DEPARTMENT OF NATURAL RESOURCES

INVASIVE SPECIES 2025 ANNUAL REPORT

Photo on cover: *Invasive Species Specialist April Londo holds a rake full of aquatic vegetation during a plant survey.*

DEPARTMENT OF NATURAL RESOURCES

ECOLOGICAL AND WATER RESOURCES

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

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2025 INVASIVE SPECIES ANNUAL REPORT

The Minnesota Department of Natural Resources (DNR) is pleased to submit the 2025 Invasive Species Annual Report to the governor, legislature, and people of Minnesota.

This report provides an overview of program activities, finances, prevention and management efforts, goals, highlights, partnerships, and future needs and plans for individual program areas. It highlights accomplishments of the DNR Invasive Species Program and keeps you up to date with new challenges facing the program as we work with partners around the state to reduce the impacts of invasive species.

We look forward to working with you in 2026 as we continue our work to prevent and manage invasive species to benefit Minnesota's natural resources.

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Highlights from 2025

PREVENTION

Figure 1. Conservation Officer Cassie Block and K9 Jet search a boat for zebra mussels. Currently the MN DNR has six zebra mussel detection dogs.

- In 2025, the Minnesota Legislature approved an increase to the invasive species surcharge on watercraft registrations.
- Six zebra mussel detection K9 officers assisted conservation officers and aquatic invasive species (AIS) inspectors. The dogs improved their efficiency, with faster and more thorough inspections of water-related equipment. The teams provided educational demonstrations at several public events, including the Minnesota State Fair. Watercraft inspection staff, in partnership with the Enforcement Division and K9 teams, conducted a total of 479 inspections at thirteen AIS check stations held throughout the state.
- DNR conservation officers provided 11,263 hours of AIS enforcement and education.
- DNR watercraft inspection program staff trained 261 local and tribal government watercraft inspectors at 31 in-person trainings before the fishing opener. An additional 155 watercraft inspectors attended in-person training before Memorial Day.
- Watercraft inspectors hired by the DNR, and by 62 local and tribal governments with delegated authority from the DNR, inspected 451,349 watercraft in 2025, which makes Minnesota's watercraft inspection program one of the largest in the nation.
- More than 94% of incoming watercraft were in compliance with state laws. Ninety-seven percent of incoming watercraft were found free of plants, invasive animals, mud and water.
- For the second year, the DNR partnered with a Bassmaster fishing tournament on Leech Lake to inspect and decontaminate watercraft participating in the 2-day tournament. DNR watercraft inspectors inspected 202 watercraft and performed 68 decontaminations prior to the start of the tournament. Anglers came from 32 U.S. states, Canada, Japan and Australia to fish in this tournament.
- The Invasive Species Program provided information and resources so that people could better understand jumping worm regulations and help prevent their spread. The program continued to update webpages with additional information and materials for businesses, gardeners and land managers. The program engaged with the nursery and landscape industry, the Minnesota Department of Agriculture nursery inspectors, the Minnesota Pollution Control Agency, the DNR Enforcement Division and University of Minnesota researchers to provide additional jumping worm training and guidance.
- Information and resources were provided to aquarium and water garden stores and hobbyists about the live trade pathway for invasive species introductions. New outreach materials were developed, printed and distributed that employ community based social marketing (CBSM) strategies to encourage hobbyists and businesses to make commitments to prevent the spread of invasive species through supporting alternatives to the release of pets and plants.
- The DNR entered into an agreement with the U.S. Army Corps of Engineers for the design of the lock deterrent component of the Lock and Dam 5 Deterrent Project. The deterrent will be designed to be selective for invasive carp, reducing their upstream movement while allowing native fish to pass.

MANAGEMENT

- Invasive Species Program staff issued 482 permits to manage invasive aquatic plants, and the DNR Invasive Aquatic Plant Management Grant Program funded 64 grants, totaling $400,000.
- Since the initial capture of 10 signal crayfish (*Pacifasticus leniusculus*) by a commercial minnow harvester in October 2023 in Lake Winona, Douglas County, MN, no additional signal crayfish have been captured during collaborative delineation trapping efforts with the DNR, the Minnesota Aquatic Invasive Species Research Center (MAISRC) and Douglas County. Analyses conducted by MAISRC on environmental DNA (eDNA) samples showed weak signal crayfish eDNA detections and further eDNA results are pending.
- The DNR financially supported the inventory and management of terrestrial invasive plant species on 1,142 acres of state and adjacent land.
- The DNR continues to implement management actions for invasive carp as identified in the 2024 Invasive Carp Action Plan. The key purpose of this plan is to slow the spread of invasive carp, minimize their impact, and reduce the likelihood of invasive carp reproducing in Minnesota waters.
- The DNR continued to work with partners throughout the state to implement a coordinated response to nonnative *Phragmites* (*Phragmites australis* subsp. *australis*) in Minnesota, which is known to have been present at only 2,618 locations over the last 10 years. In 2025, DNR contractors evaluated populations at 1,122 sites prior to the 2025 treatment season. Nonnative *Phragmites* was not detected at 767 of those sites, with most being locations that had been treated in previous years.

RESEARCH and MONITORING

- DNR invertebrate biologists continued to work with the DNR's Large Lakes and Sentinel Lakes programs to monitor zebra mussel veliger and spiny waterflea populations and their impacts on native zooplankton and benthic (bottom-dwelling) invertebrate populations.
- DNR divers continued long-term monitoring of settled zebra mussel populations (juvenile to adult stages) in Mille Lacs Lake (since 2005) and Pelican Lake (since 2012). For both lakes, zebra mussel populations peaked about seven years after they were detected and then declined steadily to about one-third to one-half of their peak population levels.
- DNR AIS Prevention Planners continued serving in an advisory role for MAISRC's study, "Social Dimensions of Trade Pathways of AIS Spread." The project aims to evaluate the values, beliefs, and prevention behaviors of two key stakeholder groups involved in the trade pathway: aquarium and pond-related businesses (e.g., pet stores and water garden suppliers) and aquarium hobbyists.
- A 10+ year retrospective study published by DNR researchers and a companion fact sheet produced for the public show that invasive zebra mussels and spiny waterflea are having marked, ongoing impacts on native zooplankton crustaceans in Minnesota's nine largest walleye lakes, potentially impacting lake fisheries (Cattoor et al. 2025).
- The DNR partnered with MAISRC, University of Minnesota Extension, and county and local partners on an annual statewide search for new populations of starry stonewort, called "Starry Trek." In 2025, 162 volunteers searched 210 Minnesota waterbodies, including 249 public water accesses. Four new starry stonewort populations were found and the DNR is working to follow up with potential response efforts on those waterbodies.
- 198 native fish (lake sturgeon, paddlefish, bigmouth buffalo, white bass, and redhorse species) were tagged as part of the monitoring for the Lock and Dam 5 Deterrent Project. The acoustic tags implanted into these fish can be detected by a network of receivers in the water. Data from the tagged fish will help the DNR monitor the effects of the invasive carp deterrent system and adaptively manage the project to minimize impacts to native species.

Program Overview

Invasive species have serious economic, environmental and recreational impacts in Minnesota. In 1991, the Minnesota Legislature directed the 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, chapter 84D).

In 2025, the Invasive Species Program included 37 full-time positions located around the state, plus affiliated staff whose work contributes to the program. In the summer, the DNR employed 71 additional watercraft inspection staff, and trained and authorized 760 watercraft inspectors employed by local partners.

DNR Operational Order 113, which applies to DNR staff and contractors, provides policies and guidance for including invasive species prevention measures in their work.

The program works with partners to stay aware of invasive species in other areas of North America and the world, understand and manage pathways of spread, and reduce the potential for their introduction and spread in Minnesota.

Examples of key invasive species of concern that have *not* been found in Minnesota include the invasive aquatic plants hydrilla and water chestnut, and the invasive fish northern snakehead.

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

The program also addresses terrestrial invasive species on DNR-managed lands and provides information for private landowners and others. The program works to enhance the ability of DNR field staff to prevent or limit the negative impacts on Minnesota's ecology, economy and human health that can result from terrestrial invasive species such as round leaf bittersweet, wild parsnip, buckthorn, garlic mustard, jumping worms, emerald ash borer, and spongy moth.

GOALS

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

KEY STRATEGIES

1. Helping Minnesota residents and visitors understand their role in preventing the spread of invasive species by using innovative outreach and communications tools to share knowledge of aquatic and terrestrial invasive species and encourage behaviors that help prevent the spread of invasive species.
2. Creating and maintaining effective invasive species regulations across the state and working with enforcement to ensure compliance.
3. Deepening partnerships with local governments, research institutions, interest groups, lake associations, water-related businesses and others.
4. Coordinating watercraft inspection and decontamination with counties, tribal governments, lake associations, resort owners, and DNR Enforcement.
5. Coordinating the mapping and reporting of invasive species to ensure accurate information about their distribution in Minnesota.
6. Verifying and responding to new reports of possible invasive species as soon as possible.
7. Providing technical and financial assistance for invasive species management efforts.

KEY PARTNERS

The DNR's invasive species prevention and management activities depend on collaboration with tribes, other states, regional task force panels, local governments including counties, local law enforcement, cities and townships, federal agencies and other partners with similar concerns. Coordinated prevention efforts help reduce the spread of invasive species by providing the prevention, research and management resources necessary to achieve a long-term impact.

- The DNR Statewide AIS Advisory Committee (SAISAC) plays a vital role in reviewing and guiding the AIS prevention and management work of the Invasive Species Program. Members are appointed by the DNR Commissioner. They bring a range of personal and professional experience to the discussion of invasive aquatic plants and animals in Minnesota. Their interest and engagement with other stakeholders informs the program regarding policy, watercraft inspection, outreach, research, operations and other stakeholder interests. Visit mndnr.gov/aisadvisory.
- MAISRC at the University of Minnesota is a valuable partner, working closely with the program on research and advances in AIS management and related topics. MAISRC researchers regularly join Invasive Species Program meetings to discuss their latest research. The DNR's assistant commissioner who oversees the Ecological and Water Resources Division is a member of the Center's Advisory Board (CAB). Invasive Species Program personnel meet regularly with MAISRC leadership and communications staff to discuss opportunities for collaboration. Many Invasive Species Program staff attend MAISRC's annual research showcase. Visit maisrc.umn.edu.
- 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 Invasive Species Program collaborated with MISAC members in the implementation of the statewide plan "A Minnesota Management Plan for Invasive Species." As it has since 2005, MISAC produced a wall calendar for 2026 highlighting 12 invasive species and topics in Minnesota. More than 4,000 printed copies are distributed across the state, and the calendar is posted online. Visit mninvasives.org.

- The Invasive Carp Regional Coordinating Committee (ICRCC) represents the collective efforts of international, federal, tribal, state and municipal organizations to combat the spread of invasive carp into the Great Lakes. The ICRCC provides oversight and coordination of interagency prevention activities through the development and implementation of an annual Invasive Carp Action Plan and a complementary Monitoring and Response Plan. The work of the ICRCC is supported by the Great Lakes Restoration Initiative (GLRI), as well as partner agency resources. The DNR is an active member of the committee. Visit invasivecarp.us.
- Minnesota counties are key partners for invasive species prevention in Minnesota. Since 2014, the Minnesota Legislature has authorized AIS Prevention Aid to Minnesota counties to help prevent the spread of aquatic invasive species (Minnesota Statutes, section 477A.19). The Invasive Species Program has two full-time AIS prevention planning staff dedicated to working with these programs. The Department of Revenue distributes AIS Prevention Aid funds through a formula 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 to use the funds. Each county submits a copy of its guidelines for use of the funding to the DNR by December 31 of each year.
- The Minnesota Department of Agriculture (MDA) is the state regulatory lead for terrestrial invasive plant pests (such as emerald ash borer) and noxious weeds. Visit mda.state.mn.us. The DNR is a member of the Noxious Weeds Advisory Committee (NWAC) convened by the MDA to evaluate plant species for invasiveness, difficulty of management, cost of management, benefits and amount of injury caused by the species. For each species evaluated, the committee provides guidance to the MDA commissioner on if the species should be placed on the noxious weed list. Visit mda.state.mn.us/plants/pestmanagement/weedcontrol/mnnwac.
- The Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) at the University of Minnesota focuses on science-based solutions to protect Minnesota's prairies, forests, wetlands and agricultural resources from land-based invasive species. They have active research projects that involve coordination and collaboration with DNR staff. For example, the DNR terrestrial invasive species coordinator works with MITPPC researchers on jumping worm research needs. Visit mitppc.umn.edu.
- The DNR Natural Heritage Advisory Committee (NHAC) advises DNR programs in the Division of Ecological and Water Resources on issues related to sustaining the state's natural heritage and biological diversity. This committee advises the terrestrial work of the Invasive Species Program. Visit dnr.state.mn.us/nhac/index.html.
- Conservation Corps of Minnesota and Iowa (CCMI) has worked with the DNR since 1986 to preserve and improve the natural resources of the State of Minnesota. The Invasive Species Program benefits from CCMI Individual Placement positions providing additional capacity for the program's work.
- Wildlife Forever provides information and outreach materials to promote invasive species prevention; for example, in 2025 the Invasive Species Program and Wildlife Forever collaborated on a rating and labeling system to promote low-risk aquatic pets and plants.
- College and university researchers, including those at the University of Minnesota, Minnesota State University Mankato and the University of Georgia.
- The Federal Aquatic Nuisance Species Task Force and regional panels, including the Great Lakes Panel on Aquatic Nuisance Species and the Mississippi River Basin Panel on Aquatic Nuisance Species.
- The Upper Mississippi River Invasive Carp Team, the Stop Carp Coalition, Lake Pepin Legacy Alliance, MN-FISH, and Friends of the Mississippi River have provided support for the Invasive Species Program's work to prevent and manage invasive carp.
- Federal agencies, including the U.S. Fish and Wildlife Service (USFWS), the U.S. Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of Agriculture (USDA), the Environmental Protection Agency (EPA), and the National Park Service (NPS) provide coordination, leadership and expertise on invasive species horizon scanning, risk assessments and distribution mapping. The Invasive Species Program receives federal grants administered by the USFWS and EPA.

FUTURE NEEDS and PLANS

1. Continue to investigate invasive species biology, ecology, life history, impacts, and potential management measures of species not yet known to be in the state.
2. Continue to assess the risk of spreading AIS through novel and emerging pathways, such as in commerce and invasive organisms in trade.
3. Continue to investigate new methods to prevent the spread of invasives species and manage them to reduce their negative impacts.
4. Continue to partner with diverse existing and emerging groups to advance the program's goals, including by managing the impacts of invasive species in the state, learning from the results of different management strategies and applying those lessons learned to future work.
5. Use innovative outreach and communications tools to share knowledge of aquatic and terrestrial invasive species and inspire behaviors that help prevent the spread of invasive species in Minnesota, with a focus on increasing the Program's capacity to reach out to underserved and new audiences.

Program Finances

TIME FRAME

The other chapters in this report mostly include activities from calendar year 2025. However, to provide a comprehensive review of expenditures and to coordinate with the state funding cycle, this chapter refers to expenditures incurred in fiscal year 2025: July 1, 2024, to June 30, 2025.

FUNDING SOURCES

The Invasive Species Program was mostly supported by state funds in fiscal year 2025, with additional funding from federal grants.

State Funds

The Minnesota Legislature appropriated the following funds to the Invasive Species Program in fiscal year 2025 (Minnesota Laws 2023, Ch. 60, Art. 1, Sec. 3, Subd. 3(a):

- $4,222,000 from the invasive species account
- $2,831,000 from the State general fund

The invasive species account is a dedicated account in the natural resources fund in the state treasury (Minnesota Statutes, section 84D.15). Major sources of funding to the invasive species account are a surcharge on watercraft registrations and on non-resident fishing licenses. In fiscal year 2025, the $10.60 surcharge on watercraft registrations (valid for three years) provided $2,684,005 and the $5 fee on non-resident fishing licenses provided $1,209,500 to the invasive species account.

In the fiscal year 2024-2025 biennium, the legislature also made a one-time appropriation of $1,720,000 to the Invasive Species Program for the purpose of preventing and managing invasive carp (Minnesota Laws 2023, Ch. 60, Art. 1, Sec. 3, Subd. 3(n).

The Minnesota Legislature also appropriated funds to the Invasive Species Program to be administered as grant funds to MAISRC and Minnesota Lakes and Rivers Advocates (Minnesota Laws 2023, Ch. 60, Art. 1, Sec. 3, Subd. 3(j) and Subd. 3(m), respectively). In fiscal year 2025, the Invasive Species Program administered $1,335,812.28 in funds from legislative grants to those two entities (these expenditures are not included in Table 1).

Federal Funds

In fiscal year 2025, the program expended $865,084 from federal grants: 75% of those expenditures were from GLRI grants and the remainder were USFWS grants supporting invasive carp management, implementation of the State Aquatic Nuisance Species Plan and rapid response to signal crayfish. Federal funds also helped support watercraft inspections, increased focus on the organisms in trade pathway for invasive species introduction and spread, public awareness efforts, DNR Enforcement's zebra mussel K9 program and nonnative *Phragmites* management.

FISCAL YEAR 2025 EXPENDITURES

Invasive Species Program expenditures on activities during fiscal year 2025 (July 1, 2024–June 30, 2025) totaled $9.7 million. See Table 1 for a detailed breakdown by category. Table 1 does not include invasive species account expenditures appropriated directly to DNR Enforcement (Minnesota Laws 2023, Ch. 60, Art. 1, Sec. 3, Subd. 7). In fiscal year 2025, DNR Enforcement expended $1,712,260 from the general fund and $456,773 from the invasive species account on invasive species work. This table format was updated in 2025 based on feedback from the SAISAC.

Table 1: FISCAL YEAR 2025 INVASIVE SPECIES PROGRAM EXPENDITURES

	Invasive Species Account	General Fund	Other State Funds[2]	Federal	Total expenditures	Proportion of expenditures
Management/Control[1]	$353,322	$2,193,871	$102,019	$308,037	$2,957,249	0.30
Inspections/Enforcement	$1,233,871	$99,804	$695,386	$375,956	$2,405,017	0.25
State and Regional Coordination	$1,198,451	$618,332	$67,851	$133,349	$2,017,983	0.21
Administration	$605,411	$1,388,149	$19,717	$12,525	$2,025,802	0.21
Education/Public awareness[3]	$13,015	$147,611	$6,883	$19,331	$186,840	0.02
Research	$1,647	$4,393	$91,659	$15,887	$113,586	0.01
Total	$3,405,717	$4,452,161	$983,515	$865,084	$9,706,478	-

Notes:

1. Funding for management was spent on the inventory and management of Eurasian watermilfoil, starry stonewort, zebra mussels, flowering rush, invasive carp, invasive *Phragmites* and curly-leaf pondweed. $160,940 for terrestrial invasive species management is included in the Management/Control expenditures from the General Fund.
2. "Other State Funds" include Invasive Species Program expenditures from the Water Recreation Account (Minnesota Statutes, section 86B.706) and printing costs for the annual invasive species calendar.
3. Many categories overlap; for example, much of the time spent on watercraft inspections is categorized as "Inspections/ Enforcement" but watercraft inspectors are providing public education to lake and river users at the same time.

WATERCRAFT SURCHARGE CHANGES IN 2025

The Minnesota Legislature increased the watercraft surcharge during the 2025 First Special Session, effective January 1, 2026 (Session Laws 2025, 1st Special Session, Chapter 1, Article 4, Sec. 5). The watercraft surcharge increases are scaled according to the underlying registration cost for each watercraft type, varying from $14 to $50 for a three-year watercraft registration. For 63% of boaters, the increase will be less than $5/year, and 98% of boaters will see an increase of less than $10/year on their watercraft surcharge. The AIS surcharge was last increased in 2019, which was the first increase in 25 years, from $5 to $10.60 for a three-year watercraft registration.

Figure 2. K9 Bolt is ready to inspect boats for zebra mussels.

COST ACCOUNTING

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

ADMINISTRATION includes general office supplies, office rent, phone and communications support, workers' compensation fees, computer support fees, state accounting system fees, departmental operational support costs, certain repair costs, as well as clerical and administrative support costs.

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 AIS. The costs of developing and producing publications, public service announcements, videos and similar material are included, as are the costs of developing and maintaining invasive species information on the DNR website.

MANAGEMENT includes staff time, in-state travel expenses, fleet charges, commercial applicator contracts, and supplies to survey the distribution of AIS in Minnesota, and to prepare for, conduct, supervise and evaluate management activities. Funds provided to local government units and organizations to offset the cost of Eurasian watermilfoil, flowering rush and/or curly-leaf pondweed management efforts also are included.

INSPECTIONS/ENFORCEMENT includes the costs of implementing watercraft inspections at public water accesses, and the staff time and expenses associated with the promulgation of rules, development of legislation, creation of risk assessments and other invasive species prevention efforts. Expenditures by DNR Enforcement for invasive species work are also in this category but reported separately from the table above.

Figure 3. DNR Zooplankton Specialist Kylie Cattoor (top) and Invertebrate Biologist Don Eaton (bottom) conduct benthic invertebrate sampling.

RESEARCH includes staff time, travel expenses, fleet charges, supplies and contracts with the University of Minnesota and other research organizations to conduct research. These include efforts to develop new or improve existing management methods, better understand the ecology of invasive species, improve risk assessment tools and evaluate program success.

STATE AND REGIONAL COORDINATION includes general program planning, preparation of state plans and reports and general invasive species coordination with partners. This category also includes the work of program staff as well as various managers in the Ecological and Water Resources Division 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 AIS issues; work activities that staff participate in to improve their knowledge and skills, direct staff, or help on other projects; and fleet costs and the cost to purchase and repair boats, trailers, computers and similar items.

Prevention

ACTIVITIES

To help prevent the introduction and spread of AIS, the Invasive Species Program:

- Issued permits for the possession of prohibited invasive species and for certain activities on infested waters with restrictions to reduce the risk of spreading invasive species.
- Investigated reports of new AIS populations and searched water bodies and public water accesses for aquatic invasive species.
- Provided training to lake service providers.
- Assisted local, regional and national efforts to prevent the spread of invasive species through trade activities such as food markets, bait dealers, pet stores and aquatic plant dealers.

PERMITS

The DNR has authority to issue permits to allow the public to conduct certain activities with invasive species or in listed infested waters that would otherwise be prohibited under state regulations.

The DNR provides information and training to permittees on how to reduce the risk of spreading AIS while conducting these activities. Permit conditions require permittees to take actions to prevent the spread of AIS.

DNR permits related to AIS include:

- Lake service provider permits.
- Infested waters permits.
- Prohibited invasive species permits.
- Bait harvest permits.

Lake Service Provider Permits

Legislation authorizing a permit program for lake service providers (LSPs) to help prevent the spread of AIS in the state took effect in 2012. An LSP includes anyone who is paid to decontaminate, rent/lease, install or remove water-related equipment in or from Minnesota waters. Common LSP businesses include marinas, dock and lift installers, resorts and outfitters, local parks departments and lawn irrigation companies.

Lake service provider business owners are required to complete AIS prevention training and receive 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 an LSP must also successfully complete a free online training course and receive a training certificate. Permits and certificates are valid for three calendar years.

Total Statewide Certifications and LSP Permits

2,800
Certified LSP employees

986
Permitted LSPs

In 2025:

- The DNR completed permit training for 244 LSP business owners and managers, issuing 233 permits.
- 891 LSP employees completed online employee certificate training.
- 986 businesses were permitted LSPs at the end of 2025. The current list of permitted businesses is on the DNR website.
- DNR watercraft inspection program staff offered custom training for decontamination methods to interested businesses and completed two LSP hosted trainings for local LSP employees.

Invasive Species And Infested Waters Permits

People need a permit to divert or transport water from listed infested waters. In 2025, the Invasive Species Program issued five individual infested waters permits. Permits for water appropriation and work in public waters issued through the MNDNR Permitting and Reporting System (MPARS) also include invasive species conditions.

People need a permit to possess, transport, sell, purchase or import prohibited invasive species. The Invasive Species Program issued 51 prohibited invasive species permits in 2025 for species other than red swamp crayfish. In addition, 73 people were permitted in 2025 to import and/or possess frozen dead red swamp crayfish for consumption through a general permit.

Individuals can access several general permits on the DNR website. For example, to possess certain preserved specimens of prohibited invasive species for educational purposes; for fire departments using infested waters for training purposes; to transport water for water quality sampling; and to transport certain equipment away from a water body to a cleaning or storage location.

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 AIS training and comply with permit conditions to prevent the spread of AIS. 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.

REGULATIONS

Regulations, including laws and rules, are an important part of Minnesota's AIS prevention strategy that complement our education and outreach efforts. The Invasive Species Program works to review and refine state regulations to prevent the introduction and spread of invasive species and to clarify regulations for the public. That includes establishing new and revising existing regulations to address pathways of invasive species spread, designating certain nonnative species as prohibited or regulated invasive species, and listing water bodies as infested with AIS within our existing authorities.

Minnesota state law governing invasive species is primarily located in Minnesota Statutes, chapter 84D. Authorities and prohibitions related to AIS also

Figure 4. Lake service provider employees attend custom decontamination training led by Watercraft Inspection Trainers Cal Stenso-Velo and Tyler Lindholm.

Figure 5. Invasive Species Specialist April Londo pulls out a diverse mix of native aquatic vegetation during a point-intercept survey.

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 invasive species are primarily found in Minnesota Rules, chapter 6216.

Past annual reports of the 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. The most recent reports are available on the DNR website.

INVASIVE SPECIES IN TRADE

Global trade drives invasive species introductions to Minnesota and the United States. There are trades built on the movement and possession of live plants and animals which have historically led to invasive species introductions. The Invasive Species Program uses grant funding through the GLRI to support a position focused on trade and commerce pathways for invasive species introduction.

Some of this work includes:

- Developing educational materials for pet store owners, aquatic plant dealers and hobbyists.
- Creating educational 3D models of priority species in the trades to train key audiences on early detection.
- Assisting national efforts to draft model regulatory language to address priority gaps for AIS in commerce.
- Assisting national quick response efforts to prevent the spread of AIS through trade.
- Creating and updating multiple websites focusing on the trade pathways.
- Partnering with a University of Minnesota researcher to study the social dimensions of trade pathways.
- Attending multiple trade shows, auctions and conferences to educate important audiences on the AIS trade pathway.
- Coordinating prevention planning with other jurisdictions within the state and regionally.
- Contacting out of state sellers to estimate the potential of AIS introductions.
- Partnering with local hobbyist societies to inform them about invasive species in their hobby and support alternatives to release, such as surrender events.
- Advising Wildlife Forever on a project to develop labels to promote low-risk aquatic species in trade.

Figure 6. Aquatic invasive species trading cards developed in 2025 to help educate key audiences statewide.

INFESTED WATERS

The DNR will add a lake, river, pond or wetland to the infested waters list if it contains certain AIS 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 AIS are present. To reduce the risk of spreading AIS, activities like bait harvesting, commercial fishing, and water use are managed differently in infested waters. Not all AIS are included on the infested waters list; in particular, common carp and curly-leaf pondweed may not be used as the basis of listing a water body as infested per Minnesota Statutes, section 84D.03(c).

New water bodies listed as infested in 2025:

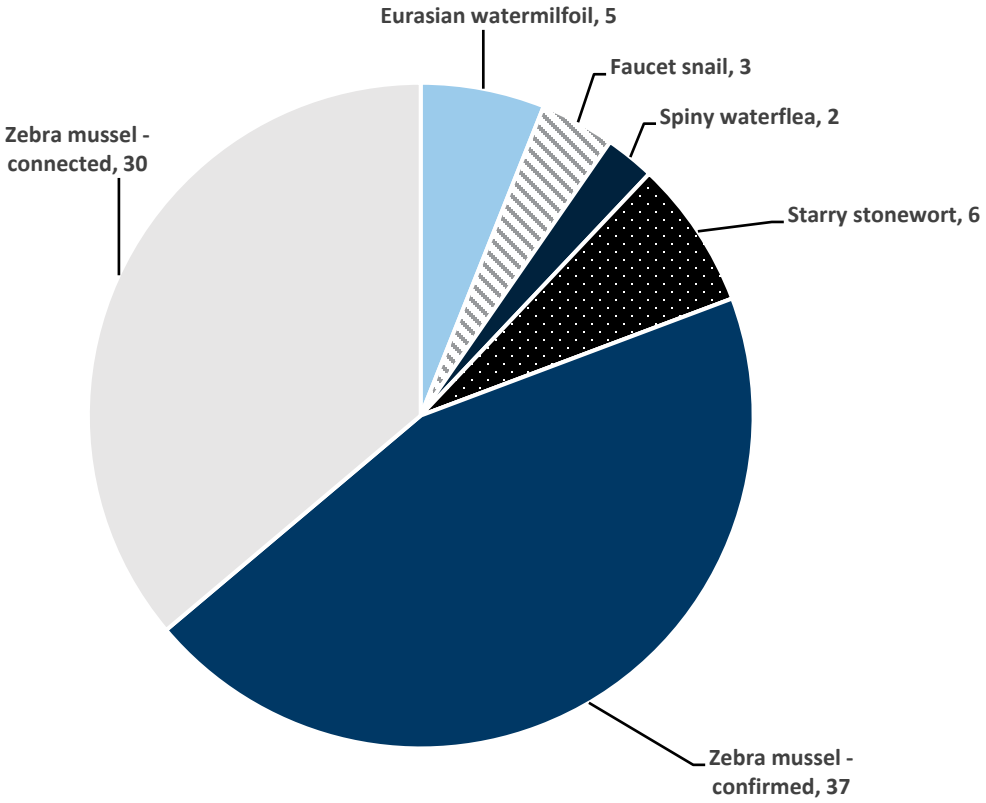

Figure 7. Number of waterbodies newly discovered with listed invasive species in 2025. Data are shown for each listed invasive species, and numbers reported are water bodies; if a water body was discovered with two listed species in 2025 (e.g., Eurasian watermilfoil and starry stonewort) it would appear twice (e.g., once under Eurasian watermilfoil and once under starry stonewort). zebra mussels are separated into "confirmed" and "connected" categories; "confirmed" status indicates the species is known in that waterbody, while "connected" status indicates the species is known in connected waterbodies.

For more information on waters listed in 2025, see Appendix B.

Total water bodies listed as infested:

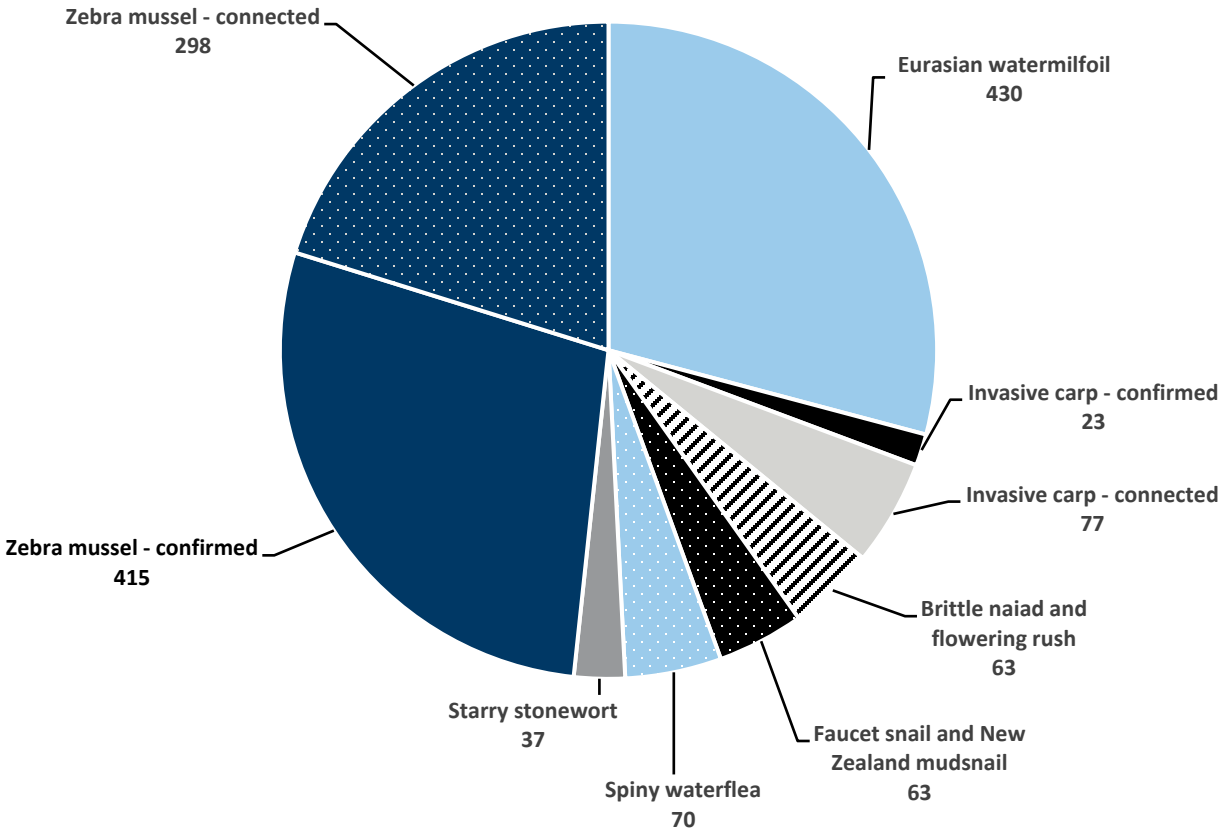

Figure 8. Total number of waterbodies with known listed invasive species in 2025. Data are shown for each listed invasive species, and numbers reported are water bodies; if a water body is known to contain two listed species in 2025 (e.g., Eurasian watermilfoil and starry stonewort) it would appear twice (e.g., once under Eurasian watermilfoil and once under starry stonewort). Invasive carp and zebra mussels are separated into "confirmed" and "connected" categories; "confirmed" status indicates the species is known in that waterbody, while "connected" status indicates the species is known in connected waterbodies.

Not included in the summary chart:

- One lake is listed as infested with red swamp crayfish, though red swamp crayfish have not been detected there since 2016.
- Lake Superior, the St. Louis River estuary, and other Superior tributaries are listed as infested with Viral Hemorrhagic Septicemia Virus (VHS), Eurasian ruffe, round goby and white perch.

Education and Public Awareness

In 2025, DNR staff engaged with a broad range of audiences to educate them about the risks of invasive species and persuade them to take actions to prevent their spread.

ACTIVITIES

- Developed strategic communication messages.
- Produced and distributed informational materials.
- Attended and handed out thousands of educational materials at special events, such as the Minnesota State Fair.
- Maintained the DNR website, created social media posts and video content, and worked with media outlets through news releases and interviews with radio, newspaper and television outlets.
- Gave presentations at local, state and national meetings and responded to numerous requests for information.
- Program communications were expanded through ongoing engagement with the Conservation Corps of Minnesota and Iowa (CCMI).

Figure 9. AIS in Commerce Prevention Planner, Eric Kenney, engages with the public at the Minnesota State Fair.

Strategic Communications CCMI Communications Position

Building on first-year effectiveness, the Invasive Species Program hosted a CCMI corpsmember position to provide full-time communications assistance. Working closely with program staff and DNR communications staff, this position has been particularly effective in enhancing collaboration with SAISAC and MAISRC. This position increases program capacity to share informative posts about AIS on social media, worked to maintain up to date information on the website, and continued a communications campaign to remind people to not release goldfish or other pets into the wild.

Promoting Behavior Change

The Invasive Species Program, in consultation with behavior change experts, continued to use CBSM methodologies to promote invasive species prevention behaviors in Minnesota (dnr.state.mn.us/invasives/ais/prevention/behavior-change.html). The DNR continued to work with local partners to help leverage CBSM in their communities.

The "Engaging Bait Shops" project continued to provide behavior change-based materials (posters, stickers, fliers) for distribution at bait shops that sell minnows and at events. Nine local programs participated in the pilot, reaching out to local bait shops to share outreach materials and assess staff AIS knowledge, attitudes and outreach needs.

Participating bait shops encouraged customers to sign a poster demonstrating their pledge to never release bait and were given pledge stickers, fishing license holders, and information cards showing how they can prevent the spread of AIS as anglers. Materials were distributed at 31 bait shops and at 12 events across the state. The DNR will continue to work with local partners to improve and expand this effort in the future.

Informational Materials

The program continued to assess and revise informational materials for public distribution and created new materials and updated existing ones, including:

- A trading cards theme for 17 different AIS species "watch cards" distributed at the Minnesota State Fair and other venues.
- A suite of outreach materials created to educate Minnesotans about trade pathways for invasive species spread including stickers, posters, rack cards and social media content.
- An AIS prevention drying cloth for boaters.
- A manual for AIS volunteers.

Digital versions of AIS outreach materials are publicly available for partners and can be found online: dnr.state.mn.us/invasives/ais/outreach.html.

The Invasive Species Program provided content for the 2025 Minnesota Fishing Regulations handbook. Available in five languages, it includes information about AIS laws, watercraft inspection information, species identification information, advertising to remind anglers to help prevent the spread of AIS, and information about the infested waters list. 595,202 copies of the handbook were downloaded in 2025.

Figure 10. Aquatic invasive species specialist Jeffrey Flory instructs participants at the 2025 plant ID workshop on how to identify emergent plant species.

SPECIAL EVENTS

Staff co-hosted booths with partners at several festivals and fairs to promote public awareness and actions to prevent the spread of invasive species. Thousands of publications, license holders and temporary tattoos were distributed.

The Invasive Species Program hosted a display area in the DNR Building at the 2025 Minnesota State Fair. The booth once again included the interactive "Muck Hunt" video game, which is designed for people to have fun while learning about invasive species prevention actions. Players can use trackballs to simulate the use of a boot brush, hose, glove and pressure washer to clean off a boat, ATV and boots on screen. Messaging focused on the steps people can take to prevent the spread of terrestrial and aquatic invasive species. DNR staff and volunteers worked the informational invasive species table and distributed publications, license holders, drying cloths, boot brushes, and temporary tattoos.

The Invasive Species Program co-hosted an Aquatic Plant Identification Training with the University of Minnesota Extension and MAISRC. Staff and researchers throughout the state collected, sorted, and identified over 80 plant species to be used in the training. Attendees included 13 consultants, 19 local government staff that conduct aquatic plant surveys and 11 volunteers interested in building identification skills.

Figure 11. Video and photo shoot with DNR's Watercraft Inspection Trainer, Cal Stenso-Velo, demonstrating to a shoreline resident how to inspect and decontaminate a boat lift.

Public Engagement

Staff participated in conferences, workshops, trainings, school events, water festivals, county fairs and many other special events throughout the year to educate the public. Program staff also made presentations to lake associations and community groups to answer questions and discuss invasive species issues and activities.

Staff responded to numerous inquiries about a wide range of topics including aquatic invasive invertebrates, terrestrial invasives, aquatic invasive plants, invasive carp, invasive species regulations, management methods, native aquatic species, prevention strategies, and individual lake issues. In several instances, regional invasive species specialists followed up with field surveys.

WEB/ DIGITAL

DNR communications specialists, including a full-time CCMI AIS communications specialist, continued the integration of news and media relations, web, social media, publications and graphic design, public access signs, advertising and public interactions.

The program continued to leverage social media messaging to increase AIS awareness and education this year. AIS-related social media messaging was released regularly on the DNR's Instagram and Facebook pages. Social media content was also shared by local partners to broaden reach.

Staff launched a small-scale online communications pilot project using social media outreach and ads to reach dock and lift owners and lake service providers about AIS laws and best practices. The pilot included short videos, social media infographics, and outreach in the Washington County area.

Promotion of the Pledge to Protect Minnesota Waters campaign continued. Anyone 18 or older can visit the Pledge to Protect Minnesota Waters website (mndnr.gov/AISPledge) to take the pledge and upload a photo, if desired. The pledge affirms that participants will follow Minnesota's "Clean, Drain, Dispose" laws and will encourage others to do so. Regardless of the activity—boating, paddling, fishing, moving shoreline equipment, using recreational gear on the water, or caring for aquarium pets or water gardens—everyone can pledge to do their part and take several simple actions to prevent the spread of AIS. As of December 2025, 892 people have taken the pledge. The program will continue to promote this webpage through various methods, partnerships and events.

Figure 12. A graphic created for use on social media to educate shoreline residents about ways to prevent the spread of AIS when removing docks, lifts, and other water-related equipment.

Media Relations

In 2025, the program continued to expand placement of more stories about innovations and new steps to reduce the spread of invasive species. In 2025, the DNR again issued dozens of localized and statewide news releases with an invasive species focus.

DNR news releases about new AIS confirmations focused on the unique dynamics of each lake and river. News releases created greater awareness of proactive steps the program is taking, such as actions to prevent the spread of invasive carp, advances in research and technologies, and the broad range of partnerships with stakeholders across the state and nation. Additionally, the Enforcement Division conducted media interviews on the importance of AIS regulation compliance.

Invasive carp continued to be a topic of focus, especially because of progress on the Lock and Dam 5 Deterrent Project, detailed in the Invasive Aquatic Animals – Invasive Carp chapter of this report.

Enforcement

ACTIVITIES

The Enforcement Division continued to emphasize invasive species enforcement as priority work and a core responsibility. The Enforcement Division continues to focus its efforts on enforcement and education, both critical tactics in preventing the introduction and spread of invasive species in Minnesota.

In 2025, DNR conservation officers conducted the following activities to enforce Minnesota's invasive species statutes and rules.

Figure 13. Enforcement staff receive AIS training at CO Academy.

ENFORCEMENT CONTACTS (Citations/Warnings)

Numbers of enforcement contacts vary due to officer staffing levels, public compliance, length of open-water season, local law enforcement involvement and outreach efforts. In 2025, a 73% compliance rate with AIS regulations was observed at AIS check stations. Three new AIS K9 Teams completed their training and joined the Enforcement Division in 2025 which created additional opportunities for focused invasive species enforcement activities. These K9s are partly supported by a USFWS grant through the Invasive Species Program.

Table 2: NUMBER OF CITATIONS AND WARNINGS BY YEAR

	2025	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015
Citations issued	49	39	57	58	39	61	98	95	127	123	244
Warnings	411	252	321	310	266	365	485	476	557	671	911

AQUATIC INVASIVE SPECIES CHECK STATIONS (SPRING TO FALL 2025)

To date in 2025, DNR Conservation Officers have completed 13 roadside check stations around the state to inspect watercraft and watercraft equipment transported in Minnesota. Check stations are a partnership between enforcement and watercraft inspection staff. Anyone trailering watercraft in a specific location is required to stop for an inspection. Conservation Officers also dedicated time to numerous AIS assignments around busy holidays and fishing openers.

Statewide Open Water Season Enforcement Results

Review of past data from DNR Enforcement check stations shows the compliance with invasive species regulations has generally risen every year since the first year of check stations back in 2012.

Figure 14. Three new K9 zebra mussel detection dogs were certified in 2025 and are now patrolling MN lakes and waterways.

Watercraft Inspections

ACTIVITIES

In 2025, the DNR watercraft inspection program conducted the following activities to help prevent the introduction and spread of AIS in Minnesota:

- Educated watercraft users and the public about AIS, AIS laws, and prevention best practices.
- Inspected and decontaminated watercraft following standardized protocols.
- Collected standardized watercraft inspection, decontamination, compliance, violation and other relevant data via a mobile application.
- Trained staff of tribal and local governments with delegated authority to conduct watercraft inspections and decontaminations.
- Trained AIS volunteers to educate the public at public water accesses.

State and Local Programs Working Together

Minnesota's watercraft inspection program is one of the largest in the nation.

- The DNR employed 40 Level 1 and 31 Level 2 watercraft inspectors in 2025; Level 2 watercraft inspectors can provide decontamination in addition to inspecting watercraft.
- Local governments (LGUs) and tribal governments can partner with the DNR through a delegation agreement. This agreement allows governments to hire authorized watercraft inspectors to support local inspection programs. There were 62 active delegation agreements during the 2025 season. These programs hired an additional 760 inspectors. This compares with 60 active delegation agreements and 763 local government inspectors in 2024.

The DNR trains all watercraft inspectors through a hybrid learning system consisting of online training, in-person training, and protocol manuals. In addition to the 40 Level 1 and 31 Level 2 DNR staff who received in person training in 2025, three DNR Trainers also trained 485 Level 1 LGU or tribal government inspectors at 56 in-person trainings and 106 Level 2 inspectors at 27 in person trainings. Including online training, a total of 760 local government and tribal staff received Level 1 training; 159 of those also received Level 2 training in 2025.

All watercraft inspectors follow standard protocols and collect the same data through a mobile application. Watercraft inspectors hired by the DNR, and by 62 entities with delegated authority from the DNR, inspected 451,349 watercraft in 2025. This number is similar to previous years, which were 451,551 in 2024 and 469,038 in 2023.

Transportation of Invasive Species

Boaters in Minnesota must remove drain plugs from watercraft and livewells to reduce the risk of transporting AIS like spiny waterflea or zebra mussel larvae, as required by the state's "drain plug law." People in Minnesota also may not transport aquatic plants under most circumstances. This helps prevent the spread of invasive plants as well as other AIS that can be attached to plants, such as zebra mussels.

In 2025, watercraft inspectors observed that most people arriving at accesses were in compliance with state AIS prevention laws.

- Ninety-seven percent of people arrived at accesses with drain plugs removed from their watercraft, in compliance with state drain plug laws.
- Ninety-seven percent of people arrived at accesses with watercraft and trailers that were free of aquatic plants, invasive animals, mud or water.
- Zebra mussels were found on 284 incoming watercraft (2024 had 163 occurrences and 2023 had 225 occurrences). Five were at water bodies not known to be infested with zebra mussels.

Figure 15. Level 2 Inspector Matt Dwelly conducts an engine decontamination on a pontoon boat's outboard motor.

DNR-authorized watercraft inspectors took the following actions to follow up with the few individuals who were in violation of state laws:

- Instructed owners not to launch until watercraft passes inspection.
- Forwarded zebra mussel violations to DNR Enforcement for follow-up.
- Required decontamination prior to the launching of any watercraft with vegetation or attached zebra mussels. Decontamination methods include hand removal, draining, hot water treatment and/or high-pressure rinse.

Decontamination Units

DNR-trained staff offer free decontamination services at dozens of public water accesses. The staff follow specific decontamination protocols using hot water to kill AIS and, if necessary, high-pressure water to remove attached AIS. During the boating season, boaters can find decontamination times and locations at www.mndnr.gov/decon.

DNR Level 2 watercraft inspectors performed 1,924 decontaminations with 26 portable decontamination units strategically located at high-use accesses on zebra mussel-infested water bodies. Local inspection programs operated an estimated 39 decontamination units in addition to DNR-operated units and decontaminated an additional 2,435 watercraft.

Volunteer Training

The DNR conducts AIS volunteer training sessions to teach people how to educate watercraft users at waters where they live or recreate. In 2025, 30 people received in-person training.

Table 3: Number of DNR watercraft inspections by region

DNR Region	2025	2024	2023	2022	2021	2020	2019	2018
Northwest - 1	8,231	11,722	14,006	11,947	18,102	18,121	19,437	13,539
Northeast - 2	14,088	8,286	5,951	6,625	7,560	7,093	8,152	7,266
Central - 3	16,217	32,299	30,214	26,167	35,874	27,797	40,623	43,653
Southern - 4	18,963	3,984	2,573	2,943	5,038	3,778	2,550	2,375
Total Inspections	57,499	56,291	52,744	47,682	66,574	56,813	70,762	66,833

Table 4: Number of DNR watercraft inspections

	2025	2024	2023	2022	2021	2020	2019	2018
Inspections	57,499	56,291	52,744	47,682	66,574	56,813	70,762	66,833
Inspection Hours	19,678	19,107	17,891	16,876	22,755	19,509	25,451	21,826
Inspections per Hour	2.92	2.95	2.65	2.83	2.93	2.91	2.78	3.06

Authorized watercraft inspections per month, 2023-2025

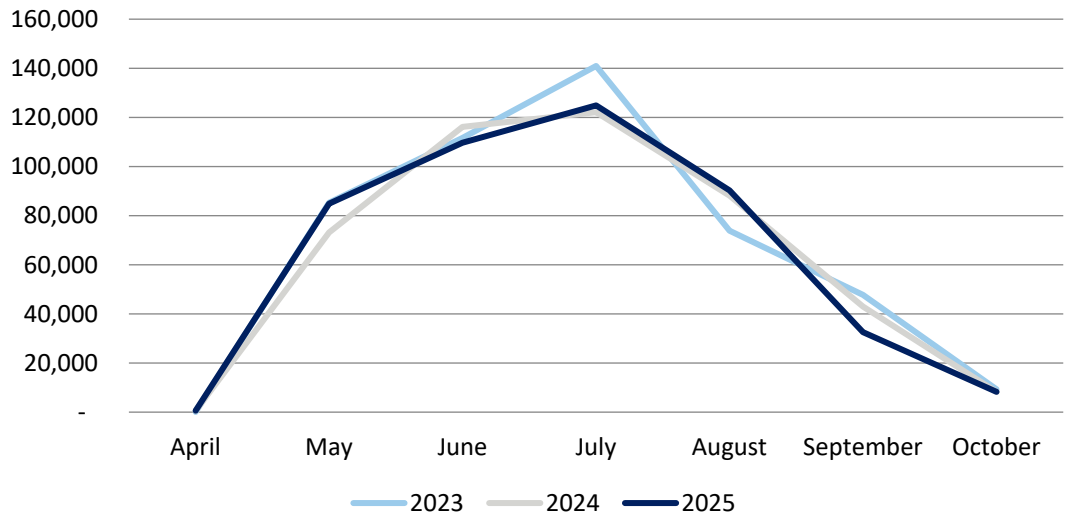

Figure 16. Monthly authorized watercraft inspections (2023-2025). Data are from the DNR and DNR-authorized watercraft inspections. Inspection programs begin in early April and conclude in October.

DNR inspections and hours per month at public water accesses in 2025

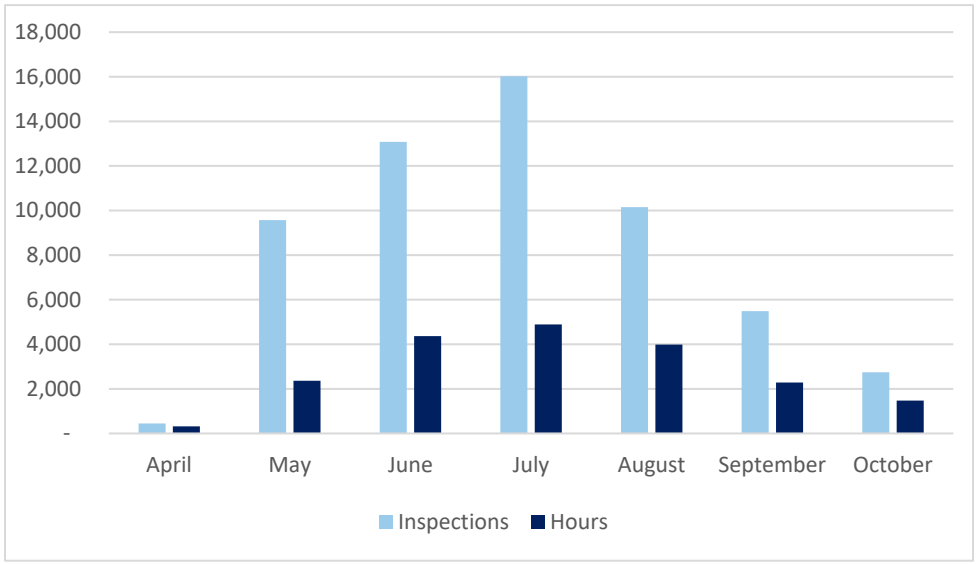

Figure 17. Number of DNR monthly inspections and inspection hours. Staff presence remains consistent throughout the season.

Aquatic Invasive Species Prevention Aid

ACTIVITIES

In 2025, DNR AIS prevention planners partnered with counties and tribes to help prevent the introduction and spread of AIS in Minnesota by:

- Providing technical support to local governments and their partners.
- Hosting workshops to learn from peers and experts and build stronger collaborative relationships.
- Maintaining a community of support among local governments doing AIS prevention work.

Technical support

DNR AIS prevention planners provided technical support to local and tribal governments and their partners as they developed, implemented and evaluated their AIS prevention strategies. For example, they:

- Provided feedback on guidelines, including plans and resolutions, to the 83 Minnesota counties that qualify to receive AIS Prevention Aid funds.
- Provided information on DNR AIS programs (e.g., public engagement, watercraft inspection, trade pathways, invasive aquatic plant management and behavior change) and opportunities for engagement and support. This included updating and promoting key resources on the AIS Prevention Aid webpage: dnr.state.mn.us/invasives/ais/prevention/index.html.
- Provided technical support and a connection to the DNR at county AIS task forces and advisory committees.
- Developed guidance documents and online resources, hosted workshops and provided presentations to relay important information to counties and their stakeholders.
- Provided feedback on communications materials developed by local AIS program managers to promote consistent, statewide messaging about AIS and prevention steps (e.g., Clean, Drain, Dispose).
- Completed an annual update of the metrics template, which provides a voluntary way for local AIS program managers and their partners to track accomplishments and demonstrate how AIS Prevention Aid is making a difference in their communities. Sixty counties submitted a template summarizing their work in 2025, which included jobs created, partnerships, funds leveraged, watercraft inspected, water bodies surveyed, and invasive species managed, along with pictures and stories of successes.

Engaged local governments and partners

- Maintained a network and community of support by continuously updating a primary contact list of county AIS program managers online and encouraged contacts to use the list to collaborate with one another. DNR prevention planners used the list to disseminate timely and relevant information about AIS Prevention Aid funding, requirements and opportunities, including new resources, innovative activities, chances for learning/collaboration, and DNR program updates.
- Hosted annual workshops for local AIS program managers and stakeholders to share their AIS prevention experiences, discuss successes and challenges, support collaborative efforts, broaden knowledge on AIS issues, and build stronger inter-county relationships.
- Hosted a series of four online meetings in February and March, each on a specific topic of interest. Meetings began with a few short presentations, primarily from local programs, which were followed by a facilitated discussion. Topics of interest were new approaches, partnerships, "learn from experts" segments, and public engagement. The online workshops attracted 70 to 90 attendees each.
- Hosted southern and northern collaboration in-person workshops in April. More than 40 staff and stakeholders involved in developing and implementing local AIS programs attended. These attendees included local and tribal government staff overseeing an AIS Prevention Aid or local AIS program, watercraft inspection staff, local AIS task force and committee members, state and federal agency staff, regional and statewide partners, non-government organizations, and representatives from academia and private businesses.
- Provided information about the AIS Prevention Aid program and general AIS education at events such as AIS task force meetings, lake association meetings, college courses and youth events.
- Connected local AIS program managers interested in conducting new AIS projects with experts and other local organizations with experience implementing similar projects. Often these connections evolved into multi-county collaborative initiatives.

AIS PREVENTION AID CHANGES IN 2025

The Minnesota Legislature made changes to the County AIS Prevention Aid program funding in 2025 (Session Laws 2025, Chapter 13, 1st Special Session Article 4, Sec. 4). According to that new law, the Department of Revenue's AIS Prevention Aid to counties will be reduced by 50% starting for aid payable in 2027. Starting in state fiscal year 2028, the total amount to be distributed to counties will be reduced from $10 million to $5 million. The DNR will continue to work with partners and local program leads in 2026 to understand anticipated impacts and coordinate plans accordingly.

Invasive Aquatic Plant Management

ACTIVITIES

In 2025, Invasive Species Program staff worked to manage impacts caused by invasive aquatic plants, to monitor their effects, and to evaluate the results of management by:

- Offering grants for the management of invasive aquatic plants.
- Issuing permits for the selective control of invasive aquatic plants.
- Providing technical support for adaptive management efforts.
- Participating in innovative management projects.

Management

Invasive aquatic plant management is an attempt to reduce the abundance or distribution of an invasive plant in a waterbody or wetland. Sometimes this work is done to help prevent the spread of that species to other waterbodies. The DNR's invasive aquatic plant management program supports efforts to minimize the harmful effects caused by invasive plants while also protecting natural resources and their use in the state. The program uses adaptive management to continually improve our efforts to reach these goals.

Aquatic plant management is complex, and reductions in invasive plants often require long term and resource-intensive efforts. Management that involves either large-scale mechanical removal of plants or any application of herbicides to public waters requires a permit from the DNR. Eligible permit applicants are listed in Minnesota Rules, part 6280.0450. DNR staff evaluate permits for work, provide advice on best management practices for treatments, and assist in monitoring the results of management projects.

Management Grants and Permits

Eurasian watermilfoil and curly-leaf pondweed

The two most common aquatic invasive plant species in Minnesota have been in the state for many decades and the bulk of the management work that happens each year targets these two species. In 2025, the DNR issued 482 Invasive Aquatic Plant Management (IAPM) Permits, 375 of which were for Eurasian watermilfoil (*Myriophyllum spicatum*) and/or curly-leaf pondweed (*Potamogeton crispus*). Curly-leaf pondweed was first noted in Minnesota in 1910, and in 2025 comprised 55% of issued IAPM permits and 58% of the total area permitted. Eurasian watermilfoil was first documented in Minnesota in 1987 and in 2025 comprised 27% of issued IAPM permits and 16% of the total area permitted.

The DNR supports the management of these and other invasive aquatic plant species through permitting their management, providing technical advice on management methods, granting funds to help cover costs, and supporting research into new management methods.

Figure 18. Curly-leaf pondweed and Eurasian watermilfoil growing in a Minnesota lake.

Grants

The Invasive Species Program has provided grants for management of Eurasian watermilfoil, curly-leaf pondweed and/or flowering rush since 2006. In recent years, the DNR has included starry stonewort management in the list of allowable projects. In 2025, the DNR made $400,000 in grants available. Grants were selected by lottery of all applicants with higher priority assigned to (1) waterbodies that did not receive funding in 2023 and/or 2024 and (2) projects proposing management of starry stonewort at public accesses. In 2025, the DNR provided 64 grants to local partners such as lake associations, watershed districts and lake improvement districts.

Table 5: Invasive aquatic plant management permits issued by region in 2025

Species	Northwest	Northeast	Central	Southern	Total
Curly-leaf pondweed	23	23	159	45	250
Eurasian watermilfoil	11	19	82	11	123
Curly-leaf pondweed and Eurasian watermilfoil			2		2
Flowering rush	10	1	12		23
Java water dropwort				1	1
Nonnative *Phragmites*	2	1	24	3	30
Purple loosestrife	1		14		15
Starry stonewort	14	4	12	2	32
Yellow iris	1		1		2
Flowering rush and nonnative *Phragmites*			1		1
Yellow iris	1		1		2
Zebra mussel	23		1		1
Total	63	48	309	62	**482**

Figure 19. DNR SCUBA divers remove starry stonewort near a public access. About once per month for the 2025 growing season, DNR SCUBA divers collected 6 cm core samples and biomass from starry stonewort beds in lakes (Moose, Pokegama, Dora) where no treatments were occurring. This data will be used as baseline information to infer what might have happened to biomass and bulbil densities at two lakes (Rush, Middle Cullen) where repeated algaecide treatments were used to control starry stonewort.

Figure 20. Starry stonewort bulbils (see arrows) in a core sample.

Technical support and innovative management efforts

Invasive species staff provided technical and field support, and desk reviews of larger or innovative management proposals throughout the state. This included reviewing lake vegetation management plans, pretreatment surveys of lakes and post treatment surveys of areas that were treated. Results of these surveys, along with surveys from consultants and other partners, pesticide application records, and pesticide residue samples were reviewed to determine the effectiveness and selectivity of the management efforts. This information is used to continue to improve aquatic invasive species management in the state.

Starry stonewort

Starry stonewort (*Nitellopsis obtusa*) was first detected in Minnesota in 2015 and has now been confirmed in 37 waterbodies in the state. AIS management is most effective early, when spread is limited, so efforts to manage starry stonewort are especially valuable now. DNR Invasive Species Program staff have worked on several innovative management techniques since its discovery in Minnesota. Treatment methods have included chemical treatment with herbicides or algaecides, Diver Assisted Suction Harvesting (DASH), suction dredging, and hand pulling followed by chemical treatment. Combination treatments, using harvesting by SCUBA divers followed by chemical treatments, have been found to be successful in small areas.

In 2025, program staff led a cooperative project to evaluate the effects of management on biomass and reproduction comparing treated populations to reference populations. This project aims to evaluate biomass and bulbil changes during two projects led by lake associations by assessing the impact of copper algaecides for early detection rapid response (EDRR) control of starry stonewort. No previous research in the field has shown an appreciable reduction in starry stonewort bulbils from control efforts, but both projects have that as a goal, and plan to use repeated algaecide applications in a single growing season to accomplish it. Previous research has highlighted the need for improved monitoring of managed and reference systems of starry stonewort (Glisson et al 2025). Other work has highlighted the need to capitalize on life-history (annual phenology) to achieve meaningful control of starry stonewort (Jurek et al 2024, Glisson et al 2022).

The project is unique in that the control efforts are both rapid response work (controlling whole populations of the invasive species as a first management action aimed at stopping expansion within the lake or eradicating from a small known area of establishment) and are poor candidates for hand removal or DASH alone.

Nonnative *Phragmites*

The overall statewide response to nonnative *Phragmites* is coordinated by a DNR - University of Minnesota collaborative team. This work is funded in part by the DNR Invasive Species Program through a GLRI grant. Cooperators on the project include the MDA, counties, private landowners, the Minnesota Department of Transportation, the USFWS, Soil and Water Conservation Districts, professional herbicide applicators and other stakeholder groups.

Management efforts focused on "clearing counties" by targeting management in areas of the state with a limited number of small infestations. To track the spread of nonnative *Phragmites* and to evaluate treatment effectiveness, University staff monitor treated sites and locate new populations of nonnative *Phragmites* during summer months. In 2025, all collaborators monitored 1,819 sites throughout the state, with the University team conducting 1,122 of those site evaluations. Within these sites visited, 177 new populations were documented, and 767 sites were revisited with previously known populations where no *Phragmites* was detected this year. Of these 767 non-detects, many are locations that had been treated in previous years (294 treated in 2024; 230 treated in 2023; 306 treated in 2022). These surveys occurred before the 2025 management season so that DNR contractors could focus their efforts on sites where invasive *Phragmites* was known to occur.

In 2025, a contractor hired by the DNR to treat invasive non-native *Phragmites* with herbicides visited a total of 911 sites in 40 counties. Treated sites were mostly small; 739 of them were one-tenth of an acre or smaller.

Figure 21. Invasive non-native phragmites (left foreground, dense seed heads) and native Phragmites (right foreground, no remaining seed heads) can often grow very close to one-another. The stands shown here are on an island in the Spring Lake Islands Wildlife Management Area on the Mississippi River near Rosemount.

Invasive Aquatic Animals – Invertebrates

ACTIVITIES

In 2025, DNR staff worked to manage impacts caused by invasive aquatic invertebrates and to monitor their effects by:

Research, long-term monitoring and management

- Continuing long-term monitoring and analyses of zebra mussel veligers (immature stages) and spiny waterflea populations and their impacts on native zooplankton.
- Continuing long-term monitoring of settled zebra mussels (juveniles to adults) in Mille Lacs Lake (since 2005) and Pelican Lake (since 2012).
- Delineating the spatial extent and abundance of signal crayfish, a new invasive species in Minnesota, using surveillance trapping and eDNA evidence, the latter provided by MAISRC collaborators.
- Collaborating with MAISRC and private sector partners on pilot projects evaluating the effectiveness of novel zebra mussel control measures and impacts on non-target native aquatic invertebrates.
- Collaborating with DNR Fisheries and Saint Thomas University on a stable-isotope lake food web study assessing the impacts of a zebra mussel invasion on Lake Whitefish (*Coregonus clupeaformis*) that primarily feed on benthic invertebrates, and Cisco (*Coregonus artedi*) that primarily feed on pelagic (open water-dwelling) zooplankton.
- Verifying AIS invertebrate records in the EDDMapS database to ensure distribution maps of AIS are updated.

Technical assistance

- Participating with regional scientists in MAISRC's 2025 Research Needs Assessment (RNA) and in an update of their priority invasive species document.
- Partnering with Voyageurs National Park to monitor spiny waterflea and early-stage zebra mussel invasions and the impacts of these invasions on zooplankton communities in the Rainy system of lakes.

Research and Monitoring

DNR staff continued to monitor invasive zebra mussel veliger (*Dreissena polymorpha*) and spiny waterflea (*Bythotrephes longimanus*) populations in nine of Minnesota's largest lakes; four with zebra mussels (Cass, Leech, Red, Winnibigoshish), and five with both zebra mussels and spiny waterflea (Lake of the Woods, Mille Lacs, Rainy, Kabetogama, Vermilion).

A 10+ year retrospective study by DNR researchers resulted in two publications, (Cattoor et al. 2025), plus a companion fact sheet that summarizes results and food web dynamics in Minnesota's nine largest walleye lakes. In these lakes that have either zebra mussels, or both zebra mussels and spiny waterflea present, the study shows declines of 26% to 71% in native zooplankton crustacean productivity. Native zooplankton crustaceans, like waterfleas and copepods, are a key component of large lake food webs and the diets of many fish, so their decline is potentially related to a 12 to 14% reduction observed in the growth of first year walleye in these lakes (Hansen et al., 2020: doi.org/10.1007/s10530-020-02198-5).

Long-term monitoring of settled zebra mussel populations (juvenile to adult stages) in Mille Lacs and Pelican Lakes continued in 2025 with AIS program and Fisheries divers contributing three days underwater. In Mille Lacs Lake, the zebra mussel population was first detected in 2005, peaked at 1,296 per square foot in 2012, and has since fallen and remained around 400 per square foot since 2021. In Pelican Lake, the population was first detected in 2011, peaked in 2018, and is currently around half the peak population level. These long-term data series are contributing to our understanding of zebra mussel population dynamics in Minnesota's inland lakes, which will help to inform management decisions.

DNR staff continued to monitor zebra mussel veliger populations in two of the Sentinel Lakes; Lake Carlos, where zebra mussel populations are abundant and were discovered in 2009, and Ten Mile Lake, where adult zebra mussels have not been found but small numbers of veligers have been documented from plankton samples in 2019, 2022, 2023, and 2025.

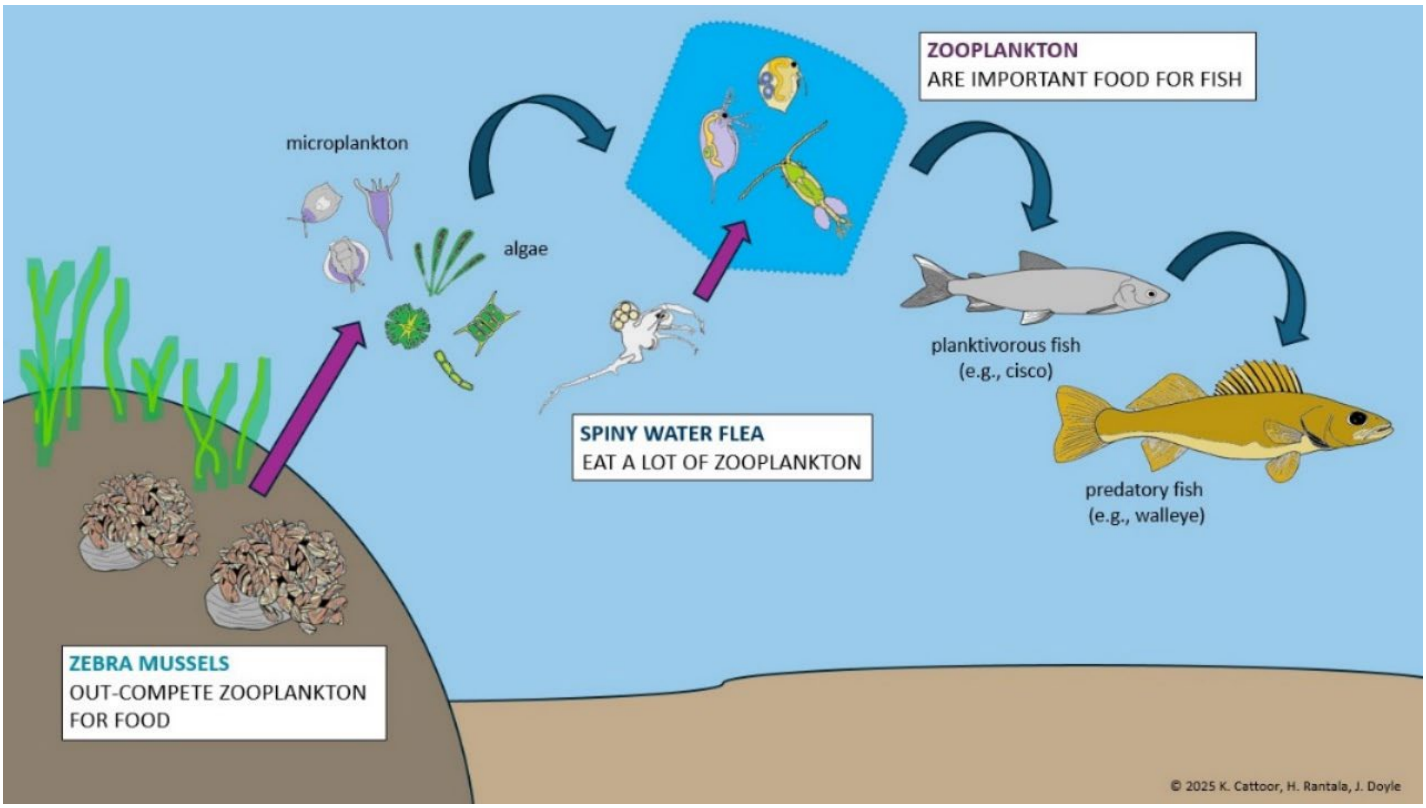

Figure 22. Food web dynamics in lakes invaded by zebra mussels and/or spiny waterflea. Invasive species make new food web links (purple arrows). Zebra mussels eat the same food as native zooplankton, causing declines in zooplankton productivity. Spiny waterflea aggressively reduce native zooplankton by eating them. Many native fish species rely on zooplankton as a food source or eat smaller fish that eat zooplankton. Figure from Cattoor et al. 2025.

Since the initial capture of 10 signal crayfish (*Pacifastacus leniusculus*) by a commercial minnow harvester in October 2023 in Lake Winona, Douglas County, MN, no additional signal crayfish have been captured during collaborative delineation trapping efforts in Winona and seven nearby lakes, totaling 3,495 trap days in 2024, and 1,187 trap days in 2025. However, analyses of 143 eDNA samples collected from April through October 2024 in Lake Winona and 8 nearby lakes by collaborators from the University of Illinois and MAISRC showed four low-amplification (weak) signal crayfish eDNA detections. Two of those were from Lake Winona where signal crayfish were discovered in 2023, one from directly-connected Lake Henry, and one from nearby Lake Carlos, headwaters of an upper Mississippi tributary, the Long Prairie River. Based on these results, MN DNR delineation trapping during the 2025 open water season was focused on Lake Winona, directly connected Lakes Agnes and Henry, Lake Carlos and connected lakes, as well as the outlet channel from Lake Carlos to the Long Prairie River. Additional eDNA samples were collected from these lakes during August 2025 when crayfish eDNA detection probability is highest (Rounds et al., 2024). Results from eDNA analyses provided by our collaborators will help inform future surveillance activities.

DNR staff collaborated with the SePRO corporation to evaluate the effectiveness of a new chelated copper molluscicide (Natrix®) for controlling adult zebra mussels and potential impacts on native non-target benthic invertebrates under *in situ* mesocosm conditions in Lake Minnetonka. The molluscicide was effective at controlling adult zebra mussels, but results on impacts to non-target benthic invertebrates were inconclusive, possibly due to ongoing disturbance where the mesocosms were located during the experiment.

DNR staff in collaboration with MAISRC, USGS, and Riley Purgatory-Bluff Creek Watershed District conducted a pre-treatment baseline benthic invertebrate survey in 2025 in zebra-mussel-infested Lake Riley (Hennepin and Carver Counties), where a pilot study evaluating a whole-lake low copper-level molluscicide treatment will be conducted in 2026. DNR divers contributed a day underwater on Lake Riley to assess the pre-treatment status of native unionid mussels. No living native mussels were encountered.

Figure 23. Kylie Cattoor, DNR zooplankton specialist, deploying a baited funnel trap for capturing signal crayfish in Lake Le Homme Dieu, Douglas County.

At Ten Mile Lake in Cass County, DNR Lake Ecology Unit and Fisheries staff collaborated with Saint Thomas University on a stable-isotope study of the lake food web to assess the impacts of a zebra mussel invasion on Lake Whitefish that primarily feed on benthic invertebrates and Cisco that primarily feed on pelagic zooplankton. Zebra mussel veligers were discovered in the lake in 2019, but adults have not been found. A survey of benthic invertebrates was conducted in 2025 to serve as a pre-invasion baseline that will be compared with a benthic invertebrate survey conducted when and if an adult population of zebra mussels is established in the lake. Populations of both Lake Whitefish and Cisco are expected to decline if zebra mussels are established due to

reductions in zooplankton productivity. Cisco populations that rely heavily on planktonic zooplankton are expected to decline to a greater extent than Lake Whitefish that could potentially shift their foraging to include benthic invertebrates in near-shore warmer waters.

DNR invertebrate biologists and invasive species specialists continued to verify AIS reports submitted to the EDDMapS database to keep distribution maps of priority AIS species in Minnesota up to date.

Technical Assistance

DNR staff participated with other regional scientists in MAISRC's 2025 RNA, and they helped update MAISRC's priority invasive species document.

DNR staff continued to partner with Voyageurs National Park to monitor spiny waterflea and early-stage zebra mussel invasions and evaluate the impacts on zooplankton communities in the Rainy system of lakes. Monitored lakes where both spiny waterflea and early-stage zebra mussel invasions have been documented include Rainy, Kabetogama, Namakan, and Crane. Lakes with only spiny waterflea include Little Vermilion and Sand Point.

Figure 25. Kylie Cattoor, DNR zooplankton specialist, collects a water sample for signal crayfish eDNA analysis in Lake Agnes, Douglas County.

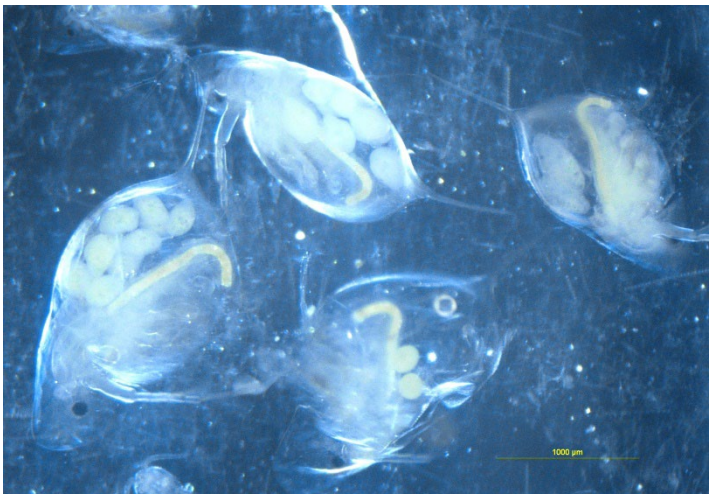

Figure 24. Native zooplankton that are potentially impacted by zebra mussels and are important food sources for Cisco, including water fleas, Super-order Cladocera.Native zooplankton that are potentially impacted by zebra mussels and are important food sources for Cisco, including waterfleas, Super-order Cladocera.

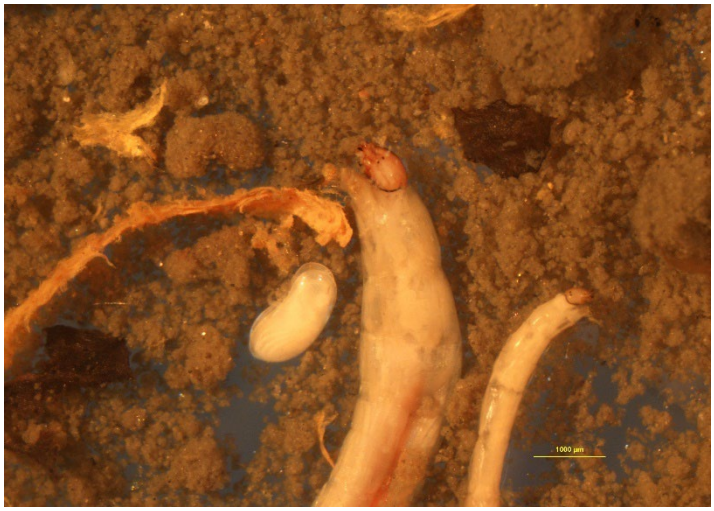

Figure 26. Native benthic (bottom-dwelling) invertebrates that are potentially impacted by zebra mussels and are important food sources for Lake Whitefish, including an ostracod, Class Ostracoda (white oval, left-middle), and two midge larvae, Family Chironomidae (cream-colored long curved objects, right half), collected along with fine sediments from the profundal zone of Ten Mile Lake (depth, 191 feet), Cass County, August 2025.

Invasive Aquatic Animals - Invasive Carp

The term "invasive carp" refers to four related fish species: bighead carp (*Hypophthalmichthys nobilis*), silver carp (*H. molitrix*), grass carp (*Ctenopharyngodon idella*), and black carp (*Mylopharyngodon piceus*). Bighead, silver, and grass carp are present in Minnesota waters; black carp have not been detected in Minnesota (mndnr.gov/invasivecarp).

ACTIVITIES

In 2025, DNR staff worked with partners to manage invasive carp populations by:

- Monitoring invasive carp, tagging them, and tracking their movements.
- Removing invasive carp from the Mississippi River using intensive netting.
- Testing bait attractants to draw invasive carp into netting sites for capture.
- Advancing the Lock and Dam 5 Deterrent Project (dnr.state.mn.us/invasives/ais/carp/lock-and-dam-5-invasive-carp-deterrent-project.html) by hiring project staff, convening an interagency technical team, making site visits to other deterrent projects, finalizing a contract with the U.S. Army Corps of Engineers for the deterrent design, and tagging both invasive carp and native fish at Lock and Dam 5.

Monitoring for adult, juvenile, and larval invasive carp

Multiple methods to monitor invasive carp are used in Minnesota:

- The DNR and other agencies may detect invasive carp during traditional fisheries monitoring programs.
- The DNR tags, releases and tracks limited numbers of invasive carp to better understand patterns of movement and find additional invasive carp. We work in partnership with the USFWS, Wisconsin Department of Natural Resources (WDNR), the USGS, and the NPS to gather as much tracking data as possible.
- The DNR and other agencies conduct sampling targeted at all life stages of invasive carp.
- The DNR contracts with commercial fishing businesses and monitors the commercial catch from other businesses.
- The DNR follows up on all reports of suspected sightings and captures of invasive carp.
- USFWS and other agencies share the results of eDNA surveys with the DNR.
- The DNR coordinates with researchers on modeling to determine key locations and actions for invasive carp monitoring and management.

Table 6: Invasive carp captures in 2025

Location	Species	Date of Capture	Number	Method of Capture	Notes
Mississippi River Pool 5A	Silver Carp	3/8/2025	5	Contracted Commercial Seine	Removed
Mississippi River Pool 5A	Silver Carp	3/10/2025	1	Contracted Commercial Seine	Removed
St. Croix River	Silver Carp	3/16/2025	1	Citizen Report	Found dead on shore
Mississippi River Pool 4	Silver Carp	3/24/2025	1	DNR Report	Found dead on shore
St. Croix River	Silver Carp	3/28/2025	1	Contracted Commercial Seine	Tagged and released
St. Croix River	Silver Carp	4/8/2025	2	Contracted Commercial Seine	Tagged and released
St. Croix River	Silver Carp	4/28/2025	1	Wisconsin DNR Report	Found dead on shore
Mississippi River Pool 8	Silver Carp	5/13/2025	17	Contracted Commercial Seine	Removed
Mississippi River Pool 8	Silver Carp	5/14/2025	1	Contracted Commercial Seine	Tagged and released
Root River, MSR Pool 8	Grass Carp	5/16/2025	1	Contracted Commercial Gillnet	Removed
Mississippi River Pool 8	Silver Carp	5/20/2025	4	Contracted Commercial Seine	Tagged and released
Root River, MSR Pool 8	Silver Carp	5/27/2025	1	Contracted Commercial Gillnet	Removed
Mississippi River Pool 8	Silver Carp	5/28/2025	1	Contracted Commercial Seine	Tagged and released
Mississippi River Pool 8	Silver Carp	6/5/2025	2	Contracted Commercial Seine	Tagged and released
Root River, MSR Pool 8	Silver Carp	6/26/2025	2	Contracted Commercial Gillnet	Removed
Mississippi River Pool 8	Silver Carp	8/28/2025	4	Contracted Commercial Seine	Tagged and released
Mississippi River Pool 8	Bighead Carp	9/3/2025	1	Contracted Commercial Seine	Tagged and released
Mississippi River Pool 8	Silver Carp	9/3/2025	7	Contracted Commercial Seine	Tagged and released
Mississippi River Pool 8	Silver Carp	9/29/2025	1	Contracted Commercial Seine	Tagged and released
Mississippi River Pool 5	Silver Carp	10/8/2025	1	Contracted Commercial Seine	Tagged and released
Mississippi River Pool 8	Silver Carp	10/30/2025	1	Contracted Commercial Seine	Tagged and released
Mississippi River Pool 8	Bighead Carp	10/30/2025	1	Contracted Commercial Seine	Tagged and released

Figure 27. Members of the DNR Invasive Carp Crew learn about commercial fishing techniques for invasive carp removal that are used in high-density populations in Kentucky during a site visit.

The invasive carp monitoring crew received 16 encounter reports from the public in 2025. All reports were investigated, and four reports were determined to be invasive carp, based on follow-up conversations, photos, and sampling.

In 2025, 57 invasive carp were captured in Minnesota and border waters. Twenty-seven of those fish were tagged and released to gather data on invasive carp movements. Tagged fish have directly led to the removal of over 500 invasive carp from Minnesota waters since 2017. Of the 57 captured, 54 were captured by contracted commercial fishers.

Flooding in spring 2023 and in June 2024 caused dams on the Mississippi River to open, allowing fish including invasive carp to move upstream. Data from invasive carp tagged downstream of Minnesota by the USFWS indicate that tagged invasive carp moved upstream to Minnesota during these flood events. In 2024, the USFWS, USGS and the DNR combined tagging data to publish a scientific journal article that shows the strong link between open dams during flooding and upstream movement of invasive carp (Fritts et al. 2024). Many of the tagged fish that moved upstream in 2023 have since moved downstream and out of Minnesota waters, but the remaining tagged fish are being used to target invasive carp for capture. No large upstream movements or range expansions were detected in Minnesota in 2025.

Invasive Carp Tracking

Tagging invasive carp allows the DNR to better understand their movements and leads researchers and managers to other invasive carp. Tagged fish are actively tracked when river conditions allow. Two additional invasive carp field staff were added at the DNR Lake City Fisheries Office starting in 2024 to expand our ability to track fish and deploy contracted commercial fishing.

A total of 27 invasive carp were tagged in Minnesota waters in 2025. Of these, 23 were tagged in Mississippi River Pool 8, near La Crosse, WI. Most tagged invasive carp detected in Minnesota in 2025 were in Pool 8, and few movements upriver were detected. Many of the invasive carp detected seemed resident near the mouth of the Root River, which empties into Pool 8 south of La Crescent, or on the Wisconsin side of the river in that vicinity. Little is known about the seasonal use of tributaries by invasive carp in the Upper Mississippi River, but the tagged carp in the area are helping uncover this information.

USFWS notified the DNR of 10 tagged invasive carp detected on one of their acoustic telemetry receivers at the mouth of the Root River in late June 2025. High flows and warm water were prompting invasive carp to move into the Root River. The DNR responded by deploying contracted commercial fishers, multiple DNR fisheries crews, and partnering with USFWS and Wisconsin DNR to herd fish towards nets for capture.

Figure 28. Two silver carp captured from the Root River by commercial fishers in July 2025. These are mature male fish, as evidenced by the presence of milt.

Figure 29. DNR and USGS staff work together to deploy equipment to dispense algae pellets and monitor for fish aggregations. This tool could be useful for luring invasive carp into capture sites.

Commercial fishers also made custom nets designed to work better in the high flows. A total of 7 invasive carp were removed. The fish were mature and in a condition to be able to spawn. However, none of the captured females had spent their eggs and there were no abrasions on the fish (an injury often incurred during spawning). Conditions appropriate for spawning were present, but we do not have confirmation that a spawn occurred, or that if a spawn occurred, the young survived. Push trawls for ichthyoplankton (fish eggs and larvae) were conducted and identification of the samples is pending by a USGS lab.

The DNR will continue to monitor for all life stages of invasive carp and to coordinate with partners downstream who also monitor for evidence of invasive carp reproduction.

The first invasive carp tagged by the DNR, a male bighead carp from the St. Croix River tagged in 2017, was observed moving from Pool 2 of the Mississippi River back into the St. Croix this year, after moving to Pool 2 in 2024. The fish usually resides in the lower St. Croix River from Anderson Bay to the I-94 bridge. The battery tag was due to expire in 2024 but has not yet stopped operating. This first tagged carp has provided years of data that led to several invasive carp captures.

The DNR coordinates with partners including the WDNR, USGS, and USFWS to share data about detections of tagged fish. The DNR is working with the WDNR and USFWS to maintain and expand the receiver network that detects tagged fish in the Upper Mississippi River Basin to provide more detailed location data.

The USFWS and USGS also collaborate extensively with the DNR to assist with implanting tags into captured invasive carp, and have provided tags, staff time and training in support of the Minnesota invasive carp program. The DNR has received funding to maintain its dedicated tracking crew in 2026.

Developing Invasive Carp Capture Techniques

The DNR has partnered with the USGS to develop and test methods for invasive carp capture. The low-density population of invasive carp and large complex river systems in Minnesota present unique challenges to capturing invasive carp. This project began in spring 2021, when the Modified-Unified Method (MUM) was first deployed in Pool 8 of the Mississippi River. The project has since evolved to include other sites and techniques specifically designed for use with a low-density invasive carp population. The goal of this project is to develop methods that can be quickly deployed and integrated into the DNR's regular sampling to maximize capture of invasive carp.

Equipment developed during these events is in use by the DNR invasive carp crew, including floating gillnets that entangle silver carp that try to escape by jumping over seines and traditional gillnets. These "anti-jumping nets" were used to capture over a dozen invasive carp in 2025.

In August-October 2025, the DNR, USGS, and WDNR co-led an experiment to test algae pellet baits for attracting invasive carp. The pellets were dispensed from floating platforms at four sites in Pool 8 of the Mississippi River, near La Crosse, WI. Each site was baited for three weeks and left unbaited for three weeks as a control.

The goal of this experiment was to test whether algae baits are a useful tool for luring invasive carp into netting sites for capture. Invasive carp are difficult to capture during summer and early fall, when water is warm, and fish are more mobile. They do not school up as readily during this time, and quickly leave sites when boats enter the area. Attractants may be a tool to overcome this challenge.

Study sites were monitored using sonar, acoustic telemetry receivers (to detect tagged fish), cameras, and by sampling with commercial seining. Equipment malfunctions limited the amount of available sonar data, but the experiment provided a valuable opportunity to troubleshoot this monitoring technology for future applications. The data that were captured during the study are pending analysis by USGS. A report

on this project is expected in 2026.

Prevention and Management

Following the recommendation of the Lessard-Sams Outdoor Heritage Council, the Minnesota Legislature appropriated $12 million to the DNR from fiscal year 2025 to fiscal year 2029 to fund activities to protect the upper Mississippi River from invasive carp. The award is to design, construct and begin the operation and maintenance of a structural deterrent for invasive carp at Lock and Dam No. 5 on the Mississippi River through an adaptive management approach (Minnesota Laws, 2024 Regular Session, Ch. 106, Art. 1, Sec. 2, Subd. 5(aa)).

Lock and Dam 5 presents both challenges and opportunities, because invasive carp pass through when the dam gates open, but the gates open less frequently than at most other dams in Minnesota. Accordingly, the DNR and project partners are pursuing a comprehensive approach to address the upstream passage of invasive carp across the entirety of Lock and Dam 5. The first step is to implement a lock deterrent with a trap and sort system to remove invasive carp that are deflected by the deterrent. These two items have gone through a preliminary scoping phase and are moving towards design.

Longer term, the DNR and project partners are interested in deterrents for the dam gates for use when the dam gates are open; such deterrents will need to be developed. Downstream removal will continue to be essential, to reduce abundance and reduce the risk of reproduction occurring below the deterrent system.

The DNR is partnering on the Lock and Dam 5 Deterrent Project with agencies with relevant expertise and jurisdiction including the USFWS, U.S. Army Corps of Engineers, USGS, and WDNR. Tribal agencies have also been engaged on the project. The team began scoping the project in July 2024.

In 2025, the DNR entered into an agreement with the U.S. Army Corps of Engineers (USACE) for the engineering design for the lock deterrent. Working with USACE on the design phase offers many efficiencies as they have experience designing invasive carp deterrents and are the owners of the Lock and Dam 5 site. The legislative appropriation language requires an engineering design for the lock deterrent to be completed no later than June 2026, with installation no later than June 2029.

The DNR and the above partners worked together to tag 198 native fish below Lock and Dam 5 in 2025. Lake sturgeon, paddlefish, bigmouth buffalo, white bass, and redhorse species were acoustically tagged so that their movements at Lock and Dam 5 and throughout the river can be detected.

Figure 30. DNR Invasive Carp Specialist Kayla Zankle measures a large sturgeon as a part of a series of fish tagging efforts for the Lock and Dam 5 Invasive Carp Deterrent Project. Both native and invasive fish were tagged to monitor fish movement at Lock and Dam 5. Tagged fish will help DNR biologists understand how invasive carp and native species pass Lock and Dam 5, which will inform decision-making on the components of an invasive carp deterrent system. Tagging will also help assess the deterrents effectiveness at reducing invasive carp passage while allowing native fish to move upstream.

The Lock and Dam 5 Deterrent Project will include a selective lock deterrent that uses sound to deter invasive carp while having minimal impact on native fish. These tagged fish will allow the DNR to adaptively manage the deterrent to minimize impacts on native fish and will also help to show patterns of where and when fish cross the dam.

Two dedicated staff members were added in 2025 to support the Lock and Dam 5 Deterrent Project, including a Project Coordinator and a Contracts Coordinator. Their added capacity and skill sets are critical to the progress on the project.

Figure 31. DNR Invasive Fish Coordinator Grace Loppnow presents to the Friends of Pool 2 of the Mississippi River group on invasive carp and the Lock and Dam 5 Deterrent Project.

The Minnesota legislature appropriated to the DNR $1.72 million in fiscal year 2024 and fiscal year 2025 for invasive carp prevention and management. These funds were used in 2025 for:

- A feasibility study of options for selective native fish passage at Lock and Dam 5 which will inform the trap and sort system,
- A study to optimize flow through dam gates to prevent invasive carp movement at Lock and Dam 5 when gates are not fully out of the water,
- Adding staff to the invasive carp crew,
- Hands-on training trips to Lock and Dam 19 and Lake Barkley, Kentucky for staff to learn about deterrent and capture methods in use in those high-density invasive carp populations,
- Additional tagging and contracted commercial fishing for invasive carp removal, and
- Purchasing needed equipment.

The DNR thanks the Kentucky Department of Fish and Wildlife Resources for leading a productive trip to Lake Barkley, where DNR staff and contractors were able to participate in commercial fishing activities, see invasive carp processing plants, and speak with the lockmaster about operations of the deterrent at the Lake Barkley Dam. The DNR also thanks USGS and USACE for hosting a tour of the Lock and Dam 19 underwater acoustic deterrent system, as well as USGS for training DNR staff on tagging techniques on that trip.

Research

Invasive carp continues to be a priority for MAISRC. Please visit the MAISRC website for past, current and future projects: maisrc.umn.edu.

The DNR worked with USGS in 2024-2025 to model silver carp reproduction in Pools 1-9 of the Mississippi River. USGS results from the FluEgg model, which simulates reproduction below each lock and dam in the system and uses a hydrologic model to simulate transport of eggs and larvae downstream, are pending publication in Scientific Reports. Main takeaways from the study are that under most conditions, if invasive carp were to spawn in the pools above Lake Pepin, the eggs would settle out and most likely die in Lake Pepin. Downstream of Lake Pepin, eggs would likely have

floated downstream of Minnesota before hatching, except under very low flows and high temperatures.

The DNR has prioritized pools below Lake Pepin for egg and larval monitoring due to evidence suggesting that there are more invasive carp downstream of Lock and Dam 5. The results of this study indicate that we should use active gear to look for invasive carp eggs and larvae in that reach (towed nets instead of traps that larvae would have to swim into).

This helps make our sampling more effective and informs where removal and other management actions are most important to prevent reproduction from occurring.

The DNR also partnered with USGS, UW-La Crosse, and USFWS researchers on a study to model different management scenarios for invasive carp in the Upper Mississippi River. The study concluded that both deterrents and removal are important to reducing invasive carp abundance (Frame et al. 2024).

Environmental DNA

The USFWS leads eDNA sampling for invasive carp. The DNR uses eDNA data as a monitoring tool that may indicate changes in the relative abundance of invasive carp. Most recent and past results can be viewed at fws.maps.arcgis.com/apps/dashboards/52b22abe9c4d4575adfe851a946f444d.

In the Mississippi River, eDNA sampling occurred at two sites in Pool 8 during May 2025. Of the 77 samples taken, 56 were positive for invasive carp eDNA. This is a significant increase in detection rates from previous years at these sites. These data align with what was observed in 2025 from tagged carp and captures; most invasive carp in Minnesota were detected in Pool 8.

Given a general pattern that some invasive carp move downstream in fall and winter, and that carp were limited from moving upstream by lower water levels in 2025, it is not surprising that most invasive carp were in this downstream pool. The DNR focused most fishing and tracking efforts on Pool 8 in 2025, following these eDNA data and detection data from tagged carp. Invasive carp are regularly captured in Pool 8, and the monitoring data from eDNA helps the DNR track relative changes in invasive carp abundance in this pool over time.

In Pool 4 of the Mississippi River near Wabasha, one of the 83 eDNA samples taken in May 2025 were positive for invasive carp eDNA. Invasive carp have been captured from this pool previously, in small numbers. This pool is being monitored for its proximity to Lock and Dam 5 and the Chippewa River.

In Pool 2 of the Mississippi River in Pigs Eye Lake, sampling occurred in May 2025. No invasive carp DNA was detected in any of the 94 samples taken.

In the Minnesota river, eDNA sampling occurred in Mankato in May 2025. No invasive carp eDNA was detected in any of the 88 samples taken. Invasive carp have been captured and removed in the Minnesota River, but in low numbers.

Two sites in the St. Croix River were sampled for eDNA in May 2025. Of the 114 eDNA samples taken at the Boom Site just upstream of Stillwater, two tested positive for silver carp DNA. This location had four positive eDNA detections out of 110 samples in 2022, no detections in 2023, and one in 2024. The DNR regularly samples for invasive carp in the St. Croix River and has removed both bighead and silver carp from the river. Invasive carp DNA was not detected in any of the 88 samples taken further upstream, just below Taylor's Falls, the furthest extent that invasive carp can travel in the St. Croix River.

Watershed breach study

The DNR initiated a study in 2025 to review connections between invaded and uninvaded watersheds to identify priority locations for invasive carp prevention measures. The study is being conducted using LIDAR mapping data, combined with local area managers' expertise, and on-the-ground verification. This work was funded by the Environment and Natural Resources Trust Fund (ENRTF) as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR). The study is anticipated to be completed in 2026.

Terrestrial Invasive Species Program

ACTIVITIES

In 2025, DNR staff worked to manage and prevent the spread of terrestrial (land-based) invasive species by:

- Continuing to provide additional outreach and create new resources related to jumping worms after becoming regulated as a prohibited invasive species in 2024.
- Enhancing the ability of DNR staff to effectively manage terrestrial invasive species on DNR-managed lands.
- Engaging partners in invasive species prevention, management, inventory, outreach, communication and research.

Prevention

- Jumping worms (*Amynthas agrestis* and related species) are an emerging invasive earthworm threat in Minnesota that damage plants and soils. They are called "jumping worms" because of their unusual behavior: when disturbed, they move like a snake and sometimes appear to jump. The Invasive Species Program continued to work with partners to examine how regulations, research and outreach can prevent jumping worm spread in Minnesota. Visit mndnr.gov/qr/jumping-worms.
- The Invasive Species Program worked to provide information and resources so that people could better prevent the spread of jumping worms. For example, the program created a new poster with jumping worm information for garden centers.
- The program led the Invasive Species Operational Order 113 Committee, an interdisciplinary team that works to engage DNR divisions in prevention and management efforts. The committee wrote articles for the DNR newsletter, provided field season reminders, and shared prevention resources and trainings.

Figure 32. The program continues to provide information about jumping worms.

Research

The Invasive Species Program collaborated with University of Minnesota researchers leading projects that focus on documenting jumping worm impacts to soil and studying potential management methods. Research funding for these projects was supported by the Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC), through an appropriation from the Environment and Natural Resources Trust Fund and by the Environment and Natural Resources Trust Fund directly.

The MITPPC at the University of Minnesota focuses on science-based solutions to protect Minnesota's prairies, forests, wetlands and agricultural resources. Funding for this work is provided by the Environment and Natural Resources Fund. In total, 15 projects active in 2025 involved coordination and collaboration between MITPPC researchers and DNR staff. Visit mitppc.umn.edu to view current research projects.

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. DNR divisions and regions spent $160,940 in fiscal year 2025 for high priority activities, which include treatment of early detection of invasive plants and management in high quality habitats. Funds were also used to purchase equipment for managing invasive plants such as herbicide sprayers, saws and brush pullers. Funds also supported invasive species prevention education through the purchase of 94 boot brush kiosks for Wildlife Management Areas.

The following species were inventoried and/or managed in fiscal year 2025 projects: Amur maple, birdsfoot trefoil, bull thistle, Canada thistle, common buckthorn, common tansy, common valerian, crown vetch, curly dock, garlic mustard, glossy buckthorn, large-leaved lupine, leafy spurge, non-native bush honeysuckles, ox-eye daisy, round leaf bittersweet, Queen Anne's lace, Siberian peashrub, spotted knapweed, white sweetclover, wild parsnip, winged burning bush, and yellow sweetclover.

Figure 33. Invasive species funds supported prevention and management activities on DNR-managed lands.

Fiscal year 2025

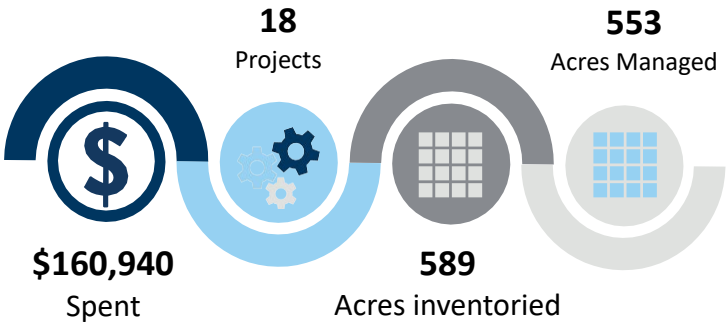

Table 7: Funding history and results

Fiscal Year	Dollars Spent	Acres (Inventoried and Managed)	Number of Projects
2015	$270,674	12,994	26
2016	$192,339	5,501	23
2017	$219,834	5,755	21
2018	$173,824	6,592	24
2019	$245,727	6,186	21
2020	$165,735	2,331	24
2021	$159,857	3,728	28
2022	$105,451	1,875	14
2023	$184,101	4,046	26
2024	$109,310	1,321	14
2025	$160,940	1,142	18

Outreach and Communication

The 2025 Minnesota State Fair terrestrial invasive species display showcased temporary tattoos, signage and display materials. Visitors learned about using boot brushes to prevent the spread of invasive plants, how to identify species like round leaf bittersweet and Asian longhorn beetles, how to prevent the spread of invasive insects by not moving firewood and how to avoid introducing jumping worms to their yards. In the interactive game “Muck Hunt” visitors use tools to virtually clean invasive species off equipment. They remove mud, weed seeds and earthworm egg cases from an ATV and hiking boots. The game emphasized the message “PlayCleanGo”.

The program continued to promote the reporting of invasive species locations. Reporters include state agency staff, interested residents, county agricultural inspectors and cooperative weed management area partners. DNR staff assisted in sharing information about reporting, making reports, and verifying them before they are made public.

DNR terrestrial invasive species webpages are an important resource for the public. Key webpages include the terrestrial invasive plants homepage, buckthorn webpages, additional invasive plant webpages and the jumping worm webpage. The following new webpages were created: small-leaf bramble, creeping meadow foxtail, common and giant butterbur, porcelain berry, stiltgrass, European mountain ash, and honeysuckle vine.

DNR staff regularly responded to reports of jumping worms by coordinating identification, reporting and follow up actions. DNR staff communicated with other state agencies, industry, master gardeners and researchers about jumping worm best management practices and continued to update information available about jumping worms.

The DNR uses messages in collaboration with the national PlayCleanGo program. PlayCleanGo is built around partnering and using consistent messaging to prevent the introduction and spread of invasive species. Visit playcleango.org.

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Notes:

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Ecological and Water Resources Division Districts by County

Northwest Region

North District: Beltrami, Cass, Clearwater, Hubbard, Kittson, Lake of the Woods, Marshall, Pennington, Polk, Red Lake, Roseau and Wadena counties

South District: Becker, Clay, Douglas, Grant, Mahnomen, Norman, Otter Tail, Pope, Stevens, Traverse and Wilkin counties

Northeast Region

East District: Carlton, Cook, Lake and St. Louis counties

West District: Aitkin, Crow Wing, Itasca, Koochiching and Pine counties

Central Region

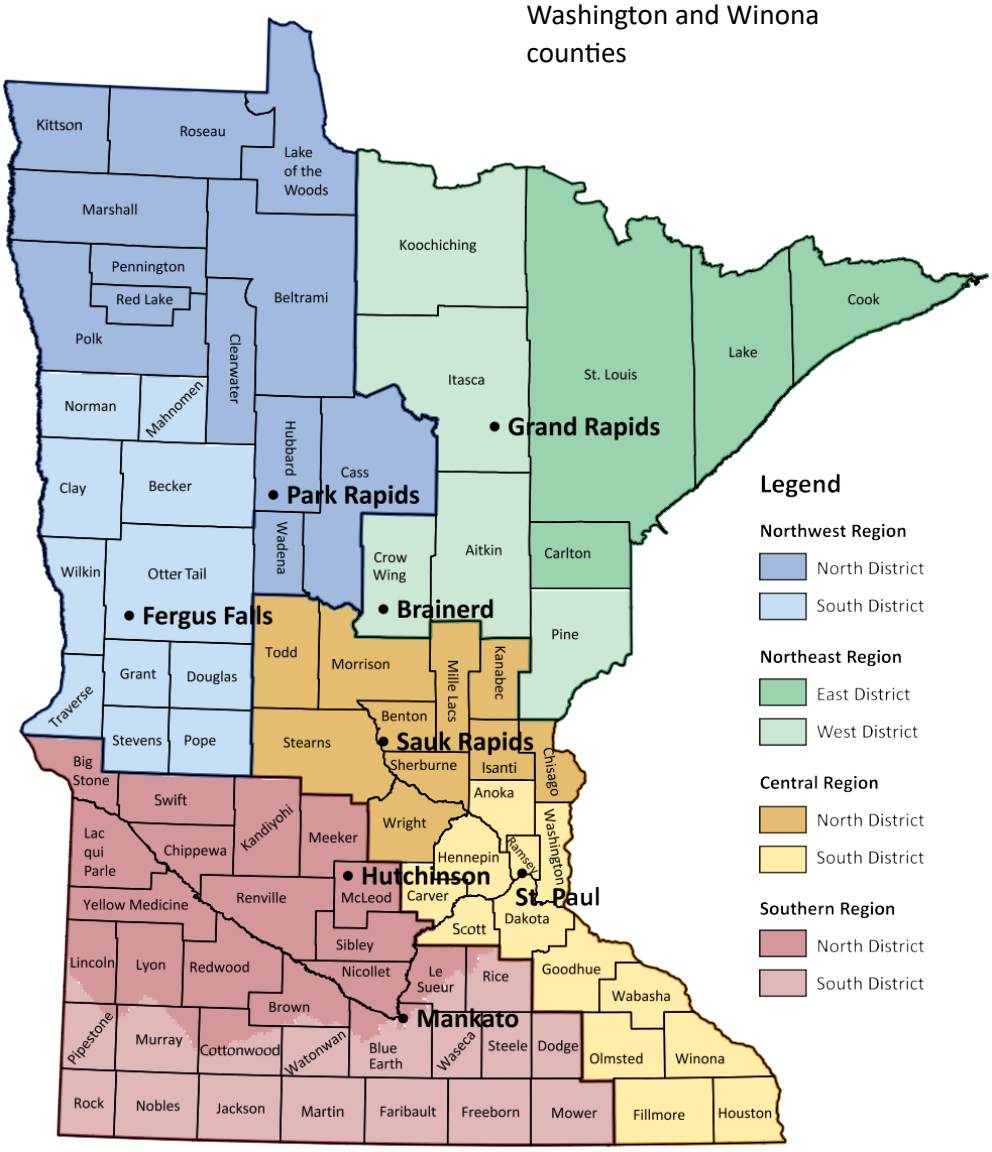
North District: Benton, Chisago, Isanti, Kanabec, Mille lacs, Morrison, Sherburne, Stearns Todd and Wright counties

South District: Anoka, Carver, Dakota, Fillmore, Goodhue, Hennepin, Houston, Olmsted, Ramsey, Scott, Wabasha, Washington and Winona counties

Southern Region

North District: Big Stone, Brown, Chippewa, Cottonwood—north of the Minnesota River, Kandiyohi, Lac qui Parle, LeSueur—north of the Minnesota River, Lincoln, Lyon, McLeod, Meeker, Nicollet, Redwood, Renville, Sibley, Swift and Yellow Medicine counties

South District: Blue Earth, Cottonwood—south of the Minnesota River, Dodge, Faribault, Freeborn, Jackson, LeSueur—south of the Minnesota River, Martin, Mower, Murray, Nobles, Pipestone, Rice, Rock, Steele, Waseca and Watonwan counties



Appendix A. Invasive Species Program Staff

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Appendix B. Water bodies listed as infested in 2025

This table includes all water bodies added to the infested waters list in 2025. Explanations of the last two columns are below:

Year species was first confirmed, or connected water body: Either 1) the year in which the DNR 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 Lake ID number of the connected, confirmed water body.

Lake ID number: an identifying number the DNR uses for lakes. 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 or "NA" in the number column; some river pools are identified with a Lake ID number.

Water body name	County or counties	Listed for aquatic invasive species	Year listed as infested	Year species was first confirmed, or connected water body	Lake ID number
Anna	Otter Tail	starry stonewort	2025	2025	56-0448
Anna	Otter Tail	zebra mussel	2025	2025	56-0448
Bass	Itasca	zebra mussel	2025	2025	31-0576
Bay	Itasca	zebra mussel	2025	connected to Moose (31-0722)	31-0723
Benedict	Hubbard	starry stonewort	2025	2025	29-0048
Big Marine	Washington	zebra mussel	2025	2025	82-0052
Big Sand	Hubbard	zebra mussel	2025	2025	29-0185
Bowen	Cass	zebra mussel	2025	2025	11-0350
Boy	Cass	zebra mussel	2025	2025	11-0143
Bronson	Kittson	zebra mussel	2025	2025	35-0003
Cedar	Scott	zebra mussel	2025	2025	70-0091
Crooked Creek, downstream of Roosevelt (11-0043) to Pug Hole (18-0209)	Crow Wing	zebra mussel	2025	Connected to Roosevelt (11-0043)	NA
Daggett Brook	Crow Wing	zebra mussel	2025	Connected to Roosevelt (11-0043)	NA
Daggett Creek	Crow Wing	zebra mussel	2025	Connected to Roosevelt (11-0043)	NA

Water body name	County or counties	Listed for aquatic invasive species	Year listed as infested	Year species was first confirmed, or connected water body	Lake ID number
Deer River downstream of Moose (31-0722) to the confluence of the Mississippi River	Itasca	zebra mussel	2025	connected to Moose (31-0722)	NA
Eagle	Hubbard	zebra mussel	2025	Connected to Potato (29-0243	29-0256
Eagle	Crow Wing	zebra mussel	2025	Connected to Roosevelt (11-0043)	18-0296
Ethel	Otter Tail	zebra mussel	2025	2025	56-0193
Fish Hook	Hubbard	zebra mussel	2025	2025	29-0242
Fish Hook River Dam	Hubbard	zebra mussel	2025	connected to Fish Hook (29-0242)	29-0504
Fish Hook River from Fish Hook (29-0242) to Shell River	Hubbard	zebra mussel	2025	connected to Fish Hook (29-0242)	NA
Fox	Becker	zebra mussel	2025	2025	03-0358
Garfield	Hubbard	starry stonewort	2025	2025	29-0061
Gervais	Ramsey	zebra mussel	2025	2025 (veligers)	62-0007
Gull	Beltrami	starry stonewort	2025	2025	04-0120
Hay Creek from Island (29-0254) to Potato (29-0243)	Hubbard	zebra mussel	2025	connected to Potato (29-0243)	NA
Ida	Hubbard	zebra mussel	2025	connected to Big Sand (29-0185)	29-0170
Inguadona	Cass	zebra mussel	2025	2025	11-0120
Island	Hubbard	zebra mussel	2025	Connected to Potato (29-0243)	29-0254
Jane	Washington	zebra mussel	2025	2025 (veligers)	82-0104
Kabetogama	St. Louis	zebra mussel	2025	2025 (veligers)	69-0845
Keller	Ramsey	zebra mussel	2025	connected to Spoon (62-0001)	62-0010-02
Kohlman	Ramsey	zebra mussel	2025	connected to Gervais (62-0007)	62-0006
Lake Six	Otter Tail	zebra mussel	2025	2025	56-0369
Little Sand	Hubbard	zebra mussel	2025	2025	29-0150
Little Thunder	Cass	zebra mussel	2025	2025	11-0061

Water body name	County or counties	Listed for aquatic invasive species	Year listed as infested	Year species was first confirmed, or connected water body	Lake ID number
Long	Washington	zebra mussel	2025	2025 (veligers)	82-0118
Lower Bottle	Hubbard	faucet snail	2025	connected to Upper Bottle (29-0148)	29-0180
Lower Twin	Wadena	zebra mussel	2025	connected to Potato Lake (29-0243)	80-0030
Marlu	Pope	zebra mussel	2025	connected to Amelia (61-0064)	61-0060
McKnight	Carver	Eurasian watermilfoil	2025	2025	10-0216
Mitchell	Crow Wing	zebra mussel	2025	connected to Roosevelt (11-0043)	18-0294
Moose	Itasca	zebra mussel	2025	2025	31-0722
Mud	Douglas	zebra mussel	2025	2025	21-0086
Mud	Hubbard	zebra mussel	2025	connected to Potato (29-0243)	29-0251
Munson	Becker	zebra mussel	2025	2025	03-0357
North Fork Crow River from Grove Lake to Rice Lake (73019600)	Multiple (Pope, Kandiyohi, Stearns)	zebra mussel	2025	connected to Grove (61-0023)	NA
North Fork Crow River from Rice Lake (73-0196) to Mud Lake (73-02000-01)	Stearns	zebra mussel	2025	connected to Rice (73-0196)	NA
Olson	Washington	zebra mussel	2025	2025 (veligers)	82-0103
Placid	Morrison	faucet snail	2025	connected to Crow Wing River	49-0080
Placid	Morrison	zebra mussel	2025	connected to Crow Wing River	49-0080
Plaisted	Washington	Eurasian watermilfoil	2025	2025	82-0148
Poplar	Cook	spiny waterflea	2025	2025	16-0239
Portage	Cass	zebra mussel	2025	2025	11-0204
Potato River from Potato (29-0243) to Fish Hook (29-0242)	Hubbard	zebra mussel	2025	connected to Potato (29-0243)	NA
Pug Hole	Cass	zebra mussel	2025	2025	11-0061-01
Pug Hole	Crow Wing	zebra mussel	2025	connected to Roosevelt (11-0043)	18-0209

Water body name	County or counties	Listed for aquatic invasive species	Year listed as infested	Year species was first confirmed, or connected water body	Lake ID number
Rice	Stearns	zebra mussel	2025	connected to Grove (61-0023)	73-0196
Ringo	Kandiyohi	Eurasian watermilfoil	2025	2025	34-0172
Roosevelt	Cass	zebra mussel	2025	2025	11-0043
Sand Point	St. Louis	zebra mussel	2025	connected to Namakan (69-0693)	69-0617
Sea Gull	Cook	spiny waterflea	2025	2024	16-0629
Shell River, confluence of Fish Hook River to Upper Twin (29-0157)	Hubbard	zebra mussel	2025	connected to Fish Hook (29-0242)	NA
Spoon Creek between Keller and Phalen lakes	Ramsey	zebra mussel	2025	2025 (veligers)	62001001
Swan	Itasca	zebra mussel	2025	2025	31-0067
Sylvan	Morrison	faucet snail	2025	connected to Crow Wing River	49-0036
Sylvan	Morrison	zebra mussel	2025	connected to Crow Wing River	49-0036
Three Island	Beltrami	starry stonewort	2025	2025	04-0134
Turtle	Ramsey	zebra mussel	2025	2025	62-0061
Two Rivers	Stearns	starry stonewort	2025	2025	73-0138
Two Rivers from Bronson (35-0003) to the Red River	Kittson	zebra mussel	2025	connected to Bronson (35-0003)	NA
Two Rivers upstream from Bronson (35-0003) to walking bridge	Kittson	zebra mussel	2025	connected to Bronson (35-0003)	NA
Union	Douglas	zebra mussel	2025	2025	21-0041
Unnamed (Simley)	Dakota	Eurasian watermilfoil	2025	2025	19-0037
Unnamed (West Mud)	Douglas	zebra mussel	2025	2025	21-0087
Upper Twin	Hubbard	zebra mussel	2025	Connected to Potato Lake (29-0243)	29-0157
Vermillion River from Vermillion Falls to the confluence with the Mississippi River	Dakota, Goodhue	zebra mussel	2025	2025	NA
Volney	Le Sueur	Eurasian watermilfoil	2025	2025	40-0033
White Earth	Becker	zebra mussel	2025	2025	03-0328