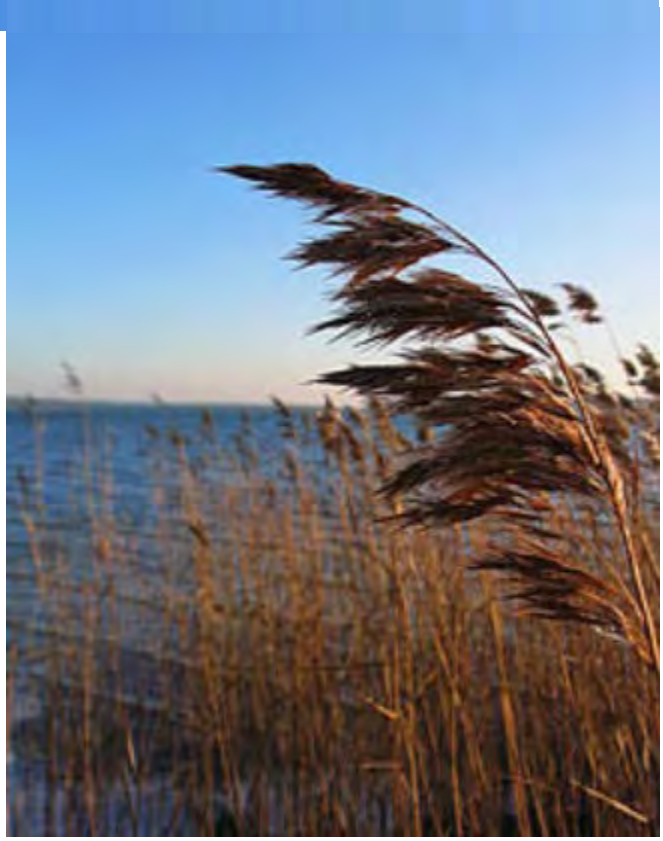
DAMAGE CONTROL!

Some plants may look beautiful, but they can have a devastating effect.

Non-native invasive species are a threat to biodiversity in our watersheds. Unchecked, invasives lead to the destruction of natural areas, force native species into extinction and can cost millions of dollars in damage to agriculture and infrastructure.



Presentation Outline

- Invasives present in the Black/Paw Paw watersheds and the dangers of invasives to aquatic and riparian areas
- How to map/record infestations; include sample data sheets and GPS protocols
- What to do with recorded data; submission to MISIN (plus a discussion of MISIN and its many uses), perhaps GIS usage if applicable
- Information on similar projects underway that would have overlapping data/interest (and contact info for those groups)
- What the future of invasives control looks like in the region, specifically the push for more early detection/rapid response to make invasives control more cost effective and successful

Shaun Howard of The Nature Conservancy will make this presentation at the Two Rivers Coalition Board meeting on **Wednesday, 14-March-2012, at 7:00pm, at the Geneva Township Hall, 62127 CR 380, Bangor, MI 49013.** The public is invited.

Mr. Howard presently coordinates a project that focuses on seven key invasives threatening coastal ecosystems (wetlands/dunes) across all 505 miles of Eastern Lake Michigan shoreline. They range from well-established, widespread invaders (Phragmites and garlic mustard), to species either well established (baby's-breath) or widespread (lyme grass) but not both, and finally early detection/rapid response species (Oriental bittersweet, Japanese knotweed, and kudzu) with limited distribution and density.

Two Rivers Coalition

An alliance of the Black River and Paw Paw River Watersheds

Controlling Invasive Plants Throughout Eastern Lake Michigan

Establishing effective, efficient, collaborative management of terrestrial invasives

The Nature Conservancy
Protecting nature. Preserving life.™

Shaun Howard – Coastal Invasives Coordinator

Invasive Species 101

- "Invasives are species outside of their natural distribution range that negatively affect the habitat or region they invade"
  - Don't confuse invasives with non-natives!

Where Do They Come From?

- Mostly human factors
  - Unintentional transport
  - Ornamental plant trade

What Do They Do?

- Impacts on ecology
  - Sedimentation (riparian/wetland)
  - Stabilization (dunes)
  - Direct competition
    - Nutrients
    - H2O
    - Sunlight
    - Allelopathy
  - Habitat loss

Ecosystems Threatened

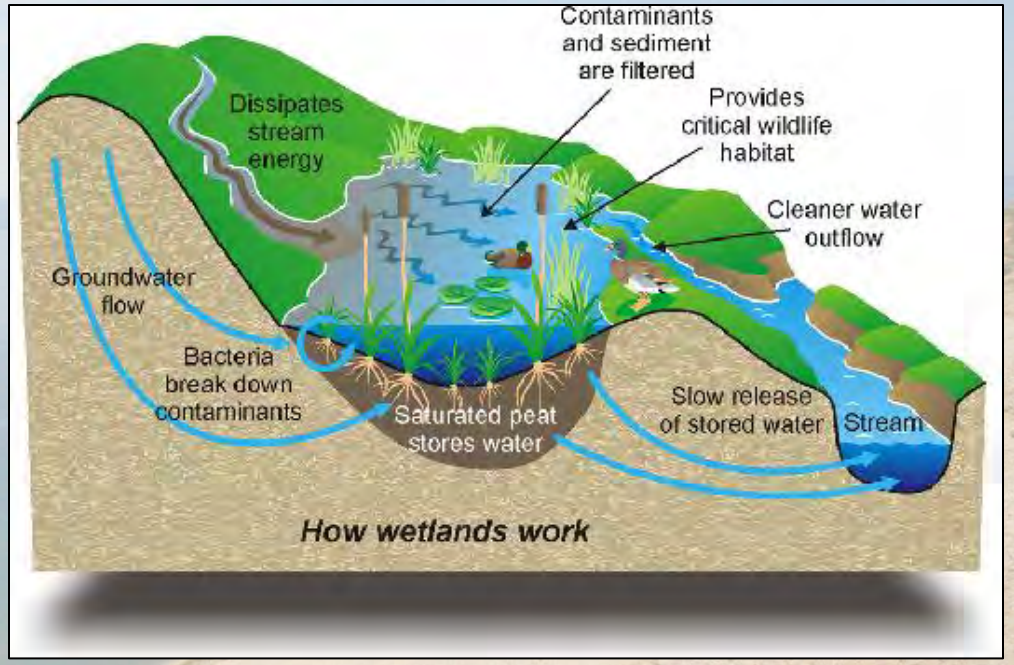
- Great Lakes Marsh
  - Herbaceous wetland community
  - Habitat for migrating/breeding waterfowl, shorebirds, fish, insects, mammals, amphibians
- **A system of exceptional biodiversity**
  - Support a large set of endemic species
    - Rare, threatened, and endangered plants and animals
    - Nurseries and nesting sites
    - Feeding grounds

Threats to Biodiversity

- "On a global basis…the two great destroyers of biodiversity are first, habitat destruction and second, invasion by **exotic species**." (*E.O. Wilson*)
- About 400 of the 958 species (42%) that are listed under the Endangered Species Act are considered to be at risk primarily because of competition with and predation by **non-indigenous species**. (*The Nature Conservancy 1995, Wilcove et al. 1998*)
- **Invading alien species** in the US ALONE cause losses adding up to almost $120 billion per year *(D. Pimentel et al. 2004)*

Additional Economic Threat

- Practical functions – "Ecosystem Services"
  - Erosion control
  - Protection from storm damage
  - Flood regulation
  - Water filters and reservoirs
- Human alternatives to these services are very costly and aren't as effective



What Can We Do?

Control Options

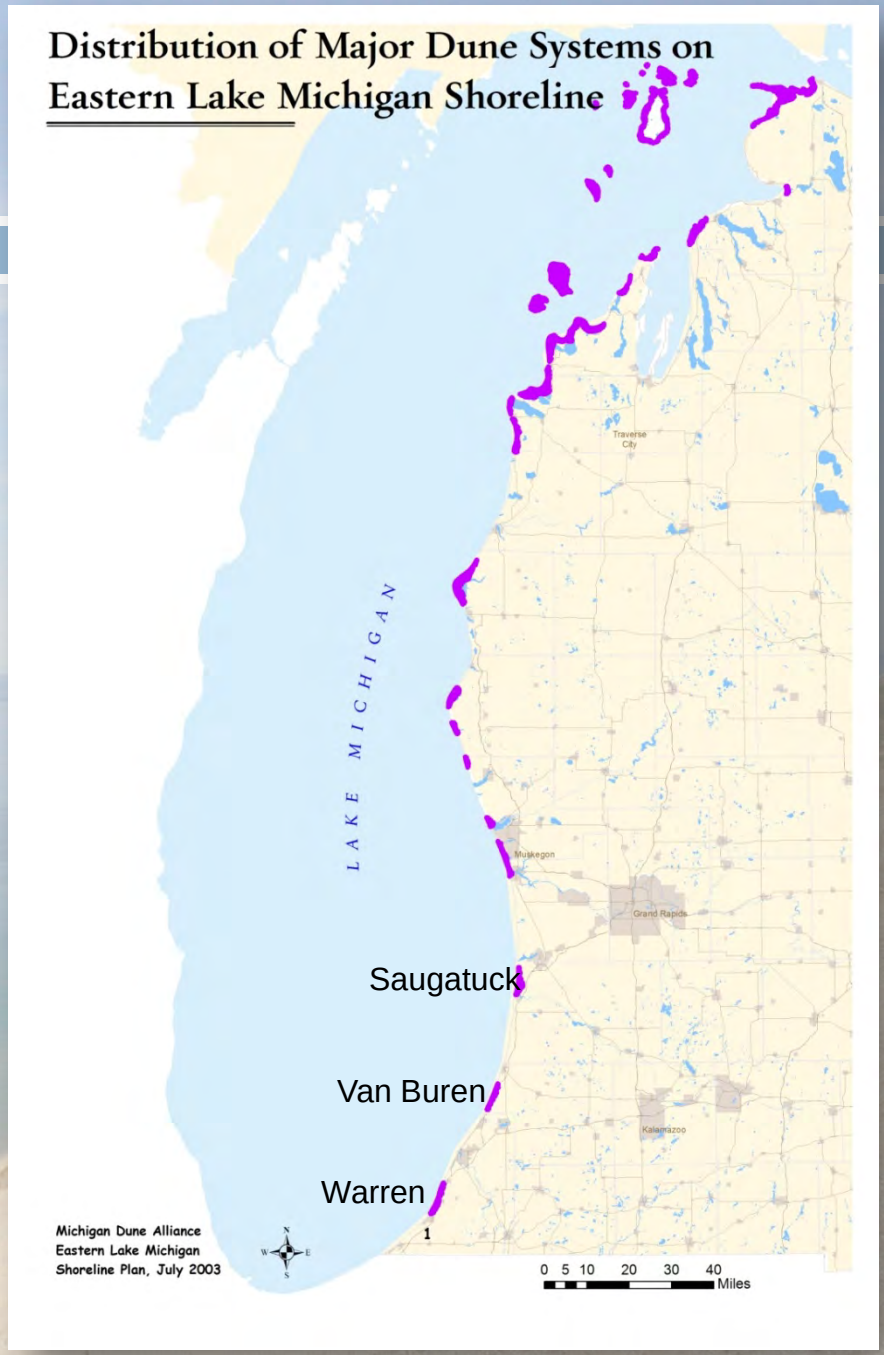
A Better Response:

The Michigan Dune Alliance

- MDA: founded in 1999
  - A coalition of land trusts, agencies, parks, and advocacy groups dedicated to conservation of dunes and shoreline.
    - **Functions as a "Cooperative Weed Management Area" (CWMA)**
- In 2001 performed "Lake Michigan Coastal Threat Assessment" for species like garlic mustard, spotted knapweed, and soapwort

Michigan Dunes

- Over 275,000 acres
- Highly dynamic
- Largest freshwater dune system in the world



Unique Ecosystems

- Perched Dunes
  - Atop glacial moraines
  - Found on the northeast shore of Lakes Michigan and Superior
  - 90-360 ft above lake level

Unique Ecosystems

- Dune and swale complex
  - Began forming 4,000 to 5,000 years ago
  - Created by sand deposition and receding lake levels
  - Water level in interdunal swales determined by Lake Michigan water level

Unique Ecosystems

- Parabolic Dunes
  - “U-shaped” dunes
  - Formation initiated with changing lake levels 4,000 to 6,000 years ago
  - Occurs where vegetation stabilizes dune ridges

Species of Concern

- Pitcher's thistle (*Cirsium pitcheri*)
  - Discovered @ Pictured Rocks National Lakeshore
  - Found only along the shores of Lake Huron, Michigan, and Superior
    - Federally threatened
  - Up to 8 years to reach maturity,

Species of Concern

- Piping plover (*Charadrius melodus*)
  - Exclusive to rocky/sandy shoreline
  - Total population of less than 7,000
    - Federally endangered in the Great Lakes region
  - Ground nests are vulnerable to

From Bouquet to Backdune…

- Baby's breath *(Gypsophila paniculata)*
  - Herbaceous perennial
  - 15,000 seeds per plant
  - Wind dispersed
  - Giant taproot over-stabilizes dune systems

From Bouquet to Backdune...

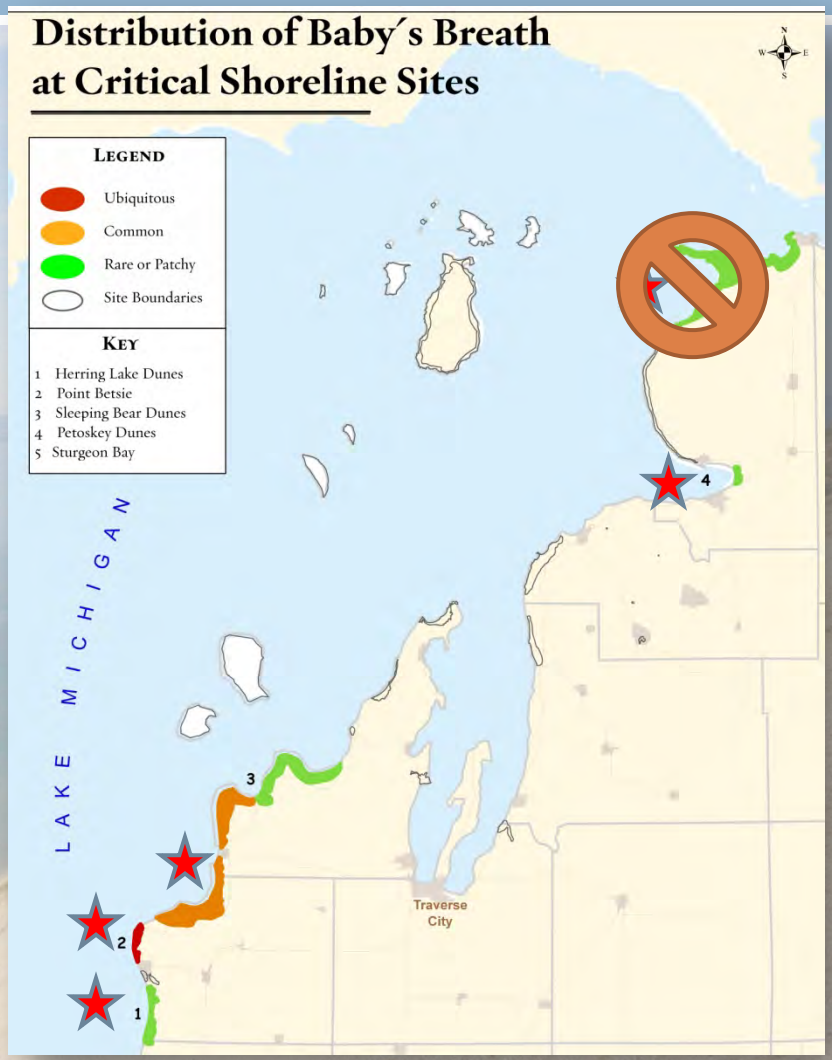
“Lake Michigan Coastal Restoration Project

- Effectively eliminate baby’s-breath from the dune systems of Northwest Lower Michigan
  - 2007-2016 (10 years)
  - Full funding provided by Meijer from 2007-2012

Untreated/Treated

"Lake Michigan Coastal Restoration Project

- Project is currently ON SCHEDULE:
  - 1,800 acres infested
  - **In first 5 years, over 50% of all baby's-breath populations have been received control treatments**
  - Eradication at Wilderness State Park?

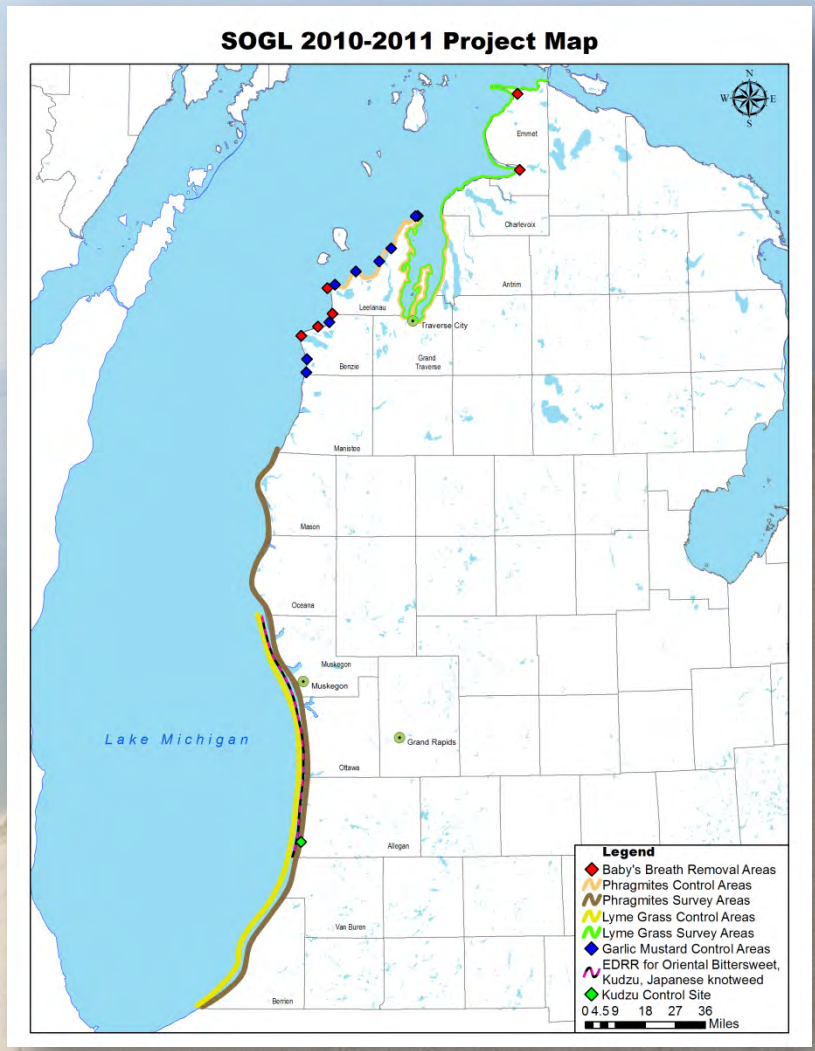


2006

2010

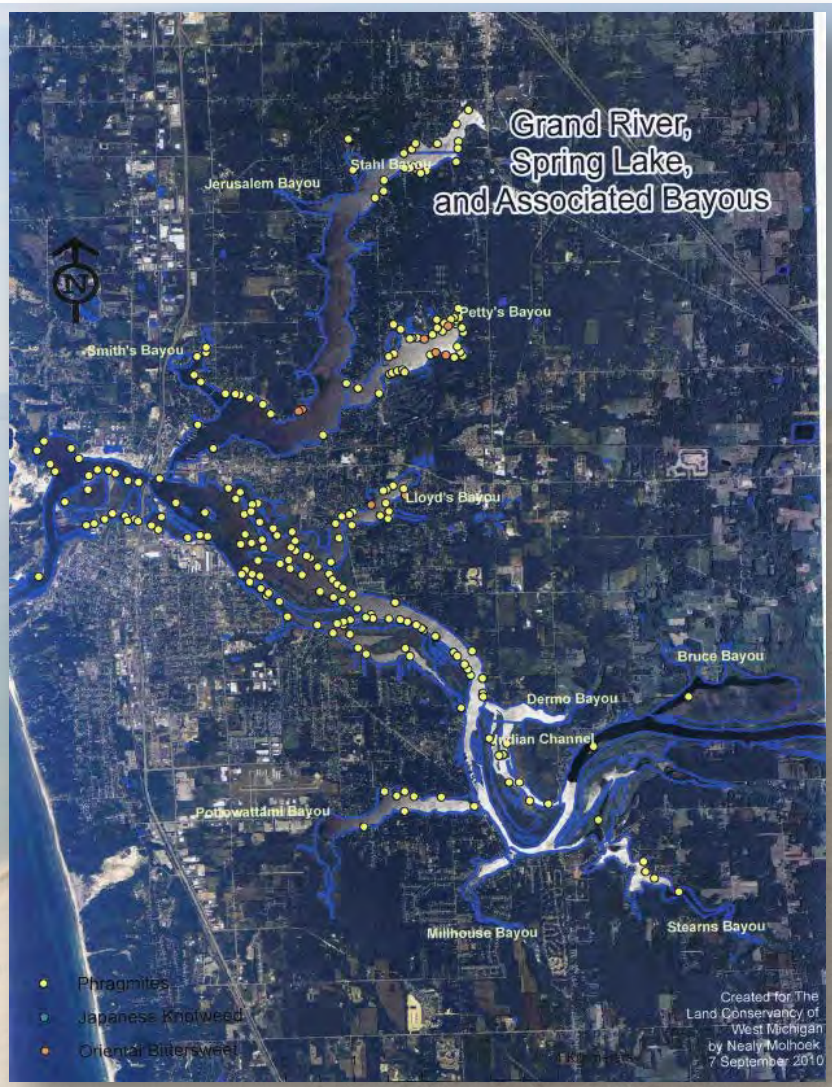
Sustain Our Great Lakes 2010-2011

- National Fish and Wildlife Foundation
  - "Controlling Invasive Plants Throughout Eastern Lake Michigan"
    - **Information and awareness** on invasive distribution and abundance
    - **Strategic control** of coastal invasives through CWMA partnership
    - Initial focus on **seven key coastal invasives**



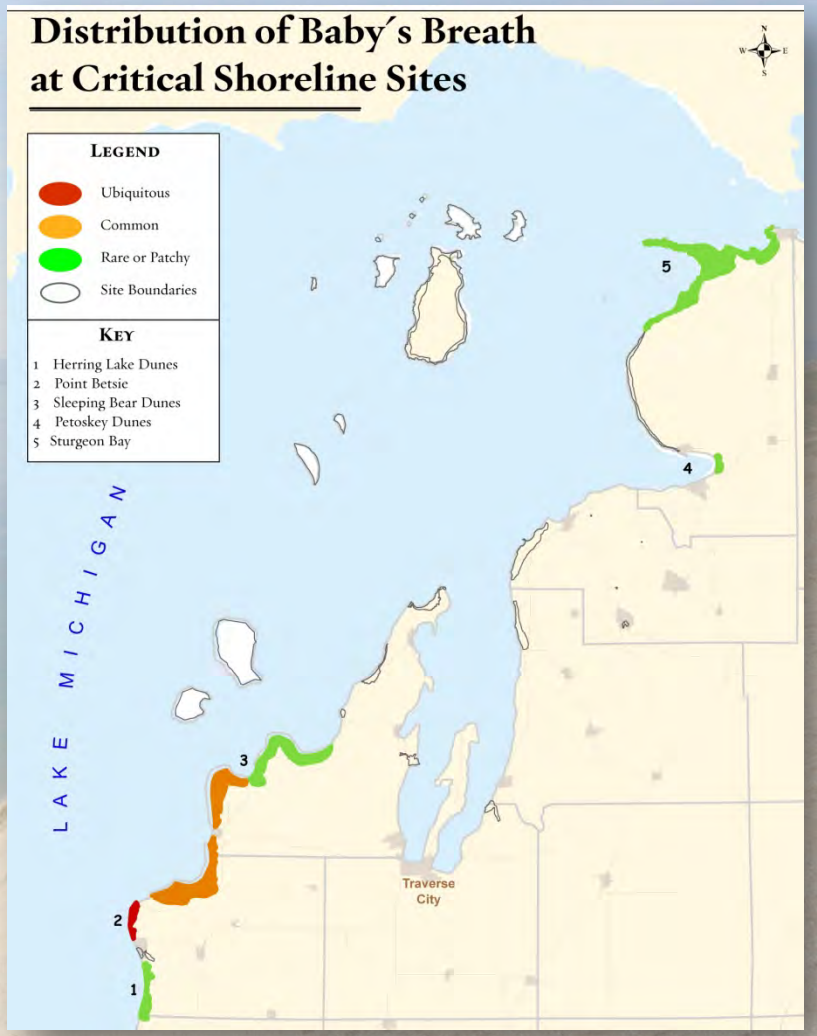
How to Control at Varying Levels of Distribution and density?

- Non-native Phragmites:
  - High distribution
  - High density
- Control requires:
  - Rigorous prioritization
  - Long-term treatment plan



How to Control at Varying Levels of Distribution and density?

- Baby's-breath:
  - Low distribution
  - High density
- Control requires:
  - Intensive treatment
  - Long-term effort

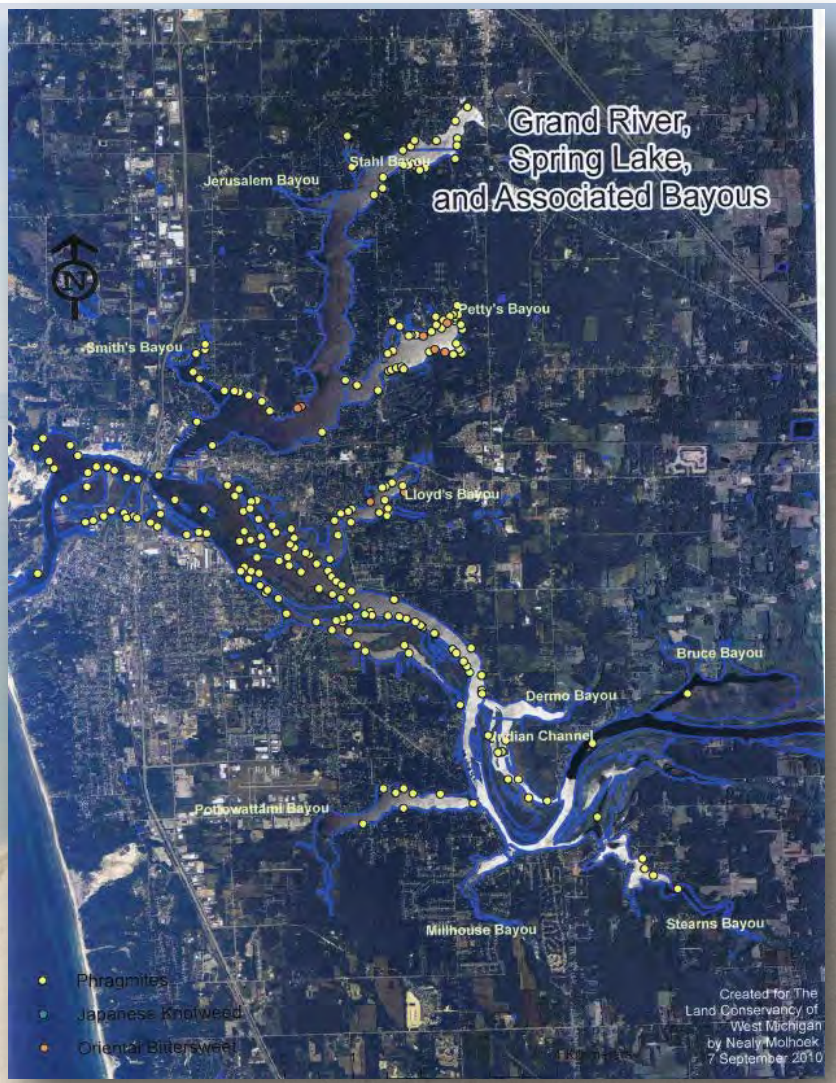


How to Control at Varying Levels of Distribution and density?

- Lyme grass:
  - High distribution
  - Low density
- Control requires:
  - Ongoing survey work
  - Follow-up monitoring

How to Control at Varying Levels of Distribution and density?

- Japanese knotweed:
  - Low distribution
  - Low density
- Control requires:
  - **Early Detection/Rapid Response**
  - Comprehensive surveys and fast treatment

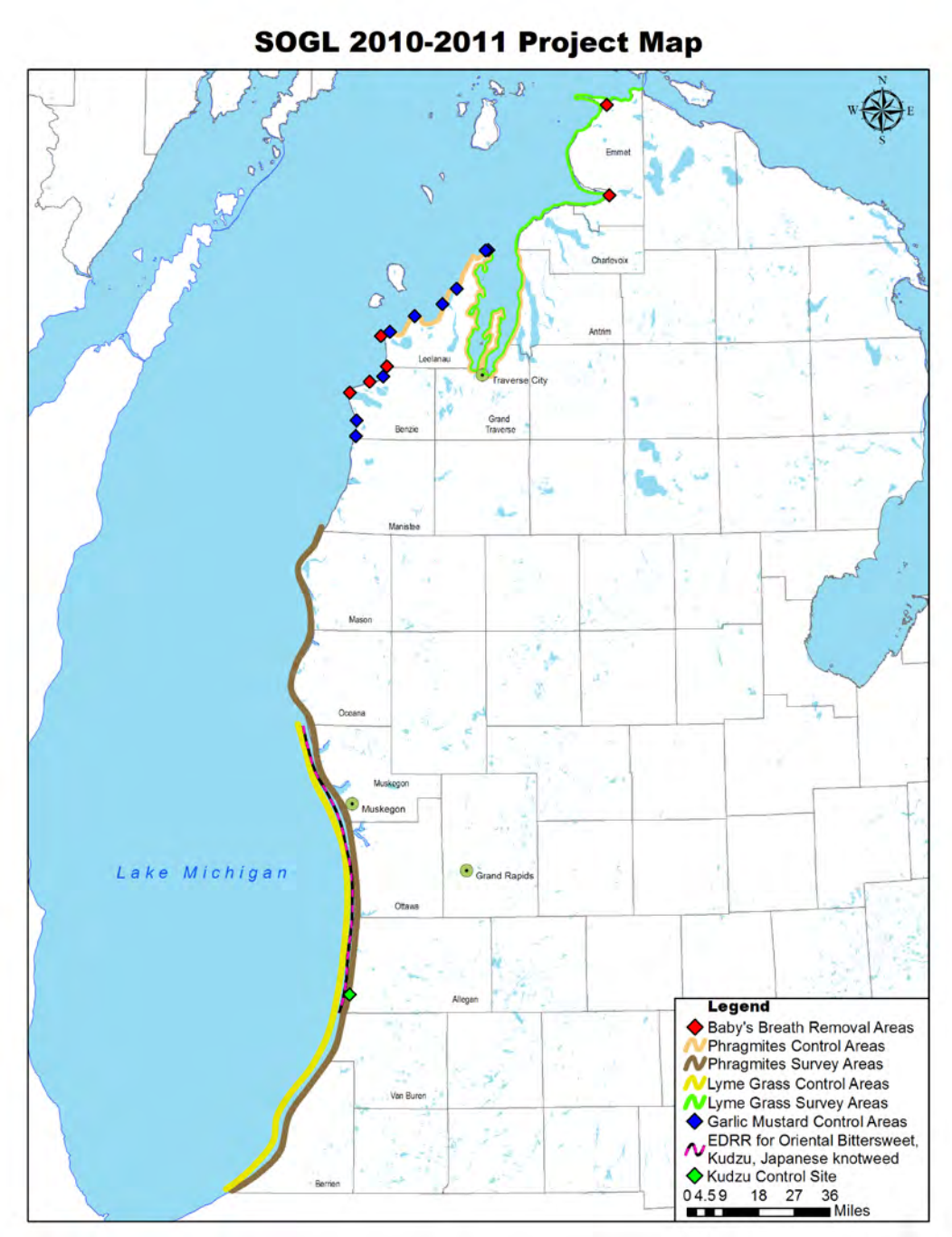


How to Control at Varying Levels of Distribution and density?

- Kudzu
  - VERY low distribution
  - High density
- Control requires:
  - **Early Detection/Rapid Response**
  - Research into control methods

A Regional Approach

- How to survey, treat, and monitor 505 miles of shoreline?
  - Utilize partners – **<u>efficient, tailored response</u>**
    - Local knowledge
    - Resources in place
    - Build on past work
- **<u>Issue</u>** – regional versus



MDA Partners Active in SOGL

- Leelanau Conservancy
- Grand Traverse Regional Land Conservancy
- Land Conservancy of West Michigan
- Southwest Michigan Land Conservancy
- National Park Service at Sleeping Bear Dunes
- Michigan DNR – Parks and Rec. Division
- US Forest Service at Manistee National Forest

Partner Achievements – 2010-11

- Japanese knotweed/Oriental bittersweet/kudzu
  - Surveyed **over 8,000 acres**
  - Treated **40 percent** of the 607 infestations found
  - Kudzu treatment, biomass removal, and monitoring
- Phragmites
  - Treated **2,600 populations**
  - Removed biomass at **1,700 occurrences**
  - **105 miles** of shoreline, wetlands, lakes, and drowned river mouths surveyed
- Lyme grass
  - Treatment of **nearly 40%** of all infestations

TNC Achievements – 2007-11

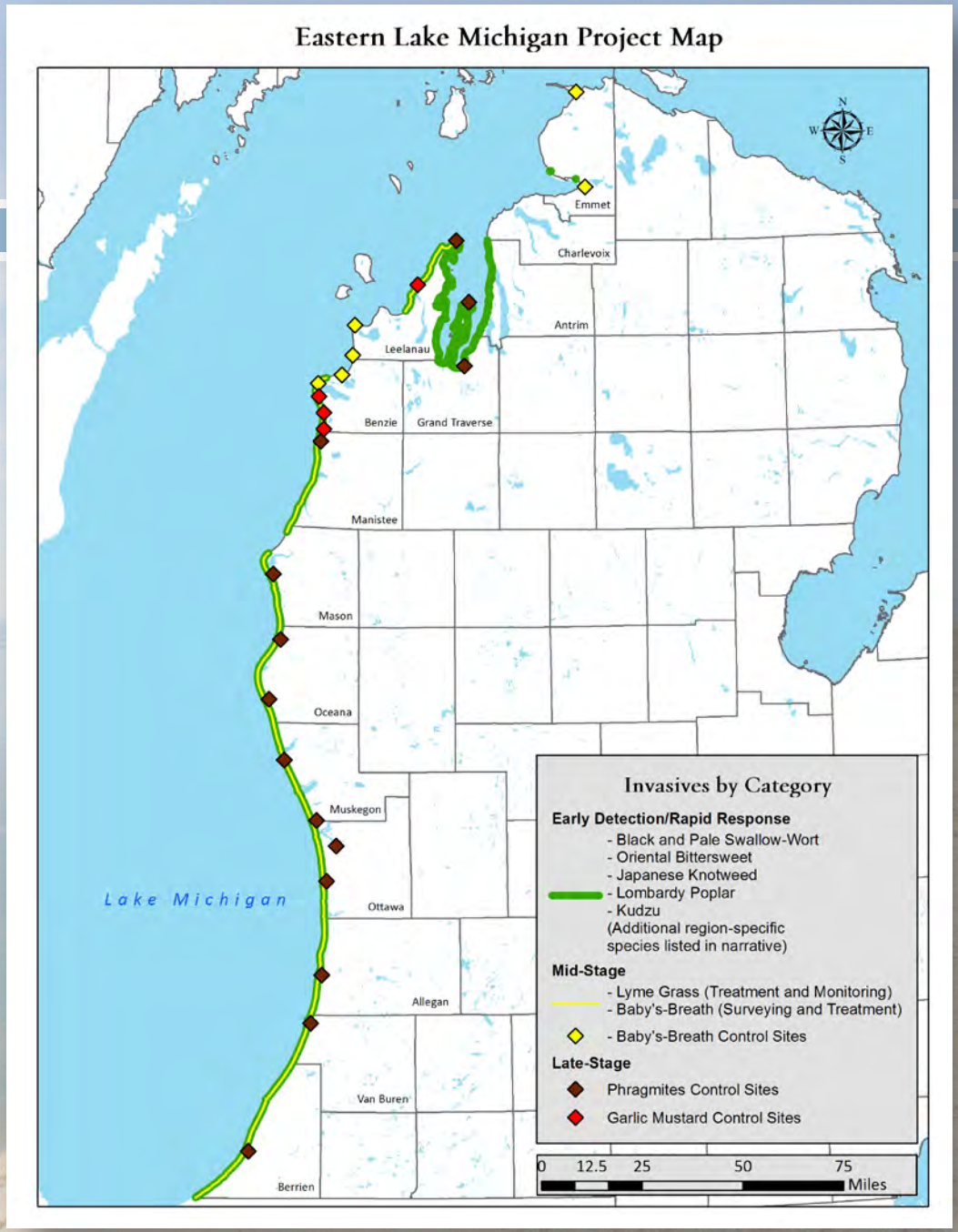
- Baby's-breath
  - **Over 50%** of all known populations in northwest lower Michigan have received **at least two years of treatment**
  - **900+ acres** treated
- Lyme grass
  - Completed a 3 year survey of all **505 miles** of ELM shoreline
    - Only **2 occurrences** north of Sleeping Bear Dunes National Lakeshore!

Targeted Outcomes

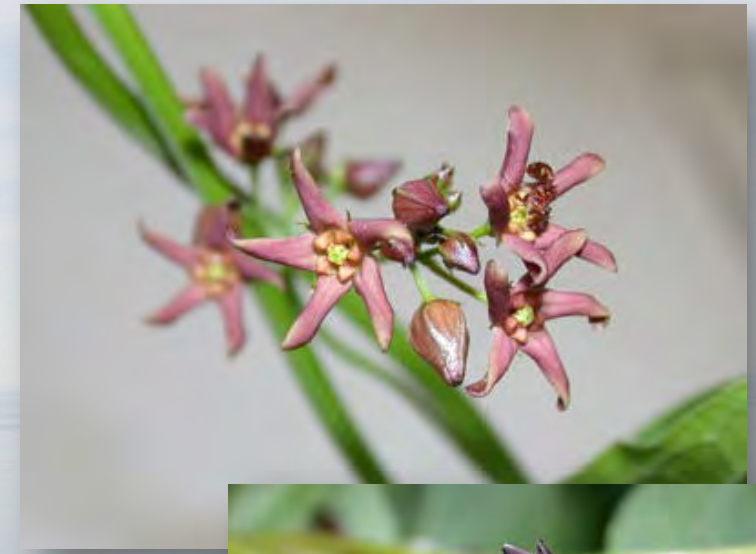
- Newly-emergent species
  - Eradication!
  - Develop and implement ED/RR program
  - Information sharing
- Regionally-concentrated species
  - Contain spread
  - Develop strategic approach for long-term maintenance
    - Resource allocation
- Widespread species
  - Prioritize
    - Value of site
    - Extent and abundance
    - Potential impacts of population
    - Feasibility of control or restoration

SOGL II

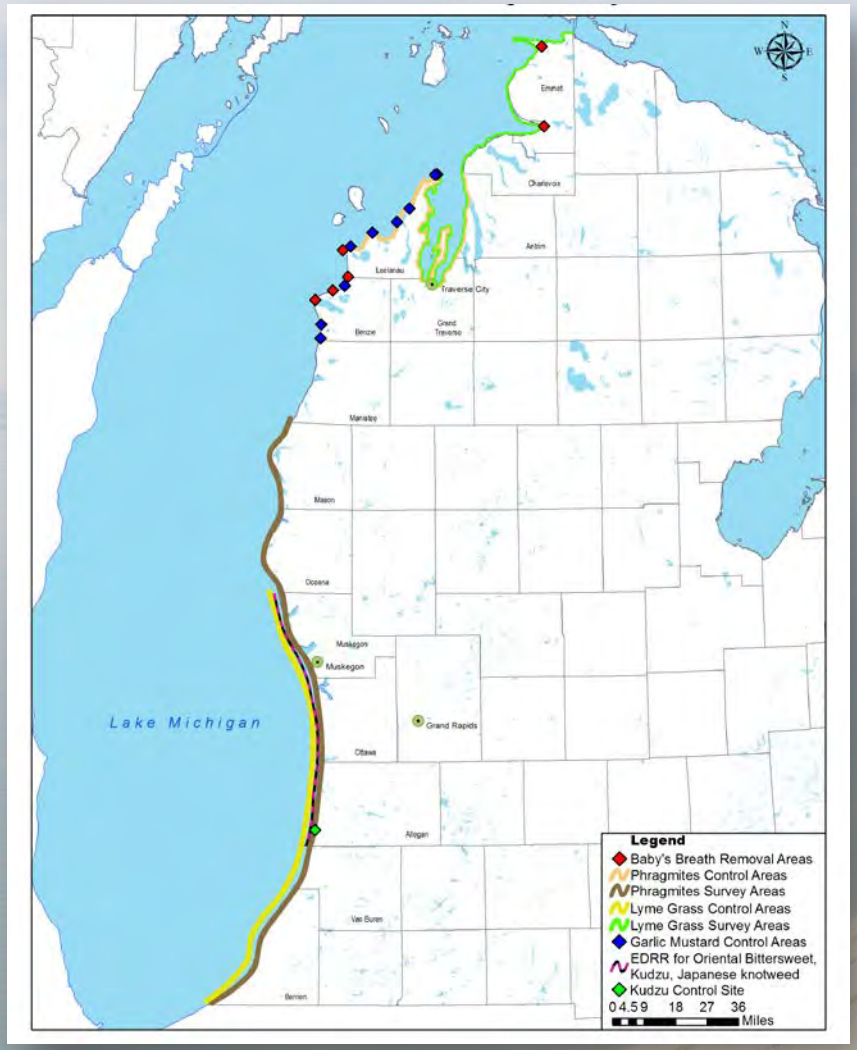
- "Full-Scale Invasive Plant Control in Eastern Lake Michigan"
  - Expand ED/RR program
    - Variety of new species, widespread and regionally-specific
    - 400 miles of shoreline
  - Control and/or eradicate mid-stage invasives
  - Prioritize treatment efforts for late-stage invasives

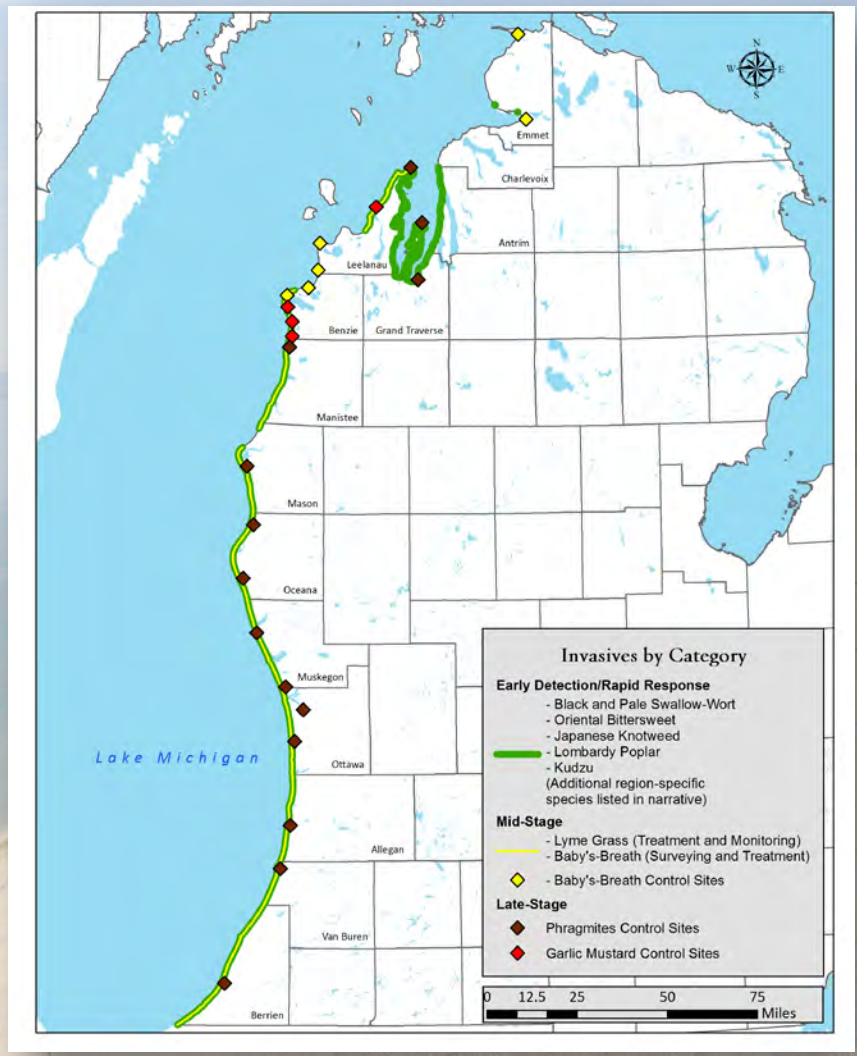


Project Growth



Project Growth





What Can I Do?

Invasive Species Data Collection Sheet

GPS Waypoint: XXYYZZ001***	Area:	Density:	Treatment Status:
XX = Site: **YY** = Observer **ZZ** = Species **001** = Waypoint ID (Consecutive, Ascending, and Non-Repeating, i.e. 001, 002, 003, etc.) *** = Additional characters may be used to describe **area**, **density**, and **treatment status**	**0** = None **1** = Individual/Few/Several **2** = < 1,000 Sq Ft (Half Tennis Court) **3** = 1,000 Sq Ft to 0.5 Acre **4** = 0.5 Acre to 1.0 Acre (Football Field w/o End zones) **5** = > 1.0 Acre (Record Polygon if Possible)	**1** = Sparse (Scattered Individual Stems or Very Small Stands) **2** = Patchy (Mix of Sparse and Dense Areas) **3** = Dense (Greater than 40% of the Area) **4** = Monoculture (Nearly 100% of the Area)	**U** = Untreated **#** = Consecutive Years Treated **N** = Nonconsecutive Treatment **D** = Don't Know

Date: **Site:** **Observer:**

GPS Waypoint/ Latitude & Longitude	Species	Area	Density	Treatment Status	Comments (Further Explanation of Data Collected, Additional Site Information, Etc.)

EUP CWMA Invasive Species Survey Form

Invasive
ID Code: _____
(Office Use Only)

Date: _____

Observer's Name: _____

E-mail address: _____ Phone Number: _____

Location Information of Invasive Species County: _____

Township: _____ Townline: _____ Range: _____ Section: _____

GPS Coordinates: _____ Latitude _____ Longitude

Map

N

Plant Species: _____

Area: _____

Select one of the following options:

1 = single/small patch
2 = <1 acre
3 = 1--10 acres
4 = 10--50 acres
5 = 50--100 acres
6 = >100 acres

Density: _____

Select one of the following options:

Sparse: Scattered individual stems or very small patches
Patchy: A mix of dense and sparse areas
Dense: Greater than 40% of the area mapped
Monoculture: nearly 100% of area mapped

Treatment Status (Circle one):

Treated Untreated Don't know

Comments:

_____
_____
_____
_____
_____
_____

Information Sharing

- Survey and treatment data made publicly available through MISIN database
  - Track progress and quantify output
  - A record of distribution (future comparison)
  - Informs others and provides a “starting point”
- WWW.MISIN.MSU.EDU

MISIN Midwest Invasive Species Information Network

Report Sightings : Midwest In

www.misin.msu.edu/report/

MISIN Midwest Invasive Species Information Network

WEDNESDAY, MARCH 14, 2012

SEARCH: GO

REGISTER | LOGIN • RSS FEED

HOME | ABOUT | E.D.S.S. | REPORT SIGHTINGS | SPECIES INFORMATION | BROWSE DATA | HELP

AIS News | Blogs | Meetings | News Highlights | Partners | What's New

Report Sightings

Welcome to the invasive species reporting module of the MISIN web site. Here you will be able to interactively map targeted invasive species occurrences. We have developed a mapping service based on the ESRI ArcGIS Server platform which allows users to navigate the project area and screen digitize species occurrences with the aid of statewide digital imagery.

Registered MISIN users have access to the mapping service for reporting purposes. Completion of a short training module corresponding to the species you wish to report is required before you can contribute data.

STEP 1 Register and Login

STEP 2 Species Training

STEP 3 Report Sighting

How Do I Report An Invasive Species Sighting?

GO Michigan SWD Detection Survey

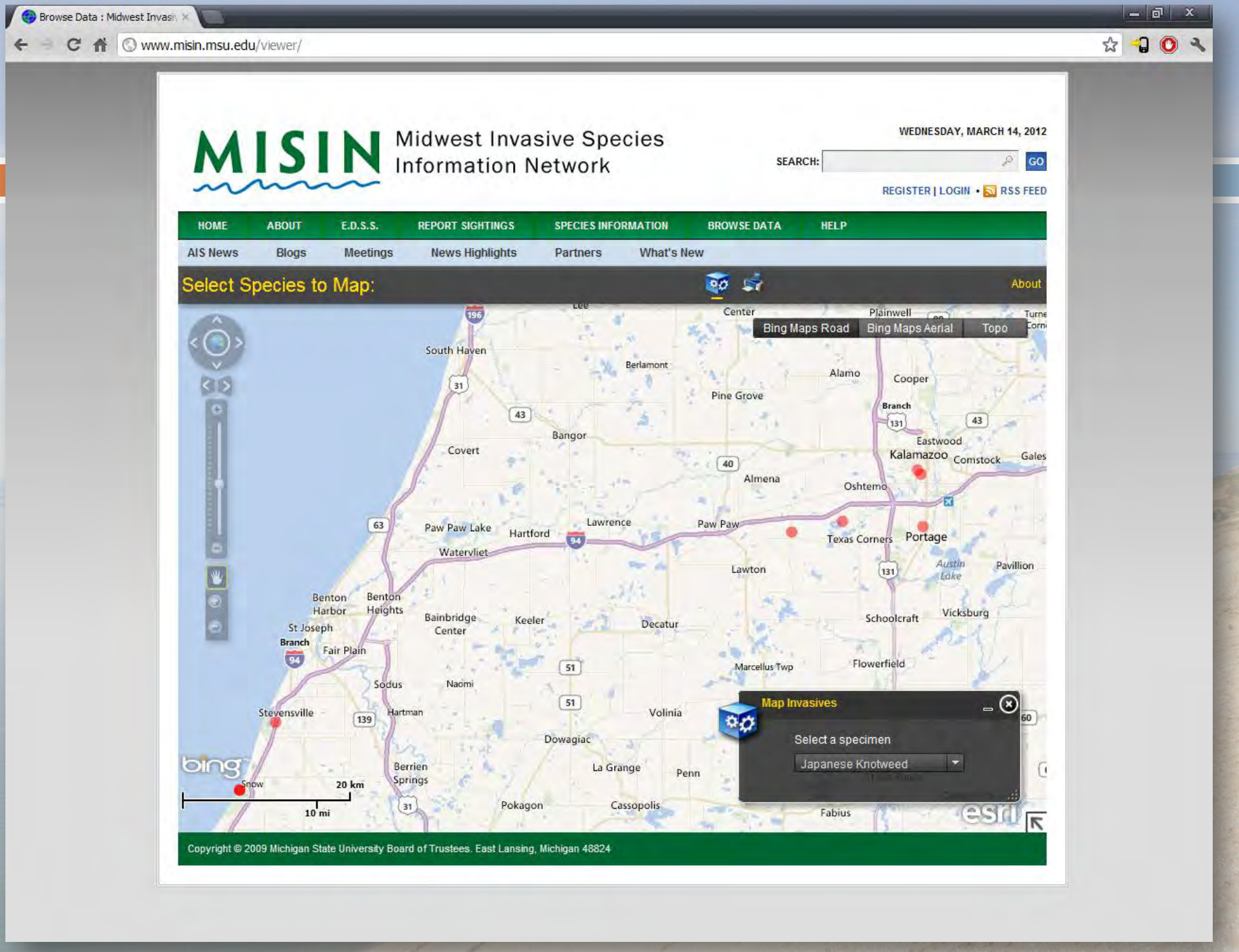
Garlic Mustard / Learn More...

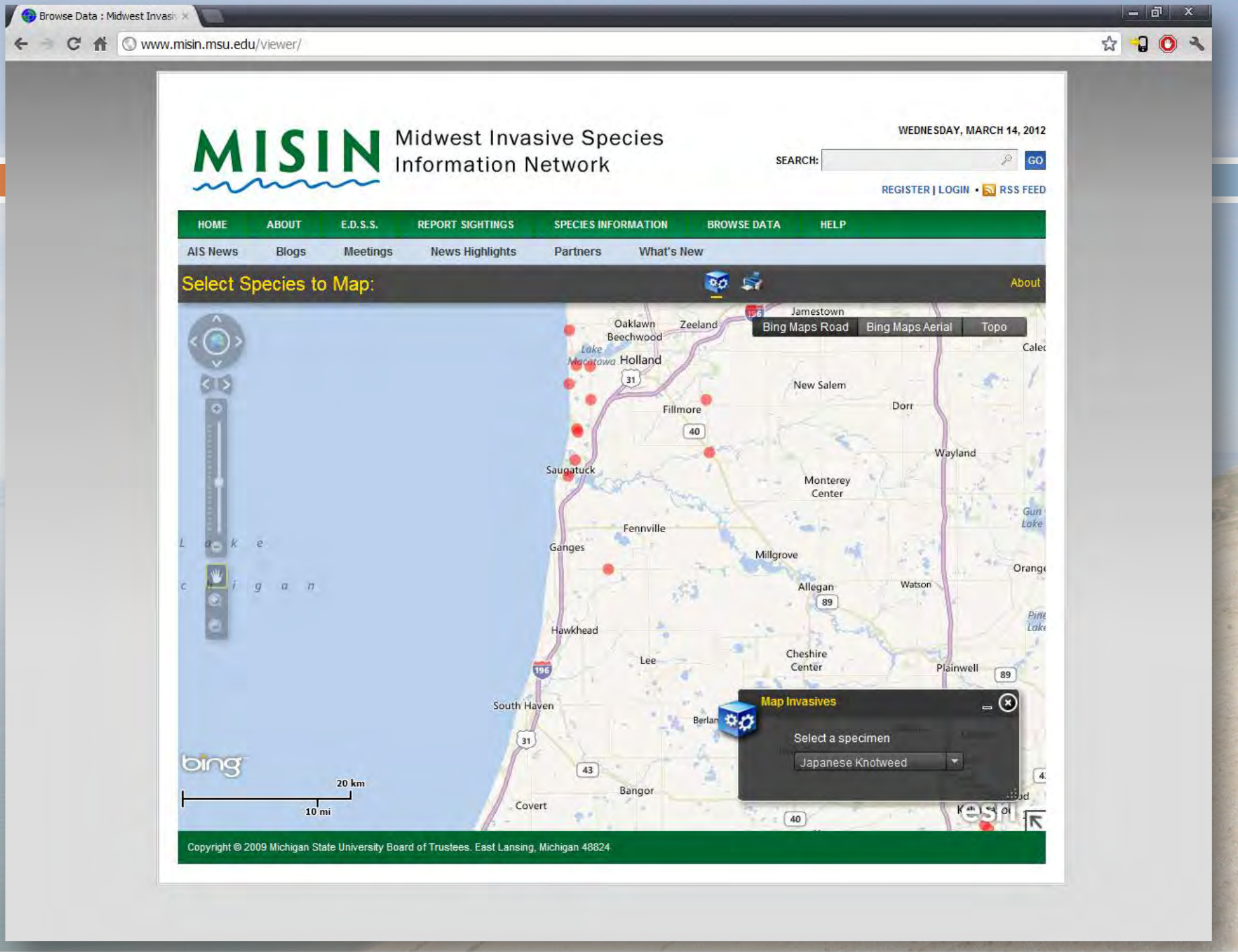
eNews & Updates

Sign up to receive the latest MISIN news, as well as daily postings from our network partners!

Enter your email address... GO

Find us on


Browse Data : Midwest Invasi
www.misin.msu.edu/viewer/
MISIN
Midwest Invasive Species Information Network
WEDNESDAY, MARCH 14, 2012
SEARCH:
GO
REGISTER | LOGIN • RSS FEED
HOME
ABOUT
E.D.S.S.
REPORT SIGHTINGS
SPECIES INFORMATION
BROWSE DATA
HELP
AIS News
Blogs
Meetings
News Highlights
Partners
What's New
Select Species to Map:
About
Bing Maps Road
Bing Maps Aerial
Topo
South Haven
Berlamont
Center
Plainwell
Alamo
Cooper
Pine Grove
Branch
Bangor
Covert
Eastwood
Kalamazoo
Comstock
Almena
Oshtemo
Paw Paw Lake
Hartford
Lawrence
Paw Paw
Texas Corners
Portage
Watervliet
Lawton
Austin Lake
Pavillion
Benton Harbor
Benton Heights
St Joseph
Bainbridge Center
Keeler
Decatur
Schoolcraft
Vicksburg
Fair Plain
Marcellus Twp
Flowerfield
Sodus
Naomi
Stevensville
Hartman
Volinia
Map Invasives
Select a specimen
Japanese Knotweed
Dowagiac
La Grange
Penn
Berrien Springs
Pokagon
Cassopolis
Fabius
bing
esri
20 km
10 mi
Copyright © 2009 Michigan State University Board of Trustees. East Lansing, Michigan 48824


Browse Data : Midwest Invasi
www.misin.msu.edu/viewer/
MISIN
Midwest Invasive Species Information Network
WEDNESDAY, MARCH 14, 2012
SEARCH:
GO
REGISTER | LOGIN • RSS FEED
HOME
ABOUT
E.D.S.S.
REPORT SIGHTINGS
SPECIES INFORMATION
BROWSE DATA
HELP
AIS News
Blogs
Meetings
News Highlights
Partners
What's New
Select Species to Map:
About
Bing Maps Road
Bing Maps Aerial
Topo
Jamestown
Oaklawn
Beechwood
Zeeland
Lake Macatawa
Holland
New Salem
Dorr
Fillmore
Wayland
Saugatuck
Monterey Center
Fennville
Ganges
Millgrove
Allegan
Watson
Hawkhead
Lee
Cheshire Center
Plainwell
South Haven
Bangor
Covert
Map Invasives
Select a specimen
Japanese Knotweed
bing
20 km
10 mi
Copyright © 2009 Michigan State University Board of Trustees. East Lansing, Michigan 48824

Looking ahead

- Invasives at a Lake-Wide Scale
  - Islands
  - Upper Peninsula
  - Wisconsin, Illinois, Indiana
- Resource Allocation/Prioritization
  - Needs for ongoing surveying, treatment, and monitoring
  - **Issue** - How to balance ED/RR focus with containment, prioritization, and monitoring efforts?
- Long Term Funding and “Right Sizing”
  - Align timelines of funding and treatment
  - Sustainability through varying resource availability

Shaun Howard
Coastal Invasives Coordinator
The Nature Conservancy in Michigan
616.785.7055 ext. 3020
showard@tnc.org