AQUATIC INVASIVE SPECIES

A handbook for education efforts





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CHAPTER 1

Introduction

Aquatic invasive species are an international issue – plants and animals are stowing away in the ballast of ocean-going ships that circle the globe. Species native to countries around the world are being sold for food and for use in aquaria and gardens. Most exotic (non-native) species do not become troublesome invaders. However, with current levels of international trade and travel, the potential for new introductions, and the continued spread of invasive (harmful) exotics, continues to grow.

Though we know about the international importance of this issue, it is often something much closer to home that calls Wisconsin residents to take action. Maybe it's the day we notice that the Northwoods lake where we spent our summers as a child is clogged with Eurasian water-milfoil, or when we take our children fishing for perch in Lake Michigan, only to catch seemingly hundreds of round gobies. Whatever the reason, increasing numbers of Wisconsin citizens are looking for ways to get involved in helping to prevent the introduction and spread of aquatic invasive species.

Zebra Mussel

MICHIGAN SEA GRANT

Minnesota has had an established state invasive species program since 1991, with heavy emphasis on using education to prevent the spread. They have targeted boaters and anglers with a nationally-accepted set of prevention steps (see Chapter 2 for more details). Survey results, as well as infestation levels, demonstrate that the approach has worked. In 2000, 90% of Minnesota boaters reported taking special steps to prevent the spread of invasive species when moving their boats. As of late 2004, approximately 160 inland Minnesota lakes had confirmed Eurasian water-milfoil infestations, compared to more than 400 in Wisconsin. Only 2 inland Minnesota lakes were confirmed to have zebra mussels, as compared to approximately 50 in Wisconsin. While not all variables in the two states are the same, the success in Minnesota is promising. Wisconsin's statewide program, the bulk of which started after 2001 (highlighted in Chapter 3), is based heavily on Minnesota's successful efforts.

MICHIGAN SEA GRANT

Surveys and data indicate that education can be extremely effective in preventing the spread of invasive species, but this battle will not be won with a statewide education effort alone. Numerous groups – schools, counties, towns, lake associations, businesses – have recognized this and are beginning to launch their own prevention education efforts. This handbook is designed to serve as a resource for those interested in aquatic invasive species education efforts. It includes a compilation of information on the state program, resources, contacts, and action strategies. It also provides some suggested approaches for designing successful local education efforts. The hope is that this book will serve as a resource for those who might be interested in taking on this issue but don't know where to begin! Finally, this handbook serves as a single place to go for information on the statewide educational resources and programs that exist in Wisconsin and ideas/suggested strategies on how to move forward with local aquatic invasive species education efforts.

Aquatic Invasive Species

a quick introduction (in other words…why bother reading this book?)

Aquatic invasive species

Non-native, exotic, alien, non-indigenous – no matter what you choose to call them, non-native species are plants and animals present in an ecosystem beyond their native range. Some of these species become "invasive," and may threaten native species and interfere with commercial, agricultural, or recreational activities. In their native environments, there are typically predators, parasites, pathogens, and competitors that keep these invasive species in check and create a balance. However, when they are transported to a new environment, the natural checks are usually left behind. This gives invasive plants and animals a jump on the native competition. Additionally, Wisconsin's native species haven't "grown up" with these new species, so they often don't know how to eat them or compete against them. You've likely heard stories of zebra mussels covering every available hard surface in a lake, Eurasian water-milfoil plants forming mats so dense that people can no longer boat, fish, or swim, and purple loosestrife crowding out all other plants in a wetland. These are just three examples of the invasive plants and animals threatening Wisconsin waters and wetlands.

How do they get here?

Many aquatic invasive species, including zebra mussels and round gobies, have been introduced into the Great Lakes in the discharged ballast water of ocean-going ships. Additional species made their way into the Great Lakes by way of canals created for shipping. Some species, like the common carp, were intentionally stocked. Others, like rusty crayfish, were likely introduced when unused bait was discarded. Gardening and aquarium retailers and hobbyists, as well as the aquaculture industry, can also inadvertently introduce invasive plants and animals.

DNR FILE PHOTO

How do they spread?

Once in our waters and wetlands, aquatic invasive species often hitch rides to new waterbodies on the boats, trailers, and equipment that we transport from place to place. Anglers can also inadvertently transport them in bait buckets and live wells. Other things that move between waters, including birds and sea planes, also have the ability to carry "hitchhikers." Once introduced, some species are even able to move without our help – fish can swim into adjoining waters, and plant seeds and fragments move with the current to new locations.

Why do we care?

Aquatic invasive species have major impacts on the waters of Wisconsin and our ability to enjoy them.

Ecological impacts – Invasive species have the ability to change aquatic systems and the plants and animals that live in them. Plants like Eurasian water-milfoil form dense mats that shade out native plant species. Zebra mussels encrust the shells of our native mussels, making it difficult for them to survive. These invasive mussels also consume the tiny plants and animals that young fish rely on for food. Wetlands overrun with purple loosestrife no longer support animals that depend on native plants for food and shelter.

Economic impacts – The costs to control invasive species are extremely high. Individual lake organizations spend tens of thousands of dollars per year to simply manage (not eradicate) invasive plant populations. Power plants and industries spend millions of dollars combating the zebra mussels that threaten to clog their water intakes. The Great Lakes support a $4 billion fishing industry that is also threatened by current and future invasives.

Recreational impacts – Invasive species have the ability to harm native sport fish populations – the decimation of lake trout populations by sea lamprey is a good example. Invasive plants often form dense mats that make boating, fishing, and swimming difficult. Zebra mussels encrust piers, lift stations, and boats, sometimes leading to costly repairs. Their sharp shells also cut the feet of unsuspecting swimmers.

What can we do?

The good news is that there are prevention steps that we as individuals can take when boating, fishing, and otherwise enjoying the water that can help prevent the spread of invasive species.

- Inspect and remove aquatic plants, animals, and mud from your boat, trailer, and equipment before leaving the water access;
- Drain water from your boat, motor, bilge, live wells, and bait containers before leaving the water access;
- Dispose of unwanted bait in the trash;
- Spray/rinse boats and recreational equipment with high pressure and/or hot tap water ($> 104^{\circ}$ F), especially if moored for more than a day, OR
- Dry boats and equipment thoroughly for at least 5 days.

There are also a number of additional ways for individuals and groups to take action to combat the spread of invasive species, from starting their own boat launch education program to rearing beetles to control purple loosestrife. These and other "action" opportunities are highlighted in Chapter 3.

CHAPTER 2

ANS Task Force web site:
www.anstaskforce.gov

For a summary of the National Invasive Species Act (NISA), visit www.nemw.org/nisa_summary.htm

In addition to establishing the Task Force and regional and state responsibilities, much of this NISA act dealt with national ballast water management. The act expired in 2002, so Congress must authorize NISA (a revised version) for its provisions to continue.

A Brief Look at the National Perspective

This chapter provides a brief overview of some of the aquatic invasives species work taking place at a national level, specifically the contributions that have been made to information and education efforts focused on prevention of spread. This will hopefully lead to a better understanding of how the guidelines used in Wisconsin were developed. Additional information on national legislation is included in Chapter 3, after discussion of state aquatic invasive species laws. Numerous web sites from national programs and agencies are provided in Chapter 6 under Web Resources.

The ANS Task Force and its Role at the National, Regional, and State Levels

The Aquatic Nuisance Species (ANS) Task Force was created by the passage of the federal Nonindigenous Nuisance Prevention and Control Act of 1990 (NANPCA). The Task Force has since served as an oversight organization, coordinating national ANS activities and implementing NANPCA. The NANPCA mandates were expanded with the passage of the National Invasive Species Act (NISA) in 1996 (see box above). The ANS Task Force is chaired by the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration, and consists of 7 federal agency representatives and 11 ex officio members. Task Force committees focus on a variety of broad issues, including risk assessment and management; monitoring; research protocol and coordination; communications, education, and outreach; and specific issues, including round goby control; recreational activities; and the Chicago waterways dispersal barrier.

Regional ANS panels also exist throughout the country, and their role, as established by Congress, is to advise and support the Task Force in carrying out its responsibilities in their region. The coordinators of each panel report to the Task Force. Wisconsin has been represented on the Great Lakes Panel on ANS since its inception in 1991. We are now also part of the more recently formed Mississippi River Basin Panel on ANS as well. Much is accomplished in these panels – working on a regional level brings in expertise from a number of states and has lead to numerous regional and even national collaborative projects, ranging from publication development to full-scale outreach and control initiatives.

The ANS Task Force also supports implementation of ANS prevention and control strategies at the state level. States submit management plans, and if approved by the Task Force, the states then receive federal funding for ANS activities. Wisconsin's plan was approved in 2003, and the state now receives federal money to supplement its state dollars to implement the plan. (A summary of Wisconsin's Comprehensive State Management Plan is included on the accompanying CD.)

What does this mean to us?

Recreational activity guidelines – where did they come from and why should we use them?

While the work of the national Task Force sounds good, it may be hard to see direct benefits/impacts on the work being done in Wisconsin, aside from the funding we're receiving. However, the Task Force leads the development

of the nationally accepted voluntary guidelines for recreational users. This is an example of work at a national level that is linked directly to education initiatives in Wisconsin.

In NANPCA, recreational water use, including boating and angling, was recognized as a means of transport and spread of aquatic invasive species. The Task Force was charged with developing voluntary national guidelines (with supporting information and analyses) to prevent the spread of aquatic invasive species through recreational activities. It established a recreational activities committee to draft the voluntary guidelines. The committee members represented state and federal natural resource agencies, as well as boating, fishing, and aquaculture interests.

The Great Lakes panel had already developed several guidelines after confirming with a survey that different members were promoting different messages, and therefore boaters and others were likely confused about what to do. The national committee used these guidelines as a starting point. However, it still took them four years and a great deal of work to come up with the guidelines that finally received federal approval (published in the Federal Register, December 28, 2000, 65(250): 82447-82451).

The goal of the voluntary guidelines is to provide clear, concise information for distribution to the public identifying specific steps that can be taken to avoid the transport of aquatic invasive species. A great deal of work was put into insuring that the guidelines were simple, effective, reasonable, and easy to read. The benefit to developing national guidelines is consistency throughout the country – boaters, anglers, and others who visit many different places should see/hear the same basic message in a variety of contexts and from different sources (see photo of sign from Illinois/Indiana below). For this reason, it is important that WI DNR, WI Sea Grant, University of Wisconsin-Extension and any others in the state working to educate the public on this issue use these guidelines!

Prevention steps for boaters and anglers should basically be as follows (with only minor differences, "wash" instead of "rinse" might be an example), often with an accompanying graphic:

- Inspect and remove aquatic plants, animals, and mud from your boat, trailer, and equipment before leaving the water access;
- Drain water from your boat, motor, bilge, live wells, and bait containers before leaving the water access;
- Dispose of unwanted bait in the trash;
- Spray/rinse boats and recreational equipment with high pressure and/or hot tap water (> 104° F), especially if moored for more than a day, OR
- Dry boats and equipment thoroughly for at least 5 days.

ILLINOIS/INDIANA SEA GRANT

These are the steps you will see in publications from other Great Lakes states, as well.

The steps are simple, easy to follow, and always presented in the same order. They are demonstrated by watercraft inspectors at boat landings. These prevention steps are the basis for any education materials developed at a statewide level that target boaters and anglers.

Similar steps were developed for other water recreation activities, including SCUBA diving, waterfowl hunting, and personal watercraft use. Many of these are included in the "Help Stop Aquatic Hitchhikers" brochure (see resource section). To view these steps, you may also visit www.protectyourwaters.net, the web site for the national Stop Aquatic Hitchhikers! campaign. See Chapter 8 for more detailed prevention steps.

CHAPTER 3

Wisconsin Statewide Programs

The purpose of this chapter is to provide a brief summary of the statewide invasive species programs, including grants, laws and answers to related legal questions. It also includes detailed descriptions of several statewide volunteer programs that allow citizen groups of all ages to get involved in invasive species prevention, monitoring, and/or control. The large statewide programs are primarily centered within or connected to the Department of Natural Resources (including contracts with UW-Extension) and UW Sea Grant.

DNR Aquatic Invasive Species Program

Wisconsin DNR's aquatic invasive species program focuses on preventing the introduction of new invasive species, preventing the spread of invasives that are already in the state, and controlling established populations when possible. The program, funded by state and federal dollars, is composed of these main components:

Watercraft inspection – In cooperation with UW-Extension and Sea Grant, this effort involves dissemination of information to anglers and recreational boaters to make them aware of what invasive species look like and what precautions they should take to avoid spreading them. It also involves visual inspection of boats to make sure they are "clean" and demonstration to the public of how to take the proper steps to clean their boats, trailers, and boating equipment. Watercraft inspectors also install signs at boat landings informing boaters of infestation status, state law, and steps to prevent spreading invasives.

Monitoring – This effort involves monitoring for aquatic invasive species, including zebra mussels, Eurasian water-milfoil, spiny waterfleas, and rusty crayfish. For zebra mussels, it involves collecting samples for veliger (larval zebra mussel) analyses and deployment of substrate samplers. There are also specific sampling procedures for spiny waterfleas and rusty crayfish. For Eurasian water-milfoil and other aquatic plants, it involves inspection of watercraft for invasive plants or visual shoreline inspections.

Information and education – In close cooperation with UW-Extension and Wisconsin Sea Grant, education efforts focus on working with resource professionals and citizens to teach boaters, anglers, and other water users the steps to take to prevent transporting aquatic invasives to new waters. Efforts also involve addressing other potential mechanisms of introduction, including aquarium pet release and water gardening. Many educational tools are used to reach the public – brochures and publications, "watch cards" and "wild cards," public service

announcements and displays at parks, sport shows, Travel Information Centers, conventions and symposiums.

Purple Loosestrife biological control – In cooperation with UW-Extension, this citizen-based project emphasizes using two safe, purple loosestrife foliage-feeding beetle species, in combination with traditional methods, for controlling this invasive plant. Citizens of all ages make up the backbone of this cooperative program by rearing and releasing these insects in their local wetlands – and learning about these precious places in the process (see program details on page 15).

Clean Boats, Clean Waters volunteer program – Sponsored by the DNR, UW-Extension, and the Wisconsin Association of Lakes, this program offers training on how to organize a watercraft inspection program, how to inspect boats and equipment, and how to interact with the public. Volunteers are also encouraged to help monitor for aquatic invasives. Workshops are open to adults and youth; adult groups are encouraged to work with local youth partners (see program details on page 14).

Research – Through the Center for Limnology, the University of Wisconsin is developing monitoring protocols for rusty crayfish, spiny waterfleas, and rainbow smelt. Databases on the distribution of these species will be developed along with models predicting which waters are most vulnerable. The DNR also contracts with Michael Moody from the University of Connecticut to conduct work on Eurasian water-milfoil (EWM) hybrids to determine their chemical resistance and to do vouchering of EWM for the DNR.

St. Croix Interstate Plan for Aquatic Invasive Species – The DNR receives approximately $25,000 annually in federal funding from the U.S. Fish and Wildlife Service to implement an interstate plan with Minnesota and tribes on the St. Croix River. Funding is used for monitoring, information and education, and watercraft inspection efforts on the Mississippi and St. Croix Rivers. Additionally, the grant supports monitoring dives for zebra mussels on the Upper St. Croix, monitoring efforts for Asian carp on the Mississippi River, public service announcements, and development and printing costs for educational materials.

Wisconsin's Comprehensive State Management Plan for Aquatic Invasive Species – Starting in 2004, the DNR receives annual federal funding from the U.S. Fish and Wildlife Service to implement its management plan (a summary of the management plan can be found on the accompanying CD). Funding is being used to update a comprehensive aquatic invasive species database and address pathways of introduction, including bait and pet industries, the aquaculture and aquarium trades, and mail order and Internet sales.

TOP TO BOTTOM
MINNESOTA SEA GRANT
CBCW PROGRAM
MICHIGAN SEA GRANT

Aquatic Invasive Species Grants (At-A-Glance)

About the grants

Aquatic Invasive Species (AIS) Control Grants are designed to assist in a state/local partnership to control aquatic invasive species. The DNR was directed to establish procedures to award cost-sharing grants to public and private entities for up to 50% of the costs of projects to control invasive species. These funds are available to units of local government and others for grants to control aquatic invasive species. The grant projects are broken down into three major categories:

① Education, Prevention and Planning

② Early Detection and Rapid Response

③ Controlling Established Infestations

Grants are available to conduct projects on all waters of the state, including lakes, rivers, streams, wetlands and the Great Lakes.

Eligible sponsors

Any entity that is eligible for a Wisconsin Lake or River Planning or Protection grant is also eligible for an AIS control grant. This includes units of local government, tribes, lake protection and rehabilitation districts, qualified lake associations, qualified river management organizations, nonprofit conservation organizations and qualified school districts. However, first priority will go to local units of government.

About the money

The budget for this grant program was initially $500,000 per year and will reach $1.5 million by 2006-2007. The state will pay up to 50% of the cost of a project, with caps of:

$75,000 for Education, Prevention and Planning

$10,000 for Early Detection and Rapid Response

$75,000 for Controlling Established Infestations

The remaining 50% must be provided by the local organization in the form of cash, time, services, or "in-kind" items. Grants operate on a reimbursement basis. For Education, Prevention and Planning Projects, sponsors may request an advance payment of 25%.

Permit fees are considered an eligible cost, as well as the expenses required to obtain permits (retroactive up to 12 months prior to application). Watercraft inspection projects are limited to $2,500 per public boat launch facility, but can be a component of a larger project.

Eligible projects can include:

Education, Prevention and Planning

- ✦ Educational programs and distributing information about aquatic invasive species (Note: projects will be reviewed for consistency with the DNR statewide education strategy and the use of existing publications and outreach materials).

- Monitoring, mapping and reporting of data about the presence or absence of AIS to provide baseline information and monitor trends in a water body or water bodies.
- Development of plans for the prevention and control of AIS.
- Studies or assessments that will aid in the prevention and control of AIS.
- Watercraft inspection and education projects following DNR Clean Boats, Clean Waters (PUB-WT-780-2004) program guidelines. Specifically, projects involving watercraft inspectors are required to attend a Clean Boats, Clean Waters training workshop, conduct inspections, collect and report data, and be present at boat launch facilities a minimum of 200 hours between May 1 and October 30.

Early Detection and Rapid Response

- Identification and removal, by approved methods, of small pioneer populations of aquatic invasive species in the early stages of colonization or re-colonization. (For rooted aquatic plants like Eurasian Watermilfoil, a pioneer infestation is defined as a localized bed that has been present less than 5 years, and is less than 5 acres in size or less than 5% of lake area, whichever is greater.)
- Control of a re-colonization following the completion of an established infestation control project.

Controlling Established Infestations

- DNR-approved control activities recommended in a management plan adopted by the sponsor for the control of aquatic invasive species.
- Experimental or demonstration projects following a DNR approved plan.
- Purple Loosestrife bio-control projects (no plan approval required).

Applications

Applications for Education, Prevention and Planning Projects and Established Infestation Control Projects are due by February 1 and August 1 of each year. Early Detection and Rapid Response grants are offered continuously on a first-come, first-serve basis and funded in order of approval.

The DNR can provide help with applications and technical guidance – contact your regional DNR Lake Coordinator or Environmental Grant Specialist for more information (see contact list in Chapter 6, page 81). Private consultants can also assist you. A list of consultants, without endorsements, can be obtained from the UW-Extension Lakes Program: www.uwsp.edu/cnr/uwexlakes/lakelist

FACTSHEETS

An in-depth factsheet on Aquatic Invasive Species, as well as factsheets on DNR Lake Planning and Protection Grants can be found on the accompanying CD or at www.uwsp.edu/cnr/uwexlakes/grants

GRANTS

Visit the DNR Bureau of Community Financial Assistance at dnr.wi.gov/org/caer/cfa/grants to learn more about application information, grant requirements, etc.

UW Sea Grant Program

Wisconsin Sea Grant has been working in aquatic invasive species (AIS) prevention since the mid 1980s when zebra mussels were first found in the Great Lakes. They offer a range of publications on AIS as well as water quality, K-12 education, marine safety, habitat restoration, fisheries, and coastal engineering. They also have a strong Geographic Information System (GIS) program and are part of a network of eight Great Lakes Sea Grant programs that work together to provide information and outreach to Great Lakes residents and users.

The Sea Grant Nonindigenous Species website (www.sgnis.org) offers publications and abstracts available online. Many of the publications are peer-reviewed but some additional literature is available as well. SGNIS offers an extensive kids' area with information and activities involving invasive species. In addition to articles, SGNIS provides AIS photos for presentations and publications. Low-resolution photos for slide presentations are available online and are available at high resolution upon request.

State Volunteer Programs – Opportunities to Take Action

Volunteers statewide are looking for opportunities to help in the fight against invasive species. The following statewide programs offer opportunities to get involved with invasive species and other water quality issues.

FRANK KOSHERE

Case studies highlighting groups that have implemented these programs in their communities are included in Chapter 5.

Clean Boats, Clean Waters Volunteer Watercraft Inspection Program

In 2002, a group of students from northern Wisconsin researched the impact tourism had on their town, Minocqua, and the devastating impacts aquatic invasive species could have on the surrounding lakes. They proposed an action plan to prevent the spread of an invasive aquatic plant, Eurasian water-milfoil. The Christopher-Columbus foundation, recognizing innovative ideas from young people, awarded this group $25,000 to develop and market an educational tool kit for boaters along with a volunteer watercraft inspection program, and the Milfoil Masters program was born (see Chapter 5, page 58 for a case study). This successful project worked to create an awareness of invasive species and the steps each boater needs to take to prevent their spread.

Within a year, the DNR Invasive Species Program allocated funds to continue the momentum started by the Milfoil Masters. A new expanded program, Clean Boats, Clean Waters, grew out of this successful project.

New resource tool kits, t-shirts and volunteer handbooks were designed to guide communities in developing volunteer watercraft inspection teams focused on preventing the spread of all aquatic invasive species. The DNR, UW-Extension and Wisconsin Association of Lakes assisted with a series of statewide workshops to deliver the Clean Boats, Clean Waters materials. These workshops were strategically located in lake-intensive areas where invading aquatic species were most likely to take a foothold.

During the summer of 2004, fourteen workshops trained over 350 people in 38 counties. Lake residents, county board members, tribal community members, county park and forest program employees, and boat marina employees attended the workshops to learn how aquatic invasive species threaten Wisconsin waters. They also received instructions on how to organize a volunteer watercraft inspection program, how to approach boaters, perform boat/trailer checks, record pertinent data and report suspect specimens. Trained volunteers became the frontline defense against aquatic invasive species as they positioned themselves at the boat landings. On weekends and busy holidays, teams of volunteers across the state educated boaters on how and where invasive species were most likely to hitch a ride and how to perform watercraft inspections.

To register or learn more about workshops, contact the Clean Boats, Clean Waters Program Coordinator, Laura Felda-Marquardt at (715) 365-2659 or email at laura.felda@dnr.state.wi.us

During the watercraft inspections, volunteers and agency watercraft inspectors kept a record of the boaters' traveling patterns, recreational use, boat horsepower and invasive species knowledge. This information was entered into a statewide database: dnr.wi.gov/org/water/fhp/lakes/watercraftinspection

As of December 2004, 2,889 boats had been inspected and 6,136 people had been contacted by volunteers during watercraft inspection efforts. Survey results indicate that 88% were Wisconsin boaters and that fishing was their primary recreational activity. Additional comments revealed that many boaters were not aware of the role they played in moving aquatic plants and animals from one water body to another. Some watercraft inspection efforts uncovered hidden plants on boat trailers and other recreational equipment. Watercraft records indicate that 5% of all inspected boats had vegetation attached when approaching the landing, while 27% of the boats had vegetation attached as boats pulled away from the landing.

Records from lakes participating in the program, including Shell Lake and Crescent Lake (see case studies in Chapter 5) illustrate the importance of this program in preventing the spread of invasive species to new lakes in Wisconsin. The Clean Boats, Clean Waters program schedules training workshops each winter, to be conducted the following spring and summer. A complete list of workshops and other resource information is available on the Wisconsin Lake Partnership website: www.uwsp.edu/cnr/uwexlakes/cbcw

Purple Loosestrife Biological Control Program

SCOTT NIELSEN

The increasing pressure purple loosestrife (PL) was exerting on wetlands throughout the Northern U.S. by the 1980s and the failure of traditional control methods to stop the spread of this invasive plant resulted in a search to find an effective bio-control. Over 100 species of insects that feed on PL in its home range in Europe were researched, safety-tested and re-tested before several qualified for release in North America in 1993. The DNR first released these in Wisconsin in 1994 and for three years thereafter concentrated on research to be sure they would be safe and effective here. A small scale, inexpensive rearing process was also perfected for two Galerucella species of beetles (nicknamed "Cella") and these insects were released at a dozen places, showing excellent PL control and native plant recovery at smaller sites in only several years.

In 1997 the DNR decided to begin releasing as many bio-control insects as quickly and widely as possible to integrate with existing control methods–and perhaps eventually replace most. Funds for the work were extremely limited. When it became apparent that lake associations, other groups, and even individuals were so concerned about their own infested wetlands that they would rear Cella beetles at their own expense to release them locally, the current program became feasible. Gradually, over the next couple years, good re-collection of propagation stock at early release sites eliminated dependence on expensive, imported rearing insects, cutting insect costs. In 2000, state funding became available to support the work, making continued DNR coordination of the work possible, and free rearing equipment available to dedicated cooperating volunteers. By 2003, program cooperators had released an estimated 8 million Cella beetles, helping control PL at 900 sites! – unfortunately, still only about 3% of all known PL sites. So the need for new cooperators continues.

Today, the program recommends short-term PL control by preventing establishment of new patches, and long term control mainly through beetle releases. In both pursuits ample opportunities exist for citizens to help and ensure only a minor role for invasive PL in their wetlands' future. Prevention can include learning to identify PL and pulling new plants as seen, or reporting new infestations to the Bio-control Program. Cleaning clothing and gear after travel in infested areas to reduce seed dispersal is also important, as is educating others about PL. This includes gardeners to be sure plants are not grown locally – intentionally or not, and local governments to see that seed is not spread unintentionally through poorly timed roadside mowing or other activities.

Long-term control may be done most simply and cheaply with bio-control. Though herbicides may sometimes be better, they are often quite expensive and unspecific. Cella beetles can be raised in backyards, school yards or even outside at work. The process includes transplanting large PL rootstocks into 12-inch pots in early spring, covering each with a fabric cage, and placing them in an outdoor kids' wading pool with several inches of water. When 2 feet tall, each plant gets 10 old beetles that produce up to 1,000 new adults by mid-summer – as the cooperator simply maintains water in the pool and watches all the activity. At the first sign of new adults the pots are placed next to healthy PL plants in the wetland and the cages removed. The beetles do the rest! And, as strong fliers, they can spread control to other wetlands. Beetle stock is free if picked up in Madison and most necessary equipment is free to dedicated cooperators.

Bio-control Program

(608) 221-6349

brock.woods@dnr.state.wi.us

Call or email to get an introductory program letter, which describes the program and enables you to sign up more completely.

For more information about the purple loosestrife problem, distinguishing it from native plants, and control opportunities, look at the state's PL brochure at

clean-water.uwex.edu/pubs/purple.pdf

Also check the DNR's web site

dnr.wi.gov/invasives

For more details about beetle rearing, forms for joining the effort and (for educators) 15 educational activities ready for teaching about invasives like PL, access the Program's "See Cella Chow: A Bio-control Manual for Educators" at

dnr.wi.gov/org/es/science/publications/ss981_2003.htm

Hard copies of these items can be mailed if you have no email.

Today the DNR/UWEX Program continues to do bio-control research and recommend control strategies, as well as create new Cella rearing stock sites, recruit cooperators, and coordinate distribution of equipment and bio-control beetles. But the real work of the program is still accomplished by regular citizens willing to get up close and personal with their wetlands and the bio-control insects that will protect them. If PL is threatening to invade your wetland consider joining these statewide efforts! Even if it has not yet invaded your "backyard," learn your native plants and the invader so you can take quick, effective action if it does.

Adopt-A-Lake is an interdisciplinary program that uses hands-on activities to encourage youth to learn about inland lakes in Wisconsin while actively working to protect those resources. The program supports youth and adults working together to protect lakes in their community. There are a variety of unique and exciting Adopt-A-Lake projects occurring throughout the state, ranging from water quality monitoring, storm drain stenciling, and litter clean-ups to community lake user surveys and the design of educational materials about lake protection. Young people can address aquatic invasives with an Adopt-A-Lake project focused on efforts such as bio-control, community education, or boat launch monitoring.

Despite many variations in communities and approaches, there are common requirements that youth groups and schools interested in the program should fulfill. Adopt-A-Lake has five common goals for active lake projects: commitment, community involvement, creative and interdisciplinary approach, learner-centered, and action-oriented. These goals create a framework intended to assist groups in developing their lake projects while also providing Adopt-A-Lake staff with guidance in determining support services and recognition of program participants. For more information contact: (715) 346-2116 or uwexlakes@uwsp.edu

Self-Help Lake Monitoring, the core of the Wisconsin Lakes Partnership, creates a bond between over 1,200 citizen volunteers statewide and the DNR. The goals are to collect high quality data, educate and empower volunteers, and share this data and knowledge.

Volunteers measure water clarity using a Secchi Disk as an indicator of water quality. This information is then used to determine the lake's trophic state. Volunteers may also collect chemistry, temperature, and dissolved oxygen data, as well as identify and map plants, watch for the first appearance of Eurasian water-milfoil near boat landings, or alert officials about zebra mussel invasions on Wisconsin lakes.

The DNR provides all equipment to the volunteers. Training is provided by either DNR or UW-Extension staff. Volunteers provide their time, expertise, energy and a willingness to share information with their lake association or other lake residents. The information gathered by the volunteers is used by DNR lake biologists, fisheries experts and water regulation and zoning staff, as well as by UW-Extension, lake associations and other interested individuals. For more information, contact your local Self Help Contact Person. To find the contact for your area, visit dnr.wi.gov/org/water/fhp/lakes/selfhelp/shlmcont.asp or call (888) 947-3282.

Water Action Volunteers (WAV) is a statewide program for Wisconsin citizens who want to learn about and improve the quality of Wisconsin's streams and rivers. The program is coordinated through a partnership between the DNR and the UW-Extension. Citizens participate in stream monitoring, assessing six different parameters: dissolved oxygen, turbidity, temperature, habitat, stream flow, and macroinvertebrates. WAV monitors also participate in a research project to survey crayfish populations in waterbodies of the state, collecting crayfish at their monitoring sites along with other information about the conductivity and pH of the water. One goal of this project is to better understand the distribution of rusty crayfish, an invasive species, throughout the state. If you are interested in learning more about the program, contact the WAV Coordinator, Kris Stepenuck at (608) 265-3887, (608) 264-8948. kris.stepenuck@ces.uwex.edu

Aquatic Invasive Species Laws

State Laws

A number of state statutes and administrative rules (which have the force of law) have been established in Wisconsin to regulate some component of aquatic invasive species introduction, control, or spread. Several of these are summarized very briefly below. The actual statues and administrative rules can be viewed in full online. Wisconsin Statutes, promulgated by the State Legislature, can be found at www.legis.state.wi.us/rsb/stats.html, and administrative rules, promulgated by state agencies such as the DNR, can be found at www.legis.state.wi.us/rsb/code/. For direct links to several of the statutes and rules listed below, visit the National Invasive Species Council web site at www.invasivespecies.gov/laws/state/wi.shtml

For years, Wisconsin had a variety of statutes and administrative rules that dealt with exotic species, but 2001 Wisconsin Act 109, which was a state budget adjustment bill, established a statutory framework for the comprehensive state aquatic invasive species program (statewide program; invasive species council; watercraft inspection program; reporting process to the legislature; re-writes of statutes dealing with nuisance weed [purple loosestrife and multiflora rose] control, research, education; re-writes of statutes dealing with aquatic plant permits; regulations prohibiting the launch of boats with plants or zebra mussels attached).

Pertinent statutes (In statutes below, "the department" refers to the Department of Natural Resources):

s. 15.347 (18) Governor's Council – establishes criteria for the invasive species council membership and meetings.

s. 23.22 Invasive species – Definitions; includes department responsibilities in establishing a statewide program; specific duties of the Governor's council, including subcommittees; watercraft inspection guidelines; reporting guidelines.

s. 23.235 Nuisance weeds – Includes purple loosestrife (and multiflora rose); law prohibits their sale or distribution; directs the department to develop a state-wide plan to control purple loosestrife, research control techniques, and educate landowners and agencies responsible for maintaining roadways, forests, etc.

s. 23.24 Aquatic plants – Directs the department to establish an aquatic plant management program that protects and develops diverse native plant communities, regulate management of aquatic plants, and administer procedures/requirements for issuing permits for aquatic plant management; outlines management activities that require permits, along with penalties.

s. 29.735 Importation of fish – Unless a person has a permit, it is illegal to bring into this state any fish, or fish eggs, of a species that is not native to this state for the purpose of introduction into the waters of the state, or for use as bait or for rearing in a fish farm.

DNR FILE PHOTO

s. 29.737 Permit for private management – People owning all of the land bordering on a navigable lake that is completely landlocked may apply to the department for a permit to remove, destroy or introduce fish in such lake.

s. 30.715 Placement of boats, trailers, and equipment in navigable waters No person may place or use a boat or boating equipment or place a boat trailer in a navigable water if the person has reason to believe that the boat, boat trailer, or boating equipment has any aquatic plants or zebra mussels attached; a law enforcement officer may order the person to remove plants or zebra mussels, or to remove or not place the boat in the water.

Administrative rules:

Chapter NR 19, Wisconsin Administrative Code, contains rules promulgated by the DNR.

s. NR 19.05 Release and importation of fish – It is illegal to bring into the state to introduce or release or cause to be introduced or released in any manner into the inland or outlying waters any fish or the eggs or spawn thereof, without first applying for in writing and receiving a written permit from the department. The permit shall be granted only after the department or its agents investigates and inspects the fish or the eggs or spawn to determine that the introduction or release will not be detrimental in any manner to the conservation of the natural resources of the state.

s. NR 19.27 Crayfish restrictions – It is illegal to: use live crayfish as bait on inland waters (except the Mississippi River); to possess live crayfish on inland waters (unless removing them); to possess live crayfish and hook and line fishing equipment simultaneously (unless on the Mississippi River); to release/introduce/deposit live crayfish into waters of the state without a permit.

Federal Legislation

One important national piece of aquatic invasive species legislation is the National Invasive Species Act, mentioned in Chapter 2 (for a summary of NISA, visit www.nemw.org/nisa_summary.htm). The act expired in 2002, so Congress must authorize NAISA (a revised version of NISA) for its provisions to continue (for more information on NISA, visit: www.nemw.org search "naisa"). Much of this act dealt with national ballast water management. A great deal of national and international focus has been placed on ballast water because of its implication in numerous aquatic invasive species introductions worldwide. The U.S. Coast Guard is responsible for regulating ballast water management. Visit the Coast Guard Office of Operating and Environmental Standards web site for information on regulations and links to specific ballast water programs. www.uscg.mil/hq/g-m/mso/ans.htm

Also important are federal regulations that define "prohibited" species and establish rules restricting their movement. The Lacey Act establishes a list of injurious species, as well as penalties for importing or shipping them (for more information, visit: invasives.fws.gov/Index.LacetAct.html). The Federal Noxious Weed list includes some aquatic species, like hydrilla, as well as a number of terrestrial species. To view the complete list and associated regulations, visit the Animal and Plant Health Inspection Service (APHIS) web site (www.aphis.usda.gov/ppq/weeds). Species listed under both acts cannot be moved into or through the United States without a permit.

Local Ordinances

A number of local, county, and municipal noxious weed ordinances and laws also exist throughout the state. One example is Post Lake in Vilas County, which has its own noxious weed laws against purple loosestrife. It is best to check on these laws locally, as there is not a single statewide summary.

Boat Landing Legal Questions – DNR Answers

Invasives species are posing an increasing threat to the quality of our water experience in Wisconsin. Communities are looking at developing campaigns 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 the DNR receives from communities as they consider their prevention plans.

FRANK KOSHERE

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. Use of plat maps, and searches at the Register of deeds office for the county where the landing is located are useful. Landings owned and leased by the DNR are identified on the DNR's website (dnr.wi.gov) on the "State Parks and Forests" webpages. The DNR web site also provides a page with links to web sites for county-owned parks.

Does different ownership have different privileges? (i.e. does state ownership carry with it different responsibilities/issues than county/village/city ownership?)

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 they 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.

State-operated boat landings are required to operate under the same hours as the state parks.

What is acceptable/legal signage and items (composting bins, garbage cans) to be placed 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 they 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 DNR is likely to propose some changes to Ch. NR 115, Wis. Adm. Code, that would allow counties to exempt certain regulatory and informational signs that meet specified standards from county shoreland setback requirements). 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 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. Charging excessive, unjustified, or unreasonable boat launching fees restricts or prohibits 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 non-motorized or non-trailered 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 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 you charge a special non-resident (out-of-state resident) fee?

Under s. NR 1.91(11)(g), Wis. Adm. Code, local units of government, including lake management districts, which 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.

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Can you charge a special fee if you are 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 increase over time to assist in lake management (i.e. controlling invasives 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 non-motorized equipment such as canoes, SCUBA equipment, 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." Relying on this definition, 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 as they are non-motorized or non-trailered boats. A non-motorized boat is a boat which is not a motorboat but which is designed and constructed to be used as a boat for transportation of a person or persons on water. This term includes, but is not limited to, any canoe, sailboat, inflatable boat or similar device, row boat, raft and dinghy which 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, where 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 trust for the public in navigable waters of the state to be administered by 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 only be restricted 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 requiring local numbering, registration or licensing of boats or any ordinance or local regulation charging fees for inspection.

CLEAN BOATS, CLEAN WATERS PROGRAM

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 which governs any activity regulated by ss. 30.50 to 30.71, Stats.

Under s. 30.77(2), Stats., any municipality may enact ordinances which 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 Department (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, no fee is required for the use of the boat wash facility and the requirement does not unreasonably exclude any boat from access to public waters.

Could a lake association/district place a boat wash facility on an access area owned by the state?

A lake association/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/district volunteers manage a boat wash facility on a state owned access area? What conditions (liability waivers, etc.) would need to exist?

Yes, this could be accomplished through an operational lease that would include indemnification clauses.

Is there any permissible basis for closing a public launch site?

Closing 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 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 where environmental degradation is occurring at the site as a result of existing use, and 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, no fee is required for the use of the boat wash facility, and the requirement does not unreasonably exclude any boat from access to public waters.

CHAPTER 4

Designing Educational Programs – Let's Get Started!

Say you are ready to change the behavior of boaters in your community so that they begin taking the appropriate steps to prevent the spread of invasive species. Or, maybe you want to encourage local businesses to educate their customers about invasive species and at the same time take precautions themselves to avoid invasives introduction/spread through everyday work activities. So, how do you begin? There is no one "right" way to take on the aquatic invasive species issue locally with your own outreach campaign. Much of the approach depends on who you want to reach and with what method. However, regardless of these details, there is no doubt that putting time into planning your approach and thinking about how you will measure your success can yield big rewards – more success and a better understanding of how to do things the next time around! A number of tools exist that can help you in planning your local education efforts. You might want to use the suggestions profiled here, or research a few of your own. Examples of information gathered through statewide program efforts (including survey results) are included as well.

Much of this section is based on "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns," a U.S. EPA publication. The guide provides the tools needed to develop and implement an effective outreach campaign. Though the subject matter is watersheds and water quality issues, substitute the goal of "changing local boater behavior to prevent the spread of invasive species" for "reducing nutrient runoff from residential areas" and you've got yourself a guide book! The same approaches can be used to develop and implement a local outreach campaign regardless of the message. (The information provided in this hand book was designed to introduce you to the things you may need to consider, but is in no way a comprehensive guide. "Getting in Step" is more than 100 pages long and includes details you will likely need when planning your own outreach campaign. "Getting in Step" is included on the accompanying CD, and free copies are available online at www.epa.gov/owow/watershed/outreach/documents or by calling (800)490-9198.)

Many suggestions in the EPA guide book are taken from the growing field of community-based social marketing, which focuses on changing behavior, not just awareness and attitudes, by removing barriers to activity while at the same time enhancing the activities' benefits. For more information on community-based social marketing, see the quick reference included on the CD accompanying this manual. Also on the CD are other resources on outreach and education that you

may find useful – U.S. EPA and Cooperative Extension fact sheets that focus on community-based education, resources on how adults learn, and other tips for reaching adult learners.

You may also consider visiting the UW-Extension Program Development and Evaluation Web Site at: www.uwex.edu/ces/pdande for a number of excellent resources on program planning and evaluation.

SURVEY RESULTS

Notes on the Wisconsin Boater Survey

Look for this Boater Survey icon throughout this chapter whenever survey results are discussed!

In 1994, Minnesota Sea Grant conducted a survey of registered boaters in Minnesota, Wisconsin, and Ohio to gain a better understanding of what aquatic invasive species information boaters had, where they got it, and what they were doing (if anything) to prevent the spread. While there are a number of possible mechanisms for aquatic invasive species transport, boaters are known to be one of, if not the, most significant vectors for transport of the species between water bodies. Therefore, they are one of the primary audiences for invasive species education.

In 2000, a modified version of this survey was conducted in Minnesota, Ohio, Kansas, Vermont, and California. The objective was to compare results from 1994 to determine if education efforts were working, and to assess boater knowledge and action in states where education efforts were at varying stages. The Minnesota results illustrated the effectiveness of their strong education program…more than 90% of their boaters reported taking special steps to prevent the spread of invasive species, up from 70% in 1994.

In 2003, Wisconsin, along with Michigan and Oregon, repeated the 2000 survey conducted in the 5 other states. The goal here was to gauge how much progress had been made in Wisconsin since 1994, but also to assess our young invasive species program and establish a baseline for future surveys. The survey was conducted by the Minnesota Center for Survey Research, which coordinated the 2000 boater surveys as well. Surveys were mailed to 800 randomly selected registered boaters in the state. Follow up post cards and additional mailings were sent to insure a good response rate, 65% at completion of the survey. Specific questions from this survey are discussed in this chapter, and they help reinforce the need for a variety of outreach approaches. One striking change in 2003 was in the number of boaters reporting that they take action to prevent the spread of invasive species while boating – 80% of those who moved their boats indicated that they do take action, up from 39% in 1994. Survey results can be used to improve education efforts, and we can expect to see an increase in the percentage of those who take action again in the next survey.

Getting in Step – Developing Your Outreach Campaign

(taken from "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns," a U.S. EPA publication)

The following steps to developing your outreach campaign are discussed below:

① Define the driving forces, goals, and objectives

② Identify and analyze the target audience

③ Create the message

④ Package the message

⑤ Distribute the message

⑥ Evaluate the outreach campaign

Step 1 – Define the driving forces, goals, and objectives

Consider what's driving the need for an outreach campaign. This will help you determine the scope of your campaign and focus on exactly what you'll need to do to get the job done. Usually, the driving force centers around a specific issue and, if you're reading this hand book, that issue probably has something to do with aquatic invasive species, and perhaps a desire to help prevent their spread.

The next step is to identify your goal. Maybe your community does not yet have aquatic invasive species problems, and your goal is simply to raise awareness of the importance of the lakes in your area and, because of the potential impacts of invasives, the need to protect them. Or, you might be quite concerned about the spread of invasive animals through bait bucket releases or invasive plants from water gardens, so your goal may be to change the behavior of area anglers or gardeners, encouraging proper disposal of unwanted bait and plants in the trash.

Whatever your goal, once you've identified it, you can develop several objectives for trying to reach it (ask yourself, "How am I going to do this?"). Objectives should be SMART: specific, measurable, action-oriented, relevant, and time-focused. The basic idea is to keep your desired goal/outcome in mind – do you want to create awareness or encourage action by a specific group (anglers or gardeners, for example)? The more specific you're able to make these objectives; the easier it will be to know if you've actually achieved them! For example, if your goal is to raise awareness of the invasive species issue, one objective may be to arrange presentations or exhibits on the subject at three scheduled events in the coming year – fairs, festivals, river clean-ups, etc.

Evaluation after each step of the process can be quite valuable – getting feedback to determine what's worked to help you in moving forward. Don't overlook this important step – spending time on it up front can pay big dividends later!

STEP 1 PROCESS CHECKLIST Consider the following before moving on:

Are the objectives consistent with my goals?

Are the objectives specific, with time limits and measurable components?

Will the objectives be accepted and understood by the people that will be affected by them?

Will I be able to evaluate whether the objectives were accomplished?

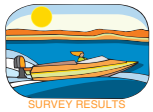
Do I have the resources to accomplish the identified objectives?

Step 2 – Identify and analyze the target audience

The next step in the process is to identify your target audiences – these are the people you want to reach. Sometimes it might be quite obvious (for example, boaters and anglers). In other cases, some research might be required. Unless your goals and objectives are quite specific, there is rarely just one target audience. Therefore the messages and approaches that you develop will need to be tailored to those you want to reach. For example, what resonates with a lake property owner might be very different from that which reaches a pleasure boater, marina owner, or local policy maker. If you don't think about who you need to reach first, you might end up expending a great deal of energy and not reaching the right people.

Whenever possible, break down your target audiences into the smallest segments possible and tailor your messages to them. Think of them as customers – you want them to "buy" behaviors and attitudes that will achieve your goal. Ask yourself, "What's in it for them?" The nice thing about the aquatic invasive species issue is that a great deal of effort has already been put into developing a standard set of prevention steps for various recreational water users (see Chapter 8). The idea behind understanding your target audiences would then be to look at the best ways to frame or present these guidelines to appeal to them.

A number of the resources listed at the end of this chapter and included on the accompanying CD include discussion of how to decide which segment of your audience to target, what information you may need to know about them (demographics, communication channels, knowledge base, current perceptions, etc.), and then strategies for getting this information. These tools range from using data and databases that already exist, to conducting surveys and focus groups to gain more information about your target audience. The level of effort needed will vary on a case by case basis, but the idea is to better understand your audience. Why do they do what they do? What are their reasons for NOT taking the action that you're promoting?


SURVEY RESULTS

The 2003 Wisconsin statewide boater evaluation survey provides good examples of how surveys can be valuable in understanding your audience, as well as determining how best to reach them and what's motivating them. A basic demographic question revealed that

89% of the registered boaters that responded to the survey were male. Because we use public service announcements as one method to reach this target audience, we asked what types of radio stations they listen to. The top three answers were oldies/classic rock music (58%), country music (45%), and talk radio (42%). Therefore, we will target these types of radio stations when purchasing air time. We can combine this with other data that did not require a survey – knowledge that boaters are out in largest numbers on the weekends, and particularly on holiday weekends (Memorial Day, July 4th, Labor Day). So, to get the most bang for our buck, we might try to purchase air time on the sorts of stations mentioned above and at times close to/during big boating weekends. And, we might target the public service announcement message towards males, since they are the largest component of our audience.

Surveys also help you to understand your audience's motivation for taking action or, sometimes more importantly, NOT taking it!

Surveys also help you to understand your audience's motivation for taking action or, sometimes more importantly, NOT taking it! This prevents you from having to guess. For example, it might be easy to assume that most boaters who aren't taking action to prevent the spread of invasive species feel that it won't really help prevent their eventual spread, or they might not even believe that these species are really a problem. If you're operating under such assumptions, a lot of your education effort may go toward trying to convince boaters of the severity of the problem, or convince them that the prevention steps really do work and can prevent the spread. Another commonly assumed excuse for inaction is inconvenience – perhaps people don't feel they have the time to take precautions. If you are working under this assumption, you might focus effort on convincing people that the steps are very simple and take very little time. However, all of these things are really just guesses, and in fact NOT what were found to be the primary reasons for inaction in the boater survey.

Of the Wisconsin boaters surveyed who reported that they moved their boats between water bodies in 2003, 80% stated that they do take special steps to prevent the spread of aquatic invasive species (up from 39% in 1994!). Of the 20% who said they don't take special precautions, the single biggest reason reported was that they didn't know exactly what to do (43%). The next highest percentage (41%) reported inaction because boat washing equipment wasn't readily available. (Percentages total more than 100 because respondents were asked to circle all that apply).

What about the "assumptions" for inaction mentioned above? Only 2% didn't believe aquatic invasives are a problem, only 4% didn't believe special precautions will prevent the eventual spread of invasives, and only 9% said that taking these steps is inconvenient (don't have time). So, what does this mean? First, it indicates that efforts to raise awareness about invasive species have been successful. Most people know that invasive species are "bad" and even that boater actions are important. In fact, they're important enough that most people don't blame inconvenience for not taking action. So, education campaigns may not need to spend a great deal of effort trying to convince boaters to care about invasives. This is supported by information gathered from two additional survey questions which showed that, even when only a very small percentage of boaters knew details about specific species, a much larger percentage thought it was important to take steps to prevent their spread. This implies that just knowing that these plants and animals are invasive,

even without detailed knowledge of individual species, was enough to convince boaters that taking precautions was important.

Instead, the survey points to the need to take the next step, focusing on teaching boaters exactly what to do to prevent the spread of aquatic invasive species. Watercraft inspectors at landings, for example, can spend time one on one with boaters working through the prevention steps with them. The fact that many perceive boat washes as necessary for prevention also indicates the need for more emphasis on the prevention steps themselves. While washing boats is one step that definitely helps to prevent the spread of aquatic invasives, there are simple steps (inspecting and removing plants and animals, draining water, and disposing of bait in the trash) that are extremely effective, can be done right at the boat landing, and do not require any special equipment. So, making sure that boaters understand all of the steps should also be a priority. There will likely never be boat wash facilities at every landing in the state, but that doesn't mean that boaters can't be effective in preventing the spread of invasive species!

STEP 2 PROCESS CHECKLIST Consider the following before moving on:

Have I defined the audience in a way that separates it from the general public?

How many target audiences or segments have I identified?

Have I segmented the target audience so that I can develop messages for each subgroup?

Is the target audience for each objective sufficiently defined?

Have I identified the communication channels used by the target audience?

Have I collected enough data on the target audience?

How long will it take to collect survey data on the target audience?

Do I understand the target audience?

Do I know what is important to the target audience?

Do I know what barriers prevent the target audience from changing its behavior?

Are there barriers to accessing the target audience that can hinder the plan?

Step 3 - Create the message

After you have information about your target audience, it's time to work on a message that will reach them and help achieve your objectives. Your message should be different then simply restating your objectives – objectives describe final results; messages prompt the knowledge, attitudes, and actions needed to achieve them. You can take a

variety of approaches. Some messages focus on what might be lost if action isn't taken (a lake may lose great fishing/boating). Others might highlight potential threats and present the targeted behavior as desirable and widely accepted. If you're asking people to take a specific action (dispose of unused bait in the trash, for example), they will be more likely to respond if the message also builds awareness (includes something about preventing the accidental introduction of an invasive species), and if you tell them what benefit their specific action will have. In other words, attempt to inform and suggest acceptable behaviors at the same time. The language and style should match those of the target audience.

The message needs to capture the attention of your audience, prompting them to respond. Use humor, graphics or images, or engaging stories. Knowing a bit about the people you're trying to reach can help. In general, it's good to keep things simple – don't overwhelm your audience with too much at once. If you come up with something you think will work, test it out with a few representatives from the target audience first before fully committing to it.

In order to get a response, you need to focus on very specific action items for people to take, and make them clear and easy to remember. You also need to think about which behavior changes will give you the most impact for your money and effort. If your target audience is boaters, anglers, or other recreational water users, a great deal of work has already been put into identifying key actions/behaviors that will prevent the spread of invasive species. So, some of your work is already done! (See Chapter 8 for prevention steps.) You can focus instead on the best way to present these steps to your target audience.

The Stop Aquatic Hitchhikers! campaign is a great example of an outreach initiative that has come up with a slogan, a logo, and a simple message. It has also generated a number of materials. These are all available for you to use as part of your outreach campaign if you choose – visit www.protectyourwaters.net and see the Resources section of this handbook (Chapter 6) for more information.

If your goal is something different – to involve area bait dealers in helping to promote the prevention message, for example, there aren't any set steps or action items already established. However, once you learn more about this audience, you will likely come up with some that are quite specific. Additionally, you may be able to think of incentives to encourage participation, such as highlighting the names of all participating bait dealers and applauding their efforts in a local newspaper.

STEP 3 PROCESS CHECKLIST  Consider the following before moving on:

Is the message relevant and accessible to the target audience?

Is the language of the message appropriate to the target audience?

Is the message specific for each audience, and will it resound with each?

Can the message be understood by the target audience?

Is the message vivid and memorable?

Have I included personal goals in the message?

Have I road-tested the message with members of the target audience?

Can the target audience respond to the message in an easy, convenient way?

Have I successfully identified which behaviors to ask the target audience to change?

Does the message motivate behavior or attitude change?

Have I considered how the message will be delivered?

Step 4 – Package the message

Once you have settled on your message, it's time to determine the best package or format for delivery to the target audience. The information that you compiled while getting to know your target audience (Step 2) will help you to determine the best approach. When selecting the message format, think about where the target audience gets its information. Also, think about some of the characteristics of your audience, including size, geographic distribution, level of awareness, and preferred format that may influence your decision.

In the 2003 Wisconsin boater survey, boaters were asked if they had heard of or read about aquatic invasive species from a list of sources. This was an effort to determine where they are getting their information. The highest percentages with "yes" responses were:

- ✘ Newspaper (86%)
- ✘ Fishing/boating regulation pamphlets (79%)
- ✘ TV news or program (75%)
- ✘ Magazine (74%)
- ✘ Signs at marina or boat launch (73%)
- ✘ Boating registration materials (64%)
- ✘ Signs/information at bait shops (44%)
- ✘ Radio news or program (39%)
- ✘ Booth at sport show, fishing show, or similar event (39%)

(A number of additional sources of information fell above 20%.)

In the same survey, boaters were also asked how effective a list of items would be in getting them to take action to prevent the spread of aquatic invasive species. After ranking each item in terms of how effective it would be (very, somewhat, or not very effective),

and after noting if these items had already led them to take action, the boaters were asked to choose up to four of their "very effective" items that they feel would be **most** effective in getting them to take action. The top responses were as follows:

- ✘ A desire to keep aquatic invasive species out of our waters (51%)
- ✘ A sense of personal responsibility (45%)
- ✘ Signs at marinas and boat launches (35%)
- ✘ Laws or regulations to prevent the transport of aquatic invasive species (28%)
- ✘ Fines that must be paid by violators (26%)
- ✘ Enforcement checks on the road or at boat launches to catch violators (23%)
- ✘ Fishing or boating regulation pamphlets (23%)
- ✘ A desire to prevent damage to my boat or equipment (21%)
- ✘ Talking with friends or acquaintances (20%)
- ✘ Media sources (newspapers, radio, TV) (18%)
- ✘ Brochures, species ID cards, fact sheets, other printed materials (14%)

(A number of additional items fell below 10%.)

Many of the answers in the second question are likely to come in handy during other steps of the planning process. Perhaps your goal or objective (Step 1) is to increase local enforcement of aquatic invasive species laws. Or, maybe knowledge of the strong desire to keep invasive species out of our waters and the sense of personal responsibility noted by boaters would be helpful in crafting your message (Step 3). However, when taken together, the two questions are also helpful in determining how to best package the message to reach boaters.

Not only did boaters say that they had learned about this issue through signs, but these signs were one of the most effective tools in getting boaters to take action. So, this supports continued sign posting at public landings by DNR staff, and encourages local groups to get involved in helping to install these same signs at private/smaller landings. Fishing and boating regulation brochures were also seen by many and cited as an effective tool in promoting action by boaters. So, the DNR will continue to improve its placement of prevention information in these publications. Media sources also ranked high, both in terms of visibility of the message and effectiveness. This information can be used by the statewide program, which will continue to issue press releases and participate in radio and TV interviews. Local groups considering education initiatives should be encouraged to use the media (something that is discussed further on the following pages).

Negative survey responses are also very informative. Internet web sites ranked low in both questions and therefore do not appear to be one of the best tools for reaching boaters. Conferences, workshops, and other presentations were also not ranked highly among the boaters. What is also interesting to note is that even though laws, enforcement, and fines ranked highly with many boaters, they also received some of the highest "not very effective" votes. This points to the very important fact that what is effective in reaching one person might be very ineffective in reaching another, even when your target audience (in this case, boaters) is fairly well defined. Therefore, it is often useful to create a consistent message (as was done with the national prevention steps) but package and distribute it in a variety of ways. Also, remember that the more times your message is heard, the more likely it will be remembered. (Why do you think the same commercials run over and over and over again?) So, keeping it in front of people in a variety of different formats can be effective.

What is effective in reaching one person might be very ineffective in reaching another, even when your target audience is fairly well defined.

Back to packaging your message. When thinking about the format(s) you are planning to use, consider the following:

- ✘ Is it user-friendly?
- ✘ Does it clearly communicate your message?
- ✘ How will the target audience use the information?
- ✘ Is it something they will look at once and throw away, or refer to often?
- ✘ How much will it cost, and who will pay for it?
- ✘ Do resources, formats, or templates exist that can be tapped into?

The DNR, UW-Extension, Sea Grant, and other agencies have produced a number of resources featuring the prevention message and other information. They come in a variety of formats (brochures, cards, posters, flyers) and are often available free of charge to your group for distribution. In some cases, electronic files of these items are available for you to print and distribute. Some are even customizable, with room for you to add your own logo, etc. Before developing new materials, explore the Resources section of this handbook (Chapter 6), and use existing materials whenever possible. This not only ensures that consistent messages are being distributed statewide, but also prevents you from "reinventing the wheel" and depleting precious funds that could be used elsewhere in your campaign.

Format options

Mass Media

As evidenced in the survey questions discussed above, people tend to get their information from the media. It reaches large numbers of viewers/readers with each edition. News media are effective, widely available, and often FREE.

It is useful to develop a relationship with the media in your area. You may want to introduce yourself to local reporters before ever submitting a story. This will help you to understand what the reporters need and help them to understand a bit more about your efforts. Maybe then they'll even call you if they are covering a related story!

Choosing the right format

Format	*Pros*	*Cons*	*Uses*
TV news coverage	• Creates awareness, publicity, and recognition • Most popular source of environmental information • Free • Can reach a large captive audience • Can include graphics and video • Most people would rather watch than read	• Working with reporters takes time and patience • Reporters might change focus of desired coverage • Training on giving interviews might be needed	• Events • Weekly reports • Hot topics • Controversial issues • Public education
Advertising with TV or Radio PSAs	• Can be free to air • Can reach a large audience • Can focus in on target audience • Can provide follow-up through toll-free medium (hotline or Web site) • TV ads provide high impact and the ability to demonstrate a behavior	• Stiff competition for air time • Very passive • Difficult to evaluate effectiveness • Can be expensive to produce TV PSAs of suitable quality • Short format often does not allow for more than awareness • Little control of airing without paying; sometimes aired later at night • Message can be obscured by commercial clutter • Target audience might not be watching/listening when advertisement is aired	• Events • Fundraisers • Building awareness
Video	• Can discuss an issue in depth • Have control over the content • Can be visually appealing • Can air on cable television stations	• High costs • Hard to do well • Need a good distribution mechanism	• Workshops • Public education • Schools
Printed formats such as newsletters and brochures	• Can reach a large audience • Can be more technical than other formats • Can tailor messages for specific audiences for different publications • Go beyond building awareness by providing detailed information • Reach more educated audiences • Audience can clip, reread, and think about the material • Might provide more credibility • Often low-cost (with unit prices decreasing with quantity) • Good to use as a follow-up mechanism	• Printing and mailing are costly • Require staff time • Passive, not participatory • Only as good as the mailing list used or kiosks and help desks where placed • Audience must have the interest to pick them up and read them • Small ads might not be noticed	• Articles and interviews • Events (announcing and summarizing) • Workshops • Scientific data • Requesting feedback from public • Public education

(taken from "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns", a U.S. EPA publication)

continued on page 40 ▶

Choosing the right format (cont.)

Format	Pros	Cons	Uses
Events	• Good for persuasion • Can model positive behavior • More personal • Offer two-way communication	• Might be difficult to reach entire audience • Require staff time • Could be expensive • Potential low attendance • Require significant planning time • Require publicity for success • Can damage reputation if not done well	• Awareness and recognition • One-on-one communication • Encouraging and modeling behavior change (motivating action)
Presentations workshops conferences group mtgs.	• Can be participatory • Good for persuasion • Can model positive behavior • More personal	• Reach small audiences • Require staff time • Can be too technical • Hard to get commitment to attend – need to offer incentives • Person delivering the presentation could make it or break it	• Getting feedback from attendees • Awareness and recognition • Public education
Giveaways	• Increase awareness • Inexpensive • Easy to produce	• Very short message • Not very persuasive • Materials themselves might be considered "pollution" or "junk"	• Awareness building • Distribution at events and workshops • Incentives for participation • Behavior reminders (prompts)
Websites	• Can reach a large audience • Inexpensive • Easily maintained • Offer up-to-date information	• A challenge to market • Difficult to evaluate effectiveness • A long-term project	• Public education • Returning visitors if material is updated frequently
Internet Listservers	• Can reach a discreet audience • Inexpensive • Easily maintained	• May be spreading the message to an already educated audience • Long-term project	• Ongoing projects or complex campaigns • Public education
Displays libraries malls fairs/events	• Can reach a large audience • Visually pleasing • Reusable	• Require staff time • Must be durable • Can be specific to an event, which can date the materials	• Awareness and recognition
Billboards	• Can reach a large audience • Visually pleasing	• Very short message • Drivers might not read billboards that require high amounts of attention • Generally high cost	• Awareness and recognition • Behavior reminders (prompts)

(taken from "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns", a U.S. EPA publication)

News Releases

News releases supply reporters with the basics they need to develop a story. You may choose to write them in a style that can be used "as is", though many reporters will choose to rewrite the stories. When reviewing news releases, reporters typically look for a local connection – a local person, city, county, or water body. You can use news releases to announce upcoming events, highlight community efforts, discuss policy issues, etc. Releases should be sent a few days before reporters' deadlines, and you may want to place follow up calls to the reporters to confirm that the release arrived and answer any questions.

How to write a news release

News releases are usually one page long, but they can be longer if the subject is sufficiently important. When writing a news release, start with the local connection and "news nugget" – the most important element – first. Then present supporting information, putting the least important material at the end. It's important to grab the reporter's attention in the first paragraph. Quotes from a spokesperson can be included, although many newspapers might want to confirm direct quotes prior to publication. What makes the news? To increase the chances that your release will be used, keep in mind the elements reporters look for in a news story.

Your release doesn't need to have all the elements listed below, but the more of them you include, the better your chances for coverage:

- ✘ Involve local people or issues/documented statistics
- ✘ Focus on unique or unusual attributes
- ✘ Relate to significant issues or events
- ✘ Quote well-known or respected members of the community
- ✘ Affect many people throughout a region
- ✘ Involve controversial issues or strong emotions
- ✘ Include a celebrity figure
- ✘ Are timely

How to send the news release to the media outlet

The news media are a target audience just like any other audience. Get to know the reporters that cover the environmental beat ahead of time, and ask them how you should format your releases. Many now prefer e-mail but want the text pasted into the body of the e-mail message rather than included in attachments because of potential virus threats. News papers and TV news programs often want relevant graphics like photos or data collected during watercraft inspections. Ask reporters what type of format they prefer and how material should be delivered.

Here are some tips for writing news releases:

Keep sentences short	Avoid jargon
Write in the active voice	Keep paragraphs short
Ask for peer editing	Proofread, proofread, proofread!

News release nuts and bolts

Include "For immediate release," the date, and the name and phone number of the contact person at the top

Use a catchy headline, touching on the news nugget

Include short paragraphs telling who, what, where, when, why, and how

Add "###" at the bottom center of the page to indicate the end of the document. If the document has two pages, put "more" at the bottom of the first page rather than "###"

(Adapted from "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns", a U.S. EPA publication)

Video news releases are also used to increase the odds that a TV news station will cover a story. However, these are much more expensive, as they typically require the services of a professional production company. These may be a pre-produced news segment 1 to 3 minutes long, followed by b-roll (raw footage).

The DNR has already produced a 5-minute-long b-roll tape, copies of which were sent to all major TV news stations in the state. The footage features multiple shots of Eurasian water-milfoil and zebra mussels, and also shows boaters and anglers taking the appropriate prevention steps. The DNR is willing to supply your group with a copy of this b-roll footage for you to share with local TV stations. Contact the Aquatic Invasives Education Specialist at (608) 267-3531 for more information.

Letters to the Editor

A letter to the editor is yet another way to bring issues or concerns to the public's attention. When sending a letter to the editor, be sure to look into the newspaper's requirements. They might have length limits or other restrictions. Include your contact information, in case the paper would like to follow up with you. Here are some additional tips:

- ✘ Be brief, clear, and to the point
- ✘ Sign your name and note your affiliation
- ✘ Talk about the issues; avoid getting personal or petty
- ✘ Type your letter and limit it to the paper's length restrictions (or even make it shorter if possible)
- ✘ One letter per month per person is the limit for most papers
- ✘ Send your letter to a single paper; most papers require published letters to be exclusives

Public Service Announcements

Public service announcements (PSAs) are different than news coverage because they are advertising – you are in control of what is aired on the radio or TV.

Rich Hoops recording for Sea Grant Radio

COURTESY OF WISCONSIN SEA GRANT/BOB RASHID

Radio Public Service Announcements

Though some radio and TV stations will play Public Service Announcements (PSAs) for free, it may be at undesirable times (like 3 a.m.) and you won't necessarily be assured of reaching your target audience. So, many groups choose to purchase air time. Radio stations should be able to supply you with a rate kit that includes demographics of their audience as well as available advertising packages. If you're on a limited budget (and who isn't?) it is recommended that you focus on frequency – it is better to reach 10 percent of your audience 10 times than 100 percent once! Producing a radio PSA can cost from $1,500 to $10,000 (maybe more, if professional writers or directors are involved).

How to write and format a radio PSA

① Use paper with the organization's letterhead.

② Type "Public Service Announcement" at the top middle of the page.

③ Skip a few spaces.

④ Type the requested air date.

⑤ Insert the organization's contact name, phone number, fax number, e-mail address, and PSA length.

⑥ Skip a few lines.

⑦ Insert the PSA's title in bold letters.

⑧ The script should provide a brief description of the event/issue, including the who, what, when, where, why, and how.

⑨ The script should close with the name of your organization and where to go for more information.

⑩ Close the document with "###" at the bottom middle of the page.

PUBLIC SERVICE ANNOUNCEMENT

Wisconsin example featuring Babe Winkelman, professional angler

University of Wisconsin Sea Grant
Phil Moy phone: (920) 683-4697
Fax: (920) 683-4776
E-mail: pmoy@uwc.edu
PSA Length: 60 seconds

Hi! This is Babe Winkelman.

Ya know… you in Wisconsin are truly lucky to have so many wonderful lakes and rivers. And any day is a good day to enjoy them…to go swimming, boating, or my favorite, fishing. But the future of these activities is threatened by the invasion of exotic species!

Like zebra mussels that compete with game fish for food. And Eurasian water-milfoil that forms dense, underwater forests hampering fish movement and clogging boat motors.

But, anglers and boaters can help stop the spread of these pests. Here's how:

- *Look for and remove all plants and animals from your boat and trailer.*
- *Drain the water from your boat, motor, livewell, and baitwell.*
- *Empty your unused bait in the trash, not back in the water…and*
- *Use high pressure or hot water to rinse your boat and equipment. OR let it dry for five days.*

Do yourself and our fisheries a favor – don't give aquatic hitchhikers a free ride. Remember, clean boats mean clean waters.

Brought to you by the Wisconsin DNR and UW Sea Grant program.

###

TV PSAs

Many of the same facts apply to TV PSAs – some stations will air them for free, but it might be hard to determine exactly what sort of exposure you'll get. Again, packages can be purchased, but they can be quite expensive. Production requires experienced technicians and costly equipment and can easily run $10,000 or more, depending on what's involved. Celebrities are great additions to TV PSAs, but can increase the cost.

In Wisconsin, a unique partnership was formed between the Sea Grant program and Babe Winkelman, a recognizable professional angler with his own TV show. Babe agreed to endorse radio and TV PSAs created by Sea Grant with cooperation from the DNR. These PSAs are available to your groups to use as part of your local outreach campaign. Contact Sea Grant (920) 683-4697 or DNR (608) 267-3531 for details.

Print Materials

The most popular format for outreach campaigns is print. Printed materials can range from brochures and fact sheets to newspaper inserts, placemats, or maps. Again, it is important to think about how target audiences will use the information, how quickly the materials are likely to become outdated, and the cost (see page 37 to review pros and cons of print materials).

Before creating a new poster or flyer, visit the Resources section of this handbook. (Chapter 6) The DNR, UW-Extension, and Sea Grant have created a number of publications that are available for your use. If a large number of copies aren't available, often the files are (see accompanying CD). Many were created in black and white to limit your printing costs. Several even have room for your group to customize the publication with your own logo or other information. They were professionally designed by graphic artists with high quality images. Whenever possible, you are encouraged to use these publications – it will save you time, effort, and money, and will ensure statewide consistency.

After reviewing all available publications, you may not find everything that you're looking for. If you are going to create something of your own, there are a number of things to consider:

* Design and production are important…you don't want to end up with a page so crowded that no one wants to stop to read it, or choose a font that makes people dizzy! Remember that the goal of your materials is to communicate, so the text should be readable.

* Keep the text interesting, short, to the point and your message simple. Consider using a hook – a sort of headline to get the readers attention.

* A logo can serve as your campaign's signature – if you have one, it can appear on all of your materials. You might also consider joining a national campaign like Stop Aquatic Hitchhikers! at www.protectyourwaters.net, and consider including their logo on your materials. This recognizable logo is found on most current statewide and regional/national materials, and would link your local effort to much larger campaigns.

* Photos and graphics are also important elements to include. See Chapter 6, page 93 for photo gallery web sites with photos available for your use in publications, presentations, etc.

Curious about printing costs? See the table on the following page 44 for estimates.

Tips for better brochures

- ✘ Use colored or textured paper, graphics, and an audience-targeted layout
- ✘ Explore various sizes and folds, taking care to fit the layout to the fold
- ✘ Collect and review samples to get an idea of what you like and don't like
- ✘ Produce enough extras on the first run to handle additional demand
- ✘ Using colored ink can result in interesting combinations
- ✘ Leave plenty of white space; don't crowd the content
- ✘ Include variety in design, but watch out for an overly "busy" appearance
- ✘ Use subheadings to break up massive blocks of text
- ✘ Use bullets for quick and easy reading
- ✘ Ask several people to edit, critique, and proofread
- ✘ Avoid acronyms and technical jargon
- ✘ Don't forget to include an address, contact number, or web site for more information

Help Stop Aquatic Hitchhikers, brochure.

Giveaways

Giveaway items can be useful in promoting your efforts and providing people with a quick reminder of your message whenever they use/view the item you've given them. Giveaways can range from pencils to t-shirts to rulers, but they are most effective when the message they convey is related to the type of giveaway and when the item will be used repeatedly at the time when a person needs to choose the appropriate behavior. For example, it would likely be much more effective to distribute floating key chains to boaters and anglers, rather than golf balls or pencils! The Stop Aquatic Hitchhikers! logo/prevention message could be printed on the side. These key chains are likely to be used for boat keys and therefore at the times when boaters need to be reminded of what to do to prevent the spread of invasive species. Cost estimates for some popular giveaways are included in the table on the following page. To make your money go farther, talk to local businesses. Some may be interested in helping to pay for the giveaway item if their logo is included on it.

Costs for various outreach materials

Category	Item	Cost (per 1000)*
Giveaways	Magnets	$300 for 2-color business card size
	Posters (11" x 17", 4 colors, glossy paper)	$1,000
	Canvas Tote Bags 1 color, 2 sides 2 colors, 2 sides	 $3,100 $3,850
	Stickers (one color, 3" diameter)	$300
	Lapel pins	$1,150
	Key holders	$1,500
Printed materials	Printed fact sheets (2-sided) 1 color 2 colors 4 colors	 $600 $840 $960
	Trifold panel brochure (11" x 25.5") 1 color 2 colors 4 colors	 $1,600 $2,100 $2,400

Category	Item	Cost (per item)*
Display booths	Tabletop	$500-$800
	10' x 10'	$1,500-$2,500
Bus advertisements	Panels on bus interior (bus boards)	$100-$150 for 1-12 months on 20-60 buses (production costs vary from region to region)
	Vinyl Panels on entire bus exterior	$1,250/month per bus (fees may be higher in large metropolitan areas; Production cost vary from region to region.)
Billboards	Billboard	$700-$1,000/month
Web sites	Register domain name	$8-$70 for first 2 years
Newspaper ads	4" x 6" ad	$300-$5,000
Movie theaters	30-second PSA	$1,400/week in 16 theaters
Other	Stock photos on a CD-ROM	$30-$400

* Note: These costs are only estimates (2003 prices). Contact individual vendors for actual prices.
(taken from "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns", a U.S. EPA publication)

Presentations

When done right, an oral presentation can be a great way to reach your target audience. It takes time, planning, and practice to craft a well-organized and interesting presentation that conveys your message. Avoid reading slides to your audience and be sure to mix in plenty of

photographs and other images to keep their interest. See the resources included on the accompanying CD for additional things to consider when giving a presentation. You might also want to consider piggybacking other activities onto the conferences and meetings where you give presentations. Maybe you can set up a display or arrange a field trip to visit a site infested with an invasive species.

PowerPoint® pointers

Like it or not, PowerPoint® is the preferred medium for slide presentations. Avoid these pitfalls:

- ✘ Color choices. In general, if you are showing your slides in a very dark room, a dark background like black or royal blue with light text is best. If the room has some ambient light, a light background with black text is best.
- ✘ Color scheme. PowerPoint® has a variety of templates and color schemes that help to make a unified presentation. Do not introduce more than three colors, and keep the background color the same throughout.
- ✘ Sound effects. Attaching sound effects to your text as it flies onto the screen can be amusing for the first few slides, but it will grow annoying. Use sound effects sparingly to emphasize key points.
- ✘ Monotony busters. Break up the text slides with full-color photographs or cartoons to avoid the appearance of the same slide being repeated.
- ✘ Animation. Introduce some movement to your slides through arrows appearing to highlight a key bullet, or graphics "dissolving" on the screen.
- ✘ Text movement. If your text flies onto the screen from the left, keep it consistent to avoid making the audience queasy.
- ✘ Keep it moving. Introduce your text in groups, or the whole slide at once, instead of line by line.
- ✘ Bells and whistles. Keep the special effects to a minimum so your listeners will be more interested in the content of your presentation.

(taken from "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns", a U.S. EPA publication)

STEP 4 PROCESS CHECKLIST ✓ Consider the following before moving on…

Am I getting the message to my target audience with this format?

Is the format appropriate for the message?

Is the format appropriate for the target audience?

Does the format exclude any members of the target audience?

Does the format favor any members of the target audience?

Does the format grab the attention of the target audience?

Do I have the resources necessary to prepare and use the selected format?

Do I have access to the skilled staff needed to prepare and use the selected format?

Will I have enough time to produce and distribute this format?

Will I be able to distribute messages in this format effectively?

Will I have enough materials for the entire target audience?

Step 5 – Distribute the message

Once you have packaged your message, you're ready for distribution. You've likely already thought about this when learning more about your target audience and considering the best ways to reach them. Some common means of distribution are by direct mail, door-to-door, by phone, through targeted businesses (that may be willing to make things available at the point of purchase), during presentations, as handouts at events, through media outlets, and by posting materials in public places. Consider which methods work best for your group and, whenever possible, partner or piggyback on existing efforts. For example, the DNR invasive species program includes ⅛ page inserts containing prevention information with all boating registration mailings. This enables the program to reach hundreds of thousands of registered boaters. However, because the insert does not increase the overall cost of the mailing (which would be sent out anyway), all the invasives program pays for is the printing of the inserts. Another good example is lake associations that include aquatic invasive species brochures with mailings to their members announcing meetings, collecting dues, etc.

You should also consider who will deliver your message. It should come from a person or organization trusted by the target audience. Peers can often be extremely effective. In the boater survey question asking what sources of information were likely to motivate them to take action (see discussion on page 35), boaters scored "talking with friends and acquaintances" quite high. In fact, 20% of those who responded listed this as one of the top 4 most effective items at getting them to take action to prevent the spread of invasive species. So, involving members of your target audience, or other trusted figures, in delivering the message might add to its effectiveness.

Mail

The mail can be a great way to get information out to your audience, assuming you have access to mailing lists. Post cards are the most inexpensive option, but the postal service has size restrictions to qualify for post card rates: at least 3.5 inches high by 5 inches long by .007 inches thick and no more than 4.5 inches high by 6 inches long by .16 inches thick. Letters allow you to send more items – newsletters, surveys, etc. They, too, have size restrictions to be eligible for the standard postage rate – at least the size of a post card up to 6 inches high by 11.5 inches long by .25 inch thick. The postal service will charge more for items that are irregularly shaped or too thick, so

consider this carefully when putting mailings together. You can also ship larger sized letters and envelopes, but the more they weigh, the more it costs. For information on bulk mail and other mailing costs, visit the U.S. Postal Service Web Site at www.usps.gov.

Email is a cheap and fast way to get messages and materials out. However, be sure to keep email lists up to date so that you don't get 100 returned messages with every one that you send. Also, use email lists sparingly – if you start sending too many messages, you run the risk of being deleted!

Timing is also important. If you're encouraging residents to monitor for invasive plants in their lakes, December is not the best time to send a postcard. They will likely forget by spring. Also, people receive a lot of mail around the holidays. If you send bulk mail items between Thanksgiving and New Years, you run the risk of having them lost in the holiday shuffle.

Distribution can also require considerable time – think about how to staff your effort. Consider partnering with other organizations, businesses, or schools to get your message and materials out. You may be able to recruit volunteers to help, and local business can be great partners. To get brochures or other materials to anglers, for example, ask to display the materials at local bait shops.

STEP 5 PROCESS CHECKLIST Consider the following before moving on...

Do I have the resources necessary to distribute the message?

Will I have enough time to distribute the message?

Will I be able to distribute messages in this format effectively?

Have I chosen the appropriate marketing method for my message?

Am I distributing my outreach materials effectively?

Step 6 – Evaluate the outreach campaign

Evaluation provides feedback so that you can continuously improve your outreach efforts. By thinking about evaluation from the beginning and including it in your planning, you will ensure that you get at least some feedback on your program. Why bother? Outreach efforts require a lot of time and money. Evaluation can help you to justify your program, potentially helping to secure funding, and may also help save time, effort, and money in the long run. Evaluation can help you to identify what worked and what didn't so that you can make improvements to your program along the way.


SURVEY RESULTS

For example, the 2003 boater evaluation survey helps to justify statewide aquatic invasive species education efforts. The fact that 80% of boaters reported taking steps to prevent the spread of aquatic invasive species in 2003, up from 39% in 1994, is extremely

encouraging. Coupled with the information gathered about where boaters are getting their information on invasive species and which sources of information are most effective, the data helps to show that the statewide education efforts are reaching boaters and are resulting in desired behavior changes.

What steps are Wisconsin boaters actually taking? In the survey, boaters were asked how often they take a list of prevention steps after removing boats from the water. The following percentages reflect boaters who reported "almost always" for the prevention steps listed:

- ✘ Drain water from boats including live wells, bilge, and bait buckets (75%)
- ✘ Conduct visual inspection of boats and equipment for aquatic plants and animals (71%)
- ✘ Remove aquatic plants and animals from boats and equipment (70%)
- ✘ Avoid release of unwanted live bait in water (58%)
- ✘ Allow boat to dry for five days (48%)
- ✘ Rinse boat with high pressure and/or hot water (17%)
- ✘ Flush motor's cooling system with tap water (12%)

MINNESOTA SEA GRANT

CLEAN BOATS CLEAN WATERS

The results are encouraging, since the state program emphasizes inspecting boats and trailers and removing plants and animals, draining water, and properly disposing of bait. The prevention steps are the key components of the statewide outreach program, so charting the answers to this question (with a goal of increasing these percentages over time) will allow the statewide program to continue to evaluate its success.

SURVEY RESULTS

One specific component of the statewide program is installation of signs at boat landings. When asked where they had heard about aquatic invasive species, 73% of boaters reported signs at boat landings and marinas as sources of information. Furthermore, 70% indicated that such signs would be very effective in getting them to take steps to prevent the spread of invasives, with 63% indicating that these signs had already lead them to take action. Furthermore, of the boaters who said they knew they had boated on infested waters in 2003, 77% were alerted to this fact by signs at boat launches or marinas. Therefore, the DNR can justify the continued purchases of these signs, as well as the staff time and volunteer efforts needed to install them.

Another example is fishing and boating regulation pamphlets – these go directly to the target audience and therefore seem like a good vehicle to reach them (in fact, 79% of boaters reported reading about invasives in these sources), but are they effective? The survey says yes, with 60% of boaters reporting that these sources of information would be very effective in leading them to take action (another 35% indicated that they would be somewhat effective), and 60% also saying that these had already led them to take action. Therefore, the DNR should continue to include this information in its regulation pamphlets, and may even want to explore making it more prominent.

Surveys also help to teach you what's not effectively reaching your target audience. Boaters

indicated that they are not getting much of their information on this topic from the internet, and that this source is not very likely to get them to take action. Does that mean that internet sites on the subject are useless? No… in fact, many resource professionals and others rely on them for information. However, it would be difficult for the DNR, Extension, and Sea Grant to justify putting money into web resources specifically targeting boaters based on the survey results.

Adaptive management is a widely-promoted approach to program planning and evaluation. By evaluating your campaign along the way, you can continually improve your goals and objectives, messages, distribution mechanisms, etc. Can you evaluate every single thing you do? Probably not. However, you can look for opportunities to gather information that will prove useful. Three different sets of indicators that your outreach evaluation may include are:

Process indicators – These are related to the execution of the program itself (activities). For example, did you hold all of the workshops you had scheduled and did people attend (and how many)?

Impact indicators – These are related to achievement of the goals/objectives of your program. For example, the statewide boater survey looked at the effect of the overall education effort (and specific products) on getting boaters to take action to prevent the spread of invasive species.

Context indicators – These are related to how the community/public as a whole perceives the project. For example, were volunteer watercraft inspectors well received by boaters at boat landings?

Outreach Campaign Evaluation Question

Process Evaluation

Are the planned activities being implemented according to schedule? Is additional support needed? Are additional activities needed? Do some activities need to be modified or eliminated? Are the resources allocated sufficient to carry out the task? Did the target audience receive the materials distributed? What feedback has been received, and how does it affect the remaining outreach campaign objectives and activities?

Impact Evaluation

Were the campaign objectives achieved? Did the campaign change the behavior of the target audience members? Are there measurable improvements?

Context Evaluation

Was the campaign right for the target audience? Did it effectively address aquatic invasive species issues for the target area? Did the campaign compete with other social or economic issues? Were the formats and messages appropriate?

UW–Extension offers support and resources on evaluation. These can be found on the Evaluation pages of the Program Development and Evaluation web site: www.uwex.edu/ces/pdande You may find the Quick Tips and Evaluation Publications sections particularly useful.

STEP 6 PROCESS CHECKLIST Consider the following before moving on…

Do I have a baseline on the target audience's behaviors, beliefs, and attitudes?

How will I know whether the target audience has received the message?

What tools will be used to assess the impact of the outreach campaign?

Can those tools be used if the campaign changes?

What will be done with the results of the evaluation?

Who will be responsible for tracking budgets and schedules?

Do I have the resources to conduct pre/post survey or evaluation techniques?

Is the outreach campaign accountable to the public, government agencies, another organization, or other funding sources?

Implementing the Campaign

Once you have a plan in place it's time to begin to implement what you've planned! Develop a "to do" list from your outreach plan. It will help you to figure out who's going to do what, deadlines, expenses, etc. The key is to outline your plan based on what will achieve those objectives that you identified way back at the beginning of your planning process.

You are going to need three primary things to launch your outreach effort: people, technical support, and funding. Partnerships with other groups, organizations, or individuals can help with all of these things, bringing in more people, more expertise, and possibly even more financial resources (several of the case studies in the following chapter illustrate the importance of partnerships). Consider other organizations in your community that are interested in aquatic invasive species issues, that have a network of dedicated volunteers, or that have a vested (perhaps business) interest in the protection of lakes, rivers, and wetlands from invasive species.

Web resources on recruiting volunteers:

Nebraska Cooperative Extension ianrpubs.unl.edu/consumered/g1415.htm

Charity Village Ltd. www.charityvillage.com/cv/research/rvol32.html

Service Leader.org www.serviceleader.org/new/managers/2003/04/000072.php

Ontario Ministry of Agriculture, Food and Rural Affairs www.gov.on.ca/OMAFRA/english/rural/facts/96-005.htm

Florida International University Volunteer Action Center www.fiu.edu/~time4chg/Library/recruit.keep.html

Securing funding may also be a challenge. In addition to approaching local partners, consider applying for a DNR Aquatic Invasive Species grant (see Chapter 3 for information on the grants and Chapter 5 for case studies from groups that have used these grants for local projects). You might also want to look into federal funding sources, keeping in mind that applying for grants can sometimes be costly and time consuming. (www.cfda.gov – all federal funding sources, Catalog of Federal Domestic Assistance)

Keep up your momentum

It can take time to achieve your ultimate goals and objectives. Rather than simply aiming for your ultimate goals, set small goals throughout the life of your campaign. These will help to show your success and keep everyone motivated. It is also important to recognize and understand certain barriers to success so that, should they arise during your campaign, you can work to overcome them.

Potential barriers to success:

Poor coordination and planning. Hopefully, the planning process outlined above helped to illustrate how important it is to have a plan before getting started. It doesn't have to be extensive, but get something down on paper to ensure that all who are involved agree on your direction and on who's doing what.

Lack of communication. Keep everyone involved with the campaign informed about issues that come up, changes, etc. Also, let them know when you are successful.

Politics/regulations. These things can change over the life of your project and potentially lead to contentious situations. It is often effective to work individually with stakeholder groups to address disagreements, rather than entering into public debate. Also, stay informed of local regulatory changes that might affect your campaign.

Fear of the unknown. Sometimes, fear of failure can prevent your group from starting something in the first place! Though it is good to have data to support your plans, there will always be unknowns. Once you've got a plan, don't be afraid to move forward. Keeping evaluation in mind, you can always learn from mistakes!

Letting money drive the process. Even thought your budget may be limited, avoid a plan that is completely limited by your current financial resources. You can still include additional goals in your plan and then you'll be prepared to act if/when resources become available.

Letting the process bog you down. It is important to plan and meet, but be careful not to spend more time on meetings than on the actual outreach work. Most action occurs outside of meetings, and that's what gets people excited and involved.

Want more information?

Developing an Outreach Program

Designing an Effective Communication Program: A Blueprint for Success
This handbook will guide you through the crucial steps involved in designing an environmental communication program. From designing your program to increasing the effectiveness of communication materials, this guide has it all. It's available through the University of Michigan, School of Natural Resources and Environment, Ann Arbor, MI 48109, at (734) 764-1817.

Directory of Funding Sources for Grassroots River and Watershed Conservation Groups 2001–2002 The directory profiles foundations, corporations, state and federal agencies, and nonprofits that support small, nonprofit watershed groups, as well as a few sources that support tribes. It includes contact information, grant sizes, and a brief description of each source's particular interests. Contact River Network at (800) 423-6747. www.rivernetwork.org

Partnerships: A Field Guide for Nonprofit Organizations and Community Interests
This guide introduces partnerships and explains what makes them successful and how to make them grow. It's available from the Management Institute for Environment and Business at (202) 833-6556, or call The Dryden Press at (800) 782-4479.

Getting in Step: Engaging and Involving Stakeholders in Your Watershed
This guide provides the tools needed to effectively engage stakeholders to restore and maintain healthy watersheds through community support and cooperative action. Available online.
www.epa.gov/owow/watershed/outreach/documents

Getting The Word Out in the Fight to Save the Earth
This book includes hundreds of practical and proven examples of how to effectively communicate your environmental message. It explains how any nonprofit group can expand and activate its membership, influence government officials, mobilize the news media, and shape public policy in the fight to save communities, regional ecosystems, and the earth. Available through the Johns Hopkins University Press, Baltimore, MD 21218.

Pennsylvania Department of Transportation–Public Involvement Handbook
Community participation, enhancing the public's trust, managing conflict that might arise, and developing and carrying out a public involvement program are some of the subjects in this handbook. Also included is a section of ideas and techniques that can be applied to a variety of situations. Developed in 1995, the handbook is available through the Pennsylvania Department of Transportation, Harrisburg, PA. For more information, visit
www.mccormicktaylor.com/training_services_PI_handbook.htm

Social marketing

Fostering Sustainable Behavior
Doug McKenzie-Mohr and William Smith developed this 175-page book on environmental marketing in 1999. The book is a compilation of the strategies and methods that collectively form the basis of community-based social marketing–a proven breakthrough in the field of environmental education and outreach. It was written for those involved in designing, implementing, and evaluating public education programs with the goal of promoting sustainable behavior. For more information, visit
www.cbsm.com

Developing a Communications Plan: A Roadmap to Success
This guide provides a roadmap for developing a communications plan. Readers can learn valuable processes, such as prioritization exercises and feasibility screens, as well as how to manage the challenges of building an effective consumer education plan from the ground up. Available from the Huron River Watershed Council (HRWC), 1100 North Main Street, Suite 210, Ann Arbor, MI 48104. Phone: (313) 769-5123; Fax: (313) 998-0163.

Strategic Marketing for Nonprofit Organizations
This book, written by Philip Kotler and Alan R. Andreason, forms a conceptual and practical foundation for marketing in nonprofit organizations. Its coverage encompasses the entire marketing process, providing valuable insights on strategic evaluations, positioning, market targeting, and more. For more information, visit vig.prenhall.com

Working with the media

Communications Tips for Positive Media Relations
The following web site, hosted by the Mississippi Department of Education's Office of Information and Safety, provides a list of helpful suggestions for organizations working with the media for outreach purposes: www.mde.k12.ms.us/extrel/network/nettip.htm

The Green Room: Media Writing for Environmentalists
The Green Room will show you how to get media coverage, how to implement a media campaign, and the importance of the campaign. The site will take you through each step from drafting press releases and hosting media events to developing a long-term communications strategy. www.greenmediatoolshed.org

Media Facts: A Guide to Competitive Media
Published by the Radio Advertising Bureau, this guide will help you understand and evaluate the strengths of various media formats. To download a copy, visit www.rab.com or call (800) 252-RADIO.

Media Relations Guidebook
This guidebook provides tips to help you make effective use of the media in your area to promote watershed protection. It outlines the process of writing news re-leases and announcements. The guidebook is available through the NACD Service Center, P.O. Box 855, League City, TX, 77574-0855. Phone: (800) 825-5547.

Press Release Writing
The Press Release Writing Web site provides several articles and tips for organizations beginning to write PSAs. For more information, visit www.press-release-writing.com

Public Service Advertising Research Center
The Public Service Advertising Research Center is an online information library dedicated to public service advertising. The site provides a PSA bibliography, media profiles, an interactive broadcasters' café, case studies, and help sites. www.psaresearch.com

Radio Marketing Guide and Fact Book for Advertisers, 2002–2003 Edition
Use this guide from the Radio Advertising Bureau to determine how radio can help you attain your outreach goals and market your cause more effectively. To download a copy, visit www.rab.com or call (800) 252-RADIO.

CHAPTER 5

Case Studies – Citizens Taking Action

Although there is support from the state, regional, and even national levels, much of what is being accomplished in fighting the spread of aquatic invasive species is happening county by county, lake by lake, person by person. Individuals are volunteering to spend time at boat landings talking to boaters; lake associations are devising strategies to help educate members of their communities about the invasive species issue; and classrooms are raising beetles to control purple loosestrife. This chapter provides a number of case studies featuring groups that have taken this issue on locally.

Many of the groups profiled below are involved with one or more statewide volunteer programs, including Clean Boats, Clean Waters, Purple Loosestrife Bio-control, Adopt-A-Lake, and Self Help. Information about these programs, including how to get involved, is included in Chapter 3. Many groups received funding for their projects through DNR Aquatic Invasive Species Grants or other DNR Lake Grants. Information about the grants can also be found in Chapter 3.

FRANK KOSHERE

Shell Lake

Volunteer watercraft inspection with state grant support

case study details provided by Zachary Tewalthomas and Dave Vold

JOHN HAACK

Contact: City of Shell Lake: (715) 468-7679

Why did they get involved?

Since 2002, Shell Lake, Wisconsin (Washburn Co.) has consistently sustained lake levels approaching its 100-year flood level. Nearly all lakeshore property has recently been either threatened or damaged by rising waters. In an effort to prevent further damages, the City of Shell Lake in the summer of 2002 contracted to construct a four and a half mile pipeline which would divert excess water north to the Yellow River. Conditions in the project permit stipulate that water diversion may be restricted or prohibited if species not present in the Yellow River are found in the lake. Complications and delays in the pipeline project moved the completion date to Fall 2003, and the conditions of the project permit still stand. In order to prevent further flooding and repair existing floodwater damage, the City of Shell Lake took the initiative and installed an Invasive Species Prevention Project early in the summer of 2003. Their project focuses primarily on the preventing the establishment of Eurasian water-milfoil and zebra mussels in the lake.

What did they do?

Shell Lake focused its efforts at the main landing next to the Shell Lake municipal campground. A large sign was installed at the landing alerting boaters to the need to protect the lake from invasives and including the prevention steps. Collection bins were also placed at the landing for disposal of aquatic plant materials pulled from boats and trailers.

The next step of the process required the recruitment of volunteers to inspect boats at the main landing. A volunteer coordinator was hired by the city to recruit and train volunteers, coordinate scheduling, etc. In order to get volunteers involved, it was necessary to relate the importance and urgency of the project to as many people as possible. A mention was made of it in the area newspaper and presentations were given to various groups. These presentations targeted volunteer-supportive organizations such as the Future Farmers of America, Scout groups, the local Lions Club, and the area high school's Student Council, as well as the Shell Lake Lake Association and citizens at various other public events. Although many of the volunteers who signed up to help inspect boats at the main landing came from groups with a history of volunteerism, most of the volunteers were those directly affected by the project: property owners on the lake. Once they realized that the success of the project was crucial to the reduction of flooding on the lake and that they could help to make a difference, many lakeshore residents enthusiastically volunteered.

Representatives from Shell Lake attended Milfoil Masters training (a program, started by students with DNR and UW-Extension support – it was the predecessor to the current Clean Boats, Clean Waters volunteer inspection program) in 2003. Materials and information were brought back to the lake, and volunteers were then trained to handle inspections at Shell Lake's main landing. These training sessions were usually completed within an hour, and covered identification and inspection procedures. Volunteers were familiarized with the data sheet used to gather information from boaters during inspections. After the training session, volunteers were qualified to inspect boats at the main landing.

To use their time most efficiently, volunteers were scheduled to work Friday through Sunday from 5 a.m. to 9 p.m., due to the heightened non-local boat traffic experienced throughout the weekends. During weekdays, landing usage is primarily confined to local boaters and out-of-towners that are staying throughout the week at the campgrounds and who have been inspected over the weekend. As the volunteer pool increased throughout the summer of 2004, however, inspection times spread to cover additional portions of the week. Each shift usually covered approximately three hours (sometimes more). Scheduling typically took place via telephone early in the week – messages were left with various volunteers by the coordinator and time slots were filled.

Before starting a day of inspections, the necessary materials were delivered to the volunteer who worked the earliest shift; materials were passed from volunteer to volunteer throughout the day. Volunteers were equipped with a list of Eurasian water-milfoil-infested lakes in both Wisconsin and Minnesota, a whisk broom for brushing off bunks on trailers, and a diagram of key areas to inspect on boats and trailers. Any plant life found on boats and trailers was deposited in a designated collection barrel placed at the landing. In addition to the survey and inspections, volunteers reminded boaters of the 1,000 foot no-wake zone on the lake and to empty their livewells and bait buckets before traveling between water bodies.

The volunteer coordinator provided program updates every 2 weeks, which were featured in a newspaper column, keeping the community up to date on inspection efforts.

Shell Lake also held a Lakeshore Restoration Workshop, which included information about invasive species, including purple loosestrife control – 60 people attended.

Cost

Funding for the Shell Lake invasive species efforts has come from DNR grants – one Lake planning grant (75% cost share) and one aquatic invasive species grants (50% cost share) have helped to support the volunteer inspection efforts. Funding was used to hire the volunteer coordinator and to purchase signs, T-shirts for volunteers, brochures, etc. Local match was provided by the volunteer time spent on the project. Another aquatic invasive species grant (50% cost share) is being used to study the feasibility of a wash station at the lake.

What worked (and what didn't) – how did they measure success?

Reactions to the program from the boaters and project volunteers were overwhelmingly positive. Despite the rare difficult boater, most were helpful with the inspections and often expressed concern over the threat posed by invasive species like Eurasian water-milfoil. They encountered no major problems.

Volunteers inspected a total of 1358 boats in 2004. On three occasions, Eurasian water-milfoil was found on boats/trailers. The owners of these boats were helpful – one even lifted their sailboat to provide access to hard-to-reach places on the trailer.

New volunteers continued to come on board throughout the summer season and coverage at the boat landing has increased. It is anticipated that this trend will continue with the start of the 2005 boating season.

Boaters appeared to become more conscientious, maintaining cleaner boats over the course of the summer. Fewer plants were being pulled off boats at the end of summer 2004 than at the project's inception. Initially, volunteers typically had to clean off three or four boats each day. By the end of the summer, they were "lucky" to encounter a weedy boat more than two times in an entire weekend.

The lake was also monitored throughout the summer, checking areas thought to be most susceptible to Eurasian water-milfoil infestation. None was found.

Next steps

The volunteer inspection program will continue. The lake protection advisory committee, which oversees this project, has recognized the importance of this effort and is looking into a source of permanent funding for an inspection program.

Shell Lake is planning more extensive aquatic plant studies. They will also be using their most recent DNR Aquatic Invasive Species Grant to study the feasibility of a wash station at their boat landing.

Milfoil Masters – Minocqua/Hazelhurst/Lake Tomahawk Middle School

Youth leading boater education efforts in their community and statewide

case study details provided by Laura Felda-Marquardt

LAURA FELDA-MARQUARDT

Contact: Clean Boats, Clean Waters Program Coordinator: (715) 365-2659

Why did they get involved?

In 2002, three middle school students from Minocqua/Hazelhurst/Lake Tomahawk (MHLT) Middle School, with the support of their teacher, set out to develop a plan to help solve a problem in their community. They researched invasive species and identified Eurasian water-milfoil as one species that could become particularly problematic. The students live in a community where the economy is heavily based on outdoor activities and tourism – the Minocqua, Arbor Vitae, and Woodruff areas have 3,200 lakes between them. So, the idea of doing something to prevent the spread of Eurasian water-milfoil really struck a chord with the students.

What did they do?

The students – who called themselves and their program "Milfoil Masters" - came up with a plan to help educate boaters about the threat of Eurasian water-milfoil and the steps that boaters can take to prevent its spread. They also proposed an experiment to raise a native weevil that eats Eurasian water-milfoil in a lab setting, with hopes of beginning a volunteer biological control program, similar to the one used to control purple loosestrife. Finally, they developed a plan for building aquascopes, which would allow citizens to look under the water and help monitor for the presence of invasive plants.

The Milfoil Masters team took their project ideas, along with a display, presentation, and skit all the way to the national finals for the Christopher Columbus Awards – a program that challenges teams of middle school students to explore and discover opportunities for positive change in their communities using science and technology. They competed against 2,500 middle school students and 600 other teams from across the nation and won this national award!

The team returned to Northern Wisconsin and began planning their efforts further, with the help of the DNR and UW-Extension. They experimented with raising milfoil-eating weevils and developed plans for constructing home-made aquascopes. Their biggest effort involved developing a program to train volun-

teers – the goal was to build a corps of citizen volunteers to man Wisconsin boat launches during key boating periods and educate boaters on how they can avoid accidentally introducing Eurasian water-milfoil into their favorite lake.

The team organized and conducted four training workshops in early 2003, including one at the Wisconsin Lakes Convention. Their goal was to educate volunteers (youth and adult teams) in their area and statewide and encourage them to "launch" their local volunteer efforts during the 2003 fishing opener. They constructed 150 toolkits filled with materials to distribute to boaters and resources to aid in Eurasian water-milfoil identification.

Cost

The Milfoil Masters program was fully funded by a $25,000 grant from the Christopher Columbus foundation. Money was used to develop resource kits and other program materials, print T-shirts, put on workshops, etc.

What worked (and what didn't) – how did they measure success?

The efforts of the Milfoil Masters team were extremely successful, but not everything worked exactly as planned. Their attempts to raise weevils in a laboratory setting failed and revealed a major shortcoming in attempting a volunteer biological control program involving these insects. Unlike the beetles that eat purple loosestrife, the weevils are very difficult to breed successfully. Also, while the aquascopes that they designed worked, the cost for materials was high enough that they chose to purchase pre-made scopes instead (though they still included plans for the home-made variety in their kits).

However, the true success of this program can be measured in the volunteer initiative that it started. All 150 kits were distributed through the four training workshops. The groups that were trained were encouraged to alert the local press if they were planning to be out at a boat landing on the opening day of fishing season. On May 3rd, 2003 (fishing opener) adult and youth teams from 25 counties across the state were stationed at over 50 lakes. The MHLT middle school team responsible for the project was invited to the Governor's luncheon in Minocqua. There, they met with the Governor and shared with him the successful program that they had started.

The events received press coverage locally and statewide. Citizens continued to step forward and request training workshops to expand the volunteer effort. This interest lead to the creation of the statewide Clean Boats, Clean Waters volunteer program, sponsored by DNR, UW- Extension, and Wisconsin Association of Lakes, which started in 2004.

Next steps

The Milfoil Masters project has officially ended. However, their work has continued through the Clean Boats, Clean Waters program. Over three hundred volunteers representing 38 counties were trained at 14 workshops in 2004, and numbers are expected to grow in the coming years. Preliminary data showed that these volunteers inspected close to 3,000 boats and logged over 1,100 hours at boat landings.

Whitefish Lake Conservation Organization (WILCO) and Douglas County Association of Lakes and Streams (DCALS)

Mounting a public awareness campaign

case study details submitted by Fred and Sandy Anderson

SANDY AND FRED ANDERSON

Contact: WILCO: (715) 376-2377

Why did they get involved?

Whitefish Lake Conservation Organization (WILCO) got involved because of members' overall concern for the health of their lake – a desire to preserve the beauty and solitude of the Northwoods. No aquatic invasive species have been found in Whitefish Lake, and WILCO members are interested in protecting the lake from infestation. WILCO is part of the larger Douglas County Association of Lakes and Streams (DCALS), which is interested in raising awareness of invasive species issues throughout the county and promoting the use of appropriate steps to prevent the spread of aquatic invasive species.

What did they do?

WILCO annually sponsors a boat landing monitoring program. In 2003, two teams of two young adults inspected boats and visited with boat owners at the Whitefish Lake public landing on Fridays, Saturdays, and Sundays through most of the summer. To prepare for their work the inspectors attended Milfoil Masters training (a program, started by students with DNR and UW-Extension support – it was the predecessor to the current Clean Boats, Clean Waters volunteer inspection program). Efforts went well, and, in the summer of 2004, the program was expanded to include ten youth volunteers, which resulted in more inspection hours logged – approximately 450 hours in 2004. The monitors worked Friday evenings and full days Saturday and Sunday for 15 weekends from Memorial Day through Labor Day. They were paid $7.50 per hour, as compensation for giving up their weekends during the summer.

Additionally, WILCO has worked hard to educate lake property owners and increase awareness and involvement in their community. They visually inspect weekly throughout the summers for invasive species in the area of the boat landing by assigning different weeks to different families. They have also made property owners aware of the potential invasive species and provided identification information (including photos of Eurasian water-milfoil, given to all property owners) so that individuals can inspect in front of their own property. They have featured numerous articles in their newsletter about invasive species, and brought in speakers to discuss the subject at their annual meetings.

DCALS wrote and paid for bi-monthly public service announcements in the local shopper. The group helped to install approximately 25 DNR aquatic invasive species information signs (which include prevention steps) at boat landings throughout the county. DCALS attended the planning sessions for the Northwest Lake Leaders Conference and sponsored two different seminars on the prevention of the spread of invasive species in 2003. DCALS has written a number of "letters to the editor" of local newspapers to increase the awareness of invasive species.

Cost

Some costs were covered by WILCO and DCALS. WILCO received a DNR Aquatic Invasive Species Grant in 2004 to pay a portion (50%) of the boat landing monitor salaries (which totaled roughly $7,000).

WILCO has also used a unique event to raise money - a memorial swim-a-thon, which is expanding each year. There were twelve swimmers in 2004 even though the water was uncharacteristically cold. Each swimmer was swimming in memory of a loved one and had pledges by sponsors for the portion of the 3.5 mile swim completed. They raised $2,400 to help pay for the public landing monitors.

What worked (and what didn't) – how did they measure success?

The public has received the monitors well (not a single difficult situation was reported in 2004) and many lake association members have expressed their support of the program. Approximately 490 boaters (237 total boats) were contacted in 2004. Involving local youth in the program has proven very popular – a win-win situation. They are working to prevent the introduction of invasive species and fund raising has never been easier, as public support for these efforts is overwhelming. The board of directors has decided to continue the program next year.

Pursuing media coverage has paid off – in addition to newspaper articles, two local TV stations featured the public landing monitors on Whitefish Lake and they developed very informative public service announcements that reached thousands of people.

Lake association members are starting to see bulletins posted in local sports and bait shops. They are encouraged by the fact that the business community is starting to see the importance of preserving the lakes for their own economic well being.

Fund raising with the swim-a-thon has also been very successful. Sponsors tend to be generous because they know the proceeds are going to a good cause. In fact, even some people who had previously been anti-lake association have come back in support of the efforts due to the memorial swim-a-thon. It has served as a strong community building event, while raising money in the process.

Next steps

WILCO and DCALS will continue the boat launch monitoring and public outreach efforts because the momentum is building. The board of directors voted to increase the number of inspectors to 14 in 2005. These youth monitors will work expanded hours and will have more handouts on hand to provide to boaters than in previous years. More people are starting to agree that problems will develop if people stand idly by. The conservation organization is hopeful that many more citizens will join in the mission to preserve the natural resources, the northwoods atmosphere, and "cabin living".

Crescent Lake Association

Oneida County – Clean Boats, Clean Waters success

case study details provided by Glen Peterson

JIM GEHRKE

Contact: Crescent Lake Association President, Jim Gerhke: kayjimg@charter.net

Why did they get involved?

The Crescent Lake Association Board of Directors took the initiative to form a committee of volunteer watercraft inspectors in the spring of 2004. They added additional members of the association throughout the summer. All volunteers were home owners on the lake who had a desire to do what they could to keep their lake free of invasive species.

What did they do?

Seven of the volunteers attended Clean Boats, Clean Waters (CBCW) training workshops in the spring of 2004. They then took the materials and information back to their lake association and trained four additional volunteers. The crew of 11 inspectors conducted inspections at a Crescent Lake boat landing for 20 weeks during the summer of 2004 – Memorial Day through September 25.

Volunteers worked 20 Saturdays, 10 Sundays, and 3 Mondays (holidays), typically manning the landings from 7 to 11 a.m. to make the most efficient use of their time. Occasionally, they stayed at the landings longer, until 2 p.m., and staffed the occasional weekday evening (from 4 to 7 p.m.), as well. Their goal was to have all volunteers agree to two four-hour shifts per month – this kept any one individual from being overloaded with work, yet everyone remained in the loop.

Crescent Lake inspectors logged 153 hours of volunteer inspection time during the summer of 2004.

Cost

The only cost was the $25 fee for the Clean Boats, Clean Waters workshop and materials.

What worked (and what didn't) – how did they measure success?

Doing the inspections as they had been trained and following the guidance in the CBCW manual worked well. They did their best to follow the approach recommended in the manual to be "user friendly" but at the same time were firm about not wanting invasive species to be introduced to the lake. They were seldom in situations where they had more than one boat backed up at the landing, and this gave them time to really talk with the boaters. They feel that, as a result, they were able to get their story and the appropriate information across to many of the boaters. They found the vast majority of boaters to be extremely cooperative. The group did not report any problems.

In 2004, volunteer inspectors contacted 454 boaters and inspected 244 boats. Twelve of these boats/trailers had attached aquatic vegetation (which was twice identified as Eurasian water-milfoil). Throughout the summer, increasing numbers of boaters were returning to the landing with Stop Aquatic Hitchhikers stickers on their trailer posts, indicating that they had already been contacted by watercraft inspectors at this (or another) location, which is a good sign that the word is getting out.

At the end of the season, they monitored at several locations around the lake considered potentially vulnerable to Eurasian Water-milfoil infestation and found none present. No other invasive species have been discovered in the lake.

Next steps

The volunteers feel that what was accomplished in 2004 was well worth their time and effort and they plan to run the program again in 2005, likely starting inspections at the beginning of May rather than waiting for Memorial Day. Additional lake association members may attend 2005 CBCW training workshops. Volunteers will continue to monitor the lake for Eurasian water-milfoil at least annually.

Lake Pewaukee Sanitary District

Purple loosestrife bio-control with the help of partnerships

Case study details submitted by Charlie Shong

MINNESOTA SEA GRANT

Contact: Lake Pewaukee Sanitary District: (262) 691-4485

Why did they get involved?

The Lake Pewaukee Sanitary District is involved with numerous water quality issues in and around Lake Pewaukee, including aquatic invasive species. It has been working to control Eurasian water-milfoil in the lake since the mid-1960s. Purple loosestrife is another problem species within the sanitary district. Supported by the Hartland Rotary Club, itself already involved with purple loosestrife control efforts, the District started a purple loosestrife biological control program in 1998 to help battle this invasive plant.

What did they do?

The District teamed up with a 6th grade class at Pewaukee Middle School to start its bio-control efforts. They received training from the state Purple Loosestrife Bio-control Program Coordinator, going through him to purchase the beetles they would rear. A great deal of help came from the Heartland Rotary Club, a local group that was already participating in the program. Up to 20 members of this club teamed up with the District and the students to help prepare plants and raise beetles for release. The beetles from this first year were released in the Village of Pewaukee along the Pewaukee River. Pewaukee Middle School 6th grade participated in this program for four years.

The District has continued to raise the Galerucella beetles on 14 plants annually and has teamed up with the Lake Country Rotary Club in Oconomowoc and the Women's Club of Pewaukee, which have now taken over the efforts started by the District and the Middle School. Oconomowoc Middle School has also gotten involved, expanding the bio-control efforts in the area.

Cost

Costs for the bio-control efforts have been fairly small, consisting of purchasing beetles and nets, pots, etc. used to raise captive beetles on purple loosestrife plants. The District has covered these expenses using money from its water resources fund (which runs on donations).

What worked (and what didn't) – how did they measure success?

One of the keys to starting a successful bio-control program was relying on the experience of the Hartland Rotary Club. Because they were already involved in purple loosestrife biological control, the Rotary club was able to provide valuable guidance when the District was getting started, pitching in to help the students with their efforts, and answering questions when things didn't go as planned.

One challenge in working with students on this project is that the beetles hatch and are ready for release in July, when the students aren't in school. It is a bit harder to bring them back together for the release of the beetles that they worked to raise during the school year. Partnering with an adult group that can help with the release during the summer is helpful.

For the first few years, the District and the school released a relatively small number of beetles at a number of scattered purple-loosestrife infested sites in the area. They saw little to no results on these sites at first, because the beetle populations were still quite small. But, in the summer of 2003 they were looking for a good location for the Women's Club to release beetles upstream of the other sites, and found a location that already had beetles! Since no one else had released in the area, they were sure that these had come from the 1999 release. They went back and checked the original site and found many plants with damage and numerous beetles. The release sites from 2000 and 2001 are now showing beetles and larval damage up to 800 feet away from the original location. The moral of the story: It takes time for the beetle populations to become established and to start putting a dent in the loosestrife population, particularly when small numbers of the beetles are released.

In the last 3 years, the District has been releasing all of their beetles in the same area, with the intent to establish a thriving population there. In 2004, they were seeing evidence of damage from this beetle population ¼ to ½ mile from the release site. They also have enough beetles at this location that they plan to collect beetles from this site (rather than get them from the DNR) to rear in 2005.

Next steps

The District has handed over most of its beetle-rearing responsibilities to the Women's Club, though it will still provide support. Hartland Rotary Club efforts are still going strong – they now have a large screen cage that they are using to rear beetles. The Middle School and Rotary Club in Oconomowoc are also still active.

The District is planning to focus on mapping efforts in 2005 to track purple loosestrife populations and beetle damage. They will collaborate with the county, which has GIS mapping software, to plot data collected on the ground onto aerial photographs. They hope that mapping the progress of these control efforts will prove rewarding to all partners involved, as they will see the results of their efforts. These data will be shared with the Purple Loosestrife Bio-control Program and will become part of the statewide database on purple loosestrife and beetles maintained on the internet.

Green Lake Sanitary District and Markesan High School

Large-scale purple loosestrife bio-control and beyond – partnerships within a community

Case study details submitted by Dave Burbach and Charlie Marks

DAVE BURBACH

Contact: Green Lake Sanitary District: (920) 295-4488

Why did they get involved?

Wetland communities and natural areas around Green Lake were being invaded by purple loosestrife. The state Purple Loosestrife Bio-control Program Coordinator contacted Markesan High School Biology teacher Dave Burbach and encouraged him to get involved in the program. Dave researched the program and began raising and releasing beetles with his students in 1996. In 1997, Charlie Marks of the Green Lake Sanitary District attended a Lake Leaders training. He returned with the idea of starting the Partners with Education program, working with area schools, including Markesan, on environmental issues. In 1998, the partnership between the sanitary district and the school began, resulting in a greatly expanded purple loosestrife biological control effort.

What did they do?

Markesan High School received support and training from the Purple Loosestrife Bio-control Program Coordinator when starting their bio-control program. Additionally, Dave Burbach researched purple loosestrife biological control and developed his own protocol with step-by-step instructions for how to get started (which has since been shared with many other teachers). His high school students worked to collect purple loosestrife plants, pot them, and put nets around them to raise captive beetles. This was done during the school year. Dave took the plants home in the summer and, when the beetles hatched, he called students to come help with their release.

The Partners with Education program brought together motivated biology teachers from around Big Green Lake, from Ripon, Markesan, Princeton, and Green Lake High Schools and Ripon College. The goal was for the teachers to share what they were working on, plan, and set goals. The role of the Sanitary District was to help support and expand the efforts of these teachers. The District agreed to provide funding and other support for environmental projects aimed at improving and protecting Big Green Lake. The teachers chose to specialize, each pursuing different programs. Markesan High School expanded its biological control program. Additional projects supported by the District at Markesan and the other schools include water quality monitoring, invasive species removal, zebra mussel monitoring, carp exclosures, and shoreline restoration.

Markesan High School and the Sanitary District identified the need to greatly expand their efforts to truly control purple loosestrife around Big Green Lake. They enlisted property owners around

the lake to look for new plants, so that spot treatments could be performed. They also identified larger infestations suitable for biological control. The Sanitary District worked to build a nursery on its property that could house hundreds of purple loosestrife plants, therefore allowing them to produce hundreds of thousands of beetles annually. This mass rearing cage allows the group to raise and release large numbers of beetles for release at heavily infested locations. In the spring, students from the high school and district staff and volunteers team up to dig up plants and transport them to the nursery. They also harvest beetles, adding those to the nursery, as well. When the beetles hatch in the summer, they are then introduced to pre-selected loosestrife-infested sites by staff and students.

Cost

The Green Lake Sanitary District has supported this program with a variety of funding sources, including a federal U.S. Fish and Wildlife Service grant and a DNR Lake protection grant (75% cost share). The Sanitary District staff and funds provide the local cost share required. Additional Sanitary District funds are also contributed as needed.

What worked (and what didn't) – how did they measure success?

Project cooperators estimate that they raised and released approximately 300,000 purple-loosestrife-eating beetles annually in 2003 and 2004. All were released within the Green Lake Sanitary District. Additionally, Dave Burbach has helped other communities get their own programs started. Visual inspections of infested sites are showing that the beetles are having major impacts, greatly reducing purple loosestrife populations and allowing native plants to once again compete. Awareness of this and other invasive species is also increasing due to these efforts – Markesan High School and their program has been featured in a number of local news stories, and even a statewide TV program.

Much of the success of this program has been attributed to the dedicated individuals involved. Volunteer involvement and commitment have been very important. Project coordinators have found that by giving volunteers responsibility, support, and guidance, the volunteers in turn have become very committed to the project, making it successful.

The Sanitary District feels confident that they are well on their way to controlling purple loosestrife. There is hope that they may no longer need to raise beetles, at least not at the current levels, after another 3 – 5 years.

Next steps

The program will continue with mapping and plans for the 2005 beetle release. Special attention will be paid to the existing populations of beetles and plants in the coming years to determine if the beetle populations are truly self-sustaining and to better understand what happens if purple loosestrife populations begin to rebound.

(Special thanks to Jim Humphrey – lake property volunteer, Jerry Specht – lake property volunteer, and Mark Sesing – DNR Lake Coordinator for their support of this program.)

Langlade County Waterways Association

Purple loosestrife mapping, education, and control efforts at a county-wide level

Case study details submitted by Lori Regni

DAVE BRENNER

DAVE BRENNER

Contact: Lori Regni, Chair, Langlade County Waterways Association, Inc.: (715) 275-4513

Why did they get involved?

The Langlade County Waterways Association was created in 1999, uniting eight formal lake and stream associations and districts in the county. The purpose was to give a forum to lake users, share information on issues, and to instill the realization that each water body, including the wetlands and the groundwater, is a piece of a whole watershed – the Wolf River watershed, in particular. The most common and high priority issue over the past few years was the spread of purple loosestrife along lakeshores and stream banks, and even to the ornamental gardens of some residents who were transplanting the showy plant because of its beauty and resilience in the severe climate.

What did they do?

The Langlade County Waterways officers recognized that the effort to control purple loosestrife would require vast resources from a variety of sources. In 2002 under the umbrella of the Waterways Association, the Langlade County Purple Loosestrife Task Force was formed. Invited participants included local conservation and civic groups, Wisconsin Dept. of Transportation, WI DNR, USDA conservationists, county board supervisors, county zoning staff, UW-Extension resource and agricultural agents, the Menominee Nation scientists, and seventeen village and town boards.

After one year of operation, strong inroads had already been made into organizing control efforts. The organization met monthly, published several educational articles in the cooperating newspapers, rented display booths at various fairs in the county, solicited individuals and schools in beetle rearing (biological control) efforts, and has become the coordinating group, uniting and facilitating efforts among its partners.

In 2003, coordinating with the Wisconsin Wetlands Association and DNR, the Task Force took on the effort of mapping the purple loosestrife infestations throughout Langlade County. A strategic plan was formed. The cooperation of the townships and villages was identified as the most important component of this effort. If citizens could report their sightings to their town leaders who would then report to the UW-Extension agricultural agent who would report to the task force for verification, then a final report could be sent to

the Wetlands Association and the DNR. Formal invitations were sent out to the town leaders. Eight townships responded positively, designating purple loosestrife contacts. Ads were placed asking the public to report sightings. The task force printed posters describing the plants and asking the public to call the appropriate contact person or town board. Volunteers stepped forward to drive the township roads looking for the plant. Additionally, the Task Force asked the Langlade County Board to include purple loosestrife in its noxious weed ordinance, and the request was granted.

In 2004, the group fielded only four purple loosestrife sightings, and only one was new. They expanded the beetle releases (for biological control) to two new sites, and were able to collect the beetles from the Wolf River for the beetle rearing station (115 pots) due to the success of a breeding colony developed over three years. They also created controlled test sites for chemical and biological controls and burning. The Task Force maintains a master infestation map and binders tracking each site year to year.

Cost

The entire project for one year costs approximately $1,100. The Task Force obtained a grant from the Wisconsin Wetlands Association for some of the expenses, with the rest covered by the Waterways Association. The bulk of the costs were for printing & laminating color posters to display in each township. Additional funds were used to pay for the rental of booth space at the county fair and for the large ad that is run each year.

What worked (and what didn't) – how did they measure success?

The obstacles seemed insurmountable at first, and it became obvious that a great deal of cooperation would be needed. Otherwise, a relatively small group of volunteers would never be able to cover the entire county and come up with the resources necessary for the effort to be a success. The strategic planning process was very important, and engaging the cooperation of the townships and villages proved to be the key to the project's success.

Several new infested areas were reported and verified, many small enough that eradication was performed with immediate results. Many residents and business owners voluntarily removed plants from gardens. Large sites are currently under evaluation for control measures which could include chemical application or biological control.

Many townships have purchased the chemicals required for control and have taken the extra step to remove plants from state and county roads in their township. Successfully educating the public officials has created an environment that promotes cooperation between the Task Force partners and the general public. The role of the townships has indeed proven to be the critical "link" and, by 2004, all townships had come up with their own town contacts.

Task Force efforts have expanded to public education beyond just purple loosestrife – they are now involved with Clean Boats, Clean Waters volunteer watercraft inspection efforts, as well as additional displays, public speaking opportunities, and Adopt-A–Lake efforts.

Next steps

The Task Force plans to solicit the involvement of more school groups and civic groups to help with beetle rearing to expand biological control efforts. They will also be working to involve canoe & kayak groups to help with mechanical and chemical control efforts on the Wolf River.

Phelps School District and the North and South Twin Lakes Riparian Association

Adopt-A-Lake program working to educate a community about Eurasian water-milfoil

Case study details submitted by Don Zirbel and Jason Pertile

CAROLYN JOHNSON

Contact: Don Zirbel: (715) 479-2800

Why did they get involved?

The North and South Twin Lakes Riparian Association (NSTLRA) is an organization of concerned property owners working to maintain the integrity of the lakes. At a 2001 Vilas County Association of Lakes meeting, the association learned about the Adopt-A-Lake program, which supports youth and adults working together to protect lakes in their community. The Association knew that Phelps School was very close to North Twin Lake and thought it might be a good fit – a chance to get youth involved in lake issues in their community. They approached the school about getting a program started. At the same time, Eurasian water-milfoil was first discovered in North Twin Lake.

What did they do?

When NSTLRA approached the Phelps School District, the district administrator was extremely supportive of the idea. They planned three meet-the-lake pontoon trips for the 6th and 7th grades in the fall of 2001. The first was on North and South Twin Lakes. The second trip was to nearby Sand Lake, which was so heavily infested with Eurasian water-milfoil that channels had been cut to allow boat access to deeper waters. This made an impact on students and Association members, making them aware of the potential impacts

of Eurasian water-milfoil. For the third trip, students returned to North and South Twin Lakes, where they conducted water quality monitoring activities.

The students collected plant samples, identified them, and pressed them. They created Eurasian water-milfoil awareness posters to display in Phelps and gave presentations, including one at the NSTLRA annual meeting. They also used a video teleconference with three other schools to further share their findings and information about Eurasian water-milfoil.

Ultimately, Kindergarten, 2nd, 6th, and 7th grade classes as well as some high school students have become involved with the Adopt-A-Lake efforts.

Cost

The pontoon boats and other associated materials and support were provided by NSTLRA. The school district also received a $950 grant from the Land-O-Lakes Fish and Gun Club to purchase materials and equipment.

What worked (and what didn't) – how did they measure success?

The Phelps School District and NSTLRA won the youth stewardship award at the 2002 Wisconsin Lakes Convention in recognition of their efforts, which were instrumental in raising awareness of Eurasian water-milfoil in their community. NSTLRA is very active in the fight against Eurasian water-milfoil on both North and South Twin Lakes. They are exploring new treatment options and looking for ways to raise additional funds needed for control.

Since North and South Twin Lakes are heavily used by the public, the school feels that they have an opportunity to truly make a difference through education and plan to continue their efforts.

Next steps

In 2004, NSTLRA representatives attended Clean Boats, Clean Waters training workshops. They are planning to partner with the school to begin volunteer watercraft inspection efforts at boat landings in 2005. Prior to the start of boating season, 6th grade students will use Clean Boats, Clean Waters materials to learn more about the species of concern. High school environmental education students will design their own aquatic invasive species brochures and educational materials.

High school students will also be sampling macroinvertebrates in the lake in 2005. They will continue to monitor the Eurasian water-milfoil populations, mapping the aquatic plant beds, which will help NSTLRA with future planning and control efforts.

Vilas County Land and Water Conservation Department

Multiple approaches to increase aquatic invasive species awareness/prevention in Vilas County

case study details provided by Carolyn Scholl

CAROLYN SCHOLL

Contact: Vilas County Land and Water Conservation Department: (715) 479-3747

Why did they get involved?

The Vilas County Land and Water Conservation Department (LWCD) has been involved in aquatic invasive species issues for a number of years. The economy of Vilas County is very dependent on the "Northwoods" vacation and tourism industry, and therefore depends on high-quality lakes that are desirable places for fishing, swimming, and water recreation. Aquatic invasive species have the potential to decrease the recreational value of lakes and the property value of land around them. Vilas County residents have become frustrated and concerned about this issue and the increasing numbers of non-native species to watch out for. The LWCD provides support to these residents and is helping to promote community action to tackle this growing problem.

What did they do?

The LWCD has provided local support for state programs, helping to train volunteers to identify aquatic plants and distributing DNR invasive species signs for installation at state boat landings. In 2003, the Vilas LWCD created aquatic invasive species kits filled with publications on key species, videos, etc. and placed them in every public library in the county. The kits include handouts for distribution at lake association meetings or other educational opportunities and articles/topics to feature in newsletters. LWCD personnel now direct individuals who call to request information and articles to this resource. The kits are particularly helpful when staff is not able to make it to an event. Local groups still have access to key information.

The LWCD also created packets in 2004 on a variety of lake related resources, including invasive species, water quality, etc. The county was able to secure funding for creation of these packets through a DNR lake planning grant. When meeting with a lake organization, they provide one of these packets to the group. Lake organizations are usually interested in learning more about a variety of lake and lake protection activities, and these packets typically provide more than enough to get them started in the right direction.

In 2003, the LWCD Lake Conservation Specialist began the development of a technical resource guide on aquatic invasive species. The target audience for the publication is lake organizations and the goal is to provide them with a "how to" guide on how to prevent the introduction of non-native species to a lake, or

how to deal with invasives if they have already arrived - "proactive" and "reactive" lake management strategies. The guide is currently under development, and will include information on aquatic invasive species biology and reproductive strategies, treatment options that are currently available (AND legal in the state), how and when to seek a treatment permit from the DNR, information about what to do now to help prevent an infestation, step-specific methodology to deal with an existing infestation, and local contact information for resource professionals who can help with lake management projects. The guide is being designed to have statewide application and will be available for use by LWCDs, other natural resource professionals, and lake organizations statewide.

The largest aquatic invasive species effort that the LWCD is involved with is the Vilas County Aquatic Invasive Species Strategic Planning Project. A DNR representative approached the LWCD and others in Vilas County with the idea of developing a county-level plan to deal with invasive species issues. The LWCD helped coordinate a meeting with state senator Roger Breske and representatives from towns, businesses, chambers of commerce, Vilas County Lake Association, etc. throughout the county. Everyone agreed that the problem is too big for any one entity to solve. The response was positive and it was agreed that different members of the diverse group could accomplish different tasks – for example, towns could pass local ordinances and apply for grant funding while lake associations could work directly with lake property owners on control options and education and outreach. The goal of the project is for all interested parties to work and plan together, rather than the current situation, with individual entities working separately.

The county hired a coordinator in late 2004 to facilitate the planning and implementation of a county-wide strategic plan. This person will work with a committee comprised of a wide range of interest groups – lake organizations, natural resource professionals, businesses, town governments, citizens, tribes, etc.

Cost

The LWCD has received grants from the DNR for several of their projects. Lake Planning Grants helped pay for the library kits, the informational folders, and development of the technical resource guide. A multi-year $158,000 DNR Lake Protection Grant is funding the strategic plan project. An in-kind match for these grants is supplied by county staff professional time and local volunteer time.

What worked (and what didn't) – how did they measure success?

The kits and packets have been well received, and there is much demand from citizens in the county for presentations and other information on aquatic invasive species. So, efforts to raise awareness in the county have been successful. There has been some frustration on the part of LWCD staff due to the large demands on their time dealing just with this issue. Also, in many cases, people have heard the message but are not concerned until something happens in "their" lake or town. Presenting this strategic planning approach brought many people to the table and is encouraging them to be proactive with prevention efforts. Efforts to raise awareness of the importance of this issue have resulted in cooperation and the support of the county-wide strategic planning process. The LWCD and other partners have been successful in bringing multiple partners to the table, encouraging community members to be proactive, and securing funding to move ahead with the strategic planning process.

Next steps

Strategic planning began over the winter of 2004-2005, with implementation of the plan to continue through 2007. The technical resource guide is scheduled for completion in 2005. The LWCD will continue to provide information, publications, and other support to citizens dealing with this issue.

Bayfield County Lakes Forum

A county-wide organization working to engage community support

case study details provided by Roger Dreher and Nan Olson

Contact: Bayfield County Lakes Forum at: weekends (715) 372-4045, weekdays (218) 723-3936, or rhdreher@aol.com

Why did they get involved?

The Bayfield County Lakes Forum (BCLF) is a county-wide lake organization founded in 2000. The group is dedicated to protecting the natural, scenic, recreational and economic values of Bayfield County lakes and shorelands. BCLF became involved in the aquatic invasive species issue after president Roger Dreher attended the 2003 WI Lakes Convention. He came away with the strong feeling that DNR resources alone were inadequate to do all that needed to be done to prevent the spread of aquatic invasive species, including Eurasian water-milfoil and zebra mussels, to inland lakes in Northwest Wisconsin. He felt that immediate action needed to be taken to prevent these and other species from invading county lakes. He wanted to involve all who use the lakes or whose businesses depend on lake users to help fight the invasion of these species.

What did they do?

Working with the support of the DNR and UW-Extension, BCLF volunteers posted DNR signs at boat landings, with priority placed on sign installation at developed landings with the heaviest use. They helped to install approximately 50 signs. The county Land Conservation Department and U.S. Forest Service also assisted with sign posting. BCLF volunteers have also been active in monitoring lakes throughout the county for Eurasian water-milfoil.

BCLF volunteers also contacted resorts, campgrounds, and marinas in the area asking if they would post or distribute information on invasive species. In the summer of 2004, 300 flyers (which BCLF worked with the DNR to design) were distributed to these businesses for posting. The Bayfield County Zoning Office also agreed to include flyers purchased by BCLF in their shoreland owner information packages.

BCLF wrote a press release in 2003 documenting their activities and working to raise awareness of this issue in their area, highlighting the importance of taking action. The release ran in the Ashland Daily Press around July 4th weekend. They have also continued to make aquatic invasive species a high priority topic at the annual Northwest Wisconsin Lakes Conference. This event, sponsored by the Wisconsin Association of Lakes and the county lake associations from Burnett, Bayfield, Douglas, Sawyer and Washburn counties, draws about 300 people.

Cost

BCLF uses funds from their annual Northwest Wisconsin Lakes Conference to help support these efforts, along with contributions from lake associations in the county. In 2004, approximately $500 was spent on aquatic invasive species work.

What worked (and what didn't) - how did they measure success?

Asking for the support of local businesses has worked well – businesses have been nearly unanimous in their support of the effort and have agreed to help. By communicating with local resorts, etc., BCLF has also been able to get feedback on the types of publications, signs, and flyers that work well for area businesses.

BCLF has also been quite successful in getting volunteer Eurasian water-milfoil monitors involved. As a result of working to raise awareness of the issue in their county, citizens have been ready and willing to step up and help. Members suggest starting with one project and then branching out to take on others. Once people are educated about the issue and have gotten involved, it is easier to build on new efforts.

BCLF members suggest that other counties interested in getting more involved with this issue talk to their neighbors and learn from what they've done. BCLF was one of the first county-wide lake organizations in their area to take on aquatic invasive species outreach. They have since shared their experiences with neighboring Sawyer County, saving them time and resources as they start similar efforts.

Next steps

Unfortunately, despite the efforts of many, in late 2004 the first inland lakes with Eurasian water-milfoil were discovered in Bayfield County. BCLF has shifted much of its focus to dealing with these new infestations and to preventing this plant from spreading from these infested lakes to other county lakes. They hope to help the affected communities come together to work towards a solution to this threat to lakes and those who enjoy them. They will continue to promote and support volunteer monitoring and volunteer boat launch education efforts through the Clean Boats, Clean Waters program, and help lake associations apply for DNR Aquatic Invasive Species Grants. They will also inventory boat landing signs to make sure they are in place and replace those that are damaged or missing.

BCLF is also assisting UW-Extension in presenting an Aquatic Invasive Species Workshop in April 2005. The target audiences include area business interests (resorts, campgrounds, marinas, boat dealers, bait stores and fishing guides) and local government units. The objective of the workshop is to develop comprehensive action plans directed at preventing further spread of Eurasian water-milfoil and other aquatic invasives in northwest Wisconsin.

Waupaca Chain O'Lakes

Thinking Strategically About Invasive Species Prevention and Education

case study details provided by Mike Koles

BOB KORTH

Contact: Mike Koles, UWEX Waupaca County: (715) 258-6230

Why did they get involved?

The Waupaca County Chain O'Lakes includes 22 lakes and 800 acres of surface water. The lakes are highly developed and heavily used by non-residents. Recreational use has created an invasive species threat. To date, the lakes have been "invaded" by purple loosestrife and Eurasian water-milfoil (EWM). The realization that the Chain is near many water bodies infested with other invasive species prompted the Chain O'Lakes District to begin researching preventive methods that could be combined with the current EWM control response.

What did they do?

The District contacted UW-Extension Community Development Educator Mike Koles as part of their inquiry into preventive methods. Koles teamed with Laura Felda, UW-Extension Volunteer Coordinator for the Invasive Species Program, and DNR staff, to provide a series of educational programs to the District and Association in 2003. The programs led to a decision to apply for a $10,000 Aquatic Invasive Species Grant. Koles worked with a team of District members to write the grant. The application proposed using two major initiatives. First, an Aquatic Invasives Species (AIS) Committee representing local residents, the District, the Association, local businesses, and local government would collaborate to develop a strategic plan to prevent aquatic invasive species on the Chain. Second, during the completion of the plan, certain immediate educational strategies would be implemented.

The purpose of the second objective was two-fold. By implementing certain educational strategies now, the AIS Committee would not only begin to increase peoples' knowledge but also help prevent infestation and exacerbation of invasive species. According to committee Chair, John Hebbring, "we wanted to plan for some extensive prevention and education efforts, but we did not want the 2004 and 2005 boating seasons to pass without some educational strategies being implemented. The two step approach helped us accomplish both." Not only did the second initiative immediately get some education on the ground, the committee felt it would build support for the project and help the collaboration to coalesce by enabling concrete projects to be completed by the "doers" in the group. The grant was subsequently received.

Strategic Planning

Step 1: Vision and Mission Development

The AIS Committee began the planning process by identifying the vision and mission that would guide their work. They developed the following vision and mission statements:

Vision

"The Chain O'Lakes will be a system in which existing invasive species (purple loosestrife and Eurasian water-milfoil) are effectively controlled and infestation of other invasive species is prevented."

Mission

"Develop an aquatic invasive species plan to control and prevent invasive species on the Chain O'Lakes using functional and educational methods."

According to Hebbring, the mission discussion received a lot of attention. "Everyone agreed that educational methods and functional strategies, such as boat and species monitoring, should be used. However, they could not agree as to whether or not structural methods, namely boat washing stations, should be used." Ultimately, due to space and money constraints, multiple boat landings, and a question regarding effectiveness, they decided against structural methods.

Step 2: Goal Development

The next step for the AIS Committee was to determine the goals that needed to be achieved to fulfill the mission and vision. The committee began to develop these by answering the question, "What would you like to change, create, or preserve on the Chain"? According to Koles, "This question was purposely broad and resulted in the development of a multitude of goals. One idea behind strategic planning is to realize there are always time and money constraints so you have to try to get the biggest bang for your buck. Ultimately, the committee strategically narrowed the goals down to a reasonable number."

Step 3: SWOT Analysis

Once the goals were prioritized, the AIS committee identified what would help them achieve the goals and what would prevent them from achieving the goals. This step, referred to as SWOT Analysis, involves analyzing strengths (S), weaknesses (W), opportunities (O), and threats (T). By identifying the things that would help or hamper their efforts, the committee was better equipped to develop strategies.

Step 4: Strategy Development

The next step the AIS Committee took was to develop specific educational and functional strategies. Each strategy identified: A) what needed to be done, B) who was in charge of it, and C) a timeline in which the strategy should be completed.

Immediate Educational Strategies

UW-Extension worked with the AIS Committee to publish 2 newsletters that were sent to over 1,400 individuals, a series of press releases, an in-depth newspaper interview and article, an educational workshop for riparians, and a public service announcement that played on local radio. The committee continues to work on signage at the boat landings and bridge crossings.

Cost

Project costs include $10,500 for planning and immediate educational strategies not including signage. Signage costs are estimated at $9,500. AIS grant funding covered 50% of the project while in-kind support covered 75% and cash covered 25% of the remaining $10,000.

What worked? (and what didn't) – how did they measure success?

The strategic planning process prompted the District to address the issue more proactively. Education and prevention are more prominent pieces of the invasives species effort than they would have been absent taking some time to plan an effective and comprehensive approach. That said, combining some immediate strategies with planning proved critical in engaging stakeholders who are more "doers" than planners.

Next Steps

The AIS Committee is working to develop a second grant application to help fund a volunteer coordinator and education manager to implement the strategic plan. It is expected that once the educational and boat monitoring initiatives are developed, which is projected to take several years, the District can take over management of the project.

CHAPTER 6

Resources

Statewide Contact list

This information is current as of 2004. Program titles and main office numbers are provided in the event of staff changes.

Statewide Invasive Species Program Contacts:

Aquatic Invasive Species Program Coordinator (DNR) – 608-266-9270 – Ron Martin, ronald.martin@dnr.state.wi.us Coordinates statewide watercraft inspection and monitoring efforts, oversees all contracts with UW-Extension, also tied into policy discussions and development on state, regional, and national levels.

Aquatic Invasives Education Specialist (UWEX/DNR) – 608-267-3531, 268-261-1092 – Mandy Beall, mandy.beall@dnr.state.wi.us Coordinates statewide aquatic invasives education efforts (contact for information on publications, press releases, public service announcements, etc.), also familiar and involved with regional education efforts.

Aquatic Invasives Volunteer Coordinator (UWEX/DNR) – 715-365-2659, 715-346-3366 – Laura Felda-Marquardt, laura.felda@dnr.state.wi.us Coordinates the Clean Boats, Clean Waters volunteer watercraft inspection and monitoring program, and works statewide with DNR and Sea Grant watercraft inspectors. Web site: www.uwsp.edu/cnr/uwexlakes/CBCW

Purple Loosestrife Biological Control Program Coordinator (UWEX/DNR) – 608-221-6349 – Brock Woods, brock.woods@dnr.state.wi.us Coordinates volunteer efforts, research, and education associated with the bio-control program.

Non-indigenous Species Specialist (Sea Grant) – 920-683-4697 – Phil Moy, pmoy@uwc.edu Involved with Great Lakes invasive species and fisheries issues statewide as well as regionally, also involved with statewide aquatic invasive species outreach efforts. Sea Grant main office – 608-262-0905 Contact for general aquatic invasive species and Sea Grant publication information. Web site: www.seagrant.wisc.edu/

Lake Partnership Team Leader (DNR) – 608-261-6423 – Carroll Schaal, carroll.schaal@dnr.state.wi.us Coordinates the statewide lake grant programs, including aquatic invasive species grants.

Invasive Plant Coordinator (DNR) – 608-267-5066 – Kelly Kearns, kearns@dnr.state.wi.us Contact about invasive plants (aquatic and terrestrial), including potential invasive plants of the future.

Local DNR Contacts

Each region has at least one staff person who oversees the regional monitoring and watercraft inspection programs (Regional Aquatic Invasive Species Coordinators); many are also lake coordinators and/or aquatic plant management specialists for their regions. They can be reached by calling the general office numbers below. For more information on applying for an AIS grant, contact your local Lake Coordinator or Environmental Grant Specialist at the same numbers.

Northern Region Rhinelander:	715-365-8900
Northern Region Spooner:	715-635-2101
Northern Region Superior:	715-392-7988
Northeast Region Green Bay:	920-662-5100
South Central Region Fitchburg:	608-275-3266
Southeast Region Waukesha:	262-574-2100
West Central Region Eau Claire:	715-839-3700

For grant application information, grant requirements, etc. visit the DNR Bureau of Community Financial Assistance. dnr.wi.gov/org/caer/cfa/grants

Local UW-Extension Contacts

All of the Extension contacts listed on the previous page work specifically on aquatic invasive species efforts at the statewide level. There are also Extension agents in each county working on a wide variety of issues, and some are involved in invasive species work. Those groups of agents are highlighted below, and the general office number for each county is provided should you want to contact one of your local agents. It is important to note that not all of these agents work on aquatic invasive species issues! So, please don't assume that all will be involved with this issue when you call. If you are not sure who to call, feel free to contact one of the statewide contacts on page 80 – they will try to connect you with someone working on this issue in your area.

Basin Educators for Natural Resources The basin approach to resource management encourages locally-led conservation by involving agency partners, as well as public and private stakeholders in identifying and addressing local natural resource issues. Basin Educators for Natural Resources are a statewide network of educators, whose task it is to encourage local partnerships and provide educational and technical support to stakeholders. These educators help identify and address natural resource issues and priorities particular to the locations and communities they serve. Some basin educators are already involved with invasives projects in their areas; others may be able to provide support to new efforts (visit basineducation.uwex.edu for more information on the program and current contact information).

Community, Natural Resource and Economic Development (CNRED) Agents CNRED educators work with local governments, civic organizations, businesses and community leaders to help identify critical local concerns, set goals and work on solutions. Many have skills in facilitating strategic planning, and some have helped local groups in forming their invasive species strategies

Horticulture aand Urban Agriculture/Horticulture agents provide research and educational support for the rapidly expanding horticulture industry in Wisconsin. They provide the educational foundation to facilitate use, production, maintenance and appreciation of horticulture in an environmentally and socially responsible manner. Many work on invasive plant and plant pest issues, and may be able to provide information and support in invasive species prevention, education, identification, and control.

4-H Youth Development programs emphasize: getting youth involved in and excited about civic activity; helping local groups assess and improve their youth development programs and activities, and; improving youths' skills in interpersonal relations – communications, negotiations, group decision-making and dealing with conflict. There is a national 4-H project booklet already available on raising purple loosestrife biological control beetles, and several 4-H agents in Wisconsin are involved with the purple loosestrife bio-control program.

UW-Extension County Office Numbers:

Adams	608-339-4237	Iowa	608-935-0391	Polk	715-485-8600
Ashland	715-682-7017	Iron	715-561-2695	Portage	715-346-1316
Barron	715-537-6250	Jackson	715-284-4257	Price	715-339-2555
Bayfield	715-373-6104	Jefferson	920-674-7295	Racine	262-886-8460
Brown	920-391-4610	Juneau	608-847-9329	Richland	608-647-6148
Buffalo	608-685-6256	Kenosha	262-857-1945	Rock	608-757-5696
Burnett	715-349-2151	Kewaunee	920-388-7191	Rusk	715-532-2151
Calumet	920-849-1450	LaCrosse	608-785-9593	Sauk	608-355-3250
Chippewa	715-726-7950	Lafayette	608-776-4820	Sawyer	715-634-4839
Clark	715-743-5121	Langlade	715-627-6236	Shawano	715-526-6136
Columbia	608-742-9680	Lincoln	715-536-0304	Sheboygan	920-467-5740
Crawford	608-326-0223	Manitowoc	920-683-4170	St. Croix	715-684-3301
Dane	608-224-3700	Marathon	715-261-1230	Taylor	715-748-3327
Dodge	920-386-3790	Marinette	715-732-7510	Trempealeau	715-538-2311
Door	920-746-2260	Marquette	608-297-9153	Vernon	608-637-5276
Douglas	715-395-1363	Menominee	715-799-4654	Vilas	715-479-3648
Dunn	715-232-1636	Milwaukee	414-290-2400	Walworth	262-741-3190
Eau Claire	715-839-4712	Monroe	608-269-8722	Washburn	715-635-4444
Florence	715-528-4480	Oconto	920-834-6845	Washington	262-335-4477
Fond du Lac	920-929-3170	Oneida	715-365-2750	Waukesha	262-548-7770
Forest	715-478-2212	Outagamie	920-832-5121	Waupaca	715-258-6230
Grant	608-723-2125	Ozaukee	262-238-8288	Waushara	920-787-0416
Green	608-328-9440	Pepin	715-672-5214	Winnebago	920-232-1970
Green Lake	920-294-4032	Pierce	715-273-3531	Wood	715-421-8440

You can also visit the county office web site (www.uwex.edu/ces/cty), from which you can link to each county and view all programs and staff contacts. Or, visit the online Cooperative Extension Staff Directory (at www.uwex.edu/ces/dir), where you can search for staff by name, county, program area, etc.

U.S. Fish and Wildlife Service Efforts of this federal agency include surveillance, control, and monitoring for aquatic invasive species in the Great Lakes and Big Rivers of the region, primarily focused on fish and invertebrates; they may also have information on identification, distribution, etc.

Green Bay	920-866-1717
Ashland	715-682-6185
LaCrosse	608-783-8434

Great Lakes Indian Fish and Wildlife Commission – (715) 682-6619, web site: www.glifwc.org This inter-tribal agency maintains an exotic plant information center www.glifwc.org/epicenter and is very active in the purple loosestrife bio-control program, as well as monitoring and mapping invasive plant distributions on tribal lands and throughout MN, MI, WI.

County Land Conservation Departments (LCD) Conservationists and educators deliver natural resource programs in their counties, working with farmers, landowners, and businesses. A number of LCDs are providing aquatic invasive species prevention and identification education, assistance to local groups working on invasives prevention, assistance in control efforts, etc. in cooperation with DNR, UWEX and other partners.

Find county conservationists and educators in the Land Conservation Directory online www.datcp.state.wi.us/arm/agriculture/land-water/conservation/lcdir.jsp or call DATCP at 608-224-4620 to request a directory.

In the government pages of your phone book, look under your county for the LCD number

U.S. Forest Service This federal agency is involved with prevention education, as well as management/control of invasives on forest service land (A list of Forest Service invasives contacts can be found at www.fs.fed.us/r9/wildlife/nnis/r9-nnis.contacts.shtml) All of their invasive plant resource information (including control) is at: www.fs.fed.us/r9/wildlife/nnis/indexp

Chequamegon-Nicolet National Forest, Park Falls office: 715-762-2461

Eastern regional office, Milwaukee: 414-297-3600

U.S. Geological Survey – 608-783-6451 - Invasive Species Research Team Leader, Upper Midwest Environmental Sciences Center, LaCrosse, WI The center has information on current invasive species research, as well as other aquatic invasive species issues.

National Park Service, St Croix National Scenic Riverway – 715-483-3284, Ext. 642 or 616, web site: www.nps.gov/sacn/ This federal agency is involved with monitoring (particularly for zebra mussels) on the St. Croix and upper Mississippi, as well as prevention of spread education.

Non-profit organizations

A number of non-profit organizations are involved with education initiatives, legislation (lobbying for laws on invasives), and grants related to invasive species. These may include:

Wisconsin Association of Lakes – 608-662-0923 or 800-542-5253 email: info@wisconsinlakes.org
web site: wisconsinlakes.org

Wisconsin Wetlands Association – 608-250-9971, email: info@wiscwetlands.org
web site: www.wiscwetlands.org

Invasive Plant Association of Wisconsin – email: info@ipaw.org
web site: www.ipaw.org

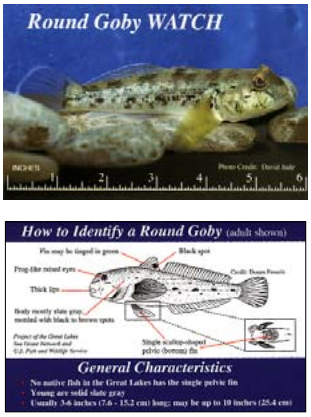
River Alliance of Wisconsin – 608-257-2424, email: wisrivers@wisconsinrivers.org
web site: www.wisconsinrivers.org

Publications

Whenever possible, PDF files of the following publications have been included on the CD that accompanies this handbook. Many are suitable for printing – please feel free to print, copy, and distribute them as you see fit! These publication resources change often, as new products are developed and older ones are phased out. For current publication information, visit dnr.wi.gov/invasives

Watch Cards

These Sea Grant-produced ID cards are distributed throughout the Great Lakes region. Cards obtained from WI Sea Grant, DNR or UW-Extension are customized with Wisconsin-specific contact information. All cards include photos and sketches with identification information, background on the featured species, and information on "what you can do".



ACTUAL SIZE IS 2.5" X 3.5"

Cards can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

Cards can also be obtained from Wisconsin Sea Grant. Single copies can be ordered online at the UW Aquatic Science Center online store: aqua.wisc.edu/publications (click on the Exotic Species sidebar). For multiple copies, contact Sea Grant at 608-263-3259.

Available Watch Cards (and DNR publication numbers):

Bighead and Silver Carp (WT-777)

Eurasian Water-milfoil (WT-745)

European Frogbit (WT-754)* Limited quantities available

Purple Loosestrife (WT-744)

Round Goby (WT-743)

Ruffe (WT-742)

Rusty Crayfish (WT-752)

Spiny and Fishhook Waterfleas (WT-753)

Zebra Mussel (WT-730)

Wisconsin Wild Cards – Aquatic Alien Invaders

These youth-friendly pocket-sized trading cards were created by DNR and UW-Extension. Each card includes information about the featured species, the problems it causes, what you can do, and a "wild" fact.

ACTUAL SIZE IS 3.5" X 2.5"

Cards can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

Available Wildcards (and DNR publication numbers):

Alewife (WT-736)

Curly-leaf Pondweed (WT-759)

Eurasian Water-milfoil (WT-741)

Purple Loosestrife (WT-740)

Rainbow Smelt (WT-757)

Round Goby (WT-734)

Ruffe (WT-733)

Rusty Crayfish (WT-739)

Sea Lamprey (WT-737)

Spiny and Fishhook Waterfleas (WT-760)

Threespine Stickleback (WT-735)

White Perch (WT-758)

Zebra Mussel (WT-738)

Educators can obtain sets of 30 of each card by using the the DNR Education Connection order form, found at: dnr.wi.gov/education/PDF/EducationConnection.pdf

*PDF files of the cards are available on the accompanying CD.

Help Stop Aquatic Hitchhikers Brochure

(DNR publication number WT-801)

ACTUAL SIZE IS 4" X 9"

This brochure was created by Minnesota DNR in cooperation with neighboring states. It is recommended for distribution during watercraft inspections. The brochure includes nationally accepted prevention guidelines for boaters, as well as additional steps for other recreational water users. It also includes photos and a brief description of several aquatic invasive species. Contact information for DNR, UW-Extension, and WI Sea Grant is also included.

This brochure can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

Stop the Invasion of Wisconsin's Waters Poster

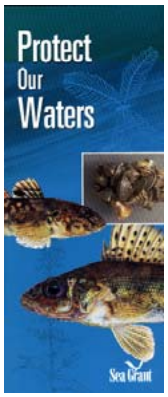
(DNR publication number WT-781)

ACTUAL SIZE IS 22" X 28"

This full-color poster features several of the aquatic invasive species of concern in Wisconsin, along with the steps for boaters and anglers to take to prevent their spread. This is suitable for posting in businesses, class rooms, chambers of commerce, etc. The poster can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF files of the poster is available on the accompanying CD.

Protect Our Waters Brochure



ACTUAL SIZE IS 3.75" X 8.5"

This Wisconsin Sea Grant brochure includes general information about several aquatic invasive species, as well as the steps that boaters and anglers can take to prevent their spread. It also includes a Stop Aquatic Hitchhikers! sticker that can be removed and applied to a trailer post, etc. (See description of sticker on page 90).

The brochure can be obtained from Wisconsin Sea Grant – single copies can be ordered online at the UW Aquatic Science Center online store: aqua.wisc.edu/publications (click on the Exotic Species sidebar). For multiple copies, contact Sea Grant at 608-263-3259.

The Facts…on Eurasian Water-milfoil Brochure

(DNR publication number WT-781)

ACTUAL SIZE IS 3.75" X 8.5"

This brochure contains information on Eurasian water-milfoil, including mechanisms of spread, identification tips, control methods, and what you can do to prevent its spread. It can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF file of this brochure, suitable for printing, is found on the accompanying CD.

Eurasian water-milfoil/Northern water-milfoil ID card

(DNR publication number WT-394)

ACTUAL SIZE IS 3.5" X 5"

This new and improved version of an earlier DNR publication provides a quick reference for identifying Eurasian water-milfoil and distinguishing it from Northern water-milfoil, one of the native milfoil species that can be mistaken for this invasive species. This card can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF file of this card is available on the accompanying CD.

Recognizing Eurasian Water-milfoil and Native Look-A-Likes Fact Sheet

(DNR publication number WT-783)

ACTUAL SIZE IS 8.5" X 11"

A number of native aquatic plant species look similar to Eurasian water-milfoil. This fact sheet provides sketches and identification information to help distinguish the beneficial native species from the harmful, invasive Eurasian water-milfoil. This fact sheet can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF file of this fact sheet, suitable for printing, is found on the accompanying CD.

Zebra Mussel Boater's Guide Brochure

(DNR Publication number WT-383)

ACTUAL SIZE IS 3.75" X 8.5"

This brochure contains information on zebra mussels, including identification and life cycle, impacts, steps to prevent their spread, and methods to protect your boat from zebra mussel damage. It can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF file of this brochure, suitable for printing, is found on the accompanying CD.

Purple Loosestrife: A Major Threat to Wisconsin's Wetlands and Waterways Brochure

(DNR publication number WT-799)

ACTUAL SIZE IS 3.75" X 8.5"

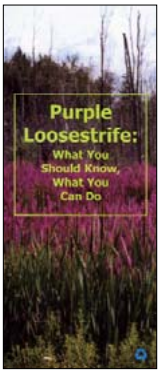
New in 2004, this brochure includes information on purple loosestrife, including identification and native look-a-likes, control methods (biological control as well as traditional methods), what you can do to help, and distribution in Wisconsin. It can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

View brochure online at: clean-water.uwex.edu/pubs/purple.pdf

A shortened, black-and-white version of this color brochure, suitable for mass photocopying and distribution, will be available (hard copy and electronic versions) in late 2005.

Purple Loosestrife: What You Should Know, What You Can Do Brochure

(DNR publication number WT-276)

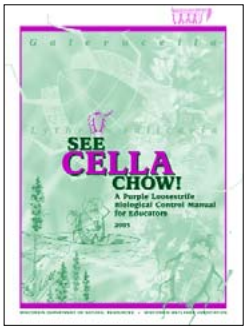


ACTUAL SIZE IS 3.75" X 8.5"

This brochure was created in Ontario, with the last page customized with Wisconsin information. It includes purple loosestrife identification information, as well as information on various control methods. It can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

See Cella Chow! A Purple Loosestrife Biological Control Manual for Teachers

(DNR publication number SS-981)



ACTUAL SIZE IS 8.5" X 11"

A set of 14 curricular activities focusing on wetland ecology and function, invasive species and their effects and, the specific process of developing, rearing and releasing beetles to control purple loosestrife. Appendices include information on how to start a bio-control program in your area. Contact Brock Woods, Wisconsin DNR at (608) 221-6349 or brock.woods@dnr.state.wi.us or WI Wetlands Association at (608) 250-9771 for a free copy. The entire publication can be downloaded at: dnr.wi.gov/org/es/science/publications/ss981_2003.htm

*A PDF file of this brochure is available on the accompanying CD.

Clean Boats, Clean Waters Volunteer Watercraft Inspection Program Brochure

(DNR publication number WT-782)

ACTUAL SIZE IS 3.75" X 8.5"

This brochure provides an introduction to the Clean Boats, Clean Waters program – an opportunity for volunteers to fight the spread of invasive species through volunteer watercraft inspection, boater education and monitoring. It also includes contact information for the program coordinator. The brochure can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF file of this brochure is available on the accompanying CD.

Exotic Species Advisory Fact Sheet

(DNR publication number WR-411)

ACTUAL SIZE IS 8.5" X 11"

This fact sheet is a paper version of the DNR sign posted at landings of infested water bodies. The paper version can be posted on bulletin boards at businesses, etc. and can also be used as a hand out. The fact sheet can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF file of this brochure, suitable for printing, is found on the accompanying CD. Also included is a customizable version of this fact sheet, with space for you to add your own logo or sponsorship information.

Stop Aquatic Hitchhikers Sticker

(DNR Publication number WT-747)

ACTUAL SIZE IS 5" X 3.25"

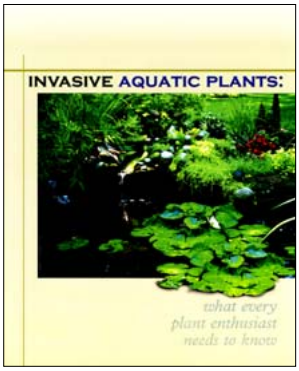
This sticker is part of the Stop Aquatic Hitchhikers! Campaign materials. DNR, Sea Grant, and volunteer watercraft inspectors distribute the sticker to boaters while talking with them about the steps to take to prevent the spread of aquatic invasive species. Boaters are asked to place it on their trailer posts to remind them of these steps each time they move their boats. The stickers can also be placed on tackle boxes and other locations where they can be seen while boating and fishing.

Stickers are available from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

A PDF file of this sticker (called a tackle box sticker) can be found on the Stop Aquatic Hitchhikers web site (www.protectyourwaters.net). A number of additional campaign materials are also available for you to use, including print "adds" that can be customized with your logo/information. Details about how to become an official partner of the campaign and receive high-quality versions of these files suitable for printing can also be found at the site listed above.

Invasive Aquatic Plants: What every plant enthusiast needs to know Brochure

(DNR publication number WT-765)



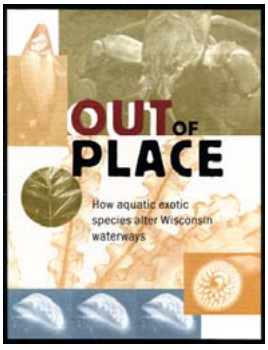
ACTUAL SIZE IS 8.5" X 11"

Produced by Illinois/Indiana Sea Grant, this publication includes information for water gardeners as well as plant retailers on aquatic invasive species and the things that these groups can do to prevent their introduction and spread through water gardening. The brochure can be obtained from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*A PDF file of this publication is found on the accompanying CD.

Out of Place: How Aquatic Invasive Species Alter Wisconsin Waterways Magazine Insert

(DNR publication number WT-708)

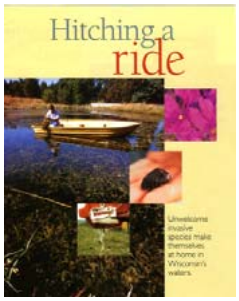


ACTUAL SIZE IS 8.5" X 11"

This 31-page publication was produced as an insert to the Natural Resources Magazine in 2001. It is useful as a reference, providing background on the invasive species issue in Wisconsin. Limited copies are available from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694). *This publication my also be viewed online at: www.nrm.com/supps/2001/jun01/intro.htm

Hitching a Ride

(DNR publication number CE-4014)



ACTUAL SIZE IS 8.5" X 11"

This 16-page publication was produced as an insert to the Natural Resources magazine in 2005. It provides updates on various components of Wisconsin's invasive species program, and addresses issues that extend beyond our borders. Limited copies are available from a regional DNR service center (see contacts section) or by contacting DNR Central Office, Bureau of Watershed Management: Watershed Publications Coordinator (Kristi Minahan), 608-266-7055, or Aquatic Invasives Education Specialist (Mandy Beall), 608-267-3531, (general Watershed Management office number is 608-267-7694).

*This public ation may also be viewed online at: www.wnrmag.com/supps/2005/jun05/intro.htm

Additional publications on the CD

Several additional publications can be found on the enclosed CD. The DNR does not have copies of these in stock, but all are suitable for printing. Most of these are black and white, so, even if you print them on colored paper, they should be relatively inexpensive to reproduce.

Many of the documents are customizable, meaning there is room to add your own logo. However, please do not change the prevention steps or facts about the species…this information should be consistent statewide. To insert a logo or "Sponsored by…" text, Adobe Acrobat Writer is required. If you do not have this software, your local copy shop should – you'll just need to provide them with the appropriate file and logo.

ACTUAL SIZE IS 6" X 6"

Eurasian water-milfoil fact sheet (customizable) – This sheet includes a sketch of Eurasian water-milfoil, along with key identification characteristics. There is room at the bottom for you to add your group's logo or other sponsorship information. Consider printing it on the back of a lake map or on a menu at a lake-side restaurant!

Help Prevent Invasives Flyer (customizable) – This flyer could be posted on bulletin boards at local businesses or included with the resources provided in guest rooms at a lodge. Black and white and color versions are provided. There is also a version with room for you to add your own logo/information.

ACTUAL SIZE IS 3.75" X 11"

Stop Invasives insert (customizable) – This ⅓-page flyer was designed to be included as an insert in mailings without increasing postage costs. It may also be useful as a windshield flyer or for distribution at boat landings. A version with room for logos, etc. had been provided.

Additional fact sheets available online

The Ohio and Illinois/Indiana Sea Grant programs have created a number of fact sheets on invasive species of concern. These can be found online at the web sites listed below. Copies of several of these factsheets are included on the accompanying CD. If you do not have access to the Internet and would like more information on the factsheets, contact the Aquatic Invasives Education Specialist (608-267-3531).

All IL/IN Sea Grant free publications: www.iisgcp.org/products/free.htm

All Ohio Sea Grant publications: www.sg.ohio-state.edu/publications

Other resources

Signs

The following signs are produced and posted by the DNR at boat landings statewide. They are also available to volunteer groups, county LCDs, etc. who are willing to help further the statewide posting efforts. Signs should be obtained from your regional Aquatic Invasive Species Coordinator (see page 81 for contact information). Sign posting plans should be coordinated with your DNR contact, who should also be able to provide posting guidelines.

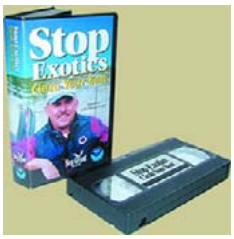
- Exotic Species Advisory Sign – This sign is posted at boat launches at known infested water bodies.
- "Help Prevent" Sign – This sign is posted at boat launches of water bodies not know to contain any invasive species
- "Please Stop" Sign – This sign should be posted so that it is visible as boaters are leaving the boat launch area at both infested and uninfested lake as a final reminder to remove aquatic plants and animals from their boat and trailer.

Displays

DNR staff use attractive aquatic invasive species table top displays at fairs, meetings, and other events. These are housed in regional offices throughout the state, and may be available for your group to borrow. Contact your local Aquatic Invasive Species Coordinator (see page 81 for more information.

Videos

Stop Exotics, Clean your Boat



This eleven minute video features John Ratzenberger (famous for his roll as "Cliff" on Cheers) and highlights steps that boaters can take to prevent the spread of exotic plants and animals. For more information visit: www.seagrant.umn.edu/exotics/stop.html To order, contact MN Sea Grant at (218) 726-6191 or fill out the online order form at: www.seagrant.umn.edu/pubs/mailorder.html cost $10.

Restoring the Balance: Biological Control of Purple Loosestrife

This video presents a good summary of the purple loosestrife problem, why chemical and mechanical control methods haven't been sufficient, and the case for biocontrol, including safety issues. Item # 147VBCPL. Available from Cornell University at orderbook@cupserv.org, or CUP Services, 750 Cascadilla St., PO Box 6525, Ithaca, NY 14851; FAX (607) 277-6292; phone (607) 277-2211; cost $27.95. Bulk discounts may be available.

Rearing of Biological Control Agents for Purple Loosestrife

This video has more detailed information and video on rearing Galerucella ("Cella") beetles and raising Hylobius weevils. Item # 147VRBCA. Available from Cornell University at orderbook@cupserv.org, or CUP Services, 750 Cascadilla St., PO Box 6525, Ithaca, NY 14851; FAX (607) 277-6292; phone (607) 277-2211; cost $27.95. Bulk discounts may be available.

Presentations

Exotics To Go! Presentations and Publications to Prevent the Spread of Aquatic Nuisance Species (CD)

This CD was designed for people in need of materials to give presentations about zebra mussels and other aquatic nuisance species. It contains 7 "conveniently wrapped" PowerPoint® presentations – including scripts, images, and talking points. Use the presentations as they are or adapt the presentations to suit your needs. Twenty-two informational publications in PDF format and lists of people to contact about aquatic invasive

species are also included. For more information visit: www.seagrant.umn.edu/exotics/exoticstogo.html To order, contact MN Sea Grant at (218) 726-6191 or fill out the online order form at: www.seagrant.umn.edu/pubs/mailorder.html Cost $4.50.

* Three of these presentations are included on the enclosed CD with permission from the authors.

Presentations on the CD

The following presentations and scripts are included on the enclosed CD:

Aquatic Exotics – A general presentation on aquatic invasive species, including a number of species profiles. Written by Doug Jensen, University of Minnesota Sea Grant Program, also included on the Exotics to Go CD (University of Minnesota Sea Grant Program)

Mussel Menace…Zebra Mussels and You – Includes information on zebra mussels, control, and boat protection. Written by Doug Jensen, University of Minnesota Sea Grant Program, also included on the Exotics to Go CD (University of Minnesota Sea Grant Program)

Protecting Boats and Motors from Zebra Mussels – Details on how to protect boats from zebra mussels. Written by Fred Snyder, Ohio State University Sea Grant Program, also included on the Exotics to Go CD (University of Minnesota Sea Grant Program)

There Goes the Neighborhood… – This presentation introduces the concept of invasive species and highlights 4 problem species in Wisconsin (Wisconsin Lakes Partnership)

Invasive Species – Fact or Fiction? – This presentation consists of a series of statements about invasives species, with the script explaining which statements are true and which are false. Not intended as a stand-alone presentation, portions of this may be inserted into other presentations as needed (Wisconsin DNR)

Aquatic Exotics in Wisconsin – An introduction to aquatic invasive species and profiles of 6 species found in Wisconsin (Wisconsin Sea Grant)

These can be used as-is, or modified to suit your needs. Note: Distribution maps may have changed since the creation of the CD – for Wisconsin distribution maps and information, visit the DNR web site at: dnr.wi.gov/invasives for updated distribution information. For updated national distribution maps, visit the USGS web site: nas.er.usgs.gov

Public Service Announcements

In Wisconsin, a unique partnership was formed between the Sea Grant program and Babe Winkleman, a well-recognized professional angler with his own TV show. Babe agreed to endorse PSAs created by Sea Grant with cooperation from the DNR. These PSAs can be made available to your group to use as part of your local outreach campaign. Contact Sea Grant (920-683-4697) or DNR (608-267-3531) for details.

Video Footage

The DNR has produced a 5 minute long b-roll (edited raw footage) tape, copies of which were sent to all major TV news stations in the state. The footage features multiple shots of Eurasian water-milfoil and zebra mussels, and also shows boaters and anglers taking the appropriate prevention steps. The DNR is willing to supply your group with a copy of this b-roll footage to for you to share with local TV stations. Contact the Aquatic Invasives Education Specialist at (608) 267-3531 for more information.

Resources for educators

Most of the resources listed below, along with many others, are also included in: Aquatic Invasive Species: An Educator's Information and Materials Guide, produced by Minnesota Sea Grant found online at: www.seagrant.umn.edu/exotics/ais_guide.pdf

Classroom Resources and Curricula

Attack Pack – A self-contained teaching kit designed to help high school students teach younger students about invasive species. The kit includes maps, brochures, Watch cards, overheads, PowerPoint® presentations, specimens and activities. It is free to teachers and schools. Contact Phil Moy, Wisconsin Sea Grant, at (920) 683-4697 or e-mail: pmoy@uwc.edu. View pack contents at: seagrant.wisc.edu/ais/ (see sidebar)

Biological Control of Purple Loosestrife, 4-H Youth Guide – This 48-page manual shows students in grades 9-12 how, with the right tools and adult guidance, to raise and release beetles that feed only on purple loosestrife. Written 5/2001. Item #4-H-917. Order from Purdue University, call (888) 398-4636, ask for the Media Distribution Center, or order online at www.ces.purdue.edu/new (click on Education Store) Cost $2

Biological Control of Purple Loosestrife, 4-H Leaders' Guide – This manual features activities that teach youth about wetlands, invasive species, and biological control, particularly how to raise and release Galerucella beetles to help control purple loosestrife. It contains answers to activities in the youth manual and FAQs, links to science standards (for teachers), and 10 appendices with additional information. Written 5/2001. Item #4-H-918. Order from Purdue University, call (888) 398-4636, ask for the Media Distribution Center, or order online at www.ces.purdue.edu/new (click on Education Store) Cost $8.

Community Stewardship Projects on Exotic Aquatic Species – A booklet of activities and stewardship projects developed by students as part of the "Exotics Aquatics on the Move" education project. Contact Sea Grant at (217) 333-9441 or white2@uiuc.edu or download the booklet at: www.iisgcp.org/edk-12/community/steward.htm

(EATM) Exotic Aquatics on the Move – 27 classroom activities that align with National Geography Education Standards by linking ANS (Aquatic Nuisance Species) activities and projects from the Exotic Aquatics on the Move workshops, held in Indiana, Louisiana, New York, and Washington. These interpretive activities also facilitate community awareness of exotic aquatic species and improve understanding of how these species affect humans and how humans affect their dispersal and population distribution. Contact Robin Goettel, IL/IN Sea Grant at goettel@uiuc.edu. Cost: $4.50 (CD) includes shipping. Sample Activities at: www.iisgcp.org/edk-12/eatm/eatm.htm

ESCAPE – Exotic Species Compendium of Activities to Protect the Ecosystem (ESCAPE) is a collection of activities developed from the Exotic Species Day Camp Project for Educators. This package includes 36 user-friendly sets of lessons that incorporate experiments, art, music and games. The project was conducted by Programs in the Great Lakes Sea Grant Network. For more information contact: Sea Grant at (217) 244-8809 or thalles@uiuc.edu. Visit: www.iisgcp.org/edk-12/escape/escape.htm to view sample activities and for ordering information Cost: $58

Great Lakes Invasion Curriculum Guide – This guide will give students a good introduction to aquatic invasive species and is a helpful teaching tool to enhance biology/ecology/environmental science lessons. Creative and fun activities! Developed by Illinois-Indiana Sea Grant and The Chicago Tribune News in Education. Available at: www.iisgcp.org/edk-12/invasion/invasion/htm

Invasive Species of the Great Lakes Kit – This kit was designed to help students understand the effects of invasive species and why we should help to prevent their spread. The kit contains preserved samples of eight invasive species in safe, nonformaldehyde NASCO Guard®. A complete teacher's guide contains maps, activities, games, and information regarding this worldwide environmental problem. Available from NASCO (product number LS03762(X)MH) – to order or for more information, visit the NASCO E-catalog at: www.nascofa.com/prod/Home?seqid=3 and search by product number, or call (800) 558-9595 Cost $45.

See Cella Chow! A Purple Loosestrife Biological Control Manual for Teachers – A set of 14 curricular activities focusing on wetland ecology and function, invasive species and their effects and, the specific process of developing, rearing and releasing beetles to control purple loosestrife. Contact Brock Woods, Wisconsin DNR at (608) 221-6349 or brock.woods@dnr.state.wi.us, or WI Wetlands Association at (608) 250-9771 for a free copy. The entire publication can be downloaded at: dnr.wi.gov/org/es/science/publications/ss981_2003.htm

Web Resources for Educators

EEK! Alien Invader web pages, WI DNR's online magazine for kids: dnr.wi.gov/org/caer/ce/eek/earth/aliens.htm

Nab the Aquatic Invader! Be a Sea Grant Super Sleuth: sgnis.org/kids

National Invasive Species Council: Aquatic and terrestrial invasive species educational resources: www.invasivespecies.gov/education/act.shtml

T.E.A.C.H. Great Lakes, the Education and Curriculum Homesite, Great Lakes Commission, Non-native invasive species pages: www.great-lakes.net/teach/pollution/ans/ans_1.html

Web resources

Photo galleries

(Online photos of aquatic invasive species with photo credits provided – can be used in presentations, publications, etc.)

Center for Aquatic and Invasive Plants: aquat1.ifas.ufl.edu/welcome.html

Michigan Sea Grant Graphics Library: miseagrant.umich.edu/gphotos

National Sea Grant Network Exotic Species Graphics Library: www.sgnis.org/publicat/slide/catalog1.htm

UW Herbarium: (photos may be reproduced for educational purposes with credit to the Herbarium as photo source) www.botany.wisc.edu/wisflora

Information Clearinghouses/databases

APIRS online database of aquatic, wetland and invasive plants: plants.ifas.ufl.edu/search80/NetAns2

Sea Grant Nonindigenous Species Site (SGNIS): www.sgnis.org

National Aquatic Nuisance Species Clearinghouse: www.aquaticinvaders.org/nan_ld.cfm

PLANTS Database, Natural Resources Conservation Service, USDA: plants.usda.gov

Other Web sites

Aquatic Nuisance Species Task Force (ANSTF): www.anstaskforce.gov

Aquatic Plant Management Society (APMS): www.apms.org

Center for Aquatic and Invasive Plants, University of Florida: aquat1.ifas.ufl.edu

Cornell University Department of Natural Resources: Biological Control of Non Indigenous Plant Species: www.invasiveplants.net

EPA Office of Water: www.epa.gov/watrhome

Great Lakes Indian Fish and Wildlife Commission's (GLIFWC) Exotic Plant Information Center: www.glifwc.org/epicenter

Great Lakes Information Network (GLIN): www.great-lakes.net

Habitattitude Campaign – Protect our environment by not releasing unwanted fish and aquatic plants: www.habitattitude.net

Illinois/Indiana Sea Grant: www.iisgcp.org

Invasive Plant Association of Wisconsin: www.ipaw.org

Maine Department of Environmental Protection Invasive Aquatic Species Program: www.state.me.us/dep/blwq/topic/invasives

Michigan Invasive Plant Council: forestry.msu.edu/mipc

Midwest Invasive Plant Network: mipn.org

Minnesota DNR Harmful Exotic Species: www.dnr.state.mn.us/ecological_services/invasives.html

Minnesota Sea Grant Exotic Species www.seagrant.umn.edu/exotics

Non-Native Invasive Species - Eastern Region, USDA-Forest Service: www.fs.fed.us/r9/wildlife/nnis

North American Lake Management Society: (NALMS) www.nalms.org

Plant Conservation Alliance's Alien Plant Working Group: www.nps.gov/plants/alien

Sea Grant Nonindigenous species home page: www.sgnis.org

Stop Aquatic Hitchhikers! Campaign: www.protectyourwaters.net

USDA Aquatic Weed Laboratory, UC Davis: wric.ucdavis.edu/exotic/exotic.htm

U.S. Geological Survey Nonindigenous Aquatic Species: nas.er.usgs.gov

Washington State Department of Ecology: www.ecy.wa.gov/programs/eap/lakes/aquaticplants

Wildland Invasive Species Team: tncweeds.ucdavis.edu/esadocs.html

Wisconsin Vascular Plants wiscinfo.doit.wisc.edu/herbarium

Wisconsin DNR Invasive Species: dnr.wi.gov/invasives

Wisconsin Sea Grant Nonindigenous Species: seagrant.wisc.edu/ais

Wisconsin State Herbarium: www.botany.wisc.edu/herbarium

Accompanying CD contains:

Aquatic Invasive Species Manual

Getting In Step (EPA publication)

DNR/UWEX Publications

Aquatic Invasive Species Grants: At A Glance

Aquatic Invasive Species Grants – In depth fact sheet

Clean Boats, Clean Waters Program Brochure

Eurasian Water-milfoil/Northern Water-milfoil Card

Eurasian Water-milfoil Fact sheet (customizable)

Exotics Advisory Fact sheet (customizable and print-ready versions)

Help Prevent the Spread Flyer (customizable and print-ready versions)

Lake Planning Grants Factsheets

Lake Protection & Certification Grants Factsheets

Protect Your Boat and Engine From Zebra Mussels

Recognizing Eurasian Water-milfoil and Native Look-a-Likes Fact sheet

See Cella Chow – Biological Control Manual

Stop the Invasion Poster

Stop the Spread Insert (customizable and print-ready)

Summary – State Aquatic Invasive Species Comprehensive Plan

The Facts on Eurasian Water-milfoil Brochure

Wisconsin Wild Cards

Zebra Mussel Boater's Guide

Sea Grant Publications

Aquatic Invasive Species: An Educator's Information and Materials Guide

Invasive Aquatic Plants – What every plant enthusiast should know

Round Gobies Invade North America Fact sheet

Ruffe: A New Threat to Our Fisheries Fact sheet

Rusty Crayfish: A Nasty Invader Fact sheet

The Spiny Waterflea Bythotrephes cederstroemi – Another Unwelcome Newcomer to the Great Lakes Fact sheet

Zebra Mussels in North America Fact sheet

Zebra Mussels: Questions and Answers for Inland Lake Managers Fact sheet

Lake Line Articles (NALMS publication)

Crayfish

Curly-leaf Pondweed

Eurasian water-milfoil

Non-indigenous Plans

Prevention and Control

Purple loosestrife

Round goby

Ruffe

Zebra mussels

Educational Program Resources

Building Capacity: Community-Based Environmental Education in Practice

Building Capacity: Educating for Community Action

Building Capacity: From Transferring to Transforming

Engaging Learners in Learning: A Checklist for Face-to-Face Settings

Physiological Factors in Adult Learning

Quick Reference: Community-Based Social Marketing

Seven Characteristics of Highly Effective Adult Learning Programs

Presentations

Aquatic Exotics

Aquatic Exotics in Wisconsin

Invasive Species – Fact or Fiction?

Mussel Menace…Zebra Mussels and You

Protecting Boats and Motors from Zebra Mussels

There Goes the Neighborhood…

CHAPTER 7

Species Specific Information

Several of the aquatic invasive species of greatest concern in Wisconsin are profiled on the following pages. However, the list of species included here is not comprehensive. Unfortunately, new species are introduced over time. Visit the DNR (dnr.wi.gov/invasives) and Sea Grant (www.seagrant.wisc.edu/ais) web sites for updates on these species and information on others, including additional wetland species and potential future threats.

Species profiles are included for the following species:

Eurasian water-milfoil

Purple loosestrife

Rusty crayfish

Zebra mussels

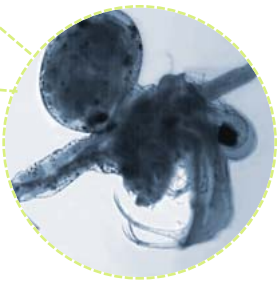
Round goby

Sea lamprey

Eurasian ruffe

Curly-leaf pondweed

Spiny and Fishhook waterfleas



Eurasian Water-milfoil

Myriophyllum spicatum

Description

UNIVERSITY OF MICHIGAN SEA GRANT

Eurasian water-milfoil (EWM) is an invasive, underwater aquatic plant accidentally introduced in the 1940s to North America from Europe, where it is widespread. It most likely came to eastern North America via the aquarium trade, introduced when aquarium owners released the contents of their aquariums into local lakes. EWM flourished and began to spread westward by clinging to recreational boats. EWM first arrived in Wisconsin in the 1960s. During the 1980s, it began to move from several counties in southern Wisconsin to lakes and waterways in the northern half of the state. (For current Wisconsin distribution information, visit dnr.wi.gov/invasives)

EWM is one of eight water-milfoil species found in Wisconsin and the only one that is not native. The most common native water-milfoil in Wisconsin lakes is northern water-milfoil (Myriophyllum sibericum). It bears a strong resemblance to EWM but it is not prone to the rapid growth and canopy formation that make EWM a nuisance. It is important to be able to distinguish EWM from similar aquatic plants.

- ✘ EWM is a submersed aquatic plant with feather-like leaves arranged in whorls (circles) on the stem.
- ✘ There are usually 12 to 21 pairs of leaflets per leaf.
- ✘ The leaves have a distinct featherlike appearance, with the lower leaflet pairs about half the length of the midrib.
- ✘ Stem tips are tassel-like. Branching is abundant in water 3 to 10 feet deep.

Why is Eurasian Water-milfoil a Concern?

EWM can form thick underwater stands of tangled stems and vast mats of vegetation on the water surface, especially in shallow, nutrient-rich water. These mats can limit boating, swimming, and fishing. Milfoil generally does not produce mats on the surface in water more than 15 feet deep, and doesn't usually grow in water more than 20 feet deep.

EWM can disrupt the ecology of a water body by crowding out native aquatic plants. Because it interferes with shoreline access to shallow waters, it can adversely affect property values. Under severe conditions, property owners and

lake associations can expect increased costs to keep boat channels open by mechanical harvesting and costs associated with disposal of rotting vegetation. The City of Sturgeon Bay, Wisconsin spends over $100,000 annually on the control of EWM. Statewide, this plant costs citizens of Wisconsin millions of dollars annually.

How does Eurasian Water-milfoil spread?

EWM plants spread naturally through underground runners, but the most troubling aspect of EWM is its ability to spread through fragmentation. Stem pieces only two inches (5 cm) long can take root and start new colonies when deposited in new waters or in other areas of a lake. The fragments are transported by watercraft or on waves and currents to new areas where they can root and grow. The stems break easily and become tangled on propellers and trailers as a boat is retrieved from the water. If not cleaned off, these fragments can introduce the plant to new waters.

How can you prevent the spread of Eurasian Water-milfoil?

EWM may become tangled in boat propellers, transducers, trim tabs, bow lines, fishing nets, and on trailers. Actions you take as a responsible boater are critical in preventing the spread of Eurasian water-milfoil to other waters.

* Inspect and remove aquatic plants, animals, and mud from boat, trailer, and equipment before leaving the water access;
* Drain water from boat, motor, bilge, live wells, and bait containers before leaving the water access;
* Dispose of unwanted bait in the trash;
* Spray/rinse boats and recreational equipment with high pressure and/or hot tap water (> 104˚ F), especially if moored for more than a day, OR
* Dry boats and equipment thoroughly for at least 5 days.

What are the about Eurasian Water-milfoil regulations in Wisconsin?

It is unlawful in Wisconsin to:

* Place a boat or trailer with attached aquatic plants or zebra mussels into Wisconsin waters.

Management and Control

Once EWM is well established in a lake, it is nearly impossible to eradicate. It does not cause severe problems in every water body, when it does become problematic, several management options are available. *Most management options require a DNR permit. Before engaging in any aquatic plant management or nuisance control activities, contact your local Aquatic Plant Management Coordinator. For more information, visit:*
www.dnr.wi.gov/org/water/fhp/lakes/aquaplan.htm

Early detection of EWM growth is critical in stopping the plant from becoming a widespread problem. The best chance to halt this non-native invader is when it first appears on the scene. EWM often appears near boat landings and at disturbed sites. New colonies are best removed before they expand. Hand pulling and removal from the water is a simple and effective control method for small areas. Harvesting, raking, or screening the bottom also works well. Milfoil can be effectively treated with selected chemicals early in the summer before plants flower. A permit is required from the DNR for chemical treatment or bottom screening. Whole-lake herbicide treatment is not generally permitted because of the potential to disrupt lake ecosystems by eliminating both invasive and beneficial native plants.

For lakes dominated with beds of milfoil, control efforts must be focused on reducing its spread. Mechanical harvesting can open areas for boating and swimming and cut fish cruising lanes. Harvesting encourages growth of native plants while removing milfoil canopies that limit native plant growth.

Biological control of EWM is still uncertain. A small aquatic weevil (Euhrychiopsis lecontei) feeds on milfoil and actually prefers EWM to our native milfoils. Weevils are found in many Wisconsin lakes. To locate a weevil, look in milfoil stems for signs of damage. There are often small holes or weak spots in the stems that point to weevil damage. These holes allow water to enter the stem, expose the plant to bacterial infection and decrease the plant's buoyancy. The plant will drop lower into the water column and will not canopy out on the surface. Over time, weevils can impact the populations of EWM, but complete eradication is unlikely. Additional research and development is needed before biological control with weevils can be considered an effective management tool.

EWM Publications (see Publications section for more information):

The Facts on Eurasian Water-milfoil Brochure	(DNR publication number WT-781)
Eurasian water-milfoil/Northern water-milfoil ID card	(DNR publication number WT-394)
Recognizing Eurasian Water-milfoil and Native Look-A-Likes Fact Sheet	(DNR publication number WT-783)
Eurasian Water-milfoil Watch Card	(DNR publication number WT-745)
Eurasian Water-milfoil Wildcard	(DNR publication number WT-741)

*See accompanying CD for EWM article from Lake Line, a publication of the North American Lake Management Society.

Purple Loosestrife

Lythrum salicaria

MINNESOTA SEA GRANT

Description

Purple loosestrife is a European perennial herb 3-10 feet tall with a dense bushy growth of 1-50 stems. The stems, which range from green to red to purple, die back each year. Showy flowers vary from purple to magenta and bloom from July to September. Leaves are opposite, nearly linear, and attached to four- to many-sided stems without stalks. This plant's optimal habitat includes wet soils of marshes, stream margins, alluvial flood plains, sedge meadows, and wet prairies, but it is tolerant of both shallow water and drier soil sites, once established. Purple loosestrife has also been planted in lawns and gardens, which is often how its seed has gotten into many of our wetlands, lakes, and rivers.

This species may be confused with a variety of native plants, especially two close native relatives. Wing-angled loosestrife (Lythrum alatum) is found in southern moist prairies or wet meadows and water willow (Decodon verticillatus) is a plant of marl bottomed water edges. How to distinguish these and 10 other native look-a-likes from purple loosestrife is described in DNR's Purple Loosestrife brochure (Publication number WT-799, See Chapter 6).

Purple loosestrife probably first arrived in ballast water of ships sailing from Europe during the 1800s. Spreading naturally and as a popular garden perennial it has since extended its range to include most temperate parts of the United States and Canada.

Purple loosestrife was first detected in Wisconsin in the 1930s, but remained uncommon until the 1970s. It is now widely dispersed in the state, having been recorded in all 72 of Wisconsin's counties. Low densities in most areas suggest the plant is still in an early stage of establishment. Heaviest infestation is in the southeastern corner of the state, sections of the Wisconsin River and the Wolf and Fox River drainage systems, the shores of Green Bay, and the Ashland-Superior area. (Current distribution information is available on the Great Lakes Indian Fish and Wildlife Commission web site, www.glifcw-maps.org).

Why is purple loosestrife a concern?

Purple loosestrife displaces native wetland vegetation and degrades wildlife habitat. Rare plants are often the first species to disappear. It can overrun wetlands thousands of acres in size, reduce or eliminate native animals, and degrade recreation by choking waterways.

How does purple loosestrife spread?

A mature plant can annually produce over 2 million tiny seeds, its primary dispersal agent. It can also grow from bits of root or broken stem that readily root in moist soil. Water, animals (especially birds), boats, construction equipment, and people can transport its seeds long distances and they may remain viable in soil for many years. Some uninformed gardeners still buy or trade and plant purple loosestrife.

All sunny wetlands, including temporarily wet fields and roadside ditches, are susceptible to purple loosestrife invasion. A new infestation usually starts with a few transported seeds that produce pioneering plants. These quickly build up a large seed bank in the soil. Disturbances, such as water draw-downs, accelerate the invasion by providing open substrate and sunlight for seedlings that quickly fill the wetland with loosestrife.

How can you help prevent the spread of purple loosestrife?

- Inspect for and remove aquatic plants, mud, and seeds from boats, trailers, gear, clothing and footwear used in infested areas before moving to un-infested areas.
- Learn to identify purple loosestrife, pull young, small plants wherever found, and report all infestations to the DNR at brock.woods@dnr.state.wi.us, using a form at dnr.wi.gov/org/caer/ce/news/on/3200119.pdf
- Encourage your local highway department to find alternatives to mowing the plant. Mowing usually helps to spread roots and seeds if timed poorly.
- Help curb local use of the plant – discourage local cultivation and distribution.
- Actively work to control purple loosestrife in a wetland near you.
- Teach about purple loosestrife and citizen action using materials found at www.dnr.wi.gov/org/es/science/publications/ss981_2003.htm

What are the purple loosestrife regulations in Wisconsin?

By law, purple loosestrife is a nuisance species in Wisconsin. It is illegal to sell, distribute, or cultivate the plants or seeds, including any cultivars of *lythrum salicaria* (purple loosestrife).

Management and Control

Evaluate each site to choose the best method(s) of control. Factors include site type, level of infestation, resources available, and site goals. Balance short and long term control strategies. Get details from your regional DNR Aquatic Plant Management Coordinator.

Mechanical and Chemical Methods

These methods offer quick and up to 95% control, but can be disruptive, require follow-up for years to catch missed plants and new seedlings, and be expensive on large areas. Thus, they are often practical only on smaller sites. Some work well in tandem with biocontrol. Minimize site disturbances that expose loosestrife seed, and destroy all removed loosestrife by drying and burning or landfilling, not composting.

- Hand Pulling/Digging A very important prevention method, it is usually done with small numbers of small, young plants, especially in loose, sandy, or gravely soil. Older and larger plants often require extensive digging or break when pulled, leaving the roots to re-sprout, making this method ineffective or even counter-productive.
- Cutting Cutting all loosestrife stem tops on a site eliminates the current year's seed crop, but will have little long-term effect. It is often used in conjunction with establishing biocontrol insects to leave foliage for them. Tops should be cut just as plants are starting to flower.
- Herbicide Application Follow all label instructions and test to find the most effective herbicide concentrations for your plants. Acquire a free permit from your DNR regional office for herbicide work over water, an important environmental safeguard.
- On smaller sites, cut all loosestrife stems during active growth (usually mid summer) and immediately apply a glyphosate herbicide (20% to 40% active ingredient) to the stumps.

Use “Roundup” or equivalent product on drier sites and “Rodeo” or equivalent product on plants over standing water. Exercise care since glyphosate is nonselective and will kill any green foliage that it touches.

* On larger sites, carefully spray only loosestrife foliage during active growth with glyphosate or triclopyr herbicides. For sites with mainly broad-leaved plants use glyphosate (see above for appropriate products and care for different locations) in a foliar solution (about 1% active ingredient). Avoid spraying native plants to minimize damage. On sites with many native monocots, such as cattails, sedges, grasses, rushes or reeds, consider spraying loosestrife foliage with a triclopyr product such as “Renovate” (see label for concentration). It will kill only broad-leaved plants and should minimize damage to the most native plants there.

Biological Control - Using one organism to control another

The DNR and UW-Extension promote the use of natural insect enemies of purple loosestrife from Europe to control the plant. Careful research has shown several insects to be dependent on purple loosestrife, an effective control, and little threat to other plants. Biocontrol will not usually eliminate purple loosestrife, but should provide adequate control. And as loosestrife on a site diminishes, the insects fly to find other loosestrife infestations. Monitoring insect releases continues to ensure process safety and efficacy.

Biocontrol is likely the cheapest and best long-term control method, promising to greatly reduce the need for the other more costly and disruptive methods. Biocontrol usually takes several years to develop, so combining it with some above method(s) may give both good short and long-term control. For example, cutting flower tops and leaving lower foliage for development of newly placed biocontrol beetles may keep seed from large infestations out of surrounding areas while beetles develop.

Biocontrol is useful on any size site, especially large ones where no other control methods are practical, except where ill suited to insect success. Acquire and distribute enough biocontrol leaf beetles to provide the level of loosestrife control desired. Best is to propagate beetles outside at home, school or work with a cheap and easy rearing project sponsored by the DNR/UW-Extension PL Biocontrol Program. If propagation isn’t feasible, collect beetles if a local source exists, or buy them, and simply disperse them into the infested wetland. A free DNR permit is required to cultivate the purple loosestrife plants needed to raise the insects. Contact brock.woods@dnr.state.wi.us (608) 221-6349 for more information or to enroll in the Purple Loosestrife Biocontrol Program.

Purple Loosestrife Publications (see Publications section for more information):

Purple Loosestrife: A Major Threat to Wisconsin’s Wetlands and Waterways Brochure	(DNR publication number WT-799)
Purple Loosestrife: What You Should Know, What You Can Do	(DNR publication number WT-276)
See Cella Chow! A Purple Loosestrife Biological Control Manual for Teachers	(DNR publication number SS-981)
Purple Loosestrife Watch Card	(DNR publication number WT-744)
Purple Loosestrife Wild Card	(DNR publication number WT-740)

*See accompanying CD for purple loosestrife article from Lake Line, a publication of the North American Lake Management Society.

Rusty Crayfish

Orconectes rusticus

Description

Rusty crayfish (Orconectes rusticus) are native to streams in the Ohio River Basin states of Ohio, Kentucky, Illinois, Indiana, and Tennessee. They were likely introduced to Wisconsin waters primarily by anglers who used them as live bait. They are still sold as bait (see law below) and by biological supply companies.

Adults are generally 3-5 inches long (excluding claws). Their claws are typically larger and smoother than many other crayfish. They also tend to have an oval gap when closed. "Rusties" often have characteristic rust-colored spots on their sides. Rusty crayfish are prolific; females lay from 80-575 eggs!

Why are rusty crayfish a concern?

Rusty crayfish eat small fish, insects, and fish eggs. They also eat aquatic vegetation, damaging underwater habitat that is important for fish spawning, cover, and food. They are more aggressive than native crayfish and better able to avoid fish predation, allowing them to displace native crayfish.

How do rusty crayfish spread?

It is thought that many populations started with bait bucket releases by anglers. They may also become established if released by aquarium hobbyists or teachers who were keeping them as study specimens.

How can you help to prevent their spread?

Do not release live crayfish (or any other plants or animals) into waters of the state. Do not fish with live crayfish. To be safe, always dispose of unused live bait in the trash, not in the water.

What are the regulations about rusty crayfish in Wisconsin?

It is illegal to possess both live crayfish and angling equipment simultaneously on any inland Wisconsin water (except the Mississippi River). It is also illegal to release crayfish into a water of the state without a permit. A fishing license is required to harvest crayfish.

JEFF GUNDERSON MINNESOTA SEA GRANT

Rusty Crayfish Publications

(see Publications section for more information):

Rusty Crayfish Watch Card
(DNR Publication number WT-752)

Rusty Crayfish Wild Card
(DNR Publication number WT-739)

Rusty Crayfish: A nasty invader
(fact sheet on CD)

*See accompanying CD for crayfish article from Lake Line, a publication of the North American Lake Management Society.

Zebra Mussels and Quagga Mussels

Dreissena polymorpha and dreissena bugensis

GREAT LAKES SEA GRANT NETWORK

Description

Zebra and quagga mussels are small, rarely exceeding about 1½" in length. Their shells have alternating light and dark stripes from which they get their name. When the flat edges of their shells are placed on a flat surface, quagga mussels will tip over, zebra mussels will not. Both attach to hard surfaces with byssal threads. Quagga mussels are able to survive in deeper water and are even displacing zebra mussels in parts of the Great Lakes. Otherwise, the two species are quite similar - the zebra mussel information included below applies to quaggas, as well.

Where did they come from?

Like many of our recent invaders, zebra and quagga mussels are native to the Black and Caspian Sea region of Europe.

How did they get here?

They came to the United States in the ballast water of ocean-going ships. Zebra mussels were first found in Lake St. Clair in the mid 1980s. In only a few years they spread throughout the Great Lakes and by 1999 had expanded their range all the way to the Gulf of Mexico. Quagga mussels were introduced into the Great Lakes in the early 1990s. (For current Wisconsin distribution information, visit the DNR web site at: dnr.wi.gov/invasives, for current national distribution information, visit USGS web site, nas.er.usgs.gov)

How do they spread?

Zebra mussels have a microscopic planktonic larva called a veliger. Veligers are invisible to the naked eye and can float in the water for three weeks to three months depending on water temperature, allowing them to move downstream in currents and to be carried in water transported by boaters and anglers. Zebra mussels can reproduce from spring to late fall and their larvae can be present in the water well into winter. They may also spread as juveniles and adults attached to hard substrate such as plants, boat hulls, motors, anchors or any submerged object.

What do they do?

Unlike our native freshwater mussels that burrow in the sediment (such as barnacles) zebra mussels attach to hard surfaces. This characteristic makes them troublesome for municipal water and power facilities and anyone else who uses lake or river water. As the larval zebra mussel grows it settles and sticks to just about any submerged hard surface. This may include rocks, stumps, boats, weeds, other mussels, motors, piers and the inside of water intake pipes.

Once inside a water intake pipe the mussels can form layer upon layer of living mussels, enough to clog or significantly impede the flow of water in the pipe. Great Lakes water treatment plants and electricity generating plants spend millions of dollars annually to keep their intake pipes clear of zebra mussels.

This same colonizing and clogging ability can also be a problem for boaters if they leave their boat in the water all summer. Zebra mussels colonize water intake grids and sea lockers on boats too. Fire suppression and cooling systems may become inefficient or inoperable once clogged with the mussels. (See article included on the accompanying CD for information on how to protect your boat from zebra mussel damage.)

Perhaps of greater interest to anglers are their effects on fish habitat. Zebra mussels are filter feeders. They pump water over their gills and filter out small animals and plants (plankton) for food. A single adult zebra mussel can filter a liter (~1.2 qts.) of water per day. As they feed, zebra mussels remove plankton from the water. This can make the water clearer. As the water clears light can penetrate deeper. Light sensitive fish such as walleye may move to deeper waters than traditionally found. Greater light penetration can also allow weed beds to increase both in density and depth. At the extreme this can interfere with boating and other recreational activities.

Zebra mussel feeding can also affect the aquatic food web. Zooplankton (animal plankton) forms the first food for many of our favored sport fish. This zooplankton relies on phytoplankton (plant plankton) for food. As zebra mussels filter plankton from the water they are competing with larval fish or their forage for food. Zebra mussels are glutinous feeders, filtering more food particles than they can consume. The excess food is egested in a mucous covered packet called pseudofeces. Pseudofeces settles on the bottom and creates a new food supply for bottom dwelling insects, worms and crustaceans. This can increase the food supply for bottom feeding fish or their prey, so the impact of zebra mussels is twofold: they remove food from the water column and deposit it in a different form on the bottom.

Finally, zebra mussels are bioaccumulators; they accumulate contaminants present in the water at three to five or as much as 10 times the concentration in the water. As the zebra mussels themselves become food for fish and birds the concentration of the contaminants can increase in successive steps as they pass up the food chain.

What are the zebra mussel regulations in Wisconsin?

It is unlawful in Wisconsin to:

- Place a boat or trailer with attached aquatic plants or zebra mussels into Wisconsin waters.

Prevention:

The following simple steps help to prevent the spread of zebra mussels while boating and fishing.

- Inspect and remove aquatic plants, animals, and mud from boat, trailer, and equipment before leaving the water access;
- Drain water from boat, motor, bilge, live wells, and bait containers before leaving the water access;
- Dispose of unwanted bait in the trash;
- Spray/rinse boats and recreational equipment with high pressure and/or hot tap water (> 104˚ F), especially if moored for more than a day, OR
- Dry boats and equipment thoroughly for at least 5 days.

Zebra Mussel Publications (see Publications section for more information):

Zebra Mussel Boaters Guide Brochure	(DNR Publication number WT-383)
Zebra Mussel Watch Card	(DNR Publication number WT-730)
Zebra Mussel Wild Card	(DNR Publication number WT-738)
Zebra mussels in North America: The invasion and its implications	(fact sheet on CD)
Boaters: Take action against zebra mussels	(fact sheet on CD)
Zebra Mussels: Questions and Answers for Inland Lake Managers	(fact sheet on CD)

*See accompanying CD for zebra mussel article from Lake Line, a publication of the North American Lake Management Society.

Round Goby

Neogobius melanostomus


DAVID JUDE

Description

Round gobies are small bottom-dwelling fish with large pectoral fins and an unusual single, fused pelvic fin that is shaped like a suction cup. This characteristic helps to distinguish them from native sculpins. They are usually 3-6 inches long, though some may reach 10 inches.

Where did they come from?

Gobies came from the Caspian Sea region of Europe. They were first found in the Great Lakes in 1990 in the St. Clair River in Michigan.

How did they get here?

Gobies hitched a ride in ballast water of ocean going vessels. First deposited in Lake St. Clair, they are now present in all the Great Lakes to various degrees, as well as the Mississippi River watershed, and are extending their range. (For current regional distribution information, visit USGS web site, nas.er.usgs.gov)

How do they spread?

Gobies can spread on their own by swimming and through population expansion. They reproduce quickly and can become quite abundant. Anglers can inadvertently spread gobies if they are used as bait.

What are their effects?

Round gobies are fierce competitors for food. They out-compete our native bottom dwelling fish such as sculpins and log perch, forcing them out of their living spaces and spawning sites. Gobies are also voracious egg predators. They get so numerous that even smallmouth bass that guard their eggs cannot successfully defend their nests from the onslaught of hungry gobies. Smallmouth bass pulled off their nests by anglers in the spring may find few if any eggs remaining when they return to their nests upon release. Gobies also consume eggs of other fish that broadcast their eggs or build nests in the cobble substrate preferred by gobies. These fish might include walleye, sunfish, lake trout and other salmonids.

Gobies can reproduce up to six times a summer, allowing their populations to expand rapidly. As they become abundant in near shore areas they may be a nuisance to anglers fishing with worms or other invertebrates. They are bait stealers, often getting caught in the process.

Where are they found?

Gobies are most commonly found in cobbled areas near shore, but do range into water as deep as 50 feet.

Prevention

Unless they happen to spread as larvae or eggs, preventing the spread of gobies is simple: don't use them as bait and be certain they are not included in the minnows sold to you as bait. Always dispose of unused live bait in the trash, not in the water. In many jurisdictions it is illegal to possess a live goby.

Round Goby Publications

(see Publications section for more information):

Round Goby Watch Card
(DNR Publication number WT-743)

Round Goby Wild Card
(DNR Publication number WT-734)

Round gobies invade North America (fact sheet on CD)

*See accompanying CD for round goby article from Lake Line, a publication of the North American Lake Management Society.

Sea Lamprey

Petromyzon marinus

Description

Sea lampreys (Petromyzon marinus) are primitive, jawless fish native to the coastal regions of the Atlantic Ocean. Unlike other fish that are found in and around Wisconsin, they possess no scales, paired fins, swim bladders, or bones. Sea lampreys' specialized months allow them to attach to the sides of host fish and feed on body fluids.

Until 1919, sea lampreys were prevented from entering the Great Lakes by Niagara Falls, which acted as a natural barrier. When the Welland Canal was deepened, it became possible for ships, as well as the sea lamprey, to bypass the falls and enter the Great Lakes. By 1938 the sea lamprey had invaded all of the Great Lakes.

DAVID BRENNER

Why are sea lampreys a concern?

Sea lampreys are parasites, and each lamprey can destroy up to 40 pounds of fish in its lifetime. They prey on a variety of large fish, including lake trout and whitefish. In the 1940s and 1950s, sea lamprey populations in the Great Lakes exploded and there were no effective controls. This contributed to the collapse of populations of a number of large fish in the Great Lakes.

Sea lamprey control

Sea lamprey populations in the Great Lakes are currently kept in check through aggressive control using several methods, including lampercide (a selective chemical) application, barrier installation (preventing them from traveling up streams to spawn), sterile-male release, and trapping. These techniques have successfully reduced sea lamprey populations by an estimated 90%. While it is likely impossible to eliminate sea lampreys from the Great Lakes, these controls have allowed fish populations to rebound.

Sea Lamprey Publications (see Publications section for more information):

Sea Lamprey Wild Card (DNR Publication number WT-737)

Eurasian Ruffe

(pronounced like “rough”)

Gymnocephalus cernuus

Description

The ruffe is a small, perch-like fish. Because they are a member of the perch family, ruffe may be mistaken for a young walleye or yellow perch. Here are some ways to tell them apart:

Distinguishing characteristics:

- ✘ Ruffe are small; adults average 4-6 inches in length
- ✘ They have spiny dorsal and anal fins
- ✘ Ruffe have a large dorsal fin; the spiny and soft-ray portions of the fin are joined.
- ✘ There are dark spots between the spiny rays of the dorsal fin
- ✘ Ruffe have no scales on their head
- ✘ When handled, ruffe are quite slimy

Ruffe are fast growing and have a high reproductive capability. They mature in about two or three years. They spawn between mid-April and July depending on water temperature. Females tend to live longer than males, with an average life span of seven years; males live from three to five years. Ruffe grow rapidly and can begin to reproduce at one to two years of age. Females produce up to 200,000 eggs per season allowing rapid population growth.

GARY CHOLWEK

Like other invasive species, they tolerate a wide range of environmental conditions. In its native range, the ruffe is found in fresh to brackish waters with salinity up to 5 ppm. Ruffe prefer lakes or slow moving rivers with soft bottoms. They do well in turbid waters but are found in deep, clear lakes too.

Where are they from and how do they spread?

The native range of the ruffe includes northeastern France, England, the rivers entering the Baltic and White Seas, most of Siberia, and the Baltic Sea. Its spiny and slimy characteristics make it unsuitable as a forage and bait fish and it has little or no commercial value. The ruffe probably came to the United States in the ballast

water of ocean-going vessels. First found in western lake Superior in 1986, it has spread along the southern shore of Lake Superior and has been found in Thunder Bay in Lake Huron, in Thunder Bay, Ontario on the northern shore of Lake Superior and in Escanaba in Lake Michigan. (For current regional distribution information, visit USGS web site at: nas.er.usgs.gov)

The most likely means of spread for this invasive fish is range expansion on its own and through inadvertent introductions through ballast water. It is possible that the Lake Huron and Lake Michigan populations are new introductions and were not spread from Lake Superior. It could also spread if mixed with wild-harvested minnows used or sold as bait.

What are their effects?

Ruffe may disrupt the Great Lakes fisheries through competition for food with young and adults of native species. They have the potential for rapid population growth. A large, new population of ruffe in a Great Lakes ecosystem could mean less food and space for other fish with similar diets and feeding habits. Young ruffe will compete with young perch, walleye and other zooplankton-eating fish. Adult ruffe will compete with fish that eat soft-bodied, bottom dwelling invertebrates. Though ruffe have poor eyesight they can feed in total darkness using sensory organs called neuromasts. These organs are located in canals in the head of the ruffe and can detect minute water currents such as those caused by the movement of gills on the abdomen of a mayfly.

Prevention

In Minnesota and Wisconsin it is illegal to possess or transport a live ruffe. Ruffe cannot be used as bait by anglers, and bait dealers who trap in areas infested with ruffe should take special precautions to insure they are not contributing to the spread of this invasive species. Always dispose of unused live bait in the trash, not in the water.

Ruffe Publications (see Publications section for more information):

Ruffe Watch Card	(DNR Publication number WT-742)
Ruffe Wild Card	(DNR Publication number WT-733)
Ruffe: A new threat to our fisheries	(fact sheet on CD)

*See accompanying CD for ruffe article from Lake Line, a publication of the North American Lake Management Society.

Curly-leaf pondweed

Potamogeton crispus

Description

Curly-leaf Pondweed was likely accidentally introduced to the U.S. along with the common carp in the 1800s, and was established in the Midwest by the 1930s. It is a submersed aquatic plant, though its stems can reach the surface, forming mats. Its leaves are reddish-green, oblong, and about 3 inches long, with distinct wavy edges that are finely toothed. The stem of the plant is flat and reddish-brown. Curly-leaf beds may start in 1-2 feet of water and extend out to 10-12 feet or more.

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

V. RAMEY, UNIVERSITY OF FLORIDA

Why is curly-leaf a concern?

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

How does curly-leaf spread?

Similar to Eurasian water-milfoil, curly-leaf pondweed can be spread between waterbodies on boats and equipment.

How can you help prevent the spread?

- Inspect and remove aquatic plants, animals, and mud from boat, trailer, and equipment before leaving the water access;
- Drain water from boat, motor, bilge, live wells, and bait containers before leaving the water access;
- Dispose of unwanted bait in the trash;
- Spray/rinse boats and recreational equipment with high pressure and/or hot tap water (> 104° F), especially if moored for more than a day, OR
- Dry boats and equipment thoroughly for at least 5 days.

What are the regulations about curly-leaf pondweed in Wisconsin?

It is unlawful in Wisconsin to:

- Place a boat or trailer with attached aquatic plants or zebra mussels into Wisconsin waters.

Management and control

Once curly-leaf is well established in a lake, it is nearly impossible to eradicate. It does not cause severe problems in every water body, but when it does, several management options may be available. Just as with Eurasian water-milfoil, physical, mechanical, and chemical options are all used to control curly-leaf, depending upon the extent of the infestation and other characteristics of the infested waterbody.

Long-term management requires the reduction or elimination of turions to interrupt the life cycle. To have the maximum benefit, manual/mechanical efforts (such as raking, hand-cutting, or harvesting) as well as chemical control efforts should be undertaken in the spring or early summer, when native plants are still dormant.

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

Most management options require a DNR permit. Before engaging in any aquatic plant management or nuisance control activities, contact your local Aquatic Plant Management Coordinator.
Visit www.dnr.wi.gov/org/water/fhp/lakes/aquaplan.htm for more information.

Curly-leaf Pondweed Publication (see Publications section for more information):

Curly-leaf Wild Card (DNR Publication number WT-759)

*See accompanying CD for curly-leaf pondweed article from Lake Line, a publication of the North American Lake Management Society.

Spiny Waterflea

Bythotrephes cederstroemi

Fishhook Waterflea

Cercopagis pengoi

MINNESOTA SEA GRANT

Description

Both species of waterfleas entered the Great Lakes in ship ballast water from Europe – the spiny waterflea arrived in the 1980s, followed in the 1990s by the fishhook waterflea. One or both species are now found in all of the Great Lakes. (For current regional distribution information, visit USGS web site at: nas.er.usgs.gov) Spiny waterfleas were found in the Gile Flowage, a lake in Iron County near Lake Superior, in September 2003. This is the first time the invasive waterfleas have been found in an inland Wisconsin lake.

Only about ¼ to ½ inches in length, individual waterfleas may go unnoticed. However, both species tend to gather in masses on fishing lines and downrigger cables, so anglers may be the first to discover a new infestation.

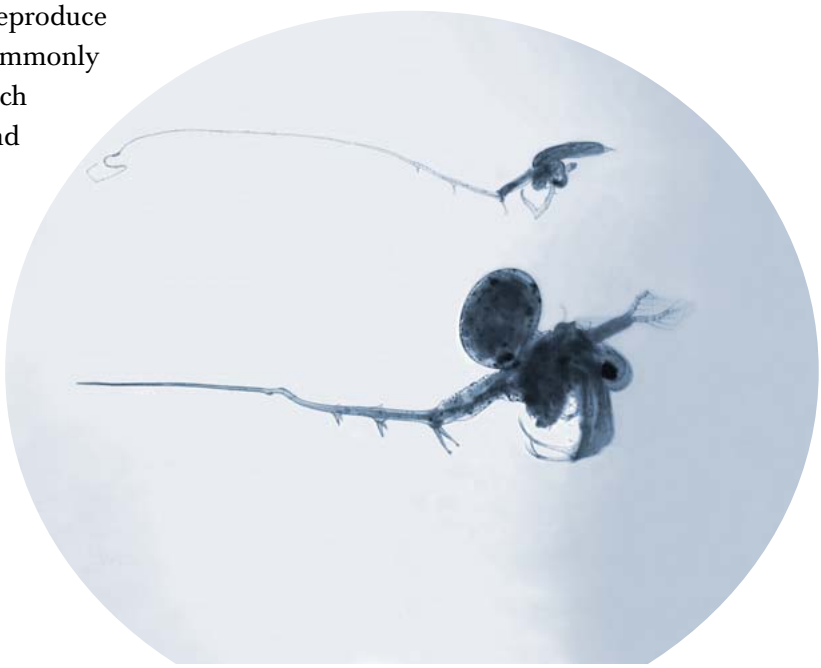
Spiny and fishhook waterfleas are predators – they eat smaller zooplankton (planktonic animals), including Daphnia (native waterfleas). This puts them in direct competition with juvenile fish for food.

Why are invasive waterfleas a concern?

These tiny predators complete directly with young fish for food. Additionally, young fish have trouble eating them due to their long, spiny tails. Therefore, invasive waterfleas have the potential to disrupt food webs.

The spiny and fishhook waterfleas reproduce rapidly through parthenogenesis, commonly known as asexual reproduction, which means that no males are required and populations can explode in number. Therefore, a single female has the potential to start a new population.

Both waterfleas reproduce asexually in summer and can gather in masses on fishing lines and downrigger cables. These masses can clog the first eyelet of rods, damage a reel's drag system, and prevent fish from being landed.



HANK VANDERPLOEG, NOAA GREAT LAKES

How do they spread?

Fishing, boating, and other water recreational equipment can transport waterfleas and their eggs to new water bodies. Their resting eggs can survive long after the adults are dead, even under extreme environmental conditions. So care must be taken not to transport water between waterbodies and to remove all waterfleas and eggs from equipment.

How can you help prevent their spread?

Waterfleas spread to inland waters when fishing gear is contaminated with egg-laden females. Take care to clean fishing equipment.

Before going from one waterbody to another:

- Inspect and remove aquatic plants, animals, and mud from boat, trailer, and equipment before leaving the water access;
- Drain water from boat, motor, bilge, live wells, and bait containers before leaving the water access;
- Dispose of unwanted bait in the trash;
- Spray/rinse boats and recreational equipment with high pressure and/or hot tap water (> 104° F), especially if moored for more than a day, OR
- Dry boats and equipment thoroughly for at least 5 days.

Spiny and Fishhook waterflea Publications (see Publications section for more information):

Waterflea Watch Card (DNR Publication number WT-753)

Waterflea Wild Card (DNR Publication number WT-760)

Spiny Water Flea, Bythotrephes cederstroemi: Another unwelcome newcomer to the Great Lakes (fact sheet on CD)

CHAPTER 8

Prevention steps

Chapter 2 highlighted the process that led to the development of national guidelines for recreational water users to prevent the spread of aquatic invasive species. Prevention steps for a number of water users are included below, along with web sites where additional information can be found. Boat wash stations are often discussed as a tool for preventing the spread of invasive species, so some guidance/considerations on boat wash stations is also included.

Boaters and anglers

Prevention steps for boaters and anglers should be as follows (with only minor differences, "wash" instead of "rinse" might be an example):

- Inspect and remove aquatic plants, animals, and mud from boat, trailer, and equipment before leaving the water access;
- Drain water from boat, motor, bilge, live wells, and bait containers before leaving the water access;
- Dispose of unwanted bait in the trash;
- Spray/rinse boats and recreational equipment with high pressure and/or hot tap water (> 104° F), especially if moored for more than a day, OR
- Dry boats and equipment thoroughly for at least 5 days.

Additional steps for…

Personal watercraft:

- Avoid running engine through aquatic plants;
- Run engine for 5-10 seconds on the trailer to blow out excess water and vegetation from internal drive, then turn off engine;
- Remove aquatic plants and animals from water intake grate, steering nozzle, watercraft hull, and trailer.

Sailboats:

- Remove aquatic plants and animals from hull, centerboard or bilgeboard wells, rudderpost area, and trailer.

More detail is also available for the steps presented above. While this expanded level of detail isn't recommended for standard outreach materials that go to boaters and anglers – remember keep things simple! – it is helpful for special circumstances. For example, to clean hard-to-treat equipment, like the sampling nets and other materials used by agency staff, the recommendation is:

- Use hot (> 40° C or 104° F) or salt water to clean your equipment.

The following recipes are recommended for cleaning hard-to-treat equipment that cannot be exposed to hot water:

- Dipping equipment into 100% vinegar for 20 minutes will kill harmful aquatic hitchhiker species.

- A 1% table salt solution for 24 hours can replace the vinegardip. This table provides correct mixtures for the 1% salt solution in water:

Gallons of Water	Cups of Salt
5	⅔
10	1¼
25	3
50	6¼
100	12⅔

- If hot water is not available, spray equipment with high-pressure water.

- Dry equipment. If possible, allow for 5 days of drying time before entering new waters.

Waterfowl Hunters

In addition to following the prevention steps for boater and anglers presented above, it is recommended that waterfowl hunters:

- Remove aquatic plants, animals, and mud from boat, motor, trailer, waters or hip boots, decoy lines, and anchors (elliptical and bulb-shaped anchors can help reduce snagging aquatic plants);

- Drain water from decoys, boats, motors, etc.;

- Cut cattails or other plants above the waterline when they are used for camouflage or blinds.

SCUBA Divers

In addition to following the prevention steps for boaters and anglers presented above, it is recommended that SCUBA divers:

- Remove aquatic plans, animals and mud from all equipment, including regulators, masks, snorkels, and other dive gear;
- Drain water from buoyancy compensator (bc), regulator, tank book, and other containers;
- Rinse suit and inside of bc with hot water;
- Dry gear, suit, and other equipment thoroughly.

Seaplanes

Seaplanes have the potential to transport aquatic invasive species between waterbodies. The following prevention steps are recommended:

Before take-off:

- Remove aquatic plants and animals (e.g., zebra mussels) from floats, rudders, cables, transom, chine, wheel wells, and step area;
- Pump water from floats;
- Avoid taxiing through heavy growths of aquatic plants;
- Raise and lower rudders several times to free aquatic plants.

After take-off:

- Raise and lower rudders while over waters you are leaving or over land. If plants remain, return to that waterbody to remove.

Regular Maintenance – Use one or more of the following methods:

- Spray floats with high-pressure water;
- Dry floats by storing aircraft on land for at least 5 days;
- Scrub or scrape undersides of floats (when spraying or drying is not possible) especially if moored for more than a day.

The prevention steps listed above correspond to those presented in the Stop Aquatic Hitchhikers! campaign. To view additional detailed information, visit www.protectyourwaters.net.

The web site and associated Stop Aquatic Hitchhikers! materials are part of the ANS Task Force public awareness campaign, and are sponsored by the U.S. Fish and Wildlife Service and the U.S. Coast Guard. Any organization, agency, club etc. can sign on to become a partner in the campaign… many state agencies nationwide have done so, including Wisconsin DNR. Including the Stop Aquatic Hitchhikers! logo on publications and using their campaign materials is another way to make materials created in Wisconsin, whether at a statewide or local level, consistent with others used nationwide.

Aquarium hobbyists and water gardeners

If you have acquired undesirable aquatic plant or fish species for your aquarium or water garden, it is important not to release these plants or animals into the environment. While most of these organisms will die, some may be able to survive. And a smaller number of those that do survive have the potential to create negative impacts on our natural environment and our wallets and misperceptions about your hobbies.

So, if you are faced with the situation of having an undesirable species, what can you do? By choosing between several alternatives, you can properly dispose of these unwanted aquatic plants or fish.

- ✻ Educate yourself about your hobby's potential environmental consequences;
- ✻ Adopt these alternatives to release as responsible consumer behaviors:
    - Contact retailer for proper handling advice or for possible returns
    - Give/trade with another aquarist, pond owner, or water gardener
    - Donate to a local aquarium society, school, or aquatic business
    - Seal aquatic plants in plastic bags and dispose in trash
    - Contact veterinarian or pet retailer for guidance about humane disposal of animals
- ❖ Model and promote these behaviors within your peer groups as ways for aquarium hobbyists and water gardeners to show their environmental values;
- ✻ Become involved with policy solutions.

The prevention information listed above is part of the national Habitattitude campaign, sponsored by Sea Grant, the Pet Industry Joint Advisory Council, and the U.S. Fish and Wildlife Service. More details can be found at: www.habitattitude.net

BOAT WASH FACILITIES

So you're considering a boat washing facility…

DNR and Extension staff receives a number of questions on the feasibility of installing boat washing stations at water access sites. (See Chapter 3 for legal questions and answers concerning boat launches and wash stations.) The stations could be used as tools to reduce the risk of transport of aquatic invasive species by recreational boaters. Wisconsin has not conducted any studies to determine the feasibility of using boat wash facilities. 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. From those studies, we have learned:

① Boat washing facilities should not be considered as 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 invasive species program is a consistent list of prevention steps, which is emphasized in all public education brochures, pamphlets, watch cards, public service announcements and signage. Those steps can be found on page 114 of this chapter. Boat washing is just one of the prevention steps, and installation of a wash station should accompany other education efforts focusing on all of the steps.

② Boat washing stations are a costly alternative to an effective watercraft inspection program and a well-planned education campaign.

There are several issues to consider before the installation of washing stations:

① Costs for construction and maintenance of these facilities;

② Physical constraints for installation of the stations;

③ Washing cannot be made mandatory for all boaters;

④ Safety of the facility and liability are issues;

⑤ Practical concerns about how best to capture and treat the waste water;

⑥ Boaters acceptance of delays due to washing; and

⑦ Unresolved legal questions related to whether fees can be charged for cleaning boats as a condition of launching.

③ There are circumstances and situations under which it may be advisable to install a boat wash facility.

If prevention and containment is a serious issue or a condition of a permit or if there is a venue where 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), a boat wash facility may serve an important purpose. 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 organizations are considering installing and operating a boat wash station, the following is a list of guidelines that should be followed:

- The wash station should be part of an overall watercraft inspection and education program, not simply a substitute for other prevention steps;
- Do not require washing as a condition of launching but rather treat boat washing as a voluntary option to ensure that boaters 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 or put all the waste in the trash;
- Give serious thought 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 issues and liability of a wash station and follow all OSHA regulations;
- Seek feedback on boater acceptance of the facility, if possible, to improve statewide understanding of the issue;
- Consider installing a boat washing facility for boaters leaving an infested waterbody to prevent the spread of invasive aquatic species to other waters;
- Stay at least 75 feet back from the lake with the placement of any wash station 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 are not included in the guidelines presented above. Lake organizations can contact their local DNR staff to obtain information on vendors in their area that could help the community decide what type of wash facility would be most effective for their particular launch site(s).

The key message that should be shared with all groups that may be interested in installing a boat wash facility is as follows: wash stations are a poor substitute for an effective education and watercraft inspection program that emphasizes the basic 'inspection and removal' message, BUT washing stations can be one component of an overall prevention and control strategy.