



The Grand Traverse Band of Ottawa and Chippewa Indians

Legal Department

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MANDATORY 30-DAY POSTING

MEMORANDUM

TO: Tribal Membership
FROM: GTB Legal Department
RE: **30-day Posting “Aquatic Invasive Species Management Plan”**
DATE: November 16, 2016

Please post the attached proposed draft of the above referenced document in an area where GTB tribal members can review.

Any comments regarding the above referenced should be directed to the GTB Legal Department either by writing to the GTB Legal Department, 2605 N.W. Bayshore Dr., Peshawbestown, MI 49682, or by telephone (231) 534-7601, or by e-mail, to Mary.Kelley@gtbindians.com.

Posting Sites:

Administration Building
Accounting Department Annex
Annex II – Human Resources Building
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Natural Resources/Conservation
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Benzie Satellite Office – via e-mail
Charlevoix Satellite Office – via e-mail
Traverse City Satellite Office - via e-mail
Strongheart Center
Library/Yo Building/Youth Center
Tribal Court

EDC Building
Leelanau Sands Casino –
Employees/Supervisors’ Break-room

Leelanau Sands “The Lodge” –
Employees/Supervisors’ Break-room

Turtle Creek Casino –
Employees/Supervisors’ Break-room

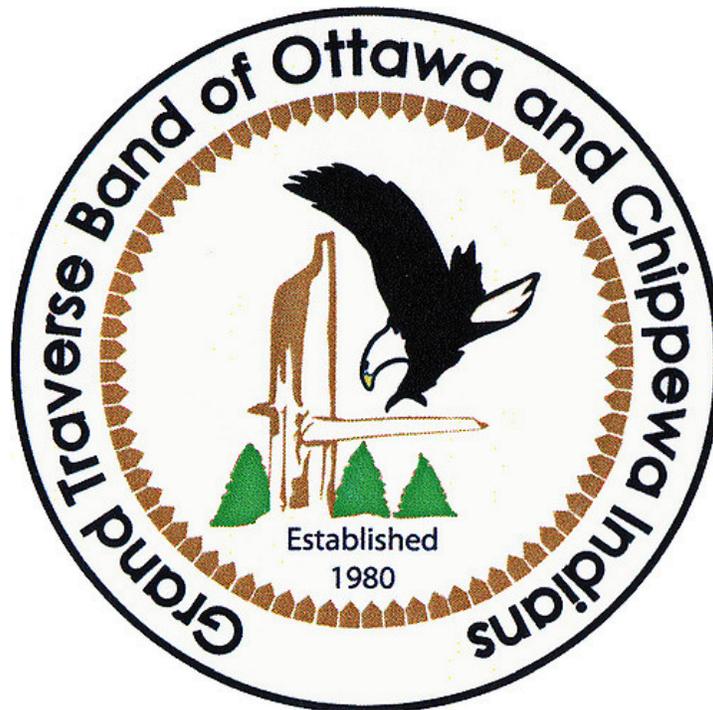
Attachments

DRAFT

Aquatic Invasive Species Management Plan

Grand Traverse Band of Ottawa and Chippewa
Indians

November 9, 2016



Prepared by:

Environmental Consulting and Technology, Inc.



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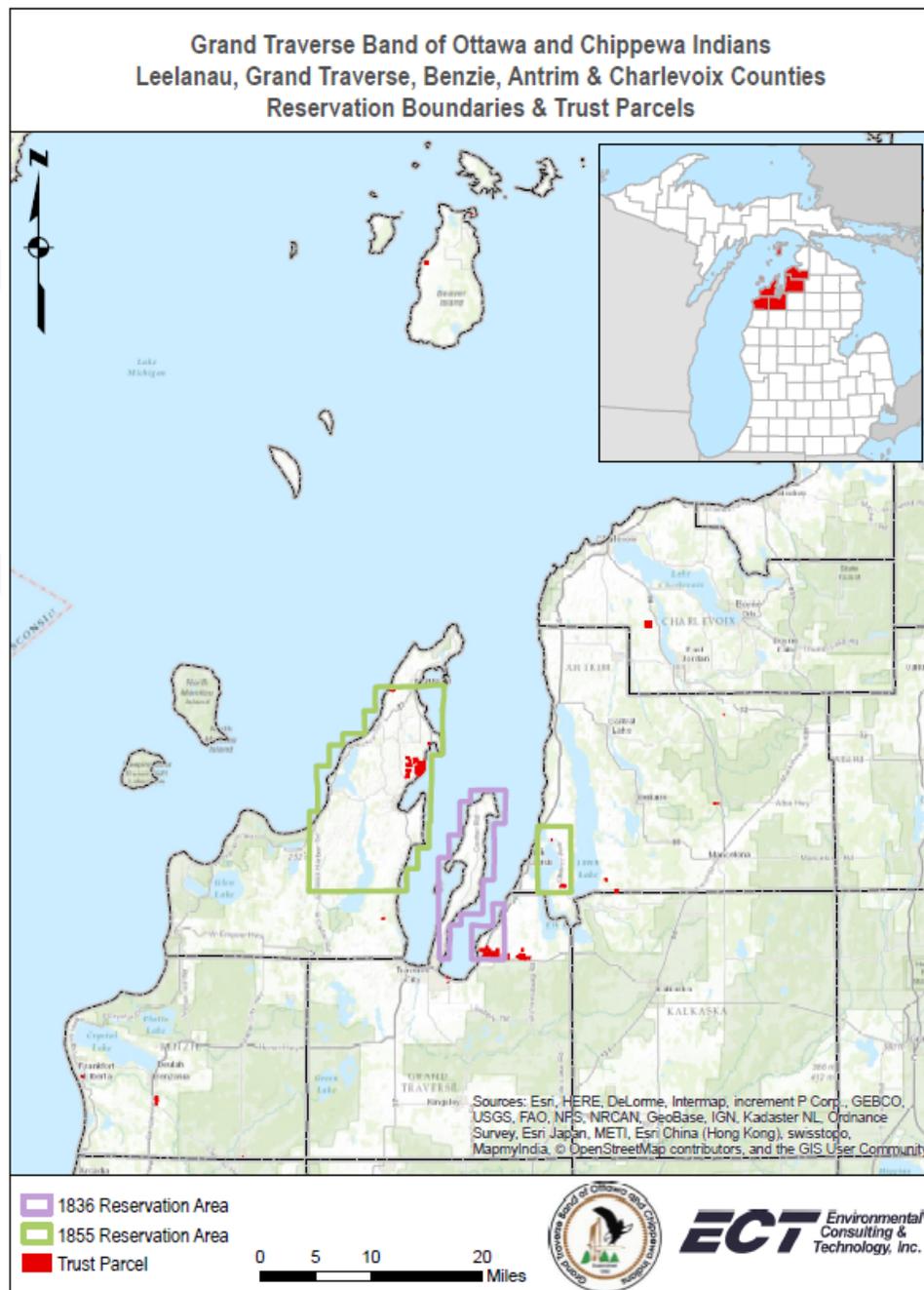
APPENDICES

- A – Timeline of Significant AIS Events Relevant to Michigan (MDEQ 2013)**
- B – GLANSIS Database: non-indigenous species “established” in the Great Lakes (NOAA 2016)**
- C – AIS Management Plan - Implementation Table**
- D – Prohibited/Restricted Aquatic Species (MDEQ 2013) and Watch List Species (MI AIS Program 2015)**

A. INTRODUCTION

The Grand Traverse Band of Ottawa and Chippewa Indians (GTB) are people of the Three Fires Confederacy, the Odawa (Ottawa), the Ojibwa (Chippewa), and the Bodowadomi (Pottawatomi) people. The United States recognized the GTB under the conditions of the Tribal Federal Acknowledgement Process (currently 25 C.F.R. Part 83) in 1980 and GTB's Constitution was ratified in 1988 (Fletcher and Fletcher 2007). GTB's historic reservation area includes lands and trust parcels in the northwestern section of Michigan's Lower Peninsula, in Leelanau County, Grand Traverse County, Benzie County, Antrim County, and Charlevoix County (Figure 1).

Figure 1. GTB Reservation Land & Trust Parcels



The GTB are signatories of the Treaties of March 28, 1836 (1836 Treaty) and July 31, 1855 (1855 Treaty). The 1836 Treaty defined areas (Ceded Territory) covering the northwestern third of Michigan’s Lower Peninsula, the eastern portion of the Upper Peninsula, and adjacent areas of the Great Lakes of the United States. Article 13 of the 1836 Treaty contains specific language that reserves the usufructuary rights for both Commercial and Subsistence Fishing in the Treaty Ceded Waters of the Great Lakes described in the Consent Decree of August 8, 2000, and Inland Fishing, Hunting, Trapping and Gathering on specific lands and inland waters described in the Inland Consent Decree Entered November 7, 2007 (GTB 2016a). The 1855 Treaty defined areas and, more specifically, the boundaries of the formal reservation lands within the 1836 Ceded Territory that were to be held for the Grand Traverse Band of Ottawa and Chippewa Indians (Figure 1). The Ceded Territory occupies portions of the eastern Northern Lower Peninsula and eastern Upper Peninsula (Figure 2).

Figure 2. 1836 Treaty Boundary



a) Purpose of the AIS Management Plan

The primary purpose of this Aquatic Invasive Species (AIS) Management Plan is to establish an initial framework through which GTB can define goals, objectives, and strategies aimed at establishing partnerships and engaging in collaborative efforts to implement AIS management in the 1836 Ceded Territory. Through this approach, the AIS Management Plan is intended to help GTB's work on preventing and/or minimizing the impact of AIS on the natural resources critical to GTB.

This AIS Management Plan has been prepared specifically for GTB. The plan meets the requirements of the Non-Indigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990 (US Congress 1990), which was amended by the National Invasive Species Act (NISA) of 1996 (US Congress 1996). The format of this AIS Management Plan follows the criteria outlined by the Aquatic Nuisance Species (ANS) Task Force in the document "*ANS Task Force Guidance for State and Interstate Aquatic Nuisance Species Management Plans*" (ANS Task Force 2005). Approval of this AIS Management Plan by the ANS Task Force is required to obtain funding under Section 1204 of the NANPCA of 1990.

b) AIS Management Plan: Geographic Scope & Overlapping Jurisdictions

The geographic scope of GTB's AIS Management Plan encompasses the 1836 Ceded Territory, which occupies portions of the eastern Northern Lower Peninsula and eastern Upper Peninsula (Figure 2).

AIS management activities in the 1836 Ceded Territory are managed by many partners who share responsibility for protecting Michigan's inland lakes and waters. Types of jurisdictions include, but are not limited to: federal, state, and local government agencies; Indian Tribes; Cooperative Invasive Species Management Areas (CISMAs); non-profit organizations; and/or volunteer organizations.

This AIS Management Plan seeks to promote actions that facilitate partnerships for the implementation of AIS control efforts and enhance communication/coordination across overlapping jurisdictions.

B. PROBLEM DEFINITION & RANKING

a) Administration & Coordination of AIS Efforts

The mission of GTB's Natural Resources Department (GTB-NRD) is to "*Protect and enhance the natural resources and environment for managed utilization by Anishnaabek for past, present, and future generations*" (GTB 2016b). Staffing capacity of the NRD and the ability to maintain regular communication/coordination with overlapping jurisdictions are critical limitations affecting GTB's administration and coordination of AIS efforts.

i. Staffing Capacity

GTB-NRD has identified the lack of a dedicated AIS-staff as a critical problem affecting GTB-NRD's ability to stay informed of AIS issues, coordinate engagement with AIS control efforts in the Ceded Territory, seek funding opportunities that would benefit GTB and/or their partners, and build partnerships.

ii. Communication / Coordination with Overlapping Jurisdictions

The 1836 Ceded Territory crosses multiple jurisdictions and multiple partners work on AIS issues and conduct AIS management activities. Coordination with partners working in these jurisdictions is critical to effectively implement GTB's AIS Management Plan.

GTB-NRD has identified the absence of a communication strategy through which GTB can stay informed of AIS issues and maintain regular communication with federal, state, local, tribal, and/or non-governmental partners as a critical problem affecting GTB-NRD's management of AIS within the 1836 Ceded Territory.

Through strategies identified in this AIS Management Plan, GTB seeks to facilitate partnerships, collaborate with implementation of AIS control efforts, and enhance communication/coordination with the following organizations:

- Michigan Department of Natural Resources (MDNR)
- U.S. Fish and Wildlife Service (USFWS)
- Great Lakes Fisheries Commission (GLFC)
- Michigan Environmental Council (MEC) – Northern Michigan Region
- North Country CISMA
- C.A.K.E. CISMA
- Northwest Michigan Invasive Species Network (ISN)

b) AIS Concerns & Threats in the GTB's Territory

The Great Lakes region has been impacted by intentional and unintentional introduction of non-indigenous aquatic flora and fauna since the 1800s (Mills et al. 1993). The earliest record of an invasion by an AIS is the sea lamprey, which first entered the Great Lakes from the Atlantic Ocean via the Erie Canal during the 1820s (IAGLR 2002). Since then, the Great Lakes ecosystem is considered a heavily invaded aquatic system (Mills et al. 1993; Ricciardi 2006). The Michigan Aquatic Species State Management Plan (Michigan-SMP) lists many AIS introduction events that have significantly shaped AIS management in the State of Michigan (MDEQ 2013a) (Appendix A).

Present and future Aquatic Invasive Species (AIS) introductions have the potential to harm the ecology of the Great Lakes and can also have negative effects on the economic and public health conditions of the Great Lakes region and adjoining states (MDEQ 2013a). Thus, management of AIS in the Great Lakes has been deemed a priority for many federal agencies and state governments and employs two regulatory approaches, one that addresses a particular known species and another that targets pathways by which AIS are introduced (Corn and Johnson 2013).

In Michigan, aquatic ecosystems often experience ecological imbalances from the presence of AIS and the continued threat of new AIS introductions only serves to deteriorate already perilous situations. According to the National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Aquatic Non-Indigenous Species Information System (GLANSIS) online database (NOAA 2016), at least 181 non-indigenous aquatic organisms have colonized habitats of the Great Lakes ecosystems and are considered "established," including algae (26), vascular plants (58), crustaceans (21), mollusks (17), fish (26), insects (2), other invertebrates (25), and bacteria and viruses (6) (Appendix B).

The National Invasive Species Council (NISC) defines an invasive species as "*alien (non-native) species whose introduction does or is likely to cause economic or environmental harm or harm to human health.*" Evidence suggests that disruptions from invasion of these alien/non-native species have accumulating impacts including loss in native biodiversity, altered habitats, changes in water chemistry, altered biogeochemical processes, hydrologic modifications, altered food webs, impacts on economically important fish, as well as economic and social/cultural impacts (IAGLR 2002; Bierwagen et al. 2007).

Examples of negative effects that AIS may cause include but are not limited to (MDEQ 2013a):

- Directly outcompete native species for resources like food and habitat causing displacement or reduced populations of native species to the point of biological significance.
- Affect the composition and structure of aquatic communities and cause cascading changes throughout aquatic food webs resulting in indirect negative effects.
- Degrade habitat and negatively affect wildlife and water quality.
- Decrease sportfishing opportunities and therefore have negative economic effects on recreation and tourism industries.
- Degrade shorelines and wetlands for human use and therefore have negative economic effects on recreation and tourism industries (e.g., Zebra mussels fouling beaches and invasive Phragmites decreasing hunting and fishing opportunities).
- Negatively affect human and wildlife health (e.g., Zebra mussels linked to botulism).
- Decrease property values (e.g., invasive Phragmites blocking views).
- Alter wildfire frequency and intensity causing negative ecological effects and increased cost in fire management and damages (e.g., invasive Phragmites).
- Negatively affect commercially valuable species.
- Increase costs to utilities and municipalities (e.g., control of Zebra mussels at water intakes).

As declared by the 1836 Treaty and re-affirmed by the 2007 Inland Consent Decree, GTB retains the rights to hunt, fish, trap, gather and other usual privileges of occupancy in the Ceded Territory within the State of Michigan (Kappen, Allison, and Verhaaren 2012). Tribal citizens exercise treaty rights for subsistence, spiritual, cultural, management, and recreational purposes.

The negative impact of AIS and AIS introductions have the potential to impact cultural resources and natural ecosystems that could negatively affect GTB by:

- a) Displacing culturally relevant species, such as those used as traditional food, medicine, and tools;
- b) Altering spiritually significant locations; and/or
- c) Impacting the tribe's commercial and subsistence fishery activities.

Thus, assessment and control of AIS within the inland lakes and streams in the Ceded Territory is an important part of GTB's commitment to managing natural resources, and it is critical to the continued affirmation of GTB's treaty rights. However, identifying which species pose the greatest threats to tribal resources in the 1836 Ceded Territory is challenging. GTB's vision of an AIS Management Plan encompasses the Ceded Territory (Figure 2) and is based on partnerships, collaborations with ongoing AIS control efforts, and on communication/coordination with organizations operating in the Ceded Territory.

Although a comprehensive survey of AIS within the Ceded Territory has not been compiled, various agencies and organizations maintain lists, databases, or maps of AIS occurrence. Some data are focused on the Great Lakes, other focus on regions, states, or the entire country. No single source can provide definite distribution of AIS within the Ceded Territory, but the following sources can be utilized to evaluate species and analyze their potential impact to tribal resources within the Ceded Territory:

- NOAA - GLANSIS online database (NOAA 2016).
- Michigan's List of legally restricted/prohibited species and watch list species (MI Invasive Species Program 2015; 2016b; 2016c)
- U.S. Geological Service (USGS) – Non-Indigenous Aquatic Species (NAS) online database (USGS 2016).
- Michigan Invasive Species Information Network (MISIN) (MISIN 2016)
- Great Lakes Indian Fish & Wildlife Commission (GLIFWC) – GIS Maps (GLIFWC 2016)
- Northwest Michigan Invasive Species Network (ISN) Top 20 Least Wanted List (NW Michigan ISN 2010)

Review of the above listed lists/databases/maps indicate that AIS are present and continue to pose a significant threat to natural resources in the 1836 Ceded Territory. Through this AIS Management Plan's unique strategy, GTB will work towards preventing new introductions, reducing the spread of AIS, and controlling existing AIS occurrence. Partnerships with jurisdictions across the Ceded Territory will allow GTB to identify what species are particularly injurious to GTB's interests and cultural resources.

C. EXISTING AUTHORITIES & PROGRAMS

A summary of applicable laws and programs that address the problem of invasive species at the federal, regional, and state levels is provided below. Particular attention is given to those are necessary to facilitate the implementation of the GTB's AIS Management Plan.

a) Federal Laws & Programs

Lacey Act of 1900 (and amendments): The Lacey Act of 1900 (18 U.S.C. 42) authorizes the Secretary of the Interior to regulate importation and transport of vertebrates, mollusks, and crustaceans that are injurious to the health and welfare of humans, the interests of agriculture, horticulture, or forestry, and the welfare and survival of wildlife resources of the United States (USFWS 2006).

Non-Indigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990: The NANPCA (16 U.S.C. 4701 *et seq.*) established a federal program to prevent and control infestations of the coastal waters of the United States by the zebra mussel and other non-indigenous aquatic nuisance species (US Congress 1990).

National Invasive Species Act (NISA) of 1996: The NISA (16 U.S.C. 110 Stat. 4073) amended and expanded the NANPCA. The act directed the ANS Task force to develop regulations for ballast water management; encourage development of State Management Plans and use of regional panels to combat the spread of ANS; carrying out ANS education/technical assistance programs and research (US Congress 1996).

Executive Order 13112 (and amendments): Executive Order (EO) 13112 (64 F.R. 6183) established the National Invasive Species Council (NISC), which helps coordinate activities of existing federal agencies that address terrestrial and aquatic invasive species. The EO also established the Invasive Species Advisory Committee (ISAC), which consists of non-federal representatives and stakeholders who provide recommendations, input, and advise to NISC (Executive Office of the President 1999; NISC 2005).

U.S. Fish and Wildlife Service (USFWS) – Aquatic Invasive Species Program: The USFWS is the agency within the U.S. Department of Interior whose primary responsibility is the conservation of the nation's fish, wildlife, and plants. The USFWS-Fisheries Program's Branch of Aquatic Invasive Species (BAIS) leads the

Service's AIS Program and provides technical assistance to states developing invasive species control plans. AIS activities include preventing the introduction of AIS; detection and monitoring of AIS; rapid assessment and response to new introductions of AIS; control and management of AIS; and outreach and education.

The *USFWS Native American Policy* indicates that during implementation of programs that affect tribal interests, the USFWS will maintain working relationships with tribal governments through Regional Native American Liaisons, observe legislative mandates and trust responsibilities, and implement programs that affect tribal interests (USFWS 2016a).

U.S. Department of Agriculture (USDA) Forest Service – Invasive Species Program: The USDA-Forest Service (USFS) has developed an invasive species program to reduce, minimize, or eliminate the potential for introduction, establishment, spread, and impact of invasive species across all landscapes and ownerships. Through the *Forest Service National Strategic Framework for Invasive Species Management* the USFS implements programs for the prevention, detection, and control of invasive insects, pathogens, plants, wildlife, and fish (USFS 2013; 2016b). The USFS's Office of Tribal Relations (OTR) provides internal directives and policies that guide the USFS to work with Indian Tribes, on tribal relations, authorities, objectives, training for USFS staff, consultation processes, etc. (USFS 2016a).

Bureau of Indian Affairs (BIA): The BIA's Indian Affairs Manual (IMA) contains current department policies and directives of Indian Affairs. *Part 54 Agriculture and Range - Chapter 7 Management of Noxious Weeds on Indian Lands* documents the Indian Affairs roles and responsibilities related to the management of noxious weeds on Indian Lands (BIA 2014). These guidelines do not include provisions for or guidelines related to AIS.

The BIA administers funding from the Great Lakes Restoration Initiative (GLRI) to federally recognized and Inter-Tribal Organizations through the Great Lakes Region and facilitates communication of tribal priorities within GLRI budget frameworks (BIA 2016). Through the GLRI, the BIA supports activities related to restoration and protection of habitat and wildlife and control of invasive species. Funding is allocated based on the five focus areas of the GLRI Action Plan II, which include: toxic substances and areas of concern; invasive species; non-point source pollution impacts on nearshore health; habitats and species; and foundations for future restoration actions (GLRI 2014).

USDA's National Invasive Species Information Center (NISIC): The NISIC was established in 2005 at the USDA's National Agricultural Library to serve as a repository of invasive species information from federal, state, local, and international sources (USDA 2016).

U.S. Geological Survey (USGS) Non-indigenous Aquatic Species (NAS) Program: The USGS's NAS Program tracks the status and distribution of introduced aquatic organisms and provides information (e.g., scientific reports, online queries, spatial data, distribution maps) for research, management, and education (USGS 2016).

U.S. Environmental Protection Agency (EPA): Because the EPA implements the Clean Water Act (CWA), various offices are involved with AIS issues, including: ballast water and National Pollutant Discharge Elimination System (NPDES) permits, Total Maximum Daily Load (TMDL) and impaired water listings, biological indicators, economic consequences, and pesticide usage for control (Bierwagen et al. 2007). The EPA has also investigated the effects of climate change on AIS and its implications for management and research (EPA 2008).

b) State Laws & Programs

Natural Resources and Environmental Protection Act (NREPA) – Act 451 of 1994: Part 413, Transgenic and Non-native Organisms of NREPA defines prohibited and restricted plant species and limits their possession, import, or sale. Prohibited species cannot be sold or grown in the state and restricted plants are those that occur in the state and are generally considered as nuisance or economically detrimental.

Part 33, Aquatic Nuisance Species of NREPA defines permitted actions and procedures for the treatment of aquatic nuisance species. The Michigan Department of Environmental Quality's (MDEQ) Aquatic Nuisance Control Program regulates chemical control of aquatic plants, algae, and intermediate aquatic hosts that cause swimmer's itch ¹ when they impair the use or enjoyment of the water resource.

Part 31, Water Resources Protection - Section 3103, Ballast Water Reporting and Part 21, General Real State Powers of NREPA provide authority to the State of Michigan to issue permits for oceangoing vessels to engage in port operations.

Michigan Seed Law (Act 329 of 1965) and Regulations 715 (Under Act 329) Seed Law Implementation: This law identifies species whose seeds are prohibited and restricted as contaminants in seed offered for sale.

Michigan State Management Plan: Michigan's AIS State Management Plan (Michigan-SMP), first published in 1996 and last updated in 2013, was developed by the MDEQ, the MDNR, and Michigan Department of Transportation (MDOT), and the Michigan Department of Agriculture and Rural Development (MDARD). The Michigan-SMP outlines new actions to maintain and enhance existing efforts to prevent the introduction of AIS, prevent the dispersal of established AIS, detect and respond to new invaders, and manage and control AIS to minimize the harmful effects of AIS in Michigan waters, including the Great Lakes, connecting channels, rivers, streams, inland lakes, and wetlands (MDEQ 2013a).

Michigan AIS Program: The Michigan AIS Program is cooperatively implemented by MDEQ, MDNR, MDOT, and MDARD and use the Michigan-SMP and the Draft Terrestrial Invasive Species (TIS) Management Plan (MI Invasive Species Program 2016a) as the foundation for their work. The goals of the AIS Program are to prevent new AIS introductions, limit the spread of established species, detect and respond to new invasions, and manage and control established species (MI Invasive Species Program 2016c). In 2013, the Michigan's AIS Program received final recommendations from the AIS Advisory Council (AIS Advisory Council 2013). In general, the MDEQ, MDNR, and MDARD share responsibility for AIS policy, legislation, regulation, education, monitoring, assessment, management, and control; according to the program's response plan for AIS, if a newly-identified AIS in Michigan waters, the departments will work together to identify a lead agency depending on the taxa of concern, the location of the issue, and existing agency authority (MI Invasive Species Program 2014).

Conservation Districts: Conservation Districts are local units of state government that utilize state, federal, and private sector resources to provide conservation programs and services and link land owners and managers to conservation programs and opportunities. The Michigan Association of Conservation

¹ Four genera of snails that serve as potential intermediate host for avian and rodent schistosomes (i.e. parasitic flatworm) which are the causative agents for swimmer's itch in Michigan, *Lymnaea sp.*, *Aplexa sp.*, *Physa sp.*, and *Gyraulus sp.* The two of these are the most important carriers: *Lymnaea catascopium* and *Physa integra* (MDEQ 2014b).

Districts (MACD), which represents its members at the state level, lists 77 Conservation Districts currently active in Michigan (MACD 2016).

Michigan Sea Grant: The Michigan Sea Grant is a cooperative program of the University of Michigan and Michigan State University and part of a network of national Sea Grant programs administered by NOAA, dedicated to the protection and sustainable use the Great Lakes and coastal resources (MI Sea Grant 2016). The Michigan Sea Grant organizes projects and strategies under four focus areas: Healthy Coastal Ecosystems, Sustainable Fisheries and Aquaculture, Resilient Communities and Economies, and Environmental Literacy and Workforce Development (MI Sea Grant 2012; 2015).

c) Interstate Agreements

The Great Lakes – St. Lawrence River Basin Water Resources Compact of 2005 details how Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin will work together, to manage and protect the Great Lakes-St. Lawrence River Basin and provides a framework for each State to enact programs and laws protecting the basin. The Great Lakes-St. Lawrence River Basin Water Resources Council (Compact Council) was established on December 8, 2008 when the Great Lakes – St. Lawrence River Basin Water Resources Compact became State and Federal law. The Compact Council coordinates with the Premiers of Ontario, Quebec, and the Great-Lakes – St. Lawrence River Water Resources Regional Body (Compact Council 2016).

d) International Agreements

The United States and Canada have formed several collaborative programs and agreements to address AIS issues.

International Joint Commission (IJC): The IJC is an independent advising body that prevents and resolves disputes between the United States and Canada under the *1909 Boundary Waters Treaty*. The IJC has the responsibility to regulate shared water uses and investigate and recommend solutions to transboundary issues.

The IJC implements the *Great Lakes Water Quality Agreement (GLWQA)*. The GLWQA was entered by the United States and Canada in 1978 and amended in 1983, 1987, and 2012. The purpose of the agreement is to “*restore and maintain the chemical, physical, and biological integrity of the Waters of the Great Lakes.*” The 2012 amendment to the GLWQA facilitates actions by the United States and Canada on threats to the Great Lakes water quality includes a) measures to prevent ecological harm that address the nearshore environment, AIS, habitat degradation, and the effects of climate change; and b) supports work on existing threats to human health and the environment in the Great Lakes basin such as harmful algae, toxic chemicals, and discharges from vessels (IJC 2016). The GLWQA requires the IJC to report triennially to the federal, state, and provincial governments progress concerning progress toward achieving objectives and the effectiveness of programs and measures used (IJC 2013).

Great Lakes Fisheries Commission (GLFC): The GLFC was established in 1955 by the *Convention on Great Lakes Fisheries* between the United States and Canada to improve and perpetuate the Great Lakes fisheries resources through coordinated, binational fisheries management (GLFC 2000). The GLFC has two major responsibilities: a) develop coordinated programs of research in the Great Lakes and recommend measures allow the maximum sustained productivity of stocks of fish of common concern; and b) formulate and implement a program to eradicate or minimize sea lamprey populations in the Great Lakes (GLFC 2011).

e) Tribal Law

GTB's Constitution was established under the authority of the Indian Reorganization act of June 18, 1934 (48 Stat. 984), as amended (GTB 2007a). The GTB's Code (GTB 2007b) establishes resolutions and regulations subject to GTB's jurisdiction.

f) Inter-tribal Agreements

The Chippewa-Ottawa Resource Authority (CORA) regulates commercial, subsistence, and recreational fishing activities in the 1836 Treaty Ceded Waters of Lake Superior, Lake Huron, and Lake Michigan by citizens of the GTB, Bay Mills Indian Community, Little Traverse Bay Bands of Odawa Indians, and Sault St. Marie Tribe of Chippewa Indians. CORA governs through two committees, the Great Lakes Resource Committee (GLRC) which serves as the inter-tribal management body for the treaty fishery in the 1836 Treaty Ceded Waters and the Inland Lands and Waters Resources Committee (ILWRC), which oversees inland resource matters. As of 2014, five tribes are members of CORA, (CORA 2000; 2013; 2016).

Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and the 1854 Treaty Authority are organizations that function as tribal resource management agencies with authority delegated from tribes who were signatories to the treaties of 1837, 1842, or 1854. These organizations provide support to member tribes regarding their rights on ceded land, while protecting the natural resources of those lands (Kappen, Allison, and Verhaaren 2012). GTB is not a member of GLIFWC.

D. GOALS, OBJECTIVES, STRATEGIES

The fundamental long-term goal of this AIS Management Plan is for GTB to be in a position to establish partnerships and have the capability to be involved in various aspects of AIS issues, including: coordination with state and federal agencies; implementation of AIS control efforts through cooperation with state/federal agencies and CISMAs; and participation in grant writing efforts to provide GTB's perspective and contribute to the success of AIS projects in the Ceded Territory.

This AIS Management Plant will allow GTB to implement specific goals, objectives, and strategies that would contribute to management of AIS issues in the Ceded Territory. These elements are organized in an *Implementation Table* (Appendix C) and described in the context of measures of success, timetables, cooperating agency or organization, funding source, and status.

The **AIS Management Plan - Implementation Table** is provided in Appendix C.

a) Goal 1: Establish & Strengthen Strategic Partnerships and Collaborative Efforts

i. Objective 1.1: Align with, Leverage, and Engage with Ongoing AIS Efforts in the GTB's Territory

- *Strategy 1.1a: Draft a Phragmites Control Ordinance consistent with ordinances enacted by overlapping jurisdictions. Present to Tribal Council (TC). Evaluate the MDEQ's Phragmites Treatment/Management Prioritization tool and determine if GTB can benefit from using this tool to identify specific areas important to GTB's interests.*
- *Strategy 1.1b: Evaluate if practices at GTB-operated marinas are consistent with current Michigan ballast water legislation. Determine if vessels utilizing these facilities are complying with current Michigan ballast water legislation. If needed, develop policies necessary for GTB-operated marinas to be in compliance with current Michigan ballast water legislation; present to*

TC. Evaluate if state-recommended BMPs relating to recreational boating and angling are used at GTB-operated marinas. If needed, develop a tribal program that promotes and enforces state-recommended BMPs that prevent introduction/movement of AIS through recreational equipment and angling.

- *Strategy 1.1c: Engage with the following CISMAs: North Country CISMA, C.A.K.E. CISMA, and NW Michigan ISN. Communicate GTB's perspective/priorities to the CISMAs. Work with CISMAs in efforts that support GTB.*
- *Strategy 1.1d: Evaluate the need for an AIS Rapid Response Plan within GTB's territory that could be incorporated into State/Federal Plans.*
- *Strategy 1.1e: Review and summarize ongoing GTB-NRD programs/contracts with MDNR/USFWS. Identify future opportunities and needs.*
- *Strategy 1.1f: Identify and seek opportunities to become a partner with MDNR and USFWS in regional projects for the prevention of AIS introduction and Early Detection and Rapid Response (EDRR) efforts. Provide GTB-NRD perspective. Work with MDNR and USFWS in EDRR efforts that support GTB.*

ii. Objective 1.2: Develop a Communication Plan with AIS Partners

- *Strategy 1.2a: Establish regular communication with MDNR. Address the need to be notified of planned interagency AIS actions or efforts.*
- *Strategy 1.2b: Establish regular communication with USFWS. Address the need to be notified of planned interagency AIS actions or efforts.*
- *Strategy 1.2c: Establish regular communication with GLFC. Address the need to be notified of planned interagency AIS actions or efforts.*

iii. Objective 1.3: Track AIS Legislative Action that May Impact Treaty Rights

- *Strategy 1.3a: Establish regular communication with MEC-Northern Michigan Region. Establish plan to track AIS legislative issues that may impact rights.*

b) Goal 2: Collaborate and Engage with Sea Lamprey Control Efforts

i. Objective 2.1: Collaborate with Ongoing Sea Lamprey Control Efforts

- *Strategy 2.1a: Continue efforts/renew contract with USFWS-Marquette Field Office to operate sea lamprey traps (spawning phase) on the Boardman River and Betsie Rivers and to conduct mark/recapture surveys*
- *Strategy 2.1b: Continue partnership with the GLFC selective fish passage facility project at Union Dam, Traverse City.*
- *Strategy 2.1c: Develop innovative strategies for sea lamprey control at lowermost barriers that simultaneously provide passage for native species. Meet with USFWS partners to evaluate strategies and possible implementation.*

ii. **Objective 2.2: Continue GTB-NRD's Sea Lamprey Wounding Data Collection**

- *Strategy 2.2a: Continue collecting sea lamprey wounding data from Tribal commercial fishing operations and GTB-NRD's assessment sampling. Incorporate data into models used to generate harvest limits across Treaty Waters.*

c) **Goal 3: Secure Funding for Implementing AIS Management Plan**

i. **Objective 3.1: Secure Funding for Implementing the AIS Management Plan**

- *Strategy 3.1a: Identify and evaluate all sources of funding available to support GTB's goals and objectives described in the AIS Management Plan.*
- *Strategy 3.1b: Identify priority resource needs and targeted efforts and new funding opportunities related to these priorities.*
- *Strategy 3.1c: Evaluate currently funded programs and identify opportunities for these funds to be re-allocated to address specific AIS issues and priorities of the AIS Management Plan.*

ii. **Objective 3.2: Secure Funding to Increase Staff Capacity of the GTB-NRD**

- *Strategy 3.2a: Identify and evaluate all sources of funding available to fund one (1) new full-time position to be the dedicated AIS Staff within the GTB-NRD.*
- *Strategy 3.2b: Define specific responsibilities of the AIS Staff position.*

E. **PRIORITIES FOR ACTION**

a) **Priority Species**

In Michigan, there are 55 species listed as legally “prohibited or restricted” under Part 413 of NREPA (MI Invasive Species Program 2016c). Prohibited or restricted species, which are also regulated by other federal or state laws, are the primary concern for the State. Some of the prohibited or restricted species are not yet known to be present in Michigan, while others have been documented in certain locations for decades (MDEQ 2013a). Additionally, 28 species, including fish (5), mollusks (1), crustaceans (1), aquatic plants (10), terrestrial plants (7), mammals (1), and insects and tree diseases (4), are listed in the state’s “watch list.” Watch list species have been identified as posing an immediate and significant threat to Michigan’s natural resources (MI Invasive Species Program 2015; 2016b).

Attempts at prioritizing species should take into account how well established a species is, the level of threat that the species poses, and how likely treatment is to succeed (Higman and Campbell 2009). However, given the geographic extent of the 1836 Ceded Territory, GTB is not in a position to independently work on EDRR efforts targeting prohibited/restricted species (n=55) or watch list species (n=28) (Appendix D).

Consequently, implementation of this AIS Management Plan and GTB’s work on AIS issues within the Ceded Territory relies on establishing partnerships that will enable GTB to collaborate with ongoing EDRR efforts or AIS control efforts taking place or planned within the Ceded Territory.

Based on GTB’s current and/or past collaborative efforts, the following species are considered “priority species” in the context of this AIS Management Plan:

- Sea Lamprey (*Petromyzon marinus*)
- Common reed (*Phragmites australis*)

Additionally, GTB will seek opportunities to be involved in coordination and/or control efforts targeted to AIS and those that grow near aquatic ecosystems or coastal areas listed in the NW Michigan ISN list of top 20 least wanted species (NW Michigan ISN 2010); these include:

- Purple Loosestrife (*Lythrum salicaria*)
- Reed canary grass (*Phalaris arundinacea*)
- Narrow-leaved cattail (*Thypha angustifolia*)
- Lyme grass (*Leymus arenarius*)

Lastly, GTB will also seek opportunities to be involved in coordination and/or control efforts targeted to other species of concern in northwest lower Michigan, which include:

- Baby's breath (*Gypsophila paniculata*)

b) Priority Actions & Priority ASI Efforts

i. Priority Actions

Increase Staff Capacity of GTB-NRD

A priority action for GTB will be to increase the NRD's staff capacity. Selection of a qualified professional to be the dedicated AIS-staff within the GTB-NRD is an instrumental step to begin implementation of this AIS Management Plan. Responsibilities of the AIS-staff will include, but will not be limited to:

- Manage the implementation of GTB's AIS Management Plan
- Participate in grant writing efforts for GTB and for partners
- Seek funding opportunities for GTB and for partners
- Actively collaborate with North County CISMA, C.A.K.E CISMA, and NW Michigan ISN
- Plan field efforts, as needed
- Plan and conduct outreach efforts
- Engage with GTB partners and participate in coordination meetings as necessary
- Establish regular communication with USFWS, MDNR, GLFC, and MEC

Increase Involvement with CISMAs

GTB is currently a supporting member of the NW Michigan ISN; GTB will continue to support and partner with this non-profit organization. Active cooperation with the NW Michigan ISN, as well as the North Country CISMA and the C.A.K.E. CISMA will be a priority for GTB.

GTB will seek opportunities with these organizations to coordinate grant writing efforts, provide project ideas and technical capacity, and provide GTB's perspective to contribute to the success of regional projects. Additionally, GTB will network with these organizations by attending events such as the Michigan Invasive Species Coalition (MISC) partner meetings, which are conducted annually, as well as similar events.

Develop a Communication Plan with Partners

GTB-NRD has identified the absence of a communication strategy through which GTB can stay informed of AIS issues and maintain regular communication with federal, state, local, tribal, and/or non-governmental partners as a critical problem affecting GTB-NRD's management of AIS within the 1836 Ceded Territory.

Developing a communication plan with the MNDR, the USFWS, and the GLFC will be a priority for GTB. Through this communication plan, GTB will state the need to be notified of planned inter-agency coordination efforts. Specifically, GTB will establish communication via email or conference call a minimum of twice per calendar year.

Track AIS Legislative Action

Staying informed of legislative action relating to AIS issues with the potential to impact the affirmation of treaty rights will be a priority for GTB. With this objective, GTB will establish regular communication with the MEC's Northern Michigan Region via email/conference call a minimum of twice per calendar year.

ii. Priority AIS Efforts

Sea Lamprey Control

The USFWS Marquette and Ludington Biological Stations and the Department of Fisheries and Oceans Canada (DFOC) are contracted by the Great Lakes Commission (GLC) to implement the sea lamprey control program in the Great Lakes (USFWS 2016b).

For the last 20 years GTB has contracted with USFWS-Marquette Biological Station supporting the sea lamprey control program; continuing these efforts will be a priority for GTB. Specifically, GTB has been contracted to operate traps during spring and early summer to capture spawning-phase sea lamprey on the Boardman River and the Betsie River. These activities also include mark-and-release studies as a method to estimate lake-wide abundance. GTB's contract with USFWS-Marquette Biological Station is typically renewed on a biannual basis.

Independently, GTB collects sea lamprey wounding data from Tribal commercial fishing operations and GTB-NRD's assessment sampling. Wounding data is incorporated into models used to generate harvest limits across Treaty waters. Continuing these activities will be will be a priority for GTB.

Ballast Water & Boating BMPs

GTB operates several marinas including commercial marinas in Peshawbestown and Beaver Island. Therefore, opportunities for GTB to work on preventing the introduction and/or movement of AIS at these facilities may exist.

The MDEQ regulates ballast water management of all ocean going vessels operating on the Great Lakes and the St. Lawrence waterway and engaging in port operations in Michigan. A priority effort of GTB-NRD will be to evaluate whether practices at GTB-operated marinas are consistent with ballast water legislation and determine if vessels utilizing these facilities are complying with current Michigan ballast water legislation. If needed, GTB-NRD will develop policies necessary for GTB-operated marinas to be in compliance with current Michigan ballast water legislation. Though this effort, GTB will align with

priorities stated in the Michigan-SMP, which include “*prevention of AIS introductions through ballast water discharges.*”

Several Michigan Laws (e.g., Part 413, Transgenic and Non-Native Organisms of NREPA, Fish Disease Control Order) enforce Best Management Practices (BMPs) relating to recreational boating and angling/fishing activities. These laws prohibit launching a watercraft or placing a trailer in the water if aquatic plants are attached; releasing unused bait into the water; and transporting water over land in bilges and live wells. A priority effort of GTB-NRD will be to evaluate whether state recommended BMPs (e.g. cleaning boats, trailers, and equipment; drying live wells and bilges of residual water; drying boats and equipment; disposing of unwanted bait in the trash) are used at GTB-operated marinas. To conduct this evaluation, GTB-NRD will consider using the *2015 Michigan AIS and Boating Survey Final Report* (Lee et al. 2015) as a model of how to survey GTB-operated marinas. If needed, GTB-NRD will develop a tribal program that promotes and enforces the use of state-recommended BMPs that prevent the introduction/movement of AIS through recreational boating and fishing activities. Through this effort, GTB will support state management efforts that address AIS movement through recreational equipment and angling.

Common Reed (*Phragmites australis*) Control:

GTB, as a supporting partner with the NW Michigan ISN, was involved in treatment of *Phragmites* in the greater Grand Traverse County area. However, GTB’s involvement is not currently ongoing.

According to The Watershed Center Grand Traverse Bay (Watershed Center), who is the lead organization in Grand Traverse County for controlling *Phragmites* in the Grand Traverse Bay Watershed, management of *Phragmites* is more efficient when townships enact ordinances allowing treatment of *Phragmites* along the Great Lakes Shoreline (Watershed Center 2016; Great Lakes *Phragmites* Collaborative 2016). To align with ongoing *Phragmites* control efforts, GTB will draft a *Phragmites Control Ordinance* that is consistent with overlapping jurisdictions (e.g., townships adjoining Tribal Reservation lands, counties within the 1836 Ceded Territory). This draft will be presented to TC for approval.

In Michigan, there many resources for *Phragmites* treatment that include guidelines published by the MDEQ, township ordinances, and other non-governmental publications (Brooks et al. 2015). GTB will specifically evaluate the MDEQ’s *Phragmites Treatment/Management Prioritization Tool* published by the MDEQ, which is intended to help groups and individuals prioritize treatment based on ecological, human values, feasibility/coordination criteria (MDEQ 2013b; MDEQ 2014a). GTB will determine if using the MDEQ tool can help identify specific areas important to GTB’s interests; identifying such areas will in turn help GTB seek partnership opportunities to coordinate control efforts in these specific areas.

F. AIS MANAGEMENT PLAN – MONITORING & EVALUATION

The evaluation process of the AIS Management Plan will provide a means of monitoring implementation of the goals and objectives of the plan, evaluating needs and problems, assessing progress of coordination efforts, and evaluating effectiveness of communication plans and strategies. The plan will be evaluated annually; any corrections or updates to the plan will be made as needed and will be incorporated during the annual evaluation. As part of this evaluation process, GTB will assess the effectiveness of the plan’s approach to address AIS issues within the Ceded Territory.

Because this AIS Management Plan lays out a framework for collaboration with partners, a measure of its implementation will also be based on the successful continuation of ongoing collaboration; number of

partnerships through collaborative grant/funding opportunities; and extent of GTB's engagement with organizations that implement AIS efforts (e.g. MDNR, USFWS, and CISMAs).

G. LIST OF ACRONYMS & GLOSSARY

AIS	Aquatic Invasive Species
ANS	Aquatic Nuisance Species
BAIS	USFWS's Branch of Aquatic Invasive Species
BIA	Bureau of Indian Affairs
BMPs	Best Management Practices
CISMAs	Cooperative Invasive Species Management Areas
CORA	Chippewa-Ottawa Resource Authority
CWA	Clean Water Act
DFOC	Department of Fisheries and Oceans Canada
EDRR	Early Detection Rapid Response
EPA	U.S. Environmental Protection Agency
GLANSIS	Great Lakes Aquatic Non-Indigenous Species Information System
GLC	Great Lakes Commission
GLFC	Great Lakes Fishery Commission
GLIFWC	Great Lakes Indian Fish and Wildlife Commission
GLRC	Great Lakes Resource Committee
GLRI	Great Lakes Restoration Initiative
GLWQA	Great Lakes Water Quality Agreement
GTB	Grand Traverse Band of Ottawa and Chippewa Indians
IJC	International Joint Commission
ILWRC	Inland Land and Waters Resources Committee
IMA	BIA's Indian Affairs Manual
ISN	Invasive Species Network
MACD	Michigan Association of Conservation Districts
MDARD	Michigan Department of Agriculture and Rural Development
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
MEC	Michigan Environmental Council
MISC	Michigan Invasive Species Coalition
NANPCA	Non-Indigenous Aquatic Nuisance Prevention and Control Act
NAS	Non-Indigenous Aquatic Species
NISA	National Invasive Species Act
NISC	National Invasive Species Council
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System (NPDES)
NRD	GTB-Natural Resources Department
NREPA	Natural Resources and Environmental Protection Act
OTR	USFS's Office of Tribal Relations

SMP	Michigan's AIS State Management Plan
TC	Tribal Council
TIS	Terrestrial Invasive Species Management Plan
TMDL	Total Maximum Daily Load
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Alien, Non-indigenous Species, or Non-native: with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem (i.e., is living outside of its native distributional range) and has arrived by human activity, either deliberate or accidental.

Ballast Water: Any water and associated sediment used to manipulate the trim and stability of a vessel.

Biological Invasion: the process by which non-native species breach biogeographical barriers and extend their range.

Early Detection and Rapid Response: EDRR programs are designed to monitor habitats to discover new species soon after introduction, report sightings of previously unknown species in an area, and work quickly to keep the species from becoming established and spreading.

Ecosystem: the complex of a community of organisms and its environment.

Established: criterion used in NOAA's GLANSIS online database for a non-indigenous species that has a reproducing population within the basin, as inferred from multiple discoveries of adult and juvenile life stages over at least two consecutive years.

Introduction: the intentional or unintentional escape, release dissemination, or placement of a species into an ecosystem as a result of human activity.

Invasive Species: an alien/non-native/non-indigenous species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

Native Species or indigenous Species: a native species to a given region or ecosystem if its presence in that region is the result of only natural processes with non-human intervention.

Pathway: the means by which invasive species are moved, intentionally or unintentionally, into new areas.

Prohibited or Restricted Species: In Michigan, a species whose possession, import, or sale is prohibited under Part 413 of NREPA. These species are the primary concern in the state.

Risk Analysis: the set of tools or processes incorporating risk assessment, risk management, and risk communication, which are used to evaluate the potential risks associated with a species or pathways possible mitigation measures to address that risk, and the information to be shared with decision-makers and other stakeholders.

Watch List species: In Michigan, a species that has been identified as posing an immediate and significant threat to Michigan's natural resources.

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Appendix A

Timeline of Significant AIS Relevant to Michigan (MDEQ 2013)

Appendix A - Timeline of Significant AIS Events Relevant to Michigan (MDEQ 2013)

Date	Event
1829	The Welland Canal opens, connecting Lakes Ontario and Erie and allowing Great Lakes ships to bypass Niagara Falls.
1848	The Illinois and Michigan Ship Canal opens, creating a hydrological connection between the Mississippi River and Great Lakes basins. It was deepened in 1900 and renamed the Chicago Ship and Sanitary Canal.
1873	Alewife (<i>Alosa pseudoharengus</i>) are first recorded in Lake Ontario, though introduction probably occurred sometime prior.
1879	Purple Loosestrife (<i>Lythrum salicaria</i>) is collected in the Muskegon area, representing the oldest Michigan collection (Voss, 1985).
1900	The Federal Lacey Act is enacted, prohibiting the trade of certain plant and animal species.
1919	Mute swans are introduced to Michigan in Charlevoix County as an ornamental.
1920	Sea lamprey (<i>Petromyzon marinus</i>) are observed in Michigan portions of Lake Erie and the upper Great Lakes. The species entered the Great Lakes Basin via the Erie Canal sometime in the 1820's or 1830's. Some contend it is native to Lake Ontario.
1935	Cabomba (<i>Cabomba caroliniana</i>) or fanwort is reported as "abundant" in several Kalamazoo and St. Joseph County lakes, representing the earliest observations in Michigan (Voss, 1985).
1946	Curlyleaf pondweed (<i>Potamogeton crispus</i>) is identified in the Little Traverse Bay of Lake Michigan in Emmet County (Voss, 1985).
1959	The St. Lawrence Seaway opens, connecting the Great Lakes to the Atlantic Ocean.
1970	Eurasian watermilfoil (<i>Myriophyllum spicatum</i>) is first officially recorded in Michigan, however it was likely present for many years prior to 1970 (Voss, 1985).
1974	The Federal Noxious Weed Act is enacted to address the spread of noxious weeds. It is later superseded, in part, in 2000 by the Plant Protection Act.
1984	The spiny water flea (<i>Bythotrephes cederstroemi/longimanus</i>) is first recorded in the Great Lakes (Lake Huron) (Bur et al., 1986).
1986	Starry stonewort (<i>Nitellopsis obtusa</i>) is identified in the Detroit River (Scloesser et al., 1986), the earliest known confirmation of this species in the state. The first confirmation in an inland lake occurs in 2006.
1988	The zebra mussel (<i>Dreissena polymorpha</i>) is discovered in Lake St. Clair. By the mid 1990's, the mussels had spread and researchers had started to document significant changes to the Great Lakes biological communities.
1989	The quagga mussel (<i>Dreissena bugensis</i>) is first recorded in the Great Lakes near Port Colborne, Lake Erie (USGS NAS: http://nas.er.usgs.gov/). By 2005, it was determined that the quagga had overtaken its formerly ubiquitous cousin, the zebra mussel, as the dominant mussel in Lake Michigan.
1990	The Federal Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA of 1990) is enacted.
1990	The round goby (<i>Neogobius melanostomus</i>) is first recorded in Michigan in the St. Clair River.
1991	The Great Lakes Panel on Aquatic Nuisance Species is established.
1994	Galerucella beetles are released in the Saginaw Bay area as a biological control for purple loosestrife.
1994	The amphipod <i>Echinogammarus ischnus</i> is discovered in the Detroit River.
1994	Eurasian ruffe (<i>Gymnocephalus cernuus</i>) is first recorded in Michigan from the Black and Ontonagon rivers in the Upper Peninsula (USGS NAS: http://nas.er.usgs.gov/)
1996	The National Invasive Species Act (NISA) of 1996 (now expired) reauthorizes the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990.
1996	The State of Michigan's first Aquatic Nuisance Species (ANS) State Management Plan (SMP) is developed and approved by the federal ANS Task Force.
1996	Commission Fish Order 193, entitled "Possession and Transportation of Exotic Species," is issued in 1996 and prohibits any person from possessing or transporting live Eurasian Ruffe (<i>Gymnocephalus cernuus</i>), tubenose goby (<i>Proterorhinus marmoratus</i>), and round goby (<i>Neogobius melanostomus</i>). Subsequent revisions in 2001, 2003 and 2007 prohibits individuals from possessing or transporting any of the following, including their eggs: black carp (<i>Mylopharyngodon piceus</i>), bighead carp (<i>Hypophthalmichthys nobilis</i>), silver carp (<i>Hypophthalmichthys molitrix</i>), largescale silver carp (<i>Hypophthalmichthys harmandi</i>) and all members of the snakehead family Channidae, genus <i>Channa</i> . The order will remain in effect through March 31, 2012.
1998	The State of Michigan develops and begins to distribute boat launch signs to alert boaters to the dangers of introducing aquatic nuisance species.

Appendix A - Timeline of Significant AIS Events Relevant to Michigan (MDEQ 2013)

Date	Event
1999	A National Invasive Species Council is created by federal executive order to address all invasive species, both aquatic and terrestrial.
2000	The Council of Great Lakes Governors establishes a Ballast Water Task Force.
2001	Michigan enacts ballast water legislation that requires ships entering or using the Great Lakes to report to the DEQ annually on compliance with ballast water best management practices established by shipping associations and federations.
2002	The NISA expires.
2002	Michigan Executive Order No. 2002-21 creates the Aquatic Nuisance Species Coordinating Council. In 2009, Executive Order No. 2009-44 abolishes the Council.
2002	Michigan ANS SMP is updated.
2002-2004	Michigan Sea Grant develops additional AIS watch cards, including Eurasian watermilfoil, rusty crayfish, spiny and fishhook waterflea, European frogbit, bighead and silver carp, and Hydrilla.
2003	The first Aquatic Nuisance Species Awareness Week is proclaimed by Governor Jennifer Granholm to be the first week of June, 2003. An Awareness Week designation occurs annually thereafter.
2003	Michigan enacts Part 413, Transgenic and Nonnative Organisms, of the Natural Resources and Environmental Protection Act, Act 451 of 1994, as amended. It becomes effective on March 30, 2004. Part 413 is subsequently amended several times to update various aspects of the Act, including modifying the prohibited & restricted species lists and adding a section prohibiting placement of a boat, boating equipment, or trailer in waters of the state with aquatic plants attached.
2003	A muskellunge from Lake St. Clair becomes the earliest confirmed report of Viral hemorrhagic septicemia (VHS) in the Great Lakes, although it is likely to have been introduced in 2002 or 2003. By 2009, VHS was found in all of the Great Lakes. In 2007, Budd Lake in Clare County became the first inland lake in the state confirmed to be infected by VHS.
2004	Construction begins on the permanent electrical barrier in the Chicago Sanitary and Ship Canal to prevent spread of AIS (particularly Asian carp).
2004	Michigan drafts a Hydrilla Rapid Response Plan, a rapid response case study.
2004	The Michigan and Minnesota Sea Grant Programs team together to update their "Aquatic Invasive Species – Hazard Analysis and Critical Control Point Training Curriculum."
2004	The DNR Director issues Fisheries Order 227 entitled "Waters Open and Regulations Governing the Taking of Wigglers and Crayfish for Commercial Purposes" which prohibits the take, possession, or sale of rusty crayfish anywhere in the State of Michigan.
2005	The Great Lakes Regional Collaboration releases the "Strategy to Restore and Protect the Great Lakes," which has AIS as one of its focal areas.
2005	Michigan's Invasive Species Advisory Council, whose purview includes both aquatic and terrestrial invasive species, is created. In 2007, Executive Order No. 2007-14 abolishes the Council as part of a general downsizing of committees.
2005	The DEQ Director issues a final determination regarding ballast water treatment for ocean-going vessels.
2005	Michigan enacts legislation requiring all oceangoing vessels engaging in port operations to obtain a permit from the DEQ.
2006	Michigan issues state Ballast Water Control General Permit, which requires the treatment of ballast water discharges.
2006	Bloody red mysid (<i>Hemimysis anomala</i>) is discovered in Lake Michigan.
2006	Michigan Sea Grant and DEQ team up to adapt the Clean Boats, Clean Waters Program (developed by Wisconsin's Department of Natural Resources, UW-Extension and the Wisconsin Association of Lakes) for Michigan and created the manual, "Guidelines for Clean Boats, Clean Waters – Michigan's Aquatic Invasive Species Volunteer Program."
2007	DEQ, DNR, Ducks Unlimited and other partners joined forces to initiate the multi-year Saginaw Bay Phragmites Control and Restoration Demonstration Project to investigate various control strategies. The project spurs the development of several popular publications, including "A Landowner's Guide to Invasive Phragmites Control" and "A Guide to the Control and Management of Invasive Phragmites."
2008	The USEPA issues the Vessel General Permit, which includes ballast water requirements.

Appendix A - Timeline of Significant AIS Events Relevant to Michigan (MDEQ 2013)

Date	Event
2008	The Midwest Invasive Species Information Network (MISIN), established at Michigan State University, goes online to serve as a database of invasive plant information and to geospatially track infestations.
2008	DEQ's Water Resources Division issues a General Permit for chemical control of certain invasive aquatic plants along the Great Lakes shoreline.
2008	DEQ hosts a public workshop, "Michigan's Call to Action on Aquatic Invasive Species." Over 80 stakeholders attended to discuss the various economic and environmental challenges caused by AIS.
2008	DEQ develops the Michigan Great Lakes Plan (MI-Great Lakes Plan) to protect, restore, and sustain the Great Lakes for current and future generations. More than 20 public meetings were held across the state and more than 2,000 citizens were ultimately involved in the review and comment process. One of the eight priority areas in the Plan is aquatic invasive species. The final Plan was released in January 2009.
2009	The Great Lakes Commission, working with an advisory team of experts from government, businesses and conservation groups, holds a series of workshops aimed at addressing AIS introduction and spread through Organisms in Trade.
2009	DNR Wildlife Division, in cooperation with MNFI, finalizes its invasive species strategy, "Meeting the Challenge of Invasive Plants: A Framework for Action."
2010	The State of Michigan formally creates a multi-department AIS Program using federal grant funding and for the first time has a full-time AIS Program Coordinator.
2010	The multi-year, federal Great Lakes Restoration Initiative (GLRI) is initiated to address Great Lakes priorities, including AIS prevention, early detection, rapid response, and management. In the first year alone, public and private organizations in Michigan receive grants for a dozen projects focused on AIS, totaling almost twelve million dollars in funding.
2010	DNR Fisheries Division drafts the "Proposed Plan for the Prevention, Detection, Assessment, and Management of Asian Carps in Michigan Waters," and develops related outreach materials (e.g., fact sheets and identification guides) and reporting procedures.
2010	MDNR Wildlife Division is awarded a GLRI grant from the U.S. EPA to develop and test an early detection and rapid response program for six aquatic invasive plant species.
2010	The Lake Superior Binational Program drafts the Lake Superior Complete Prevention Plan (LSCPP), the first comprehensive plan to cover an entire Great Lake basin. The LSCPP was also among the first to focus attention on vectors and pathways, rather than individual species.
2011	The federal Asian Carp Prevention and Control Act (S. 1421) is signed into law and bighead carp is added to federal injurious wildlife list (Lacey Act). Also in 2011, the federal Asian Carp Regional Coordinating Committee releases the 2001 Asian Carp Control Strategy Framework.
2011	The Great Lakes Commission convenes a 3-day symposium to discuss coordinated and strategic management and control of invasive phragmites in Michigan. The symposium draws over 120 participants from across Michigan and the Great Lakes region.
2011	Michigan establishes an Aquatic Invasive Species Advisory Council. The 19-member group includes leaders from industry, conservation organizations, and state agencies.
2012	The Great Lakes Commission and the Great Lakes and St. Lawrence Cities Initiative releases their study, "Restoring the Natural Divide: Separating the Great Lakes and Mississippi River Basins in the Chicago Area Waterway System."
2012	Michigan reissues the state ballast water control general permit.
2012	The National Park Service outfits the Ranger III with a ship-based ballast water treatment system, the first of its kind in the Great Lakes. The Ranger III provides access to Isle Royale via Houghton, Michigan.

Source: MDEQ. 2013. "Michigan's Aquatic Invasive Species State Management Plan 2013 Update: Prevention, Detection, and Management in Michigan Waters." Lansing, MI: Michigan Department of Environmental Quality - Water Resources Division.

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Appendix B

GLANSIS Database: non-indigenous species established in the Great Lakes (NOAA 2016)

Appendix B - GLANSIS Database: non-indigenous organisms considered "established" in the Great Lakes Basin (NOAA 2016)

Group	Scientific Name	Common Name
Algae	<i>Actinocyclus normanii</i> f. <i>subsalsa</i>	diatom
	<i>Bangia atropurpurea</i>	red alga
	<i>Chaetoceros muelleri</i>	diatom
	<i>Chroodactylon ornatum</i>	red alga
	<i>Contricribra guillardii</i>	diatom
	<i>Cyclotella atomus</i>	diatom
	<i>Cyclotella cryptica</i>	diatom
	<i>Cylindrospermopsis raciborskii</i>	Cyandro
	<i>Diatoma ehrenbergii</i>	diatom
	<i>Discostella pseudostelligera</i>	diatom
	<i>Discostella woltereckii</i>	Diatom
	<i>Hymenomonas roseola</i>	coccolithophorid
	<i>Pleurosira laevis</i>	diatom
	<i>Skeletonema potamos</i>	diatom
	<i>Skeletonema subsalsum</i>	Diatom
	<i>Sphacelaria fluviatilis</i>	brown alga
	<i>Sphacelaria lacustris</i>	brown alga
	<i>Stephanodiscus binderanus</i>	diatom
	<i>Stephanodiscus subtilis</i>	diatom
	<i>Thalassiosira baltica</i>	Diatom
	<i>Thalassiosira lacustris</i>	diatom
	<i>Thalassiosira pseudonana</i>	diatom
	<i>Thalassiosira weissflogii</i>	diatom
	<i>Ulva</i> (Enteromorpha) <i>flexuosa</i> subsp. <i>flexuosa</i>	green alga, grass kelp
	<i>Ulva</i> (Enteromorpha) <i>intestinalis</i>	green alga, grass kelp
	<i>Ulva</i> (Enteromorpha) <i>prolifera</i>	green alga, grass kelp, sea lettuce
Annelids-Oligochaetes	<i>Branchiura sowerbyi</i>	a tubificid worm
	<i>Gianius aquaedulcis</i>	a tubificid worm
	<i>Potamothrix bedoti</i>	a tubificid worm
	<i>Potamothrix moldaviensis</i>	a tubificid worm
	<i>Potamothrix vejdoovskyi</i>	a tubificid worm
	<i>Ripistes parasita</i>	an oligochaete
Bacteria	<i>Aeromonas salmonicida</i>	furunculosis, ulcer disease, erythrodermatitis
	<i>Piscirickettsia</i> cf. <i>salmonis</i>	Muskie pox
	<i>Renibacterium</i> (<i>Corynebacterium</i>) <i>salmoninarum</i>	bacterial kidney disease (BKD), Dee disease
Bryozoans	<i>Lophopodella carteri</i>	freshwater bryozoan
Coelenterates-Hydrozoans	<i>Cordylophora caspia</i>	freshwater hydroid
	<i>Craspedacusta sowerbyi</i>	freshwater jellyfish
Crustaceans-Amphipods	<i>Echinogammarus ischnus</i>	scud
	<i>Gammarus tigrinus</i>	amphipod
Crustaceans-Cladocerans	<i>Bosmina coregoni</i>	water flea
	<i>Bythotrephes longimanus</i>	spiny waterflea
	<i>Cercopagis pengoi</i>	fishhook waterflea
	<i>Daphnia galeata galeata</i>	waterflea
	<i>Daphnia lumholtzi</i>	a waterflea
	<i>Eubosmina maritima</i>	a cladoceran
Crustaceans-Copepods	<i>Argulus japonicus</i>	Japanese fishlouse
	<i>Cyclops strenuus</i>	Copepod
	<i>Eurytemora affinis</i>	a calanoid copepod
	<i>Heteropsyllus</i> nr. <i>nunni</i>	harpacticoid copepod
	<i>Megacyclops viridis</i>	Cyclopoid copepod

Appendix B - GLANSIS Database: non-indigenous organisms considered "established" in the Great Lakes Basin (NOAA 2016)

Group	Scientific Name	Common Name
	<i>Neoergasilus japonicus</i>	a parasitic copepod
	<i>Nitokra hibernica</i>	a harpacticoid copepod
	<i>Nitokra incerta</i>	a harpacticoid copepod
	<i>Salmincola lotae</i>	parasitic copepod
	<i>Schizopera borutzkyi</i>	oarsman
	<i>Skistodiaptomus pallidus</i>	calanoid copepod
Crustaceans-Crayfish	<i>Procambarus clarkii</i>	red swamp crayfish
Crustaceans-Mysids	<i>Hemimysis anomala</i>	bloody red shrimp
Fishes	<i>Alosa aestivalis</i>	Blueback Herring
	<i>Alosa pseudoharengus</i>	Alewife
	<i>Apeltes quadracus</i>	Fourspine Stickleback
	<i>Carassius auratus</i>	Goldfish
	<i>Cyprinus carpio</i>	Common Carp
	<i>Enneacanthus gloriosus</i>	Bluespotted Sunfish
	<i>Gambusia affinis</i>	Western Mosquitofish
	<i>Gymnocephalus cernua</i>	Ruffe
	<i>Ictiobus cyprinellus</i>	Bigmouth Buffalo
	<i>Lepisosteus platostomus</i>	Shortnose Gar
	<i>Lepomis humilis</i>	Orangespotted Sunfish
	<i>Lepomis microlophus</i>	Redear Sunfish
	<i>Misgurnus anguillicaudatus</i>	Oriental Weatherfish
	<i>Morone americana</i>	White Perch
	<i>Neogobius melanostomus</i>	Round Goby
	<i>Notropis buchanani</i>	Ghost Shiner
	<i>Oncorhynchus gorbuscha</i>	Pink Salmon
	<i>Oncorhynchus kisutch</i>	Coho Salmon
	<i>Oncorhynchus mykiss</i>	Rainbow Trout
	<i>Oncorhynchus nerka</i>	Sockeye Salmon
	<i>Oncorhynchus tshawytscha</i>	Chinook Salmon
	<i>Petromyzon marinus</i>	Sea Lamprey
	<i>Phenacobius mirabilis</i>	Suckermouth Minnow
	<i>Proterorhinus semilunaris</i>	Freshwater Tubenose Goby
	<i>Salmo trutta</i>	Brown Trout
	<i>Scardinius erythrophthalmus</i>	Rudd
Insects	<i>Acentria ephemerella</i>	(European) aquatic/water moth
	<i>Tanysphyrus lemnae</i>	duckweed/aquatic weevil
Mollusks-Bivalves	<i>Corbicula fluminea</i>	Asian clam
	<i>Dreissena polymorpha</i>	zebra mussel
	<i>Dreissena rostriformis bugensis</i>	quagga mussel
	<i>Pisidium amnicum</i>	greater European peaclam
	<i>Pisidium henslowanum</i>	Henslow peaclam
	<i>Pisidium moitessierianum</i>	pygmy peaclam
	<i>Pisidium supinum</i>	humpbacked peaclam
	<i>Sphaerium corneum</i>	European fingernail clam
Mollusks-Gastropods	<i>Bithynia tentaculata</i>	mud bithynia, faucet snail
	<i>Cipangopaludina chinensis malleata</i>	Chinese mysterysnail
	<i>Cipangopaludina japonica</i>	Japanese mysterysnail
	<i>Elimia virginica</i>	Piedmont elimia
	<i>Gillia altilis</i>	buffalo pebblesnail
	<i>Potamopyrgus antipodarum</i>	New Zealand mudsnail
	<i>Radix auricularia</i>	European ear snail

Appendix B - GLANSIS Database: non-indigenous organisms considered "established" in the Great Lakes Basin (NOAA 2016)

Group	Scientific Name	Common Name
	<i>Valvata piscinalis</i>	European stream valvata
	<i>Viviparus georgianus</i>	banded mysterysnail
Plants	<i>Agrostis gigantea</i>	redtop
	<i>Alnus glutinosa</i>	black alder
	<i>Alopecurus geniculatus</i>	water foxtail
	<i>Butomus umbellatus</i>	flowering rush
	<i>Cabomba caroliniana</i>	Carolina fanwort
	<i>Carex acutiformis</i>	lesser pond sedge
	<i>Carex disticha</i>	tworank sedge
	<i>Chenopodium glaucum</i>	oak-leaved goosefoot
	<i>Cirsium palustre</i>	marsh thistle
	<i>Conium maculatum</i>	poison hemlock
	<i>Echinochloa crus-galli</i>	barnyard grass
	<i>Epilobium hirsutum</i>	great hairy willow herb
	<i>Frangula alnus</i>	glossy buckthorn
	<i>Glyceria maxima</i>	reed mannagrass
	<i>Hydrocharis morsus-ranae</i>	European frogbit
	<i>Impatiens glandulifera</i>	ornamental jewelweed
	<i>Iris pseudacorus</i>	yellow iris
	<i>Juncus compressus</i>	flattened rush
	<i>Juncus gerardii</i>	black-grass rush
	<i>Juncus inflexus</i>	European meadow rush
	<i>Lupinus polyphyllus</i>	bigleaf lupine
	<i>Lycopus asper</i>	rough water-horehound
	<i>Lycopus europaeus</i>	gypsywort
	<i>Lysimachia nummularia</i>	moneywort
	<i>Lysimachia vulgaris</i>	garden yellow loosestrife
	<i>Lythrum salicaria</i>	purple loosestrife
	<i>Marsilea quadrifolia</i>	European water-clover
	<i>Mentha spicata</i>	spearmint
	<i>Mentha x gracilis [arvensis x spicata]</i>	gingermint
	<i>Myosotis scorpioides</i>	true forget-me-not
	<i>Myosoton aquaticum</i>	giant chickweed
	<i>Myriophyllum spicatum</i>	Eurasian watermilfoil
	<i>Najas marina</i>	spiny waternymph
	<i>Najas minor</i>	brittle waternymph
	<i>Nasturtium officinale</i>	water-cress
	<i>Nitellopsis obtusa</i>	starry stonewort
	<i>Nymphoides peltata</i>	yellow floating-heart
	<i>Persicaria maculosa</i>	spotted ladythumb
	<i>Phalaris arundinacea</i>	reed canary grass
	<i>Phragmites australis australis</i>	common reed
	<i>Pistia stratiotes</i>	water lettuce
	<i>Pluchea odorata</i>	sweetscent
	<i>Pluchea odorata</i>	sweetscent
	<i>Poa trivialis</i>	rough-stalked meadow grass
	<i>Potamogeton crispus</i>	curly-leaf pondweed
	<i>Puccinellia distans</i>	weeping alkali grass
	<i>Rorippa sylvestris</i>	creeping yellow cress
	<i>Rumex longifolius</i>	yard dock
	<i>Rumex obtusifolius</i>	bitter dock

Appendix B - GLANSIS Database: non-indigenous organisms considered "established" in the Great Lakes Basin (NOAA 2016)

Group	Scientific Name	Common Name
	Salix alba	white willow
	Salix purpurea	purple willow
	Salix x fragilis	crack willow
	Solanum dulcamara	bittersweet nightshade
	Solidago sempervirens	Seaside goldenrod
	Sparganium glomeratum	northern bur-reed
	Trapa natans	water chestnut
	Typha angustifolia	narrow-leaved cattail
	Veronica beccabunga	European speedwell
Platyhelminthes	Dactylogyrus amphibothrium	a monogenetic fluke
	Dactylogyrus hemiamphibothrium	a monogenetic fluke
	Dugesia polychroa	a flatworm
	Ichthyocotylurus pileatus	a digenean fluke
	Neascus brevicaudatus	a digenean fluke, trematode
	Scolex pleuronectis	cestode
	Timoniella sp.	a digenean fluke, trematode
Protozoans	Acineta nitocrae	a suctorian ciliate
	Glugea hertwigi	a microsporidian parasite
	Heterosporis sp.	Microsporidian parasite
	Myxobolus cerebralis	myxosporean parasite, salmonid whirling disease
	Psammonobiotus communis	testate amoeba
	Psammonobiotus dziwnowi	testate amoeba
	Psammonobiotus linearis	testate amoeba
	Sphaeromyxa sevastopoli	Myxosporean parasite
	Trypanosoma acerinae	a flagellate parasite
Viruses	Novirhabdovirus sp. genotype IV sublineage b	Viral Hemorrhagic Septicemia Virus (VHSV-IVb)
	Ranavirus	Largemouth bass virus (LMBV)
	Rhabdovirus carpio	spring viremia of carp (SVC)

Source: NOAA 2016. "Great Lakes Aquatic Non-Indigenous Species Information System (GLANSIS)." National Oceanic and Atmospheric Administration (NOAA): Great Lakes Environmental Research Laboratory. <http://nas.er.usgs.gov/queries/greatlakes/Search.aspx>.

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Appendix C
AIS Management Plan – Implementation Table

Goal 1: Establish & Strengthen Strategic Partnerships and Collaborative Efforts

Objective	Strategic Action	Measure of Success	Target Date	Cooperating Agency or Organization	Estimated Cost	Funding Source	Status
Objective 1.1: Align with, Leverage, and Engage with Ongoing AIS Efforts in GTB Territory	Strategy 1.1a: Draft a <i>Phragmites Control Ordinance</i> consistent with ordinances enacted by overlapping jurisdictions. Present to TC. Evaluate the <i>MDEQ's Phragmites Treatment/Management Prioritization Tool</i> and determine if GTB can benefit from using this tool to identify specific areas important to GTB's interests.	Phragmites Control Ordinance & TC approval. Determination to use/not use MDEQ's tool.	1-Dec-2018	Leelanau County, and townships within Leelanau County	\$10,000	USFWS - GLRI AIS	Will apply
	Strategy 1.1b: Evaluate if practices at GTB-operated marinas are consistent with current Michigan ballast water legislation. Determine if vessels utilizing these facilities are complying with current Michigan ballast water legislation. If needed, develop policies necessary for GTB-operated marinas to be in compliance with current Michigan ballast water legislation; present to TC. Evaluate if state-recommended BMPs relating to recreational boating and angling are used at GTB-operated marinas. Consider using the <i>2015 Michigan AIS and Boating Survey Report</i> (Lee et al 2015) as a model of how to survey GTB-operated marinas. If needed, develop a tribal program that promotes and enforces state-recommended BMPs that prevent introduction/movement of AIS through recreational equipment and angling.	Enforce ballast water policies at GTB-operated marinas. Promote/enforce use of BMPs that prevent introduction/movement of AIS through recreational equipment and angling.	1-Sep-2019	N/A	\$20,000	USFWS - GLRI AIS	Will apply
	Strategy 1.1c: Engage with the following Michigan Cooperative Invasive Species Management Areas (CISMAs): North Country CISMA, C.A.K.E. CISMA, and NW Michigan ISN. Communicate GTBs perspectives/priorities to the CISMAs. Work with CISMAs in efforts that benefit GTB.	Attend one IAS per CISMA per calendar year	1-Sep-2019	North Country CISMA, CAKE CISMA, NW Michigan ISN	\$10,000	USFWS - GLRI AIS	Will apply
	Strategy 1.1d: Evaluate the need for a <i>AIS Rapid Response Plan</i> within GTB's territory that could be incorporated into State/Federal Plans.	Summarize results and present to TC	1-Sep-2019	MDEQ, MDNR, USFWS	\$10,000	USFWS - GLRI AIS	Will apply
	Strategy 1.1e: Review and summarize ongoing GTB-NRD programs/contracts with MDNR/USFWS. Identify future opportunities and needs.	List of ongoing programs/contracts. List of future opportunities/needs	1-Dec-2019	MDNR/USFWS	\$5,000	USFWS - GLRI AIS	Will apply
	Strategy 1.1f: Identify and seek opportunities to become a partner with MDNR and USFWS in regional projects for the prevention of AIS introduction and Early Detection & Rapid Response (EDRR) efforts. Provide GTB-ND perspective. Work with MDNR and USFWS in EDRR efforts that support GTB.	Collaborate with MDNR and USFWS regional AIS efforts	1-Sep-2019	MDNR/USFWS	\$5,000	USFWS - GLRI AIS	Will apply

Goal 1: Establish & Strengthen Strategic Partnerships and Collaborative Efforts

Objective	Strategic Action	Measure of Success	Target Date	Cooperating Agency or Organization	Estimated Cost	Funding Source	Status
Objective 1.2: Develop a communication plan with AIS partners.	Strategy 1.2a: Establish regular communication with MDNR. Address the need to be notified of planned interagency AIS efforts.	Establish correspondence.	Twice per calendar year	MDNR	\$1,000	USFWS - GLRI AIS	Will apply
	Strategy 1.2b: Establish regular communication with USFWS. Address the need to be notified of planned interagency AIS efforts.	Establish correspondence.	Twice per calendar year	USFWS	\$1,000	USFWS - GLRI AIS	Will apply
	Strategy 1.2c: Establish regular communication with GLFC. Address the need to be notified of planned interagency AIS efforts.	Establish correspondence.	Twice per calendar year	GLFC	\$1,000	USFWS - GLRI AIS	Will apply
Objective 1.3: Track ASI Legislative Action with the potential to impact treaty rights.	Strategy 1.3a: Establish regular communication with the Michigan Environmental Council (MEC) Northern Michigan Region. Establish plan to track ASI legislatives issues that can have an impact on treaty issues.	Schedule a meeting or call 2 times per calendar year.	Twice per calendar year	MEC	\$1,000	USFWS - GLRI AIS	Will apply

Goal 2: Collaborate and Engage with Sea Lamprey Control Efforts

Objective	Strategic Action	Measure of Success	Target Date	Cooperating Agency or Organization	Estimated Cost	Funding Source	Status
Objective 2.1: Collaborate with Ongoing Sea Lamprey Control Efforts.	Strategy 2.1a: Continue efforts/renew contract with USFWS-Marquette Field Office to operate sea lamprey traps (spawning phase) on the Boardman River and Betsie Rivers and conduct mark/recapture surveys.	Operate sea lamprey traps and conduct mark/recapture surveys for 2017-2019	Jul-31 annually	USFWS	\$12,500 Annualy	USFWS	Ongoing
	Strategy 2.1b: Continue partnership with the Great Lakes Fisheries Commission's (GLFC) two-way fish passage structure project at Union Dam.	GTB NRD Staff participation in project activities	As needed	GLFC	\$40,000	EPA- BIA GLRI	Ongoing
	Strategy 2.1c: Develop innovative strategies for sea lamprey control at lowermost barriers that simultaneously provide passage for native species. Meet with USFWS partners to evaluate strategies and possible implementation.	List of strategies and schedule meeting with USFWS	1-Dec-2019	USFWS	\$5,000	EPA- BIA GLRI	Ongoing
Objective 2.2: Continue GTB-NRD's Sea Lamprey wounding data collection.	Strategy 2.2a: Continue collecting sea lamprey wounding data from Tribal commercial fishing operations and GBT-NRD's assessment sampling. Incorporate data into models used to generate harvest limits across Treaty waters.	Generate harvest limits for the year.	1-Dec-2016	GTB-NRD	\$50,000	BIA & Consent Decree Trust Fund	Ongoing

Goal 3: Secure Funding for Implementing the AIS Management Plan

Objective	Strategic Action	Measure of Success	Target Date	Cooperating Agency or Organization	Estimated Cost	Funding Source	Status
Objective 3.1: Secure Funding for Implementing the AIS Management Plan.	Strategy 3.1a: Identify and evaluate all sources of funding available to support GTB's goals and objectives described in the ASI Management Plan.	List of potential funding sources	1-Dec-2016	N/A	\$5,000	EPA-BIA GLRI Tribal Capacity	Will Apply
	Strategy 3.1b: Identify priority resource needs/targeted efforts and new funding opportunities related to these priorities.	List of resources needs/targeted efforts	1-Dec-2016	N/A	\$5,000	EPA-BIA GLRI Tribal Capacity	Will Apply
	Strategy 3.1c: Evaluate currently funded programs and identify opportunities for these funds to be re-allocated to address specific AIS issues and priorities of the AIS Management Plan.	Re-allocate funds if possible	1-Dec-2016	N/A	\$5,000	EPA-BIA GLRI Tribal Capacity	Will Apply
Objective 3.2: Secure Funding to Increase Staff Capacity of the GTB-NRD.	Strategy 3.2a: Identify all sources of funding available to fund one (1) new full-time position to be the dedicated AIS Staff within the GTB-NRD.	Fund one (1) full-time position	1-Dec-2016	N/A	\$40,000	MI AIS program, BIA Noxious Weed Program, USDA-NRCS	Will Apply
	Strategy 3.2b: Define specific responsibilities of AIS Staff position.	Position description	1-Dec-2016	N/A	\$5,000	EPA-BIA GLRI Tribal Capacity	Will Apply

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**Appendix D
Prohibited/Restricted Aquatic Species (MDEQ 2013)
&
Watch List Species (MI AIS Program 2015)**

Table C-1. Federal and State Regulated Species Lists: Aquatic Plants.

Species	Federal Laws		State of Michigan Laws			Distribution in the State of Michigan ¹	Comments
	Federal Noxious Weeds List ²	Title 18, Section 46 of U.S. Code ³	Part 413 of NREPA ⁴	State Noxious Weeds List ⁵	1995 PA 182 ⁶		
African oxygen weed (<i>Lagarosiphon major</i>)	X		P			Absent	
Alligator weed or grass (<i>Alternanthera philoxeroides</i>)		X				Absent	
Anchored water hyacinth (<i>Eichhornia azurea</i>)	X					Absent	See below for the related <i>Eichhornia crassipes</i> under 'water hyacinth'
Arrowleaf false pickerelweed (<i>Monochoria hastata</i>)	X					Absent	
Asian marshweed (<i>Limnophila sessiliflora</i>)	X					Absent	
Brazilian waterweed (<i>Egeria densa</i>)			P			Absent	Isolated populations in MN, IN, IL, and OH.
Curly leaf pondweed (<i>Potamogeton crispus</i>)			R			Widespread	Common, especially in the lower peninsula.
Cylindro (<i>Cylindrospermopsis raciborskii</i>)			P			Isolated	Recorded in several drowned river mouths in the Lake Michigan basin.
Duck lettuce (<i>Ottelia alismoides</i>)	X					Absent	
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)			R			Widespread	Common, especially in the lower peninsula.
European frogbit (<i>Hydrocharis morsus-ranae</i>)			P			Locally Abundant	Herbarium records exist for several southeast counties and the Saginaw Bay area; nine locations were field verified through 2012; likely fairly widespread in SE MI but not in high densities.

Table C-1. Federal and State Regulated Species Lists: Aquatic Plants.

Species	Federal Laws		State of Michigan Laws			Distribution in the State of Michigan ¹	Comments
	Federal Noxious Weeds List ²	Title 18, Section 46 of U.S. Code ³	Part 413 of NREPA ⁴	State Noxious Weeds List ⁵	1995 PA 182 ⁶		
Fanwort (<i>Cabomba caroliniana</i>)			P			Locally Abundant	Recorded in several dozen inland lakes in lower peninsula; present in IN, IL, OH, and ONT
Flowering rush (<i>Butomus umbellatus</i>)			R			Locally Abundant	Two dozen observations confirmed in the field in southeast Michigan, both inland and coastal; also identified in MN, WI, IN, IL, OH, and ONT.
Giant hogweed ⁷ (<i>Heracleum mantegazzianum</i>)	X		P	X		Isolated	Found scattered throughout the Lower Peninsula and western Upper Peninsula; some occurrences have been controlled.
Giant salvinia (<i>Salvinia molesta, auriculata, biloba, or herzogii</i>)	X		P			Absent	
Hawaii arrowhead (<i>Sagittaria sagittifolia</i>)	X					Absent	
Heartshape false pickerelweed (<i>Monochoria vaginalis</i>)	X					Absent	
Hydrilla or waterhyme (<i>Hydrilla verticillata</i>)	X		P			Absent	Isolated populations in IN, WI, and OH.
Indian hygrophila (<i>Hygrophila polysperma</i>)	X					Absent	
Japanese knotweed (<i>Fallopia japonica</i>)			P			Widespread	Scattered throughout lower and upper peninsulas
Killer algae (<i>Caulerpa taxifolia</i>)	X					Absent	

Table C-1. Federal and State Regulated Species Lists: Aquatic Plants.

Species	Federal Laws		State of Michigan Laws			Distribution in the State of Michigan ¹	Comments
	Federal Noxious Weeds List ²	Title 18, Section 46 of U.S. Code ³	Part 413 of NREPA ⁴	State Noxious Weeds List ⁵	1995 PA 182 ⁶		
Mosquito fern (<i>Azolla pinnata</i>)	X					Absent	
Parrot feather (<i>Myriophyllum aquaticum</i>)			P			Absent	Isolated populations in IN, IL, OH, PA, and NY.
Phragmites or common reed (<i>Phragmites australis</i>)			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 and southern UP along Lake Michigan shoreline. Often confused with native subspecies, or found intermixed.
Punktree or broadleaf paper bark tree (<i>Melaleuca quinquenervia</i>)	X					Absent	
Purple loosestrife (<i>Lythrum salicaria</i>)			R ⁸		X	Widespread	Biological control is reducing populations statewide.
Simplestem bur-reed (<i>Sparganium erectum</i>)	X					Absent	
Starry stonewort (<i>Nitellopsis obtusa</i>)			P			Locally Abundant	Recorded in over one hundred inland waterbodies, mostly in southern peninsula.
Swamp morning-glory (<i>Ipomoea aquatica</i>)	X					Absent	
Water chestnut (<i>Trapa natans</i>)		X	P			Absent	Observations in PA and NY.

Table C-1. Federal and State Regulated Species Lists: Aquatic Plants.

Species	Federal Laws		State of Michigan Laws			Distribution in the State of Michigan ¹	Comments
	Federal Noxious Weeds List ²	Title 18, Section 46 of U.S. Code ³	Part 413 of NREPA ⁴	State Noxious Weeds List ⁵	1995 PA 182 ⁶		
Water hyacinth (<i>Eichhornia crassipes</i>)		X				Isolated	Six populations verified in southeast Michigan in 2012 (not verified as overwintering). Also see above for related species, Anchored water hyacinth (<i>Eichhornia azurea</i>)
Wetland nightshade (<i>Solanum tampicense</i>)	X					Absent	
Yellow floating heart (<i>Nymphoides peltata</i>)			P			Absent	Isolated populations in WI, IL, IN, OH, and ONT.

¹ State-wide distribution based on best available knowledge. Intensive state-wide surveillance has not been conducted for some species; those marked as “absent” may be merely undetected. Categories: Absent; Isolated; Locally Abundant; Widespread.

² Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 *et seq.*): http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds

The species found on the federal noxious weed list are not necessarily non-native. Species displayed in Table C-1 are those federally-listed noxious weeds that are categorized as “aquatic/wetland” by the U.S. Department of Agriculture (as of May 1, 2010). Presence in this column does not imply that the species could become naturalized in Michigan. It would be a federal offense to transport any of noxious weeds across state lines.

³ Title 18, Section 46 of the U.S. Code, entitled “Transportation of water hyacinths,” prohibits knowingly transporting three species in interstate commerce.

⁴ Part 413, Transgenic and Nonnative Organisms, of the Natural Resources and Environmental Protection Act, Act 451 of 1994: <http://legislature.mi.gov/doc.aspx?mcl-451-1994-III-2-1-WILDLIFE-CONSERVATION-413>. Definitions of Prohibited (“P”) and Restricted (“R”) can be found in the statute.

⁵ Act 359 of 1941, Noxious Weeds: <http://legislature.mi.gov/doc.aspx?mcl-Act-359-of-1941>

⁶ The Insect Pest and Plant Disease Act, Act 189 of 1931: <http://legislature.mi.gov/doc.aspx?mcl-Act-189-of-1931>

⁷ The National Wetland Indicator status is facultative, meaning the species is equally likely to occur in wetlands or non-wetlands. Giant hogweed is often associated with wet areas in Michigan.

⁸ Certain sterile cultivars are exempt (see Part 413 for details), however no sterile cultivars have been proposed to, or approved by, the state.

Table C-2. Federal and State Regulated Species Lists: Aquatic Animals.

Species	Federal Laws	State of Michigan Laws			Distribution in the State of Michigan ¹	Comments
	Lacey Act ²	Part 413 of NREPA ³	DNR Admin. Rule 299.1052 ⁴	DNR FO 227 ⁵		
Crustaceans						
Mitten Crab (genus <i>Eriocheir</i> - 3 species)	X				Absent	Isolated occurrences in the Great Lakes, including the Detroit River, Lake Erie, and Lake Superior (though not in Michigan waters).
Rusty crayfish (<i>Orconectes rusticus</i>)		P		X	Widespread	Widespread and breeding in inland waters.
Fishes						
Bighead carp (<i>Hypophthalmichthys nobilis</i>)	X	P			Absent	Several isolated, historical specimens were collected from western Lake Erie (Ohio), however no established population.
Bitterling (<i>Rhodeus sericeus</i>)		P	X		Absent	
Black carp (<i>Mylopharyngodon piceus</i>)	X	P			Absent	
Eurasian ruffe (<i>Gymnocephalus cernuus</i>)		P			Locally Abundant	Patchy distribution in the Great Lakes, absent from inland waters.
Grass carp (<i>Ctenopharyngodon idellus</i> or <i>idella</i>)		P	X		Isolated	Isolated collection from Michigan inland waters; no evidence of breeding.
Ide (<i>Leuciscus idus</i>)		P	X		Absent	
Japanese weatherfish (<i>Misgurnus anguillicaudatus</i>)		P	X		Isolated	Single breeding population in the Shiawassee River.
Largescale silver carp (<i>Hypophthalmichthys harmandi</i>)	X				Absent	
Round goby (<i>Neogobius melanostomus</i>)		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.

Table C-2. Federal and State Regulated Species Lists: Aquatic Animals.

Species	Federal Laws	State of Michigan Laws			Distribution in the State of Michigan ¹	Comments
	Lacey Act ²	Part 413 of NREPA ³	DNR Admin. Rule 299.1052 ⁴	DNR FO 227 ⁵		
Rudd (<i>Scardinius erythrophthalmus</i>)		P	X		Absent	Isolated collections on the Ontario side of Lake St. Clair.
Silver carp (<i>Hypophthalmichthys molitrix</i>)	X	P			Absent	
Snakehead family (family Channidae)	X	P			Absent	
Tench (<i>Tinca tinca</i>)		P	X		Absent	
Tube-nose goby (<i>Proterorhinus marmoratus</i>)		P			Isolated	Isolated, established populations in the St. Clair River, Lake St. Clair, Detroit River, and western Lake Erie.
Walking catfish (family Clariidae - 13 genera, ~100 species)	X				Absent	
Mammals						
Nutria (<i>Myocastor coypus</i>)		P			Absent	Farmed in Michigan in the 1930s; accidentally released but did not survive.
Mollusks						
New Zealand mud snail (<i>Potamopyrgus antipodarum</i>)		P			Isolated	
Quagga mussel (<i>Dreissena bugensis</i>)		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.
Zebra mussel (<i>Dreissena polymorpha</i>)	X	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.

¹ State-wide distribution based on best available knowledge. Intensive state-wide surveillance has not been conducted for some species; those marked as “absent” may be merely undetected. Categories: Absent; Isolated; Locally Abundant; Widespread.

² Lacey Act: http://www.aphis.usda.gov/plant_health/lacey_act or <http://www.fws.gov/injuriouswildlife>.

³ Part 413, Transgenic and Nonnative Organisms, of the Natural Resources and Environmental Protection Act, Act 451 of 1994: <http://legislature.mi.gov/doc.aspx?mcl-451-1994-III-2-1-WILDLIFE-CONSERVATION-413>. Definitions of Prohibited (“P”) and Restricted (“R”) can be found in the statute. The New Zealand mud snail was added to Part 413 through a DNR Director’s Order, entitled Invasive Species Order Amendment No. 1 of 2009.

⁴ DNR Fisheries Division Administrative Rule 299.1052 (Importation and Transportation of Fish and Eggs): http://www.michigan.gov/dnr/0,4570,7-153-10366_37141---,00.html.

⁵ DNR Fisheries Order 227 (Waters Open and Regulations Governing the Taking of Wigglers and Crayfish for Commercial Purposes): http://www.michigan.gov/dnr/0,1607,7-153-10366_37141-237033--,00.html.

Invasive Species Reporting in Michigan

The following information is presented as a guide for reporting occurrences of select invasive species of concern in Michigan.

Invasive Species “Watch List”

The invasive species included on the watch list are priority species that have been identified as posing an immediate and significant threat to Michigan’s natural resources. These species have either never been confirmed in Michigan or have very limited distribution, or are localized. Early detection and timely reporting of occurrences of these species is crucial for increasing the likelihood of stopping an invasion and limiting negative ecological and economic impacts. Species are listed below by category. The invasive species below should be reported immediately and directly to staff. Please use the contacts below each category to report a possible detection of a watch list species.

Insects and Tree Diseases (Tree diseases list the scientific name for the pathogen or fungus associated with the disease):

- Asian longhorned beetle (*Anoplophora glabripennis*)
- Balsam woolly adelgid (*Adelges piceae*)
- Hemlock woolly adelgid (*Adelges tsugae*)
- Thousand cankers disease (*Geosmithia morbida*)

REPORT the species above to John Bedford – MDARD Plant Industry Section, bedfordj@michigan.gov, 517-284-5650

Mammals:

- Nutria (*Myocastor coypus*)

REPORT the species above to Sue Tangora – DNR Wildlife Division, tangoras@michigan.gov, 517-284-6223

Terrestrial Plants:

- Asiatic sand sedge (*Carex kobomugi* Ohwi)
- Chinese yam (*Dioscorea oppositifolia* L.)
- Himalayan balsam (*Impatiens glandulifera*)
- Japanese stiltgrass (*Microstegium vimineum* (Trin.) A. Camus)
- Kudzu (*Pueraria montana* var. *lobata*)
- Mile-a-minute weed (*Persicaria perfoliata*)

REPORT the species above to Sue Tangora – DNR Wildlife Division, tangoras@michigan.gov, 517-284-6223

Aquatic Plants:

- Parrot feather (*Myriophyllum aquaticum*)
- Yellow Floating Heart (*Nymphoides peltata*)
- European frog-bit (*Hydrocharis morsus-ranae*)

- European Water-clover (*Marsilea quadrifolia*) – **This species is currently allowable for sale and possession. Please contact the DNR if these plants are observed outside of cultivation.**
- Brazilian elodea (*Egeria densa*)
- Hydrilla (*Hydrilla verticillata*)
- Water chestnut (*Trapa natans*)
- Water hyacinth (*Eichhornia crassipes*) – **This species is currently allowable for sale and possession. Please contact the DNR if these plants are observed outside of cultivation.**
- Water lettuce (*Pistia stratiotes*) – **This species is currently allowable for sale and possession. Please contact the DNR if these plants are observed outside of cultivation.**
- Water soldier (*Stratiotes aloides*)

REPORT the species above to Sue Tangora – DNR Wildlife Division, tangoras@michigan.gov, 517-284-6223

Fish and other Aquatic Animals:

- Asian carps
 - Silver carp (*Hypophthalmichthys molitrix*)
 - Bighead carp (*Hypophthalmichthys nobilis*)
 - Grass carp (*Ctenopharyngodon idella*)
 - Black carp (*Mylopharyngodon piceus*)
- Northern snakehead (*Channa argus*)
- Red swamp crayfish (*Procambarus clarkii*)
- New Zealand mudsnail (*Potamopyrgus jenkinsi*)

REPORT the species above to Seth Herbst – DNR Fisheries Division, herbstS1@michigan.gov, 517-284-5841 or for Asian carp report electronically at www.michigan.gov/asiancarp

For more information, please refer to:

MI DNR Invasive Species website – www.Michigan.gov/InvasiveSpecies

MI DEQ Aquatic Invasive Species website – www.Michigan.gov/AquaticInvasives

MI DARD Invasive Species website - www.michigan.gov/exoticpests

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