WISCONSIN DEPARTMENT OF NATURAL RESOURCES
2018-2020 INVASIVE SPECIES REPORT

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ABOUT THIS REPORT

This biennial report provides updates on the Department of Natural Resources' invasive species programs, progress in controlling invasive species, and future needs from July 1, 2018 through June 30, 2020. During this time, the department has engaged partners in early detection, management, and control, implemented a coordinated response framework, and provided training and outreach for businesses and other stakeholders.

The Invasive Species Identification, Classification, and Control Rule (Chapter NR 40, Wis. Adm. Code) classifies invasive species in Wisconsin as ***Prohibited*** or ***Restricted*** and regulates their transportation, possession, transfer and introduction. It also establishes "Preventative Measures" to slow the spread of invasive species. This rule applies to **over 245 species** and **affects everyone in Wisconsin**.

Yellow floating heart. (Chris Hamerla)

What are invasive species?

The legislature has defined invasive species as "nonindigenous species whose introduction causes or is likely to cause economic or environmental harm or harm to human health." These species can be aquatic or terrestrial weeds, insect pests, nuisance animals, or disease-causing organisms.

Why does this matter?

Invasive species can occur in all types of habitats and affect urban and rural areas throughout Wisconsin. The adverse effects on our environment and citizens include damage to natural resources, alteration of aesthetic values, harm to wildlife and human health, and a strain on our economy. The costs to manage and control invasive species can be reduced or avoided if invasions are prevented in the first place.

FUNDING OF INVASIVE SPECIES ACTIVITIES

Aquatic Invasive Species (AIS) Funding

AIS is a subprogram in the department's Water Quality Bureau and has a diverse funding base that utilizes state and federal funding. Together these funds provide support for two Permanent FTEs, four Project FTEs and several LTEs to support statewide efforts as well as their travel, supplies and some discretionary project money. In addition, approximately $4 million is available each year in cost-sharing grants to various local entities. The dedicated state funding for AIS allows for major gains that are not possible for terrestrial species where a majority of the work is grant-funded.

Annual Funding (FY2019) and Funding Source

$388,170 Lake, River and Invasive Species Management (Water Resources Account)
$ 133,243 Boat Registration AIS Research Check-off
$4,029,100 Aquatic Invasive Species Grants
$45,454 U.S. Fish & Wildlife Service (USFWS) Aquatic Nuisance Species Grant
$598,859 USFWS/Great Lakes Restoration Initiative Grant

$ 5,194,826 TOTAL

Boat Registration AIS Research Check-off allows boat owners to voluntarily make contributions to an account that is used to augment AIS research efforts. Its used to fund priority research projects as well as support an LTE who compiles and organizes information, summarizes findings and helps make it available to staff, partners and the public. For more information see: https://dnr.wisconsin.gov/topic/Lakes/SayYesToLakes

Aquatic Invasive Species Grants are a component of NR 193 Surface Water Grant program. This provides financial assistance for eligible applicants to prevent, contain and control AIS throughout the state. The program's $4 million in funds are dedicated each year through a competitive grant program to support work on lakes, rivers and wetlands. This year, the department completed a 3 year rulemaking process to unite the 10 different grant subprograms under one set of policies and procedures, creating a holistic program to support organizations whatever their management needs. Whether an organization is looking for help with outreach, assessments, surveys, planning, project design or management, there is a surface water grant program that can help. For more information see the surface water grants website. Below is a summary of AIS grant awards made for the 2 recent fiscal years as well as a graph of funding trends since 2015.

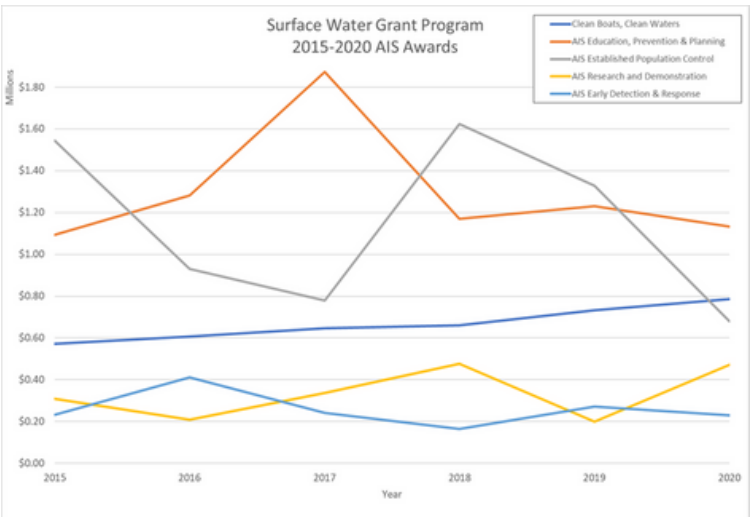
Fiscal Year 2020

Grant Type	Grants Awarded	Award Amounts	Encumbrances
AIS Education, Prevention, & Planning	25	$1,132,533.22	$1132533.22
AIS Established Population Control	7	$680,123.77	$680,123.77
AIS Early Detection & Response	13	$230,896.00	$213040
AIS Research & Demonstration	2	$472,555.00	$472555
AIS Maintenance & Containment	3	$860.00	$2130
Clean Boats, Clean Waters	152	$798,609.88	$798609.88
Total FY20		$3,315,577.87	$3,298,991.87

FUNDING OF INVASIVE SPECIES ACTIVITIES

Fiscal Year 2019

Grant Type	Grants Awarded	Award Amounts	Encumbrances
AIS Education, Prevention, & Planning	32	1,229,991.23	1,229,991.23
AIS Established Population Control	14	$1,328,889.94	$1307713.90
AIS Early Detection & Response	17	$272,863.79	270947.79
AIS Research & Demonstration	1	$199,966.00	199966
AIS Maintenance & Containment	2	$1,040.00	1040
Clean Boats, Clean Waters	141	$732,755.07	732755.07
Total FY19		$3,765,506.03	3,742,413.99



USFWS Aquatic Nuisance Species Grant provides annual, variable flexible funding to implement the State's Aquatic Invasive Species Management Plan. In this time period it was used to fund LTEs to catch up on a back log of AIS data management needs and reports as well as some outreach and education.

USFWS Great Lakes Restoration Initiative Grants have provided the State with a stable funding source for the last 12 years supporting the bulk of staffing for AIS; 1 permanent FTE, 4 Project FTE and 4 LTE in addition to travel, supplies and project materials. While GLRI has averaged around $900,000 a year, FY 19 was the lowest award received to date. Our pending award for FY2020 is $800,000. These staff conduct a large segment of the State's AIS monitoring and response efforts and is engaging on a project to identify, assess and intervene in all potential pathways that AIS can enter the State as described in Wisconsin's Aquatic Invasive Species Management Plan.

Aerial treatment of cattail and phragmites

In 2019 (FY20), DNR and Ducks Unlimited cooperatively contracted aerial spraying on 1,859 acres of invasive cattail and phragmites across 23 DNR managed properties around the state. Funding for this work came from federal Pittman-Robertson and Great Lakes Restoration Initiative grants, totaling $134,777.

Aerial herbicide treatment on large monotypic stands of cattail helps improve floristic diversity and open water conditions that are favorable for waterbirds and other wildlife that people view and hunt. The treatment of non-native cattail in eastern Wisconsin is important for the same reasons, but also to minimize the spread of this species in other areas of the state where it has not established.

Arial view of control work completed in Jefferson Marsh. (DNR files)

Pivoting a grant to meet public need for control of invasive plants

In 2018, the department's Forest Health program received a grant from the U.S. Forest Service to provide cost sharing for control of lesser celandine to landowners around Geneva Lake where the invasive plant was becoming established. Unfortunately, in the first control season, a critical local partner was not able to contribute as expected and the response of local landowners was minimal. While cost sharing to the two participating landowners was provided, there was a need to redirect this funding to have an impact within the grant period. The Division of Forestry manages the Weed Management Area – Private Forest Grant Program (WMA-PFGP), which awards state funds to locall organized partnerships that manage invasive plants on forested lands. Adding the federal funding to the existing state grant program ensured that the money would be spent on regionally prioritized projects to control invasive plants in woodlands. This supplementation of funding was timely as applications to the grant doubled in 2020, with requests totaling $160,000. With $51,000 of federal funding added to the states WMA-PFGP budget of $60,000, we were able to support several additional control projects across Wisconsin at a low cost of administration. The flexibility of the U.S. Forest Service was critical to the success of this work.

Northwoods Cooperative Weed Management Area (CWMA) volunteers pull garlic mustard in the Bad River watershed spring 2019. (DNR files)

Northwoods CWMA prepares for garlic mustard removal in May 2020. (DNR files)

FUNDING OF INVASIVE SPECIES ACTIVITIES

Pittman-Robertson

Between 2018-2020, a number of invasive species projects were conducted using federal Pittman-Robertson funds. Projects took place on DNR-owned properties that allow hunting. Projects funded fell under the following categories:

- Control of herbaceous ($200,000) and woody ($350,000) invasive species on 85 DNR properties. In total, these properties cover 414,855 acres across the state ($550,000 total).
- Monitoring and Control of 16 species that are either Prohibited or are a priority for early detection and control ($60,000). Species controlled: porcelain berry, wild chervil, narrowleaf bittercress, golden creeper, black swallow-wort, butterfly dock, European marsh thistle, hedge parsley, poison hemlock, garden valerian, glossy buckthorn, lesser celandine, Chinese bushclover, Grecian foxglove, Japanese hops, and Japanese wisteria.
- Assistance for coordinating the release and monitoring of biocontrol agents for spotted knapweed throughout Wisconsin ($30,000).
- Purchase of prescribed fire equipment for DNR staff ($125,000).
- Purchase of 200 trailhead signs for DNR hunting lands to encourage visitors to prevent the spread of invasive species ($10,000).
- Creation of a pesticide reporting tool within an existing system to allow staff to track pesticide use and other land management activities ($50,000).

Turkey and Pheasant Stamp

During the reporting period, three turkey stamp projects were funded that included invasive species management as part of their prescription, totaling over $361,980 in stamp funds. Grassland habitat is essential to pheasants and turkeys for different life cycle requirements. Pheasants require grassland habitat year round and invasive species spraying and cutting helps stop the encroachment of woody shrubs. Oak savanna is one particularly valuable habitat type for turkey nesting and brooding in Wisconsin as it provides understory cover for poults and acorns, an important food source. Oak savanna requires regular management to combat invasive species encroachment that would compromise the natural grassy understory.

Applying prescribed fire as an invasive species management tool. (DNR files)

Controlling invasive species provides better habitat for game species. (DNR files)

INVASIVE SPECIES PREVENTION, MONITORING AND CONTROL EFFORTS

A note on COVID-19: The spring of 2020 saw the cancellation of many travel and field work plans for department staff due to COVID-19. Monitoring and control work was limited to efforts for some Prohibited species, deemed "essential" by the department. Many projects were set back several years due to the inability to do the work this year, although some progress was made in some areas and for certain species.

Aquatic and Wetland Species

Water hyacinth in Green Bay

In late August 2019, a single water hyacinth plant was observed on the East River in Green Bay by a DNR stream biologist. Shortly thereafter, DNR staff conducted surveys and found an extensive population of water hyacinth throughout the East and Fox Rivers. A lone plant was even observed as far out as Deadhorse Bay. Plants were removed and staff identified the upstream extent, narrowing in on the area where the plant could have been purposefully or accidentally introduced. Outreach and monitoring efforts were implemented throughout the fall and will continue into 2020.

Amanda Smith (DNR) and Rob Simmonds (USFWS) with a "boat load" of water hyacinth removed from the East and Fox Rivers, Green Bay. (Ryan Jenquin)

Yellow floating heart

A newly registered herbicide was used to treat yellow floating heart in a private artificial pond in Dane County in August 2018. With limited regrowth observed in 2019 the treatment is indicating promising results with the hopes that the population will eventually be fully eradicated. In winter of 2019 WDNR AIS staff were made aware of another yellow floating hear population in a private artificial pond in Marinette County. This population was thought to have been eradicated after draining and relining the pond years ago, but has since re-emerged. A similar herbicide treatment is currently being planned for late summer 2020 along with reconnaissance monitoring to ensure the plant did not spread to public water bodies.

Herbicide application of yellow floating heart in Dane County. (Amanda Smith)

INVASIVE SPECIES PREVENTION, MONITORING AND CONTROL EFFORTS

Butterfly dock

In June 2020, two DNR botanists responded to a report of suspected butterfly dock in a right-of-way just north of Gillett. The botanists verified the species as prohibited and pursued control efforts with the help of a local contractor and Timberland Invasives Partnership (a Cooperative Invasive Species Management Area, or CISMA) that serves Langlade, Forest, Menominee, and Oconto counties. The only other finding of this species in Wisconsin was in 2015 at a nursery in northern Wisconsin.

Butterfly dock population in Oconto County. (Alix Bjorklund)

Round goby

The WDNR Round Goby Response Team continued to work with the Fox River Navigational Authority (FRNSA) to keep the Menasha Lock closed while FRNSA pursues ways to return the lock to operation. The Menasha lock was closed in 2015, when round gobies where discovered there, to keep these fish from reaching Lake Winnebago. In October 2019, FRNSA submitted a plan to the DNR for review from which the Response Team identified information gaps. The FRNSA board of directors contracted a series of studies that are currently underway to provide the following information:

- Comprehensive information about the round goby's ability to swim against water velocity at all stages of the fish's life;
- How an electrical field will affect a round goby at all stages of the fish's life.

Non-native phragmites in the Green Bay area. (Amanda Smith)

Non-native phragmites

The department treated over 2,400 populations covering 199 acres throughout the Lake Michigan basin using funding from the Great Lakes Restoration Initiative. Control has been conducted on small pioneer populations in western basin counties, along highways 41 and 141 north of Green Bay, at small northern lakes, and within the Lake Winnebago watershed. The department has also partnered with Ducks Unlimited to control phragmites and narrow-leaved cattail to expand and improve waterfowl breeding areas. Phragmites control has also occurred in other areas of the basin led by other conservation groups including the Lakeshore Natural Resource Partnership (LNRP) in Manitowoc and Sheboygan counties, and the Ozaukee-Washington Land Trust (OWLT).

INVASIVE SPECIES PREVENTION, MONITORING AND CONTROL EFFORTS

Hairy willowherb

The department continued control work on hairy willowherb populations with the Southeastern Wisconsin Invasive Species Consortium (SEWISC) in the Milwaukee metropolitan area. Partnerships were expanded to include the City of Sheboygan for control within some of its parks. A new population of the smallflower hairy willowherb was discovered at the southern end of the Chiwaukee Prairie in Kenosha County.

Hairy willowherb. (Eleanor Saulys)

Giant hogweed. (Donna Ellis)

Giant hogweed

Giant hogweed is less well known than wild parsnip, but causes more severe burns. It takes a team effort to keep this plant out of Wisconsin. SEWISC has continued to monitor and control populations of giant hogweed throughout their area. New populations have been discovered in a residential neighborhood in Sheboygan. The Golden Sands Resource Conservation & Development Council (RC&D) has worked with private landowners in Portage County. All known sites in the state are being controlled.

Lesser celandine

Multiple populations have been controlled for several years in Milwaukee, Waukesha, Walworth, Kenosha and Dane counties. Grant funding has been given to SEWISC for large scale control in the Milwaukee metropolitan area. Larger populations are too extensive for DNR to coordinate or fund control work, so landowners are asked to do the work.

Lesser celandine. (Robert Bierman)

INVASIVE SPECIES PREVENTION, MONITORING AND CONTROL EFFORTS

Asian Clam In Kewanis Pond and Lion's Park Pond, Rock County

Asian clam were discovered by DNR biologists in two Rock County Ponds in 2018. Following the discovery DNR surveyed nearby waterbodies and initiated an eDNA improvement project. Further early detection monitoring of Rock River and waterbodies in the 15-mile area with boat landings by WDNR and CLMN is planned but has been put on hold due to COVID-19. Outreach events at Janesville Rotary Gardens (right next too and on shore of Lions Park Pond) have also been planned, but events are on hold due to COVID-19.

Searching for Asian Clam. *(Jim Amrhein)*

Searching for Asian Clam. *(Jim Amrhein)*

Prohibited Cattails Accidentally Used in Restoration

Following discovery of the graceful cattail in the I-94 cloverleaf in Milwaukee in 2017, three other populations were identified along ROW restoration projects and in stormwater ponds in Waukesha County. There are no other known populations of this miniature cattail in the state, but DNR, DOT and partners are on the lookout for other populations. The DOT has been working with a contractor for control of the Graceful cattail in the I94 and Ryan Road cloverleaf, this was done in 2018. In 2019, a major construction effort was done in the cloverleaf and follow up monitoring is needed.

Reed Mana Grass in Phillips

Reed mana grass was discovered by the WDNR in a roadside ditch near the Price County Airport. Since this discovery, the WDNR along with the United States Forest Service (USFS) have been monitoring proximal lakeshore, wetlands and roadsides. Plans have been made to partner with the Upper Chippewa Invasive Partnership & the Department of Transportation (DOT) to expand monitoring and test efficacy of drones.

Spiny Waterflea in Plum Lake

The discovery of spiny waterflea in Plum Lake (2018) brings is the sixth known population of SWF inland in northern WI.

INVASIVE SPECIES PREVENTION, MONITORING AND CONTROL EFFORTS

Terrestrial Species

Porcelain berry

Porcelain berry is a prohibited invasive species that was first discovered in Wisconsin in 1999. A large two-year treatment project was conducted in the Madison metropolitan area. DNR staff worked with contractors to monitor and control this species in residential neighborhoods, public parks, and transportation corridors. Additional control was conducted at the Badger State Trail in Dane County. Following the treatment period, new populations have been reported within the Madison-area. Hundreds of homeowners were informed about this plant, and following initial efforts by the DNR, the homeowners are now responsible for follow-up control and monitoring.

Porcelain berry. (DNR files)

Porcelain berry. (Jil Swearinger)

Amur cork tree

The Lower Chippewa Invasive Partnership continued their project to use grant funds to provide match for landowners who were asked to remove their trees. A large infestation at a Girl Scout camp in Vilas County was identified.

A mature Amur cork tree. (Jean PolGrandmont)

Cork-like bark and yellow inner bark of an Amur cork tree. (DNR files)

Golden creeper

This showy vine can quickly climb over grasses, shrubs and trees. It produces potato-like tubers that can float downstream and start new populations. Herbicide trials and surveys were conducted by UW-Madison partners on one very large population on and near the Big Green River in Grant County. Additional smaller populations in Waukesha County are being controlled and one of them is now considered eradicated.

Golden creeper invasion. (Eddie Shea].

Black swallowwort. (Kelly Kearns].

Black swallow-wort

Invasive vines like black swallow-wort are particularly challenging to manage and control as they climb and blanket other vegetation and climb fences and trees. Populations in the far southwestern part of Wisconsin are beyond controlling, but smaller populations have been controlled annually, preventing spread by seed production.

Japanese hedgeparsley

Similar to garlic mustard, this plant is a biennial, spreading by abundant seeds. It primarily spreads along roadsides, and then into adjacent forests where it can form dense stands. It is not yet present in much of the state and new, small populations are easily pulled; however, once allowed to spread, populations of this plant are much more difficult to control.

Japanese hedgeparsley. (Kelly Kearns].

INVASIVE SPECIES PREVENTION, MONITORING AND CONTROL EFFORTS

Poison hemlock. (Elizabeth J. Czarapata)

Poison hemlock

This large member of the carrot family is extremely toxic. It spreads down roadsides with mowing, and can then spread into adjacent pastures and hayfields, potentially causing poisoning in livestock.

Wild chervil

Wild chervil is a biennial plant in the carrot family. It spreads along roadsides by mowing. The Lower Chippewa Invasives Partnership (CWIP) and the Southeast Wisconsin Invasive Species Consortium (SEWISC) continues extensive outreach, education and cost-sharing of control with counties and townships. Other smaller sites have been controlled annually to prevent the spread seen in northwestern counties.

Wild chervil. (Elizabeth J. Czarapata)

Garden valerian

This plant was introduced to North America as an herbal plant and has since spread. It is already too widespread to contain in some areas of Wisconsin, like much of the far northwestern corner. New populations in other areas are important to contain before they expand.

Garden valerian. (DNR files).

Chinese bushclover. (Elizabeth J. Czarapata)

Chinese bushclover

This legume was used in wildlife plantings years ago, primarily in states to the south of Wisconsin. It can completely dominate a grassland, eliminating other plants. This is the situation at a private nature preserve in the state, and the managers have initiated control.

Purple Loosestrife Biocontrol Program - New Coordinator and Updates

During 2019, the coordination of the Purple Loosestrife Biocontrol Program began a transition from the twenty-five-year leadership of Brock Woods, who developed the program, to Jeanne Scherer in preparation for his Spring 2020 retirement. An updated program guide has been produced and will go through public comment in Summer 2020. A new color quick guide has also been developed, along with an updated application form, permitting letter, and required release form for the beetles raised to control the wetland invasive plant. Spring training for volunteers and Aquatic Invasive Species Network partners were adapted from in person events to online webinars. Like the Clean Boats, Clean Waters Program, a special guide for conducting partners' efforts during Covid-19 was also produced and distributed. Although the level of participation was lower due the pandemic, the program is often done by individuals and family groups who already had supplies on hand, so many continued as usual to do their part to keep purple loosestrife from again choking Wisconsin wetlands.

A purple loosestrife beetle release by a member of the Oneida County team. (Oneida County Land and Water Conservation Dept)

Purple loosestrife. (Elizabeth J. Czarapata)

WHITE NOSE SYNDROME IN BATS

White-nose syndrome (WNS), a deadly disease that develops in bats infected with the fungus *Pseudogymnoascus destructans* (Pd), is currently regulated as a Prohibited invasive species. It has now affected cave bat populations in Wisconsin for seven hibernation seasons. The WNS fungus is considered present in hibernation sites statewide. Hibernacula now in year 6 of disease progression have experienced an overall decline of over 89% compared to the pre-WNS mean. Two of Wisconsin's largest surveyed sites are down 87% and 71% from their pre-WNS mean. Both sites (now in their fifth year of infection) originally held tens of thousands of little brown bats and other bat species.

Hibernating little brown bats in a mine. (J. Paul White)

Research collaborators collecting environmental samples from a bat hibernaculum. (Heather Kaarakka)

DNR and key collaborators from Virginia Tech have found bats that are hibernating in colder/drier microclimates (within a given cave/mine) early in the season (fall) are more likely to survive WNS than those individuals that select warmer/wetter areas of caves early in the season. The research partnership has also found the amount of fungus in the hibernacula determines infection severity in the population of that cave or mine and determines the impact to that population over the course of the winter.

Little brown bats. (DNR files)

INVASIVE SPECIES WE'RE WATCHING FOR

SOUTHERN PINE BEETLE

This tiny bark beetle is native to the southern U.S., Mexico and Central America. It has expanded into New England, perhaps due to warming temperatures. The beetles are attracted to weakened mature pine trees.

ASIAN LONGHORNED BEETLE

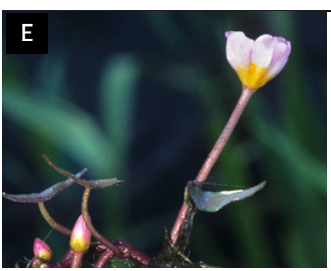
This beetle is a threat to Wisconsin's hardwood trees. It currently infests parts of Massachusetts, New York and Ohio, where it threatens recreation and high-value forest resources.

JAPANESE STILTGRASS

This species was reported for the first time in Wisconsin in July, 2020. A volunteer found some plants in the Coulee Experimental Forest near La Crosse. Control and monitoring efforts will continue.

EUROPEAN FROG-BIT

This troublesome plant is present in Washington, New York, Vermont, and Michigan. Thick mats impede movement of boats and wildlife. Mats block light from submerged vegetation, and when they die, decreased oxygen kills other species.



CAROLINA FANWORT

Taking root in freshwater, this plant has been a nuisance in New York, Michigan, and Oregon. It spreads on recreational equipment and through the aquarium trade. Its dense mats, harm other species, clog streams and canals, and impede recreation and agricultural water use.

Photos: (A) An example of damage from southern pine beetles in New York State (DNR files). (B) Adult Asian longhorned beetle (The Ohio State University). (C)Japanese Stiltgrass (DNR files). (D) European Frog-bit (DNR files). (E) Carolina Fanwort (Ann Murray, University of Florida).

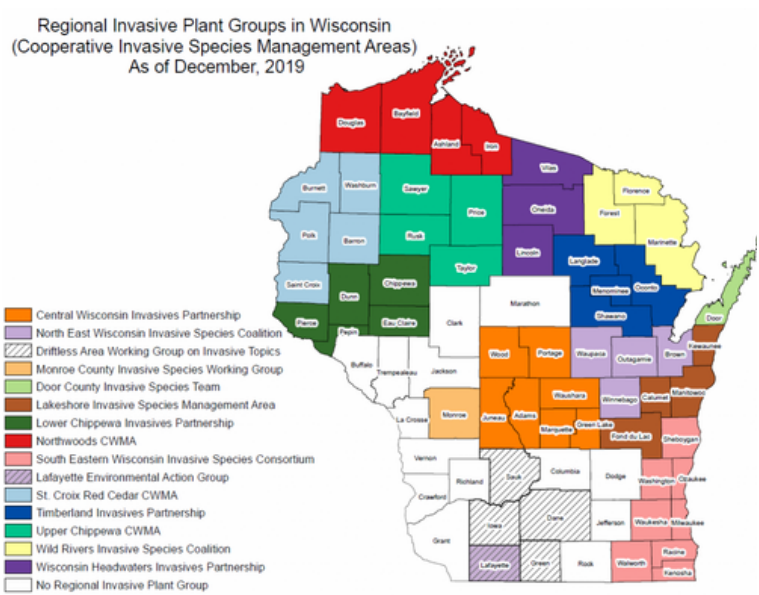
PARTNERSHIPS ARE KEY TO SUCCESS

The DNR works closely with a variety of state and federal agencies , tribal organizations, and other groups on invasive species issues to ensure a coordinated statewide approach without overlapping regulatory pressure. Throughout this reporting period, the department partnered extensively with the Wisconsin Department of Transportation (DOT), the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers on invasive species prevention and control efforts.

CISMAS

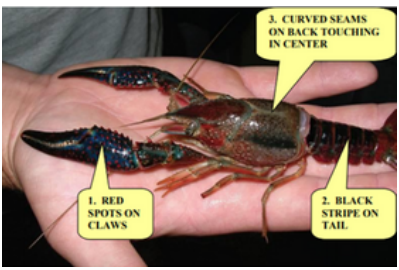
Wisconsin has a strong network of Cooperative Invasive Species Management Areas (CISMAs); fourteen CISMAs cover 56 of our 72 counties. These coalitions of private, public and non-profit organizations, volunteers and landowners work together to identify and address local needs. In coordinating AIS efforts, the Wisconsin Lakes Partnership, River Alliance of Wisconsin, and regional and county AIS staff provide a foundation of statewide cooperation. Counties, myriad lake organizations, and thousands of volunteers actively participate in AIS prevention, detection, containment, and control.

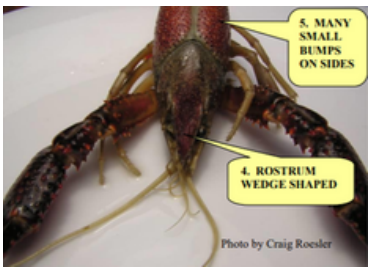
Two new CISMAs got underway this year. The North East Wisconsin Invasive Species Coalition includes Brown, Outagamie, Waupaca and Winnebago Counties. The South Central Wisconsin Invasive Species Collaboration includes Dane, Green, Sauk, Lafayette and Iowa counties.



Red swamp crayfish in Sauk County

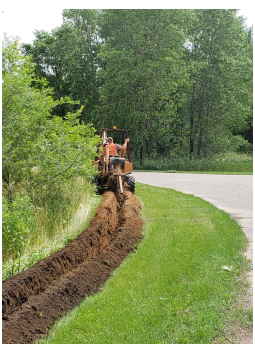
Multiple citizens observed red swamp crayfish at a Wisconsin River boat landing parking lot near the Sauk City Wastewater treatment plant in summer 2019. DNR law enforcement and fisheries responded quickly to set traps, dig trenches, and remove as many as possible to block them from the Wisconsin River. After a month of sampling, no more crayfish were observed. Regional DNR AIS coordinator, Shelby Adler, will work with law enforcement and volunteers from the Upper Sugar River Watershed Association to monitor for crayfish. This release is under investigation.





Red swamp crayfish characteristics. (Wisconsin Crayfish Identification Guide)

Red swamp crayfish are native to the Florida panhandle. Live Red swamp crayfish have been imported to Wisconsin for crayfish boils and for classrooms to study this crayfish's aggressive behavior. They do not have natural predators to regulate their populations, which is a problem because they prey on native plants, snails, insects and fish, and compete with native crayfish for habitat. They are dark red with bright red raised spots covering their bodies and claws. A key identifying characteristic is their curved seams on their back touch. The native white river crayfish is easily mistaken for the red swamp crayfish due to their brilliant red color, but there is a gap between the seams. See the *Wisconsin Crayfish Identification Guide* for details.



Backfilling a trench. (Nathan Nye)

Trench fencing installation. (Nathan Nye)

Red swamp crayfish. (Sean Neverman)

AIS Boater/Angler Survey

In 2019, the WDNR, Division of Extension, and the University of Wisconsin Sea Grant Institute completed a 3rd statewide mail survey of 1,500 randomly selected registered boat owners in Wisconsin to better understand their opinions and behaviors in terms of aquatic invasive species (AIS) prevention. This survey has also occurred in 2009 and 2013, with the longitudinal nature of the study enabling AIS staff to determine any changes that may have occurred in opinion and behavior over time. To our knowledge, Wisconsin is the only state with a time series of data on the AIS behaviors and knowledge of boaters in the United States. The survey focuses on anglers' and boaters' perceptions of awareness, knowledge and familiarity of AIS, compliance with AIS steps, transience levels and preferred sources of AIS-related information. Current sources of AIS-related information are also investigated. Although reported awareness of AIS, familiarity with AIS steps and compliance with AIS steps have increased since 2013, knowledge about AIS laws has decreased over the same period. These changes were statistically significant ($p<.05$). Reported compliance with AIS steps has increased since 2009. While high transience levels among boaters and anglers decreased from 47% (2013) to 39% (2018), low transience levels increased from 53% (2013) to 57% (2018). In both 2013 and 2018, the majority of respondents chose signs at boat landings as sources from which they had seen or heard about AIS-related information. In 2018, about 75% of respondents preferred obtaining information at a boat launch. These results indicated that AIS outreach efforts should continue to be targeted at transient waterbody users and aimed at increasing users' knowledge about AIS prevention actions through signs at boat landings and launches.

Clean Boats, Clean Waters Landing Blitz and Drain Campaign during COVID-19

Selina Walters, boat inspector/educator from Golden Sands Resource Conservation & Development Council, Inc., during the COVID19 pandemic wears her CBCW mask to protect herself and the public. (Chris Hamerla)

While 2019 was business as usual for the Clean Boats, Clean Waters (CBCW) program and the early season Drain Campaign and 4th of July holiday Landing Blitz, 2020 has been a challenge due to the pandemic. In 2019, over 33,500 people were reached directly at boat landings to be reminded of the law to drain all water from boats and gear, remove all vegetation and any clinging animals like zebra mussels, and to not move live fish (still in water) from the boat launch area. By early April 2020, we knew those close contacts could put both the public and the boat inspectors at risk, many from both in high risk categories. WDNR, Extension Lakes and UW-Madison Extension's AIS Outreach Program staff pulled together to provide guidelines for safely moving forward. Special CBCW face masks and a sign promoting physical distancing were also provided to those groups who chose to go ahead with their programs. The Drain Campaign was merged with the Landing Blitz for June 28-July 5. Data is still being collected, but many of the partners were at the launches as usual and shared the AIS Prevention message based on templates provided by the statewide coordinator through interviews on television and radio and through newsletters and social media. Wisconsin also participated in the Great Lakes Regional Landing Blitz over the same time period.

Changes to the Aquatic Invasive Species Partnership

The Aquatic Invasive Species (AIS) Partnership is invaluable to Wisconsin's AIS prevention efforts, uniting diverse partners in their collaborative work to prevent and control AIS. Historically, partners have provided their own funding for the work or would seek financial support from external entities, including the Department of Resources' Surface Water Grant Program. Over the years, competition for surface water grants grew, leading to gaps in coverage across and within regions. To address the problem of inconsistent prevention efforts, the WDNR and the AIS Partnership worked together to redesign the program's funding structure to provide more consistent and reliable funding statewide. What emerged from the joint effort is referred to as the "Lake Monitoring and Protection Network."

The new program seeks to provide a consistent amount of non-competitive, non-cost-shared funds allocated to each county to support core AIS prevention and lake monitoring work. Partners will begin transitioning from competitive grants to the Lake Monitoring and Protection Network in the fall of 2020, or when their current agreements expire. Work under the new model begins January 1, 2021.

Katelin Anderson, AIS Coordinator for Polk County, counting the leaflets on a stem of watermilfoil to determine if it's the invasive Eurasian watermilfoil or one of the native lookalikes. (Polk County Land and Water Resources Department)

Drone Use

Remote sensing tools are needed to detect invasive species at different spatial scales. Classification algorithms have been used to identify specific species using satellite and aerial imagery. Research has been done to use these tools to identify invasive species in broad landscapes. Remote sensing analysis can help the department understand where invasive species are found across broad landscapes, including large lakes, wetlands, and other DNR managed lands that could not be easily searched on foot.

Continued Funding Needed

Federal Pittman Robertson funding the last 3 years allowed DNR to work with partners to initiate urgent control of prohibited species. Almost all invasive species require multiple years of regular control work to get the population contained. Further funding is needed to continue this important work to minimize the spread of these newly invading species.

CISMAs are critical partners in doing outreach, education, surveying for new invasives and working with landowners to get control work initiated. Stable funding to assist these partners is needed.

Invasive species management. (Jared Urban)

INVADER CRUSADER AWARDS

Each year, individuals are nominated by the public to be recognized for their exemplary efforts at addressing issues surrounding terrestrial and aquatic invasive species, including plants, pests, animals and disease-causing organisms. The 16th annual Invader Crusader Awards were presented in June 2020. Among this years' winners are a retired Cambridge elementary school teacher's aide still organizing students who help keep invasive species out of the school forest, a Fox Valley resident who has "rehomed" more than 400 exotic pets so they're not released into the wild, and a Wausau resident and his yellow Labrador dog who have tirelessly educated boaters and anglers on how to avoid spreading invasive aquatic plants. Wisconsin owes these individuals and groups a great debt for their important work on invasive species.

The usual in-person awards ceremony was not held this year due to COVID-19. The 2020 award winners will be invited to attend the 2021 ceremony where they will again be recognized.

Professional Individual Category Winners

Bob Wakeman, Wauwatosa

Natalie Dutack, Milwaukee

Cisco the Dog and Chris Hamerla, Wausau

Marian Farrior, Sauk City

Michele Jasik, Madison

Professional Group Category Winner

Golden Sands Resource Conservation & Development Council, Stevens Point

Volunteer Individual Category Winners

John Eron, Stevens Point

Margaret Smith, River Falls

Georgia Gomez-Ibanez, Cambridge

John Moyles, Menasha

WHO TO CONTACT

General questions on invasive species:
invasive.species@wisconsin.gov

Wisconsin's Invasive Species Rule
tara.bergeson@wisconsin.gov

Terrestrial invasive plants:
Kelly Kearns – kelly.kearns@wi.gov or mary.bartkowiak@wisconsin.gov

Aquatic invasive species – find your local AIS coordinator:
https://dnr.wi.gov/lakes/invasives/Contacts.aspx?role=AIS_RE_COORD

Forest insect or diseases – find your regional forest health specialist:
https://dnr.wi.gov/topic/ForestHealth/staff.html

HOW YOU CAN HELP

Found an invasive species that may be new to your area? Send photos and details of its location, abundance and habitat to: *Invasive.Species@wi.gov*

Reporting an aquatic invasive species? Check out this page:
https://dnr.wi.gov/topic/Invasives/report.html

Want to work with others on invasive species in your area? Join your local Cooperative Invasive Species Management Area (CISMA):
https://ipaw.org/the-solution/education/cismas/

Want to control specific invasive species on your land? You can find more information at these sites:
https://dnr.wi.gov; https://dnr.wi.gov/topic/Invasives/control.html; https://mipncontroldatabase.wisc.edu/

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