AQUATIC INVASIVE WATCH LIST SPECIES

Sarah LeSage

Aquatic Invasive Species Program Coordinator

Water Resources Division

Agriculture and Natural Resources Week: Great Lakes Conference

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East Lansing, Michigan

ASIAN LONGHORNED BEETLE

ANOPLOPHORA GLABRIPENNIS

- Wood Boring Beetle native to eastern China, Japan, and Korea
- Status: Not known to be in Michigan
- Pathway:
  - Arrived to US from Asia in solid wood packing material
  - Can be moved on firewood
- Impacts:
  - Forest Ecosystems
  - Industries: Lumber, Nursey, Tourism

First identified in North America in New York in 1996

Chicago 1998
(declared eradicated 4/08)

New Jersey 2002
(declared eradicated 3/11)

Toronto 2003
(Declared eradicated 4/13
But detected again later in 2013

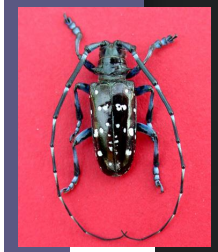
Massachusetts 2008

Most recently detected in Ohio 2011

More than 1 billion maples grow in Michigan

IMPACT OF
ASIAN LONGHORNED BEETLE

IDENTIFICATION



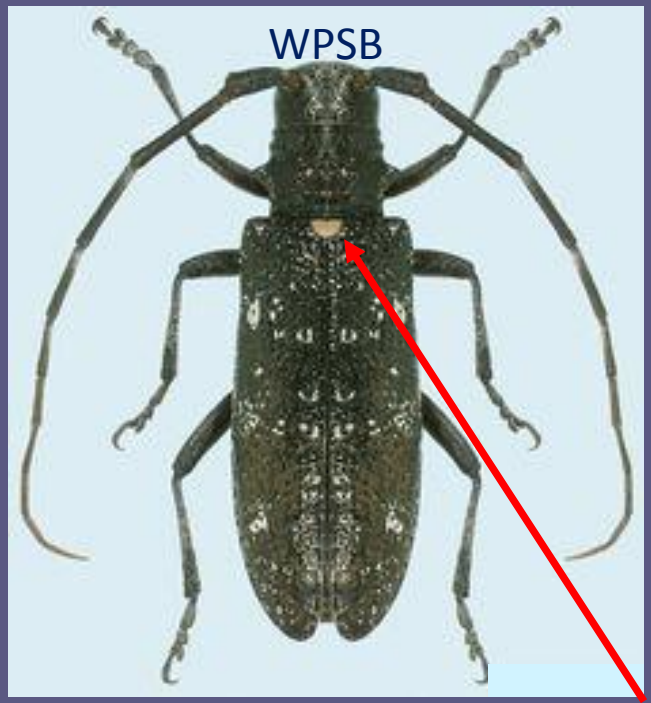
Male

Female

- Adults are glossy black with irregular white spots on their wing covers
- Body size ranges from ¾ to 1¼ inches in length, not including the very long black and white antennae

ASIAN LONGHORNED BEETLE
VS.
WHITE SPOTTED PINE SAWYER BEETLE

A white spot is all it takes to tell the difference between a dangerous invasive insect, the Asian longhorned beetle (ALB), and its harmless native look-alike, the white spotted pine sawyer beetle

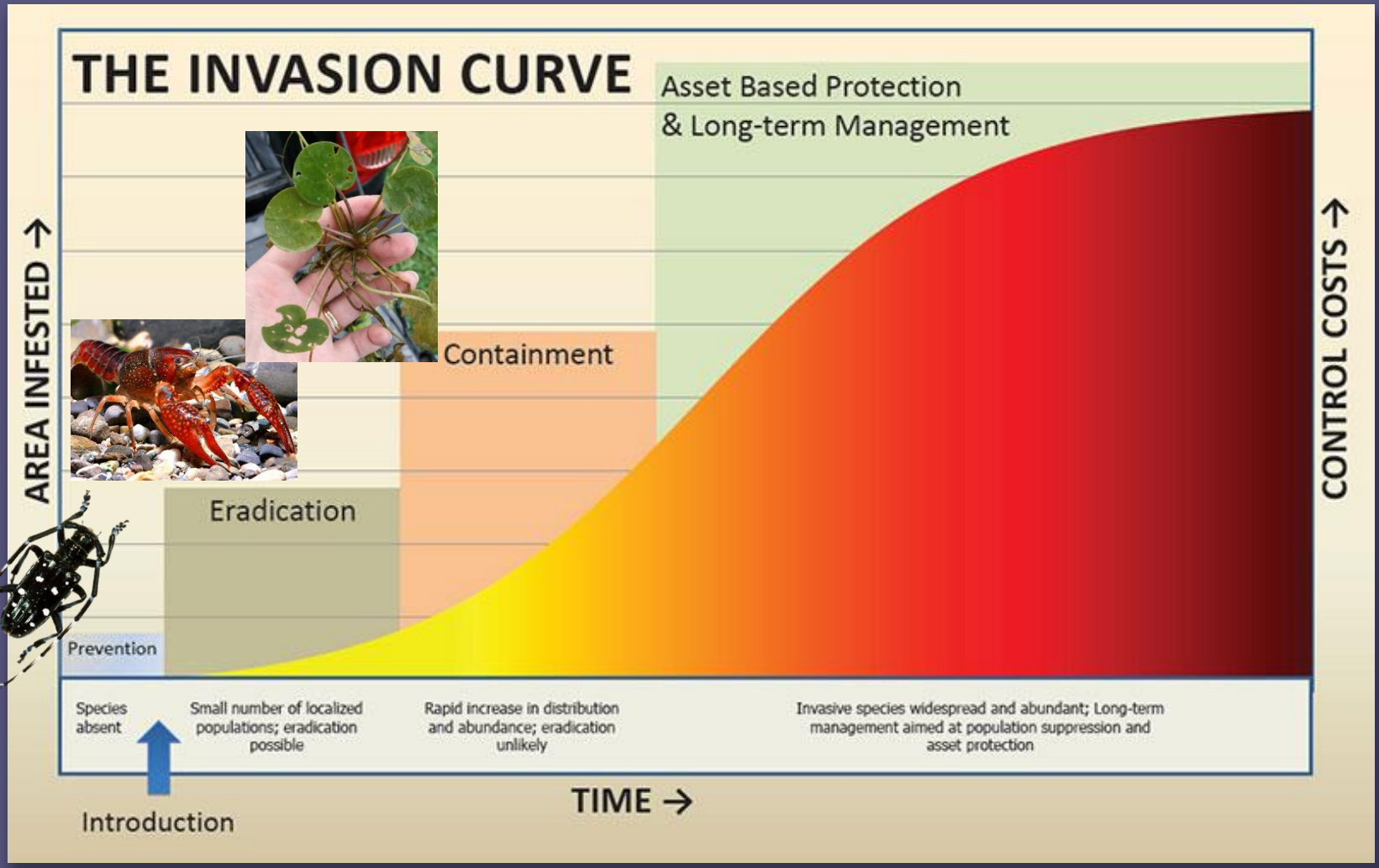


The native has a distinct white spot between the top of it's wing covers; ALB does not

No white spot

ASIAN LONGHORNED BEETLE
SIGNS & SYMPTOMS

INVASION CURVE



EUROPEAN FROG-BIT

HYDROCHARIS MORSUS-RANAE

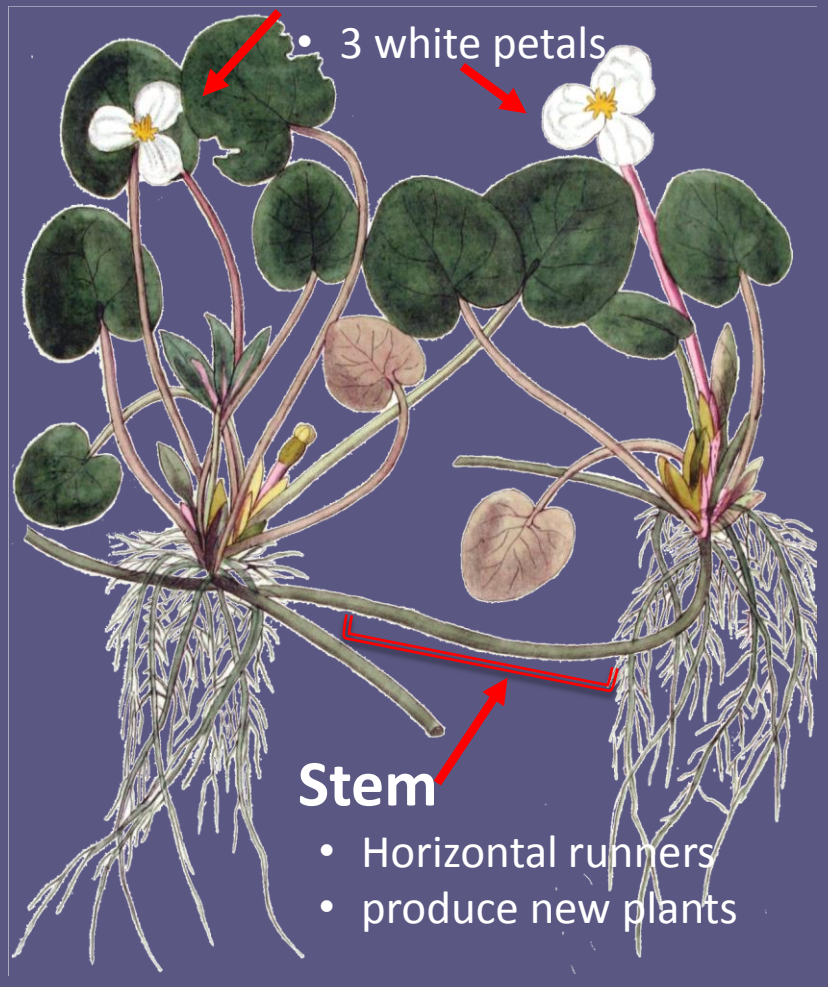
- Floating aquatic plant native to Europe and parts of Asia and Africa
- Status: Established in Michigan
  - First report in Michigan: 1996
  - Occurs from the eastern UP to Lake Erie with one outlier population near Grand Rapids
- Pathway: Ornamental, Recreation
- Impacts:
  - Reduced light, nutrients, dissolved oxygen, aquatic plant diversity
  - Obstruct recreation and reduce property values

EUROPEAN FROG-BIT
IDENTIFICATION

Leaves
- 0.5 – 2.25” across
- Round to Heart-shape
- Leathery

- Habitat: lentic or slow lotic
- Free-floating
- Rosette form
- Develops dense mats

Flower
- 3 white petals



Stem
- Horizontal runners
- produce new plants

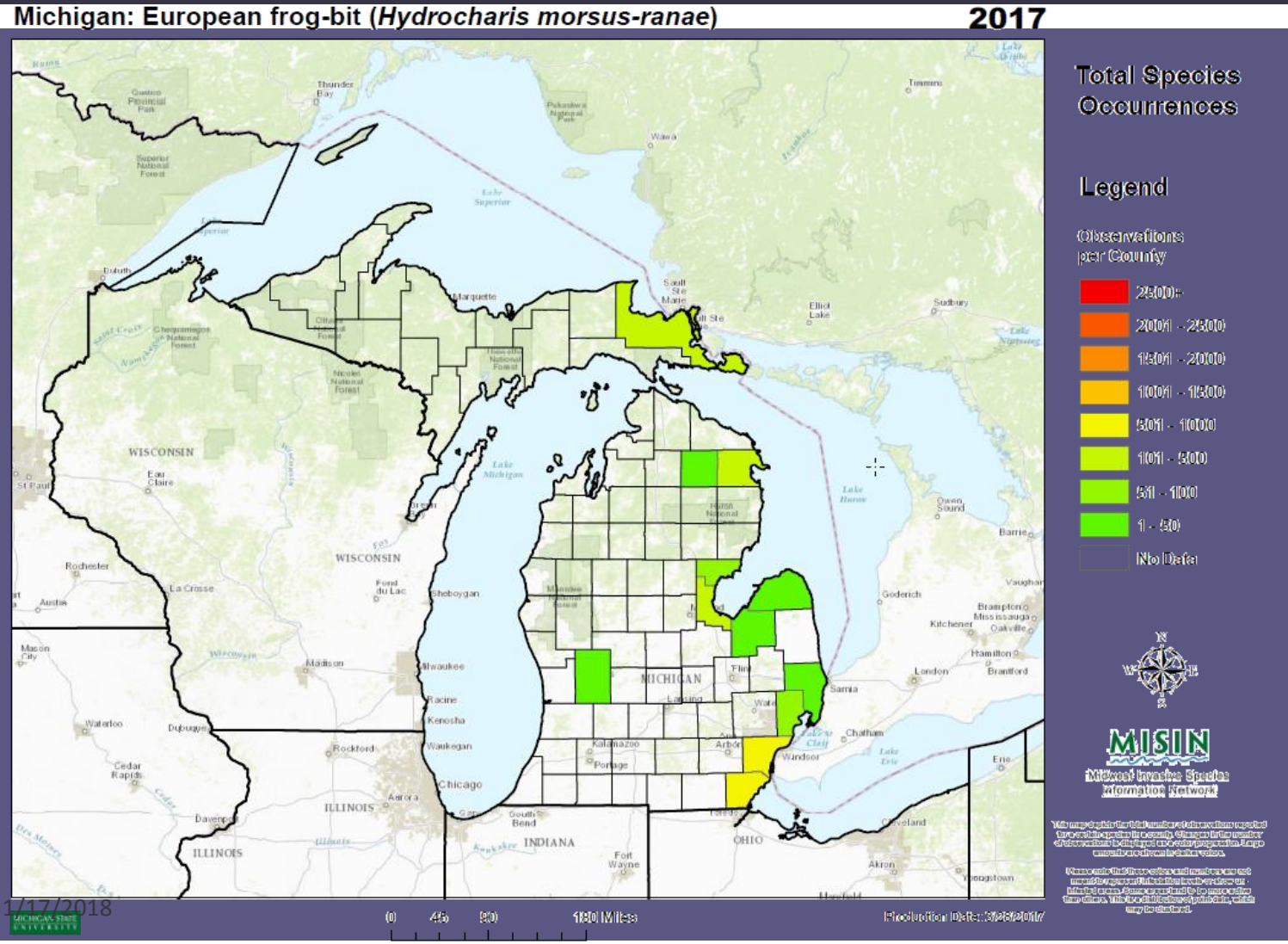
EUROPEAN FROG-BIT
VS. NATIVE PLANTS

Spadderdock
- Heart-shaped leaf with round lobes
- Large leaves up to 16”
- Yellow flower

White water lily
- Pointed leaf lobes
- Many-petaled white flower

Duckweed
- Leaves 1/16 – 1/8”
- Free-floating

DISTRIBUTION



Updated: 1/17/2018

SAGINAW BAY

MUNUSCONG BAY

NAYANQUING POINT, SAGINAW BAY
2015

- Management of priority areas within State Game Areas
- Multiple years of control efforts

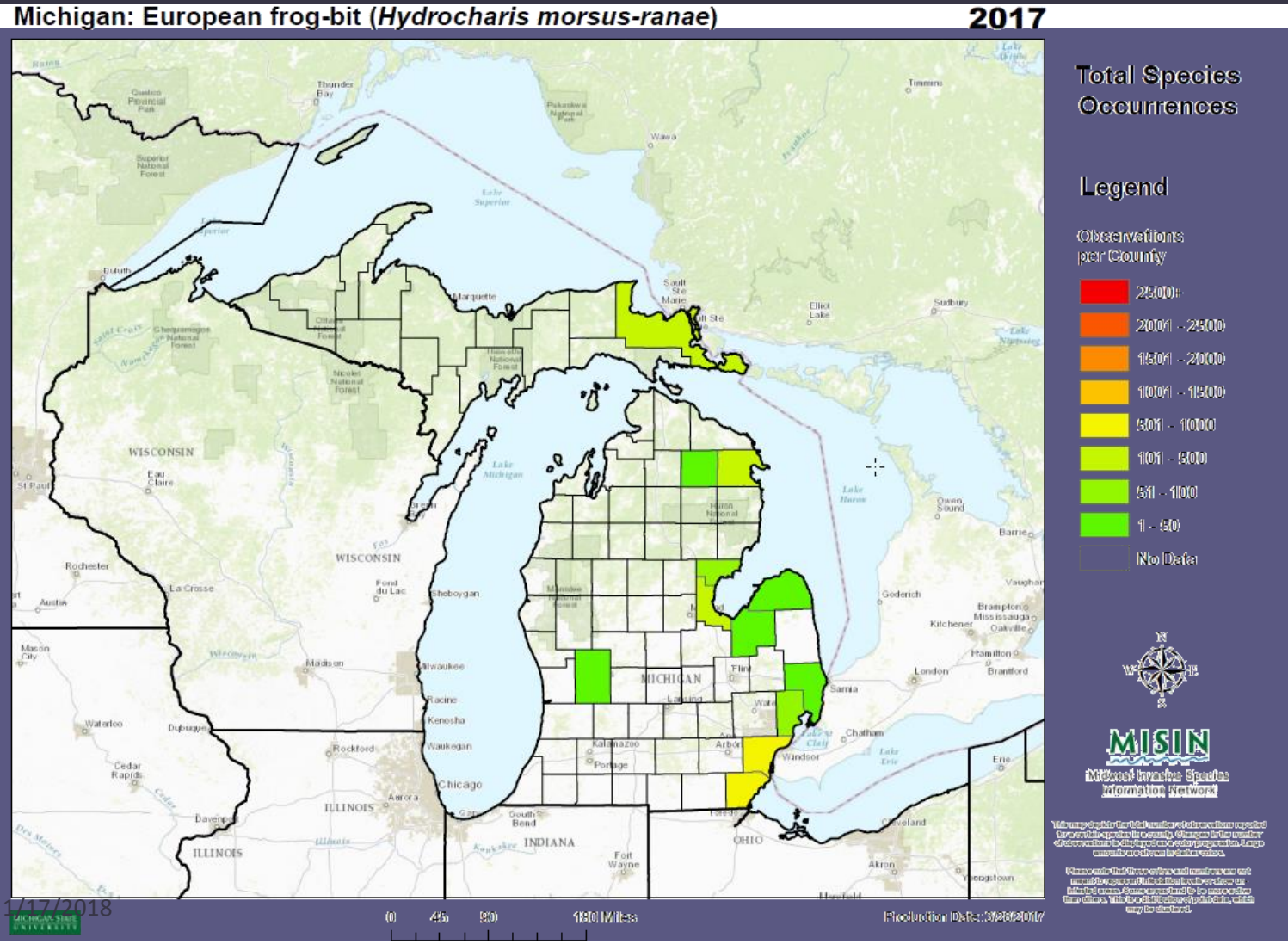
NAYANQUING POINT, SAGINAW BAY

- 2017
- Coastal wetland treatments
  - Reduce density
  - 315 acres
  - Airboat application of herbicides
  - $26,000
- Multiple years of control efforts

THREE SHORES COOPERATIVE INVASIVE SPECIES MANAGEMENT AREA

NORTHEAST MICHIGAN COOPERATIVE INVASIVE SPECIES MANAGEMENT AREA

DISTRIBUTION



Updated: 1/17/2018

REEDS AND FISK LAKES

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July 2017

Aug 2017

- Management goal is eradication
- Manual removals and herbicide treatments

RESEARCH ON NOVEL TREATMENT

- Loyola University Chicago
- European frog-bit and invasive *Typha* co-occur in Great Lakes coastal wetlands

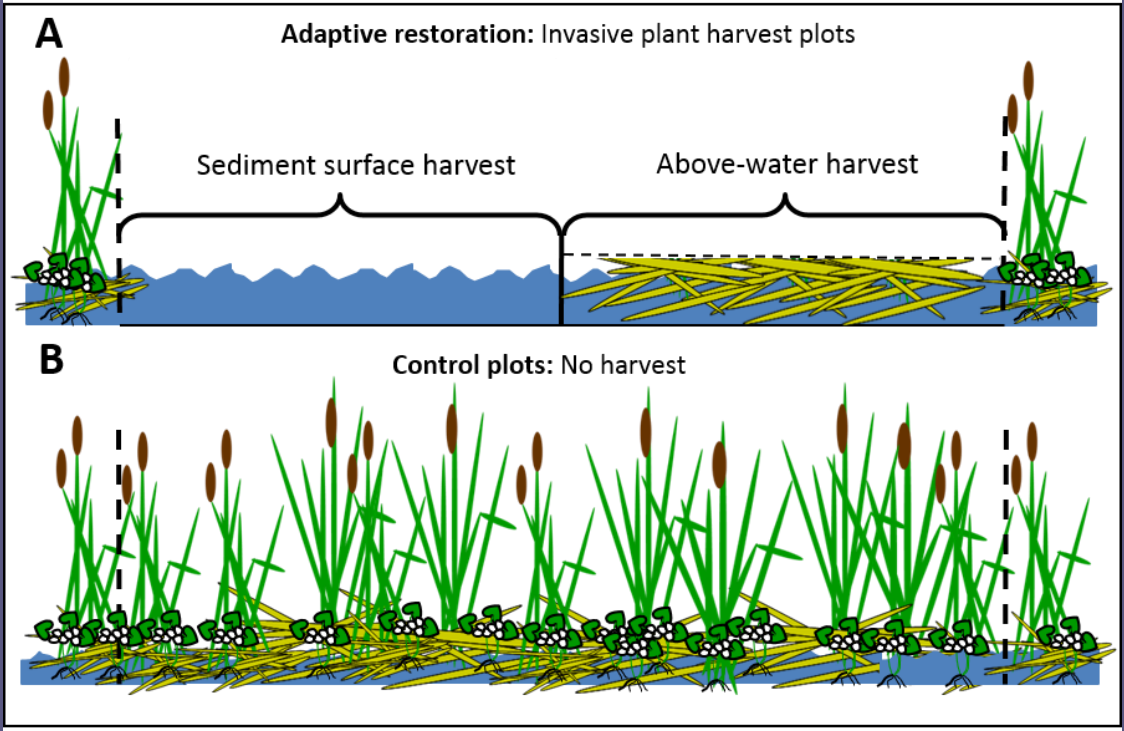


Figure 3 Diagram of 1-acre plots: A) treatment plots – each plot will be split with ½ acre harvested above-water (Softrak harvest alone) and ½ acre harvested at sediment surface; B) control plots.

Figure from Shane Lishawa, Loyola

RESEARCH ON NOVEL TREATMENT

- Loyola University Chicago
- European frog-bit and invasive Typha co-occur in Great Lakes coastal wetlands

Figure 1 European frogbit at Munuscong Wildlife Management Area. A) 2011, frogbit growing densely within a stand of invasive cattail during experimental cattail harvesting; B) 2012, reduced cattail and frogbit cover in a plot where cattail was harvested, note that frogbit leaves are concentrated on the plot's more protected periphery.

Figure from Shane Lishawa, Loyola

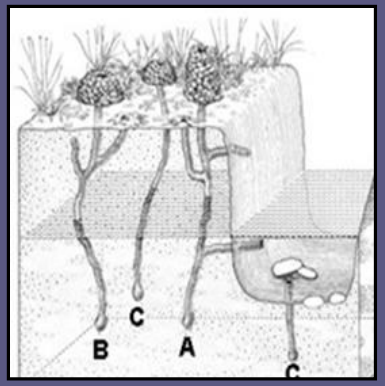
RED SWAMP CRAYFISH

PROCAMBARUS CLARKII

- Native to southern US
- Status: Isolated locations in southern Michigan
  - First report: 2017
- Pathway: Aquaculture, aquarium trade, food markets, bait, biological supply
- Impacts:
  - Food web alteration, native species decline
  - Habitat changes

RED SWAMP CRAYFISH IMPACTS

- Most invasive crayfish worldwide
  - Outcompete native species
  - Dig complex burrows causing erosion and infrastructure problems
  - Feed on vegetation and negatively impact water clarity (water becomes turbid)
  - Reproduce in large numbers
- Prohibited in 2015
  - Anglers- live crayfish as bait in SW MI
  - Teachers- classrooms



PATHWAYS

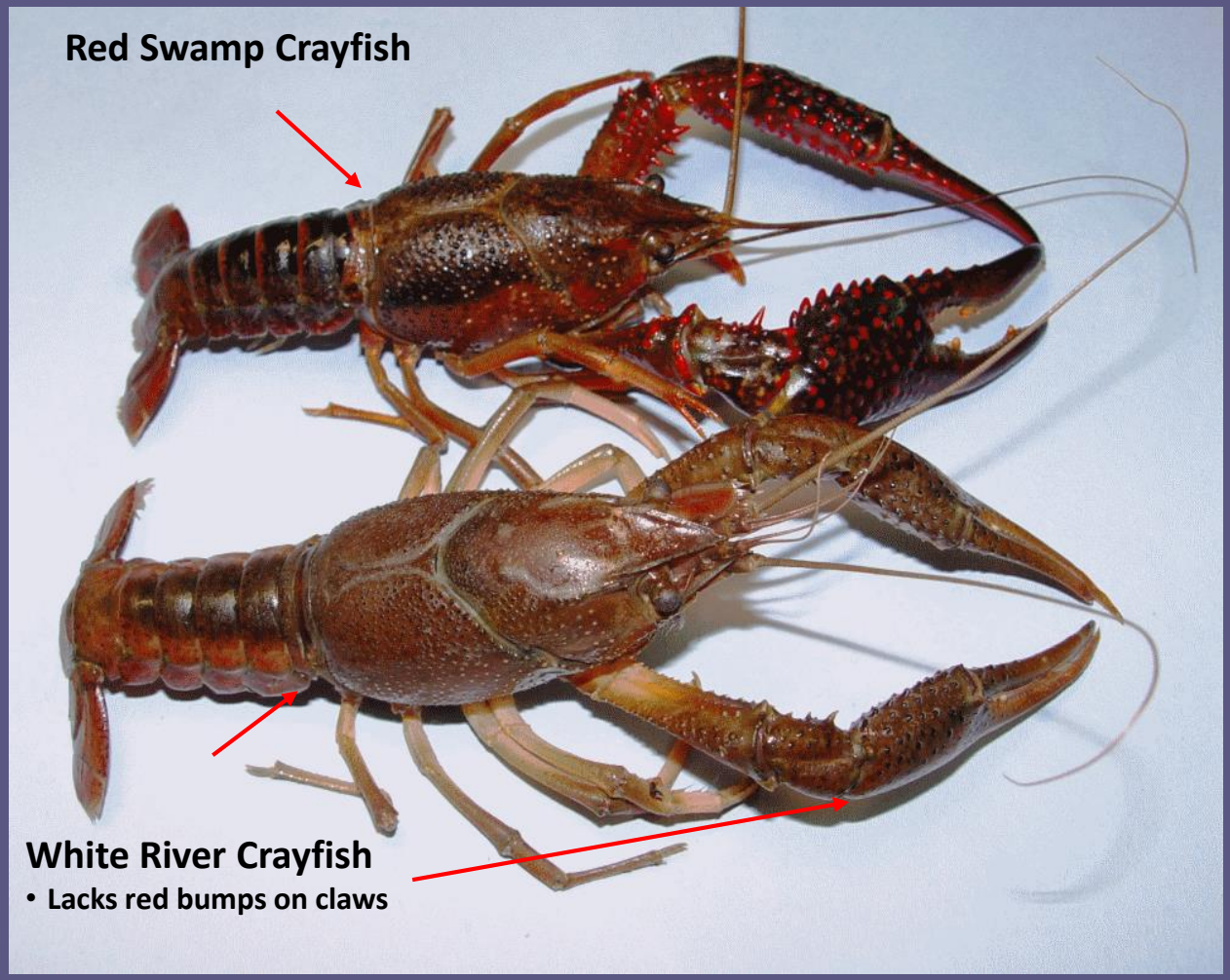
- Michigan State University 2014-2015
- Michigan Science Teacher Survey K-12
  - Crayfish Acquisition and Disposal categorized as risky or safe
  - 157 respondents from 45 counties
  - 17 use crayfish- many risky behaviors
- Inspections for live crayfish in major population centers
  - Pet shops, bait shops, food markets
  - 125 visits, 60 revisits
  - Confirmed many shops selling red swamp crayfish, even after prohibition

Examples of *P. clarkii* color morphs found in pet shops

RED SWAMP CRAYFISH
IDENTIFICATION

- Dark red with bright red raised spots
- 2-5” long
- Black wedge shaped stripe on top of tail
- Black to blue line under the tail

RED SWAMP CRAYFISH VS. NATIVE WHITE RIVER CRAYFISH



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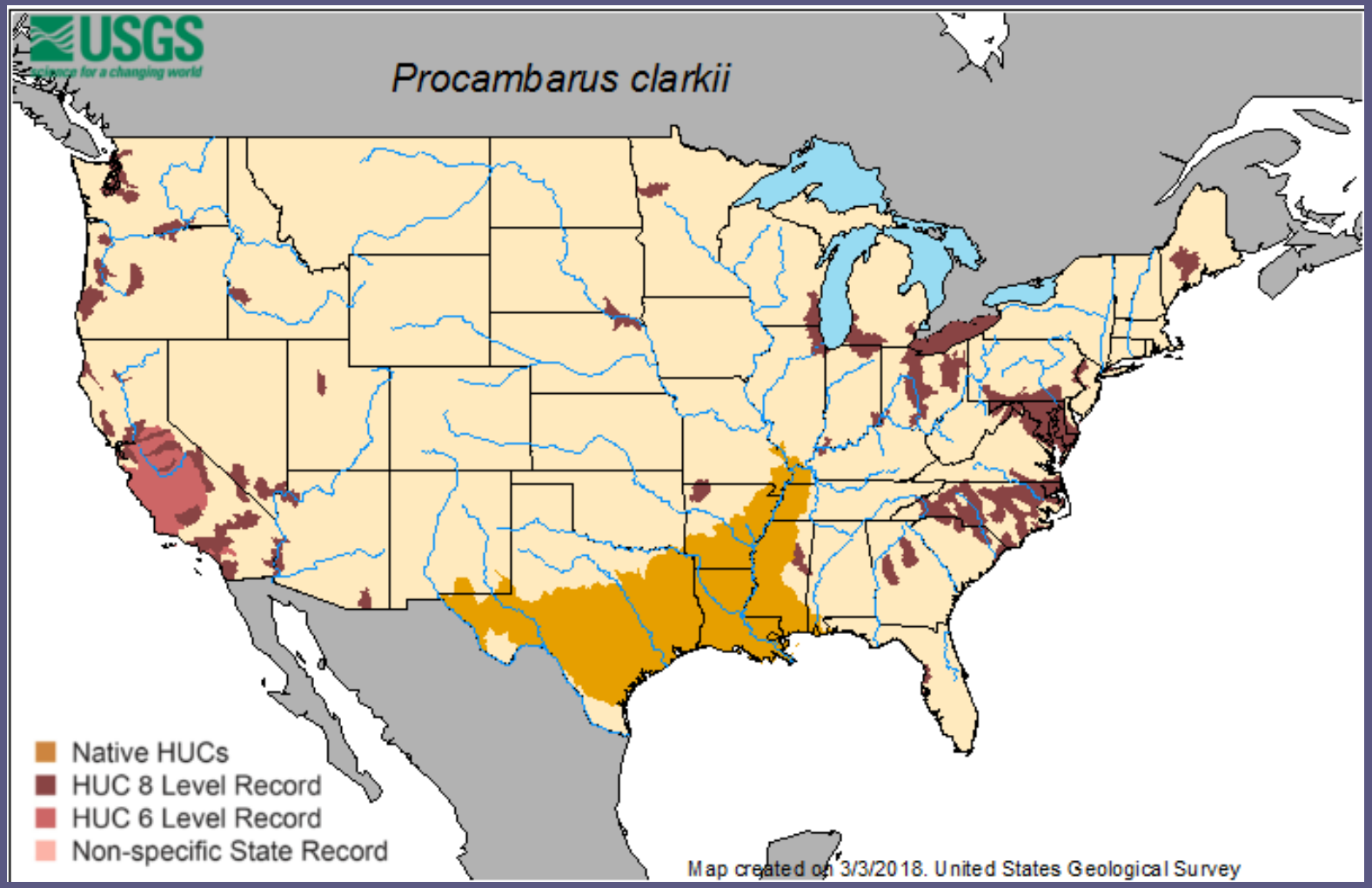
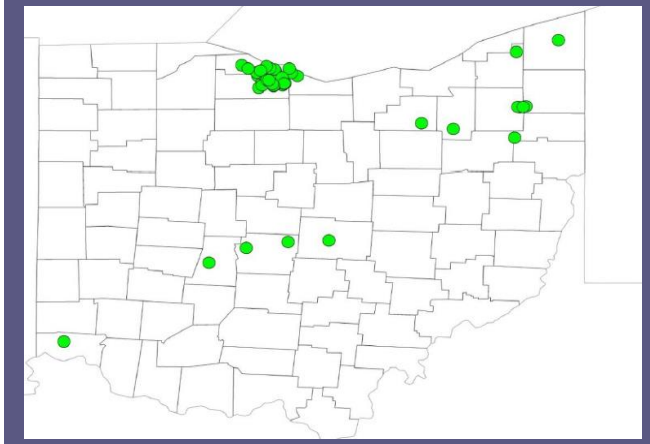
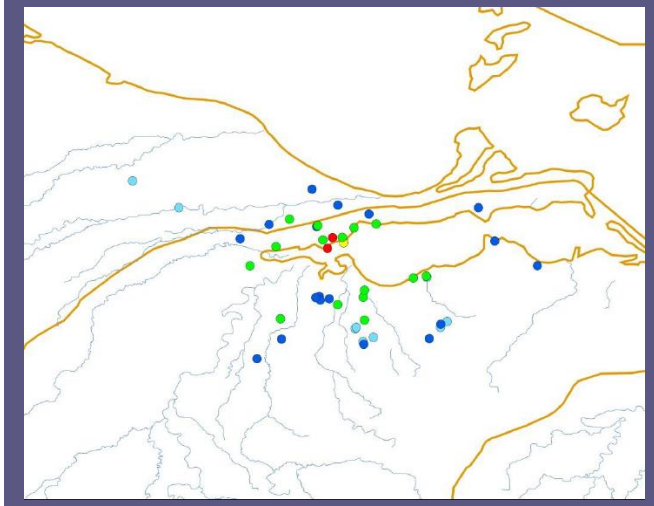


RED SWAMP CRAYFISH IN OHIO



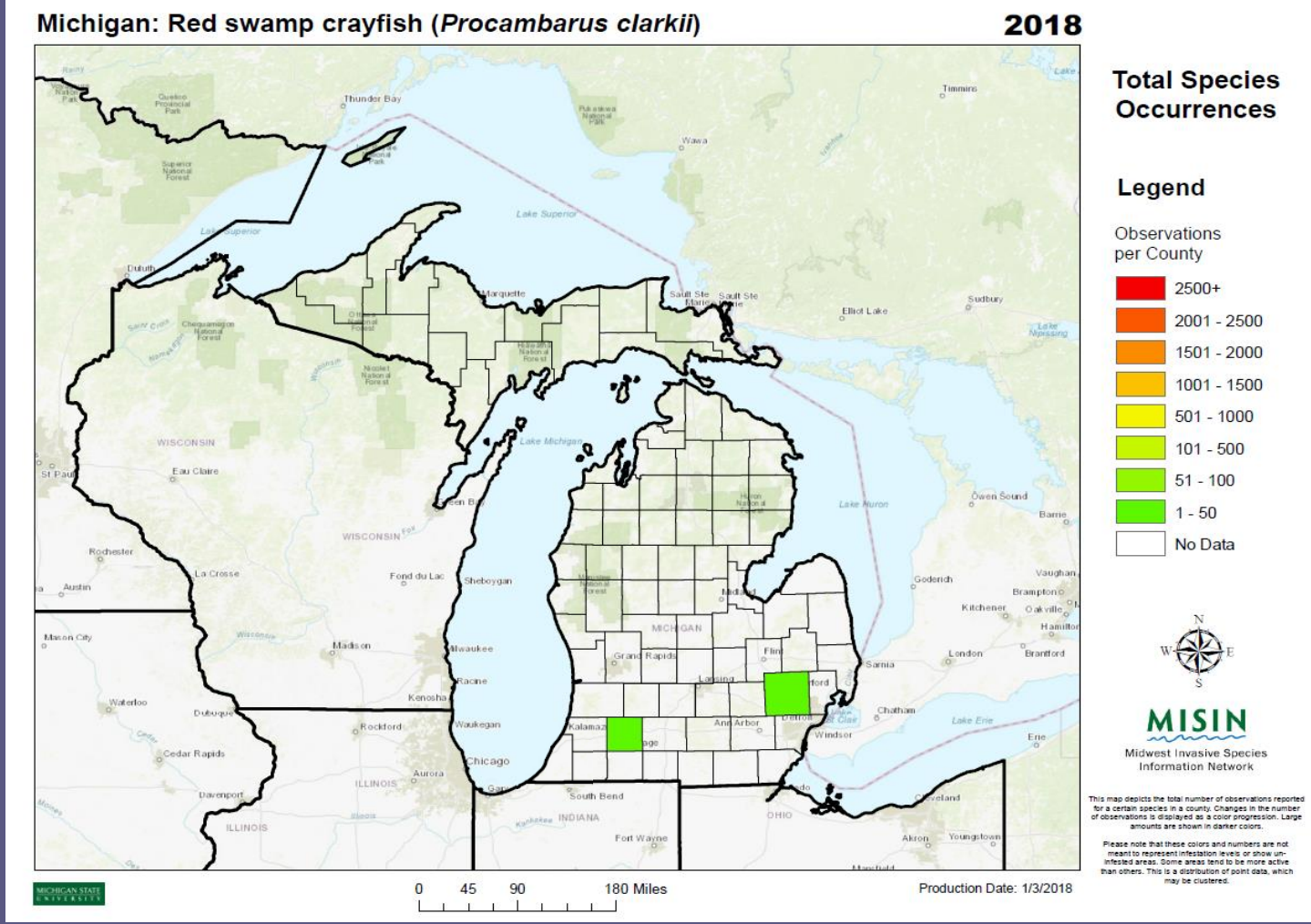


Figures from John Navarro, Ohio DNR

- Established in Sandusky Bay for >50 years
- Low gradient ditches dispersal route
- Prefer soils with high organic content
- Widespread and abundant
- Outcompeting other crayfish

Red - 1960s
Yellow -1970s
Green - 1980s
Light Blue - 1990s
Dark Blue - 2000s

RED SWAMP CRAYFISH IN MICHIGAN



2017 RED SWAMP CRAYFISH REPORTS

- Initial report to Fisheries Division on July 14, 2017 from Sunset Lake in Vicksburg (Kalamazoo County)
- Second report from Novi Retention pond on July 16, 2017
- Increased awareness through statewide press release, social media, you tube video, and signage
  - Followed up on over 100 public reports

Tiny lobsters of doom: Why this invasive crayfish is bad news

By KATE WELLS · JUL 27, 2017

PROGRAM
The Environment Report

Tweet
Share
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Email

This is the photo sent to Seth Herbst. "And as soon as I saw that photo, it was a clear as day that that was a red swamp crayfish," he sighed.

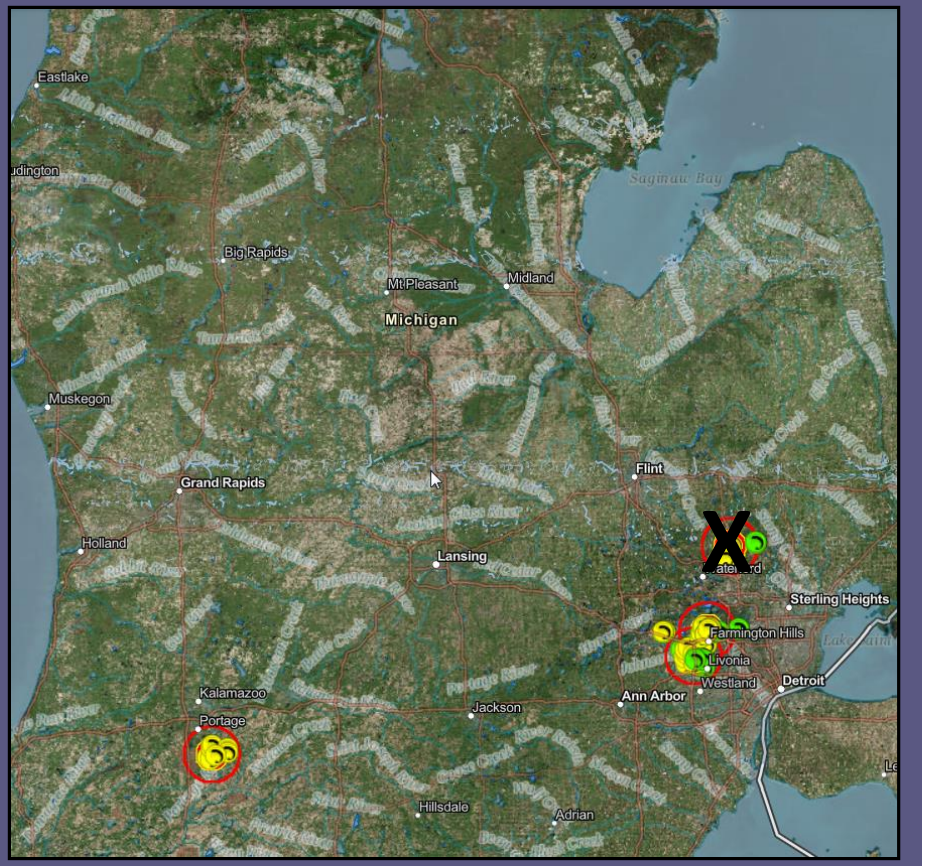
COURTESY SETH HERBST

2017 RED SWAMP CRAYFISH RESPONSE

- Multiple credible reports
- Most of reports are of native crayfish

Confirmed:

- Sunset Lake
  - No detected spread
  - ~70 removed
- Novi
  - 11 infested ponds
  - >4,000 removed
- Farmington Hills
  - 3 infested ponds
  - ~1,500 removed



POTENTIAL PATHWAYS

- Red swamp crayfish were widely available prior to 2015
- Crayfish could have been introduced from releases linked to multiple vectors
- Law Enforcement Division has been active with enforcing regulations to prevent future introductions

RED SWAMP CRAYFISH RESPONSE PLAN

Goals:

1) Determine the distributional extent of the infestations

2) Implement and evaluate an early detection monitoring strategy in high risk areas

3) Determine the source and relatedness of red swamp crayfish infestations

4) Collect baseline biological and physical information that will inform a future assessment of impacts

5) Implement and evaluate control measures to increase effectiveness of response efforts

MICHIGAN STATE UNIVERSITY

RED SWAMP CRAYFISH RESPONSE

- Continued implementation of Michigan's response plan with MSU
- Collaborate with crayfish and AIS control experts to evaluate and implement effective controls
  - USGS, USFWS, MSU, Auburn, others
- Potential field application of chemical treatments in 2018

WATCH LIST SPECIES
AND RESPONSE

IDENTIFICATION & REPORTING TOOLS

MISIN Midwest Invasive Species Information Network

Learn, Identify, Report, Map

www.misin.msu.edu

www.michigan.gov/invasives

Sarah LeSage
lesages@michigan.gov
517-243-4735

Subscribe to Invasive Species Updates

www.michigan.gov/invasives

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Great Lakes RESTORATION