DEPARTMENT OF NATURAL RESOURCES

August 23, 2017

Senator Bill Ingebrigtsen, Chair
Environment and Natural Resources Finance Committee
3207 Minnesota Senate Building
St. Paul, MN 55155

Senator Carrie Ruud, Chair
Environment and Natural Resources Policy and Legacy Finance Committee
3233 Minnesota Senate Building
St. Paul, MN 55155

Representative Dan Fabian, Chair
Environment and Natural Resources Policy and Finance Committee
359 State Office Building
100 Rev. Dr. Martin Luther King Jr. Blvd.
St. Paul, MN 55155

Subject: Annual Invasive Species Report

Dear Senators and Representatives:

Minnesota Statutes (Chapter 84D.02 Subd. 6) require the Department of Natural Resources (DNR) to prepare and submit an annual report on invasive species of aquatic plants and wild animals to the legislative committtees having jurisdiction over environmental and natural resource issues. A copy of the recently completed report for the 2016 calendar year is provided. The comprehensive report includes a description of the DNR Invasive Species Program, progress in management of several species, education activities, watercraft inspections, regulations, enforcement activities, and expenditures.

Please contact Luke Skinner at 651.259.5106 or Luke.Skinner@state.mn.us if you have questions regarding this report.

Sincerely,

Tom Landwehr
Commissioner

c: Bob Meier, Assistant Commissioner
Luke Skinner, Director, Division of Ecological and Water Resources
Ann Pierce, Manager, Ecosystem Management and Protection Section
Legislative Reference Library

INVASIVE SPECIES 2016

ANNUAL REPORT

DEPARTMENT OF NATURAL RESOURCES

DEPARTMENT OF NATURAL RESOURCES

Ecological and Water Resources

500 Lafayette Road, St. Paul, MN 55155-4025

651-259-5100

For current invasive species regulations, a list of infested waters, species information, and local DNR contacts, visit www.mndnr.gov/AIS.

DNR Information Center

Twin Cities: 651-296-6157

Minnesota Toll Free: 1-888-646-6367

Telecommunication device for the deaf (TDD): 651-296-5484

TDD Toll Free: 1-800-657-3929

Submitted to: Environment and Natural Resources Committee of the Minnesota House and Senate

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Executive Summary

The Minnesota Department of Natural Resources (DNR) is pleased to submit the 2016 Invasive Species Annual Report to the governor, legislature and citizens of Minnesota. This report summarizes our efforts to prevent the introduction and spread of invasive species of aquatic plants and animals in Minnesota.

The report provides an overview of program activities, finances, prevention and management efforts, goals, highlights, partnerships, and future needs and plans for individual program areas.

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Invasive Species Program Overview

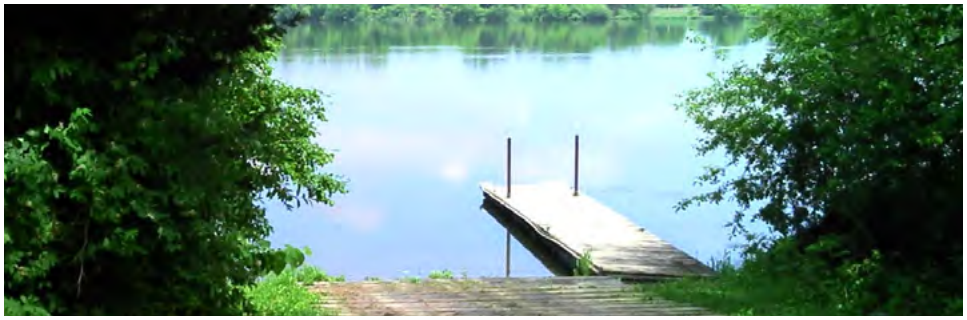
Invasive species have serious economic, environmental and recreational impacts in Minnesota. In 1991, the Minnesota Legislature directed the Minnesota Department of Natural Resources (DNR) to establish an Invasive Species Program. The program is tasked with preventing the spread of invasive species and managing invasive aquatic plants and wild animals (Minnesota Statutes 84D).

Program staff work with:

- local government units
- states, provinces, multi-jurisdictional and national groups
- the Minnesota Aquatic Invasive Species Research Center at the University of Minnesota
- the Aquatic Invasive Species Advisory Committee
- regional DNR staff and specialists in each of the four DNR regions. There are 24 full-time positions in the invasive species program.
- approximately 140 summer staff are hired by the program to inspect boats at public water accesses and help implement management activities.

All DNR staff have made a commitment to include invasive species prevention measures in their work under Operational Order 113.

DNR aquatic invasive species specialists examine native plants as well as invasive species.



Goals

The three primary goals of the DNR Invasive Species Program are to:

1. Prevent the introduction of new invasive species into Minnesota;
2. Prevent the spread of invasive species within Minnesota;
3. Reduce the impacts caused by invasive species to Minnesota's ecology, society, and economy.

The DNR's Invasive Species Program tracks invasive species in other areas of North America and the world, works with partners to understand and manage pathways of spread, and works to reduce the potential for their introduction and spread in Minnesota.

Examples of key invasive species not known to be in Minnesota include:

- Hydrilla, an invasive aquatic plant
- Water chestnut, an invasive aquatic plant
- Northern snakehead, an invasive fish

The program addresses invasive species in Minnesota, such as Eurasian watermilfoil, purple loosestrife, zebra mussel, spiny waterflea and starry stonewort. Efforts in this area include working to prevent further spread and to manage impacts from invasive populations.

The DNR's prevention and management activities hinge on collaboration with other states, agencies, and partners with similar concerns. Coordinated prevention efforts not only reduce the spread of invasive species, but also buy critical time needed for research and management that may provide long-term control solutions.

The program also addresses terrestrial invasive species on DNR-managed lands and provides information for private landowners. The program works to enhance the ability of DNR field staff to prevent and manage terrestrial invasive species effectively.

Key strategies include:

1. Generating awareness and conducting enforcement of Minnesota's invasive species laws;
2. Deepening partnerships with local governments, research institutions, interest groups, lake associations, related businesses and others;
3. Coordinating watercraft inspection and decontamination with counties, lake associations, resort owners and DNR Enforcement.
4. Verifying, reporting and responding to all new infestations immediately;
5. Coordinating invasive species management efforts, inventories, and sharing knowledge of aquatic and terrestrial invasive species.

For more information
www.dnr.state.mn.us/invasives.com

Highlights

- Since the first confirmation of starry stonewort in Minnesota in August of 2015, the DNR confirmed the invasive algae in seven more lakes in 2016. The DNR worked with lake associations and other stakeholders to attempt to eradicate starry stonewort in several lakes. The DNR also coordinated the first DASH (Diver-Assisted Suction Harvesting) treatment on a Minnesota lake (West Lake Sylvia, Wright County) and the first suction dredge treatment (Turtle Lake, Beltrami County). See the Management chapters for more information.
- Red swamp crayfish was confirmed in Minnesota in September. Red swamp crayfish have been listed as a prohibited invasive species, and therefore illegal to possess, sell, or import, since 2012. The DNR removed two specimens from Tilde Lake in Clay County, but found no additional crayfish in a follow-up search. The DNR will continue to survey the lake using targeted trapping in 2017.
- Compliance with aquatic invasive species laws has been steadily increasing. The DNR and partners' enforcement and education efforts have helped to push compliance above 95%, based on more than 417,000 watercraft inspections in 2016. See Watercraft Inspection and Enforcement chapters for details.
- Invasive Species Prevention Planners completed their second year of work. Their coordination with local government staff overseeing their county's aquatic invasive species prevention funds helped maximize the effectiveness of Minnesota's $10 million aquatic invasive species prevention aid program. See the Aquatic Invasive Species Prevention Aid chapter for details.
- In addition to DNR watercraft inspectors, the DNR provided watercraft inspection training to a record 857 tribal and local government unit (LGU) authorized inspectors working throughout the state—an increase from 705 trained LGU inspectors in 2015.
- The program implemented the aquatic invasive species Affirmation for Minnesota boaters and nonresident anglers. They now receive an affirmation card as they renew their licenses. Signing the card affirms they understand laws that prevent the spread of aquatic invasive species in Minnesota.
- The DNR launched mandatory AIS training for people convicted of violating AIS law during the 2016 boating season (required in M.S.86B.13). Enforcement issued 116 civil and criminal citations for AIS violations in 2016 and, as of the close of the year, 55% of violators had completed the mandatory training. The agency has followed up with the remaining violators to ensure completion before the start of the 2017 boating season. An additional 685 citizens voluntarily completed the training in 2016.
- 177 lake service provider businesses completed training and were issued permits by the end of the year. The DNR will launch online lake service provider training in 2017 to make it easier for providers to get their permits.
- The program is now using EDDMapS Midwest as an interface for reporting and mapping aquatic and terrestrial invasive species. Many U.S. states and Canadian provinces are using EDDMapS (Early Detection and Distribution Mapping System). EDDMapS can be found at: www.EDDMapS.org/midwest or downloaded onto a mobile device by searching for "GLEDN" in the device's app store.

9.16

Red swamp crayfish **confirmed in Minnesota**

For more information
www.EDDMapS.org/midwest

Program Finances

TIME FRAME

This report covers activities that took place in calendar year 2016: January 1 to December 31, 2016. However, to provide a comprehensive review of expenditures and to coordinate with the state funding cycle, we include expenditures incurred in fiscal 2016: July 1, 2015 to June 30, 2016.

FUNDING SOURCES

Funding for the Invasive Species Program comes from a variety of sources, including:

State Funds

- $1,370,844 from a $5 surcharge on watercraft registration (valid for three years) in Minnesota.
- $1,075,702 from a $5 fee on non-resident fishing licenses.
- $4,924,000 from a general fund appropriation (of this amount, $356,000 supported the terrestrial invasive species program).

Federal Funds

- Funds from the U.S. Fish and Wildlife Service (USFWS), including those from the Great Lakes Restoration Initiative, administered by U.S Fish and Wildlife Service, support the implementation of the Minnesota State Management Plan for Invasive Species including public awareness efforts, enforcement, and watercraft inspections. In fiscal year 2016, expenditures from federal sources totaled $473,000.

▲ *DNR and county staff share research and resources at the annual Upper Midwest Invasive Species Conference*

Local Funds

- During 2016, local groups receiving invasive species management or watercraft inspection grants from the DNR provided funding totaling $600,000 to control aquatic invasive plants and increase the number of watercraft inspections on specific lakes.

COST ACCOUNTING

Minnesota Statute (M.S. 84D.02 Subd. 6) identifies five expenditure categories that must be reported annually: Administration, Education/Public Awareness, Management/Control, Inspections/ Enforcement, and Research. A sixth category, State and Regional Coordination, covers a variety of program-wide activities that do not fit easily into the five reporting categories required by statute.

1. **Administration** - includes general office supplies, office rent, telephones, workers' compensation fees, computer support fees, the state accounting system fees, departmental operational support costs, as well as clerical and administrative support costs. Staff leave time (time used for holidays, sick leave, and vacation) has been apportioned across all categories based on the proportion of staff time invested in that category.
2. **Education/Public Awareness** - includes staff time, in-state travel expenses, fleet charges, mailings, supplies, printing and advertising costs, and radio and TV time to increase public awareness of aquatic invasive species. The costs of developing and producing pamphlets, public service announcements, videos, and similar material are included, as are the costs of developing and maintaining invasive species information on the DNR's website.
3. **Management/Control** - includes staff time, in-state travel expenses, fleet charges, commercial applicator contracts, and supplies to survey the distribution of aquatic invasive species in Minnesota and to prepare for, conduct, supervise, and evaluate control activities. Funds provided to local government units and organizations to offset the cost of Eurasian watermilfoil or curly-leaf pondweed management efforts also are included.
4. **Inspections/Enforcement** - includes the costs that conservation officers incur enforcing invasive species rules and laws, the costs of implementing watercraft

inspections at public water accesses, and staff time and expenses associated with promulgation of rules, development of legislation, conducting risk assessments, and other efforts to prevent the introduction of additional invasive species into Minnesota.

5. **Research** - includes staff time, travel expenses, fleet charges, supplies, and contracts with the University of Minnesota and other research organizations to conduct research studies. These studies include efforts to develop new or to improve existing control methods, better understand the ecology of invasive species, better risk assessment tools, and to evaluate program success.
6. **State and Regional Coordination** - includes general program planning, preparation of state plans and reports, and general invasive species coordination with a wide variety of groups. This category also includes the work of program staff as well as various managers in the Division of Ecological and Water Resources who periodically work on invasive species issues. Expenditures primarily represent staff time spent on these activities, as well as staff time and out-of-state travel expenses to work with regional and federal partners on aquatic invasive species issues; work activities that staff participate in to improve their skills, direct co-workers, or help on other projects; as well as fleet costs and the cost to purchase and repair boats, trailers, computers, and similar items.

FISCAL YEAR 2016 EXPENDITURES

Expenditures on aquatic invasive species activities during Fiscal Year 2016 (July 1, 2015-June 30, 2016) totaled $9,910,000.00

The pie chart below provides a broad look at how aquatic invasive species funding was spent in fiscal 2016. The focus on inspections and enforcement, along with Education/Public Awareness (which represents an additional 4% of fiscal 2016 spending), reflects the priority the DNR places on efforts to prevent the spread of invasive species and to help manage the problems those species cause.

Most of the funding for Management/Control was spent on Eurasian watermilfoil and curly-leaf pondweed. Funding was used for inventory, control, and grants for management of these two species.

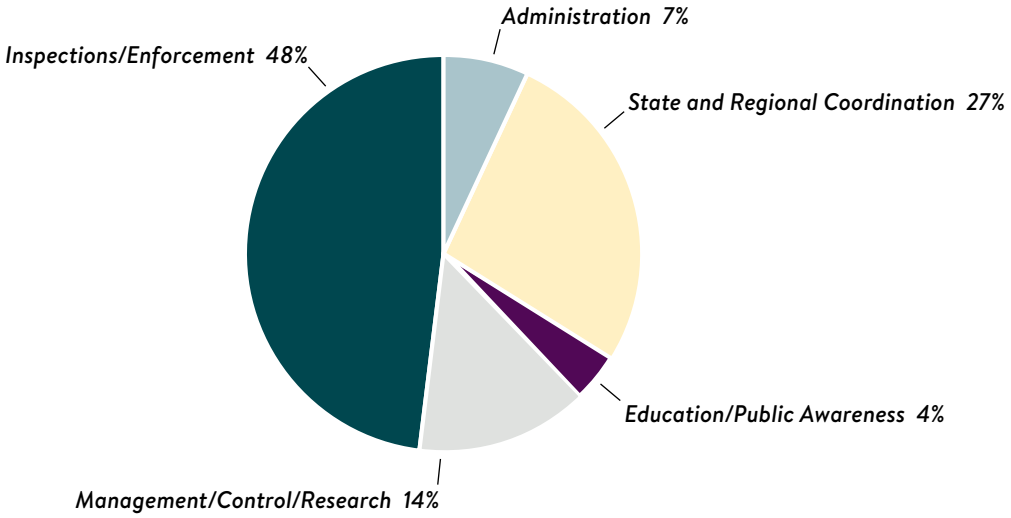
The following table lists expenditures from the Invasive Species Account and General Fund account, along with spending from other accounts including grants received from various state or federal funding sources, such as the USFWS.

The terrestrial invasive species program expended $334,667 in fiscal 2016. The work was funded exclusively from the General Fund. The terrestrial invasive species program also received a Legislative Citizen Commission on Minnesota Resources/Environmental and Natural Resources Trust Fund (LCCMR/ENTRF) grant for $140,000 for fiscal 2014, 2015 and 2016 work on biological control of garlic mustard. The project was contracted with the University of Minnesota and the remaining $40,000 was spent in fiscal 2016. Accomplishments for terrestrial invasive species management activities are covered on page 41.

The program spent $3,164,000 from the Invasive Species Account in fiscal 2016; less than the $3,242,000 appropriated by the Legislature. The Invasive Species Account will begin to go negative in fiscal 2016/2017, if the full appropriation is spent. General Fund expenditures were $4,759,000; less than the $4,924,000 appropriated by the Legislature.

INVASIVE SPECIES PROGRAM SPENDING

(Invasive Species Account, General Fund and federal dollars) in fiscal 2016 by major categories



Fiscal 2016 Income and Expenditures

The table below lists income from federal, state, and local sources, and expenditures from the Invasive Species Account and General Fund account. It also lists spending from other accounts, including grants received from various state or federal funding sources, such the USFWS.

FISCAL 2016 INCOME

Federal Funding: Implement State Management for Aquatic Nuisance Species						**Total** $990,895 in fiscal 2016*
State and Local Funding	Invasive Species Account	General Fund	Local Contributions	Heritage Enhancement	Environmental Trust Fund	
	$3,602,000	$4,924,000	$600,000			

FISCAL 2016 EXPENDITURES

	Invasive Species Account	General Fund	Local Contributions	Heritage Enhancement	Environmental Trust Fund	Other
Administration	$200,000	$403,000		$2,000		$4,000
State / Regional Coordination	$827,000	$1,396,000		$202,000		$21,000
Education/Public Awareness	$78,000	$194,000				$39,000
Management/ Control - Aquatic - Terrestrial	$240,000***	$673,000 $220,000	$600,000**	$626,000****	$44,000*****	$20,000
Inspections/ Enforcement	$1,814,000	$1,850,000				$389,000
Research - Aquatic - Terrestrial	$5,000	$13,000 $10,000			$40,000	
Total Expenditures Federal, State, and Local	$3,164,000***	$4,759,000	$600,000**	$830,000****	$84,000	$473,000

* Federal Grants to implement the State Management Plan for Aquatic Nuisance Species and to Prevent Invasive Carp awarded in 2016 will be spent in fiscal 2017/18.

** Totals include local match for Invasive Aquatic Plant control.

***Expenditures are less than the appropriation because spending the full appropriation would cause the account to go negative in fiscal 2016/17.

**** Includes funds for use specifically on invasive carp from the Lessard-Sams Outdoor Heritage Council awarded in fiscal 2013; the remainder will be spent in fiscal 2016/17.

***** Environmental Trust Funds were specifically for invasive carp management.

Prevention

Goals

The DNR's goals for aquatic invasive species prevention are to:

- prevent the spread of aquatic invasive species within Minnesota; and
- prevent the introduction of new invasive species to the state.

DNR-trained watercraft inspectors learn how to identify aquatic invasive species

Highlights

- Invasive species staff engaged with partners in a variety of prevention activities, such as delivering presentations to interested groups, inspecting docks and other equipment for aquatic invasive species, issuing infested waters and prohibited invasive species permits and following up on reports of new infestations of invasive species.
- The DNR awarded grants to local partners to fund watercraft inspections and helped provide informational signs for water accesses.
- The aquatic invasive species Affirmation card for Minnesota boaters and nonresident anglers, and mandatory AIS training for people convicted of violating AIS law, are important prevention measures that took effect in 2016.

REGIONAL PREVENTION ACTIVITIES

In 2016, regional invasive species staff engaged with partners to provide technical guidance, delivered presentations to a variety of groups, and participated in public awareness events such as outdoor shows. Invasive species specialists also provided customized training about how to prevent the spread of aquatic invasive species to groups such as lake service providers and minnow dealers to help them meet permit and certification requirements.

Other prevention activities that regional invasive species staff perform include:

- partnering with lake associations and other stakeholders to provide technical guidance regarding prevention activities on lakes around the state;
- searching for zebra mussels and other aquatic invasive species on water-related equipment on lakes and at public water accesses, in some cases working with a DNR Enforcement aquatic invasive species detection dog;
- inspecting lakes for aquatic invasive species, working with partners to perform early detection aquatic invasive species surveys, and following up on reports from lake users about suspected aquatic invasive species;
- releasing Galerucella beetles for biocontrol of purple loosestrife and providing collection maps and other resources to other partners for beetle releases;
- working with counties, aquatic invasive species task forces, and non-profit groups to effectively use the county funding dollars to raise awareness of aquatic invasive species and prevent their spread; and
- increasing public awareness of aquatic invasive species by sharing expertise with radio, newspaper and television outlets.

PERMITS

The DNR has authority to issue a number of permits to allow the public to conduct activities with invasive species or in listed infested waters. The DNR provides training to permittees to demonstrate ways to reduce the risk of spreading aquatic invasive species, and permit conditions require permittees to take actions to prevent the spread of aquatic invasive species. The DNR permits related to aquatic invasive species include: lake service provider permits, infested waters permits, prohibited invasive species permits, and bait harvest permits. The DNR also issues invasive aquatic plant management permits, which are discussed on page 34.

◀ *The AIS program conducts learning sessions for county staff, lake service provider businesses, and many other groups throughout the year.*

LAKE SERVICE PROVIDER PERMITS

Legislation authorizing a permit program for lake service providers to help prevent the spread of aquatic invasive species in the state took effect in 2012. Lake service provider business owners are required to complete aquatic invasive species prevention training and acquire a Lake Service Provider Permit before conducting work that involves decontaminating, installing, removing, or renting water-related equipment from or in state waters. Employees who work for a service provider must also successfully complete a free online training course and receive a training certificate. Permits and certificates are valid for three calendar years.

The Lake Service Provider Program is in the process of creating an online permit training option and updating the current online employee certificate training, scheduled to launch in 2017.

213 LSP owners trained

714 LSP employees trained

19 LSPs trained in decon

1157 LSPs permitted

2016 Activities

- DNR staff completed 17 in-person permit trainings for 213 lake service provider owners and managers and issued 177 permits to their businesses.
- 714 lake service provider employees completed mandatory online certificate training.
- The DNR trained 19 participants from 15 lake service provider businesses in hot-water/high-pressure decontamination skills during three, free events.
- A total of 1,157 businesses were permitted lake service providers at the end of 2016. The current list of permitted lake service provider businesses is posted on the DNR website.

Future plans

- Complete testing of new online lake service provider permit training and updated employee certificate training, scheduled to launch in 2017.
- Pilot aquatic invasive species outreach and communication materials for resorts and campground businesses to use with their visitors.

INVASIVE SPECIES AND INFESTED WATERS PERMITS

People need a permit to divert or transport water from listed infested waters (*Minnesota Rules*, part 6216.0500). In 2016, the invasive species program issued 33 infested waters permits, and 47 permits for water appropriation and work in public waters were issued through the DNR's Permitting and Reporting System (MPARS) with invasive species conditions.

People need a permit to possess, transport, sell, purchase, or import prohibited invasive species. The invasive species program issued 34 prohibited invasive species permits in 2016.

The DNR also developed several new general permits in 2016. Two permits allow people to possess certain preserved and herbarium specimens of prohibited invasive species provided they can comply with the permit conditions. Another permit is designed for fire departments who need to use infested waters for training purposes. A fourth permit allows a person to take and transport water for water quality sampling purposes.

PERMITS TO HARVEST BAIT FROM INFESTED WATERS

In Minnesota, commercial bait harvesters need a permit to work in listed infested waters. DNR Fisheries issues permits to licensed minnow dealers who work in infested waters. Permittees must successfully complete aquatic invasive species training and comply with permit conditions to prevent the spread of aquatic invasive species from infested waters. For example, permitted commercial bait harvesters must attach tags to equipment used in infested waters and they may not use that gear in waters other than those identified by the tag. In general, people cannot harvest bait for personal use from waters listed as infested with aquatic invasive species.

PREVENTION GRANTS AND SIGNS

DNR grants help lake associations, local citizen groups, coalitions of lake associations, and local government units implement locally-focused aquatic invasive species prevention activities such as watercraft inspections. In 2016, 21 entities received 7,152 hours of DNR staff time for watercraft inspections.

The DNR also funded the placement of signs at water accesses to educate water access users about how to prevent the spread of aquatic invasive species. The DNR made sign art available so cooperators could manufacture the DNR signs on their own; local partners can order a limited number of aquatic invasive species signs from the DNR to post with permission at water accesses.

REGULATIONS

Regulations, including laws and rules, are an important part of Minnesota's aquatic invasive species prevention strategy. The invasive species program works to review and refine state regulations to optimize legal authority for prevention of the import and introduction of invasive species and to clarify regulations for the public. That includes establishing new and revising existing regulations to address pathways of aquatic invasive species spread into and within the state, designating certain nonnative species as prohibited or regulated invasive species, and listing water bodies as infested with aquatic invasive species within our existing authorities.

Minnesota state law governing aquatic invasive species is primarily located in *Minnesota Statutes*, chapter 84D; however, authorities and prohibitions related to aquatic invasive species also can be found in: chapter 86B, Water Safety and Watercraft; chapter 97C, Fishing; and chapter 103G, Waters of the State. The administrative rules related to aquatic invasive species are primarily found in *Minnesota Rules*, chapter 6216.

Find current versions of statutes and rules at www.revisor.leg.state.mn.us

Past annual reports of the DNR's Invasive Species Program are also a good source of summaries of changes to statute and rule related to invasive species; many of these are available from the Minnesota Legislative Reference Library.

During the 2016 Regular Session of the Minnesota Legislature, several changes were made to invasive species laws. These provisions were part of the 2016 DNR policy and technical bill, introduced as HF2866/SF2793, and ultimately passed as part of the omnibus supplemental budget bill (chapter 189, Bill numbers HF2749/SF2356). Each short description below is followed by the location in statute that was changed; for full statutory language changes, see Appendix C.

Statutory changes in 2016

1. Made a technical correction to change the word "list" to "designate" in several locations in statute to ensure consistency with the language used in 84D with respect to the process used to classify invasive species (*Minnesota Statutes*, section 17.4982, subd. 18a; *Minnesota Statutes*, section 84.027, subd. 13).
2. Clarified that the definition of aquatic macrophytes includes aquatic plants and "macro" algae like starry stonewort, an aquatic invasive species first found in Minnesota in 2015 (*Minnesota Statutes*, section 84D.01, subd. 2).
3. Removed an exception that allowed people to have prohibited invasive species if the species was lawfully acquired dead or preserved and clarified that invasive species laws apply to invasive species in any life stage and whether they are alive or dead (*Minnesota Statutes*, section 84D.05, subd. 1; *Minnesota Statutes*, section 84D.075).
4. Provided an exception to allow commercial garbage haulers to transport aquatic plants without a permit (*Minnesota Statutes*, section 84D.09, subd. 2).
5. Clarified that invasive species laws apply when moving equipment over land from one water body to another water body (*Minnesota Statutes*, section 84D.10, subd. 4).

6. Authorized a pilot study, including permit authority, which would allow certain lake service provider businesses to replace equipment that came from Lake Minnetonka back into the same lake without removing zebra mussels (*Minnesota Statutes*, section 84D.108, subd. 2a; *Minnesota Statutes*, section 84D.11, subd. 1); the DNR will be required to submit a report on the pilot study (2016 Session Laws).
7. Specified civil penalties for certain aquatic invasive species violations that previously would "default" to criminal penalties (*Minnesota Statutes*, section 84D.13, subd. 4; *Minnesota Statutes*, section 84D.13, subd. 5).

The DNR also made changes to *Minnesota Rules* to designate starry stonewort as a prohibited invasive species, to classify water hyacinth as a regulated invasive species, to correctly list yabby (a crayfish) as an invertebrate, and to correct the spelling of scientific names of tilapia. These changes were made through an expedited permanent rulemaking, with the first notice published on November 16, 2015 (40 State Register 565) and the rule adopted in on August 1, 2016 (41 State Register 113). See Appendix C for the changes to the text of *Minnesota Rules*, part 6216.0250 and *Minnesota Rules*, part 6216.0260.

INFESTED WATERS

The DNR will add a lake, river, pond or wetland to the infested waters list if it contains certain aquatic invasive species that could spread to other waters. The DNR may also list a lake, river, pond or wetland as infested if it is connected to a body of water where an aquatic invasive species is present. To reduce the risk of spreading aquatic invasive species, activities like bait harvest, commercial fishing, and water use are managed differently in infested waters.

Most water bodies in Minnesota are not on the infested waters list – only about 5% of Minnesota's more than 11,000 lakes are on the infested waters list. Less than 2% of Minnesota lakes are listed as infested with zebra mussels, and the DNR has confirmed zebra mussels in only 1% of Minnesota lakes.

In 2016, the DNR added one water body with red swamp crayfish to the list of infested waters.

Download the current list of infested waters at www.dnr.state.mn.us/invasives/ais/infested.html

Find out if a specific lake is on the infested waters list, search Lakefinder at www.dnr.state.mn.us/lakefind

WATER BODIES LISTED AS INFESTED BY AQUATIC INVASIVE SPECIES

Species	Number of water bodies added to the infested waters list in 2016	Total number of water bodies on infested waters list
Eurasian watermilfoil	21	342
zebra mussel*	33	275
spiny waterflea	1	66
faucet snail*	6	44
bighead carp and silver carp	0	43
flowering rush	1	36
grass carp	0	11
starry stonewort	7	8
brittle naiad	0	4
round goby, ruffe, VHS, and white perch**	0	3
New Zealand mud snail	0	2
red swamp crayfish	1	1

*2016 totals include water bodies where the aquatic invasive species was newly discovered in 2016, plus connected water bodies that were listed as infested. See Appendix D for more detail.

**Totals for these species include "Lake Superior tributaries" as one listed water body instead of hundreds.

Prevention plans in 2017

Prevention is a key element in the state's plan to manage aquatic invasive species. Over the next year, the DNR will continue to:

- work with partners and stakeholders to plan and implement prevention activities;
- monitor the distribution of aquatic invasive species in the state;
- assess the risk of spreading aquatic invasive species during different activities; and
- improve and refine the DNR's aquatic invasive species prevention program and supporting regulations.

"Invasive species management is complicated and costly, which is why preventing new infestations is critical."

– Keegan Lund, invasive species specialist

DNR staff create hundreds of epoxy molds of actual invasive species, so people can see what they really look like.

Education and Public Awareness

Goals

- To provide the public with clear actions to prevent the introduction and spread of AIS through an understanding of the laws and recommended practices.
- To heighten public awareness of the important recreational and economic value of Minnesota's lakes, rivers, streams and wetlands.
- To raise public awareness of the potential for AIS to have negative environmental and economic impacts on Minnesota resources.
- To increase awareness of the DNR's AIS research, management and prevention efforts, and inform stakeholders, the public and other agencies of available training, funding and educational resources.

Highlights

STRATEGIC COMMUNICATIONS

- Two information officers serving the program serving the program on a part-time basis continued the integration of news and media relations, web, publications and graphic design, public access signs, advertising, and public interactions. In December, the program implemented the state's new branding and unified logo initiative, as seen throughout this report.
- The program expanded its commitment to the Community-Based Social Marketing (CBSM) model and presented CBSM overviews and trainings at numerous meetings and conferences. CBSM uses positive messaging and reinforcement to build community norms to encourage desirable behaviors.

- The DNR website "refresh" coincided with a program audit of AIS web pages and presence. Updates of AIS web pages will continue in 2017.

INFORMATIONAL MATERIALS

- Continued assessment and revision of all DNR AIS informational materials for public distribution. Along with expanded use of a service-marked "Clean In, Clean Out" icon, the program continued to refine public access signs, point of contact materials, and use of license Affirmation language for consistency and greater awareness.
- Updated invasive species content and advertising for the 2017 Minnesota Fishing Regulations handbook, which includes information about AIS laws and watercraft inspections, species identification information, advertising to remind anglers to help prevent the spread of AIS, and the infested waters list. More than 900,000 copies of the fishing regulations will be printed and distributed beginning in February.
- Reviewed and updated display materials for upcoming sport shows and other trade events and expositions.

ADVERTISING

- The program is continuing its research into the most effective traditional and new media advertising channels, with a particular focus on the new media advertising channels, including geo-fencing and other tools that reach targeted audiences on their smartphones and through social media channels. All materials are designed for smartphone functionality and reach, where most people can now be reached most effectively.
- Print and online materials focused on growing compliance with AIS laws, highlighting the "Clean, Drain, Dispose" and "Clean In, Clean Out" messages. Materials were designed to target boaters, anglers, and waterfowl hunters as well as cabin owners who remove docks in the fall.

▲ *Local government staff discuss AIS communication and outreach strategies and showcase local materials at a DNR-facilitated workshop.*

WEB/DIGITAL

- As mentioned above, AIS web pages are being updated for the 2017 season. Outdated pages/material are being deleted, and existing pages are being updated for consistent appearance, greater clarity and visual appeal, plain language and accessibility. Responsive design is being incorporated as much as possible, for the high percentage of people using mobile devices. Responsive design allows web content to display properly not only on computers but also on cell phones and other mobile devices.
- The program is increasingly making use of the DNR's social media accounts. These efforts are typically coordinated with media events or other major public information efforts.

MEDIA RELATIONS

- The program again issued a record number of news releases (39) in 2016. Along with information about new AIS confirmations, releases created greater awareness of the growing community of compliance with AIS laws, aggressive treatment of starry stonewort, advances in research and technologies, and the broad range of partnerships with stakeholders across the state.
- We also held several media events on the DNR's ongoing efforts to stop the spread of AIS. Events in 2016 focused on the fishing opener, the Governor's Water Action Week in April, zebra mussel-sniffing canine officers, starry stonewort treatments, and expanded enforcement efforts and county programs. Media events are well attended and generate substantially more earned coverage than news releases alone.

SHOWS AND FAIRS

- Invasive Species Program staffing of the DNR building and information booth at the Minnesota State Fair continued our annual effort to reach out and talk with fairgoers. DNR and partner brochures and information were distributed and frequent questions/concerns were tabulated for ongoing use.
- Staff participated in numerous county fairs, sports and outdoor shows, as well as other special events throughout the year to educate the public and distribute literature and information. Staff also made presentations to lake associations and community groups to answer questions and discuss invasive species issues and activities.

Partnerships

Other agencies and organizations in Minnesota have been cooperatively involved with public awareness efforts to prevent the spread of invasive species, and have partnered with the DNR on a variety of activities.

AIS Advisory Committee

The committee plays a vital role in reviewing and guiding the work of the DNR Aquatic Invasive Species Program. Their experience, vested interest, and engagement with other stakeholders informs the program regarding policy, outreach, research, and interactions with those affected by infestations and interactions with stakeholders.

MAISRC

The Minnesota Aquatic Invasive Species Research Center at the University of Minnesota is a valuable partner, working closely with the program on research and advances in AIS management. Many program staff attended MAISRC's annual showcase and explored new ways to work together.

Minnesota Sea Grant

Minnesota Sea Grant continues to partner with the DNR, Wildlife Forever, U.S. Fish and Wildlife Service, National Park Service, U.S. Forest Service, and other organizations to help prevent the spread of invasive species. Minnesota Sea Grant provides leadership and support in sharing the best available science to improve ballast water policy and assist in timely and effective implementation of ballast water management and control systems on vessels.

Wildlife Forever

Wildlife Forever is a key partner to help raise awareness about how to prevent the spread of AIS. The nonprofit organization leads the Stop Aquatic Hitchhikers! campaign in Minnesota and works with multiple partners to post highway billboards, print ads and PSAs throughout Minnesota and across the country.

The DNR trains watercraft inspectors and interns who help with AIS prevention.

Future Needs and Plans

- Continue the integration of the comprehensive invasive species communications plan.
- Find new ways to optimize both paid and earned media in the face of a rapidly changing media climate.
- Deepen engagement with CBSM experts and consultants, to more effectively build community norms and encourage desirable behaviors.
- Develop and use survey, pilot testing, and focus group instruments to more clearly understand and measure effectiveness of mutual communication efforts.
- Continue to teach DNR staff about plain language, CBSM, electronic information accessibility, and other communication components and techniques.
- Develop and implement a writing style guide to bring consistency and clarity to all written communications.
- Continue to work collaboratively with MAISRC, Minnesota Sea Grant, Wildlife Forever, and other stakeholders to pursue research and outreach funding through National Sea Grant, the Great Lakes Restoration Initiative, USFWS, foundations and other sources.

Enforcement

Goals

- Analyze the DNR's Aquatic Invasive Species (AIS) laws, with input from stakeholders:
  - Continue to work with the public and private entities on legislative issues, to provide enforcement with the tools necessary to assist in controlling the spread of AIS.
- Continue to emphasize AIS as priority work and a core responsibility:
  - Monitor and provide advanced training to all conservation officers, to ensure they have the knowledge they need to effectively enforce AIS laws.
  - Continue inspections by conservation officers, to reduce the risk of spreading AIS by water-related equipment.
  - Assist Level 1 and Level 2 inspectors at public access sites and investigate violations reported by inspectors.
  - Quickly respond to reports of new infestations.
  - Train local law enforcement to enforce invasive species laws.
  - Continue saturation details statewide to target high-priority areas.
  - Continue to analyze data, develop protocols, and secure needed equipment to safely and effectively administer AIS checkpoints.
- Work with internal and external stakeholders to identify the types of

◀ *Orange signs at public accesses indicate that the lake has been listed as infested with aquatic invasive species.*

activities that are likely to spread invasive species in Minnesota waters:

  - Provide information to the public, and work with lake associations, other user groups and media to help raise awareness about controlling the spread of invasive species. Continue attending statewide public input meetings to maintain and increase dialog with concerned citizens and user groups.

- Investigate non-traditional structures/watercraft being moved into Minnesota waters from infested water, and other pathways for spreading AIS, such as food markets, bait dealers, aquatic plant dealers, etc.:

  - Train and educate commercial entities to increase compliance with invasive species regulations.

Highlights

- During 2016, DNR conservation officers provided 15,258 hours of AIS enforcement and education.
- The Enforcement Division conducted numerous media interviews on the importance of AIS regulation compliance.
- The Enforcement Division's two zebra mussel detection canine officers assisted officers and inspectors during AIS enforcement efforts. The dogs improve the efficiency of conservation officers with faster and more thorough inspections of water-related equipment. The canine teams also provided educational demonstrations at the MN State Fair, Aquatic Invader's Summit, Upper Midwest Invasive Species Conference, and several other public events to bring awareness to AIS issues.
- Six conservation officers designated as water resource enforcement officers continued to dedicate a significant portion of their work toward AIS enforcement.
- Conservation officers staffed several AIS booths at major sport and outdoor shows and events in 2016.
- Enforcement worked with Ecological and Water Resources staff to create strategies and plans for statewide AIS work focus.

STATEWIDE CITATIONS 2016

- 123 total citations, civil and criminal
- 671 verbal warnings
- 93 citations by statute
- 657 verbal warnings by statute
- 7 citations by rule
- 14 verbal warnings by rule
- 23 civil citations

STATEWIDE OPEN WATER SEASON ENFORCEMENT RESULTS

As illustrated in the following two tables, compliance with invasive species regulations at Enforcement check stations decreased from 86% in 2015 to 82% in 2016. Compliance at check stations has sharply increased from 63% in 2012.

See chart below for summary of law enforcement AIS compliance checks in 2012-2016.

County	# of Insp.	Op. Hrs.	Vio. Delay	No Vio. Delay	Crim Cit.	Warning	Civil Cit.	Violation Rate
Olmsted	9	4	12	3.10	1	1	0	22%
Hennepin	10	4	15.30	2.30	1	1	2	40%
Meeker	35	6	12	2.76	0	0	4	11%
Washington	6	4	5	2	0	1	0	17%
Aitkin	104	3.5	9.87	2.15	0	1	14	14%
Aitkin	8	4	0	2	0	0	0	0%
LOW	63	4	4	1.81	2	3	0	8%
Freeborn	16	5	12.25	3	8	1	0	56%
Cass	69	4	3	1.20	0	9	3	17%
LOW	42	4	10.6	2.13	1	4	0	12%
Douglas	6	3	9	6	0	1	0	17%
Lyon	9	4	0	2.70	0	0	0	0%
Statewide totals and averages	**7.75 total**	**2.60 total**	**13 average**	**22 average**	**23 total**	**15.38% total**	**total**	**averages**

Delay: Time, in minutes, it takes for the DNR to complete an inspection with or without a violation, from the point they enter until they exit the check station.

DNR K9 Brady works with Conservation Officer Julie Siems to find zebra mussels on boats and trailers.

Partnerships

Enforcement of Minnesota's invasive species regulations is essential to the ultimate goal of preventing their spread into and across Minnesota. Conservation officers continue to work with lake associations, local governments, user groups and other DNR divisions to assist in sharing information about how to control the spread of invasive species.

Enforcement activities—whether educational opportunities or issuing citations and warnings—focus on compliance. Enforcement is a primary motivator to help change the behavior of those who may spread invasive species, whether intentionally or unintentionally.

Future Needs and Plans

The Enforcement Division continues to focus its efforts on enforcement and education, both proven to be critical tactics in reducing the spread of invasive species. We will continue to monitor and evaluate our actions to provide the most effective measures available. We will work with the public and private entities on legislative issues to provide enforcement with the tools necessary to prevent the spread of AIS. We also will continue to emphasize this as priority work and a core responsibility.

Enforcement will continue to plan, implement, execute and evaluate this type of natural resource enforcement to provide the most effective measures available now and into the future. This will be accomplished by our continued efforts in AIS enforcement, education, partnerships, and training. The division also will continue to work with the legislature to secure laws and funding for AIS work.

Watercraft Inspections

Goals

The Watercraft Inspection Program helps to prevent the spread of invasive species into and within Minnesota by:

- Conducting watercraft inspections at public water accesses across the state and requiring watercraft users to decontaminate their watercraft if aquatic invasive species (AIS) or water are found.
- Increasing public awareness about AIS and reducing the potential for boaters to transport AIS between water bodies.
- Increasing education efforts with citizen groups.
- Distributing information at events around the state.

Highlights

WATERCRAFT INSPECTIONS

In 2016, both the DNR and tribal or local units of government (LGUs) had authorized watercraft inspectors stationed at public water accesses across Minnesota.

- Approximately 116 DNR watercraft inspectors worked during the open water season (19 in Region 1; 34 in Region 2; 33 in Region 3; 30 in Region 4).

◀ *"Clean In Clean Out" zones stenciled at public accesses are a dedicated area to clean aquatic plants, animals and mud, drain all water and dispose of unwanted bait.*

- Through delegation agreements, tribal governments and LGUs employed an additional 857 DNR-trained watercraft inspectors throughout the state.
- Assisted the Division of Enforcement with staffing AIS check stations around the state.
- Conducted nine AIS volunteer training sessions that resulted in 121 trained AIS volunteers around the state who can educate watercraft users at public water accesses on how to inspect their watercraft. Twenty volunteers were trained via a new online training available for returning AIS volunteers.

Inspections started in mid-April and continued though the end of October. During this 25-week period, DNR watercraft inspectors logged 38,000 access inspection hours. A total of 102,441 watercraft/trailers were inspected by DNR staff and another 315,468 were inspected by watercraft inspectors authorized under a delegation agreement.

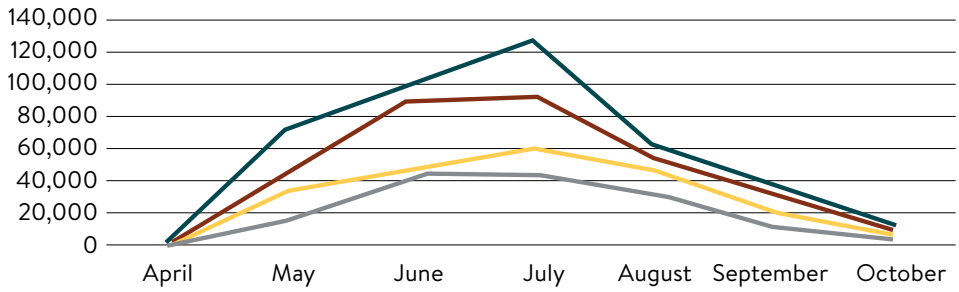
NUMBER OF WATERCRAFT INSPECTIONS conducted and total number of inspection hours completed by authorized DNR watercraft inspectors from 2013 to 2016. Totals are rounded values.

DNR Inspections	2016	2015	2014	2013
Total Inspections	102,441	103,400	120,000	123,000
Total Inspection Hours	38,000	33,000	49,550	66,800
Inspections per Hour	2.70	3.13	2.4	1.84

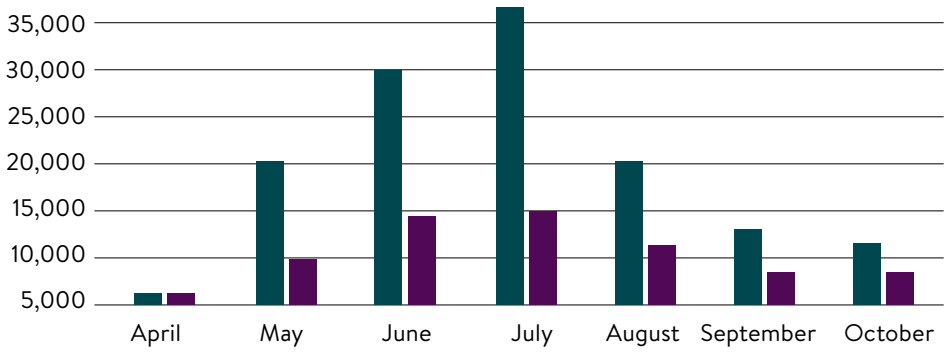
Inspections by DNR Region (included in above total)	2016	2015	2014	2013
Northwest 1	23,576	20,250	26,500	28,500
Northeast 2	13,770	12,450	14,100	17,900
Central 3	62,150	67,800	74,900	72,600
Southern 4	2,950	3,000	3,600	4,000

AUTHORIZED WATERCRAFT INSPECTIONS PER MONTH DURING THE 2013-2016 FIELD SEASONS

These figures include DNR staff as well as inspectors authorized under a delegation agreement.



DNR INSPECTIONS COMPLETED PER MONTH, COMPARED TO THE NUMBER OF HOURS WORKED AT ACCESSES STATEWIDE



How are the Hours Distributed?

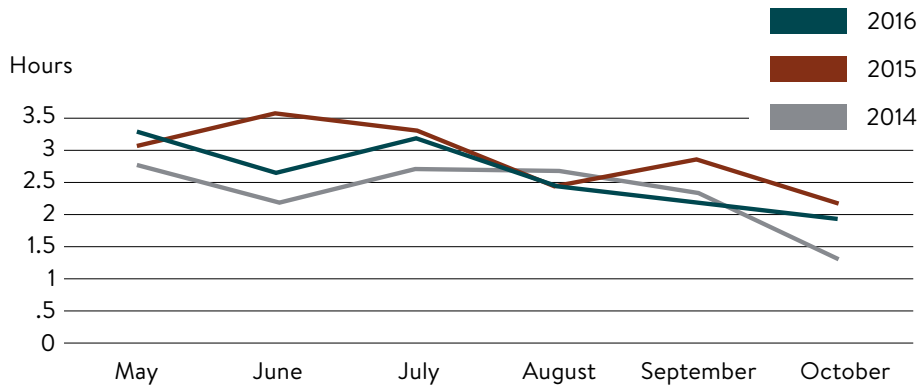
The DNR allocates its watercraft inspectors' hours using a tiered system that focuses inspection resources on: high-use, infested water bodies; high-use, non-infested water bodies; and water bodies where many of the incoming watercraft were last used at zebra mussel infested waters.

The DNR developed the tiered system to allocate watercraft inspection hours to maximize the effectiveness of watercraft inspectors at reducing the risk of AIS spread via watercraft.

In addition to the hours of watercraft inspection that are directed by the goals of the Invasive Species Program, the DNR also offered approximately 7,500 hours of DNR watercraft inspector time through grants to local groups, as well as grants to tribal governments and LGUs to hire their own authorized inspectors. See the Partnerships section on page 25 for more information.

96% of boaters arrived at inspection stations complying with invasive species laws

DNR INSPECTIONS PER HOUR BY MONTH AT PUBLIC WATER ACCESSES DURING THE SEASON (FIGURE DOES NOT INCLUDE DRIVE TIME)



Transportation of Invasive Species

In order to address the risk of moving AIS such as spiny waterflea or tiny zebra mussel larvae in water that is not drained from a watercraft or other equipment, the DNR educates boaters about Minnesota's "pull the plug" law and the importance of draining all water before transporting their watercraft.

In 2016, DNR, tribal and LGU watercraft inspectors intercepted numerous watercraft arriving at accesses in violation of state laws. In 2016, approximately 4% (8,632 occurrences) of the watercraft inspected had the drain plug in when they arrived at the access, which is the same percentage observed (4%, 8,503) in 2015. Watercraft users arriving at the access with their drain plugs in—a violation of state law— were asked to remove plugs and drain any water away from the access before launching.

- 3,835 watercraft arrived at an access with vegetation attached compared with 3,950 in 2015, with the highest number occurring in Region 3 both years.
- Watercraft inspectors found zebra mussels on 205 incoming watercraft in 2016 (2015 had 199 occurrences); 25 of these occurred at water bodies not known to be infested with zebra mussels. In these cases, inspectors instructed the watercraft owners not to launch until all zebra mussels had been removed. The highest number occurred in Region 3 with 150 watercraft arriving with attached zebra mussels; there were also 21 in Region 1 and 34 in Region 2.
- During the 2016 inspection season, watercraft inspection staff forwarded 205 zebra mussel violations to DNR Enforcement for additional follow-up.
- Watercraft inspectors required decontamination prior to launching for any watercraft attempting to enter a water body with vegetation or zebra mussels attached. Decontamination methods include hand removal, draining or a high-pressure hot water treatment.

Decontamination Units

In 2016, the Watercraft Inspection Program hired approximately 46 Level 2 watercraft inspectors trained to decontaminate watercraft with high-pressure, hot-water wash units. DNR staff used 23 portable wash units around the state to perform 1,414 decontaminations. The decontamination units were situated at high-use watercraft accesses on zebra mussel-infested water bodies. Partnering LGU authorized inspectors completed 2,145 decontaminations.

Partnerships

The DNR partners with other groups through grants and delegation agreements.

The DNR provided 7,500 hours of watercraft inspection time to citizen groups in 2016. Typically, citizen groups are seeking additional hours of inspection on lakes where they live or recreate. To address this need, the DNR offers watercraft inspection grants annually, providing a one-to-one match for hours financed by citizen groups. Organizations that receive inspection hours are allowed to use them on non-infested waters; however, applications for water bodies that are infested or are near infested waters are given a higher grant rating.

LGUs or tribal governments are able to partner with the DNR by completing a delegation agreement, which allows them to hire authorized watercraft inspectors to support local watercraft inspection programs. There were 56 active delegation agreements during the 2016 season, and these LGUs and tribal governments hired an additional 857 watercraft inspectors around the state. This is an increase when compared to 47 active delegation agreements and 705 trained LGU authorized inspectors in 2015.

These tribal or LGU employees used DNR survey questions and reported their survey findings to the DNR Watercraft Inspection Program by using a statewide watercraft inspection mobile application. More than 312,000 surveys were completed by tribal or LGU inspectors in 2016; an increase of 86,000 inspections from the total watercraft inspected in 2015.

The Watercraft Inspection Program also helped citizen groups increase the number of hours at watercraft accesses by conducting AIS volunteer training sessions to teach citizens how to educate watercraft users at waters where they live or recreate. In 2016, the Watercraft Inspection Program conducted nine AIS volunteer training sessions resulting in 121 trained AIS volunteers around the state. Watercraft inspectors also worked at the Minnesota State Fair and other local events, speaking to the public about invasive species.

Future Needs and Plans

In 2017, the Watercraft Inspection Program plans to focus on filling Level 2 inspector vacancies to increase the hours of inspection at public water accesses. In 2016 the largest number of authorized inspectors to date was trained and operating throughout the state. During the winter of 2016-2017, the Watercraft Inspection Program is focused on improving training materials and manuals to improve the efficiency of inspections statewide.

We also will review 2016 data and use it to refine our survey process and adjust the hours and days spent at watercraft accesses to try to increase our inspections per hour. We will continue to train citizen groups to conduct AIS education at local watercraft accesses and work to expand the number of partnerships with tribal governments and LGUs in an effort to increase total watercraft inspection capacity around the state.

DNR staff conduct surveys and research on lakes and rivers throughout the year.

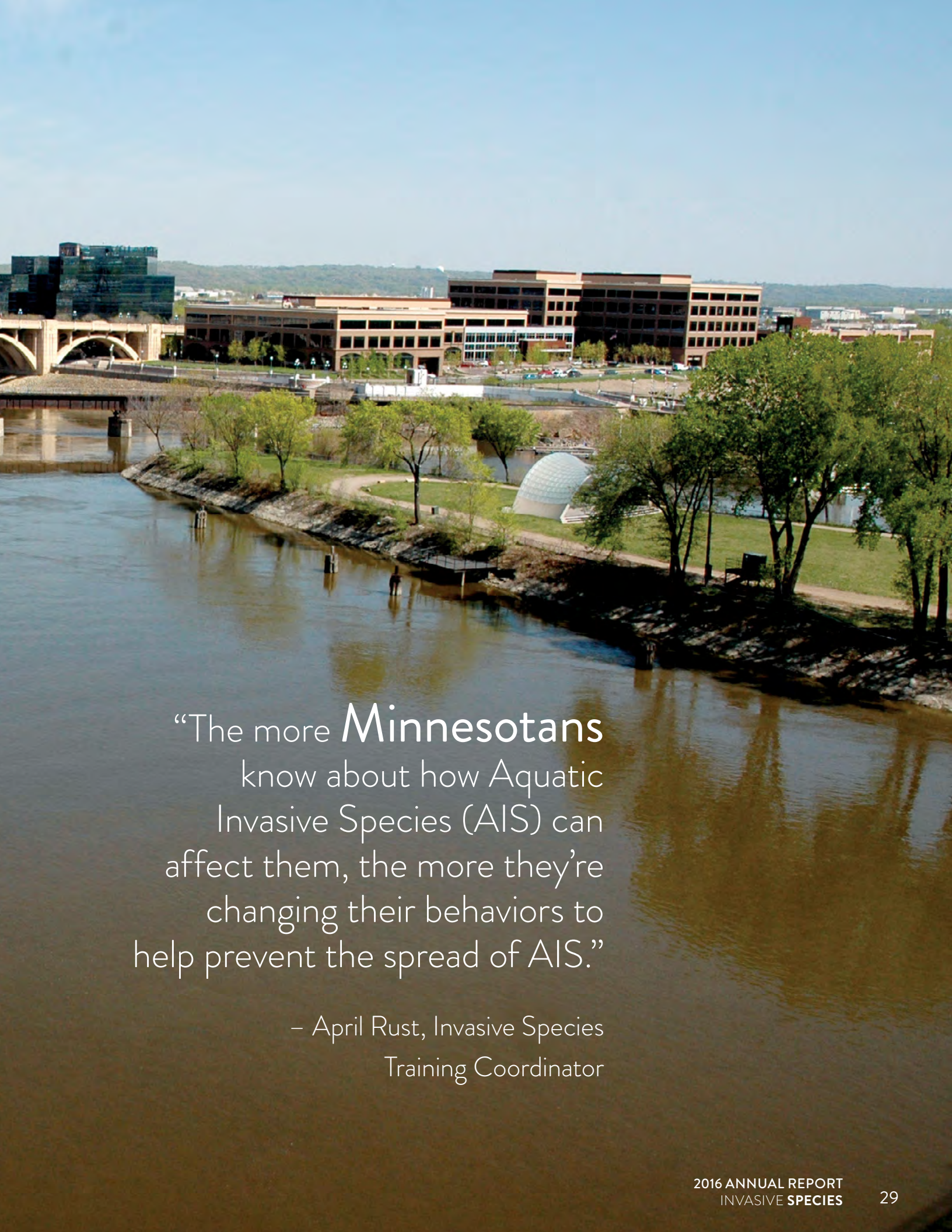
Aquatic Invasive Species Prevention Aid

The Minnesota Legislature provides $10 million directly to Minnesota counties to help prevent the spread of aquatic invasive species (AIS). The funds are allocated based on each county's share of watercraft trailer launches (50%) and watercraft trailer parking spaces (50%).

Each County Board and/or designated local government decides how the funds will be used. Each county submits a copy of its guidelines for use of the proceeds to the DNR by December 31 of each year.

Goals

- Annually review and collect county AIS plans and resolutions, describing how funds will be used each year.
- Provide technical support and training to local governments and their partners as they develop, implement and evaluate their local AIS prevention strategies.
- Provide opportunities for local government staff leading their county's AIS Prevention program to (1) share and learn from one another's



"The more **Minnesotans** know about how Aquatic Invasive Species (AIS) can affect them, the more they're changing their behaviors to help prevent the spread of AIS."

– April Rust, Invasive Species Training Coordinator

collective experiences, (2) initiate regional and statewide collaborative efforts, and (3) maintain strong relationships between stakeholders such as local governments, state and federal agencies, nonprofits, businesses, and local organizations (e.g. lake associations, outdoor recreation groups).

Highlights

PROVIDED TECHNICAL SUPPORT

- The DNR Invasive Species Program's two AIS Prevention Planners and two AIS Trainers provided technical support and training to local governments.
- Received and provided feedback on guidelines (resolutions and plans) from the 83 Minnesota counties receiving funds.
- Provided information on an array of DNR AIS Programs (e.g. watercraft inspection, invasive species management, etc.) and updated key resources and promoted available support from the DNR on the Local AIS Prevention Aid webpage (dnr.state.mn.us/invasives/ais/prevention.html).
- Played an advisory role at county AIS Task Forces and Advisory Committee meetings.
- Re-launched the web-based Local Water Access Editor Application, used by county AIS leads to update information about their public water accesses; including developing online training videos to improve the quality of data submitted.
- Provided feedback on communication materials developed by local governments to promote consistent messages about AIS and AIS prevention steps (e.g. Clean, Drain, Dispose).

ACTIVELY ENGAGED LOCAL GOVERNMENTS AND THEIR PARTNERS

- Created and maintained a network of support by developing a primary contact list of lead AIS staff in each county and encouraged them to use this list to collaborate with one another.
- Held five workshops in January 2016, bringing in 93 county representatives from 58 counties. The purpose of the workshops was to bring neighboring counties together to share their collective AIS prevention experiences, to learn from one another's successes and challenges, support collaborative efforts, and to build stronger inter-county relationships.
- Held four informal AIS learning sessions in August/September 2016. Topics were based on county requests for professional development. A key component of these sessions were for county AIS leads to showcase their projects related to each topic. The "in the field" session attracted 48 attendees from 27 counties and the "communications" session attracted 28 attendees from 23 counties.
- Designed a regional breakout session as part of the Aquatic Invaders Summit II, in which all conference attendees were split into four regional groups to have meaningful conversations about the importance of gathering metrics and impactful stories to demonstrate that AIS money coming directly to counties is making a difference. Four AIS county leads facilitated these discussions with their peers and partners.

HIGHLIGHTED SUCCESSFUL LOCAL AIS EFFORTS

- Worked to share information on projects already implemented by counties (e.g. youth education, citizen monitoring, early detection, grant programs, etc.) with other AIS county leads interested in starting similar projects.
- Gave joint presentations at the State of Water Conference and Upper Midwest Invasive Species Conference alongside leads of county AIS programs, to showcase the innovative AIS work going on in Minnesota.
- DNR AIS Planners staffed a booth at four local government association conferences (townships, soil water conservation districts, watershed districts, and counties) and provided information on how to get involved and get stakeholders involved in local AIS work.
- Presented AIS Prevention Aid information to a variety of audiences and provided general AIS education to interested groups (e.g. lake associations) and at youth education events, such as at the regional and state Envirothons.

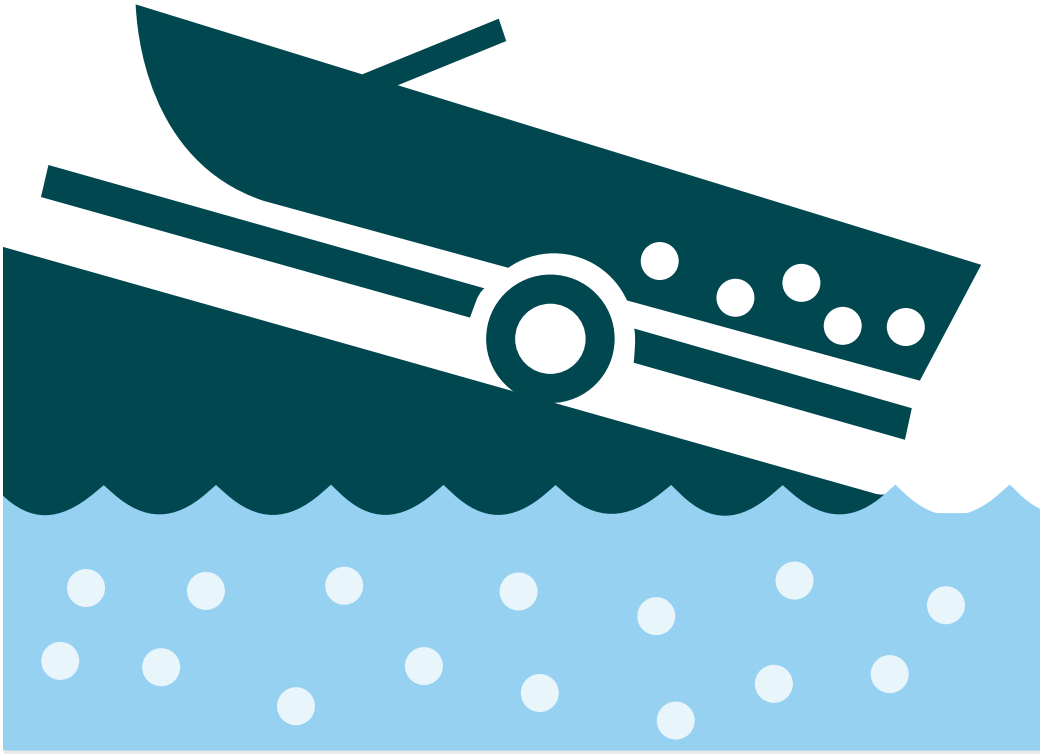
A DNR invasive species specialist shows where to look for AIS when putting equipment away for the season. ▶

Because zebra mussels are so hard to spot, docks and lifts must be carefully inspected and kept out of the water for at least 21 days before putting them into another lake.

Partnerships

There are many partners in the AIS field working toward common goals. It is essential to bridge gaps between all involved, to build and maintain effective and efficient programs.

- Built stronger working relationships between the DNR, local governments and their partners, enabling more effective implementation of AIS work locally, regionally and statewide.
- Facilitated and provided technical support to a group of AIS leads from the 12 counties that receive the most funding. This self-organized group continues to meet and brainstorm ideas on how they can work together to have a statewide impact.
- Actively participated in statewide and regional conferences, to share information from the DNR, as well as jointly with AIS county leads, on the innovative work being accomplished at the local level, challenges encountered, and how to work together to overcome those challenges.
- Continuously shared expertise and advice among DNR staff and programs. These include but are not limited to the watercraft inspection program, AIS Specialists, AIS Trainers, regional planners, creative services, communications and planning, Parks and Trails Division, Minnesota's information technology agency, etc.



Future Needs and Plans

County AIS programs are diverse, at different stages of development and implementation, and cover a spectrum of AIS activities. As the needs of the counties change, so will the technical support provided.

- Create a Listserv for interested individuals and organizations to receive information from the DNR related to the AIS Prevention Aid program.
- Create a template of metrics so that AIS county leads and their partners can track their accomplishments and demonstrate that AIS prevention aid is making a difference in their communities.
- Work to continuously improve online resources, like the DNR's Local AIS Prevention Aid webpage, to provide a "one-stop shop" of resources local governments and their partners can use to develop and implement their local programs.
- Continue to support communication and collaboration among local governments about AIS prevention strategies. For example, continue to host Regional AIS Prevention Workshops and Informal Learning Sessions.
- Continue to provide technical support, tools, and resources as needed to help local governments achieve their goals and run successful AIS prevention programs.

Invasive Aquatic Plant Management

Goals

The goals of the Invasive Species Program's efforts to manage invasive aquatic plants are to work with citizens to:

- reduce the impacts of invasive aquatic plants on Minnesota's ecology, society and economy.
- prevent the spread of invasive aquatic plants within Minnesota.

The DNR is committed to working with our partners to meet these goals by:

- providing technical assistance to individuals and organizations;
- permitting management by treatment with herbicides or mechanical control;
- providing grants to help fund costs of control done by partners; and
- supporting and using research that leads to improved AIS control techniques.

Highlights

In 2016, the DNR issued Invasive Aquatic Plant Management (IAPM) permits to allow management of curly-leaf pondweed, Eurasian watermilfoil, purple loosestrife, starry stonewort, non-native *Phragmites* and flowering rush.

In addition, more than 75 grants were awarded to offer up to $207,000 in reimbursements to support management of invasive aquatic plants by partners. This represents a reduction in the number of grants, and funds available for grants, from 2015 to 2016.

Starry stonewort, *Nitellopsis obtusa*, was discovered in seven additional lakes in

Minnesota. The DNR undertook aggressive new control efforts in an attempt to eradicate the invasive macroalgae in several waterbodies with limited populations of starry stonewort. Starry stonewort has not been eradicated in any waterbody in the United States to date. The DNR will continue to monitor treated lakes in 2017 to better understand the efficacy of these control treatments.

Management

The number of IAPM permits issued to control curly-leaf pondweed was greater than the numbers issued for any other species (Table WC1).

In 2016, the number of grants provided to support control of curly-leaf pondweed, Eurasian watermilfoil, or both, decreased by 60% from the previous year. This decline reflects the Invasive Species Program budget decline due to less revenue coming into the Invasive Species Account than the enacted budget.

During the summer of 2016, the DNR provided $200,000 in grant funds to cooperators to support control of flowering rush, curly-leaf pondweed, Eurasian watermilfoil, or a combination of those species. The DNR has reimbursed grantees $191,250 for these projects as of December 2016 and anticipates paying an additional $2,000 for work completed in 2016. An additional $7,000 grant was provided for the control of starry stonewort in October of 2016.

The number of IAPM permits varied among DNR regions (Table WC2). Region 3 issued the most permits. The proportions of permits issued in different regions were similar in all years.

TABLE WC1 Number of IAPMPs issued to allow control of various species in 2013, 2014, 2015, and 2016.

	Number of Permits Issued			
Species	**2013**	**2014**	**2015**	**2016**
Curly-leaf pondweed	126	131	168	148
Eurasian watermilfoil	68	83	110	102
Curly-leaf pondweed and Eurasian watermilfoil	15	4	5	9
Subtotal	209	218	283	259
Flowering rush	4	9	10	5
Purple loosestrife	2	1	0	3
Non-native *Phragmites*	0	0	0	3
Yellow iris	0	0	0	2
Starry stonewort	0	0	0	7

TABLE WC2 Number of IAPMPs issued In DNR regions for control of curly-leaf pondweed or Eurasian watermilfoil or both in 2013, 2014, 2015, and 2016.

Region Location and number	**2013**	**2014**	**2015**	**2016**
Northwest 1	18	18	17	15
Northeast 2	11	12	38	28
Central 3	150	157	199	185
Southern 4	30	31	29	31
Total	**209**	**218**	**283**	**259**

MANAGEMENT OF OTHER AQUATIC INVASIVE PLANTS

Starry stonewort, *N. obtusa*, was discovered in seven additional lakes within Minnesota. Four of the waterbodies are located In Beltrami County, the other three are located in Cass, Stearns and Wright Counties. Starry stonewort was first discovered in Lake Koronis and connected Mud Lake in Stearns County in August, 2015. The size and scope of starry stonewort found in the seven waterbodies varied from large populations in many locations to several plants in areas less than half an acre. Treatment methods for this new invasive macroalgae included herbicide application, Diver Assisted Suction Harvesting (DASH), and suction dredging within the infested area. Outcomes from these eradication attempts will be evaluated in the 2017 open water season in cooperation with University of Minnesota-Minnesota Aquatic Invasive Species Research Center (MAISRC).

▲ *The invasive algae starry stonewort can be spread by transport of small star-shaped bulbils, like this one taken from Cass Lake. The little dot on the finger is a bulbil.*

Research

The Minnesota Aquatic Invasive Species Research Center (MAISRC) at the University of Minnesota hired Dr. Daniel Larkin as an Assistant Professor/ Extension Specialist to develop a new research and extension program in 2015. His research and extension program focuses on aquatic and wetland plant management and restoration. In 2016, he has partnered with the DNR on research related to ecology and management of starry stonewort, Eurasian and hybrid watermilfoil, and curly-leaf pondweed.

Partnerships

Stakeholder engagement: DNR staff had many conversations with citizens by email, phone, and in person throughout the year. In addition, we continue to engage with stakeholders to hear their perspectives on invasive aquatic plants, to help guide the evolution of Minnesota's approach to management.

In an effort to improve permitting efficiency, the program is using the online Minnesota DNR Permitting and Reporting System (MPARS) for accepting IAPM permit applications. MPARS is easy and convenient to use from any computer connected to the internet. The system was available to staff in August 2016 and will be available to the public in early 2017.

Future Needs and Plans

To effectively and proactively manage invasive aquatic plants into the future, we plan to continue the following activities:

- Engage stakeholders and refine the issuance of permits and grants for the control of invasive aquatic plants.
- Work with partners to manage invasive aquatic plants.
- Monitor the distribution of invasive aquatic plants in the state, with emphasis on verification of reports of new occurrences.
- Assess risks posed to Minnesota by various nonnative aquatic plants.
- Improve our understanding of the ecology and management of invasive aquatic plants including the macroalgae starry stonewort by continuing to work with researchers at MAISRC, the U.S. Army Corps of Engineers Engineer and Research Development Center, and other institutions. Support from partners such as watershed districts will continue to be very important.
- Review the results of bay-wide or lake-wide treatments of Eurasian watermilfoil and the possible differences in susceptibility to herbicides of Eurasian watermilfoil and hybrids with native watermilfoil.
- Review results of lake-wide control of flowering rush by partners and the effectiveness of biocontrol in different years of purple loosestrife.

Invasive Aquatic Animals – Zebra Mussels

Goals

- Prevent the spread of zebra mussels to uninfested, unconnected lakes and rivers in the state.
- Support, assist and/or conduct research on zebra mussel ecology, biology, life history and other aspects to help manage and prevent spread.

Highlights

- Submitted manuscript, "Zebra Mussel *(Dreissena polymorpha)* Eradication Efforts in Christmas Lake, Minnesota" to Lakes and Reservoir Management. This was a collaborative effort with the DNR (as lead author), Minnehaha Creek Watershed District (MCWD), and Dr. Michael McCartney at the University of Minnesota. Anticipated publication release in 2017.
- Issued two Invasive Aquatic Plant Management Permits (IAPM) for zebra mussel control using pesticides in open water:

1. Lake Minnetonka - Robinsons Bay. Field evaluations of toxicity of low-dose EarthTec QZ treatments for control of zebra mussel veligers (MCWD and MAISRC project).

2. Lake Minnewashta - rapid response efforts using EarthTec QZ to control a new infestation of zebra mussels near the Carver County access.
   - collaborative effort between Carver County, MCWD, DNR
   - largest treatment ever permitted in Minnesota (29 acres)
   - largest open water treatment using EarthTec QZ in U.S.
   - this was the second pilot project approved by the DNR

- Presented Christmas Lake zebra mussel control efforts at two Great Lakes Commission webinars and at Upper Midwest Invasive Species Conference.
- Conducted zebra mussel surveys at eight metro lakes. This included SCUBA and snorkeling for purposes of early detection monitoring and/or rapid response efforts.

Research

DNR biologists published results from a three year study on veliger presence in residual water ("Veliger presence in residual water – assessing this pathway risk for Minnesota watercraft" Management of Biological Invasions 2016) and co-authored another paper on residual water ("Volume and contents of residual water in recreational watercraft ballast systems" – Management of Biological Invasions 2016). Results from a three year study on spring water temperatures and veliger production in three lakes (Prior, Sand, Gull) were finalized to help guide DNR regulations on bait harvest in infested waters. DNR staff participated in the MAISRC Technical Committee to review and amend future research priorities for MAISRC scientists and future research. DNR staff provided review of proposed new control technologies to assess efficacy and potential use in infested lakes.

Partnerships

The DNR establishes and maintains partnerships with lake associations, lake user groups, tribal organizations, local governmental agencies, and others throughout the state. DNR AIS specialists in several regions continued assisting MAISRC researcher Dr. Michael McCartney in research fieldwork. DNR staff also continued cooperative efforts with watershed districts and county park staff on Lake Minnewashta.

The DNR also depends on the work of volunteers across Minnesota who look at docks, lifts, boats, recreational equipment, shorelines and other objects to monitor for zebra mussels as part of the Volunteer Zebra Mussel Monitoring Program. Because the DNR doesn't have the capacity to monitor the thousands of lakes and other waters in the state, citizen monitors are usually the first to discover and report new infestations zebra mussels.

To learn more, visit www.dnr.state.mn.us/volunteering/zebramussel_monitoring

Future Needs and Plans

The DNR will continue to:

- Examine potential uses of pesticides to control zebra mussels as opportunities arise.
- Monitor, with partners, the post-treatment efficacy of previous control projects.
- Work with citizen groups to provide control advice and education.

Invasive Aquatic Animals - Invasive Carp

Goals

- Prevent or limit range expansion of invasive carp (bighead, black, grass, and silver carp) at strategic locations.
- Monitor Minnesota waters for changes in population sizes, range expansion and reproduction.
- Accelerate research on control strategies.

Highlights

The DNR is highly engaged on the invasive carp issue. The agency uses the Minnesota Invasive Carp Action Plan to guide activities. The agency annually updates interested stakeholders at the Minnesota Invasive Carp Forum in spring each year.

For more information about the Minnesota Invasive Carp Action Plan visit www.dnr.state.mn.us/invasive-carp/index.html

▲ *This bighead carp was removed from the St. Croix River. Invasive carp compete with native species and pose a threat to rivers and lakes.*

NEW DETECTIONS OF JUVENILE AND ADULT INVASIVE CARP

The DNR relies on five methods to detect and monitor the expansion of invasive carp into Minnesota:

1. Traditional fisheries monitoring programs
2. Targeted sampling
3. Contracted commercial fishing
4. Monitoring the commercial catch
5. Reporting sightings

In 2016, three adult invasive carp were captured using these methods:

Location	Species	Date	Number Caught	Type of Gear
Minnesota River	Bighead Carp	2/18/16	1	Commercial Fisher
Mississippi River Pool 8	Bighead Carp	4/12/16	1	Angler
Mississippi River Pool 5a	Bighead Carp	6/11/16	1	Bow Angler

The DNR received 18 encounter reports from the public in 2016. All reports were investigated in person, by phone or via e-mail. One report was confirmed as an invasive carp, seven reports were confirmed not to be invasive carp based on photographs, nine reports were unlikely to be invasive carp based on discussions, and a determination could not be made on one report. Follow up sampling was conducted in response to four of the reports. No additional carp were captured from follow up sampling.

MINNESOTA RIVER WATERSHED

In response to the risk in the Minnesota River watershed, DNR Fisheries identified priority aquatic resources for protection. As funding becomes available, barrier sites are chosen to prevent carp expansion into these resources. As of September 2015, the DNR had identified two sites in the Le Sueur River watershed to protect upstream lakes. These projects will employ electric barrier technology to prevent fish movement upstream. A site on Mayhew Creek will be an open-ditch design and protect Elysian and Buffalo lakes. A site on an unnamed creek will be an electrical array in culvert installation and protect Madison and Eagle Lakes. Designs for both projects were completed in 2016, with construction slated for spring 2017.

TELEMETRY STUDY

DNR fisheries began a fish telemetry study in spring of 2013 to understand fish movement around lock and dams and in the Mississippi River system. The U.S. Fish and Wildlife Service (USFWS) also connected the receiver system with one located in Missouri to help monitor carp movements throughout the river. This study continued in 2015-16.

Partnerships

MINNESOTA AQUATIC INVASIVE SPECIES RESEARCH CENTER – UNIVERSITY OF MINNESOTA-TWIN CITIES

Dr. Peter Sorensen's lab started lock and dam evaluation work in May. Work to date has included preliminary sonar (ARIS) work at Lock 8, Lock and Dam 2 flow modeling, stationary telemetry receiver build out, and limited tagging/tracking. Seventeen common carp have been tagged and released below Lock and Dam 2.

MINNESOTA STATE UNIVERSITY – MANKATO

The DNR is partnering with Minnesota State University-Mankato to evaluate invasive carp deterrents in the Minnesota River. University partners have been collecting and analyzing data on hydrologic and geomorphic characteristics of the Minnesota River. The project is also examining biological data to identify habitats that are highly suitable for invasive carp. Scientists are investigating the Minnesota River - Red River watershed boundary to determine the degree of connectivity. Flood mapping, channel migration, and bathymetry change analyses are nearing completion. Significant progress is being made on the habitat suitability portion.

U.S. FISH AND WILDLIFE SERVICE

The USFWS is the lead agency on eDNA sampling for invasive carp. In 2016, 807 water samples were collected from Mississippi River pools 5a, 6, 8, and 9. The samples were analyzed at the Whitney Genetics Lab in La Crosse, Wisconsin. No samples came back positive for bighead carp or silver carp.

Future Needs and Plans

Funding will be needed for additional prevention, monitoring and response projects, as identified in the Minnesota Invasive Carp Action Plan.

Terrestrial Invasive Species Program

Goals

- To improve or enhance the ability of DNR staff to effectively manage terrestrial (land-based) invasive species on DNR-managed lands through prevention, management and inventory, outreach and communication, and research.
- To prevent or limit the negative impacts on Minnesota's ecology, economy and human health that can result from terrestrial invasive species such as Oriental bittersweet, wild parsnip, buckthorn, garlic mustard, earthworms, emerald ash borer and gypsy moth.
- To prevent and manage terrestrial invasive species to protect and/or restore habitats for wildlife species, especially those species in greatest conservation need.

6.16

Abundant garlic mustard **at Prairie Creek SNA near Nerstrand, Minnesota**

Highlights

PREVENTION

- Worked with DNR staff to ensure that they had the equipment needed to prevent invasive species spread and follow DNR's Invasive Species Operational Order 113. Surveyed staff in the fall of 2016 to determine how well Op Order 113 is being implemented and what is needed to enhance implementation.
- Through outreach and education with the public, worked to prevent the introduction of terrestrial invasive species to state-managed lands.

State Fair visitors pledged to clean their boots to prevent the spread of invasive plant seeds. The inset photo shows pledges on day one. The large photo shows pledges by the end of the fair.

MANAGEMENT AND INVENTORY

- The Invasive Species Program initiated a funding program in 2006 for the management and inventory of terrestrial invasive plant species on state-managed lands. Funds are dispersed to DNR divisions and regions. Funding for this program has decreased from its high in 2010.
- Fiscal Year 2017: Twenty-nine proposals totaling $378,100 were received; $226,000 was awarded for 20 projects.

FUNDING HISTORY FOR TERRESTRIAL INVASIVE SPECIES PROGRAM

Fiscal Year/s	Dollars Awarded	Acres (Inventoried and Managed)	Number of Projects
2006-2007	$365,000	27,375	31
2008	$435,660	26,523	32
2009	$610,807	40,000 est.	47
2010	$606,777	27,955 + 40,000 from aerial survey	42
2011	$438,000	18,258	33
2012	$178,340	24,989 + 13,500 from aerial survey	26
2013	$160,000	7,547	22
2014	$144,249	11,860	18
2015	$270,674	12,994	26
2016	$192,339	5,501	23
2017	$226,000	in progress	20

FISCAL 2016 FUNDING DISTRIBUTION

Total $192,339 • 23 projects
3,421 acres inventoried •
2,080 acres managed

Species inventoried and managed in various projects:

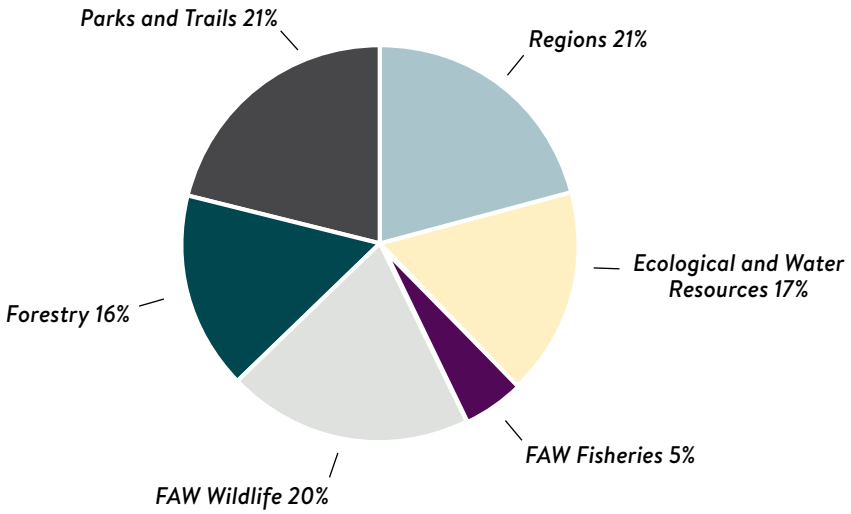
Amur maple, bird's foot trefoil, black locust, bull thistle, butter and eggs, Canada thistle, chicory, common buckthorn, common burdock, common teasel, cow vetch, crown vetch, cut-leaved teasel, garlic mustard, glossy buckthorn, Japanese hops, Japanese knotweed, leafy spurge, meadow knapweed, non-native honeysuckle, Oriental bittersweet, poison hemlock, reed canarygrass, Russian olive, Siberian elm, Siberian peashrub, spotted knapweed, tansy, wild parsnip, wooly cupgrass

DNR ADOPTS EDDMAPS AS THE TOOL FOR INVENTORY OF INVASIVE SPECIES

EDDMapS (Early Detection and Distribution Mapping System) is a national website for collecting and sharing invasive species inventory information (www.eddmaps.org). The DNR adopted EDDMapS for invasive species location information. The EDDMapS Midwest (www.eddmaps.org/midwest) webpage was created as a central source of information on invasive species in the Midwest. The EDDMapS Midwest webpage and the associated Great Lakes Early Detection Network (GLEDN) app allows people to make reports of invasive species, collect photos associated with the locations, send reports through a system of verifiers, and view verified reports.

EDDMapS Midwest modernizes invasive species inventory collection and provides a centralized place for organization to share data. EDDMapS collects data on aquatic and terrestrial invasive species including plants, diseases, insects, fish and other animals. The Terrestrial Invasive Species program funded the purchase of 37 tablets for staff across DNR divisions. Staff used tablets and the app to map invasive species, starting in the summer of 2016.

FISCAL YEAR 2016 FUNDING DISTRIBUTION



For more information
www.EDDMaps.org/midwest

Outreach and Communication

- In 2016, the outreach program "PlayCleanGo: Stop Invasive Species in Your Tracks" continued to expand. The PlayCleanGo message is used in publications, boot brush kiosks, signage, exhibits and online.
- The State Fair Invasive Species Display brought invasive species prevention messages to many State Fair visitors.

Research

- Work continued toward the goal of having effective biological control insects for garlic mustard *(Alliaria petiolata)*. Funding was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR).
  - The University of Minnesota focused host-specificity testing on the potential biocontrol insects *Ceutorhynchus scrobicollis* (a crown feeding weevil) and *C. constrictus* (a seed-feeding weevil).
    -- *C. scrobicollis* has the host specificity to be a successful biocontrol agent of garlic mustard. The researchers wrote a petition for release which summarizes the 18 years of *C. scrobicollis* host specificity testing. The petition was submitted to the U.S. Department of Agriculture Animal and Plant Health Inspection Service Technical Advisory Group in June 2016.
    -- *C. constrictus* testing indicates it also shows the host specificity to be a successful biocontrol agent for garlic mustard. Approximately 30 more species need to be tested and then a petition for release of *C. constrictus* can be submitted to the USDA.
  - Garlic mustard monitoring provided information on garlic mustard populations in the absence of biocontrol. Garlic mustard is a biennial, and long-term monitoring shows that its populations can fluctuate widely from year to year. When the plots were established in 2005 and 2006, garlic mustard was present in 100% of the plots. Garlic mustard is still present in 88% of the plots as of June 2016. Garlic mustard is currently experiencing very little herbivory in Minnesota, with an average amount of leaf removed due to herbivory ranging from 0.6 to 4.5% in 2014 - 2016. Garlic mustard cover and density, shoot heights, and seed production of individual plants are all expected to decrease after biological control release.
- The DNR cooperated with the University of Minnesota Terrestrial Invasive Plants and Pests Center on processes to identify the top invasive species threats to Minnesota and to help prioritize top invasive species research needs.

◀ *A young visitor explores the DNR State Fair invasive species display.*

- Co-authored the paper "Risk Assessments for Invasive Plants: A Midwestern U.S. Comparison," which was published in the journal Invasive Plant Science and Management.

Partnerships

- The PlayCleanGo program is built around partnering and consistent messaging. As of September 2016, PlayCleanGo had more than 340 partners in the United States and Canada.

For more information
www.playcleango.org/partners.html

- The Minnesota Invasive Species Advisory Council (MISAC) continues to provide a mechanism for interagency and inter-organization communication and collaboration on invasive species issues. The DNR was an active participant in 2016. MISAC produced a 2016 wall calendar highlighting 12 invasive species and issues of concern to Minnesotans.

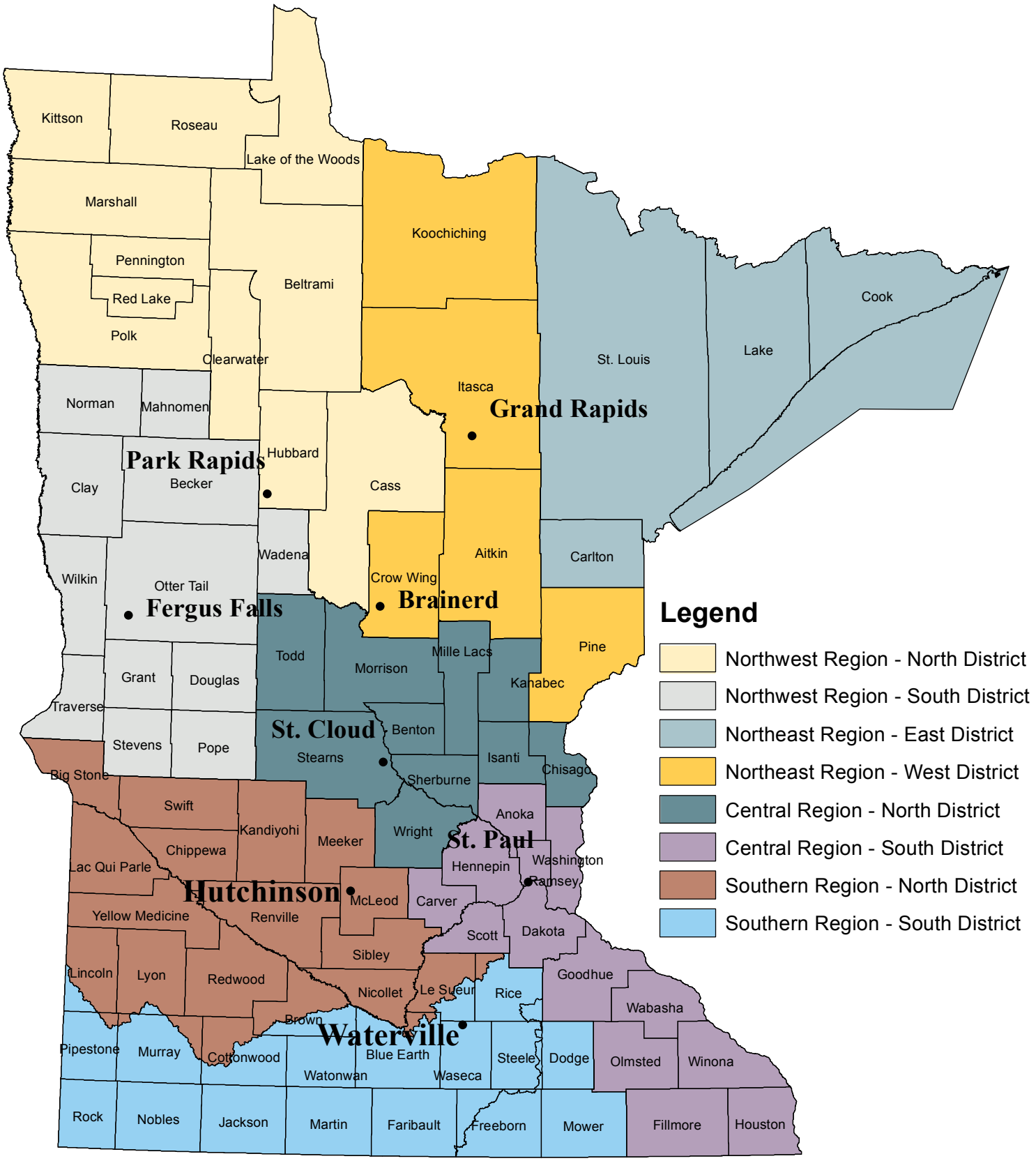
Visit MISAC at
www.mda.state.mn.us/misac

- The DNR is a member of the Noxious Weeds Advisory Committee convened by the Minnesota Department of Agriculture (MDA) to evaluate plant species for invasiveness, difficulty of control, cost of control, benefits, and amount of injury caused by the species. For each species evaluated, the committee recommends to the MDA commissioner whether the species should be placed on a noxious weed list.

Future Needs and Plans

- Within the DNR, there is a need to expand the amount of awareness, data, tools and resources to reduce impacts caused by terrestrial invasive species on state-managed lands. Funding for terrestrial invasive species work has decreased since 2010. The terrestrial invasive species program plans to continue to work to meet the growing needs for outreach materials, data, tools and resources to reduce the impacts of invasive species on state management lands.

Minnesota Department of Natural Resources
Ecological and Water Resources Districts



Appendix A

INVASIVE SPECIES PROGRAM STAFF

Staff is located in Central Office, St. Paul unless otherwise noted. Telephone numbers and email addresses are available at mndnr.gov/ais—click on Contact an Expert.

Michael Bolinski
Watercraft Inspection
Program Supervisor
Northwest Region, Fergus Falls

Kylie Cattoor
Natural Resource Specialist
Central Region, St. Paul

Wendy Crowell
Grants Coordinator

Adam Doll
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Central Region, St. Paul

Jessamyn Foley
Watercraft Inspection
Program Assistant
Northeast Region, Brainerd

Evan Freeman
Watercraft Inspection
Program Supervisor
Central Region, St. Cloud

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Invasive Fish/River Habitat
Coordinator

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Keri Hull
Watercraft Inspection
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Northeast Region, Brainerd

Phil Hunsicker
AIS Prevention Planner
Brainerd

Greg Husak
Communications/Information
Officer

Christine Jurek
Invasive Species Specialist
Central Region, St. Cloud

Nicole Kovar
Invasive Species Specialist
Northwest Region, Park Rapids

Keegan Lund
Invasive Species Specialist
Central Region, St. Paul

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Aquatic Invasive Species Trainer
Brainerd, Region 1 and 2

Courtney Millaway
Natural Resource Specialist
Central Region, St. Cloud

Gary Montz
Research Scientist

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Enforcement, New Ulm

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Aquatic Invasive Species
Prevention Coordinator

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Ecosystem Management
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Senior Specialist
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Mark Ranweiler
Assistant Aquatic Invasive
Species Specialist
Northwest Region, Fergus Falls

Richard Rezanka
Invasive Species Specialist
Northeast Region, Grand Rapids

April Rust
Training Coordinator

Mike Smith
Aquatic Invasive Species Trainer
St. Paul, Region 3 and 4

Dan Swanson (retired in 2016)
Invasive Species Specialist
Northeast Region, Brainerd

Laura Van Riper
Terrestrial Invasive Species
Coordinator

Chip Welling
Invasive Aquatic Plants
Management Coordinator

Tina Wolbers
AIS Prevention Planner

Heidi Wolf
Invasive Species Program
Supervisor

Maureen Ziskovsky
Watercraft Inspection
Program Assistant
Central Region, St. Paul

Appendix B

OTHER CONTACTS FOR INVASIVE SPECIES PREVENTION AND CONTROL PROGRAMS

STATE AGENCIES

Minnesota Department of Agriculture (MDA) – Invasive Species Programs

The MDA is responsible for the prevention and early detection of new and emerging terrestrial plant pests and management of noxious weeds. The MDA's Pest Detection and Management Unit addresses new and emerging invasive species such as brown marmorated stink bug, potato cyst nematode and Asian long-horned beetle. The Pest Mitigation and Regulatory Response Unit coordinates all aspects of survey, treatment and regulatory work pertaining to quarantined pests such as gypsy moth and emerald ash borer. The Noxious and Invasive Weed Program oversees the Minnesota Noxious Weed Law, coordinates weed biological control efforts and assists land managers with general weed management and early detection efforts.

Plant Protection Division

Pest Detection and Management Unit	Mark Abrahamson	651-201-6505
Pest Mitigation and Regulatory Response Unit	Kimberly Thielen Cremers	651-201-6329

Noxious and Invasive Weed Program

Noxious Weed Law	Anthony Cortilet	651-201-6538
Early Detection, Biological Control and Data Management	Monika Chandler	651-201-6537
Early Detection and Rapid Response	Emilie Justen	651-201-6360

Minnesota Department of Natural Resources (DNR) – Forest Health Program

The DNR's Division of Forestry, working in cooperation with the MDA, is charged with surveying and controlling forest pests including invasive organisms such as gypsy moth and several bark beetles. An annual report is prepared by the DNR Forest Health Protection Team on those issues.

Forestry Division

Invasive Species Program Coordinator	Susan Burks	651-259-5251
Forest Health Program Coordinator	Val Cervenka	651-259-5296
Metro/Southern Forest Health Specialist	Brian Schwingle	651-259-5821
Northeast Forest Health Specialist	Jess Hartshorn	218-328-8897
Northwest Forest Health Specialist	Mike Parisio	218-327-4234

University of Minnesota Sea Grant - Aquatic Invasive Species Information Center

The Aquatic Invasive Species Information Center at the University of Minnesota Sea Grant Program provides research, outreach, and education in collaboration with the DNR's Invasive Species Program. The center has served as an important resource on aquatic nuisance species and provides information to the public to prevent and slow the spread of aquatic invaders.

AIS Info Center Coordinator – Duluth	Doug Jensen	218-726-8712

INTERAGENCY AND INVASIVE SPECIES GROUPS

There are several invasive species committees and work groups that facilitate coordination between agencies.

Gypsy Moth Program Advisory Committee

Kimberly Thielen Cremers	651-201-6329

St. Croix River Zebra Mussel Task Force

Primary members include: Minnesota Department of Natural Resources, Wisconsin Department of Natural Resources, Great Lakes Indian Fish and Wildlife Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and National Park Service.

Minnesota Invasive Species Advisory Council (MISAC)

Kathy Kromroy, MISAC chair, Minnesota Department of Agriculture	651-201-6343
Marte Kitson, MISAC co-chair, University of Minnesota Sea Grant	218-726-8305

Minnesota Noxious Weed Advisory Committee

Minnesota Department of Agriculture, Anthony Cortilet	651-201-6538

Appendix C

REGULATIONS CHANGES IN 2016

See the Regulations section of the Prevention chapter (page 13) for more information about regulatory changes in 2016. This appendix presents only the statute and rule language, with deletions shown in strikeout and new text indicated by an underline. These changes to statute became effective on July 1, 2016. Presented are the subdivisions or subparts that were changed in 2016.

For complete, updated statute and rule language visit the Minnesota Office of the Revisor of Statutes website at www.revisor.leg.state.mn.us

CHANGES TO MINNESOTA STATUTES

Numbers correspond to the summary of legislative changes on page 13.

1.

17.4982 DEFINITIONS.

Subd. 18a. Nonindigenous species.

"Nonindigenous species" means a species of fish or other aquatic life that is:

(1) not known to have been historically present in the state;

(2) not known to be naturally occurring in a particular part of the state; or

(3) ~~listed~~ designated by rule as a prohibited or regulated invasive species.

84.027 POWERS AND DUTIES.

Subd. 13. Game and fish rules.

(a) The commissioner of natural resources may adopt rules under sections 97A.0451 to 97A.0459 and this subdivision that are authorized under:

(1) chapters 97A, 97B, and 97C to set open seasons and areas, to close seasons and areas, to select hunters for areas, to provide for tagging and registration of game and fish, to prohibit or allow taking of wild animals to protect a species, to prevent or control wildlife disease, to open or close bodies of water or portions of bodies of water for night bow fishing, and to prohibit or allow importation, transportation, or possession of a wild animal;

(2) sections 84.093, 84.15, and 84.152 to set seasons for harvesting wild ginseng roots and wild rice and to restrict or prohibit harvesting in designated areas; and

(3) section 84D.12 to ~~list~~ designate prohibited invasive species, regulated invasive species, and unregulated nonnative species~~,~~ and to list infested waters.

(b) If conditions exist that do not allow the commissioner to comply with sections 97A.0451 to 97A.0459, including the need to adjust season variables on an annual basis based upon current biological and harvest data, the commissioner may adopt a rule under this subdivision by submitting the rule to the attorney general for review under section 97A.0455, publishing a notice in the State Register and filing the rule with the secretary of state and the Legislative Coordinating Commission, and complying with section 97A.0459, and including a statement of the conditions and a copy of the rule in the notice. The conditions for opening a water body or portion of a water body for night bow fishing under this section may include the need to temporarily open the area to evaluate compatibility of the activity on that body of water prior to permanent rulemaking. The notice may be published after it is received from the attorney general or five business days after it is submitted to the attorney general, whichever is earlier.

(c) Rules adopted under paragraph (b) are effective upon publishing in the State Register and may be effective up to seven days before publishing and filing under paragraph (b), if:

(1) the commissioner of natural resources determines that an emergency exists;

(2) the attorney general approves the rule; and

(3) for a rule that affects more than three counties the commissioner publishes the rule once in a legal newspaper published in Minneapolis, St. Paul, and Duluth, or for a

rule that affects three or fewer counties the commissioner publishes the rule once in a legal newspaper in each of the affected counties.

(d) Except as provided in paragraph (e), a rule published under paragraph (c), clause (3), may not be effective earlier than seven days after publication.

(e) A rule published under paragraph (c), clause (3), may be effective the day the rule is published if the commissioner gives notice and holds a public hearing on the rule within 15 days before publication.

(f) The commissioner shall attempt to notify persons or groups of persons affected by rules adopted under paragraphs (b) and (c) by public announcements, posting, and other appropriate means as determined by the commissioner.

(g) Notwithstanding section 97A.0458, a rule adopted under this subdivision is effective for the period stated in the notice but not longer than 18 months after the rule is effective.

Subd. 13a. Game and fish expedited permanent rules.

(a) In addition to the authority granted in subdivision 13, the commissioner of natural resources may adopt rules under section 14.389 that are authorized under:

(1) chapters 97A, 97B, and 97C to describe zone or permit area boundaries, to designate fish spawning beds or fish preserves, to select hunters or anglers for areas, to provide for registration of game or fish, to prevent or control wildlife disease, or to correct errors or omissions in rules that do not have a substantive effect on the intent or application of the original rule; or

(2) section 84D.12 to ~~list~~ designate prohibited invasive species, regulated invasive species, and unregulated nonnative species.

(b) The commissioner of natural resources may adopt rules under section 14.389 that are authorized under chapters 97A, 97B, and 97C, for purposes in addition to those listed in paragraph (a), clause (1), subject to the notice and public hearing provisions of section 14.389, subdivision 5.

2.

84D.01 DEFINITIONS.

Subd. 2. Aquatic macrophyte.

"Aquatic macrophyte" means macro algae or a macroscopic nonwoody plant, either a submerged, floating leafed, floating, or emergent plant that naturally grows in water.

3.

84D.05 PROHIBITED INVASIVE SPECIES.

Subdivision 1. Prohibited activities.

A person may not possess, import, purchase, sell, propagate, transport, or introduce a prohibited invasive species, except:

(1) under a permit issued by the commissioner under section 84D.11;

(2) in the case of purple loosestrife, as provided by sections 18.75 to 18.88;

(3) under a restricted species permit issued under section 17.457;

(4) when being transported to the department, or another destination as the commissioner may direct, in a sealed container for purposes of identifying the species or reporting the presence of the species;

(5) when being transported for disposal as part of a harvest or control activity when specifically authorized under a permit issued by the commissioner according to section 103G.615, when being transported for disposal as specified under a commercial fishing license issued by the commissioner according to section 97A.418, 97C.801, 97C.811, 97C.825, 97C.831, or 97C.835, or when being transported as specified by the commissioner;

~~(6) when the specimen has been lawfully acquired dead and, in the case of plant species, all seeds are removed or are otherwise secured in a sealed container;~~

~~(7) in the form of herbaria or other preserved specimens;~~

~~(8)~~ (6) when being removed from watercraft and equipment, or caught while angling, and immediately returned to the water from which they came; or

~~(9)~~ (7) as the commissioner may otherwise prescribe by rule.

Appendix C continued

84D.075 NONNATIVE SPECIES, AQUATIC PLANTS, AND AQUATIC MACROPHYTES; PARTS AND LIFE STAGE. [NEW]

A law relating to a nonnative species, aquatic plant, or aquatic macrophyte applies in the same manner to a part of a nonnative species, aquatic plant, or aquatic macrophyte, whether alive or dead, and to any life stage or form.

4.

84D.09 AQUATIC MACROPHYTES.

Subd. 2. Exceptions.

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

(1) that are duckweeds in the family Lemnaceae;

(2) for purposes of constructing shooting or observation blinds in amounts sufficient for that purpose, provided that the aquatic macrophytes are emergent and cut above the waterline;

(3) when legally purchased or traded by or from commercial or hobbyist sources for aquarium, wetland or lakeshore restoration, or ornamental purposes;

(4) when harvested for personal or commercial use if in a motor vehicle;

(5) to the department, or another destination as the commissioner may direct, in a sealed container for purposes of identifying a species or reporting the presence of a species;

(6) that are wild rice harvested under section 84.091;

(7) in the form of fragments of emergent aquatic macrophytes incidentally transported in or on watercraft or decoys used for waterfowl hunting during the

waterfowl season; ~~or~~

(8) when removing water-related equipment from waters of the state for purposes of cleaning off aquatic macrophytes before leaving a water access site.; or

(9) when being transported from riparian property to a legal disposal site that is at least 100 feet from any surface water, ditch, or seasonally flooded land, provided the aquatic macrophytes are in a covered commercial vehicle specifically designed and used for hauling trash.

5.

84D.10 WATERCRAFT AND WATER-RELATED EQUIPMENT REQUIREMENTS AND PROHIBITIONS.

Subd. 4. Persons transporting water-related equipment.

(a) When leaving ~~waters~~ a water of the state, a person must drain water-related equipment holding water and live wells and bilges by removing the drain plug before transporting the water-related equipment ~~off the water access site or riparian property~~. For the purposes of this paragraph, "transporting" includes moving water-related equipment over land between connected or unconnected water bodies, but does not include moving water-related equipment within the immediate area required for loading and preparing the water-related equipment for transport over land.

6.

84D.108 SERVICE PROVIDER PERMIT.

Subd. 2a. Lake Minnetonka pilot study.

(a) The commissioner may issue an additional permit to service providers to return to Lake Minnetonka water-related equipment with zebra mussels attached after the equipment has been seasonally stored, serviced, or repaired. The permit must include verification and documentation requirements and any other conditions the commissioner deems necessary.

(b) Water-related equipment with zebra mussels attached may be returned only to Lake Minnetonka (DNR Division of Waters number 27-0133) by service providers permitted under subdivision 1.

(c) The service provider's place of business must be within the Lake Minnetonka Conservation District as established according to sections 103B.601 to 103B.645.

(d) A service provider applying for a permit under this subdivision must, if approved for a permit and before the permit is valid, furnish a corporate surety bond in favor of the state for $50,000 payable upon violation of this chapter.

(e) This subdivision expires December 1, 2018.

84D.11 PERMITS.

Subdivision 1. Prohibited invasive species.

(a) The commissioner may issue a permit for the propagation, possession, importation, purchase, or transport of a prohibited invasive species for the purposes of disposal, decontamination, control, research, or education.

(b) The commissioner may issue a permit as provided under section 84D.108, subdivision 2a, to a service provider to allow water-related equipment to be placed back into the same body of water after being seasonally stored, serviced, or repaired by the service provider. This paragraph expires December 1, 2018.

2016 SESSION LAWS LAKE SERVICE PROVIDER FEASIBILITY REPORT.

The commissioner of natural resources shall report to the chairs of the house of representatives and senate committees with jurisdiction over natural resources by January 15, 2019, regarding the feasibility of expanding permitting to service providers as described in Minnesota Statutes, section 84D.108, subdivision 2a, to other water bodies in the state. The report must:

(1) include recommendations for state and local resources needed to implement the program;

(2) assess local government inspection roles under Minnesota Statutes, section 84D.105, subdivision 2, paragraph (g); and

(3) assess whether mechanisms to ensure that water-related equipment placed back into the same body of water from which it was removed can adequately protect other water bodies.

7.

84D.13 ENFORCEMENT; PENALTIES.

Subd. 4. Warnings; civil citations.

After appropriate training, conservation officers, other licensed peace officers, and other department personnel designated by the commissioner may issue warnings or citations to a person who:

(1) unlawfully transports prohibited invasive species or aquatic macrophytes;

(2) unlawfully places or attempts to place into waters of the state water-related equipment that has aquatic macrophytes or prohibited invasive species attached;

(3) intentionally damages, moves, removes, or sinks a buoy marking, as prescribed by rule, Eurasian water milfoil;

(4) fails to remove plugs, open valves, and drain water from water-related equipment before leaving waters of the state or when transporting water-related equipment as provided in section 84D.10, subdivision 4; ~~or~~

(5) transports infested water, in violation of rule, off riparian property.~~:~~;

(6) fails to comply with a decontamination order when a decontamination unit is available on site;

(7) fails to complete decontamination of water-related equipment or to remove invasive species from water-related equipment by the date specified on a tagging notice and order; or

(8) fails to complete the aquatic invasive species offender training course required under section 86B.13.

Subd. 5. Civil penalties.

(a) A civil citation issued under this section must impose the following penalty amounts:

(1) for transporting aquatic macrophytes in violation of section 84D.09, $100;

(2) for placing or attempting to place into waters of the state water-related equipment that has aquatic macrophytes attached, $200;

(3) for unlawfully possessing or transporting a prohibited invasive species other than an aquatic macrophyte, $500;

(4) for placing or attempting to place into waters of the state water-related equipment that has prohibited invasive species attached when the waters are not listed by the commissioner as being infested with that invasive species, $500;

(5) for intentionally damaging, moving, removing, or sinking a buoy marking, as prescribed by rule, Eurasian water milfoil, $100;

(6) for failing to have drain plugs or similar devices removed or opened while transporting water-related equipment or for failing to remove plugs, open valves, and drain water from water-related equipment, other than marine sanitary systems, before leaving waters of the state, $100;

(7) for transporting infested water off riparian property without a permit as required by rule, $200; ~~and~~

(8) for failing to have aquatic invasive species affirmation displayed or available for inspection as provided in sections 86B.401 and 97C.301, subdivision 2a, $25~~.~~;

(9) for failing to comply with a decontamination order when a decontamination unit is available on site, $250;

(10) for failing to complete decontamination of water-related equipment or to remove invasive species from water-related equipment by the date specified on a tagging notice and order, $250; and

(11) for failing to complete the aquatic invasive species offender training course required under section 86B.13, $25.

(b) A civil citation that is issued to a person who has one or more prior convictions or final orders for violations of this chapter is subject to twice the penalty amounts listed in paragraph (a).

CHANGES TO MINNESOTA RULES

6216.0250 PROHIBITED INVASIVE SPECIES.

Subp. 2. Aquatic plants.

The following aquatic plants are listed as prohibited invasive species:

A. African oxygen weed (*Lagarosiphon major*) (Ridley) Moss ex Wagner;

B. aquarium watermoss or giant salvinia (*Salvinia molesta*) Mitchell;

C. Australian stonecrop (*Crassula helmsii*) (Kirk) Cockayne;

D. brittle naiad (*Najas minor*) Allioni;

E. curly-leaf pondweed (*Potamogeton crispus*) Linnaeus;

F. Eurasian water milfoil (*Myriophyllum spicatum*) Linnaeus;

G. European frog-bit (*Hydrocharis morsus-ranae*) Linnaeus;

H. flowering rush (*Butomus umbellatus*) Linnaeus;

I. hydrilla (*Hydrilla verticillata*) (Carl von Linnaeus) Royle;

J. Indian swampweed (*Hygrophila polysperma*) (Roxburgh) T. Anders;

K. purple loosestrife (*Lythrum salicaria*, *Lythrum virgatum*, or any variety, hybrid, or cultivar thereof) Linnaeus;

L. starry stonewort (*Nitellopsis obtusa*) Linnaeus;

L. M. water aloe or water soldiers (*Stratiotes aloides*) Linnaeus; and

M. N. water chestnut (*Trapa natans*) Linnaeus~~; and.~~

~~N. water hyacinth (*Eichhornia crassipes*) Solms.~~

[Expedited permanent rule effective 8-1-2016]

Subp. 3. Fish.

The following fish are listed as prohibited invasive species:

A. Amur sleeper (*Perccottus glenii*) Dybowski;

B. bighead carp (*Hypophthalmichthys nobilis*) Richardson;

C. black carp (*Mylopharyngodon piceus*) (Richardson) Peters;

D. crucian carp (*Carassius carassius*) Linnaeus;

E. Eurasian minnow (*Phoxinus phoxinus*) Linnaeus;

F. European perch (*Perca fluviatilis*) Linnaeus;

G. grass carp (*Ctenopharyngodon idella*) Valenciennes;

H. largescale silver carp (*Hypophthalmichthys harmandi*) Sauvage;

I. northern snakehead fish (*Channa argus*);

J. Oriental weatherfish (*Misgurnus anguillicaudatas*) Cantor;

K. Prussian carp (*Carassius gibelio*) Bloch;

L. roach (*Rutilus rutilus*) Linnaeus;

M. round goby (*Neogobius melanostomus*);

N. rudd (*Scardinius erythrophthalmus*) Linnaeus;

O. ruffe (*Gymnocephalus cernuus*) Linnaeus;

P. sea lamprey (*Petromyzon marinus*) Linnaeus;

Q. silver carp (*Hypophthalmichthys molitrix*) Valenciennes;

R. stone moroko (*Pseudorasbora parva*) Temminck & Schlegels;

S. tubenose goby (*Proterorhinus marmoratus*) Pallas;

T. wels catfish (*Siluris glanis*) Linnaeus;

U. western mosquitofish (*Gambusia affinis*) Baird & Girard;

V. white perch (*Morone americana*) Gmelin; and

~~*W. yabby (Cherax destructor) Clark; and*~~

~~X.~~W. zander (*Stizostedion lucioperca*) Linnaeus.

[Expedited permanent rule effective 8-1-2016]

Subp. 4. Invertebrates.

The following invertebrates are listed as prohibited invasive species:

A. faucet snail (*Bithynia tentaculata*) Linnaeus;

B. New Zealand mud snail (*Potamopyrgus antipodarum*) Gray;

C. quagga mussel (*Dreissena bugensis*) Andrusov;

D. red swamp crayfish (*Procambarus clarkii*) Girard; and

E. yabby (*Cherax destructor*) Clark; and

~~E.~~F. zebra mussel (*Dreissena* spp.).

[Expedited permanent rule effective 8-1-2016]

6216.0260 REGULATED INVASIVE SPECIES.

Subp. 2. Aquatic plants.

The following aquatic plants are listed as regulated invasive species:

A. Brazilian waterweed (*Egeria densa*) Planchon;

B. Carolina fanwort or fanwort (*Cabomba caroliniana*) A. Gray;

C. Chinese water spinach (*Ipomoea aquatica*) Forsskal;

D. parrot's feather (*Myriophyllum aquaticum*) (da Conceicao Vellozo) Verdcourt;

E. nonnative waterlilies (*Nymphaea* spp.) Linnaeus, or any variety, hybrid, or cultivar thereof. Native Minnesota waterlilies are: *Nymphaea odorata* Aiton subsp. *odorata* Aiton, *N. leibergii* Morong, and *N. odorata* Aiton subsp. *tuberosa* (Paine) Wiersema & Hellquist; ~~and~~

F. yellow iris or yellow flag (*Iris pseudacorus*) Linnaeus; and

G. water hyacinth (*Eichhornia crassipes*) Solms.

[Expedited permanent rule effective 8-1-2016]

Subp. 3. Fish.

The following fish are listed as regulated invasive species:

A. alewife (*Alosa pseudoharengus*) Wilson;

B. common carp, koi (*Cyprinus carpio*) Linnaeus;

C. goldfish (*Carassius auratus*) Linnaeus;

D. rainbow smelt (*Osmerus mordax*) Mitchell; and

E. tilapia (*Tilapia*, ~~*Oneochromis, Sartheradon*~~ *Oreochromis, Sarotherodon* spp.).

[Expedited permanent rule effective 8-1-2016]

Appendix D

Lakes and rivers listed as infested with aquatic invasive species from January-December 2016.

Water body name	County or counties	Listed for aquatic invasive species	Year species was first confirmed, or connected water body*	DOW number**
Adley	Otter Tail	zebra mussel	2016	56-0031
Adley Creek from Big Birch to the Sauk River	Todd and Stearns	zebra mussel	connected to Big Birch (77-0084) and Sylvia (73-0249)	NA
Andrew	Douglas	zebra mussel	2016	21-0085
Big Birch	Todd and Stearns	zebra mussel	2016	77-0084
Blackwater	Itasca	faucet snail	2016	31-0561
Bridge	Dakota	Eurasian watermilfoil	2016	19-0179
Byllesby	Dakota	flowering rush	2016	19-0006
Cass	Beltrami	starry stonewort	2016	04-0030
Constance	Wright	Eurasian watermilfoil	2016	86-0051
Courthouse	Carver	Eurasian watermilfoil	2016	10-0005
Detroit	Becker	zebra mussel	2016	03-0381
Devilfish	Cook	spiny waterflea	2016	16-0029
Dutch	Wright	Eurasian watermilfoil	2016	86-0184
East Spirit	Otter Tail	zebra mussel	2016	56-0501
East Sylvia	Wright	zebra mussel	2016	86-0289
Faille	Todd	zebra mussel	connected to Osakis (77-0215)	77-0195
Florida	Kandiyohi	zebra mussel	2016	34-0217
Franklin	Otter Tail	zebra mussel	2016	56-0759
George Watch	Anoka	Eurasian watermilfoil	2016	02-0005
Goose	Chisago	Eurasian watermilfoil	2016	13-0083
Guernsey	Todd	zebra mussel	connected to Osakis (77-0215)	77-0182
Hubert	Crow Wing	zebra mussel	2016	18-0375
Huntington Mine	Crow Wing	zebra mussel	2016	18-0441
Johanna	Ramsey	Eurasian watermilfoil	2016	62-0078
Jonathan (Upper Lake Grace)	Carver	Eurasian watermilfoil	2016	10-0217
Kimball	Crow Wing	zebra mussel	2016	18-0361
Knife	Kanabec	faucet snail	2016	33-0028
Lac qui Parle	Multiple (Lac qui Parle, Chippewa, Swift)	zebra mussel	2016	37-0046
Leech	Cass	zebra mussel	2016 (veligers)	11-0203
Lily	Dakota	Eurasian watermilfoil	2016	19-0180
Little Birch	Todd	zebra mussel	connected to Big Birch (77-0084)	77-0089
Little Hanging Horn	Carlton	Eurasian watermilfoil	2016	09-0035
Little Osakis	Todd	zebra mussel	connected to Osakis (77-0215)	77-0201
Long	Washington	Eurasian watermilfoil	2016	82-0030
Lower Cullen	Crow Wing	zebra mussel	2016	18-0403
Mangan Mine Pit	Crow Wing	zebra mussel	2016	18-0744
Maud	Becker	zebra mussel	2016	03-0500
McDonough	Dakota	Eurasian watermilfoil	2016	19-0076

Water body name	County or counties	Listed for aquatic invasive species	Year species was first confirmed, or connected water body*	DOW number**
Minnesota River pool behind Granite Falls, MN dam	Yellow Medicine	zebra mussel	2016	87-0187
Minnewashta	Carver	zebra mussel	2016	10-0009
Mississippi River, Pool 4	Multiple	faucet snail	2016	79-0005
Mississippi River, Pool 5	Multiple	faucet snail	2016	79-0001
Mississippi River, Pool 5A	Multiple	faucet snail	2016	85-0013
Mississippi River, Pool 6	Multiple	faucet snail	connected to other Mississippi River pools	85-0002
Moose	Beltrami	starry stonewort	2016	04-0011
O'Brien	Dakota	Eurasian watermilfoil	2016	19-0072
Osakis	Todd and Douglas	zebra mussel	2016	77-0215
Otter Tail	Otter Tail	zebra mussel	2016	56-0242
Pocket	Douglas	zebra mussel	2016	21-0140
Portage (in Lebanon Hills Regional Park)	Dakota	Eurasian watermilfoil	2016	19-0074
Quarry	Scott	Eurasian watermilfoil	2016	70-0343
Rice	Stearns	starry stonewort	2016	73-0196
Roosevelt	Cass and Crow Wing	Eurasian watermilfoil	2016	11-0043
Round	Aitkin and Crow Wing	zebra mussel	2016	01-0204
Sallie	Becker	zebra mussel	2016	03-0359
Sauk River from Osakis to Guernsey	Todd	zebra mussel	connected to Osakis (77-0215)	NA
Signalness (also known as Mountain)	Pope	zebra mussel	2016	61-0149
South Twin	Itasca	Eurasian watermilfoil	2016	31-0191
Sybil	Otter Tail	zebra mussel	2016	56-0387
Tetonka	Le Sueur	Eurasian watermilfoil	2016	40-0031
Tilde	Clay	red swamp crayfish	2016	14-0004
Turtle (Big Turtle)	Beltrami	starry stonewort	2016	04-0159
Unnamed (Grace)	Carver	Eurasian watermilfoil	2016	10-0218
Unnamed (in McGroarty Park)	Dakota	Eurasian watermilfoil	2016	19-0035
Unnamed pond (Black Tern Pond)	Ramsey	Eurasian watermilfoil	2016	62-0129
Unnamed pond north of East Spirit and south of County Road 4 (located in the NE 1/4 of the SW 1/4 of S4, T136N, R41W)	Otter Tail	zebra mussel	connected to East Spirit (56-0501)	none
Upper Red	Beltrami	starry stonewort	2016	04-0035-01
West Battle	Otter Tail	zebra mussel	2016	56-0239
West Sylvia	Wright	starry stonewort	2016	86-0279
Winnibigoshish	Cass and Itasca	starry stonewort	2016	11-0147

* Year species was first confirmed, or connected water body: Either (1) the year in which we first confirmed a population of the aquatic invasive species in the water body, or (2) "connected" to indicate that we listed the water body because it is connected to a water body where the aquatic invasive species has been confirmed; this column may also contain the name and/or DOW number of the connected, confirmed water body.

** DOW number: An identifying number for lakes. DOW stands for the former DNR Division of Waters. Ponds and wetlands that are not on the public waters inventory are listed with "none" in the number column. Most rivers and streams on the public waters inventory are listed without a number in the number column; some river pools are identified with a DOW number.

Appendix E

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