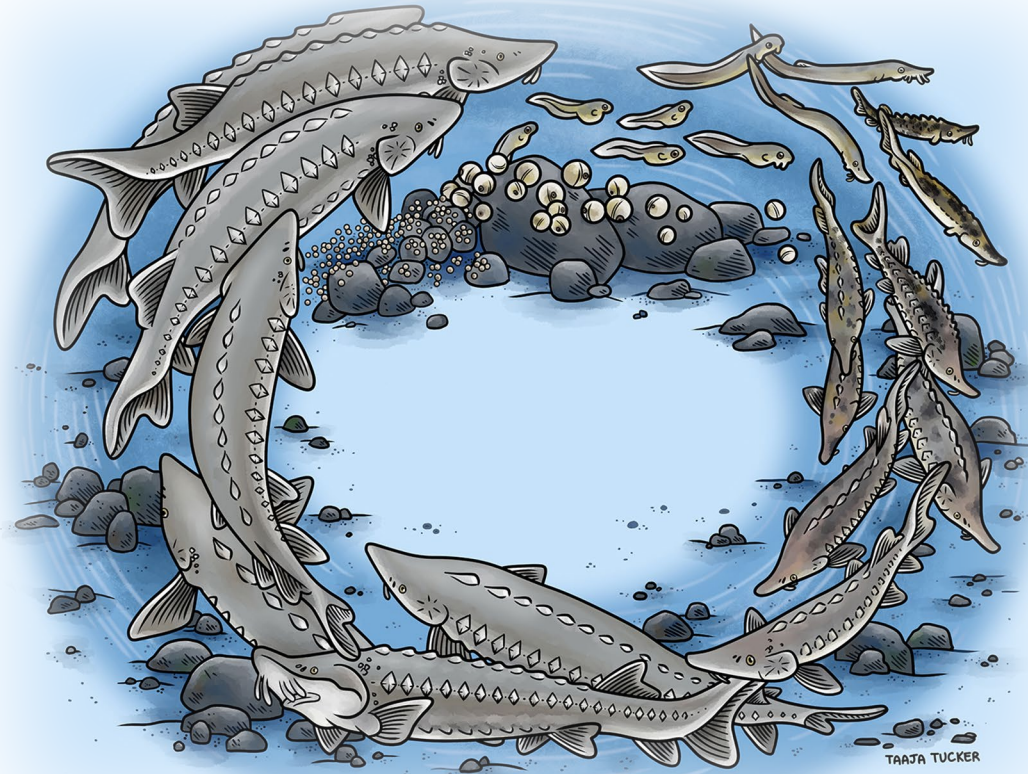


# Sturgeon Management in the Great Lakes



Authors: Justin Chiotti, Andrew Briggs, Jessica Collier, Henry Quinlan, Joshua Schloesser

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2023 Great Lakes Conference – March 7<sup>th</sup>, 2023

# Partnerships



Genetics

Stocking

Habitat Connectivity

Research

Recreational Use

Habitat Restoration

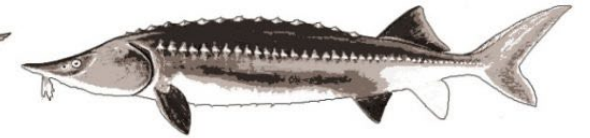
# A World of Sturgeon

## A World of Sturgeon

- 27 species of sturgeon worldwide
- Have outlived the dinosaurs and survived the ice ages
- Salt and freshwater species
- All species are listed as threatened or endangered



le Sevruga (*Acipenser Stellatus*)



le Béluga (*Huso Huso*)



l'Oscétre (*Acipenser Gueldenstaedtii*)



l'Esturgeon Amour (*Acipenser Schrencki*)



l'Esturgeon Blanc (*Acipenser Transmontanus*)



l'Esturgeon de Sibirie (*Acipenser Baeri*)

# A World of Sturgeon

Lake Sturgeon the only species in the Great Lakes

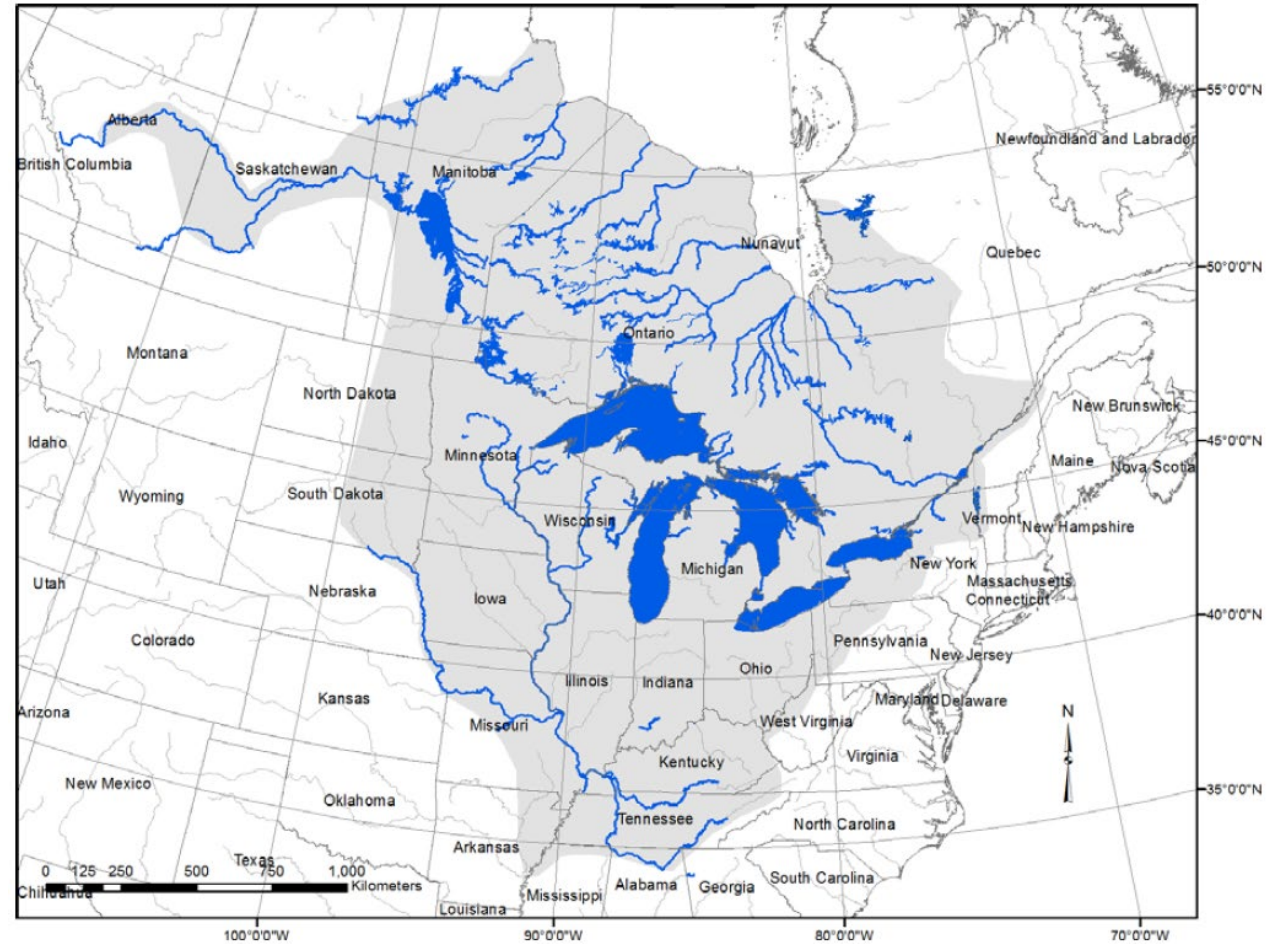
- Up to 9 feet in length; 300 pounds in weight
- Long lived
- Late sexual maturity
- Periodic spawning



# Lake Sturgeon Historical Range

(Harkness and Dymond 1961; Bruch et al. 2016)

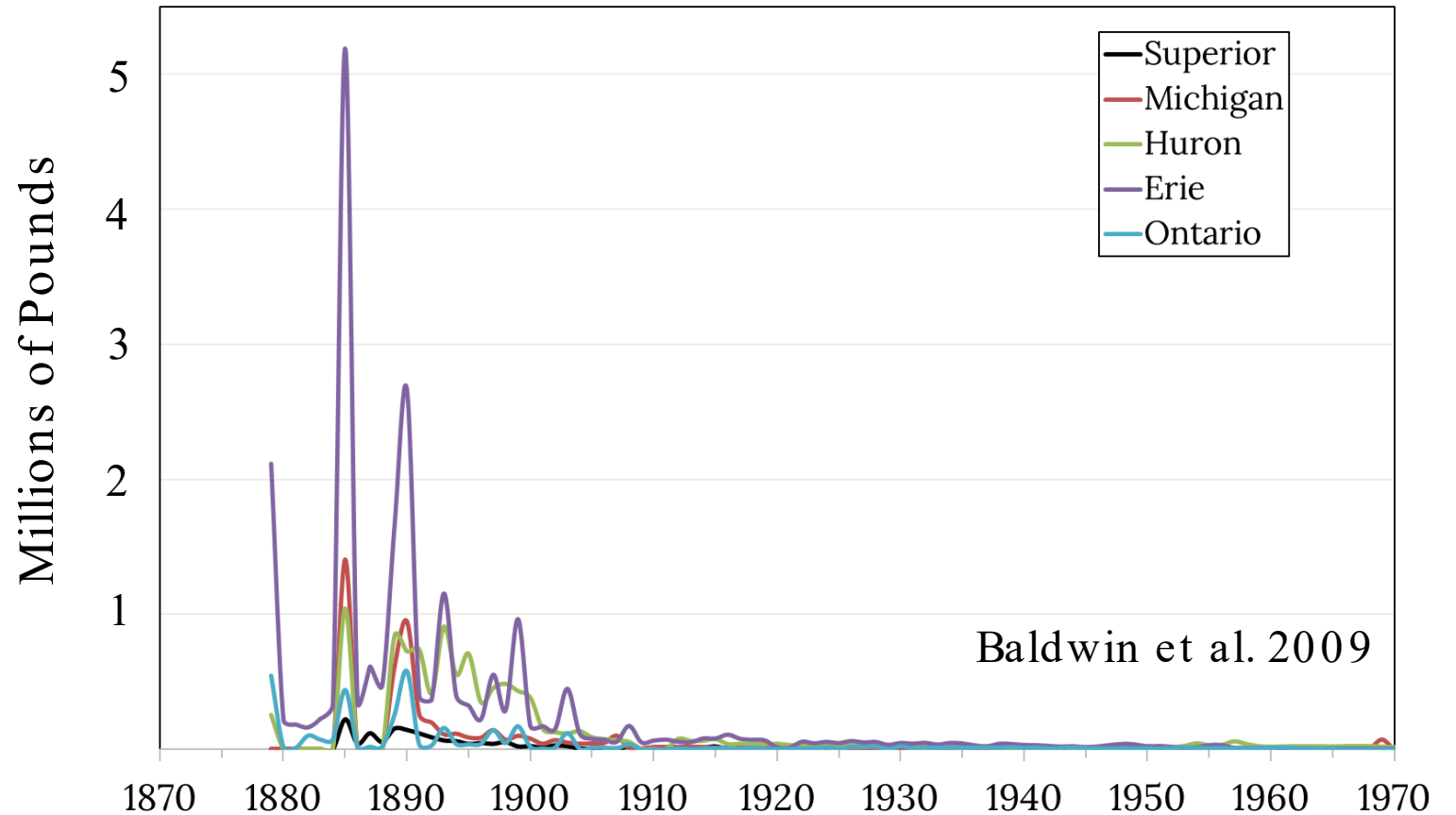
Reduced to < 1% of historic levels  
in Great Lakes



# Reasons for Decline

## Reasons for Decline

- Over-exploitation
- Habitat loss
- Exotic species



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# Reasons for Decline

## Reasons for Decline

- Over-exploitation
- **Habitat loss**
- Exotic species



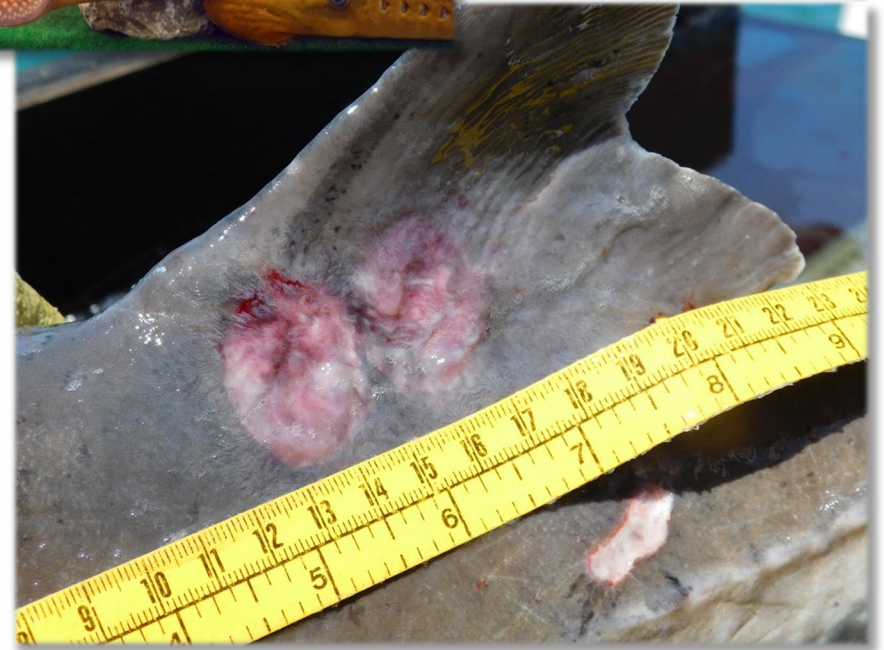
# Reasons for Decline

## Reasons for Decline

- Over-exploitation
- Habitat loss
- Exotic species



Jude 2001; Nichols et al. 2003





# Why Restore Sturgeon?

- Conserve Aquatic Species
  - < 1% of historical populations in Great Lakes
  - Remove from T & E species lists
- Conserve, Restore, and Enhance Aquatic Habitats
- Fulfill Tribal Trust and Subsistence Responsibilities
  - Cultural significance
- Enhance Recreational Fishing and other Public Uses
  - Recreational fishing
  - Harvest



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Genetics

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Habitat Connectivity

Research

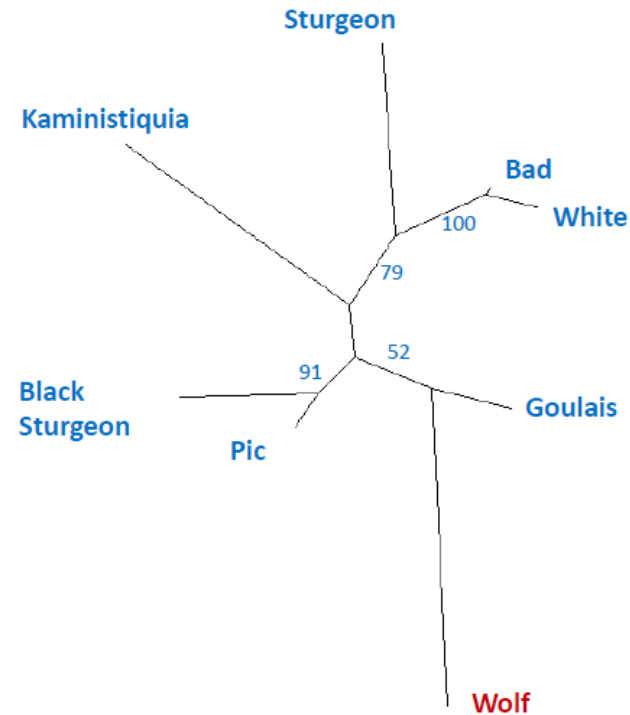
Recreational Use

Habitat Restoration

# Lake Superior

## Using Genetic Techniques to Detect Movement

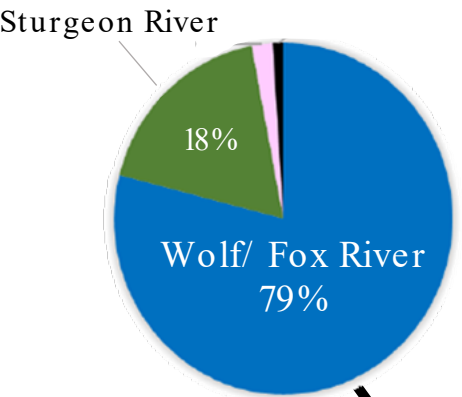
- Objective: to identify the source population of sturgeon captured in LS between 2004 – 2017
- Distinct genotypes of sturgeon populations observed
- Assignment to distinct population provides information on movement, year-class strength, and recruitment



# Lake Superior

## Using Genetic Techniques to Assess Straying

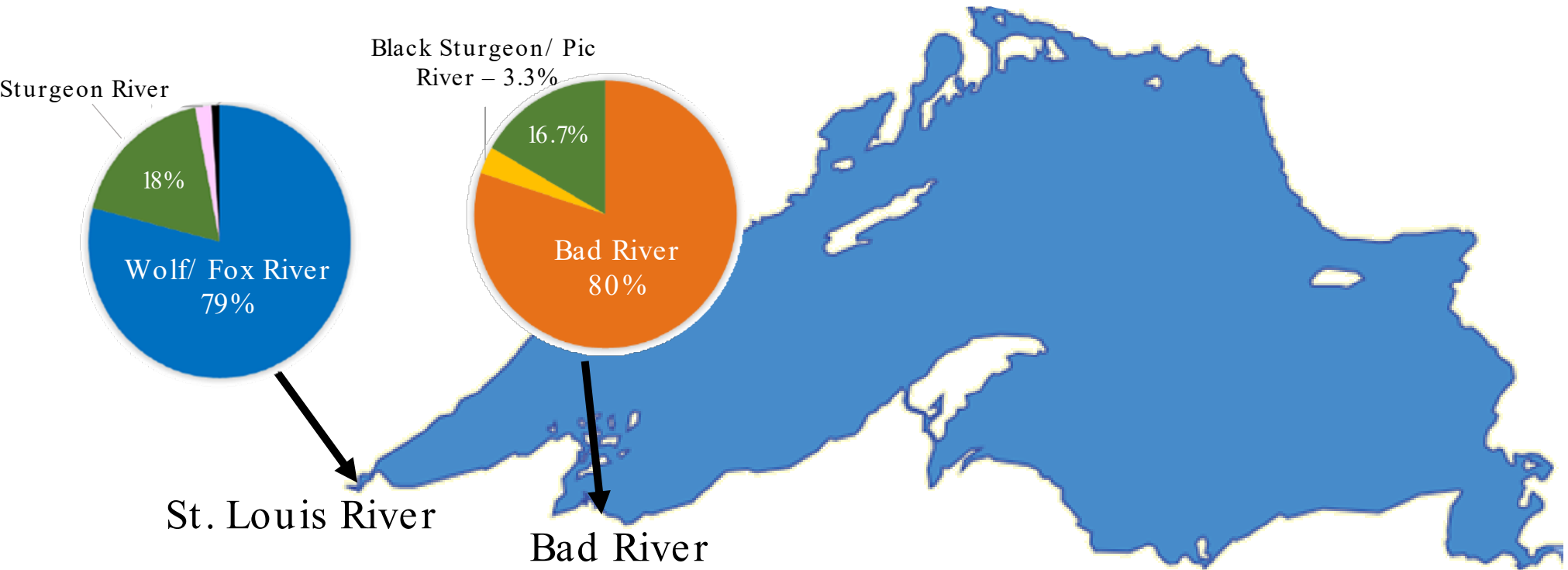
- Objective: to determine if Lake Sturgeon stocked in the St. Louis River stray to other areas of LS
- Lake Winnebago (1983 – 1994)
- Sturgeon River (1998 – 2000)



# Lake Superior

## Using Genetic Techniques to Assess Straying

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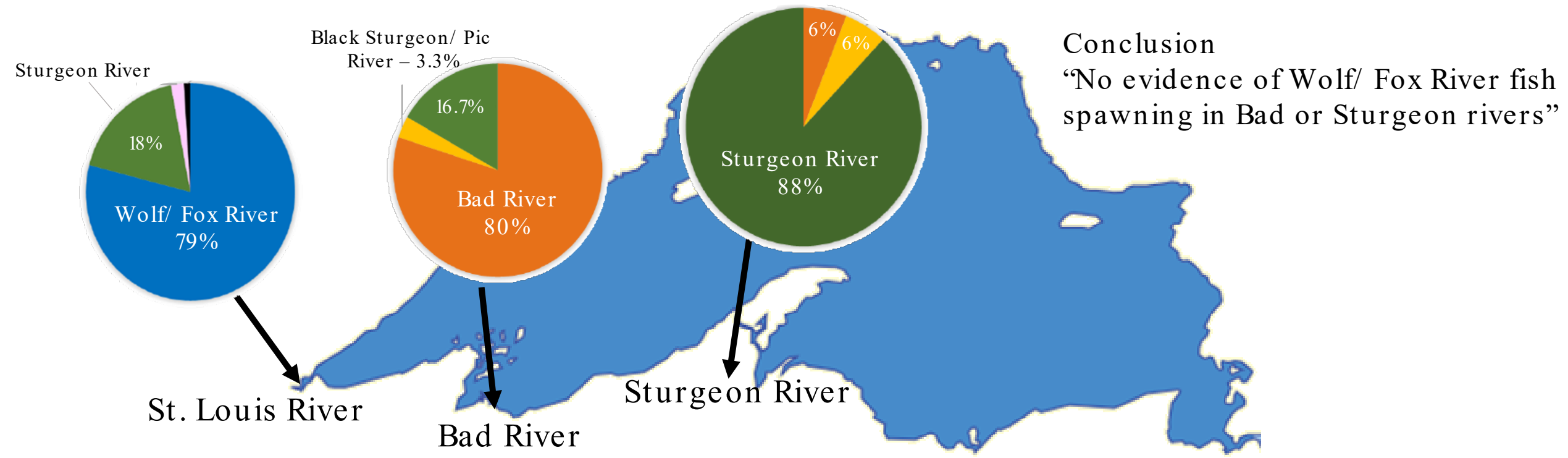


# Lake Superior

## Using Genetic Techniques to Assess Straying

- Objective: to determine if Lake Sturgeon stocked in the St. Louis River stray to other areas of LS

- Lake Winnebago (1983 – 1994)
- Sturgeon River (1998 – 2000)



## Conclusion

“No evidence of Wolf/ Fox River fish spawning in Bad or Sturgeon rivers”

# Lake Michigan

## Streamside Rearing

- Six facilities in the Lake Michigan Basin
- Tribal partners leading efforts on Manistee and Kalamazoo rivers

An important aspect of “streamside” rearing is the fish are reared in water pumped from the target river. It is hoped this will allow young sturgeon to “**imprint**” to the river water in the same way wild fish do, ensuring their return to the target river as mature adults and reducing the chance that they might stray to other rivers, causing genetic concerns for other populations.

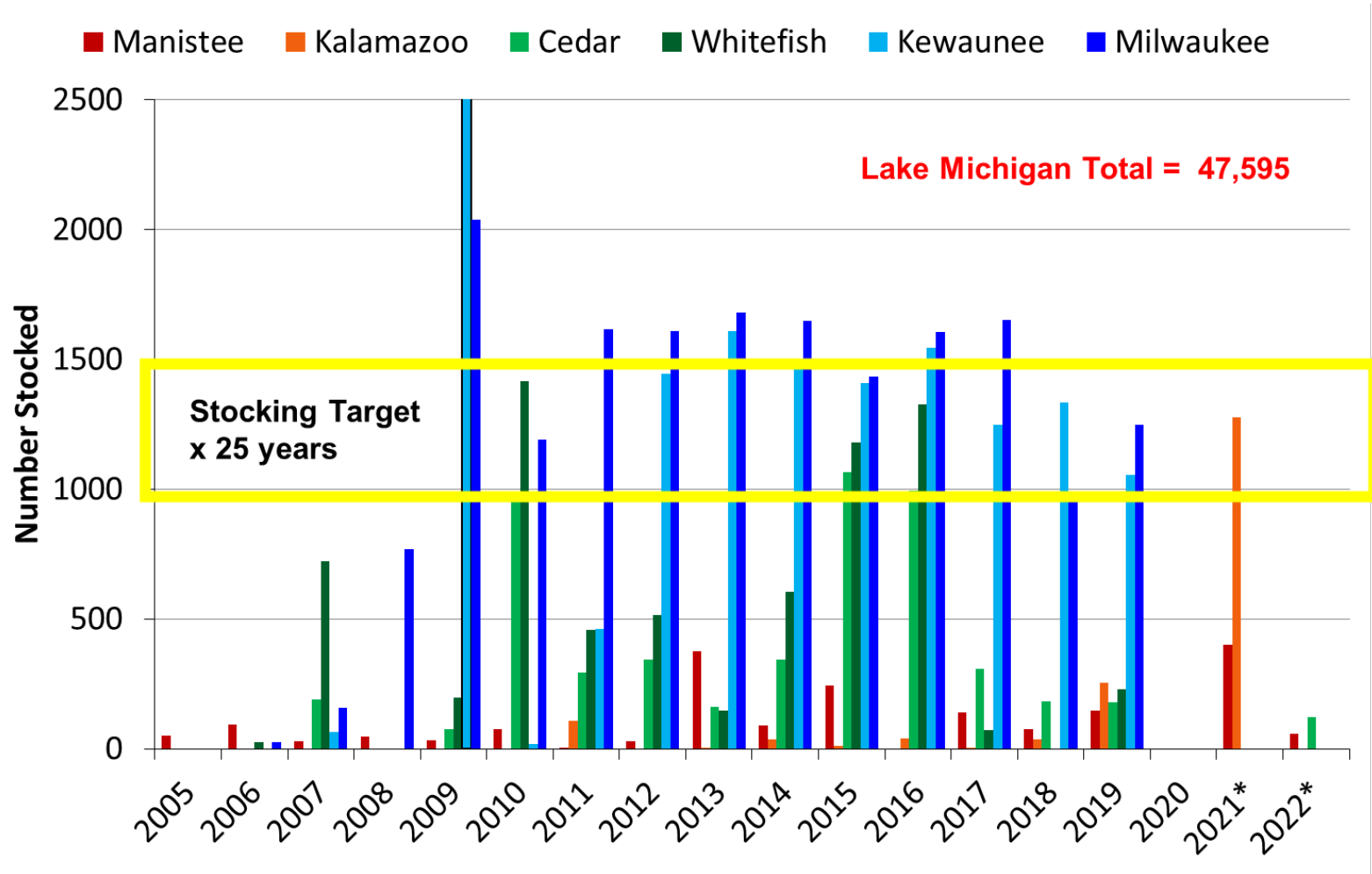


# Lake Michigan

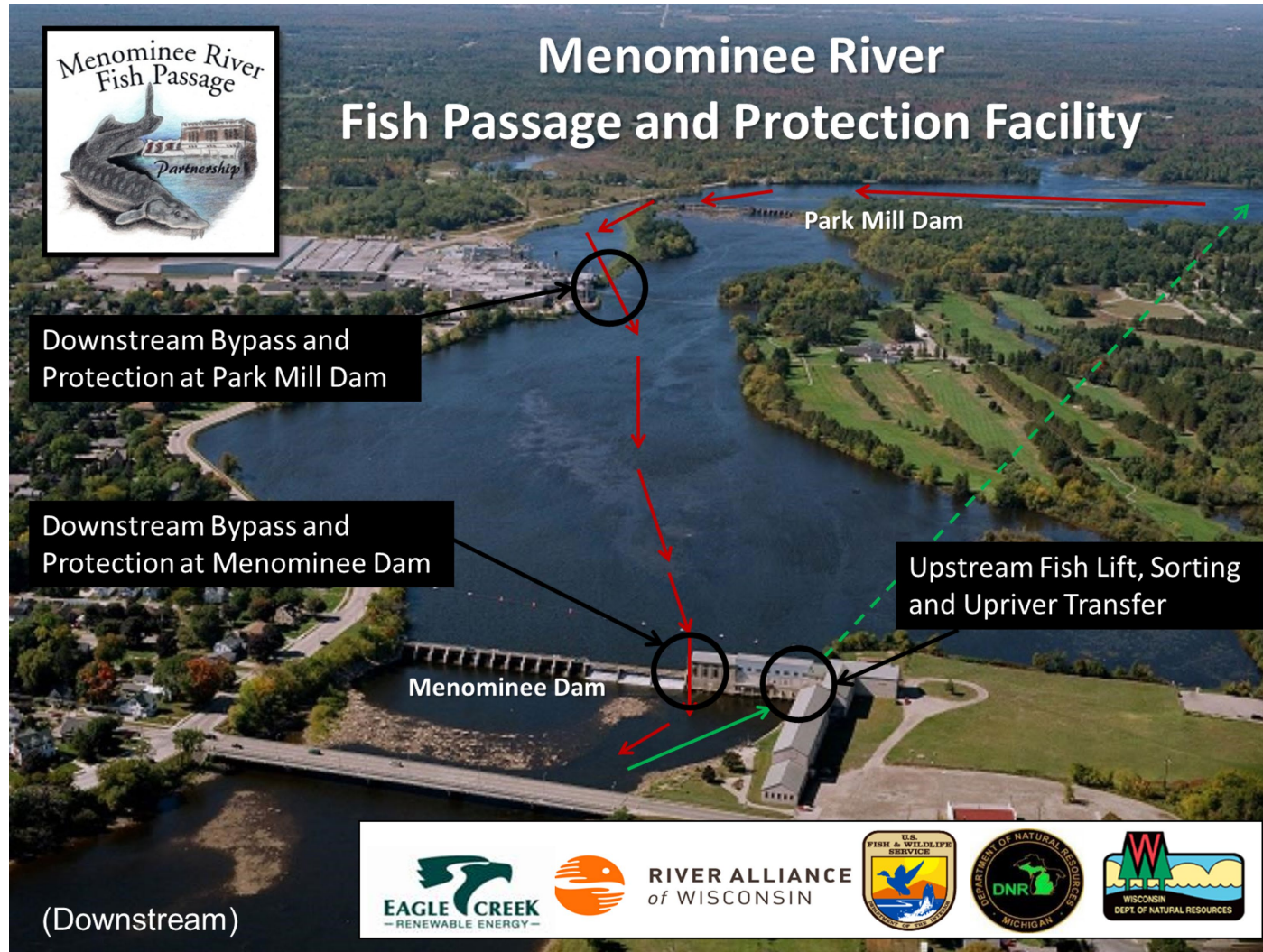




# Lake Michigan



# Lake Michigan



Genetics

Stocking

Habitat Connectivity

Research

Recreational Use

Habitat Restoration

# Lake Michigan



# Lake Michigan

Submersed Lift with  
Attraction Flow



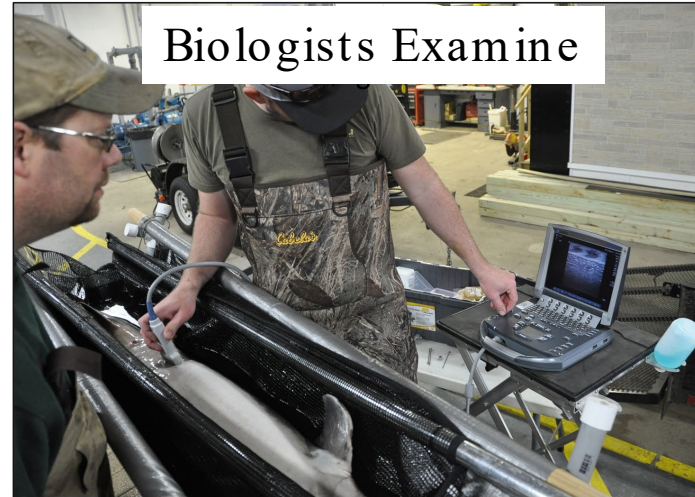
Holding tank Adjacent to Fish



Biologists Process Fish



Biologists Examine



Genetics

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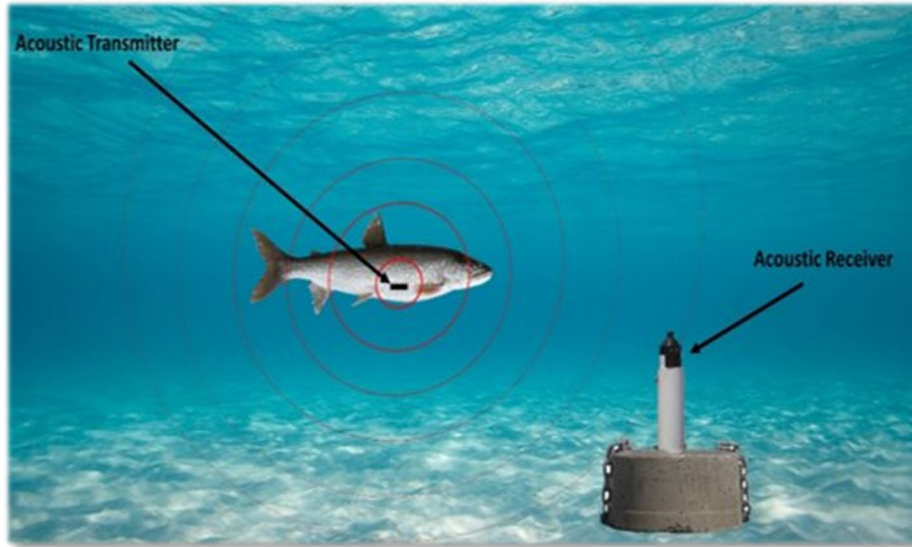
# Lake Huron

## Acoustic Telemetry

- Assess survival and movement of Lake Sturgeon stocked in the Saginaw River watershed
- 160 age-0 received V7 acoustic transmitters
- Provides survival and movement information to guide management
  - How many to stock?
  - Dredging/ construction activities



# Lake Huron



Genetics

Stocking

Habitat Connectivity

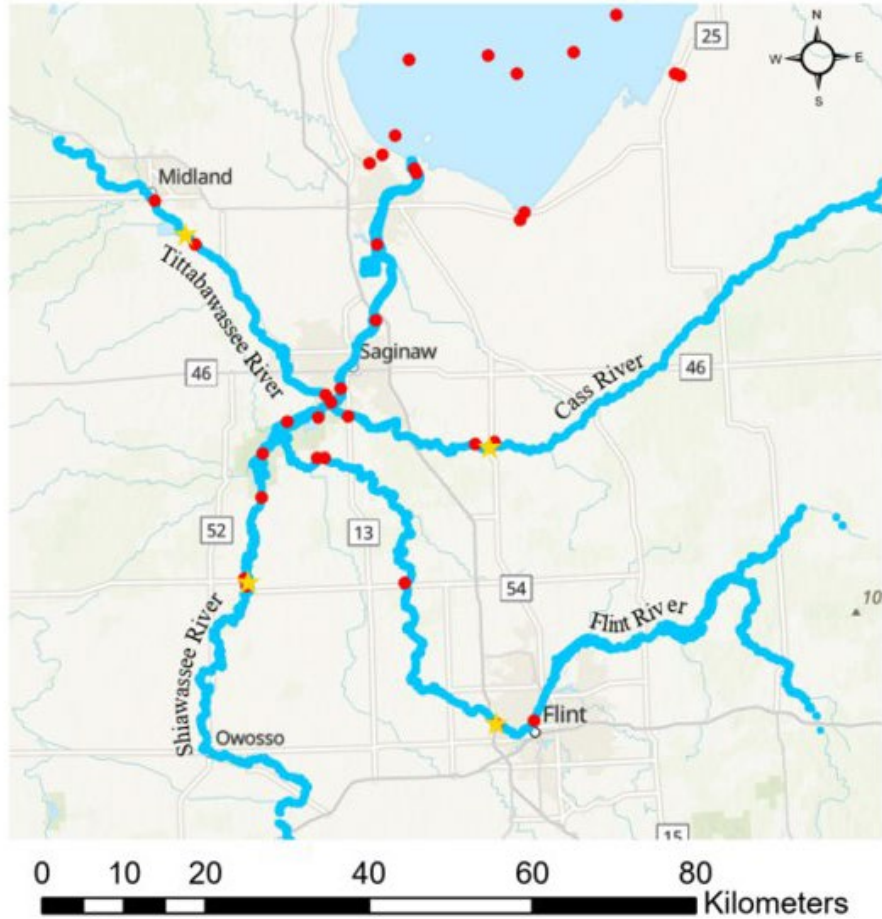
**Research**

Recreational Use

Habitat Restoration

# Lake Huron

## Saginaw River Basin Receiver Map



## 2022 Fall Results

- 83.6% accounted for on at least one receiver
- Receiver efficiency: 99.75%
- Two sturgeon detected above rock ramp in the Shiawassee River
- Some move downstream to Saginaw Bay quickly

# Lake Erie: St. Clair River System

## Trends and Effects of a Recreational Lake Sturgeon Fishery in the St. Clair System



Genetics

Stocking

Habitat Connectivity

Research

Recreational Use

Habitat Restoration



# Lake Erie: St. Clair River System



## Current regulation:

- July 16 – Sept. 30 harvest allowed
- 107 – 127 cm slot limit (42 – 50 inches)
- Oct. 1 – March 15: CIR only

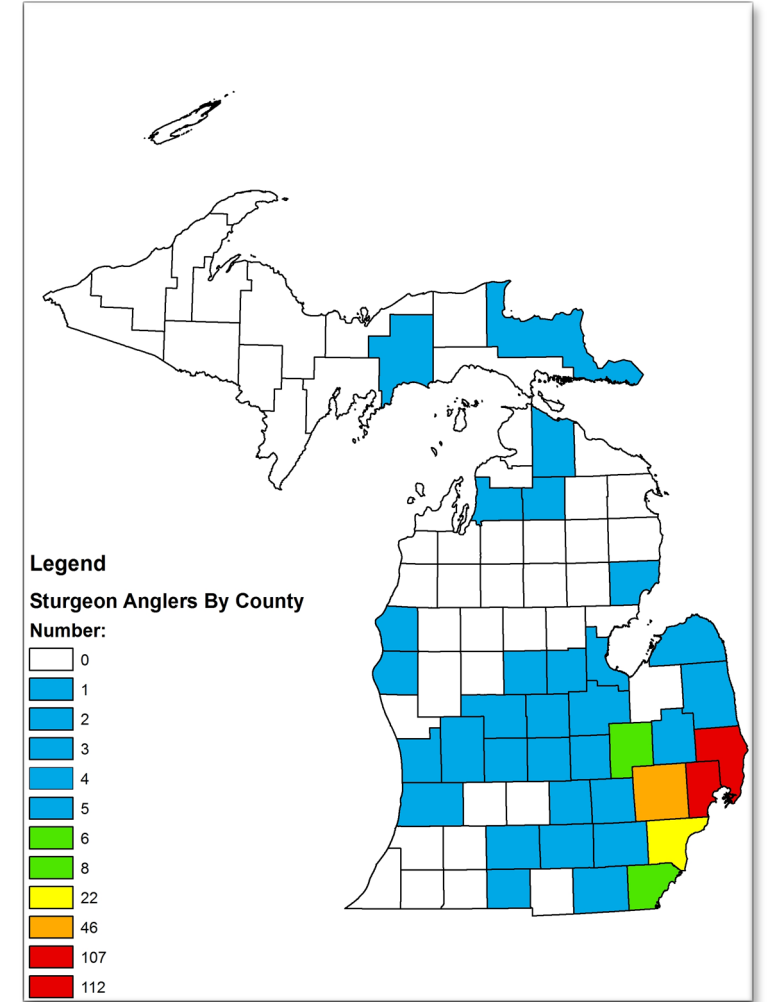
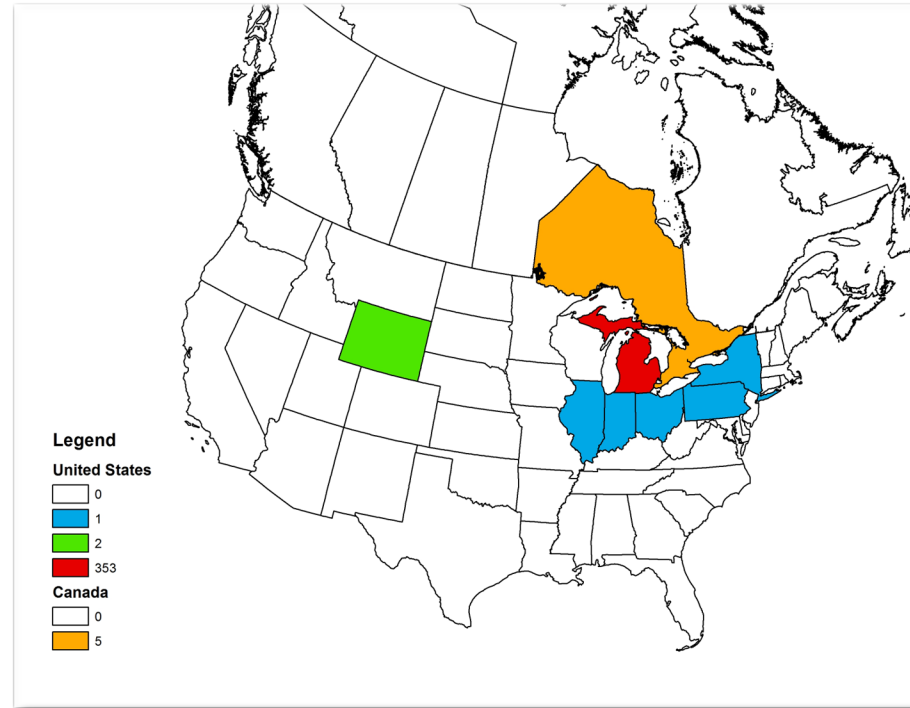
## Unique fishery

- Hook-and-line angling and harvest allowed
- No additional fees

# Lake Erie: St. Clair River System

## Unique Fishery

- 8 states/ provinces
- 37 counties in Michigan
- 72% of anglers in 3 counties
- 89% male



# Lake Erie

## Cuyahoga River Habitat Suitability

- Can the system support a Lake Sturgeon reintroduction?
- Develop habitat suitability model using substrate, water depth, flow to assess current conditions



# Lake Erie



Genetics

Stocking

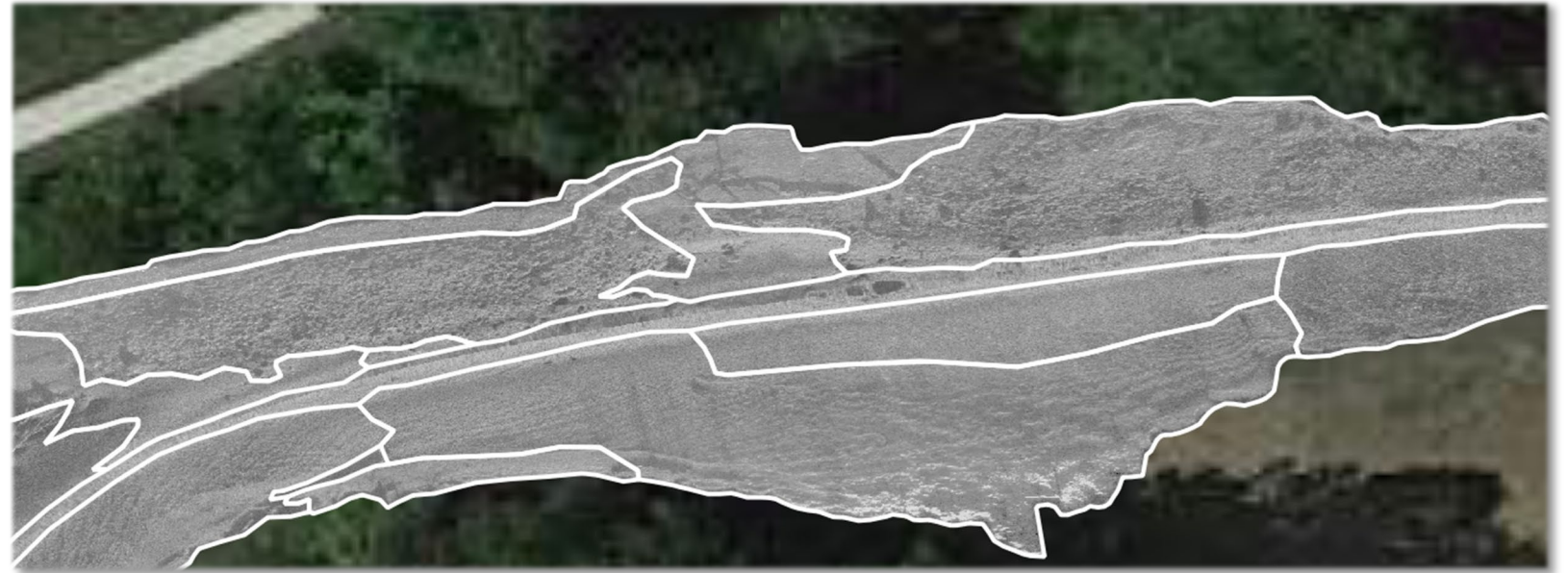
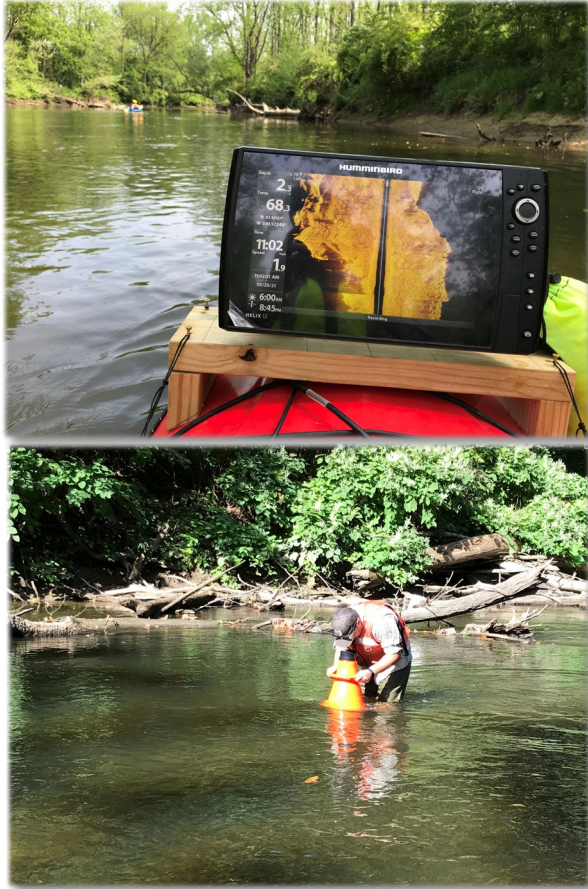
Habitat Connectivity

Research

Recreational Use

Habitat Restoration

# Lake Erie



Genetics

Stocking

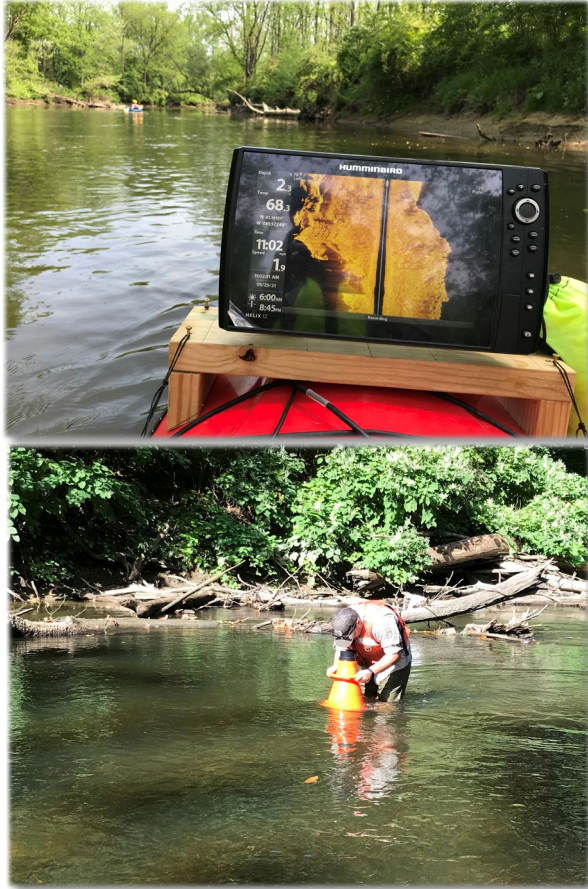
Habitat Connectivity

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# Lake Erie



Genetics

Stocking

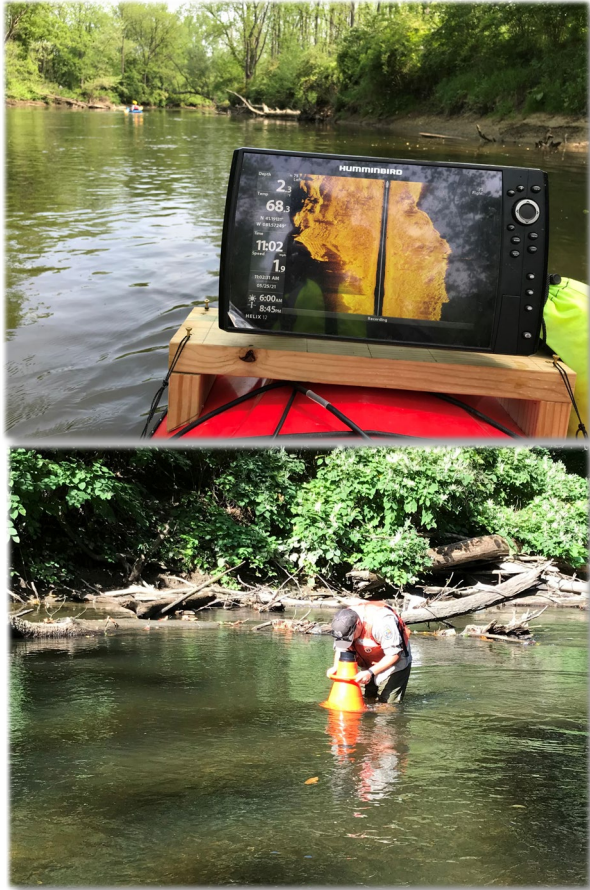
Habitat Connectivity

Research

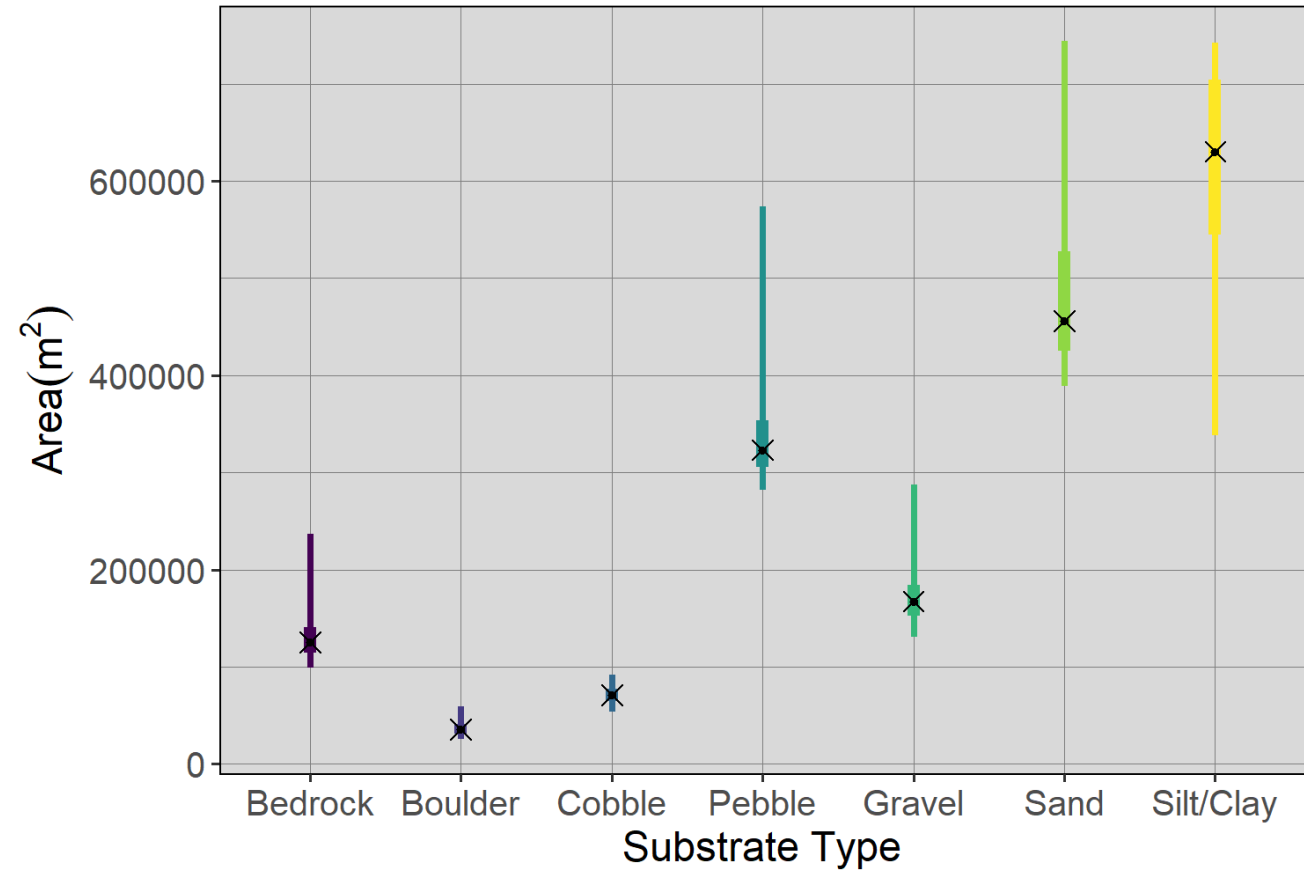
Recreational Use

Habitat Restoration

# Lake Erie



Cuyahoga River Surficial Substrate Coverage



Genetics

Stocking

Habitat Connectivity

Research

Recreational Use

Habitat Restoration

# Outreach







Questions? [Justin\\_Chriotti@fws.gov](mailto:Justin_Chriotti@fws.gov)