

# Michigan's Aquatic Invasive Species Program

Michigan Wetlands Association  
February 11, 2013

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Aquatic Invasive Species Program  
DEQ Water Resources Division



Photo credit: MI Sea Grant



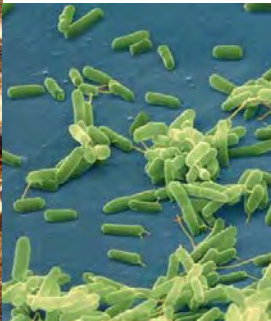
# Outline

- Definition of Aquatic Invasive Species (AIS)
- AIS State Management Plan
  - How does this impact wetlands
- AIS Program
  - AIS Core Team
  - AIS Advisory Council



# What Are Aquatic Invasive Species?

- A species that is **not native** and whose introduction causes, or is likely to cause, economic or environmental **harm** or harm to human health.







# Great Lakes Aquatic Nonindigenous Species Information System

<http://www.glerl.noaa.gov/Programs/glansis/glansis.html>



## Some of the 181 Non-Native Species Established in the Great Lakes



## GLANSIS

A one-stop source for information about non-indigenous species in the Great Lakes region!

GLANSIS ENHANCEMENTS 2010-2011

The GLANSIS project has received funding under the Great Lakes Restoration Initiative (GLRI) for several improvements in support of early detection and rapid response.

- Addition of 'range expansion' species—those native to one portion of the Great Lakes but are considered invasive to other portions of the basin.
- Addition of high priority 'watchlist' species—those that have been identified in the literature as high risk for invading and becoming established in the Great Lakes.
- Updated and consistent 'impact' information allowing cross-species comparisons that are better able to support risk assessment and management.
- Addition of management information—regulations, best management practices, and control methodologies—for all the species in the database.
- Enhanced bibliographic information. (JL-IN Sea Grant)
- Addition of non-technical fact sheets for priority species of public interest. (JL-IN Sea Grant)



GLANSIS NEEDS  
Your Verified Reports

Send reports to:  
Dr. Rochelle Sturtevant  
[rochelle.sturtevant@noaa.gov](mailto:rochelle.sturtevant@noaa.gov)  
NOAA Great Lakes Environmental  
Research Laboratory  
4840 South State Road  
Ann Arbor, MI 48108  
734-741-2235  
[www.glerl.noaa.gov](http://www.glerl.noaa.gov)

# Pop quiz:

- What are the two most recent AIS verified as being established in the Great Lakes basin?

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Viral hemorrhagic septicemia (VHS)



Bloody-red shrimp  
(*Hemimysis anomala*)



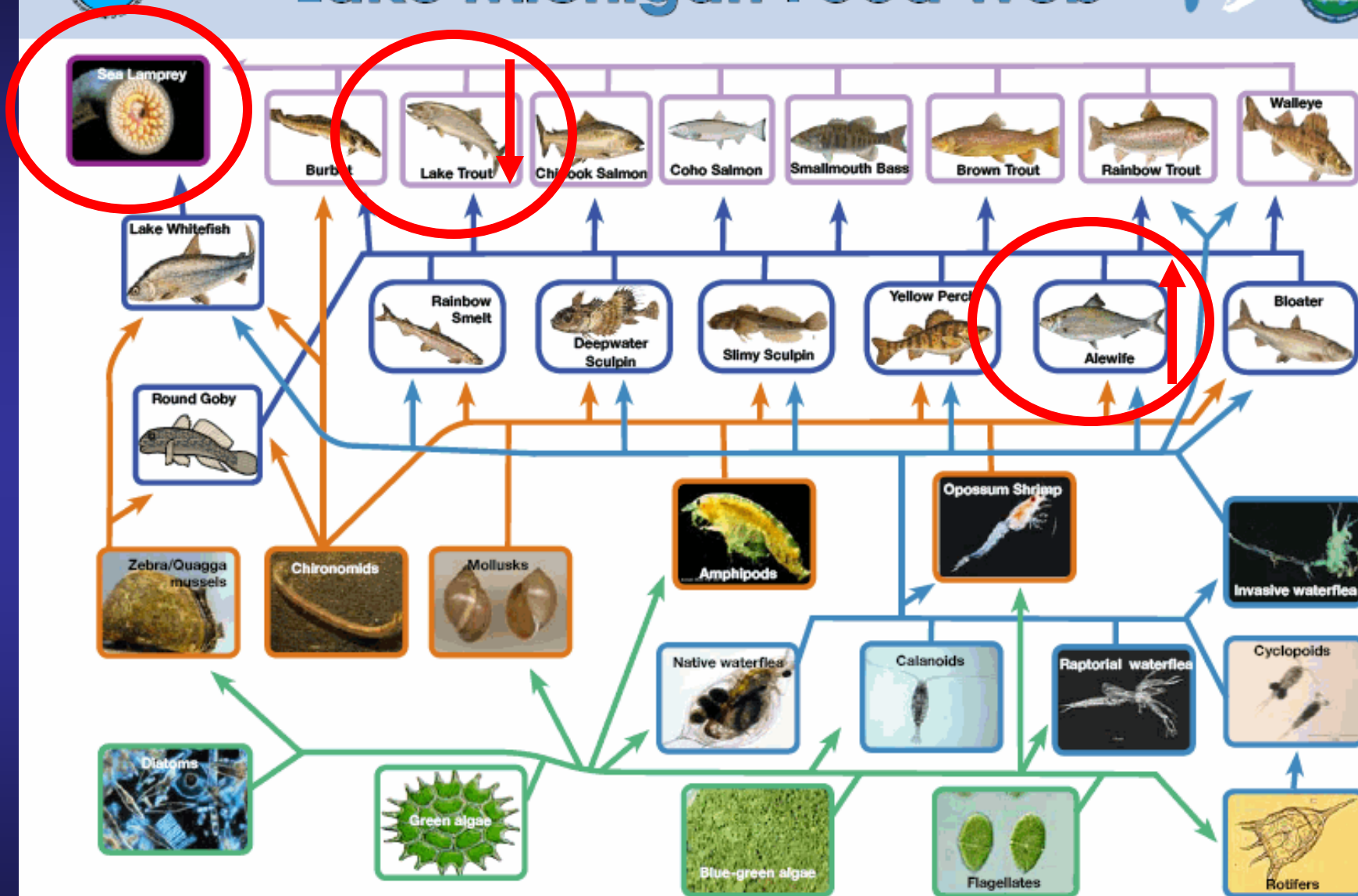


# Why care about Aquatic Invasive Species?

- Compete with native species for food and habitat or indirectly harm native species.
  - Effect diversity and abundance of native species
  - Alter foodweb
- Economic effects
  - Decreased commercial and recreational fisheries
  - Decrease property values
  - Decreased tourism
  - Effects on utilities and other industries



# Lake Michigan Food Web



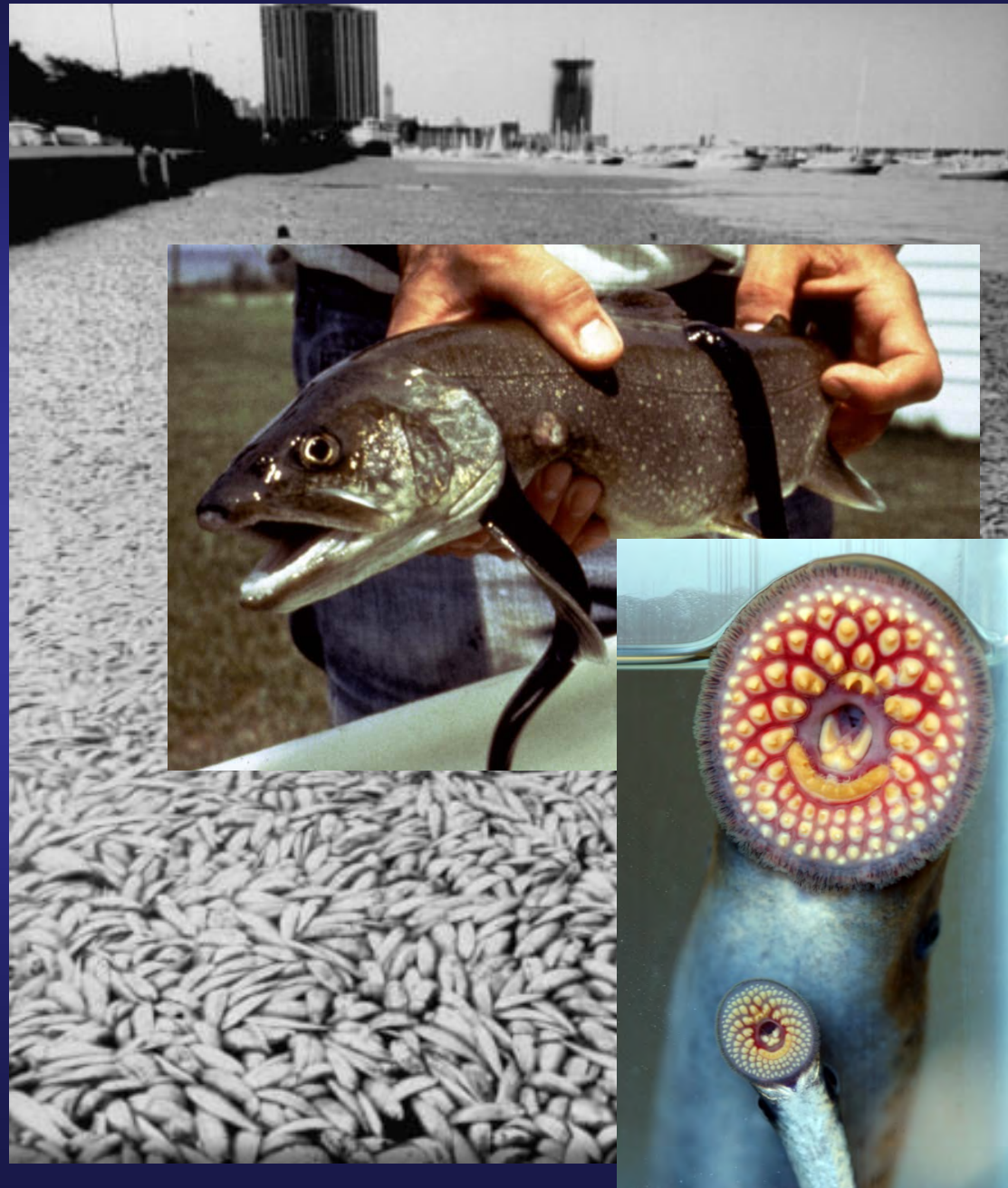
Foodweb based on "Impact of exotic invertebrate invaders on food web structure and function in the Great Lakes: A network analysis approach" by Mason, Krause, and Ulanowicz, 2002 - Modifications for Lake Michigan, 2009.

NOAA, Great Lakes Environmental Research Laboratory, 4840 S. State Road, Ann Arbor, MI 734-741-2235 - [www.glerl.noaa.gov](http://www.glerl.noaa.gov)



# Sea lamprey

- Major impacts to the food web
  - Collapse of the lake trout fishery
  - Explosion and collapse of the alewife population
- Now under control with management efforts costing **\$20 million each year**. For over 30 years and into the future!





# Phragmites

## Common reed

Photo credit: MI Sea Grant

- Crowds out native plants and animals
- Effects property values
- Reduces access for recreation
- Creates fire hazard





# Costs of management and control of AIS

**\$20M/year**



**\$10M/year**



**\$25M/year**



**Total = over \$2.5 billion  
over 20 years**



# Pop Quiz

What is the cost of the two most recent AIS verified as being established in the Great Lakes basin?



Viral hemorrhagic  
septicemia (VHS)



Bloody-red shrimp  
(*Hemimysis anomala*)



# Pop Quiz



Viral hemorrhagic  
septicemia (VHS)

**“\$ tens of millions  
staff time, lost  
hatchery capacity,  
and  
research”**



Bloody-red shrimp  
(*Hemimysis anomala*)

**“\$1.2 million on  
research projects and  
to develop diagnostic  
tests”**

**\$ ?**

# Total costs of AIS

**All AIS in GL  
region**

**\$5.7 billion  
per year**

Economic losses due to AIS  
caused ecological impacts  
(damages) + management and  
control costs =  
the total economic impact

**GL fishery  
\$4.5 billion  
per year**

**Aquatic +  
terrestrial  
invasive species  
nationally  
\$137 billion/year**





Invasion

process

Introduction from  
pathway



Establishment



Spread within GL



Ecological impact

# Management Options

Prevention (focused on pathways of introduction)

Surveillance –early detection and rapid response

Containment , Control, Eradication  
(Integrate pest management)

Adaptation



# Aquatic Invasive Species Program Priorities

- AIS State Management Plan update and implementation (1996, 2002, 2013?)
- Priority Pathways and Vectors
  - Canals - focus on the Chicago area waterway system and Asian Carp
  - Ballast water control
  - Organisms in trade



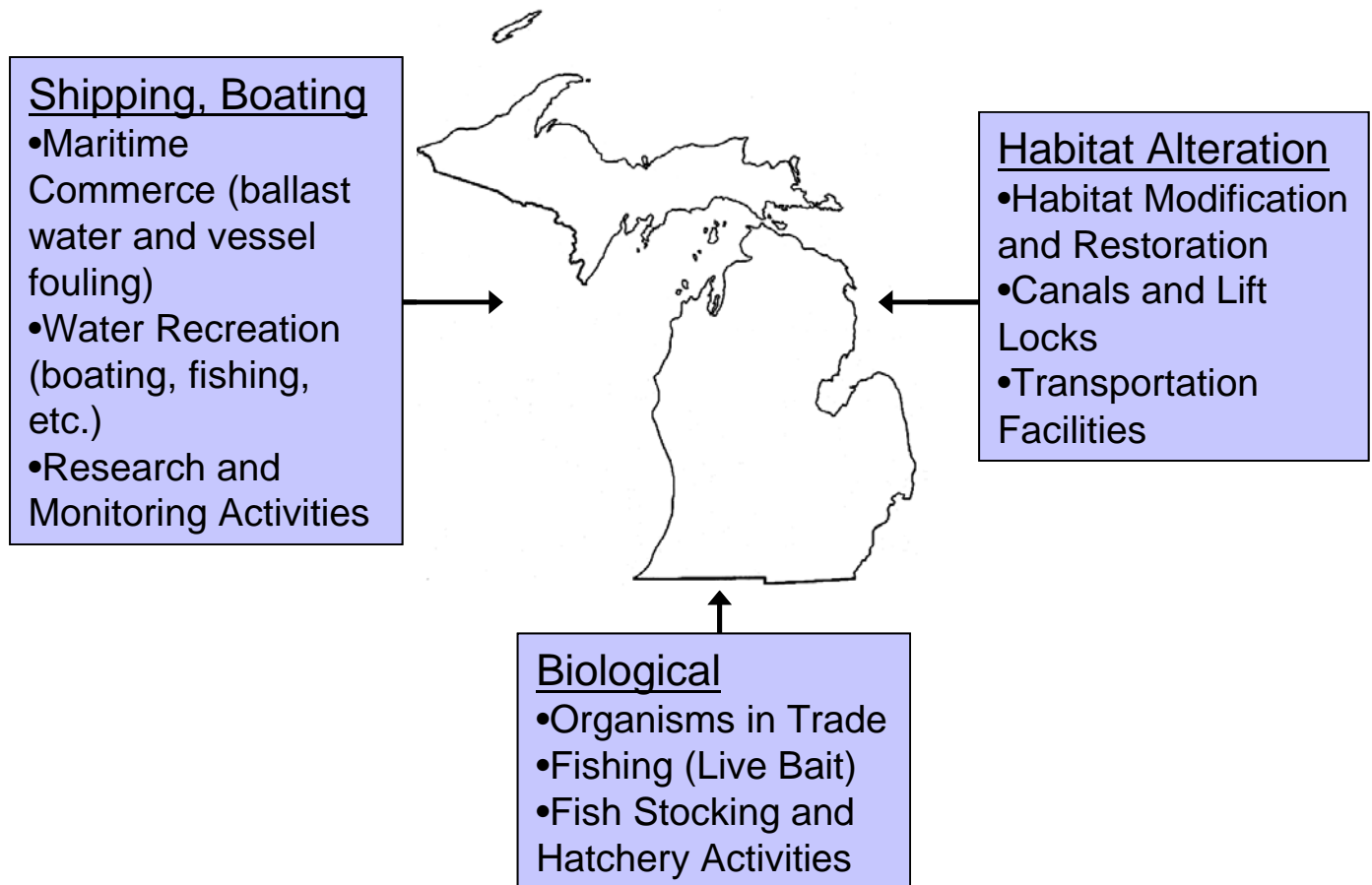
# AIS State Management Plan

- Goal I: **Prevent** new introductions of AIS into Michigan waters.
- Goal II: **Limit the spread** of established populations of AIS into uninfested waters of the state.
- Goal III: Develop an **early detection and rapid response** program to address new AIS invasions.
- Goal IV: **Manage and control** AIS to lessen the harmful ecological, economic, social and public health impacts resulting from infestation of AIS.

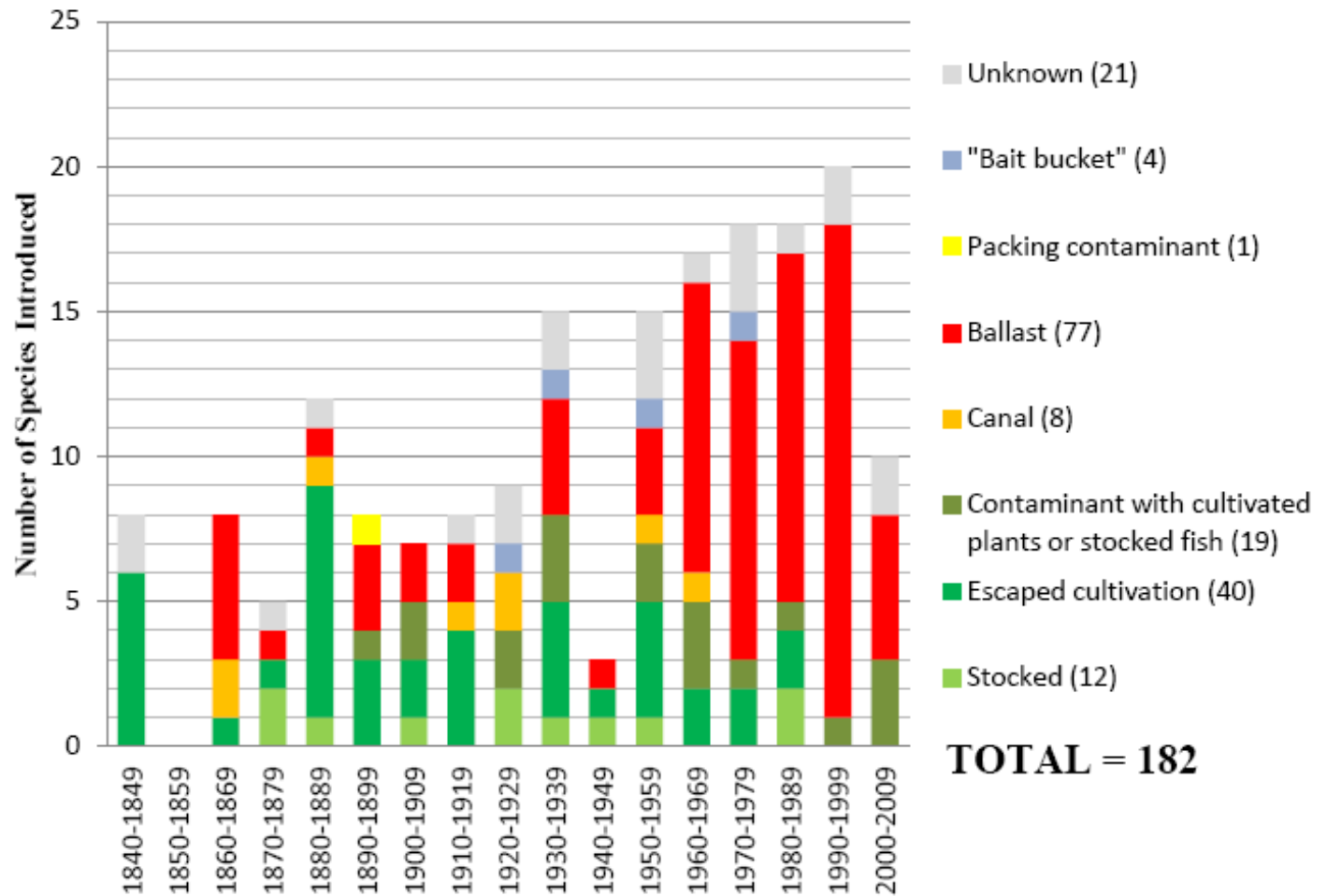




## Prevention of Aquatic Invasive Species in Michigan Waters: Vectors and Pathways Concept Map (Adapted from Lake Superior AIS Complete Prevention Plan)

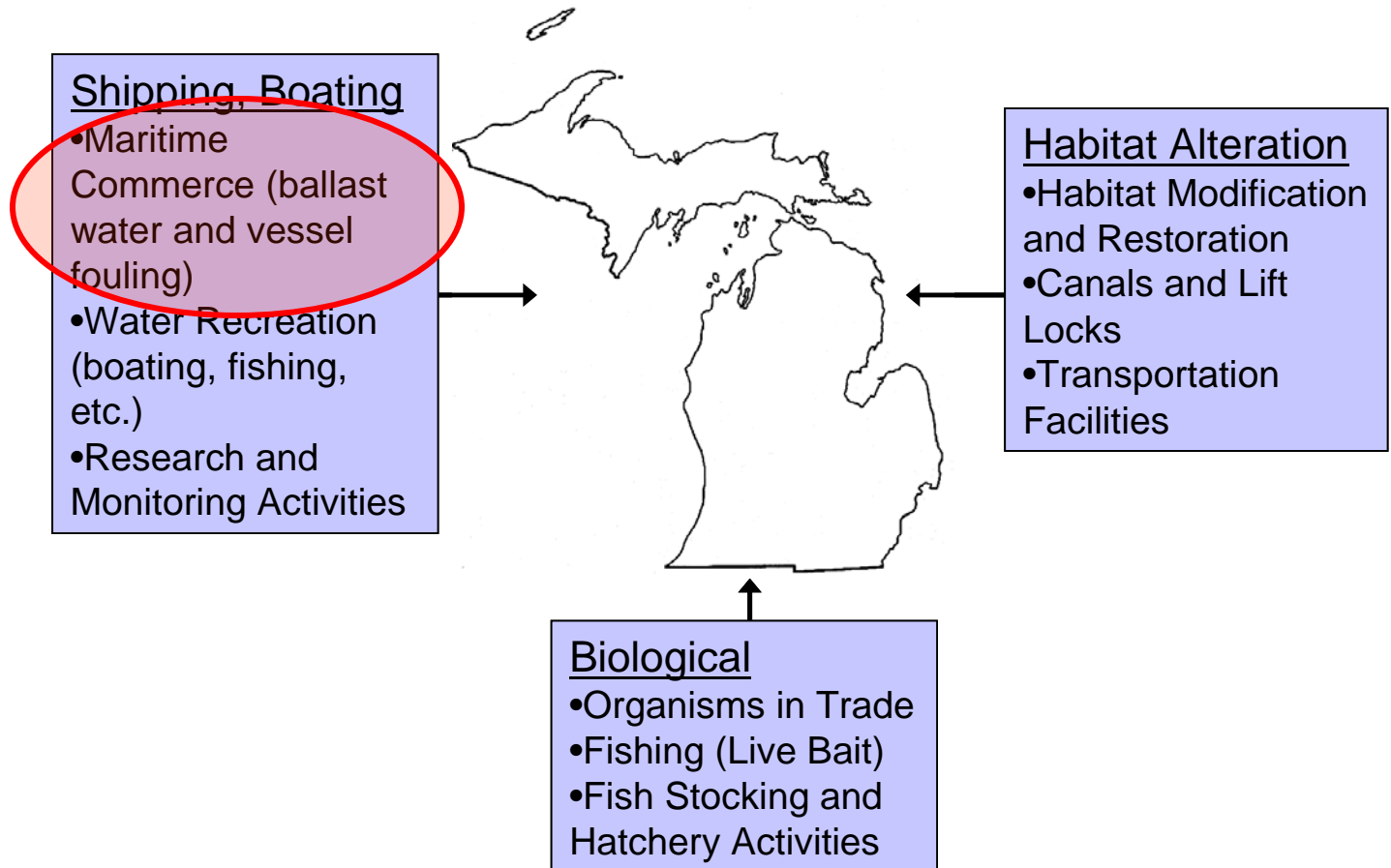


# Introduction of aquatic non-native species to the Great Lakes



Source: NOAA GLANSIS

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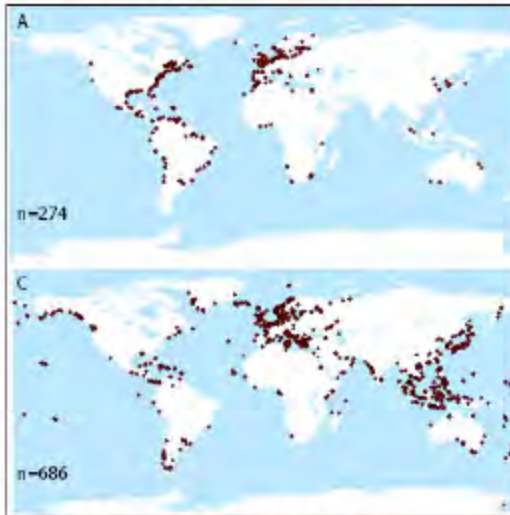




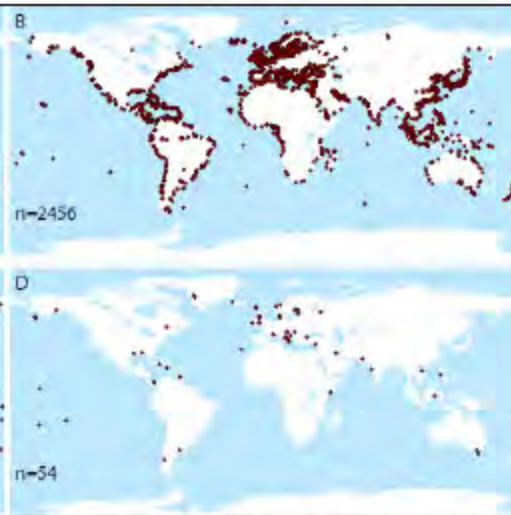
# Ballast water



**Direct connections to  
Great Lakes**



**2-step connections**



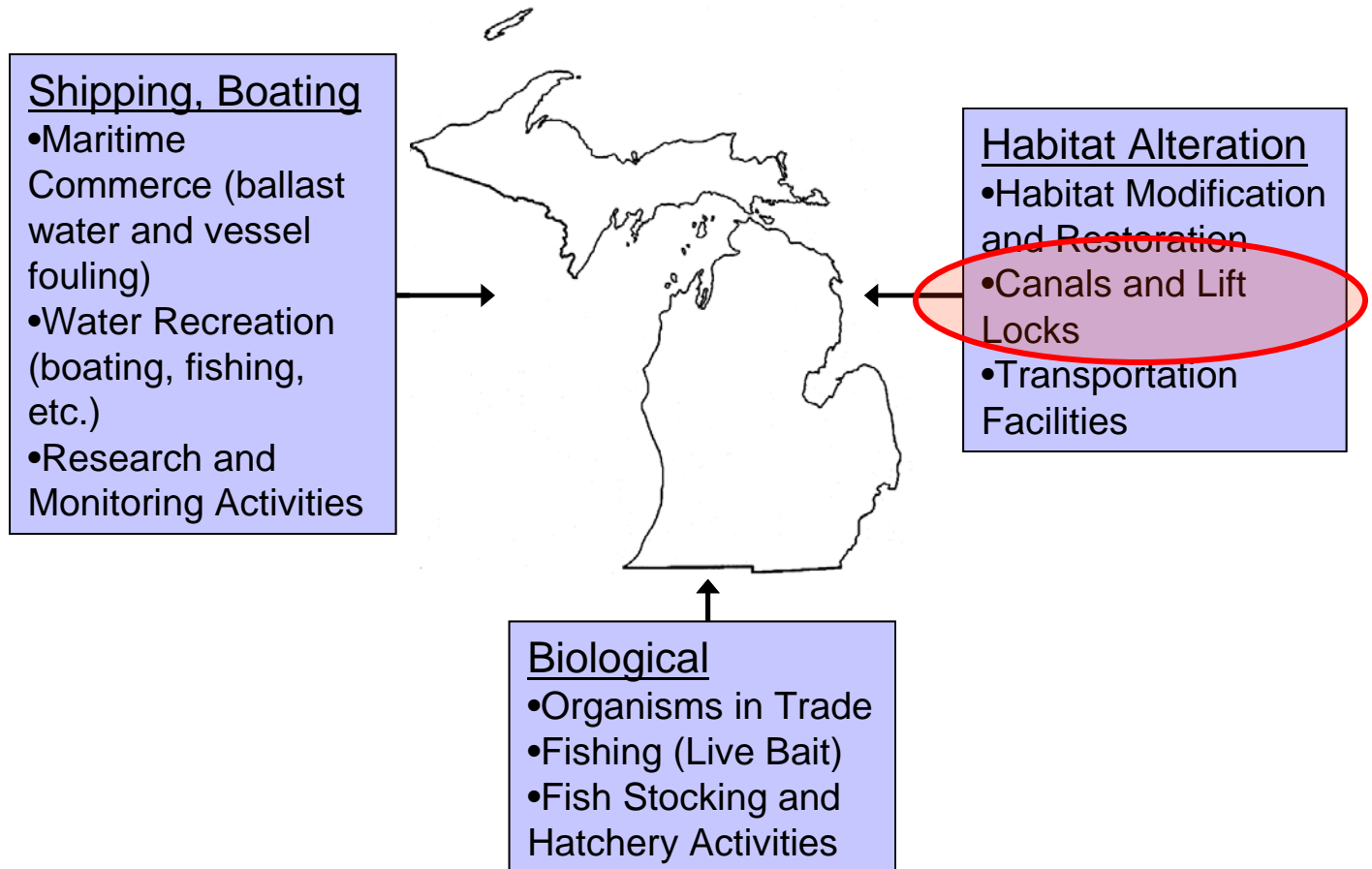
**3-step connections**



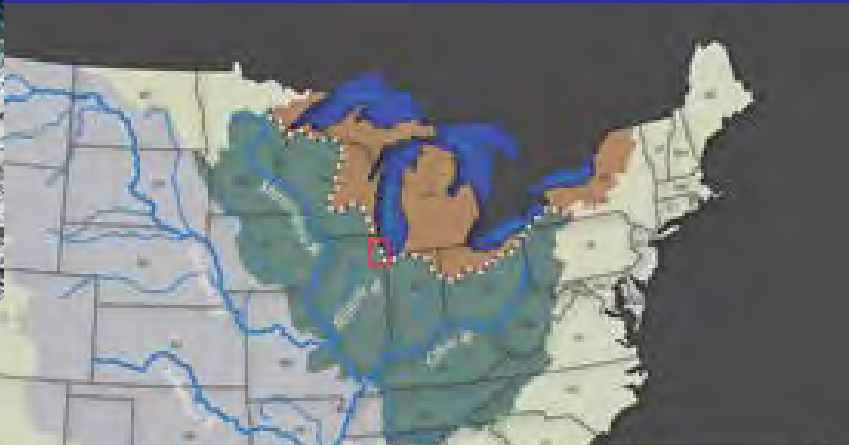
**4-step connections**



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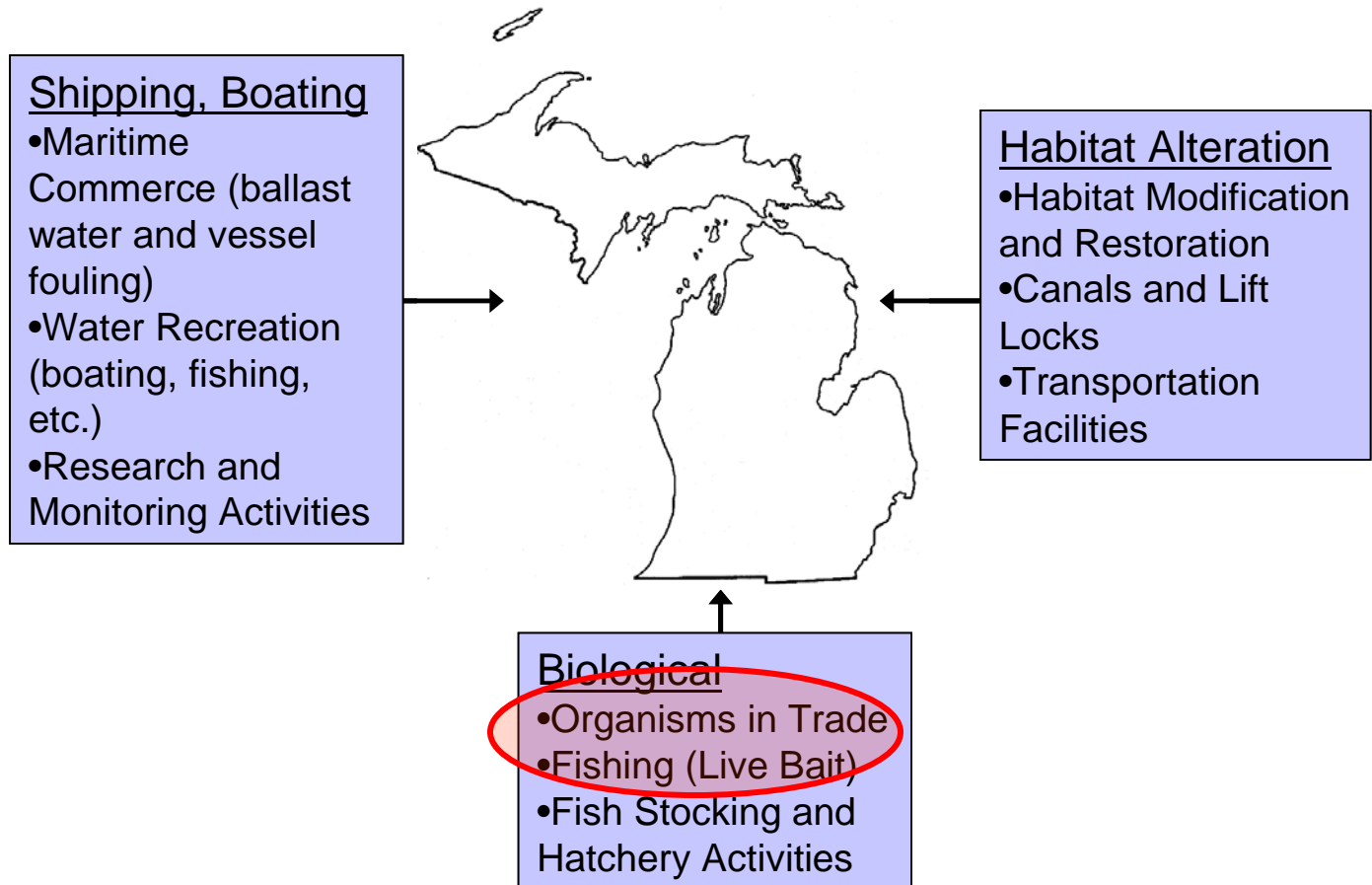


# Great Lakes Mississippi River Divide





# Prevention of Aquatic Invasive Species in Michigan Waters: Vectors and Pathways Concept Map (Adapted from Lake Superior AIS Complete Prevention Plan)







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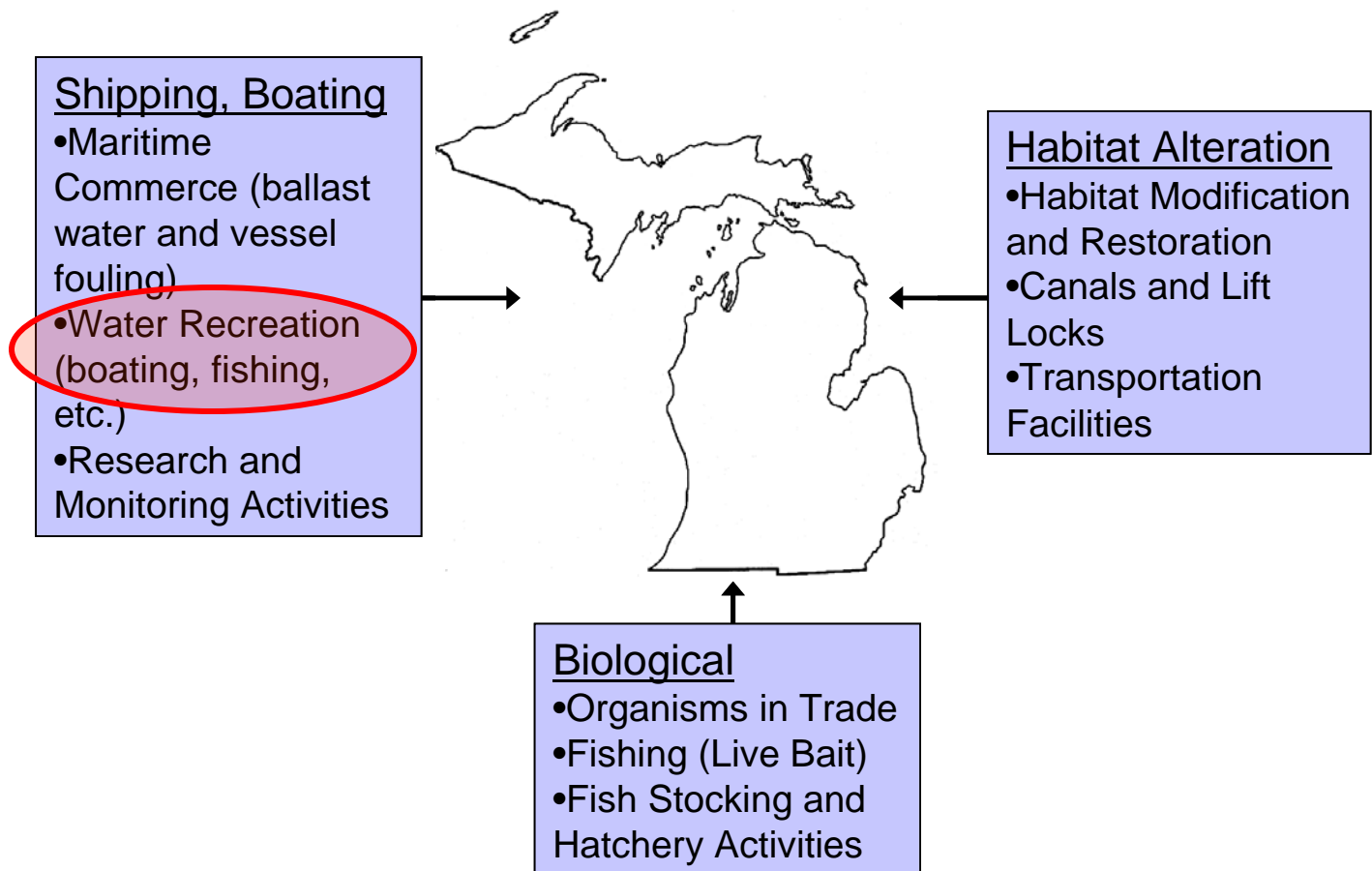


Photo credit: MI Sea Grant







# HELP STOP AQUATIC HITCHHIKERS!

To avoid spreading aquatic invasive species

## **BEFORE launching ... BEFORE leaving:**

- Remove aquatic plants and aquatic animals
- Drain lake or river water away from landing
- Dispose of unwanted live bait in the trash

## **It's the Law... Do not:**

- Transport aquatic plants, zebra mussels, or other prohibited species on public roads
- Launch a watercraft or place a trailer in the water if it has aquatic plants, zebra mussels or other prohibited species attached
- Transport water from infested waters

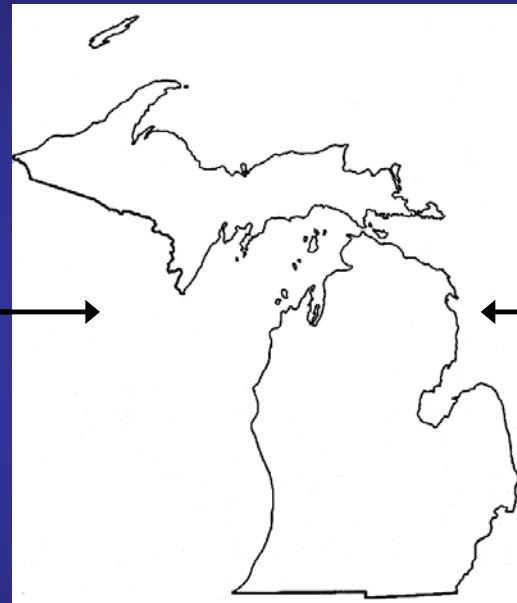
Michigan Department of Natural Resources



## Prevention of Aquatic Invasive Species in Michigan Waters: Vectors and Pathways Concept Map (Adapted from Lake Superior AIS Complete Prevention Plan)

### Shipping, Boating

- Maritime Commerce (ballast water and vessel fouling)
- Water Recreation (boating, fishing, etc.)
- Research and Monitoring Activities



### Habitat Alteration

- Habitat Modification and Restoration
- Canals and Lift Locks
- Transportation Facilities

### Biological

- Organisms in Trade
- Fishing (Live Bait)
- Fish Stocking and Hatchery Activities



# Habitat Modifications





# Discussion

- How Does This Impact Wetlands or Wetlands Related Work???
  - Ecology
  - Wetland Mitigation
  - Education/Outreach
  - BMPs
    - Soil Handling
    - Equipment Washing
    - Others?





# AIS core team

- Formally established in 2010
- Objective- update and implement the AIS State Management Plan
- Coordinated by DEQ-WRD
- Diffuse program
- Different Departments and Divisions= different authorities, perspectives, procedures, priorities, and timelines
- Team of Peers

# State of Michigan AIS team

- **Department of Environmental Quality**

- **Water Resources**

- (Sarah LeSage, Todd Losee, Anne Hokanson, Eric Bacon, Tom Alwin)

- **Office of the Great Lakes** (Roger Eberhardt, Matt Preisser, Emily Finnell)

- **Department of Natural Resources**

- **Fisheries** (Tammy Newcomb, Nick Popoff, Tom Goniea, Marty Williams)

- **Wildlife** (Sue Tangora, Kevin Walters, Matt Ankney)

- **Parks and Recreation** (Jason Fleming)

- **Law Enforcement** (Steve Huff)

- **Department of Agriculture**

- **Pesticide and Plant Pest Management** (Mike Bryan)

- **Animal Industry** (Nancy Barr)

- **Others**

- Department of Transportation (Dave Schuen)

- DNR Forestry (Ron Murray)

- Attorney General (Bob Reichel)





# AIS Advisory Council

- Established by law in 2011
- Appointed members
- State agencies, tribes, local gov, industries, environmental groups, university, etc.
- Objective- satisfy statutory requirements
  - Ballast water
  - AIS State Management Plan
  - Organisms in trade
  - Phragmites management
  - Program funding
- Chaired by DEQ
- Different levels of experience and knowledge
- Decision by consensus



# Questions?



Monkey Goby



Red Swamp Crayfish



Golden Mussel Photo: Alexander Karatayev



Water Lettuce Photo: Nicole Marti via Flickr