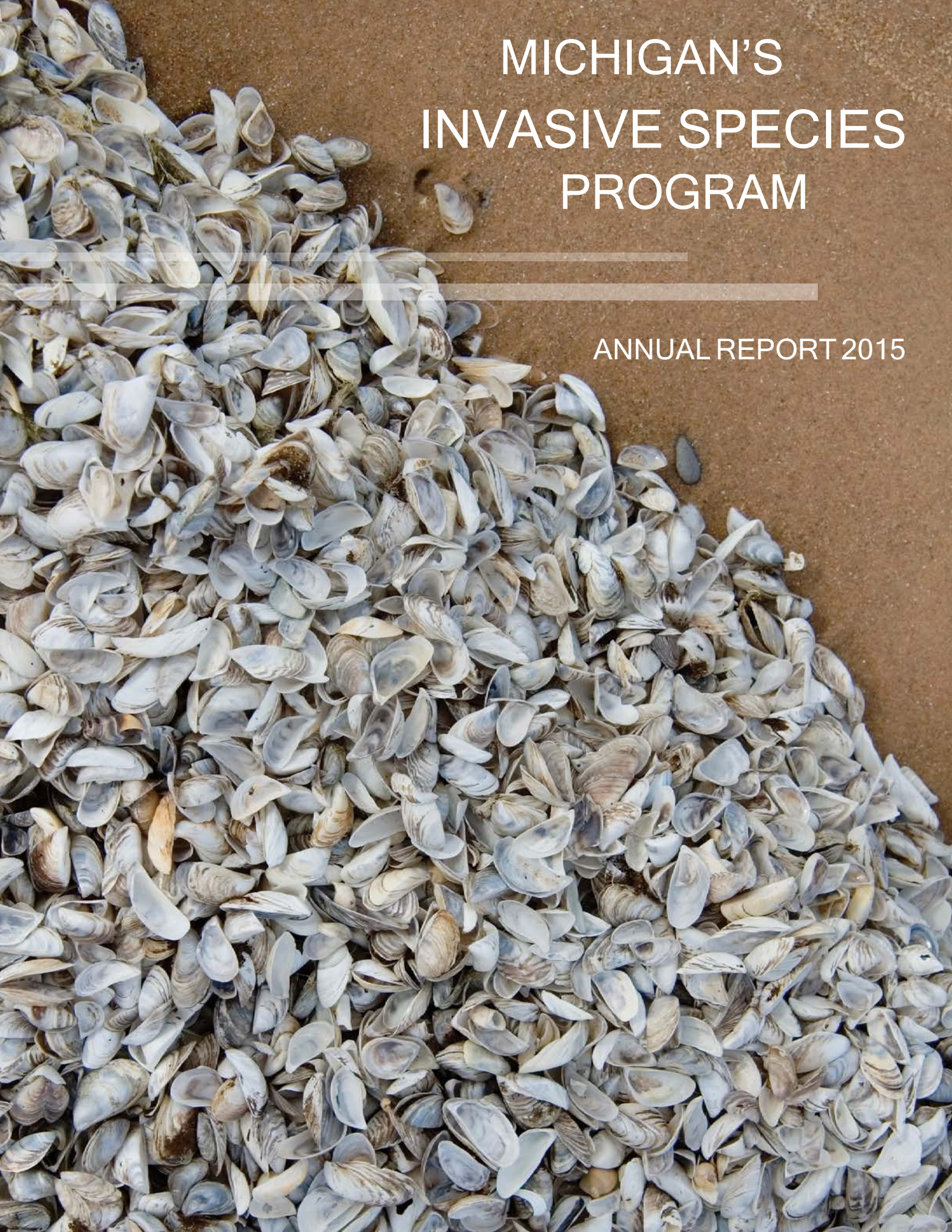
MICHIGAN'S INVASIVE SPECIES PROGRAM

ANNUAL REPORT 2015



Department of Natural Resources Michigan

Michigan Department of Agriculture & Rural Development

DEQ

Preface

Michigan's Invasive Species Program is a joint effort of Michigan's Quality of Life Departments: Agriculture and Rural Development (DARD), Environmental Quality (DEQ), and Natural Resources (DNR). The departments are pleased to submit the 2015 annual report to the governor, legislature, and citizens of Michigan. The first chapters provide an overview of the program including goals, outcomes and partnerships as well as progress in the Michigan Invasive Species Grant Program, followed by key accomplishments in the areas of prevention, management and outreach activities and the status of prohibited and restricted species in Michigan.

This report is also produced and submitted by the DNR in compliance with Michigan's Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, MCL 324.41323. The report summarizes the prevention and management activities undertaken to reduce the impacts of invasive species on Michigan's woods, waters, wildlife and recreational resources.

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Invasive Species Program Overview

Michigan's ecosystems are experiencing significant negative effects from invasive species that are already present, and the state's land and water resources are continually at risk for new invasions. Invasive species threaten not only the ecology of the state's land and water resources, but also economic and public health conditions. Invasive species may compete with native species for food and habitat, and can directly or indirectly harm or displace native species, degrade habitat and alter food webs. Invasive species can also have significant economic effects on property values, tourism, recreation, utilities and industry.

Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, Part 413 outlines the roles and responsibilities of state departments in relation to prohibiting and restricting invasive species. In 2014, Michigan's governor and legislature designated $5 million in ongoing funding, beginning in fiscal year 2015, to combat invasive species. This support initiated Michigan's Invasive Species Program.

The state of Michigan defines "invasive species" as those that are not native and whose introduction causes harm, or is likely to cause harm to Michigan's economy, environment, or human health.

Michigan's Invasive Species Program is a joint effort of Michigan's Quality of Life Departments: Agriculture and Rural Development, Environmental Quality, and Natural Resources. The departments share responsibility for invasive species policy, legislation, regulation, education, monitoring, assessment, management and control.

The Quality of Life Invasive Species Steering Committee (Appendix A) coordinates and guides the efforts of the Aquatic Invasive Species (AIS) and Terrestrial Invasive Species (TIS) Core Teams in alignment with the priorities of the administration and the department directors. The AIS and TIS Core Teams ensure cohesive programs through internal and external communication and collaboration. The AIS and TIS Core Teams develop projects and make recommendations to the Invasive Species Steering Committee based on AIS and TIS priorities. The AIS Core Team updates and implements Michigan's Aquatic Invasive Species State Management Plan through both internal and collaborative activities and projects. The TIS Core Team is developing a Terrestrial Invasive Species State Management Plan that will guide efforts in prevention, detection and control in collaboration with local, state and federal partners.

Timeframe

This report covers the activities of fiscal year 2015: October 1, 2014 through September 30, 2015.

Goals

As defined by the Invasive Species Program Charter approved in January, 2015, the program has four goals.

- Prevent new invasive species introduction into Michigan.
- Limit the dispersal of established invasive species populations throughout Michigan.
- Develop a statewide interagency invasive species Early Detection and Response Program to address new invasions.
- Manage and control invasive species to minimize harmful environmental, economic, and public health effects resulting from established populations.

Leadership and Guidance

The Invasive Species Steering Committee and Core Teams provide leadership and guidance for statewide efforts to prevent, detect and control invasive species. The program's first year focused on developing the foundation for this unique inter-departmental program and developing and implementing a process for the invasive species grants program to support the efforts of citizens and project partners.

- Michigan's Invasive Species Program was formalized by establishing a charter agreement within DARD, DEQ, and DNR in order to accomplish Invasive Species Program goals, ensure coordinated state efforts, and solicit input from industries, nongovernmental organizations, and universities. The Invasive Species Program Charter was signed by the Department Directors in January, 2015.

- The Michigan Invasive Species Grant Program was established in 2014 and funded its first year of grants, supporting 19 projects to prevent, detect, eradicate and control terrestrial and aquatic invasive species throughout the state.

- AIS and TIS Core Teams updated the Invasive Species Watch List to signal urgency in reporting species that pose immediate and significant threats to Michigan's natural resources. These species either have never been confirmed in the wild in Michigan or are known to be in limited areas only. Early detection and timely reporting of watch list species can limit potential ecological, social and economic impacts.

- Drafted the first ever Michigan Terrestrial Invasive Species State Management Plan. The plan will be available for public review in spring, 2016 and completion in the same year.

- A new invasive species website, www.michigan.gov/invasivespecies launched in January, 2016, serves as a single portal for invasive species and captures all information from the Quality of Life departments. The user-friendly format is designed to help citizens understand the state's invasive species laws and help in efforts to prevent, detect and control these invaders.

Projected Outcomes

The following specific outcomes were established to direct the use of state funding for the Michigan Invasive Species Program.

- Establishing Cooperative Invasive Species Management Areas to ensure statewide coverage
- Responding to 90 early detection sites
- Providing outreach to 750,000 citizens to enlist them in detecting and responding to emerging invasive species before they become established
- Managing and controlling 6,000 acres for terrestrial and aquatic invasive species

Tremendous progress toward these outcomes was achieved in 2015 through the Michigan Invasive Species Grant Program (MISGP) and Quality of Life (QOL) department activities (Table 1). At all levels, these projects and programs have been leveraged by federal, state and local funds and partnerships. Through the support provided by this collaboration, the program exceeded most of these outcomes for 2015.

Table 1- Michigan's Invasive Species Program Outcomes For 2015

Michigan Invasive Species Program Outcomes	Projected Outcome	MISGP Accomplished	MISGP and QOL Accomplished	Percent Accomplished
Amount of CISMA Coverage (counties)	83	64	64	77%
Early Detection Responses (sites)	90	326	355	394%
Citizen Outreach Contacts	750,000	586,272	1,495,800	199%
Control and Management (acres)	6,000	2,154	8,369	139%

Partnerships

Michigan's Invasive Species Program is a statewide effort of collaboration between Quality of Life departments, other state and tribal agencies, local conservation leaders, federal agencies, educational institutions, business, industry and an engaged citizenry. The strides made toward preventing, detecting and controlling invasive species across Michigan can be attributed largely to dedication of these important partners.

Local Partnerships

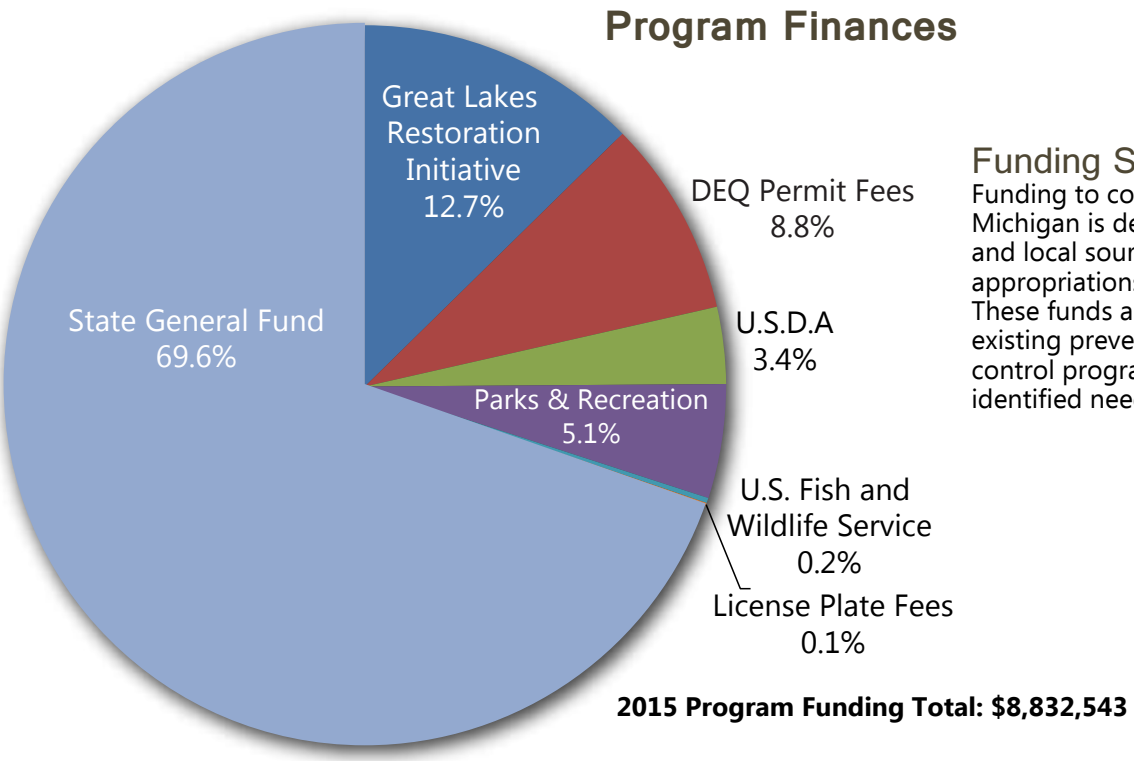
- Michigan's conservation districts, stewardship network clusters, county governments, resource conservation and development councils, their volunteers, and many other local entities provide leadership in managing, preventing and raising awareness about invasive species in communities throughout the state.

State and Federal Partnerships

- The U. S. Fish and Wildlife Service, USDA Wildlife Service, the U. S. Forest Service, the Nature Conservancy, the Great Lakes Indian Fish and Wildlife Commission, the University of Michigan – Flint, Michigan State University and Lake Superior State University have provided leadership and support for several important invasive species control and prevention projects in Michigan.
- Year-round outreach activities provided by the DNR's Marketing and Outreach and Parks and Recreation Divisions and the DEQ's Water Resources Division raised public of awareness about invasive species and what can be done to prevent them.
- MDARD's Pesticide and Plant Pest Management and DNR's Forest Resource Division continue to collaborate in combatting forest pests, including oak wilt, emerald ash borer, hemlock woolly adelgid and beech bark disease.
- The Michigan Department of Transportation participates in both the Aquatic and Terrestrial Invasive Species Core Teams and continues to develop innovations in managing invasive phragmites along state roadways.
- The Office of the Great Lakes participates in the Aquatic Invasive Species Core Team and provides support through its Coastal Zone and Great Lakes Area of Concern programs for detection and control of invasive species with the goal of restoring important recreational and natural areas.
- The DNR's Parks and Recreation Division, with help from hundreds of volunteers and conservation-minded organizations, conducts invasive species management activities on thousands of acres of parkland throughout the state.

Participation in Statewide, Regional and National Groups

- Michigan DNR staff participated in the Asian Carp Regional Coordinating Committee, Great Lakes Basin environmental DNA (eDNA) coordination, the Chicago Area Waterways Advisory Committee, and the Great Lakes Mississippi River Interbasin Separation Study Executive Steering Committee. These collaborations ensure continued operation of existing short-term preventative and response measures in the Illinois River and Chicago Area Waterway System by supporting active and collaborative monitoring of Asian carp in Michigan waters using eDNA and other tools, and working toward both near-term and long-term solutions to prevent the introduction of Asian carp into the Great Lakes.
- The Conference of the Great Lakes and St Lawrence Governors and Premiers AIS Task Force is charged with stopping the further introduction and spread of AIS into the Great Lakes and St. Lawrence River by leveraging ongoing state and provincial efforts to combat AIS and working to foster increased regional coordination. In 2015, Michigan, Ohio and Ontario initiated a pilot project to harmonize approaches to address AIS and foster further cooperation among their three jurisdictions. The Task Force is currently co-chaired by the Michigan DNR and Illinois DNR.
- The Great Lakes Panel on Aquatic Nuisance Species is a binational body composed of representatives from government, business and industry, universities, citizen environmental groups and the larger user community, that provides guidance on aquatic invasive species research initiatives, policy development and informational programs. Michigan staff actively participated in collaborative efforts in 2015, and DEQ Water Resources Division staff currently serves on the Executive Committee.
- DNR Law Enforcement Division, Great Lakes Enforcement Unit, conducted training for conservation officers with the Great Lakes Indian Fish and Wildlife Commission including officers from Michigan, Wisconsin, and Minnesota. The training included state and tribal commercial fishing, aquatic invasive species laws and enforcement efforts in Michigan, fish hauler identification, the minnow industry, and aquatic invasive species education and identification.
- The DNR Law Enforcement Division participates in the Great Lakes Fishery Commission Law Enforcement Committee. In 2015, staff provided and received training in bait industry topics and exchanged intelligence regarding the movement of invasive species through the bait industry. AIS identification training was also provided by DNR Fisheries Division and University of Michigan faculty. AIS case studies included the DNR pacific herring viral hemorrhagic septicemia investigation.
- Michigan is collaborating with the other Great Lakes States, the Nature Conservancy, and a suite of research experts to develop a basin-wide early detection surveillance plan along with a companion response plan as part of a Great Lakes Restoration Initiative-funded project through the DEQ. In addition, in 2015 the group completed a table top exercise to gain a better understanding of interstate response issues.
- DARD staff provide state representation on the Central Plant Board and National Plant Board which harmonize plant health programs, policies and methods and collaborate to communicate effectively with public and private agencies and organizations regarding plant health and regulatory issues affecting states, inter-state and international commerce.
- DEQ Water Resources Division staff continues to participate in the Great Lakes Ballast Water Collaborative, which brings together industry, and state and federal regulators, and researchers, as well as the Great Commission's Ballast Water Task Force, where state and provincial representatives work to advance future ballast water management regimes.



Funding Sources

Funding to combat invasive species in Michigan is derived from federal, state and local sources in the form of grants, appropriations and matching funds. These funds are used to supplement existing prevention, detection and control programs or to meet newly identified needs.

Figure 1-
2015 Invasive Species Program Funding by Source

State Funds

- $3.6 million in ongoing, state general fund dollars was appropriated to fund the invasive species grant program in the 2015 fiscal year.
- $1.55 million in ongoing state general fund dollars was appropriated to provide programming and staffing in support of invasive species prevention, detection, response, management and control.
- Funds derived from ballast water and aquatic nuisance control permit fees provided $777,400 in support for DEQ permitting programs.
- Water Quality License Plate fundraising via the Secretary of State contributed $12,700 to protect Michigan's waters from aquatic invasive species by supporting volunteer monitoring programs.
- A special one-time appropriation of $1 million was provided to the DNR for aquatic invasive species actions, particularly toward response.

Federal Funds

- $1,117,470 in grants from the U.S. Fish and Wildlife Service via the Great Lakes Restoration Initiative (GLRI) and other programs helped to implement Michigan's Aquatic Invasive Species State Management Plan. These grants are administered through the DEQ and support short- term projects in the DEQ, DNR, and DARD in cooperation with other partners. A number of accomplishments included in this report are supported by grants initiated in 2012, 2013, and 2014 to support aquatic invasive species prevention and early detection and response activities and to develop a Great Lakes interstate surveillance and response plan.
- $20,025 in additional funding for aquatic invasive species projects came from the U. S. Fish and Wildlife Service (USFWS) to support education and outreach programs to prevent aquatic invasive species introductions via recreational boating and angling pathways.
- $304,050 from the U. S. Forest Service (USFS), United States Department of Agriculture-Wildlife Services (USDA-WS) and USDA Animal and Plant Health Inspection Service (USDA-APHIS) Farm Bill funds assisted in combatting terrestrial invasive species.

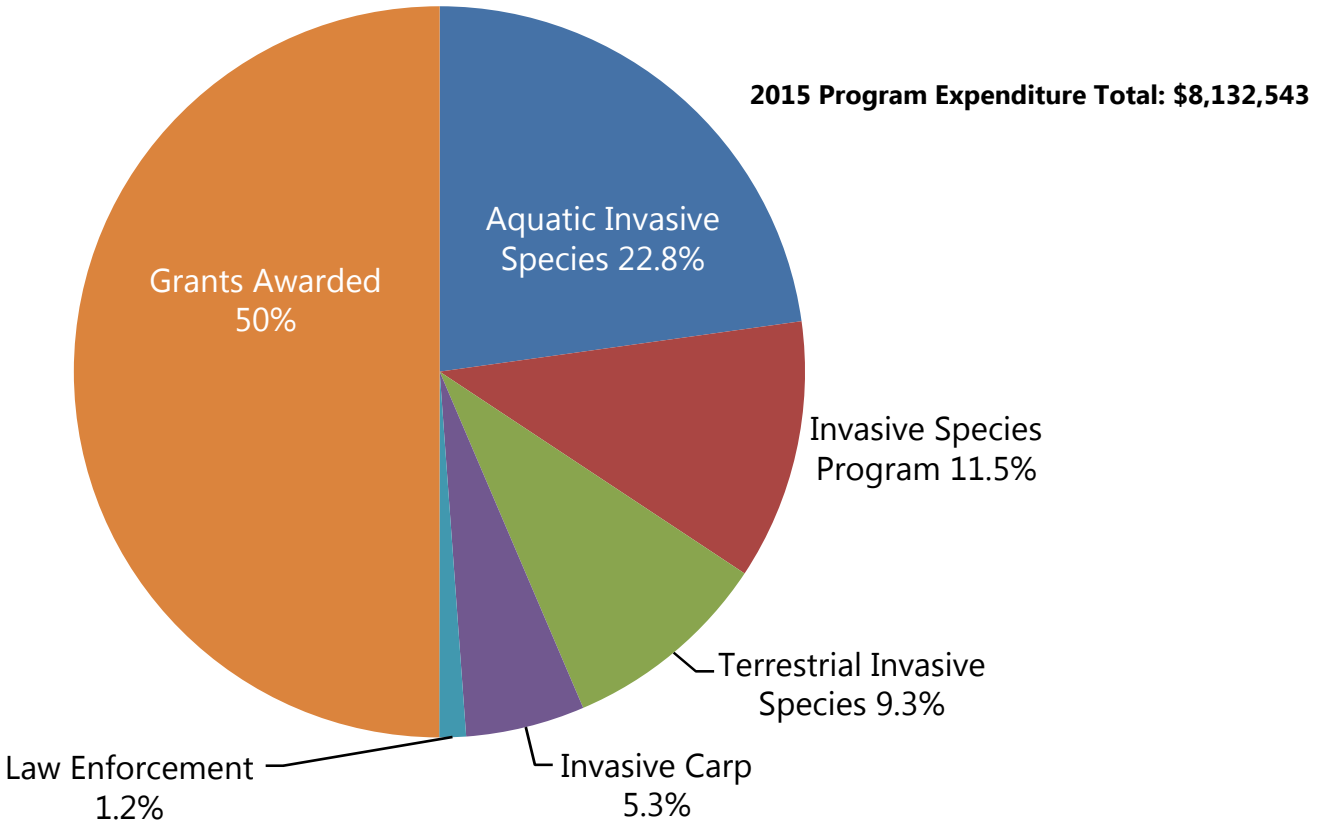
Local Funds

- In addition to the sources identified in the program funding chart above, over $2 million in local and federal match was raised by grantees of the Michigan Invasive Species Grant Program to complement the more than $4 million awarded through the grant program.
- Though actual amounts are not available, it is important to recognize the costs incurred by individual land owners and local groups managing invasive species. For example, aquatic plant management in inland lakes and other waters is routinely funded by land owners through individual collection or self-imposed special property tax assessments. Approximately $24 million (estimate from 2011) is spent annually in Michigan on the chemical control of aquatic plants like Eurasian water milfoil.

Expenditures

Figure 2 below provides a broad look at spending by major program area and includes programs and projects undertaken by the departments of Agriculture and Rural Development, Environmental Quality and Natural Resources.

Figure 2 -
2015 Invasive Species Program Expenditures by Major Program Area



- A total of $4,064,700, representing 50% of program expenditures, was awarded through the Michigan Invasive Species Grant Program (MISGP) to support 19 local projects designed to detect, eradicate and control terrestrial and aquatic species.
- Just under $2 million or 23% of overall program expenditures supported state-level efforts to prevent, detect and control aquatic invasive species in the Great Lakes and inland waters and to coordinate regional programs.
- Invasive species program expenses of 12% include management and support staff for the MISGP, training and equipment for decontaminating gear and vehicles to prevent the spread of invasive species, and in the protection, control and outreach activities expressed in this report.
- Measures to prevent the introduction and spread of terrestrial invasive species including forest pests and diseases and to control invasive species in state parks represent 9% of annual expenditures.
- Invasive carp readiness training, detection efforts and planning account for 5% of program expenses.
- Equipment and training to assist law enforcement officers in preventing the importation of invasive species to Michigan represent 1% of program expenses.

Michigan Invasive Species Grant Program

The purpose of the Michigan Invasive Species Grant Program (MISGP) is to provide funding and technical assistance to prevent, detect, eradicate, and control terrestrial and aquatic invasive species. The program – a joint effort of the Michigan departments of Natural Resources, Environmental Quality and Agriculture and Rural Development – is part of a statewide initiative launched in 2014 to help prevent and control invasive species in Michigan.

- The DNR began accepting grant applications for the first year of the grant program in October 2014. The department received 68 applications, totaling more than $15 million in proposals. Grant applicants were asked to commit to provide at least 10 percent of the total project cost in the form of a local match.
- Applicants – including a variety of conservation districts, local governments, non-profit organizations and universities – were encouraged to submit projects that demonstrated regional collaboration; directly addressed the prevention, detection, eradication or control of priority invasive species; and would result in large ecological benefits with regional and statewide implications.
- The 2014 MISGP cycle funded 19 projects across the state that will assist in efforts to detect, eradicate and control terrestrial and aquatic species. A total of $4,064,700 was awarded for these two-year projects.
- The 2015 MISGP request for proposals was issued in June and received 55 pre-proposals for projects in six focus areas. Of these, 30 were invited to complete and submit full proposals by October 30, 2015. Grant funds in the amount of $3.6 million will be allocated to selected projects in early 2016.

Accomplishments

2014 Cycle

- Regional cooperative prevention, detection, eradication and control projects: 12 projects funded for $2,604,400
- Integrated and novel approaches towards treating Eurasian watermilfoil and other aquatic invasive species: 3 projects funded for $765,600
- Reduction of forest disease incidence and transfer: one project funded for $138,500
- Prevention of new forest invaders: one project funded for $204,000
- Enhancing public reporting, species identification and documentation of treatment histories for invasive species: one project funded for $290,200
- Other projects – one project funded for $62,000 (MUCC Invasive Species Public Awareness Project)

2015 Cycle

- The QOL Invasive Species team hosted four workshops to announce the 2015 Michigan Invasive Species Grant Program. Venues in Mackinaw City, Munising, Hastings and Detroit drew 150 prospective grantees.
- Award announcements are anticipated in February, 2016.

Prevention

The most effective strategy against invasive species is to prevent their introduction. Prevention intervenes before resources are damaged - before there is a need for detection or costly treatments to eradicate or control the invasive organism. Prevention involves blocking the pathways by which invasive species enter the state or its waters, demonstrating practices that reduce the potential for introduction and monitoring the effectiveness of preventative measures.

Preventing Invasive Carp in Michigan Waters

- In fall, 2015, DNR Fisheries Division partnered with commercial fishers to conduct 20 targeted seine hauls to capture and remove grass carp in Michigan waters of Lake Erie. Though the sites were historic grass carp capture locations, no grass carp were collected.
- DNR collected and processed 33 water samples from Michigan waters of Lake Erie to determine presence of grass carp. No samples contained any grass carp environmental DNA (eDNA).
- The Michigan DNR collaborated with the Illinois Department of Natural Resources on an invasive carp control exercise on the Illinois River in 2015. The mock exercise provided 16 DNR staff with experience in identification and capture techniques for bighead and silver carp. The most effective seine haul during the exercise removed approximately 50,000 lbs. of invasive carp.
- DNR Fisheries Division responded to a positive eDNA detection for silver carp in the Kalamazoo River in October 2014 by increasing presence at local boat access sites, publishing a press release and holding media interviews to raise public awareness of the issue. Follow-up eDNA sampling on the entire stretch of the Kalamazoo River showed no positive results. Staff time for the response was supported by a 2013 GLRI grant.
- DNR Law Enforcement Division and the U.S. Fish and Wildlife Service (USFWS) collaborated to inspect and test for invasive carp eDNA at retail bait shops in July of 2015. A mobile lab provided by USFWS tested samples collected from 14 shops in southeast Michigan. All tested negative for big head and silver carp eDNA.

Prevention through Decontamination
Invasive species often spread to new areas when seeds or organisms become attached to vehicles, equipment, gear and clothing and are transported through human movement. Decontamination, or checking and removing dirt, debris and foreign objects from transported items, can help to reduce the movement of invasive species.

- A new interdepartmental DEQ, DNR, and DARD policy was implemented in 2015 and initiated training for staff on decontamination procedures for clothing, equipment and vehicles in order to prevent the spread of invasive species.
- The 2015 Landing Blitz, messaging "Clean, Drain, Dry," to boaters in order to prevent transportation of aquatic invasive species, involved over 150 volunteers working at 53 boating access sites across the state. Over 300 boats were cleaned, and approximately 4,000 citizens were reached.
- DNR Fisheries Division worked with Anglers of the Au Sable to construct and install wader wash stations at seven locations to prevent the spread of aquatic invasive species, including invasive mussels, snails and didymo, to Michigan's trout streams.
- The DEQ Water Resources Division distributed over 50 "Clean, Drain, Dry, Dispose" signs to partners for use at boating access sites to inform boaters and anglers of recommended and required actions to prevent the spread of aquatic invasive species. Since 2011, 2,500 signs have been delivered.
- The Quality of Life Invasive Species team has provided invasive species prevention, identification and reporting training for over 100 loggers through a partnership with the Michigan Forest Products Council and the Sustainable Forestry Initiative.

Prevention through Compliance Measures
State departments undertake several activities to assure compliance with invasive species laws and, whenever possible, prevent violations of these laws.

- Michigan's Office of the Great Lakes continues to operate a ballast water reporting program in accordance with state law. Ocean-going and non-ocean-going vessels are required to report compliance with best management practices to prevent the introduction of AIS. A total of 171 vessels reported compliance with best management practices in the 2015 report.
- Michigan Department of Agriculture and Rural Development (MDARD) staff continues to renew and issue intra-state compliance agreements as necessary. MDARD maintains approximately 125 compliance agreements with receivers, brokers and shippers, a majority of which move regulated materials into or within the Upper Peninsula.
- MDARD staff continues to conduct compliance inspections with emerald ash borer compliance agreement holders and write phytosanitary certificates for ash logs and lumber being shipped internationally. The movement of any article regulated by the emerald ash borer quarantine from the Lower Peninsula to the Upper Peninsula continues to be prohibited, except with a current and valid Compliance Agreement.
- MDARD staff inspected 1,063 plant dealers and 1,244 plant growers and maintains regular communication with the nursery industry to assure awareness of and compliance with state and inter-state quarantines.
- The MDEQ Water Resources Division continues to implement a permitting program for ocean-going vessels conducting port operations or ballast water discharges in Michigan waters pursuant to Section 324.3112 of the NREPA. In FY15, 16 Certificates of Coverage were issued to vessels calling on Michigan ports certifying no discharge of ballast water. No vessels indicated treatment on-board; therefore, they are not authorized to discharge untreated ballast water. There are currently 157 Certificates of Coverage in effect. A total of 326 vessels

and/or permittees have been issued Certificates of Coverage since the Water Resources Division started regulating ocean-going vessels in 2007.

- An investigation of viral hemorrhagic septicemia by DNR Law Enforcement Division concluded with a successful prosecution in 2014 when an Oregon wholesale company pled guilty to shipping non-certified pacific herring to Michigan and paid a $2,000 fine. A verbal warning was issued to the retailer.
- Undercover purchase and random inspections led DNR Law Enforcement Division to seize red swamp crayfish, a prohibited species, from two retail fish markets selling to sport anglers for fishing bait in June 2015.

Detection, Control and Restoration

Once an invasive species has been positively identified in Michigan, management efforts begin with detecting the extent of the infestation. This information is used to determine the best course of action for control and whether containment and eventual eradication is possible. Depending on the species, infested area and other variables, control measures may include manual removal, chemical treatment, biocontrol or other options. Restoration efforts can range from allowing an affected area to return to its former state to taking measures to re-establish native habitat.

Detection

Early detection of new invasive species provides the opportunity to contain an infestation and potentially eliminate the problem before it worsens. Detection is also an important tool in prioritizing management actions for known invasions. The detection and response process used by Quality of Life staff and Cooperative Invasive Species Management Areas (CISMAs) begins with surveying and mapping affected areas. These data are used to prioritize sites and review treatment options. Whether or not a site is treated, it is monitored annually to determine if future action is needed.

- With funding from the Great Lakes Restoration Initiative, Quality of Life invasive species crews surveyed over 200 miles of coastline including Saginaw Bay, Lake St. Clair, Detroit River, and the entire Michigan coastline of Lake Erie in small, motorized boats. An additional 41 inland water bodies were surveyed by kayak. Crews logged photos and GPS points for each location where invasive species were identified.
- The DEQ Water Resources Division conducted inland lake surveys using intensive methods with snorkeling and comprehensive shoreline sampling. In addition, AIS sampling was integrated into routine lake sampling and wadeable stream and river surveys. In 2015, 24 inland lakes and 211 locations on wadeable streams and rivers across the state were surveyed.
- In 2015, CISMAs surveyed over 29,000 acres of upland, wetlands, lakes and shoreline, resulting in the detection and mapping of 2,900 new invasive species locations.
- All 20 Forestry Assistance Program (FAP) foresters in Michigan were trained in and provided tools for oak wilt identification and are now using these skills to assist private land owners in 49 counties. FAP-verified oak wilt sites are now included in the statewide oak wilt database, increasing awareness about the extent of the problem and assisting in prioritization of treatment areas.
- The Midwest Invasive Species Information Network's free mobile phone app allows users to upload GPS locations and photographs of invasive species found in Michigan. The MISIN app also provides species identification and distribution information including tutorials to help users correctly and easily identify species.
- The identification and proper reporting of hemlock woolly adelgid at several locations by private sector arborists and landscapers in 2015 indicates the level of success in outreach efforts focused on identification, detection and reporting.
- The DEQ Water Resources Division continued to provide financial and technical support to Michigan State University for the Michigan Clean Water Corps Exotic Aquatic Plant Watch volunteer monitoring program for inland lakes. A total of 32 lakes were enrolled in the program during 2015. Michigan State University staff delivered AIS outreach messaging and training on species identification and program protocols to several of the program participants.

Control and Restoration

Control and restoration efforts are costly and labor intensive. State and grant-funded control projects utilize full-time and summer staff, volunteers and contractors to accomplish this work. Federal and state grant funds are also supporting potential new approaches to controlling aquatic invasive species.

- Quality of Life invasive species crews undertook 24 treatments including hand-removal of yellow floating heart, European frogbit, water lettuce and water hyacinth and large-scale herbicide treatments for frogbit and flowering rush. Follow-up monitoring and any necessary treatment will be conducted on all 24 sites in subsequent years to determine whether these species can be deemed "eradicated" from these locations.
- Existing Cooperative Invasive Species Management Areas (CISMAs) used MISGP funds to treat invasive species located in previous years' surveys. Their work included extensive treatment of phragmites along the Great Lakes in the Upper Peninsula and Northern Lower Peninsula.
- State support has doubled, and in some cases, tripled CISMAs' capacity to respond to new detections of invasive species. In 2015, CISMAs conducted 386 responses to citizen reports and completed more than 2,100 acres of treatment.
- State Park staff, with the support of partners including the Environmental Protection Agency, U.S. Fish and Wildlife Service, Pheasants Forever, Friends of the Detroit River, Huron Pines Resource Conservation and Development Council and citizen volunteers, hand-removed or chemically treated over 4,800 acres of invasive plants from locations across the state during 110 work days in 2015.

- Yellow floating heart, a state prohibited species, was identified and reported by a citizen through the Midwest Invasive Species Information Network (MISIN). After verifying the first known presence of this invasive aquatic plant in Michigan, DNR staff removed it from a garden pond on a campus of the University of Michigan. Annual monitoring will assure that this eradication effort has been successful.
- MDARD staff carried out treatment of infested hemlocks on sites in Muskegon and Ottawa counties where hemlock woolly adelgid has been detected.
- The DEQ Water Resources Division implements a permitting program for application of chemicals to waters of the state for purposes of aquatic nuisance control. In fiscal year 2015, Aquatic Nuisance Control Program staff issued 1,630 permits, 970 certificates of coverage, and 67 amendments under Part 33, Aquatic Nuisance Control, of the NREPA. Eurasian watermilfoil and starry stonewort are examples of aquatic invasive plants being managed. Approximately 30% of the permits and 45% of the certificates of coverage were issued as 3-year permits, which is a new permit duration option allowed by 2014 statutory revisions.
- A team effort led by Central Michigan University is using MISGP funds to evaluate the effectiveness of current treatment methods for aquatic invasive plants including Eurasian watermilfoil and starry stonewort and testing alternative control methods.
- The DEQ Water Resources Division initiated a Great Lakes Restoration Initiative-supported project with Lake Superior State University to investigate the efficacy of a new fungal biocontrol for Eurasian water milfoil.
- A pilot application of Zequanox, a biopesticide used for zebra and quagga mussel control, was conducted in November, 2014 to test an application strategy along the western shore of Lake Erie in order to guide future development of invasive mussel control strategies. This project was executed via a partnership between the DEQ, DNR, U. S. Geological Survey, Marrone Bio Innovations, and PLM Lake and Land Management Corp. The team was successful at setting up an enclosure at the study site and applying a layer of Zequanox to the lake bottom; however, mixing occurred after a few hours and concentrations were not maintained for the full targeted time period.

Education and Public Awareness

Invasive species education serves to raise awareness of the problem, encourage the adoption of prevention measures and enlist public assistance in detecting, reporting and controlling invasive species. Efforts are targeted at multiple sectors including recreational users, land managers, natural resource-based industries and others whose actions can positively or negatively affect the future of invasive species in Michigan.

Informational Materials

- RIPPLE, a campaign to Reduce Invasive Pet and PLant Escapes by promoting proper containment and disposal of potentially invasive organisms, was launched by MDARD with assistance from Michigan State University and funding from the Great Lakes Restoration Initiative. The campaign includes materials for use by aquarium and pond retailers and hobbyists.
- MDARD developed Forest Pest Alert flyers and rack cards for oak wilt, beech bark disease, thousand cankers disease, hemlock woolly adelgid, balsam woolly adelgid and Asian longhorned beetle and utilized a new distribution and tracking system to deliver these to public venues throughout the state.
- MDARD developed new Asian longhorned beetle display kits for use at state visitor centers, conferences and trade shows. Kits include trees that show symptoms of infestation, large models of the beetle to aid in identification and Forest Pest Alert cards.
- The Quality of Life Invasive Species team distributed over 1,500 key chains, 1,500 can coozies, 2,000 towels, 300 boat trailer stickers and 200 "Stop Aquatic Hitchhikers" signs at various events, conferences, workshops and through DEQ's boat wash partnership project and the AIS Landing Blitz.

Media

- A state media blitz for "August is Tree Check Month" provided information on the Asian Longhorned Beetle that reached over 200,000 citizens via Twitter and Facebook. None of the nearly 100 responses requesting identification confirmation resulted in the positive detection of Asian longhorned beetle.
- Through an MISGP grant, Michigan United Conservation Clubs is reaching thousands of hunters and recreationalists by including invasive species features in each issue of their Michigan Out-of-Doors magazine and in monthly blogs.
- The DNR hired Issue Media Group to develop a monthly editorial series demonstrating the impact of invasive species on Michigan's economy, ecology, and quality of life. The first five stories in this series have been read by at least 7,600 people and shared on social media 2,300 times.
- To keep citizens updated on high priority invasive species issues and to encourage best practices in invasive species prevention and control, the Quality of Life departments issued 25 press releases in 2015. A full list is included in Appendix C.

Online Access

- The Michigan Invasive Species Information Network, MISIN, is an online tool and app that helps citizens correctly identify and report invasive species. In 2015, 2,469 users enrolled in MISIN. Users generated 58,320 invasive species reports for locations throughout Michigan. MISIN provides maps by county or by species indicating where invasive species have been reported. This aids in the planning, treatment and assessment of invasive species by CISMAs and other organizations.
- The new state invasive species website, www.michigan.gov/invasivespecies, brings together information about invasive species laws, department contacts, best management practices and educational resources to aid citizens, organizations and industry in maintaining compliance with state and federal regulations.

Educational Programs

- Through over 2,000 programs at visitor centers and state parks, the DNR has provided information about invasive species to nearly 48,000 visitors.
- CISMA outreach has included over 400 events throughout the state where citizens and youth heard consistent and accurate messaging and calls to action about invasive species.
- MDARD and DNR are collaborating with the Arborist Society of Michigan's Oak Wilt Coalition in an effort to unify and spread the message about "do not prune" dates to prevent the spread of oak wilt. The coalition is building to include other state agencies, utility companies and utility and road maintenance workers.
- Quality of Life staff participated in 113 training and outreach events, providing information on identifying and reporting invasive species to over 2,000 citizens.
- DNR Law Enforcement Division's Great Lakes Enforcement Unit provided education on aquatic invasive species to the Michigan Charter Boat Association meeting in Holland.
- DNR Law Enforcement Division provided aquatic invasive species identification training using invasive carp specimens to natural resources law enforcement students at Ferris State University.
- The Quality of Life AIS Core Team's outreach display booth was deployed at 13 events during 2015, providing information on invasive species reporting and "Clean, Drain, Dry" to approximately 1,600 citizens.

Volunteer Engagement

- During 2015, the DEQ Water Resources Division's mobile boat wash project, in collaboration with Michigan State University and the U.S. Forest Service, delivered AIS outreach messaging to boaters on 35 occasions at 27 locations for a total of 1,037 impressions with boaters and 177 boats washed. AIS education and outreach was conducted at 4 additional events, accounting for another 418 impressions.
- Michigan State University's "Eyes on the Forest" project, supported by MISGP funds, has begun to recruit and train citizen volunteers to monitor "sentinel trees" at locations throughout Michigan. Sentinel trees will act as indicators of new forest invasive pests and diseases.
- Sixteen people completed the "train the trainer" course for the Clean Boats-Clean Waters campaign, which has also created a new, Michigan-focused website and approximately 5,000 informational brochures.

Michigan's Prohibited, Restricted and Other Problematic Species

Currently, Michigan laws limit the import, sale and possession of 55 prohibited and restricted species including plants, animals, fish, mollusks and crayfish. A current list is provided in Appendix B at the end of this report. If a species is prohibited or restricted, it is unlawful to possess, introduce, import, sell or offer that species for sale as a live organism, except with a valid permit.

Michigan's Natural Resources Commission, in consultation with the Department of Agriculture and Rural Development, or the Commission of Agriculture and Rural Development, in consultation with the Department of Natural Resources may add to the list of prohibited and restricted species.

The term "prohibited" is used for species that are not widely distributed in the state. Often, management or control techniques for prohibited species are not available. The term "restricted" is applied to species that are established in the state. Management and control practices are usually available for restricted species.

Additions or Deletions to Michigan's Prohibited and Restricted Species Lists

In 2013, the Council of Great Lakes Governors and the Premiers of Ontario and Quebec established a list of "Least Wanted" Aquatic Invasive Species. The DNR recommended adding the invasive species on the "Least Wanted" list to Part 413 as prohibited species, if not already listed.

In January, 2015, the Commission of Agriculture and Rural Development, in consultation with the Department of Natural Resources, determined that water soldier (Stratiotes aloides) be classified as a prohibited species in Michigan, in concordance with the criteria listed in MCL 324.41302(3)(a) and with the "Least Wanted" list.

Status of Michigan's Prohibited, Restricted and Other Problematic Species

There are several primary species of concern for Michigan that are currently listed as prohibited or restricted (Appendix B). The current distribution in Michigan, based on best available knowledge, is provided for each listed species. This coarse-scale distribution is intended to provide a basic snapshot of where each species exists along the invasion curve. Some of these species are not yet known to be present within the state, while others have been present in certain parts of the state for decades, causing significant ongoing management and control costs. In cases where distribution is listed as absent, this may mean a particular species is truly not present at all in Michigan or that no confirmed detections have been made.

Detection and/or specific management actions occurred in 2015 for the prohibited, restricted or other problematic species listed below.

Didymo (Rock Snot)

- Bloom conditions of Didymo (a nuisance algae) were identified the St. Mary's River in 2015.
- The cause of Didymo blooms is not well understood. The DEQ in cooperation with experts at Lake Superior State University and the University of Wisconsin are developing monitoring plans to better delineate, characterize, and understand this new infestation and the risk posed to nearby waters.
- Similar to the response to New Zealand mudsnails, educational efforts are critical to encourage identification and reporting of Didymo and to encourage recreational users to clean gear and equipment to limit the spread of aquatic invasive species.

Emerald Ash Borer
Since its identification in 2002, the emerald ash borer (EAB) has killed untold millions of ash trees in Michigan and surrounding states. The DNR and MDARD have conducted EAB work in conjunction with a federally funded EAB response project, initiating the following actions:

- Michigan's EAB Interior State Quarantine was last revised on January 7, 2014.
- MDARD staff renews and issues intra-state compliance agreements (CAs) as necessary. A CA is a written agreement between a person moving or receiving regulated articles and MDARD. MDARD maintains approximately 120 CAs with receivers, brokers and shippers and conduct compliance agreement inspections with CA holders.
- MDARD staff writes phytosanitary certificates for ash lumber being shipped internationally.
- USDA-APHIS conducted trapping at 142 sites in 2015 using a contractor. All non-quarantined counties of the UP were included in the survey. Survey results are expected to be announced in early 2016.

Recommendation for Emerald Ash Borer
Continued support of prevention, early detection and response, regulatory efforts and the release of biological organisms for the potential of long-term control is recommended.

Hemlock Woolly Adelgid (HWA)
In 2015, new infestations of hemlock woolly adelgid were identified in Muskegon and Ottawa Counties. In response to these findings, the MDARD and DNR, in cooperation with MSU and the U.S. Forest Service, are working to develop a comprehensive response strategy. The strategy elements include:

- Evaluation of the hemlock resource in the area of the infestations. This information will be used to develop a survey and treatment plan.
- Continuing survey efforts to delineate the extent of the infestations.
- Continuing insecticide treatment of infested and buffer trees.
- Outreach and education of key target audiences.
- External quarantine compliance monitoring.
- A robust data collection and management system.
- Development of the infrastructure that will be required for future biocontrol efforts should they become necessary.
- Collaboration with out-of-state, federal, and state partners, and HWA experts.
- Additional follow-up at HWA infestation sites in Michigan detected prior to 2015.
- Statewide monitoring and survey for HWA.
- Internal and external communication of response plans, activities and achievements.

New Zealand Mudsnail

- In 2015, New Zealand mudsnails were detected for the first time in Michigan in the Pere Marquette River near Baldwin.
- The DEQ and DNR, in cooperation with the U.S. Forest Service, responded to this finding by conducting sampling efforts through the fall to delineate the extent of the infestation. This information will be used to assess possible responses.
- Upon confirmation of New Zealand mudsnails in this popular river, outreach efforts were quickly initiated aimed at encouraging anglers and recreational users to learn how to identify and report New Zealand mudsnails and to take action to help stop the spread of invasive species. Wader wash stations were constructed and deployed at local fly fishing shops, signs were placed at highly visited access points, and staff provided presentations and information to stakeholders.

Yellow Floating Heart

- In 2015, yellow floating heart, a prohibited invasive aquatic plant, was reported and verified in a pond at the University of Michigan - Dearborn Environmental Study Area in Wayne County. This is the first record of the plant in Michigan.
- More than 1,000 pounds of yellow floating heart were manually removed from the pond and destroyed by DNR Wildlife Division staff as part of the state's Early Detection and Response program.
- Surveys were conducted in surrounding areas and waterways, where no further evidence of yellow floating heart was found. The isolation of the pond from other waterbodies is believed to have prevented the plant's spread.
- DNR staff will continue to monitor the pond and surrounding areas for the next few years to assure that the plant has been thoroughly eradicated from this location.
- The plant was detected by University of Michigan staff and identified and reported via MISIN.

Red Swamp Crayfish

- DNR Fisheries Division received a report that red swamp crayfish, a DNR prohibited species in Michigan, were being used as bait by anglers on Lake Macatawa. Fisheries Division, in collaboration with Michigan State University, responded by conducting an extensive trapping survey in Lake Macatawa and popular fishing locations on the Grand River. No red swamp crayfish were collected or observed.
- Response efforts also included posting signs at local fishing areas, contacting local partners and stakeholder groups, notifying statewide media outlets, collaborating with law enforcement to increase presence at fishing areas to increase awareness on the issue, and drafting a letter to notify industry about the new legislation.

Scientific Permits Issued in 2015 For Prohibited or Restricted Species

The issuance of permits for the possession of prohibited or restricted species is provided by NREPA Part 413 for the Department of Agriculture and Rural Development (for plants and insects) or the Department of Natural Resources (for fish or any other species) following an application and review process. In 2015, 50 permits were granted to partner agencies (USFWS, USGS, DEQ, etc.), universities and other entities (consulting firms, zoos, nature centers and other educational institutions).

Table 2- Prohibited and Restricted Species Permits Issued in 2015 by DARD and DNR

Species	Status	Number of Permits Issued	Permittees
Rusty crayfish	Restricted	15	9 universities, 2 partners, 4 other
Zebra mussels	Restricted	8	2 universities, 3 partners, 3 other
Quagga mussels	Restricted	6	5 universities, 1 other
Round gobies	Prohibited	14	5 universities, 3 partners, 6 other
Tubenose gobies	Prohibited	1	1 partner
Aquatic plants	Prohibited or Restricted	4 New, 2 Renewed	1 university, 1 partner, 4 other

Public Act 537 of 2014

Public Act 537 of 2014 became effective on April 1, 2015. This act requires the relative Department to review Michigan's current restricted and prohibited species list and to develop a permitted species list. This legislation builds upon Michigan's existing laws with a focus on preventing new introductions of invasive species. Additionally, this legislation provided a timeline and requires all aquatic plants and animals permitted for possession or trade be listed as such and also requires consultation with industry to develop the initial permitted species list. Specifically, by April 1, 2016, in consultation with industry, a list of species that were legally in trade as of April 1, 2015, and for the last five years shall be developed.

Development of the permitted species list began in 2015.

- On October 1, 2015, 30 key industry and government representatives were invited to a workshop hosted by the Michigan Department of Natural Resources and Department of Agriculture and Rural Development. The goals of the workshop were to: 1) build relationships and trust; and 2) provide a forum to understand the requirements and to share information.
- Industry representatives were quite troubled by this new legislation and there is certainly consensus among industry and government representatives that the laws pertaining to the permitted species list could be improved.
- The initial estimate on how many aquatic species there are currently in trade in Michigan was approximately 20,000.
- The list of species in trade should be finalized in April 2016.

Appendix A- Invasive Species Steering Committee Members

- William O'Neill, Forest Resources Division Chief, Department of Natural Resources
- Jim Dexter, Fisheries Division Chief, Department of Natural Resources
- Ron Olson, Parks and Recreation Division Chief, Department of Natural Resources
- Russ Mason, Wildlife Division Chief, Department of Natural Resources
- Gary Hagler, Law Enforcement Division Chief, Department of Natural Resources
- Kristin Phillips, Marketing & Outreach Division Chief, Department of Natural Resources
- Tammy Newcomb, Senior Water Policy Advisor, Department of Natural Resources
- William Creal, Water Resources Division, Department of Environmental Quality
- Richard Hobrla, Great Lakes Management Unit Chief, Office of the Great Lakes
- Gina Alessandri, Pesticide and Plant Pest Management Division Director, Michigan Department of Agriculture and Rural Development

Appendix B- Species Listed as Prohibited or Restricted Under Part 413

Species	Part 413 Status	Distribution in Michigan	Comments
Plants			
African oxygen weed (Lagarosiphon major)	P	Absent	
Autumn olive (Elaeagnus umbellate)	P	Widespread	Common and widespread throughout Southern Lower Peninsula, widespread elsewhere statewide
Brazilian waterweed (Egeria densa)	P	Absent	Isolated populations in IL, IN, MN and OH
Curly leaf pondweed (Potamogeton crispus)	R	Widespread	Common, especially in the Lower Peninsula
Cylindro (Cylindropermopsis raciborskii)	P	Isolated	Recorded in several drowned river mouths in the Lake Michigan Basin
Eurasian watermilfoil (Myriophyllum spicatum)	R	Widespread	Common, especially in the Lower Peninsula
European frogbit (Hydrocharis morsusranae)	P	Locally abundant	Locally abundant in SE Lower Peninsula; isolated populations in Saginaw Bay, Alpena County and Chippewa County
Fanwort (Cabomba caroliniana)	P	Locally abundant	Locally abundant in Lower Peninsula; present in IL, IN, OH and ONT
Flowering rush (Butomus umbellatus)	R	Locally abundant	Dozens of observation confirmed in southeast Michigan, both inland and coastal; also identified in IN, IL, MN, OH, WI and ONT
Giant hogweed (Heracleum mantegazzianum)	P	Isolated	Found scattered throughout the Lower Peninsula and western Upper Peninsula; some occurrences have been controlled
Giant salvinia (Salvinia molesta, auriculata, biloba or herzogii)	P	Absent	
Hydrilla (Hydrilla verticillata)	P	Absent	Isolated populations in IN, WI and OH
Japanese knotweed (Fallopia japonica)	P	Widespread	Scattered throughout Lower and Upper Peninsulas
Parrot feather (Myriophyllum aquaticum)	P	Isolated	Active management of an isolated population in Wayne County; isolated populations in IL, IN, NY, OH and PA
Phragmites or common reed (Phragmites australis)	R	Widespread	Common and established in coastal and inland areas of southern Lower Peninsula; somewhat less abundant from south to north; common in western UP
Purple loosestrife (Lythrum salicaria)	R	Widespread	Biological control is reducing population statewide
Starry stonewort (Nitellopsis obtusa)	P	Locally abundant	Recorded in over one hundred inland waterbodies, mostly in Lower Peninsula
Water chestnut (Trapa natans)	P	Absent	Observations in NY, PA and ONT
Water soldier (Stratiotes aloides)	P	Absent	Isolated population in ONT
Yellow floating heart (Nymphoides peltata)	P	Isolated	Isolated populations in IL, IN, OH, WI and ONT. Isolated population in SE Michigan is under eradication
Crustaceans			
Rusty crayfish (Orconectes rusticus)	R	Widespread	Widespread and breeding in inland waters
Red swamp crayfish (Procabarus clarkii)	P	Absent	
Yabby (Cherax destructor)	P	Absent	
Killer shrimp (Dikerogammarus villosus)	P	Absent	

Appendix B- Species Listed as Prohibited or Restricted Under Part 413- Continued

Fish			
Bighead carp (Hypopthalmichthys nobilis)	P	Absent	
Bitterling (Rhodeus sericeus)	P	Absent	
Black carp (Mylopharyngodon piceus)	P	Absent	
Eurasian ruffe (Gymnocephalus cernuus)	P	Locally abundant	Patchy distribution in Great Lakes; absent in inland waters
Grass carp (Ctenopharyngodon idellus)	P	Isolated	Suspected limited natural reproduction in Lake Erie and isolated detections have been reported in the St. Joseph and Kalamazoo rivers
Ide (Leuciscus idus)	P	Absent	
Japanese weatherfish (Misgurnus anguillicaudatus)	P	Isolated	Single breeding population in the Shiawassee River
Round goby (Neogobius melanostomus)	P	Widespread	Widespread and established in Lakes Michigan, Huron and Erie; isolated collection in Lake Superior near Marquette; isolated but established populations in inland waters
Rudd (Scardinius erythrophthalamus)	P	Absent	Isolated collections on the Ontario side of Lake St. Clair
Silver carp (Hypophthalmichthys molitrix)	P	Absent	
Any fish from the snakehead family (Channidae)	P	Absent	
Stone moroko (Pseudorasbora parva)	P	Absent	
Tench (Tinca tinca)	P	Absent	
Tubenose goby (Proterorhinus marmoratus)	P	Isolated	Isolated, established populations in the St. Clair River, Lake St. Clair, Detroit River and western Lake Erie
Wels catfish (Silurus glanis)	P	Absent	
Zander (Sander lucioperca)	P	Absent	
Mollusks			
Brown garden snail (Helix aspersa)	P	Absent	Two MI detections in the past - both eradicated
Carthusian snail (Monacha cartusiana)	P	Locally abundant	Wayne County
Giant African snail (Achatina fulica)	P	Absent	
Girdled snail (Hygromia cinctella)	P	Locally abundant	Wayne County
Heath snail (Xerolenta obvia)	P	Locally abundant	Lapeer County/SE MI
New Zealand mudsnail (Potamopyrgus antipodarum)	P	Isolated	Established in Oake Ontario and Lake Erie and present in Lake Superior. Established population in the Pere Marquette River in MI
Golden mussel (Limnoperna fortunei)	P	Absent	
Wrinkled dune snail (Candidula intersecta)	P	Locally abundant	Wayne County
Quagga mussel (Dreissena bugensis)	R	Widespread	Found in all of the Great Lakes, although limited in Lake Superior; isolated inland occurrence in the Great Lakes basin, including a single confirmation from Michigan's Upper Peninsula

Appendix B- Species Listed as Prohibited or Restricted Under Part 413- Continued

Zebra mussel (Dreissena polymorpha)	R	Widespread	Widespread in inland and Great Lakes waters of the Lower Peninsula; patchy distribution in inland waters of the Upper Peninsula and Lake Superior
Mammals			
Feral Swine (Sus scrofa Linnaeus)	P	Widespread	Feral swine have been observed in 72 of 83 counties in Michigan. Occurrences are presently localized with the greatest numbers occurring in the central Lower Peninsula
Nutria (Myocastor coypus)	P	Absent	Farmed in Michigan in the 1930's
Birds			
Eurasian collared dove (Streptopelia decaocto)	P	Isolated	First observed in MI in 2002, has since been documented in Kalamazoo, Traverse, Berrien, Alger and Mason counties.
Insects			
Asian longhorned beetle (Anoplophora glabripennis)	P	Absent	Not detected in Michigan; ALB infestations currently active in NY, MA, OH and Ontario; ALB eradicated from IL and NJ
Emerald ash borer (Agrilus planipennis)	P	Widespread	Widespread throughout Lower Peninsula; isolated or patchy distribution across Upper Peninsula

Appendix C- Invasive Species Press Releases in 2015

First bats to die from white-nose syndrome this winter reported in Keweenaw County	1/23/15 DNR
Volunteers needed in February for stewardship at state parks in southwest Michigan	1/26/15 DNR
DNR awards more than $4 million in grants for projects battling invasive species	2/26/15 DNR
DNR advises caution to prevent spread of oak wilt disease	4/13/15 DNR
Volunteers needed in May for stewardship in southeastern Michigan	4/29/15 DNR
MDARD Eradicates Hemlock Woolly Adelgid from Three Michigan Counties	5/11/15 DARD
Anglers encouraged to monitor bait to spot juvenile Asian carp	5/21/15 DNR
Michigan DNR lauds Michigan Court of Appeals ruling that protects state from invasive swine	6/3/15 DNR
DNR seeks volunteers for stewardship workdays at state parks in southwest Michigan	7/9/15 DNR
DEQ looking for local partners to help educate boaters about invasive species	6/4/15 DEQ
Invasive crayfish found at Ottawa County lake; DNR, local partners evaluating next steps	7/13/15 DNR
Help prevent the spread of oak wilt: Don't move firewood	7/15/15 DNR
U.S. Fish and Wildlife Service reports Finding of No Significant Impact in assessment of treatment methods to control harmful aquatic plants in Michigan	7/20/15 DNR
DNR seeks volunteers for stewardship workdays at state parks in southeast and southwest Michigan	7/28/15 DNR
Youth can learn about invasive species at Walker Tavern Historic Site Aug. 5	7/29/15 DNR
Protecting Michigan's Waters from Aquatic Invasive Species	7/30/15 DNR
Response exercise provides DNR staff with more training on Asian carp removal	8/10/15 DNR
Exotic Insect Found Infesting Hemlock Trees in Ottawa County	8/13/15 DARD
Michigan confirms two new invasive species	9/4/15 DEQ
Invasive Hemlock Pest Found at More Sites in West Michigan	9/16/15 DARD
DNR removes high-threat aquatic invasive plant from Dearborn pond	9/18/15 DNR
New Invasive Vegetable Pest Found in Michigan: Swede midge impacts cabbage, broccoli, cauliflower and other crucifers	10/5/15 DARD
Volunteers needed in December for stewardship in southern Michigan	11/24/15 DNR
Volunteers help DNR battle invasive species at Belle Isle Park in Detroit	12/3/15 DNR
Elm seed bug found in Michigan	12/10/15 DARD

Appendix D- Contacts for Invasive Species Information in Michigan

Aquatic Invasive Species	*Contact*	*Email and/or Phone*
Aquatic Invasive Species Program Questions on overall aquatic invasive species programand Michigan's Aquatic Invasive Species State Management Plan www.michigan.gov/aquaticinvasives	Sarah LeSage AIS Program Coordinator DEQ - Water Resources Division	lesages@michigan.gov 517-243-4735
Aquatic Invasive Plants General questions about aquatic plant identification and early detection, rapid response, and monitoring www.michigan.gov/invasivespecies	Kile Kucher DNR - Wildlife Division	kucherk@michigan.gov 517-641-4903 x243
Chemical Control - Questions on chemical control of aquatic species, permitting, and submerged plant identification. www.michigan.gov/anc	Aquatic Nuisance Control Program staff DEQ - Water Resources Division	DEQ-WRD-ANC@michigan.gov 517-284-5593
Mechanical Removal - Questions about mowing and other forms of mechanical control, permitting, and Great Lakes Shoreline management. www.michigan.gov/deqwetlands	Anne Garwood DEQ - Water Resources Division	garwooda@michigan.gov 517-284-5535
Mechanical Control – Questions about permitting in Critical Dune Area. www.mi.gov/criticaldunes	Kate Lederle DEQ – Water Resources	lederlek@michigan.gov 517-284-5564
Phragmites – Questions about identification and the control of invasive phragmites. www.michigan.gov/aquaticinvasives	Kevin Walters DEQ - Water Resources Division	waltersk3@michigan.gov 517-284-5473
Aquatic Invasive Animals Questions about Asian carp identification, status in Michigan, Michigan's Asian Carp Management Plan, other fish (e.g. snakehead) and aquatic animals (e.g. invasive crayfish). www.michigan.gov/asiancarp	Seth Herbst DNR - Fisheries Division	herbstS1@michigan.gov 517-284-5841
Great Lakes Regional Coordination Questions on Great Lakes coordination, restoration, and management. www.michigan.gov/deqgreatlakes	Matt Preisser DEQ - Office of the Great Lakes	preisserm@michigan.gov 517-284-5039
Ballast Water General questions on Michigan's ballast water program and Michigan's Section 401 certification. www.michigan.gov/aquaticinvasives	Sarah LeSage DEQ - Water Resources Division	lesages@michigan.gov 517-243-4735
Permits - Questions on Michigan's state ballast water permit and application. www.michigan.gov/deqnpdes	Sean Syts DEQ - Water Resources Division	sytss@michigan.gov 517-284-5469

Appendix D- Contacts for Invasive Species Information in Michigan

Terrestrial Invasive Species	*Contact*	*Email and Phone*
Terrestrial Invasive Plants, Mammals, and Birds Questions about identification, management and control of terrestrial invasive species. www.michigan.gov/invasivespecies	Sue Tangora DNR - Wildlife Division	tangoras@michigan.gov 517-420-0128
Insects *Agricultural & Landscape Pests* – Questions about invasive species that impact agriculture and landscapes MDARD Plant Pest Management *Forest Pests* - Questions about invasive insects, tre diseases, and invasive species impacts to forestry www.michigan.gov/invasivespecies	John Bedford DARD - Pesticide and Plant Pest Management Division Roger Mech DNR - Forest Resource Division	bedfordj@michigan.gov 517-284-5650 MechR@michigan.gov 517-243-0300

General (Aquatic & Terrestrial) Invasive Species	*Contact*	*Email and Phone*
Invasive Species Laws/Regulations Questions about Michigan's NREPA Part 413 Prohibited and Restricted species law, other regulations, species identification, and permits. www.michigan.gov/invasivespecies	*Plants and insects:* Mike Bryan DARD - Pesticide and Plant Pest Management Division *All other species:* Seth Herbst DNR - Fisheries Division	bryanm@michigan.gov 517-284-5648 herbstS1@michigan.gov 517-284-5841
State Parks & State Administered Boat Launches Questions about invasive species and associated is issues in state parks and at state administered boat launches	Alicia Ihnken DNR – Parks & Recreation Division	IhnkenA@michigan.gov 517-335-0883
Enforcement To report invasive species law/regulation violations, please call the DNR RAP Line.	DNR - Law Enforcement Division District 25	Report All Poaching (RAP) Line: 1-800-292-7800
AIS Education and Outreach Questions about education programs and outreach materials related to AIS	Kevin Walters DEQ - Water Resources	waltersk3@michigan.gov 517-284-5473
Michigan Invasive Species Grant Program General questions about MISGP, grant requirements application process, etc.	Kammy Frayre DNR – Finance & Operation	Frayrek1@michigan.gov 517-284-5970

For general inquiries, or if none of the above contacts fits with your question, call the DEQ's Environmental Assistance Center at 1-800-662-9278

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