Appendix C2

Project RED

Riverine Early Detectors Manual

New Zealand mudsnail

Find It! Report It! Fight It!

Version 5, March 2012

RIVER ALLIANCE of Wisconsin

www.wisconsinrivers.org

Welcome to Project RED

The health of your river depends on you! Wisconsin's rivers are vulnerable to invasion by a number of invasive species from Eurasian water-milfoil to Japanese knotweed. The key to successfully protecting your river is detecting invasives early when it is still possible to isolate or eradicate them. The longer we wait to find them and fight them the more money and time it will take. Volunteers like you are invaluable for early detection and rapid response.

Find it, report it and fight it! Project RED provides you with the necessary tools to be a Riverine Early Detector. Our protocols are easy and fun. Use this activity to become more familiar with your river or stream and to engage your friends and neighbors!

Project RED has four steps: collect samples of suspect invasives on your river, verify the specimens, submit the data, and advocate for control.

The River Alliance of Wisconsin and the Wisconsin DNR can help you take the next step of eradication or containment if you find an pioneer population. There are funding and technical resources available to you.

Grab your paddle or waders and get out on the water. We need your help.

Find It, Report It and Fight It!

Why Project RED?

- Easy, Fun Protocols to Identify Species of Concern
- Great Opportunity to Engage New Members/Volunteers
- Educate Local Landowners About Invasive Species
- GPS Units Available for Your Use at Technology Libraries Statewide
- Online Data Management Tools
- Species Verification by Professionals
- Eradication and Containment Technical Support
- Its Free!

Step I: Collecting Data and Samples

Specific monitoring and sample collection protocols for each category of invasives (wetland plants, snails and crayfish, mussels, and emergent and submersed plants) are on the following pages.

We recommend you start at the headwaters or at areas of potential introduction, such as bridge crossings or boat landings. If monitoring from a canoe, it is recommended that you wade or pay particularly close attention within the 100 meters upstream and downstream of boat landings, bridge abutments or other probable locations of introduction.

Invasive species do not respect private property lines, but we do. Inform riparian landowners about Project RED and always ask permission to venture onto their property. You must help us educate landowners in your watershed to help in the fight.

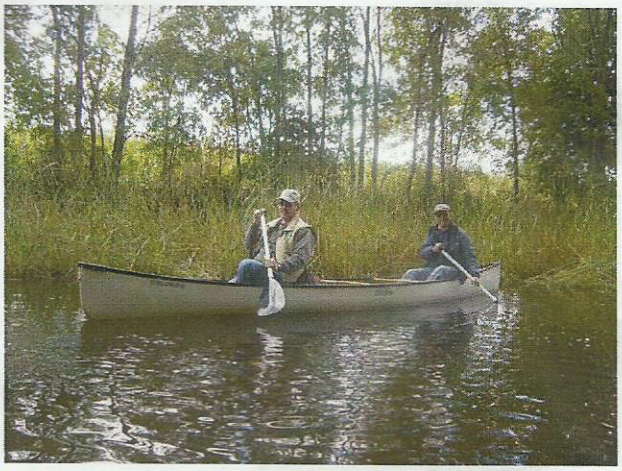
Monitoring Schedule

The time of the year can determine how easily a species can be identified and the likelihood of detection. For example, purple loosestrife is difficult to see from a canoe before it blooms. However, once it is in bloom its vibrant color is difficult to miss. **It is recommended that you monitor the same segment of river at least twice a year, once in May or June and once in August or September.** Three times is even better and will increase your chance of successfully detecting invasives. The schedule below is an estimation of when you should look for each species. This schedule might vary slightly dependant upon your latitude, micro-climates and the year's weather. Remember, be prepared for potentially cold and dangerous weather in May and September in the northern portion of the state. Safety is ALWAYS our first priority.

MAY	JUNE	JULY	AUGUST	SEPTEMBER
curly-leaf pondweed	flowering rush	purple loosestrife	Japanese knotweed	Japanese knotweed
snails and mussels	curly-leaf pondweed	common reed grass	purple loosestrife	purple loosestrife
crayfish	Eurasian water-milfoil	Japanese hops	common reed grass	common reed grass
didymo	crayfish	flowering rush	Japanese hops	Japanese hops
	snails and mussels	Eurasian water-milfoil	flowering rush	hydrilla
	didymo	hydrilla	Eurasian water-milfoil	Brazilian waterweed
		Brazilian waterweed	hydrilla	crayfish
		crayfish	Brazilian waterweed	snails and mussels
		snails and mussels	snails and mussels	didymo
		didymo	didymo	

Recommended Supplies

Clip board or other hard surface for writing
Project RED Field Data Collection Sheets
Ziploc bags
Waterproof sharpie pen (to write on Ziploc bags)
GPS unit
Heavy trash bag
Paper towels
Camera
Ice chest for keeping samples cool
Binoculars
Polarized sunglasses



Step II: Verification

Invasive species are often easily confused with native look-a-likes. To ensure quality data volunteers are encouraged to send or deliver samples or photographs to professionals to verify their findings. Verification is often required if you plan to apply for funding or technical assistance to contain or eradicate the invasive.

Prior to submitting your samples for verification double check your identification with print and online resources provided (page 9). If you have any questions about sample preparation or who to submit your sample to contact the River Alliance.

Species that are rare or have not been reported in Wisconsin yet have a red asterisk (*) after the species scientific name on the following pages. These species if found must be sent in for verification immediately.

Plant specimens should be placed in a plastic bag with a damp paper towel and delivered or mailed to your DNR regional AIS verification contact *(see contacts on page 9)* as soon as possible. Digital or film photographs are another alternative. Be sure that you photograph all parts of the plant or animal and include an object for scale, such as a coin.

Live mussels and snails should be placed in rubbing alcohol to prevent them from decay. If the shells are empty this is not necessary. **Mailing alcohol is illegal**. If you preserve a specimen in alcohol it must be hand delivered to your DNR Regional AIS Verification Contacts *(see contacts on page 9).*

See protocols on the following pages for more on sample collection and preservation.

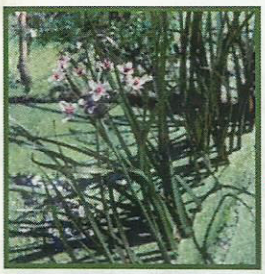
Step III: Submit Data

Don't forget to submit your data! Data sharing is important to help researchers and resource managers better understand the threats invasive species pose on our rivers in Wisconsin. Post your data on SWIMS! The SWIMS database is managed by the Wisconsin DNR. All department staff and other resource managers have access to SWIMS. It provides online data management, sharing, and viewing. Data posted here will be used by the River Alliance of Wisconsin and the Wisconsin DNR to allocate statewide resources to help eradicate and control invasives. See page 8 of this manual for instructions. If you need additional assistance with SWIMS contact the River Alliance.

We want to know if you DIDN'T find a thing! Be sure to enter you data even if you did not find any invasives.

Step IV: Taking Action

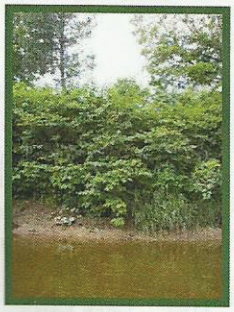
Finding and reporting an invasive unfortunately does not ensure that necessary resources will be allocated to address the problem. Your work does not stop here. Engage your neighbors and help educate landowners. With landowner consent and the necessary volunteer power, you can accomplish a lot in terms of containing or eradicating an invasive. There are technical and financial resources available to you. Contact the River Alliance of Wisconsin or your local WDNR Water Resource Management Specialist for best control practices, regulations on herbicide application, and available funding.



flowering rush
(photo by E. Czarapata)

Project RED

Wetland Invasive Plants



Japanese knotweed on the Sheboygan River

The following five species have been found on streambanks and in wetlands throughout Wisconsin. They displace native plants that provide habitat for birds and other native animals, alter nutrient cycles that sustain native life, impede recreational activities and can alter the hydrology of our watersheds.

MONITORING AND SAMPLE COLLECTION PROTOCOL

While floating or wading search both banks and surrounding wetlands for these four plants. It is best to search for these in mid-July through September while they are blooming. If possible collect a fresh sample in a plastic bag with a moist paper towel. Write the location where the specimen was found on the plastic bag and assign the sample an AIS ID# with a permanent marker. If it is not possible to safely obtain a sample, due to private property boundaries or otherwise, take detailed photographs (digital or film) for verification. Try to include flowers, seeds or fruit, buds, full leaves, stems roots and other distinctive features. In photos, try to place a coin, pencil or ruler for scale. If you can send a specimen and photos, all the better. Send samples or photos to your local coordinator. **Be careful not to spread seeds or fragments, see preventative note on back cover.**

Japanese hops
(Photo by John Randall)

phragmites
(photo by E. Czarapata)

SPECIES OVERVIEW

Japanese hops *(Humulus japonicus)*

Herbaceous vine climbing clockwise. No tendrils. Leaves opposite, 2 to 5 inches long with 5-7 deep lobes and coarse, downward pointing sticky hairs. Leaf stalk equals or exceeds length of leaf. Greenish flowers.

common reed grass/phragmites *(Phragmites australis)*

3 to 20 ft tall grass with linear green leaves 10 –20 in. long. Large, dense, featherlike grayish purple plumes in July through September. Dull, tan, rough and ribbed cane-like stems.

Japanese knotweed *(Plygonum cuspidatum, Fallopia japonica)*

Upright, semi-woody, shrub that can reach 10 feet tall. Stems resemble bamboo. Leaves about 6 inches long, heart shaped or triangular. Small green or white flowers bloom in August and/or September. Grows in dense stands.

purple loosestrife *(Lythrum salicaria, Lythrum virgatum)*

Upright, semi-woody, perennial. Square stem 3 to 9 ft tall. Purple flowers with 5 or 6 petals on numerous long spikes. Leaves linear shaped, smooth edge, attached directly to stalk.

flowering rush *(Butomus umbellatus)* *

Emergent herb 1 - 5 feet tall, stiff, narrow and triangular in cross-section leaves. Pink or white flowers with 3 petals and 3 sepals in a distinctive flat-topped spray atop a tall stalk.

Japanese knotweed
(photo by E. Czarapata)

purple loosestrife
(photo by E. Czarapata)

TIMELINE

Common Name	Scientific Name	May	June	July	Aug	Sept
flowering rush	*Butomus umbellatus*		x	x	x	
purple loosestrife	*Lythrum salicaria*			x	x	x
Japanese knotweed	*Polygonum cuspidatum*				x	x
Japanese hops	*Humulus japonicus*		x	x	x	x
common reed grass	*Phragmites australis*			x	x	x

Yellow floating heart
(photo by Mark Malchoff)

Project RED

Emergent and Submersed Invasive Plants

curly-leaf pondweed

Emergent and submersed invasive plants alter the substrate of a waterbody and alter habitat and food source for birds, bugs and fish. Didymo has not yet been found in Wisconsin but we anticipate its arrival soon.

MONITORING AND SAMPLE COLLECTION PROTOCOL

If you observe plants growing in the water, stop and closely observe them. Polarized sunglasses or a Aqua-View Scope can help. If the water is too deep to clearly identify the submerged plants or to reach a sample, drag a long-handled rake across the bottom of the river with a rope attached to the end to bring a sample to the surface. See the University of Wisconsin Extension Citizen Lake Monitoring Network Training Manual for more information about this technique. Until you grow familiar with both natives and invasives, collect suspect samples in plastic bags labeled with AIS ID #. Remember to record the AIS ID# and the sample location using your GPS on your field data sheet. At home use both print and online resources to identify them to the best of your ability and submit them for verification .

hydrilla
(photo from Vic Ramey)

SPECIES OVERVIEW

yellow floating heart *(Nymphoides peltata)* *

Bottom-rooted perennial with round, heart shaped floating leaves 1 - 6 in. in diameter. Bright yellow flowers (.5– 1.5 in.) with fringed petals growing on stalks above the water surface.

hydrilla *(Hydrilla verticillata)* *

Submersed herb with slender, branching stem up to 25 feet long. Green leaves about .6 inches long with pointed tips in whorls of 3 to 10. Leaf edges are sawtoothed, rough to touch.

Eurasian water-milfoil
(photo from TNC)

curly-leaf pondweed *(Potamogeton crispus)*

Submersed. Leaves are reddish-green, oblong, and about 3 inches long, distinct wavy edges that are finely toothed. The stem is flat, reddish-brown and grows from 1 to 3 feet long

Eurasian water-milfoil *(Myriophyllum spicatum)*

Submersed herb with slender stems whorled by feathery leaves and tiny flowers above water surface. Leaves threadlike, 9-21 pairs of leaflets per leaf typically uniform in length.

Brazilian waterweed *(Egeria densa)* *

Submersed, bushy herb without tubers. Stem is single or branching. Leaves bright green, .8 – 1.2 inches long, up to .2 inches wide in whorls of 4 to 6 along stem. Leaf edges minutely serrated. Flowers white, .7 to 1 inch across with 3 petals.

Brazilian waterweed
(photo from TNC)

Didymo/rocksnot *(Didymosphenia geminata)* *

Large diatom forming massive blooms on bottom of stream on substrate or vegetation. Forms flowing 'rats tails' that can turn white at their ends and look similar to tissue paper. Although the algae appear slimy, it feels like wet wool. Bloom is a pale yellow-brown to white color.

didymo
(photo by Stu Sutherland)

TIMELINE

Common Name	Scientific Name	May	June	July	Aug	Sept
yellow floating-heart	*Nymphoides peltata*			x	x	x
hydrilla	*Hydrilla verticillata*			x	x	x
curly-leaf pondweed	*Potamogeton crispus*	x	x	x		
Eurasian water-milfoil	*Myriophyllum spicatum*		x	x	x	
Brazilian waterweed	*Egeria densa*			x	x	x
didymo	*Didymosphenia geminata*	x	x	x	x	x

New Zealand mudsnails
(Photo by Matt Elyash)

Project RED

Invasive Snails & Crayfish

New Zealand mudsnails
(Photo by Dan Gustafson)

Invasive snails and crayfish displace native invertebrates, serve as vectors for the transmission of parasites and diseases that impact wildlife, destroy instream habitat and alter food chains threatening native fish populations. The New Zealand mudsnail has been discovered in the Great Lakes and the St. Louis River on the Wisconsin and Minnesota border. Faucet snails have been found in Shawno Lake and the Upper Mississippi River. Louisiana red swamp crayfish have been found in Germantown and Kenosha, WI.

faucet snail
(Photo Credit Paul Skawinski)

MONITORING AND SAMPLE COLLECTION PROTOCOL

Search for snail shells along the shoreline where they may have washed up. Where possible look for snails under the water on the bottom of the river in the shallows. New Zealand mudsnails and faucet snails can be found on any substrate including vegetation.

Crayfish can be caught by hand or by using a net. If you suspect that you have found Red Swamp Crayfish, attempt to catch a specimen. Be careful, this is best done with gloves they will pinch.

Suspect snails and crayfish need to be sent to an expert for vouchering. Collect the largest specimens possible and place them in a plastic bag labeled with the AIS ID # and location. If there is a body in the shell, once you are home transfer it into a container of 70-95% ethanol or rubbing alcohol. If it is an empty shell you may leave it in the ziplock bag. If you transfer to alcohol be sure to label the new container with AIS ID# and location. It is illegal to mail alcohol, so please arrange to deliver sample(s) with alcohol to your local DNR (see page 9 for contact information). Remember to save a copy of your reporting forms for your own records.

red swamp crayfish
(Photo Credit Chris Hammerla)

SPECIES OVERVIEW

New Zealand mudsnail *(Potamopyrgus antipodarum)* *

Very small snail ranging from 3 to 6 mm. Brown or black cone-shaped shells with five to six whorls. Operculum (hard "lid") covers the shell opening. Opening is on right side when shell is pointed up. Can reach incredible densities.

faucet snail *(Bithynia tentaculata)* *

Adult faucet snails can grow up to 1/2 inch in length, but are generally smaller. They are light brown to black, with 4 to 5 whorls and a cover on the shell opening. The shell opening is on the right when the shell pointed up.

Louisiana red swamp crayfish *(Procambarus clarkii)* *

Large dark red crayfish up to 8 inches in length (typically 2 to 5 in.). Claws have raised red spots. Black wedge-shaped stripe on the top of the abdomen. When it burrows it does not create hills like native crayfish.

Red swamp crayfish hole
(Photo Credit Heidi Bunk)

TIMELINE

Common Name	Scientific Name	May	June	July	Aug	Sept
New Zealand mudsnail	*Potamopyrgus antipodarum*	x	x	x	x	x
faucet snail	*Bithynia tentaculata*	x	x	x	x	x
Louisiana red swamp crayfish	*Procambarus clarkii*	x	x	x	x	x

zebra mussel
(Photo from Michigan Sea Grant Archives)

Project RED

Invasive Mussels

quagga mussel
(Photo by Mike Quigley, NOAA)

The zebra mussel and the quagga mussel are two invasive mussels that have been found in Wisconsin's rivers. They clog intake pipes, cover recreational equipment, destroy instream habitat, and outcompete native filter feeders.

MONITORING AND SAMPLE COLLECTION PROTOCOL

Search in shallow areas near shorelines for the presence of mussels (alive or empty shells) that may have washed up. Zebra mussels may be found on any hard surface (rocks, litter, piers, etc). Quagga mussels can colonize on either hard or soft surfaces. Rub your hands along rocks, piers, and vegetation. Mussels can make otherwise smooth surfaces feel like sandpaper. Be careful as to not cut yourself. Search under rocks. It is illegal to collect live native mussels (also known as clams). You may however collect empty shells of any species.

Suspect snails and mussels need to be sent to an expert for vouchering. Collect the largest specimen possible and place them in a plastic bag labeled with the AIS ID # and location. If there is a body in the shell, once you are home transfer it into a container of 70-95% ethanol or rubbing alcohol. If it is an empty shell you may leave it in the ziplock bag. If you transfer to alcohol be sure to label the new container with AIS ID# and location. It is illegal to mail alcohol, so please arrange to deliver sample(s) with alcohol to your local DNR (see page 9 for contact information). Remember to save a copy of your reporting forms for your own records.

zebra mussel
(Photo from USGS)

zebra mussels in a intake pipe
(Photo from Michigan Sea Grant Archives)

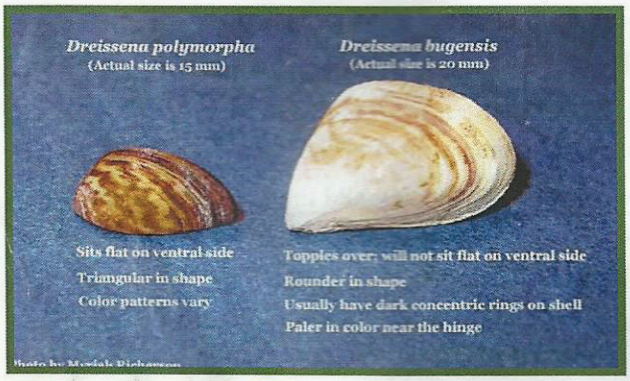
SPECIES OVERVIEW

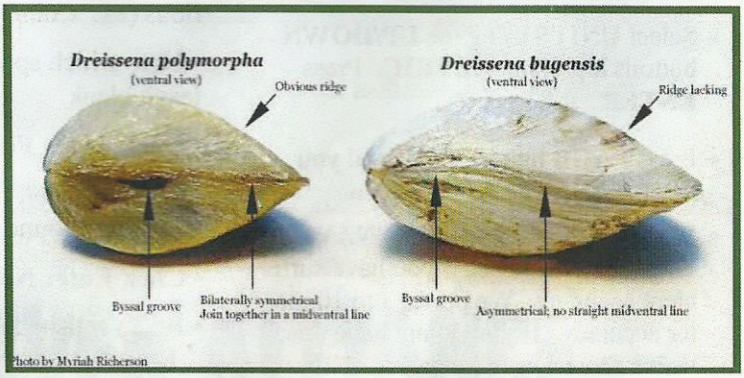
zebra mussels (*Dreissena polymorpha)*

A tiny (1/8-inch to 2-inch) bottom-dwelling clam. Yellowish or brownish D-shaped shell, usually with alternating dark and light colored stripes. Attaches to solid objects. Generally found in shallow, algae-rich water.

quagga mussel *(Dreissena bugensis)*

Light tan to almost white, with narrow stripes or mottled lines. It is fan-shaped, with pointed edges at either side. The ventral (bottom-side where the 2 shells attach) side of the mussel is convex which makes it topple over when placed ventral side down on a flat surface. The zebra mussel will remain upright when placed in this position.





(Photos by Myriah Richerson, USGS)

TIMELINE

Common Name	Scientific Name	May	June	July	Aug	Sept
zebra mussel	*Dreissena polymorpha*	x	x	x	x	x
quagga mussel	*Dreissena rostriformis bugensis*	x	x	x	x	x

Quick Guide

1. Monitor a river or stream twice a year
2. Record start and end locations
3. Record locations of invasive species
4. Collect samples and/or photographs of invasive species
5. Enter data into SWIMS whether you found anything or not
6. Verify your findings by email, mail, or hand delivering photographs or specimens
7. Contact your local AIS coordinator or the River Alliance of Wisconsin to determine what course of action is needed

Using a GPS Unit

It is crucial to check/adjust the settings of your GPS unit before recording coordinates.

- Press **PAGE** button until you reach the **MAIN MENU** screen
- Highlight **SETUP** using the **UP/DOWN** buttons and then press **ENTER.**
- Select **UNITS**
- Select **POSITION FORMAT** and using the **UP/DOWN** buttons highlight **hddd.ddddd.** Press **ENTER**
- Select **MAP DATUM** and using the **UP/DOWN** buttons highlight **WGS84.** Press **ENTER**
- Select **UNITS** using the **UP/DOWN** buttons highlight **METRIC**. Press **ENTER**
- Press **PAGE** button again until you reach the **SATELLITE** screen
- When you see **READY TO NAVIGATE,** check to see if you have sufficient accuracy. We prefer 3 to 10 meter accuracy. If you do not have this, wait a few more minutes.
- When you have sufficient accuracy, record the **LONGITUDE** and **LATITUDE** onto your field datasheet.

Entering Data into SWIMS

To get started, you will need a user id and password

- Go to http://wisconsin.gov. Click on **Get Your Wisconsin User ID.**
- Click **Self Registration**. Scroll down and hit **Accept.**
- Fill in your information. If you have a problem with it not accepting your mailing address, just leave the whole address blank (there is a bug that causes it to not accept some addresses). Before hitting Submit, print the page and jot down your password. Save in a safe place.
- Open your email account and look for an email from Wisconsin.gov.
- **Email us your user id** (lmacfarland@wisconsinrivers.org) You'll get a reply within a couple of business days saying you're all set up to enter Project RED data.

How to Enter Data

- Go to http://dnr.wi.gov/lakes/clmn-data. Log in.
- Under **My Projects** select **Project Riverine Early Detectors (Project RED)**. Under Tasks click **Enter Data.**
- Select your name from the **Data Collectors** drop down list. If there are additional data collectors not listed, feel free to list them in the comments area.
- Then, select your monitoring station. If your station is not available in the dropdown list select **Location Specified on the Next Page**
- Enter the start and end date and time (when you started and stopped monitoring that day).
- Down below, enter your written observations in the comment box (i.e. weather, wildlife)
- Click **Next**
- Enter the **Waterbody Name** and start and end location information in decimal degrees. It is not necessary to enter a negative sign before your longitude. Please provide a good description of the start and end locations (ex. County H Bridge just north of Baytown).
- Note which species you looked for. Please answer Yes or No. Do not leave blank.
- Click **Enter First ID#** to enter your first find.
- Enter the ID#, the name of the species, and the latitude and longitude where you found it.
- Click **Enter Next ID#** to enter your next find.
- When finished, click **Save and Return to List**. If you click **Save and Return to List** (or if you click **View List** from the Submit Data tab), you will see the data you recently entered.

Other Resources

ONLINE PUBLICATION SOURCES

- Citizen Lake Monitoring Network Publications
  http://www.uwsp.edu/cnr/uwexlakes/clmn/publications.asp
- UWEX, WDNR, and River Alliance of Wisconsin's AIS publications
  http://www4.uwsp.edu/uwexlakes/CBCW/pubs.asp

STATEWIDE RESOURCES

- River Alliance of Wisconsin
  www.wisconsinrivers.org
- WDNR Invasive Species Webpage
  http://dnr.wi.gov/topic/Invasives/
- Midwest Invasive Plant Network
  www.mipn.org
- UWEX Clean Boats Clean Waters
  http://www.uwsp.edu/cnr/uwexlakes/cbcw/
- WDNR Report an Invasive Species
  http://dnr.wi.gov/topic/Invasives/report.html

REGIONAL RESOURCES

- Northwoods Cooperative Weed Management Area
  www.northwoodscwma.org
- Southeast Wisconsin Invasive Species Consortium
  www.ipaw.org/sewisc/about.aspx
- Wild Rivers Invasive Species Coalition
  http://www.wrisc.org/
- Wisconsin Headwaters Invasive Partnership
  http://www.whipinvasives.org/

COUNTY RESOURCES

Many counties and Resource Conservation and Development councils (RC&Ds) have an aquatic invasive species coordinator on staff. For a complete list of contacts by county visit, http://dnr.wi.gov/lakes/invasives/topics.aspx

Contacts

Laura MacFarland
Statewide Project Red Coordinator
River Alliance of Wisconsin
(608) 257-2424 ext 110
lmacfarland@wisconsinrivers.org

DNR Regional AIS Verification Contacts:

Milwaukee Area:
Heidi Bunk
262-574-2130
heidi.bunk@wi.gov

Green Bay Area
Danielle Sippel
920-662-5497
danielle.sippel@wisconsin.gov

Madison Area
Susan Graham
608-275-3329
susan.graham@wi.gov

Rhinelander Area
Kevin Gauthier
715-365-8937
kevingauthiersr@wisconsin.gov

Park Falls Area
Jim Kreitlow
715-365-8947
james.kreitlow@wi.gov

Spooner Area
Pamela Toshner
715-635-4073
pamela.toshner@wisconsin.gov

Wisconsin Rapids Area
Scott Provost
715-421-7881
scott.provost@wisconsin.gov

Acknowledgments

Funding to produce this manual was provided by DNR Aquatic Invasive Species Grant AEPP 295-11.
Photographs courtesy of the River Alliance of Wisconsin if not noted otherwise.

WISCONSIN DEPT. OF NATURAL RESOURCES

RIVER ALLIANCE of Wisconsin

PREVENT THE SPREAD

WIPE YOUR FEET INSPECT ALL EQUIPMENT INCLUDING YOUR BOOTS AND BOATS BEFORE AND AFTER MONITORING. CLEAN ALL PLANTS, ANIMALS AND MUD OFF.

BAG IT WHEN COLLECTING SAMPLES BE SURE TO BAG THEM IMMEDIATELY. DO NOT PLACE SPECIMENS IN THE BOTTOM OF THE BOAT TO BE BAGGED LATER. IT ONLY TAKES A FRAGMENT OF A PLANT OR ONE SNAIL IN MOST CASES TO START A NEW INFESTATION.

GO WITH THE FLOW MONITOR FROM UPSTREAM TO DOWNSTREAM TO HELP PREVENT THE INTRODUCTION OF INVASIVES IN THE HEADWATERS.

LOSE THE FELT FELT SOLED WADING BOOTS ARE MORE LIKELY TO HARBOR INVASIVE SPECIES. WE RECOMMEND USING HARD RUBBER BOOTS, NOT FELT.

LEAVE 'EM HIGH AND DRY LET ALL EQUIPMENT DRY BEFORE MOVING FROM ONE WATERBODY TO ANOTHER.

Remember only you can protect your waters and stop aquatic hitchhikers!

Visit www. ProtectYourWaters.net for more information.