do you have any questions on this law as it can be a little confusing? (If yes, see prompt and offer bait sticker/brochure.)

Perform a watercraft check:

If you would walk around your boat with me, I can show you some areas to look for invasive hitchhikers.

Make sure you talk aloud as you inspect; it helps reinforce the "Clean, Boats, Clean Waters" behavior. Talk to boaters about inspecting and cleaning their watercraft and about draining the water from their boat—such as the bilge, bait buckets and live wells—before they leave the access.

Vegetation can be found on motor boats, the motor/prop, anchors, bunks, rollers, the trailer axle, lights/wiring; for jet skis, it can be found in the intake grate and propeller; and for sailboats, it can be found in the centerboards. Check your anchor and anchor line to see if any plants are clinging to it. Since water is another way invasives are spread, livewells, motors, and equipment need to be drained.

Some aquatic invasives, such as zebra mussels, are also found on the motor/prop, on the sides and bottom of boat below the waterline, on the anchor, and clinging to vegetation. Always inspect the hull and sides of your boat for aquatic invasives; if it feels gritty or sandy, it may be that new zebra mussels are attached. An extra precaution that you can take to eliminate other aquatic invasives is to wash your boat with warm tap water or take your boat through a car wash or dry your boat and equipment in the sun for five days before entering another lake.

Leave boaters with a final message:
"Clean Boats = Clean Waters"

Please make it a habit to:

- **Inspect** your boat, trailer and equipment and
- **Remove** any attached aquatic plants, animals, and mud.
- **Drain** all water from boats, vehicles, and equipment (including live wells and containers holding your catch).
- Never move live fish away from a waterbody.

Offer boaters the "Stop Aquatic Hitchhikers" brochure and sticker, which can be placed on the side of the trailer winch post or hitch. Tell them that this sticker can serve as a reminder of the AIS prevention steps. Offer anglers the "Wisconsin Anglers: Minnow Use Reminder" sticker and "Fishing with Bait" brochure. Tell them that those two items describe Wisconsin's bait laws clearly, in case they have any questions.

Thank the boaters for their time and cooperation!

After you've contact the boater, record the number of people who heard your prevention message and indicate how confident you feel about the boater's understanding of the AIS prevention steps. This completes the Watercraft Inspection Report Form!

Potential Scenarios/Questions from Boaters

"Why are you out here wasting resources when the plant is going to come anyway?"

Even the most educated will ask this question. Just be prepared mentally for such viewpoints and think about why you are out here and what you will say in reply. Expect the unexpected. Here are some suggested responses:

Even if we cannot keep the plants out completely, we can prevent a lot of widespread damage. Prevention also gives us time to adopt new control methods as they are developed in the future. The longer we keep invasives out of a lake, the longer we put off the enormous costs of management and property devaluation.

"Aren't all plants bad anyway?"

It is important to clear up this misconception! This is what you can say:

Native plants are essential lifelines for an aquatic ecosystem, providing the basis for all life within. The problem lies with non-native, invasive plants that have no natural inhibitors and, therefore, outcompete native plants, lowering the water body's aquatic diversity.

"I don't have time for this... I know all about it already!"

This remark is fairly common. If the boaters do not wish to help you with the survey, you must respect their rights and let them be. In such a situation, the suggested action would be to offer them a brochure and wish them a nice day.

"Why did it take Wisconsin so long to do something, when milfoil has been a national problem for over a decade?"

There is no good answer to this question because it's a very good point. Here is how you can respond:

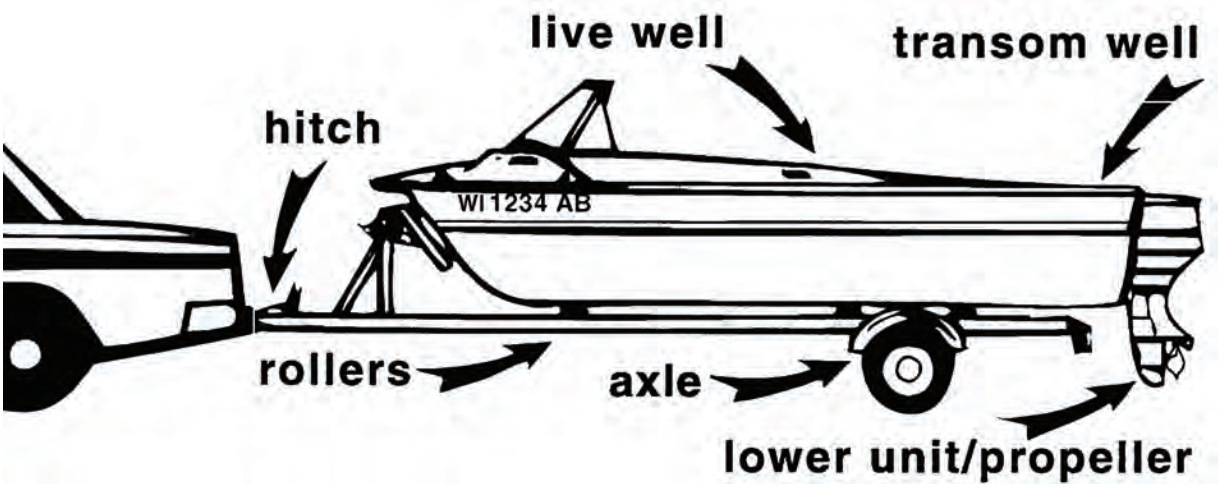
Traditionally, environmental problems become established before we do anything about them. In this case, we have learned from other states, and are trying to take action well before these plants spread to many of our sensitive environments. Instead of focusing on what could have been done, we should focus energies on the present and future.

"Why do I have to take these prevention steps when I only use my boat in one lake?"

This question gives you the opportunity to talk about the value of changing our behaviors and why it is important.

That's a great question! Although you always visit the same lake, it is still useful for you to take these prevention steps every time you boat. Repeating these steps helps the actions become a regular part of your boating behavior, so that if you do ever decide to take your boat to another lake, you will remember to take the prevention steps. Prevention is the key to stopping the spread of aquatic invasive species.

Watercraft Check Points



Trailer:

- ❑ Axle
- ❑ Bunks
- ❑ Frame
- ❑ License Plate
- ❑ Lights/wiring
- ❑ Rollers
- ❑ Spare Tire
- ❑ Wheels
- ❑ Winch Rope

Boat:

- ❑ Floor
- ❑ Hull
- ❑ Livewell
- ❑ Transom Well

Motor:

- ❑ Intake Pipe
- ❑ Prop
- ❑ Lower Unit

Boat Accessories:

- ❑ Anchor
- ❑ Bow Line
- ❑ Ladder
- ❑ Tow Rope
- ❑ Transducer

Other Accessories:

- ❑ Bait Bucket
- ❑ Fishing Line
- ❑ Landing Net
- ❑ Tackle

How to Handle Violations

With thousands of boaters traveling throughout the state and with many of those boaters jumping from lake to lake within one day, it is very realistic to expect someone to try to launch a weed-filled trailer at your landing. Since 2001, it has been illegal to launch a boat or trailer with aquatic plants or zebra mussels attached, and in 2009 it became illegal to transport aquatic vegetation or water from one place to another, in addition to other AIS laws (see Section 3 for more details). Not all folks know about Wisconsin's AIS laws. Even after a number of publications, news articles, and television programs concerning invasive species, not all boaters realize the importance of their action or lack of action in preventing the spread. Keep in mind that you should first try to educate the public.

If you choose to report launching violations, make sure you have done your homework. Contact your local DNR Conservation Warden and local law enforcement to let them know that you'll be doing inspections. Ask if they are willing to provide you with support in the case of a violation, what information is necessary for enforcement, and more importantly, ask whether the enforcement officer will be willing be act on a violation if he or she has not witnessed the event. Knowing these answers before the event will certainly predict a better outcome.

So what happens when a boater violates an AIS law? Several options can occur, from the least offensive reaction to the strongest objections to remove and comply with the law.

The soft touch: Boaters who are unaware of the AIS laws will probably put the boat in the water and think nothing about it. Unfortunately, this has been the practice for many years, which is one reason Wisconsin is struggling to control the spread of aquatic invasive species. However, you have an opportunity to educate that boater about the dangers of invasive plants and the prevention steps that boaters need to take each time they leave a body of water. With luck, boaters will listen to your message and remove aquatic plants and drain all water without any assistance.

An assertive approach: So what do you do if a boater doesn't get the point? Offer to assist the boater in checking and removing any aquatic plants. Always ask permission first before you touch any boat, trailer, or personal equipment. If the boater gives you permission, go ahead and help remove the plants and ask if you can keep a sample, especially if you suspect an invasive species. Let the boater know that you're just trying to prevent them from receiving a citation from any law enforcement or wardens that stop by, because the wardens are stepping up the number of citations they're issuing for AIS violations.

The strongest approach: And what if the boater refuses to remove the aquatic plants or drain water from their boat and equipment? At this time, you really stress the fact that it is illegal to not comply with the prevention steps that you're recommending, and you use the Violation Report form to record the basic information that a law enforcement officer requires in order to pursue the complaint. If you take a picture, it should include the boat registration number and attached plants. Usually, by this last step, the boater complies, the plants come off the boat, and the lake remains safe from another invasive arrival.

If the boater chooses to launch after all your efforts, then you can report the facts to a law enforcement officer. The definition of "law enforcement officer" for purposes of section 30.715 (4), Wisconsin Statutes, is noted at section 30.50 (4s), Wisconsin Statutes, which reads:

30.50 (4s) "Law enforcement officer" has the meaning specified under s. 165.85 (2) (c) and includes a person appointed as a conservation warden by the department under s. 23.10 (1).

Section 165.85 (2) (c), Wisconsin Statutes, in turn defines "law enforcement officer" as any person employed by the state or any political subdivision of the state, for the purpose of detecting and preventing crime and enforcing laws or ordinances and who is authorized to make arrests for violations of the laws or ordinances that the person is employed to enforce.

The definition of "law enforcement officer" is obviously very broad and would clearly allow law enforcement officers of counties and municipalities throughout the state to enforce the AIS regulations and laws. Your best resource is your regional DNR Water Guard or local DNR Conservation Warden. Before you pursue any enforcement action, make contact with your local warden to know what information the warden expects from you. The warden will decide how to process the violation.

We are excited to now have DNR Conservation Wardens devoted primarily to providing education and enforcement on the AIS laws and regulations. Each DNR region in Wisconsin has at least one Water Guard; in some cases, more than one.

Photo provided by WDNR

AIS Violation Report Form

Boat Landing/Location:_____

Date:_____ Time:_____ AM or PM

County:_____ Town/Village/City:_____

Vehicle License Number:_____ State Registered:_____

Boat Registration:_____ State Registered:_____

Car/Boat/Personal Watercraft Information -

Year:_____ Make:_____ Model:_____ Color:_____

Violator Information: Male or Female

Name of Boat Operator:_____

Hair:_____ Eyes:_____ Approx. Height/Weight:_____

Other Description (clothing, etc.):_____

Photo Taken of Violation: Yes or No

Description of Violation/Comments:_____

_____

_____

_____

CBCW Inspector's Contact Information -

Name:_____ Phone Number:_____

Address:_____

❒ Please check box if law enforcement may contact you for more information about the violation. You will remain confidential in this case.

❒ Please check box if you do not want law enforcement to contact you for more information about the violation.

Regional Water Guard Contact Info:	**To report the violation, contact your area Water Guard or DNR Warden OR call 1-800-TIP-WDNR**	Local DNR Warden Contact Info:
_____		_____
_____		_____

Section 3:

How do inspectors share their inspection data?

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Collecting & Reporting Inspection Data

As a part of conducting watercraft inspections, data is collected by volunteer and paid Clean Boats, Clean Waters inspectors at boat landings and recorded on the Watercraft Inspection Report form. This form contains questions that help citizens and the state better understand boaters' knowledge and behaviors regarding aquatic invasive species. The data gathered at the boat landings is then entered into a large online database, called the Surface Water Integrated Monitoring System or SWIMS, by watercraft inspectors.

Data collected at boat landings provides citizens and the state with valuable information.

Photo by Robert Korth

There are **many advantages** to keeping records for the watercraft inspection program:

- With limited state resources, it makes sense for each inspection team to track their own data.
- Collecting data helps the inspection team discover traveling patterns of boaters who visit their lake.
- The data may be useful information if the local lake association or lake district applies for a DNR Lake Planning and Management Grant or an Aquatic Invasive Species Prevention and Control Grant.
- The data could also be useful for local ordinance reviews that pertain to the boat landing or waterbody use.
- **Most importantly**, by recording and sharing information on SWIMS online database, inspection teams will assist lake managers with invasive species prevention and control and will quantify the impacts that both paid and volunteer inspectors are having on invasive species. **Having this information helps justify the continued need to support the invasive species programs.**

How to Use the Watercraft Inspection Report Form

Each day that you conduct watercraft inspections, you will be collecting data about boater behaviors and awareness on the Watercraft Inspection Report form. The forms are designed to be used at one boat landing for one day. Each day you inspect boats, you will use a new report form, and you may use multiple report forms if you visit more than one boat landing in a day. If you run out of room on the report form during your time at the landing that day, it's no problem - just start a new form and staple it to the other forms that you complete at that boat landing for that date. Below are a few guidelines to assist you in effectively collecting and recording the correct information on your form.

Preparing the Form for Inspections

To get your inspection form ready to enter data, fill in the top section with the who, what, when, and where information. This information can be typed into the form and printed out ahead of time or written on the form by hand.

- Inspector Name(s): Enter your name here. You may include the names of any other inspectors who are working with you at the boat landing on that day.

- Date: Enter the date you are conducting inspections. Remember, data forms can only be used for one day on one waterbody at one boat landing. If you go to another boat landing the same day, start using a new form.

- Start Time & End Time: Enter what time you are starting inspections and what time you will wrap-up inspections for the day.

- Total Hours Spent: Indicate whether you are volunteering your time or being paid to do inspections by entering the total number of hours you spend at the boat landings on either the "Volunteer" or "Paid" lines.

- Waterbody Name: Enter the name of the lake where you are conducting inspections.

- County: Enter the name of the county in which you are conducting inspections. Since many lakes have similar names, this helps us know the exact location.

- Landing Location Description: Enter the name of the boat landing where you are inspecting. If the landing has no name, describe your location on the lake as thoroughly as possible. Later when you're ready to enter your data into the online database, we can make sure the correct landing names are available for your waterbody.

Collecting Data During Inspections

Now you're ready to begin inspections. When you encounter a boater, you will introduce yourself and begin your conversation with them about AIS. The questions to ask them are outlined on the form as follows, and you will record their responses, in most cases by marking the appropriate boxes on the data form.

- In the "Boat Was..." section, note if the boat or trailer was entering the water or leaving the water. On waters that have aquatic invasive species already present, inspections should take place as boaters and anglers are leaving the landing. Sharing information with them as they leave the water helps ensure the AIS are being contained in that waterbody and not being spread elsewhere. On waters free of AIS, inspectors have a choice of educating boaters when they're entering or leaving the water. Either time offers a good opportunity to share information.

- The "Questions to Ask Boater" section includes three questions that you should talk about with the boater.

  - **Have you been contacted by an inspector this season?** Answers to this question help prevent you from sharing the same AIS prevention message with the same boaters over and over. We don't want to over-saturate the same boaters with the same message - this could frustrate them. This question also helps us to learn more about how many boaters and anglers we are reaching with inspections. It also tells you about the boater's potential awareness of AIS and boat inspections. Boaters who have never talked to an inspector before will often need more information than someone who has been inspected previously.
  - **Are you willing to answer a few questions?** If the answer is yes, continue on to the next question. If the answer is no, thank the boater for their time and tell them to have a nice day. Your conversation with them is complete.
  - **Was the boat used during the past five days on a different waterbody?** If the answer if yes, record the name (and county and state, if possible) of the last waterbody. This allows state and local groups to compile information on boater traveling patterns. If the answer is no or I don't know, please indicate that my marking the corresponding box.

- You're now ready to engage the boater in an educational conversation, using the questions and prompts listed under the "Discuss Following Prevention Steps with Boater" section.

  - Following the steps listed on the form, share the prevention message step by step and ask the follow-up questions listed after each step with the boater. Use the prompts provided on the "AIS Prevention Steps Prompts" handout to assist you with localizing your message and answering any questions you receive.

- For all anglers, share the additional step and follow-up question regarding draining livewells. If the angler uses live bait, please share the bait message and follow-up question included on the form. This information can also be shared with boaters who have questions about bait laws.

- The last two questions on the form are observations and opinions to be recorded by the inspector. These are not questions that should be asked of the boater.

  - The "Number of People Contacted" question refers to the number of people who heard your message. This can include any children who were listening while their parents prepared to launch their boats or individuals who were simply visiting the landing.

  - The "I feel confident that boater understands the steps necessary to prevent the spread of AIS" question asks for your **opinion**. After talking with the boater about the prevention steps, indicate your level of confidence that the boater **understands** the prevention steps. This is not the same as whether of not you feel the boater will take the steps - just how confident you are that they received the AIS message.

Wrapping Up After Inspections

Once you've completed your inspections at that boat landing for the day, you may have one form or many forms full of the data that you've collected. Before you put the forms aside to enter later, be sure to do just a few quick things to make sure your data form is complete.

- Fill in any additional thoughts or comments you'd like to record in the "Comments" section at the bottom of the form, such as the weather conditions, if there were any unusual occurrences that day, or anything else you'd like to share.

- Data is collected and entered for each landing each day. If you have multiple data sheets, use the "Sheet__of__" spot to indicate how many total sheets you have for that day and number each sheet accordingly.

- Lastly, total each column on the datasheet and enter the total number in the last row titled **"Totals"**. To do this, count the number of checks or marks you have made in each column and record that number in the "Totals" row (the exception being the waterbody and county/state names as they cannot be totaled). Don't forget, data is collected and entered for each landing each day. So, if you have multiple datasheets, you'll count the column marks on all of the datasheets and have a grand total for each column that includes the data from all sheets.

Now you're ready to enter your data into the online database known as SWIMS (Surface Water Integrated Monitoring System). More information and instructions on how to enter data can be found in the following pages. **Best of luck in your watercraft inspection program, and remember to let boaters know that they're making a difference by following the prevention steps!**

State of Wisconsin
Department of Natural Resources
Wisconsin Lakes Partnership

Watercraft Inspection Report

Form 3200-120 (R 4/14)

Notice: Information is collected under s. 33.02, Wis. Stats. Personally identifiable information, including names of volunteers, will be broadly distributed in conjunction with lakes data.

Inspector Name(s)	Date	Start Time ◯am ◯pm	End Time ◯am ◯pm	Total Hours Spent: Paid: _____ Volunteer: _____

Waterbody Name	County	Landing Location

Boat Was...		Questions to Ask Boater								Discuss Following Prevention Steps with Boater	Number of People Contacted	I feel confident that boater understands the steps necessary to prevent the spread of AIS. (Check one)			
		Have you been contacted by a watercraft inspector this season?		Are you willing to answer a few questions?		Was boat used during the past 5 days on a different waterbody?		If YES, where?							
Entering	Leaving	Y	N	Y	N	Y	N	Waterbody Name / County / State	Don't know			Strongly Agree	Agree	Disagree	Strongly Disagree
TOTALS: Enter the totals & waterbody information into SWIMS at http://dnr.wi.gov/lakes/cbcw-data															

WI Law requires boaters to take the following steps when leaving a boat landing:

Steps 1 & 2: **Inspect** boat, trailers and equipment and **remove** any attached plants/animals.

» Have you heard of this before? (see prompt)

Step 3: **Drain** all water from **boats**, vehicles and equipment.

» Do you have any questions? (see prompt)

If angler, state following steps:

Step 4: **Drain** water from **livewells** and containers holding your catch.

» This is a relatively new law. Were you aware that this is required? (see prompt)

Do you use live bait? (If YES, share message below.)

Bait Message: If live bait comes in contact with lake/river water, it can only be used on that same waterbody or discarded in trash. (bait=minnows/leeches/worms)

» Do you have any questions on this law as it can be a little confusing? (If yes, see Prompt and offer bait sticker/brochure)

Comments:

Sheet _____ of _____

Sharing Information

Everyone who attends a "Clean Boats, Clean Waters" training workshop is entered into the watercraft inspector database. Each participant's name, address, and contact information is collected during the workshop and reported in the inspector database. This helps us keep track of the inspection efforts that are going on around the state.

Obtain a SWIMS User ID & Password

Ready to enter your inspection data? Watercraft inspectors must obtain a user ID and password before they can enter any information into the SWIMS online database. Here's how:

1. Go to: **https://on.wisconsin.gov**.
2. Click on the link labeled **"Self-Registration"**.
3. Scroll all the way down to the bottom of the page and click **"Accept"**.
4. Fill in your name and e-mail address. (Note: Only fields with a red asterik* next to them need to be filled out. Leave the postal address field blank. Addresses for inspectors are kept in a separate database.)
5. Choose a User ID, password, and a secret question (used in case you forget your account information.)
6. Click **"Submit"**. Now check your e-mail account. You should have an e-mail from "wisconsin.gov". Open the e-mail and **click on the link in the e-mail**. Log in with your new User ID and password.
7. You're almost done! **The final step is to e-mail your User ID to: jennifer.filbert@wisconsin.gov.** In the e-mail, **state that you are a part of Clean Boats, Clean Waters and say where you are going to be inspecting** (i.e. Big Lake in Shawano County). Also, **mention if your inspection efforts are part of a DNR lake or AIS grant**. Within a couple of business days, your User ID will be entered into the SWIMS database, and you will be sent an e-mail letting you know that you're all set up to enter data.

Common Questions/Issues & Tips:

- ⇨ ***When I open the e-mail to click the link, the link doesn't work.*** If the link in the e-mail wraps to the second line and if you click and don't get a log in page, try copying and pasting the part that wrapped around onto the end of the URL.
- ⇨ ***I don't know what to put for the Secret Question.*** The secret question should be something you can easily remember that doesn't change. You want to pick something where there aren't too many ways to type the answer. For example, name of first pet, color of first car you owned. The secret question has nothing to do with your password, but if you forget your password, it's a way for the computer to tell that it's really you.
- ⇨ ***I don't have an e-mail address.*** If you don't have an email address, there are many places on the Web where you can get a free email account from Google, Hotmail (MSN), Yahoo!, etc.

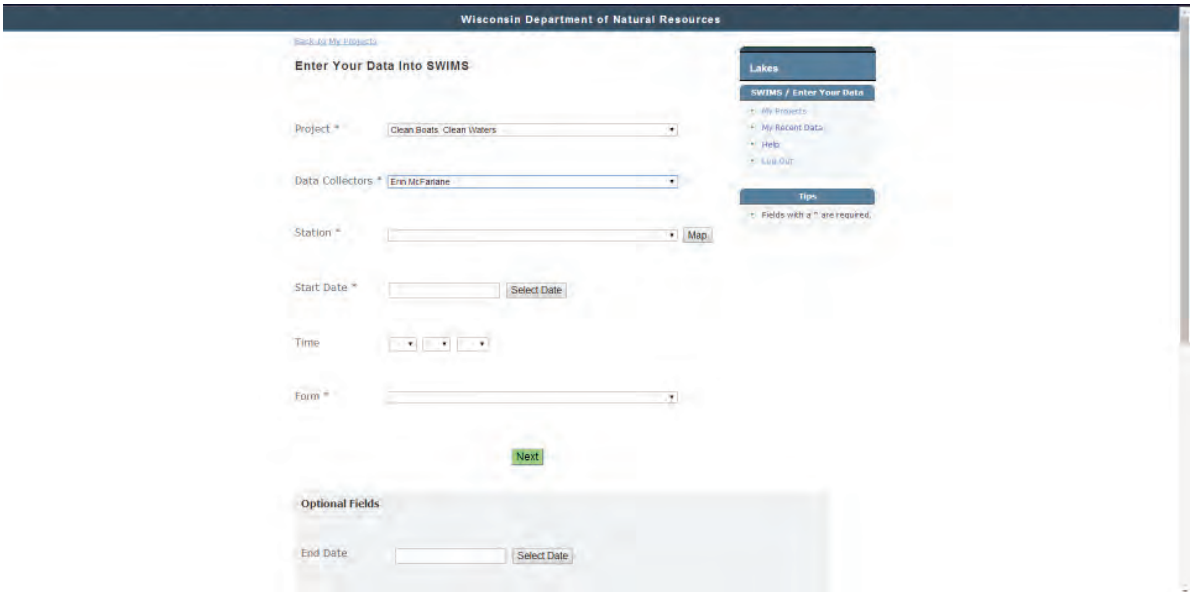
⇨ ***When I try to fill in my information (name, address, etc.), it doesn't accept it.*** There is a bug with entering postal addresses, so leave the address blank. Also note: even if you don't fill in the address, addresses for inspectors are kept in a separate database system, so we will still have your address if you have already given it to us.

⇨ ***I got a user id and password, but when I try to log into SWIMS, but it won't recognize me.*** Be sure to e-mail your user ID to Jennifer (see step 8).

Entering Your Data Into SWIMS

After you receive your user ID and password, you will be able to enter the information you have collected during the watercraft inspections. Online data entry involves entering the numbers in the"Totals" row located at the bottom of your report form. Here are step-by-step instructions on how to enter your inspection data into SWIMS:

1. Go to: **http://dnr.wi.gov/lakes/cbcw-data** (this web address is also listed on the Watercraft Inspection Report form).
2. **Log in with your user ID and password.** If you forget your password, just click on "Forgot Your Password?"
3. Your "My Projects" page will list your active CBCW projects. Projects are often specific to the lake being inspected (example: Clean Boats, Clean Waters - Long Lake). If you are inspecting many waterbodies in a county, your project may be broken down by county and year (example: Clean Boats, Clean Waters - Oneida County). Click **"Enter Data"**.
4. Ensure the correct project is listed by using the dropdown menu. Then, **select the data collectors and station (boat landing)**. If there are additional data collectors that you'd like to add but they're not listed in the dropdown menu, send jennifer.filbert@wisconsin.gov a list of names, and she will add them to you dropdown box. Alternatively, inspector names can be listed in the "Comments" field.

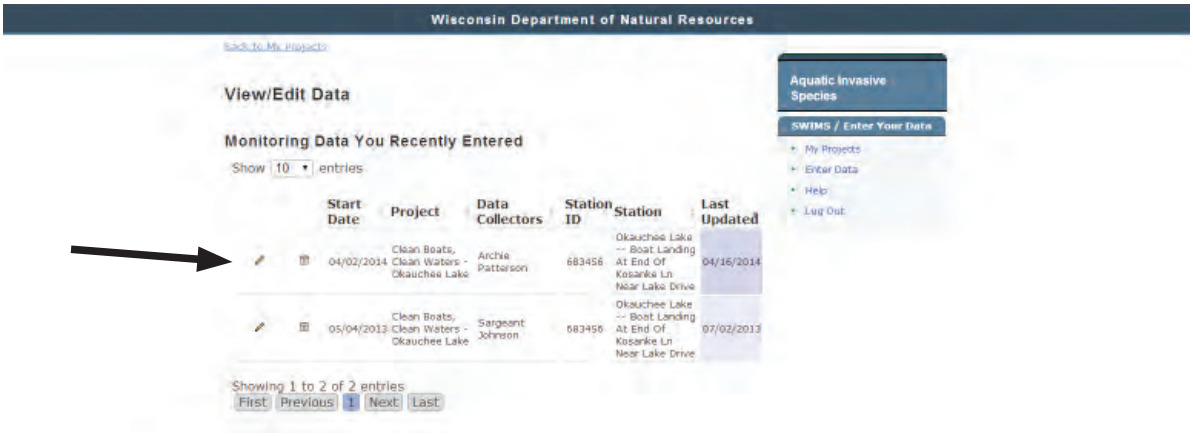


5. **Select the Start date and time** (when you started working at the landing that day). End date and time are optional.
6. Under Form, ensure the **Watercraft Inspection Report (Revised 3/2014)** is selected.
7. Down below, you have the option of entering the End Date and Time, as well as your written observations in the **comments** box (i.e. weather, wildlife).
8. **Click "Next" to begin filling in your totals**. The data you enter will be in the "Totals" row found at the bottom of your report form.
9. When you've filled in the totals, **click "Next" and you can enter any waterbody names that boaters reportedly visited during the past five days**.
10. Then, **click "Next Date" to continue entering data for another day, or click "Next Station" to enter data collected at another boat landing. If you're finished with data entry, click "Done"**. When you click "Done", you will see the data you recently entered.

Editing Existing Data

You can edit data you've entered during the current inspection season. Here's how:

1. Log into SWIMS at: http://dnr.wi.gov/lakes/cbcw-data.
2. Click **"Edit Data"** listed under your CBCW project. Click the **pencil icon** for the date you want to edit.
3. You can edit comments, etc. on the first page if necessary, and then click **"Next"**. You can now edit your results. If you hit **"Save and Return to List"**, your changes will save, and you'll return to the list of data entries.



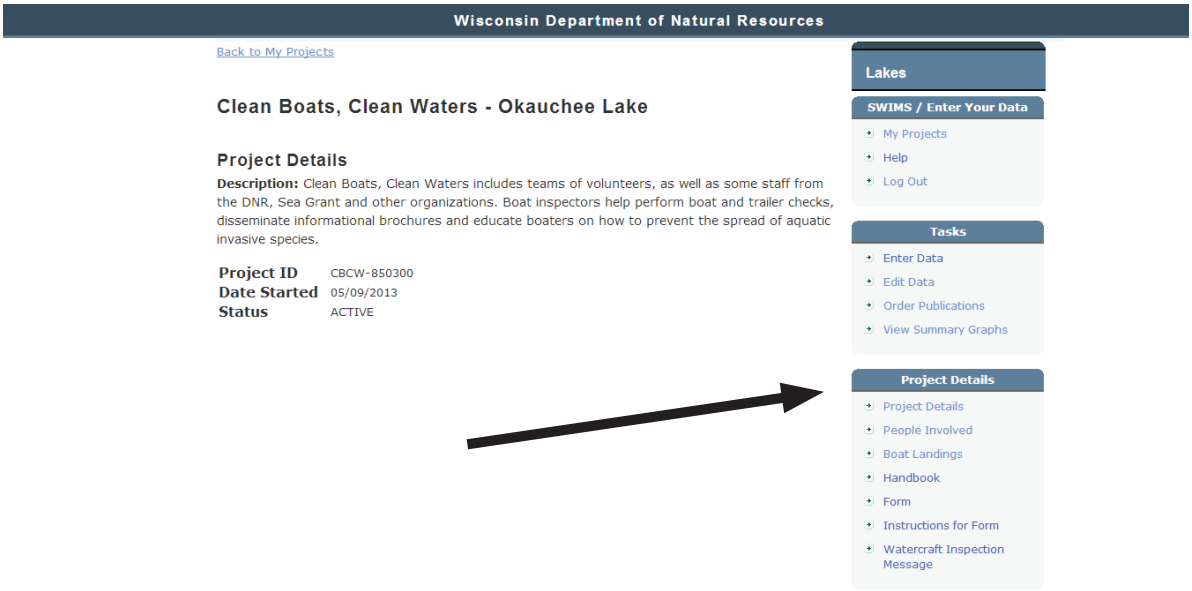
Common Question:

- ***What if the landing I need isn't listed? What if I'm not sure?*** You can select a landing and click "Show Map" to see where it is located. Otherwise, contact Jennifer at jennifer.filbert@wisconsin.gov to have a landing added or to suggest a better description for the landing.

If you need assistance with anything related to reporting your data, feel free to contact Jennifer at jennifer.filbert@wisconsin.gov.

Project Details

After logging into SWIMS, you will see your "My Projects" page that lists all of the projects you are associated with. By clicking "More" under a specific project, you can view the details of that project. You can also access a variety of project details and resources located in the tool bar on the right-hand side of the page. This includes information like: a list of the landings associated with the project, a list of inspectors involved in the project, data download and summary graphs of the project data, and links to the CBCW manual, Watercraft Inspection Report form, and more.



"Anything else you're interested in is not going to happen if you can't breathe the air and drink the water. Don't sit this one out. Do something. You are by accident of fate alive at an absolutely critical moment in the history of our planet."

- Carl Sagan

Section 4:

How can inspectors take care of their boat landings?

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Boat Landing Inventory

The "Clean Boats, Clean Waters" program offers an excellent opportunity for inspectors to inventory the boat landings on their lake. Oftentimes the signage is old or damaged and needs to be replaced. Boat ramps and piers may need servicing or trash buckets may be missing. If the landing has a message board or kiosk, inspectors can post informational brochures about invasive species and contact numbers if a questionable plant or animal is found. Remember, the boat landing is the first opportunity for inspectors to educate boaters. The watercraft inspection team cannot be there for every boater, so inspectors must be prepared to offer education and information at any time.

It is important to know who owns the landing and who to contact when maintenance needs to be done. Inspectors should always seek permission prior to making any changes at the landing site.

If the landing is in need of signage, inspectors can contact their local DNR service center for the appropriate sign (see the following pages for the sign posting information and an image of the AIS landing sign). To assist inspectors in developing an educational message, the "Clean Boats, Clean Waters" resource kit and the "Clean Boats, Clean Waters" Web site: http://www.uwsp.edu/cnr/uwexlakes/cbcw contain examples of brochures and flyers that can be customized for each community.

Photo by UW-Extension Lakes

Instructions for AIS Sign Installation

Thank you for posting Wisconsin's new AIS signs! AIS signs are an effective tool for reminding and educating boaters about AIS prevention steps and Wisconsin's AIS Law. It is our goal to place AIS signs at all public boat landings in the state.

Before Installation…

Required:

Contact Diggers Hotline before you install any post at a boat landing. Although new posts may not be required, it is helpful to contact Diggers Hotline to avoid surprises in the field. The request to Diggers Hotline can be submitted electronically. For more information, visit: http://www.diggershotline.com and click on "Ready to file? Click here!". Always call before you dig or put a post in the ground!
Diggers Hotline - Wisconsin's One-Call Center: **CALL 811 or (800) 242-8511 | (877) 500-9592 (emergency only)**

Recommended steps:

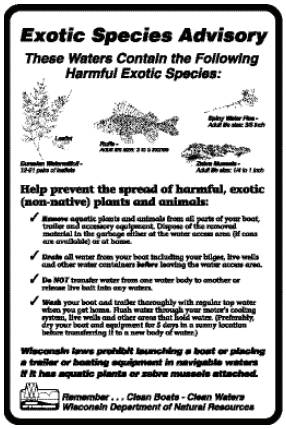
Taking the time to put together a map, obtain permission, and plan a route saves time and miles in the field. Plan ahead and follow these recommended steps:

1. Delineate township lines on map copied from Wisconsin Gazetteer and County plat books.
2. Identify lake and river landings on maps.
3. Obtain permission from landing owners by contacting Federal agencies, DNR (Forestry/ Fisheries) department, county (Land and Water Conservation, Forestry or Parks), cities, towns, villages, and private owners. Boat landing operators and managers can also be searched online within the "more information" section at: http://dnr.wi.gov/topic/lands/boataccess. County clerks offices also frequently have this information available. Please see attached sample permission letter and form for details.
4. Gather additional needed materials, such as printing off boat landing survey forms for each boat landing that will receive a new sign (see page 8-10 for survey form). This may also be a good opportunity to replenish publications at kiosks. To place AIS publication orders, please email orders to DNRAISinfo@wisconsin.gov.
5. Contact local officials for directions to landings and for locations of commonly used private landings not on the map. They often can provide names or phone numbers of private landing owners and other helpful information.

Current signs at boat landings:

There are three AIS signs that the DNR has provided in the past and you will likely encounter at boat landings. The intent of the new sign is to replace these old signs. Therefore, we recommend you take down these signs during your visit and return them to your local DNR office. These signs will be recycled for the new signs, which will greatly reduce our costs. These signs are:

1. "Exotic Species Advisory"



2. "HELP Prevent the Spread of Aquatic Exotic Plants and Animals"

3. "Please Stop and Remove All Aquatic Plants and Animals and Drain Water from Boat and Trailer"

Sign Installation

Equipment you will need:

- ✓ 7-8 foot metal U-posts (U channel posts).
- ✓ Post pounder/sledge hammer
- ✓ Step Stool
- ✓ Hammer
- ✓ Cordless drill and drill bits
- ✓ 5/16" socket and wrench
- ✓ 5/16" x 2 ½" Hex bolts for securing yellow signs to post.
- ✓ 5/16" x 2 ½" Carriage bolts for securing metal signs (no washer needed).
- ✓ 5/16" Lock nuts (with plastic threads so no lock washer needed)
- ✓ 5/16" Tufnut (anti-theft) security nuts, bolts, and washers for posting areas where signs tend to disappear.
- ✓ Maps:
  - Wisconsin Gazetteer
  - Lake Maps
  - Plat Books
- ✓ Other:
  - Boat landing survey form (1 form/sign), see attached
  - Permission slips, see attached
  - Directions to landings
  - Boat Landing Inventory Form (water resistant paper suggested)
  - Ear plugs/muffs
  - Gloves
  - Hard Hat
  - Cell Phone
  - Digital Camera
  - Regional DNR Telephone Directory
  - Warden Contact Numbers
  - Sun block
  - Sunglasses
  - Pencils
  - Permanent marker
  - Clip Board
  - Watercraft Inspection Report (to record any watercraft inspection efforts)
  - Brochures, Wild Cards to distribute to the public at the landings

How to install a sign:

1. Contact Diggers Hotline before you install and request permission to install a new sign.
2. Find ideal sign location facing water, that is easily visible to boat landing users.
3. Make sure sign is out of way of vehicle traffic. In order to maintain public safety, NO signs should ever be installed on traffic regulatory sign posts. If there are any questions about appropriate sign location at public access sites, please consult the property manager.
4. Use post pounder or sledge hammer and secure U-post 2-3 feet in ground making sure the open end of "U" faces the water.
5. Align top of sign with top of U-post and insert bolts from front of sign through predrilled hole in the top and bottom of the sign and post. (Make sure both holes line up with holes in post before securing with nut or tufnut).
6. Use socket and/or wrench to secure nut or tufnut to bolt.
7. Make sure sign is secure.
8. Place red "this waterbody is known to contain..." sticker, if applicable. Check online at http://dnr.wi.gov/lakes/invasives/AISByWaterbody.aspx for a list of waterbodies known to contain AIS.
9. FILL OUT boat landing survey form and upload information into SWIMS or return by mail.
10. Repeat at next landing.

What to do after new signs have been installed:

1. Recycle metal and plastic signs, posts, and hardware to a local recycling facility. You may also keep them if you think you may be able to use them in the future.
2. Remember to enter your boat landing survey form into SWIMS or to mail it back to:

AIS Education Specialist
Wisconsin DNR- WT/4
101 S. Webster St.
Madison, WI 53703

If you have additional questions/comments please contact Bob Wakeman at robert.wakeman@wisconsin.gov. Thank you again for your efforts in protecting Wisconsin's waters!

The new AIS boat landing sign is 18" wide by 24" high and is made from reflective metal.

Sample Permission Letter

WISCONSIN
DEPT. OF NATURAL RESOURCES

State of Wisconsin / DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
William H. Smith, Regional Director

Northern Region Headquarters
107 Sutliff Ave.
Rhinelander, Wisconsin 54501-3349
TELEPHONE 715-365-8900
FAX 715-365-8932
TTY 715-365-8957

Date:

Subject: Permission to post signs at boat landings

Dear Town Board of Supervisors,

One of the ways the Wisconsin Department of Natural Resources (WDNR) is addressing the challenge of combating invasive species in Wisconsin's waters is by posting signs at boat landings. These signs alert boaters to invasive species present in the waterbody and provide tips to prevent their spread to other lakes and streams. Other strategies to combat this problem include monitoring lakes for invasive species, training volunteers to monitor their own boat landings through the Clean Boats/ Clean Waters workshops, watercraft inspection efforts by agency staff and dissemination of education/outreach materials.

Your assistance is requested to help us post the signs. *Please forward to us a list of boat landings under your ownership.* We will then inform you which lakes contain invasive species and thus should be posted with the warning signs. *Your written permission granting authority to the WDNR to place signs at your boat landings is also necessary before sign placement can occur.*

Enclosed are copies of three metal signs. The plastic "yellow exotics advisory" sign is placed at boat landings on infested waters and the "Help Prevent…" sign is placed on uninfested waters. Both these signs are placed near the launch site. The "Stop" sign is posted as they leave the launch site as a reminder to boaters to clean their boats and equipment.

Feel free to contact me with any questions or concerns. **Please return the authorization form and the list of landings to me at the address above.**

Thank you for your interest and cooperation.

Sincerely,

Contact information

Sample Permission Form

WISCONSIN
DEPT. OF NATURAL RESOURCES

State of Wisconsin / DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
William H. Smith, Regional Director

Northern Region Headquarters
107 Sutliff Ave.
Rhinelander, Wisconsin 54501-3349
TELEPHONE 715-365-8900
FAX 715-365-8932
TTY 715-365-8957

Authorization to Post Signs at Boat Landings

The County Board of _____ hereby grants permission to the Wisconsin Department of Natural Resources to place signs at boat landings under our ownership and/or control. The signs are to alert and educate boaters to the problem of invasive species in our waters.

Granted this day of _____

_____ Signature

Authorized Representative

BOAT LANDINGS UNDER OUR OWNERSHIP

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Boat Landing Sign Survey

Our goal is to have new aquatic invasive species (AIS) signs on every public boat landing in the state of Wisconsin. In order to meet this goal, we need to determine which boat landings have received the new AIS signs and which boat landings we still need to visit. **Please fill out a separate survey for each Wisconsin DNR AIS sign that you install at an access point. This survey information can be uploaded to SWIMs or mail to:**

AIS Education Specialist
Wisconsin DNR- WT/4
101 S. Webster St.
Madison, WI 53703

The information you provide will help us greatly. Thanks for all of your hard work to protect Wisconsin's waters!

Name_____**Date of Installation** _____

Location of Access Point

Please fill out all known information.

County:_____

Municipality Name: _____

Waterbody Type:

- ❒ Lake
- ❒ River
- ❒ Wetland with navigable waterway
- ❒ Other _____

Waterbody Name: _____

Boat Landing Name: _____

Address/Closest Named Road:

_____

_____

_____

Follow-up Questions
Please fill in all known information.

Question 1: What type of access point was this?
- ❒ Ramp
- ❒ Carry-in
- ❒ Other

  If Other, please explain:_____

Question 2: Before you installed the new AIS sign, 'Prevent the Spread...', were there other AIS signs at the access point?

Circle one: Yes / No

If Yes, check all that apply:
- ❒ Yellow 'Exotic Species Advisory' sign
- ❒ Green and white 'Help.... Prevent the Spread...' sign
- ❒ Green, white and red stop sign 'Please Stop and...'
- ❒ County ordinance sign
- ❒ Lake Association sign
- ❒ Other: _____

NOTE: Once new AIS signs are installed, we ask that you please remove all other DNR AIS signs. This includes the yellow 'Exotic Species Advisory' sign, the green and white 'Help Prevent the Spread...' sign, and the green, white and red stop sign.

Question 3: Did you remove any of these signs during your visit, or do you have plans to in the near future?

Circle one: Yes / No

If Yes, check all that apply:
- ❒ Yellow 'Exotic Species Advisory' sign
- ❒ Green and white 'Help.... Prevent the Spread' sign
- ❒ Green, white and red stop sign 'Please Stop and...'
- ❒ County ordinance sign
- ❒ Lake Association sign
- ❒ Other: _____

Question 4: When installing the sign, were you able to reuse the post from previous DNR signs?

Circle one: Yes / No

Question 5: Was this waterbody known to contain invasive species? (List of waters known to contain AIS at http://dnr.wi.gov/lakes/invasives/AISByWaterbody.aspx)

Circle one: Yes / No / Unsure

If Yes, was the red sticker "This Waterbody Is Known to Contain Invasive Species" applied to the bottom of the sign? Circle one: Yes / No

Question 6: Was the sign installed facing the water so people leaving the water could read it or facing the launching area so people launching could read it?

Circle one: Water / Land

Question 7: The ideal location for an AIS sign is at the access point, facing the water. However, we recognize this is not always possible. Please indicate the location that best represents where this sign is currently located (Check one):

- ❒ Next to the access point, facing water
- ❒ Next to access point, facing launch area
- ❒ On a pier or dock
- ❒ Next to or on a shelter or kiosk
- ❒ Next to the parking lot entrance or exit
- ❒ Other: _____

Question 8: Does the access point appear to be in proper working order? Yes / No

If No, please explain: _____
_____

Question 9: How many people installed the sign?

Circle one: 1 / 2 / 3 / Other:_____

Question 10: How would you describe yourself? (Check one that best applies.)

- ❒ DNR employee
- ❒ County employee
- ❒ Municipal employee
- ❒ Boat landing owner/operator
- ❒ Lake Association Member
- ❒ CBCW Volunteer
- ❒ Other: _____

Again, thank you for your efforts to protect Wisconsin Waters! **Please contact Christal Campbell with any questions: 608-266-0061 / christal.campbell@wisconsin.gov.**

Boat Landing Questions

Invasive species are posing an increasing threat to the quality of water experiences in Wisconsin. Communities are looking at developing a campaign to educate boaters at the landings on the possibilities and consequences of moving aquatic invasives. Other communities are developing plans to look at their water resources and prevent or slow the spread of aquatic invasives. The following is a list of questions that we have been hearing from communities as they consider various prevention plans.

Landing Ownership and Maintenance

How can I find out who owns the boat landing?

Ownership of boat landings can be determined through a variety of methods. Plat maps are one useful source, as are searches at the register of deeds office for the county in which the landing is located. Department of Natural Resources (DNR)–owned and leased boat landings are identified on the DNR Web site under the "State Parks and Forests" Web pages. The DNR Web site also provides a page that contains links to the Web sites of county-owned parks.

Do state-owned parks operate under different rules than county, village, or city parks?

State-owned parks with boat landings are regulated under ch. 26, Wis. Stats. and ch. NR 45, Wis. Adm. Code. County, village, and cities that own parks with boat landings usually operate such parks and boat landings under local ordinances.

Who is responsible for maintaining the boat landings?

Whoever owns or operates a boat landing is responsible for its maintenance.

Can boat landings be closed or have special launch hours?

State-operated boat landings are required to operate under the same hours as the state parks. Most Wisconsin state parks, recreation areas, trails, and forest campgrounds are open from 6 a.m. to 11 p.m. Occasionally, DNR sites have different hours as required under conditional use permits. Boat landings that have been funded by the DNR and that are operated under lease from the DNR must maintain the same hours. Other locally owned sites are subject to hours established by the local unit of government. The state does not regulate launch hours unless the hours create a significant impediment to public use of the site. Once a boat has been launched, it must be allowed to exit from the lake, even if after the prescribed launching hours.

What signage and items (composting bins, garbage cans) are acceptable and legal at landings?

Informational signs at DNR public access sites can be installed and should be located in compliance with shoreland zoning and other local regulations whenever practicable. Boat landings that are the responsibility of other governmental entities or private individuals or businesses are not exempt from the requirements of local zoning ordinances, and responsible parties will need to apply for any permits that may be required under applicable zoning ordinances. Signs may be required to be set back 75 feet from the ordinary high-water mark of navigable waters (although the DNR is likely to propose some changes to ch. NR 115, Wis. Adm. Code, that would exempt from county shoreland setback requirements certain regulatory and informational signs that meet specified standards). Composting

bins and garbage containers that are large and relatively immobile will need to be set back at least 75 feet from the ordinary high-water mark of navigable waters. However, the DNR's shoreland zoning program has taken the position for some time that small items that are easily moved by hand (such as movable garbage cans and picnic tables) are not subject to shoreland setback requirements in county shoreland zoning ordinances, even though the definition of "structure" found in dictionaries, ch. NR 116, Wis. Adm. Code (floodplain zoning ordinance rules), and in many local zoning ordinances is broad enough to theoretically include such items. Small structures that are easily moved by hand are likely to be specifically exempted from shoreland setback requirements when ch. NR 115, Wis. Adm. Code, is revised.

Launching fees

Are there state guidelines for communities that are considering boat launching fees?

The DNR encourages free boat launching. However, under s. NR 1.91(11), Wis. Adm. Code, a reasonable launch fee may be charged under authority of s. 30.77, Stats., for the purpose of operating and maintaining a boat access site owned or operated by municipalities, lake management districts, and other access providers. Excessive, unjustified, or unreasonable boat launching fees restrict or prohibit public boating access and use of navigable waters in the state. A reasonable launch fee for the purposes of s. 30.77, Stats., is one that does not exceed the maximum allowable amount under criteria identified in s. NR 1.91(11), Wis. Adm. Code. The base fee that can be charged for a state resident is that fee that is charged a state resident vehicle for entrance to the state parks.

Under s. NR 1.91(11), Wis. Adm. Code, public boating access surcharges may be added to a base fee for specific services identified in that code section. However, prior approval by the DNR is required when a public boating access provider proposes to charge a fee in excess of the resident state park daily entry fee. In addition, no more than the base fee may be charged for nonmotorized or nontrailered boats. Surcharge fees may be charged for vehicles with trailers at boat landings in the following circumstances: when an attendant is on duty, for on-site toilet facilities, at Great Lakes sites, for boats that are at least 20 feet in length but less than 26 feet in length, and for boats that are greater than 26 feet in length.

Do the fees have to be used for a particular item?

Boat launch fees are to be used for operation and maintenance of a boat launch site. Boat launch fees cannot exceed amounts established in s. NR 1.91, Wis. Adm. Code. The DNR's jurisdiction or authority is limited to whether the fee amounts comply with the s. NR 1.91, Wis. Adm. Code requirements.

Can the fees include the costs of operating a boat wash facility?

Boat launch fees may only be used for the operation and maintenance of a boat launch site, which could include a boat wash facility. However, as noted above, additional fees cannot be charged for a boat wash facility.

Can a special nonresident or out-of-state resident fee be charged?

Under s. NR 1.91(11)(g), Wis. Adm. Code, local units of government, including lake management districts that maintain and operate public boating access sites, may charge differential fees on the basis of residency within the unit of government maintaining or operating the access. If a fee is charged, the fees for a nonresident may not exceed 150% of the fee charged a resident and may not exceed the maximum allowable amounts except when surcharges for boats longer than 20 feet are in place.

Can a special fee be charged by someone who is not a riparian owner?

As noted above, differential fees can only be charged on the basis of residency within the unit of government maintaining or operating an access site. A special fee based only on riparian ownership or lack thereof would not be appropriate.

Can the launch fee be increased over time to assist in lake management costs, for example, controlling invasive species?

Boat launch fees can not exceed the maximum allowable amount established under s. NR 1.91 (11), Wis. Adm. Code.

Can the launch fee include nonmotorized equipment such as canoes, scuba equipment, or kayaks?

Under s. 30.50(2), Stats., a boat means "every description of watercraft used or capable of being used as a means of transportation on water, except a seaplane on the water and a fishing raft." This definition means that canoes and kayaks could be required to pay a launch fee, but a fee could not be charged for scuba equipment. However, no more than the base fee may be charged for a canoe or kayak because they are nonmotorized or nontrailered boats. A nonmotorized boat is a boat that is not a motorboat but that is designed and constructed to be used as a boat for transportation of a person or persons on water. The term includes, but is not limited to, any canoe, sailboat, inflatable boat or similar device, rowboat, raft, and dinghy that is not a motorboat.

If a fee is charged, how can it be collected?

Normally, launch fees are collected through the use of launch attendants who are on duty during the day or through the use of an honor system, in which the user voluntarily pays for launching when no attendant is on duty.

Do funds need to be reported?

Launch fees are the responsibility of the municipality that is operating the launch site. Any questions or concerns concerning the reporting of launch fees should be directed to the municipality that maintains the launch site. The DNR's jurisdiction or authority is limited to whether the fee amounts comply with s. NR 1.91, Wis. Adm. Code.

What is the public trust doctrine?

The Wisconsin Constitution establishes a state-administered public trust for navigable waters of the state. Under the public trust doctrine, the state holds the beds of navigable bodies of water in trust for all its citizens and has an obligation to protect public rights in navigable waters.

What is the relationship of the public trust doctrine to local regulations?

The public trust doctrine plays a substantial role in any decision relating to the public's access to and use of public waterways. The doctrine provides that the government holds all navigable waters in trust for the benefit of, and unrestricted use by, the public as a whole. This doctrine essentially creates a property right for the public as a whole in the waterways within a state. Access and use of waters may be restricted only under the police powers of the state for the protection and conservation of the public health, safety, and welfare, including environmental conservation and recreational purposes. Any regulation of the use of waterways must be reasonable in respect to the public interest being protected.

Under s. 30.77, Stats., no municipality, public inland lake protection and rehabilitation district, or town sanitary district may enact any ordinance or local regulation that requires local numbering, registration, or licensing of boats or any ordinance or local regulation that charges fees for inspection.

In addition, these entities may not, except as provided in subs. 30.77 (2) and (3), Stats., enact any ordinance or local regulation that in any manner excludes any boat from the free use of the waters of this state or that pertains to the use, operation, or equipment of boats or that governs any activity regulated by ss. 30.50 to 30.71, Stats.

Under s. 30.77(2), Stats., any municipality may enact ordinances that are in strict conformity with ss. 30.50 to 30.71, Stats., or rules of the DNR promulgated under those sections. Under s. 30.77(3), Stats., any town, village, or city may, in the interest of public health, safety, or welfare, including the public's interest in preserving the state's natural resources, enact ordinances applicable on any waters of this state within its jurisdiction if the ordinances are not contrary to or inconsistent with that chapter and if the ordinances relate to the equipment, use, or operation of boats or to any activity regulated by ss. 30.60 to 30.71. These ordinances are subject to advisory review by the DNR (s. 30.77(3)(d), Stats.).

Boat Wash Facilities

Are there state guidelines for construction, placement, and use of a permanent boat wash station at a landing?

There are no existing state guidelines for the construction, placement, and use of permanent boat wash stations.

Are there state guidelines for portable washing stations?

There are no state guidelines for portable washing stations.

Can a lake association, district, or municipality require boat washing as a condition of access to public waters?

Washing as a condition of access may be required only if a boat wash facility is readily available for public use, if no fee is required for the use of the boat wash facility, and if the requirement does not unreasonably exclude any boat from access to public waters.

Could a lake association or district place a boat wash facility on an access area owned by the state?

A lake association or district would need the permission of the DNR to place a boat wash facility on an access area owned by the state. In such circumstances the lake association or district would need to enter into a land use agreement (lease) with the DNR. Such agreements would include an assumption of all risk by the operator and an insurance requirement.

Could lake association or district volunteers manage a boat wash facility on a state-owned access area? What conditions (such as liability waivers) would need to exist?

Yes, a volunteer-run boat wash facility on a state-owned access area could be accomplished through an operational lease that included indemnification clauses.

Is there any permissible basis for closing a public launch site?

The closing of a public launch site by a county or town would be viewed as an abandonment of a public access, which would require DNR approval. The DNR may grant an abandonment only if the access site or part thereof proposed to be abandoned or discontinued is replaced prior to granting the petition, or if the access proposed to be abandoned does not contribute to the quality or quantity of public access on the body of water. In addition, an access site may be abandoned if environmental degradation is occurring at the site as a result of existing use and if abandonment of the access will reduce or eliminate the degradation without reducing public interests in access to that body of water.

The DNR's authority does not apply to cities and villages, but court approval may still be

required if the access site is part of a platted subdivision or if the site is considered part of a highway and objections from adjoining landowners are received.

Could a local ordinance place conditions on the use of a launch site and limit access if boats are not washed?

A local ordinance may place conditions on the use of a launch site and limit access if boats are not washed only if a boat wash facility is readily available for public use, if no fee is required for the use of the boat wash facility and if the requirement does not unreasonably exclude any boat from access to public waters.

Boat Washing Facilities

A number of inquiries have been received by DNR and UW-Extension staff on the feasibility of installing boat washing stations at water access sites. The stations could be used as a tool by lake communities to reduce the risk of transport of aquatic nuisance species by recreational boaters. Wisconsin has not conducted any studies to determine the feasibility of using a boat wash facility. However, other states and provinces (Minnesota and Ontario) have tested various applications of boat washing stations, both permanent and portable, under mandatory and volunteer situations. Here is what was learned:

Boat washing facilities are not considered a substitute for the steps that the aquatic invasive species program asks boaters to take when leaving the launch site. The cornerstone of Wisconsin's "Clean Boats, Clean Waters" program is a consistent list of precaution steps that are emphasized in all public education brochures, pamphlets, watch cards, public service announcements, and signage. Those steps are:

1. INSPECT your boat, trailer and equipment
2. REMOVE any attached aquatic plants or animals (before launching, after loading and before transporting on a public highway).
3. DRAIN all water from boats, motors and all equipment.
4. NEVER MOVE live fish away from a waterbody.

Boat washing is just one of the prevention steps, and installation of a wash station should accompany other education efforts that focus on all the steps listed here.

Boat washing stations are a costly alternative to an effective watercraft inspection program and a well-planned education campaign. Several issues need to be considered before the installation of washing stations:

1. costs for construction and maintenance of these facilities;
2. physical constraints for installation of the stations;
3. that washing cannot be made mandatory for all boaters;
4. safety of the facility and liability;
5. practical concerns about how best to capture and treat the wastewater;
6. boater acceptance of delays due to washing; and
7. unsolved legal questions related to whether fees could be charged for cleaning boats as a condition of launching.

There are circumstances and situations under which it may be advisable to install a boat wash facility:

1. if prevention and containment is a serious issue or a condition of a permit, or

2. if the venue is one in which heavy use is occurring as a result of a specific activity (boating and fishing tournaments or sailing regattas) or heavy boating periods (July 4th and Labor Day).

   In these situations a portable washing unit could work well as an educational and awareness tool to show boaters how to properly clean their boats.

If lake associations are going to install and operate a boat wash station, here are some guidelines that they should follow:

- Make sure that the boat washing station is part of an overall watercraft inspection and education program; not use it as a substitute for the other prevention steps boaters are asked to take.
- Do not require washing as a condition of launching; rather, treat boat washing as a voluntary option so boaters can feel assured that they are doing everything possible to protect the resource.
- Use common sense in designing the facility—do not drain the water back to the lake, and compost all waste or put it in the trash.
- Give some serious thought as to whether the facility should be manned or unmanned, portable or permanent.
- Make sure that a reliable construction firm is in charge of the design, construction, and maintenance of the facility.
- Be aware of the safety and liability issues of a wash station and follow all OSHA regulations.
- Seek feedback on boater acceptance of the facility, if possible. Such information adds to the DNR's understanding and research of boat landing facilities.
- Consider installing a boat washing facility for boaters leaving an infested water body to prevent the spread of invasive aquatic species.
- Place any wash station at least 75 feet back from the lake to avoid conflicts with shoreland zoning regulations.
- Use the lake water as a source for the washing facility if possible.
- Restrict the use of detergents, algaecides, or disinfecting agents that could harm the lake or nearby residents.
- Provide clear instructions on how to use the boat washing facility properly and safely and include an educational message as to why it's important.
- Use high-pressure hot water for the wash facility if possible (it is most effective).
- Charge only a reasonable fee for cleaning a boat before launching (such a fee would be based on the resident state park daily entrance fee).

Please note that specifications on the types of boat washing facilities that are most effective are not readily available and are likely to vary based on specific needs. Therefore, they were not included in the guidelines. Lake associations can contact their local DNR staff to obtain information on vendors in their area who could help the community decide what type of washer would be most effective for their particular use.

Lake organizations, watershed associations, or other local units of government that may be interested in installing a boat washing facility need to understand the following message: wash stations are a poor substitute for an effective education and watercraft inspection program that emphasizes inspection and removal, *but* washing stations can be one component of an overall prevention and control strategy.

Appendix K

AQUATIC AND WETLAND INVASIVE PLANTS IN WISCONSIN

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Regulated Aquatic Invasive Plants in WI

Please report any **prohibited** species (as indicated by the red frame box) to the WDNR.
Report by email to: Invasive.Species@wi.gov or **by phone at: (608) 266-6437**
OR to find out more information, for information on reporting restricted species and whom to contact go to:
http://dnr.wi.gov/invasives/aquatic/whattodo/

Flowering rush
(Butomus umbellatus)

Purple loosestrife
(Lythrum salicaria)

Curly-leaf pondweed
(Potamogeton crispus)

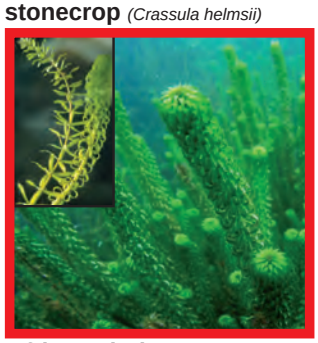
Eurasian water milfoil
(Myriophyllum spicatum)

Australian swamp stonecrop *(Crassula helmsii)*

Brazilian waterweed
(Egeria densa)

Hydrilla
(Hydrilla verticillata)

European frog-bit
(Hydrocharis morsus-ranae)



African elodea
(Lagarosiphon major)

Parrot feather
(Myriophyllum aquaticum)

Brittle waternymph
(Najas minor)

Yellow floating heart
(Nymphoides peltata)

Water chestnut
(Trapa natans)

Fanwort
(Cabomba caroliniana)

Didymo or rock snot (alga)
(Didymosphenia geminata)

Starry stonewort (alga)
(Nitellopsis obtusa)

Restricted Species Prohibited Species

For more information about NR 40 (WI's Invasive Species Rule), Restricted, or Prohibited species please visit: www.dnr.wi.gov/invasives/classification

Bureau of Watershed Management
Wisconsin Department of Natural Resources
Box 7921
Madison, WI 53707-7921

DNR PUB-WT-960-2011

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WISCONSIN DEPT. OF NATURAL RESOURCES

Design and Layout by Bonnie Reichert

Chapter NR 40:
Invasive Species Identification Classification and Control
Aquatic Invasive Plants Summary

The Invasive Species Rule (Chapter NR 40) went into effect on September 1, 2009. The rule establishes a comprehensive, science-based way to classify and regulate invasive species in Wisconsin. The rule divides species into 2 categories, "Prohibited" and "Restricted," with different regulations and control requirements. The rule also establishes "Preventative Measures" to show what actions we can take to slow the spread of invasive species. Chapter NR 40 covers over 128 species, including plants, animals, and microorganisms.

WI Statute 23.22 defines **Invasive Species** as "nonindigenous species whose introduction causes or is likely to cause economic or environmental harm or harm to human health." Not all nonnative plants are harmful, so NR 40 helps us determine which ones are invasive.

Prohibited Invasive Plants *

- These species are not yet in the state or only in a few places
- These species are likely to cause environmental and/or economic harm
- It is still possible to eradicate these species and prevent their spread statewide

Regulations: **Cannot transport, possess, transfer (buy or sell), or introduce without a permit**
Control Authority: Control is required. DNR may order or conduct a control effort

Restricted Invasive Plants *

- These species are already widely established in the state
- High environmental and/or economic impacts are evident with these species
- Complete eradication of these species is unlikely

Regulations: **Cannot transport, transfer (buy or sell), or introduce without a permit**
Control Authority: Control is encouraged but not required

*All viable part of the species (including seeds) are covered by these regulations.

What This Means for You

The primary goal of NR 40 is to slow the spread of invasive species in Wisconsin. The Department is using a "stepped enforcement" protocol, which emphasizes education and voluntary compliance. However, citations may be issued for aquatic invasive species violations. Remember:

- **It is illegal to buy, sell, give away, or barter any species listed under Chapter NR 40.**
- **Please become familiar with the listed plants and their regulated status for your county.**
- **You are responsible to comply with all elements of Chapter NR 40.**

Regulations differ slightly for certain species. Please go to the WDNR website to see listed exemptions for NR40, as well as the rule's implications for aquatic invertebrates, fish, and terrestrial species:

www.dnr.wi.gov/invasives/classification

For more information contact the WDNR
Invasive Species Project Coordinator at:
Email: Invasive.Species@wi.gov
Phone: (608) 266-6437

CS.v.8/30/11

Common Wetland Invasive Plants in WI

Please report **prohibited** species (as indicated by red on the maps) and all other species marked with an asterisk(*) when found in or near wetlands or shores. Provide the following data: exact location, land ownership (if known), population size, a photo or voucher specimen, and your contact information.

To report a sighting: send an email to: Invasive.Species@wi.gov or CALL 608-267-5066

Common buckthorn
(Rhamnus cathartica)

Glossy buckthorn
(Frangula alnus = Rhamnus frangula)

Non-native bush honeysuckles
(Lonicera spp.*)*

Canada thistle
(Cirsium arvense)

Common forget-me-not
(Myosotis scorpioides)

Dame's rocket
(Hesperis matronalis)

***Flowering rush**
(Butomus umbellatus)

***Garden valerian or heliotrope** *(Valeriana officinalis)*

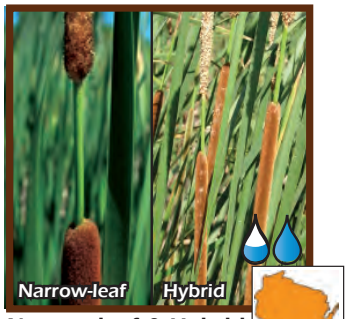
Garlic mustard
(Alliaria petiolata)

***Japanese & Giant knotweed** *(Polygonum cuspidatum & P. sachalinense)*

Moneywort
(Lysimachia nummularia)

***Purple loosestrife**
(Lythrum salicaria)

Watercress
(Nasturtium officinale)



Narrow-leaf & Hybrid cattail *(Typha angustifolia & T. x glauca)*

***Phragmites**
(Phragmites australis)

Reed canary grass
(Phalaris arundinacea)

Restricted Species | Prohibited/Restricted Species | Prohibited Species

Tree | Vine | Grass | Shrub | Forb

Species without a map are not regulated by NR 40 (WI's Invasive Species Rule)

SOMEWHAT WET (Floodplain forests, Seasonally flooded basins)

WET (Wet meadows, Shrub swamps, Wooded swamps)

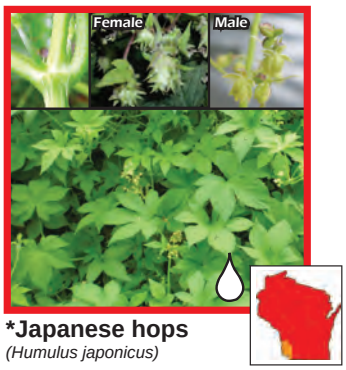
VERY WET (Deep marsh, Shallow marsh)

Early Detection Wetland Invasive Plants in WI

Early detection plants are either not yet present in WI or not widespread but have the potential to become widespread.

European high-bush cranberry *(Viburnum opulus* L. *subsp. opulus)*

***Chinese yam** *(Dioscorea oppositifolia)*



***Japanese hops** *(Humulus japonicus)*

Annual salt marsh aster *(Symphyotrichum subulatum)*

Cut-leaved teasel *(Dipsacus laciniatus)*

***European marsh thistle** *(Cirsium palustre)*

False spirea *(Sorbaria sorbifolia)*

***Giant hogweed** *(Heracleum mantegazzianum)*

***Hairy willow herb** *(Epilobium hirsutum)*

***Poison hemlock** *(Conium maculatum)*

Queen-of-the-meadow *(Filipendula ulmaria)*

Seaside goldenrod *(Solidago sempervirens)*

Yellow garden loosestrife *(Lysimachia vulgaris)*

***Yellow iris** *(Iris pseudacorus)*

***Japanese stilt grass** *(Microstegium vimineum)*

***Tall or Reed manna grass** *(Glyceria maxima)*

For more information about NR 40 (WI's Invasive Species Rule), Restricted, or Prohibited species please visit: www.dnr.wi.gov/invasives/classification

For more information about the plant species please visit: http://dnr.wi.gov/wetlands/invasive.html

Bureau of Endangered Resources
and Division of Forestry
Wisconsin Department of Natural Resources
Box 7921
Madison, WI 53707-7921

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Appendix L

WDNR GRANTS

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Lake Classification and Local Ordinance Development Grants
NR 191.30, Wis. Admin. Code

Overview:
Lake Classification projects will be conducted by counties to study the characteristics of lakes and assign them into different management classifications for the purpose of implementing lakes-based protection activities. Protection activities may be regulatory (such as improved Shoreland), land or lake use ordinances, or other best management practices or protection activities for protecting and improving water quality or aquatic habitats. Lake classification projects can be used to implement the prescribed management activities.

Development of local regulations or ordinance projects will be conducted by any unit of local government to protect or improve a lake's water quality or its natural ecosystem. Lake Classification and Local Ordinance Development projects can be funded separately or jointly. Because of their similar nature, these two grant project types are combined into one grant subprogram. Although technically "management" grants by statute, the activities associated with each are fundamentally planning and, therefore, the DNR has grouped them in with other planning grants with application deadline of Dec. 10 each year.

Lake Classification

Purpose:
Lake Classification grants provide financial opportunities for Wisconsin counties to assist in lake protection efforts. Using existing and collected lake data, county lakes with similarities can be grouped to assist in the administration of shoreland zoning or land and water conservation programs.

Eligible Projects

Classification:

- Data collection, analysis using GIS, and mapping to place waters in classes. Types of data may include lake size, depth, shape, and water quality, watershed size, potential nonpoint pollution sources, land uses and development patterns, recreational uses, fish and wildlife habitat, etc.
- Objective setting for the classification system.
- Investigation and selection of appropriate classification criteria.
- Investigation and assignment of appropriate protection and management tools. All projects must propose lake protection activities for each classification.
- Assist the DNR in setting lake water quality standards.

Note: Projects may not result in lowering existing state minimum standards designed to protect lakes.

Protection and Implementation:

- Development of educational materials and training programs to improve the understanding and compliance with the lake classification.
- Compliance monitoring and enforcement.
- Technical assistance to landowners to comply and implement protection activities.
- Developing or improving administrative procedures and processes.
- Ordinance development: zoning, watercraft regulation, construction site erosion control, public water access, piers and moorings, etc.
- Adoption of policies which encourage management of waters based on the specific needs of each waterbody.
- Implementation of alternative management tools: purchase of land or development rights, conservation easements, development of individual lake and watershed plans, etc.

NOTE: A county must have adopted a lake classification system prior to the date of application to be eligible for an implementation grant.

Ineligible Projects:
Projects not eligible for funding under this subchapter include water safety patrols.

Note: Lake Classification projects may be conducted to assist the department in setting lake water quality standards. However, any proposal for the classification of lakes to be used in setting lake water quality standards or for enacting requirements for the implementation of water quality standards based on new or existing classifications only become effective when adopted by the department as rules under s. 281.15, Wis. Stats.

Local Ordinance Development

Purpose:
Lake Ordinance development grants are intended for local governments and lake districts to create or improve regulations that will protect or improve a lake's water quality or its natural ecosystem.

Eligible Projects:
To be eligible for funding consideration, all projects must include the development of an ordinance to be presented for adoption by the local governing board with an assessment of the administration and enforcement capacity and cost to implement the ordinance. Land use planning alone is not an eligible activity.

Types of ordinances may include: boating or lake use, conservancy, wetland, shoreland, floodplain, construction erosion control, stormwater control or other ordinances with water quality or lake protection benefit. Boating ordinances that assist in managing the recreational use of surface waters should be focused on addressing the environmental impacts of lake use rather than just safety concerns.

Typical activities and eligible project costs include:

- Review and evaluation of an existing regulation or ordinance effectiveness, including necessary surveys.
- Mapping of environmental features, land use planning, and related activities as needed limited to what is necessary to the development of the proposed regulation. These activities should not be the main focus of the projects.
- Legal fees to develop regulation or ordinance language.
- Public meetings and materials, printing, postage, surveys, mailing, and similar costs related to community education on the need for and implementation of an ordinance or regulation.
- Training of officials and citizens for compliance and enforcement of an existing or new regulation or ordinance.
- Labor costs required to carry out activities identified in the grant agreement provided they require additional staff or increased hours of existing staff. Costs of additional staff positions or increased staff hours shall be based on management unit rates for the position including salary, fringe benefits and other items determined to be appropriate by the DNR.
- Other costs determined by the DNR to be necessary to carry out the development of a regulation or ordinance.

Legal fees incurred in appealing DNR decisions are not reimbursable costs. Lake associations and nonprofit conservation organizations do not have regulatory authority and therefore are not eligible for ordinance development projects unless there are clear commitments from the regulatory authority to the project. The management unit that is adopting the ordinance should be the sponsor.

If the project is an ordinance update or upgrade project specific to s. NR 115 Wisconsin's Shoreland Protection Program, s. NR 117 Wisconsin's City and Village Shoreland-Wetland Protection Program or s. NR 118 Standards for Lower St. Croix Scenic Waterway, it will need to be reviewed and certified by DNR staff. You can search the DNR staff directory under contacts on the DNR home page using "Shoreland Zoning" in the subject box to find the appropriate person to conduct the review and certification. It's recommended that you make this contact before you begin your application. Appropriate DNR staff should be advised of the process from the start of any shoreland ordinance project. For all other ordinance development projects local adoption or DNR approval is not required. However, the proposed regulation must be presented to the county or town board for adoption.

Routine ordinance enforcement is not an eligible cost for any grant in this subsection. However, site inspections and enforcement can be eligible for local ordinance development projects or lake classification if it is proposed as developing or enhancing the enforcement process. The project might create and test new forms or procedures such as compliance audits, automated record keeping or explore new information management technologies. A report on the "findings" of this element is a deliverable.

Funding Possibilities:
Maximum amount of grant is 75% of the total project costs, not to exceed $50,000.

Lake Management Planning Grants
Section 281.68, Wis. Stats., NR 190, Wis. Admin. Code

Overview:
Lake management planning grants are intended to provide financial assistance to eligible applicants for the collection, analysis, and communication of information needed to conduct studies and develop management plans to protect and restore lakes and their watersheds. Projects funded under this subprogram often become the basis for implementation projects funded with Lake Protection grants. There are two categories of lake management planning grants: small-scale and large-scale.

Small Scale Lake Planning
NR 190, Wis. Admin. Code

Purpose:
Small-scale projects are intended to address the planning needs of lakes where education, enhancing lake organizational capacity, and obtaining information on specific lake conditions are the primary project objectives. These grants are well suited for beginning the planning process, conducting minor plan updates, or developing plans and specification for implementing a management recommendation.

Eligible Projects:
- Specific monitoring and assessment projects. Collect and report chemical, biological, and physical data about lake ecosystems for a Tier I assessments, Tier II diagnostic or Tier III project evaluation.
    - Tier I if initial basic monitoring is needed to assess the general condition or health of the lake.
    - Tier II if an assessment has been conducted and more detailed data collection is needed to diagnose suspected problems and identify management options.
    - Tier III if the monitoring and assessment will be used to evaluate the effectiveness of a recently implemented project or lake management strategy.
- Collecting and disseminating existing information about lakes for the purpose of broadening the understanding of lake use, Lake Ecosystem conditions and lake management techniques.
- Conducting workshops or trainings needed to support planning or project implementation.
- Projects that will assist management units as defined in s. NR191.03 (4) & s. NR 190.003 (4) the formation of goals and objectives for the management of a lake or lakes.

Ineligible Projects:
Projects not specifically mentioned above.

Funding Possibilities:
Maximum amount of grant funding is 67% of the total project costs, not to exceed $3,000.

(see next page for Large Scale Projects)

Large Scale Projects
NR 190, Wis. Admin. Code

Purpose:
Large-scale projects are intended to address the needs of larger lakes and lakes with complex and technical planning challenges. The result will be a lake management plan; more than one grant may be needed to complete the plan.

Eligible Projects:
- Collection of new or updated, physical, chemical and biological information about lakes or lake ecosystems.
- Definition and mapping of Lake Watershed boundaries, sub-boundaries and drainage system components.
- Descriptions and mapping of existing and potential land conditions, activities and uses within lake watersheds that may affect the water quality of a lake or its ecosystem.
- Assessments of water quality and of fish, aquatic life, and their habitat.
- Institutional assessment of lake protection regulations - review, evaluation or development of ordinances and other local regulations related to the control of pollution sources, recreational use or other human activities that may impact water quality, fish and wildlife habitat, natural beauty or other components of the lake ecosystem.
- Collection of sociological information through surveys or questionnaires to assess attitudes and needs and identify problems necessary to the development of a long-term lake management plan.
- Analysis, evaluation, reporting and dissemination of information obtained as part of the planning project and the development of management plans.
- Development of alternative management strategies, plans and specific project designs, engineering or construction plans and specifications necessary to identify and implement an appropriate lake protection or improvement project.

Ineligible Projects:
Any project not specified above.

Funding Possibilities:
Maximum amount of grant funding is 67% of the total project costs, not to exceed $25,000. Multiple grants in sequence may be used to complete a planning project, not to exceed $100,000 for each lake. The maximum grant award in any one year is $50,000 for each lake. If phasing is necessary, all phases should be fully identified and a timeline identified in the initial application.

Lake Protection Grant Program
Sections 281.69 and 281.71, Wis. Stats., NR 191, Wis. Admin. Code

Overview:
Lake protection and classification grants assist eligible applicants with implementation of lake protection and restoration projects that protect or improve water quality, habitat or the elements of lake ecosystems. There are four basic Lake Protection subprograms:

a) Fee simple or Easement Land Acquisition
b) Wetland and Shoreline Habitat Restoration
c) Lake Classification and Local Ordinance Development
d) Lake Plan implementation

Land/Easement Acquisition
NR 191.10, Wis. Admin. Code

Purpose:
Grants under this subprogram are intended for the acquisition of property or property rights (also called easements) to protect lakes and their ecosystems. Land acquisition projects are reviewed and processed by DNR environmental grant specialists. All other types of surface water protection grant projects are reviewed by DNR Lake and River Grant Coordinators. A list of environmental grant specialists appears in the front of this guide.

Eligible Costs:
- The fair market value of the property as determined by DNR-approved appraisals
- Cost of appraisal(s)
- and survey fees
- Relocation payments
- Land stabilization
- Title insurance and gap insurance
- Recording fees
- Historical and cultural assessments (if required by the DNR)
- Baseline documentation for natural resources (required for conservation easements)
- Environmental inspections and audits
- Attorney fees not to exceed $2,000
- Closing costs
- Building demolition may be an eligible cost based on the degree to which the demolition contributes to lake protection or restoration.

Ineligible Costs:
- Acquisition of any property that is subject to a reversionary right or has restrictions or covenants which would prevent the property from being managed for purposes consistent with this grant program
- Land acquired through eminent domain or condemnation; projects where landowners were not treated fairly and negotiations were not conducted on a willing buyer-willing seller basis
- Acquisition of land on which a dam is located
- Environmental clean-up costs
- Brokerage fees paid by the buyer
- Real estate transfer taxes
- Any other cost not identified as eligible above

Funding Possibilities:
Maximum amount of grant funding is 75% of total costs, not to exceed $200,000.

Wetland and Shoreline Habitat Restoration
NR 191.20, Wis. Admin. Code

Purpose:
Wetland and shoreland habitat restoration grants are intended to provide financial assistance to protect or improve the water quality or natural ecosystem of a lake by restoring adjacent degraded wetlands or tributary to lakes. Shoreline habitat restoration grants are intended to provide financial assistance, including incentive payments, to owners of developed lake front lots to re-establish riparian habitat.

Eligible Projects:

- Development of plans, specifications and environmental assessment, including pre- and post-engineering and design costs.
- Construction, earth moving, or structure removal costs.
- Native plant stock or seeds for re-establishing vegetation.
- Incentive payments per landowner not to exceed $250.
- Public meetings and education and promotional materials, mailing and similar costs related to the distribution of information about restoration.
- Necessary monitoring in order to measure success in achieving the ecologic function of restoration activities.
- Purchase of fee simple or easement land acquisition on which wetland restoration activities will take place. The cost of preparing and filing deed restrictions on the property where restoration will take place.
- Labor costs required to carry out activities identified in the grant agreement including technical assistance.
- Other costs determined by the DNR as necessary to carry out a successful wetland or shoreline habitat restoration.
- Water regulatory permits required for the project. Reasonable planning, engineering and design costs necessary to complete the permit application incurred within 12 months prior to the application deadline become eligible for reimbursement for projects awarded a grant.
- Technical assistance provided to individuals seeking building permits if the intent is to improve the site's habitat conditions or comply with mitigation conditions.

Ineligible Projects:

- Environmental cleanup,
- Stairs
- Walkways
- Piers
- Costs of actual restoration that is intended to comply with a regulatory action, including wetland or shoreland mitigation projects.

Funding Possibilities:
Maximum amount of grant funding is 75% of the total project costs, not to exceed $100,000

Lake Management Plan Implementation
NR 191.40, Wis. Admin. Code

Purpose:
Lake management plan implementation grant provides financial assistance to eligible applicants that have completed a lake management plan to implement the plan's DNR-approved recommendations.

Eligible Projects:
Typical projects will include watershed or shoreland best management practices (BMPs) for nonpoint source pollution control or in-lake restoration actions like an alum treatment. s. NR 154, Wis. Admin.

Code, Best Management Practices (BMP) and Cost Share Conditions, provide DNR grant policy on the implementation of 42 nonpoint source pollution control practices. These have been established in partnership with other state and federal agencies and approved by the US Environmental Protection Agency as part of the State's Nonpoint Source Program Management Plan. Adherence to these BMPs assures eligibility for federal cost-share funds and the ability to use state-funded projects as match Clean Water Act Section 319 funds received by the DNR.

Providing grant funding for lake restoration activities that improve the recreational or environmental values of a lake are defined as natural resource enhancement services under s. NR 1.91, Wis. Admin. Code. Grant funding for these services can only be provided for lake and river projects where the public has been afforded a minimum level of public boating access as defined in s. NR 1.91(4) d. Typical projects funded by surface water grants that fall into this category are "in-water" activities such as aeration, aquatic plant management, alum treatments, bio-manipulation, drawdown, fish stocking and fishery rehabilitation, habitat restoration, and hypolimnetic withdrawal. An additional eligibility requirement for funding these activities is that the sources or causative factors of the problems to be remediated should have been or very likely will be controlled prior to implementation.

Habitat improvement or protection activities or any other type of project that will work toward protecting or improving lakes and lake ecosystems may be eligible as long as the recommendation presented in the lake management plan has been officially approved by the DNR. An application for all necessary permits must be filed with the DNR by the date on which a grant application is submitted.

Eligible Costs:

- Construction, labor, materials, supplies, laboratory costs related to eligible activities.
- Planning and engineering, landscape or construction design plans and specifications that is necessary to determine appropriate options and recommendations for lake protection improvement.
- Other costs as approved by the DNR and necessary for implementing a recommendation in an approved lake management plan.

Ineligible Project Costs:
Any project not specified above.

Funding Possibilities:
Grants are based on 75% of the total eligible project costs not to exceed the maximum grant amount of $200,000.

Healthy Lakes Projects
NR 190, Wis. Admin. Code

Purpose:
The Healthy Lakes grants are a sub-set of Plan Implementation Grants intended as a way to fund increased installation of select best management practices (BMPs) on waterfront properties without the burden of developing a complex lake management plan. Details on the select best practices can be found in the Wisconsin Healthy Lakes Implementation Plan and best practice fact sheets.

Eligible Projects:
Eligible best practices with pre-set funding limits are defined in the Wisconsin Healthy Lakes Implementation Plan, which local sponsors can adopt by resolution and/or integrate into their own local planning efforts. By adopting the Wisconsin Healthy Lakes Implementation Plan, your lake organization is immediately eligible to implement the specified best practices. Additional technical information for each of the eligible practices is described in associated factsheets.

The intent of the Healthy Lakes grants is to fund shovel-ready projects that are relatively inexpensive and straight-forward. The Healthy Lakes grant category is not intended for large, complex projects, particularly those that may require engineering design. All Healthy Lake grants have a standard 2-year timeline.

Ineligible Projects:
Any project not specified in the Wisconsin Healthy Lakes Implementation Plan.

Eligible Costs:
Best practices in the Wisconsin Healthy Lakes Implementation Plan are defined for each of 3 zones on a typical developed lake shore residential lot identified.

- Zone 1 (shallow near shore water) includes fish sticks, a practice that places trees in the water to improve fish and aquatic life habitat and protect shorelines;
- Zone 2 (transition) includes various 350 square foot native planting plots and diversion practices to improve habitat and slow runoff;
- Zone 3 (upland) includes rain gardens, diversion practices and rock infiltration practices as eligible best practices to manage runoff from structures and other impervious surfaces.

Technical assistance costs may be reimbursed not to exceed 10% of the state share of project costs.

Funding Possibilities:
Maximum amount of grant funding is 75% of the total project cost, not to exceed $25,000. Grants run for a 2-year time period. Maximum costs per practice are also identified in the Wisconsin Healthy Lakes Implementation Plan.