

# Restoring Our Detroit River Giant



# What are we talking about today?

- Sturgeon biology and life cycle
- History of Sturgeon in the Detroit River area
- Sturgeon spawning reef restoration projects – what is being done today to help Sturgeon recover?

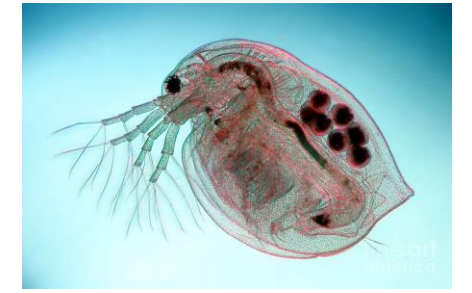
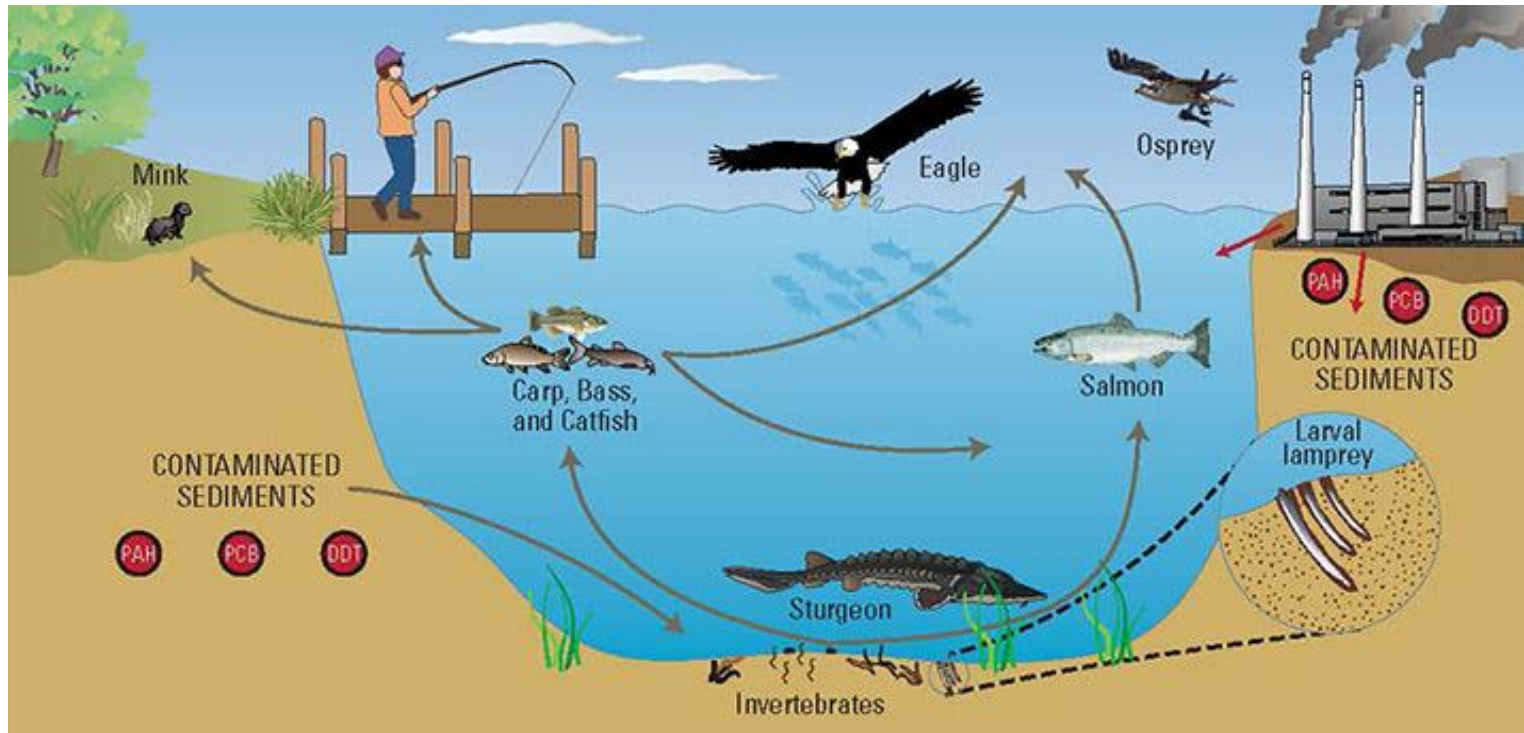


# Understanding the Giant

- Largest fish in the Great Lakes system!
- Size – 7 feet long and up to 300 pounds!
- Lifespan: 50-150 years
- Where are Sturgeon in the food web?



# Sturgeon in the food web



“Benthivores”

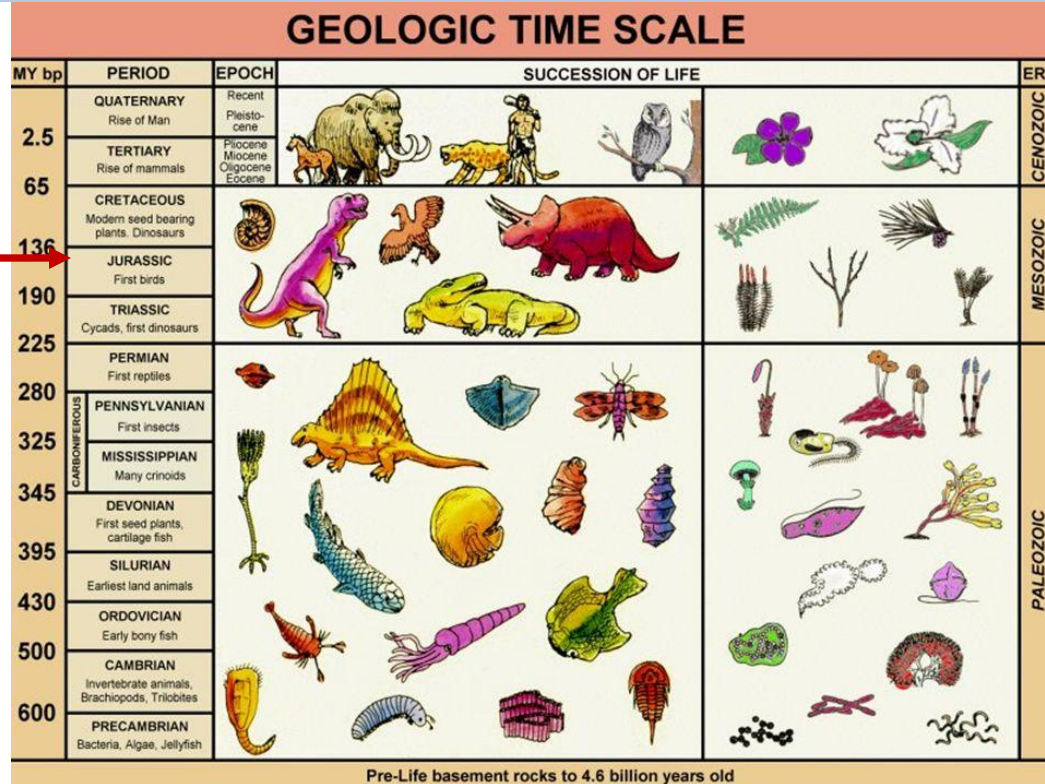


# Understanding the Giant

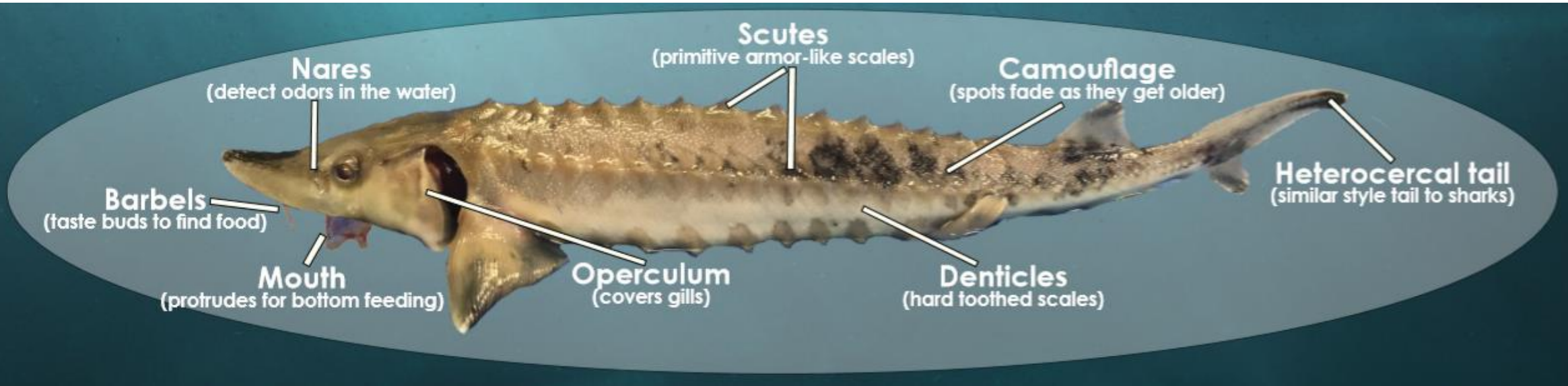
- **Living Fossil?**
  - Appear in the fossil record 136 million years ago!
  - Upper Cretaceous Period



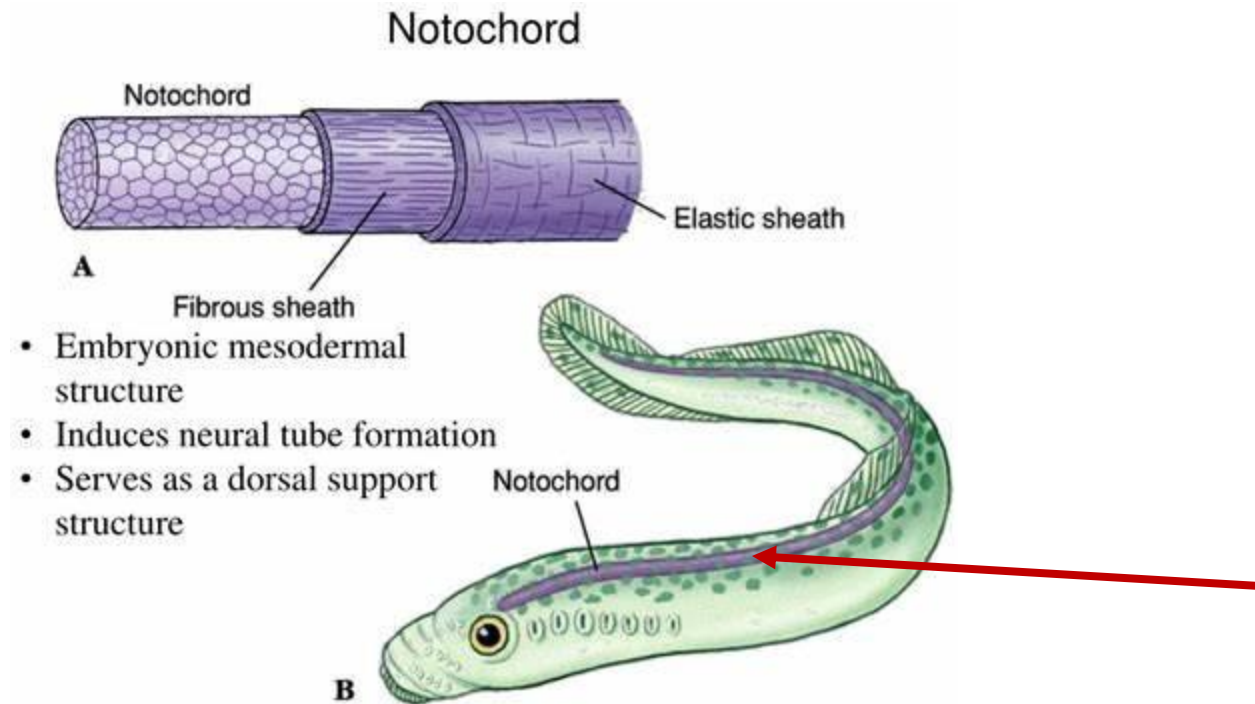
# Living Fossil?



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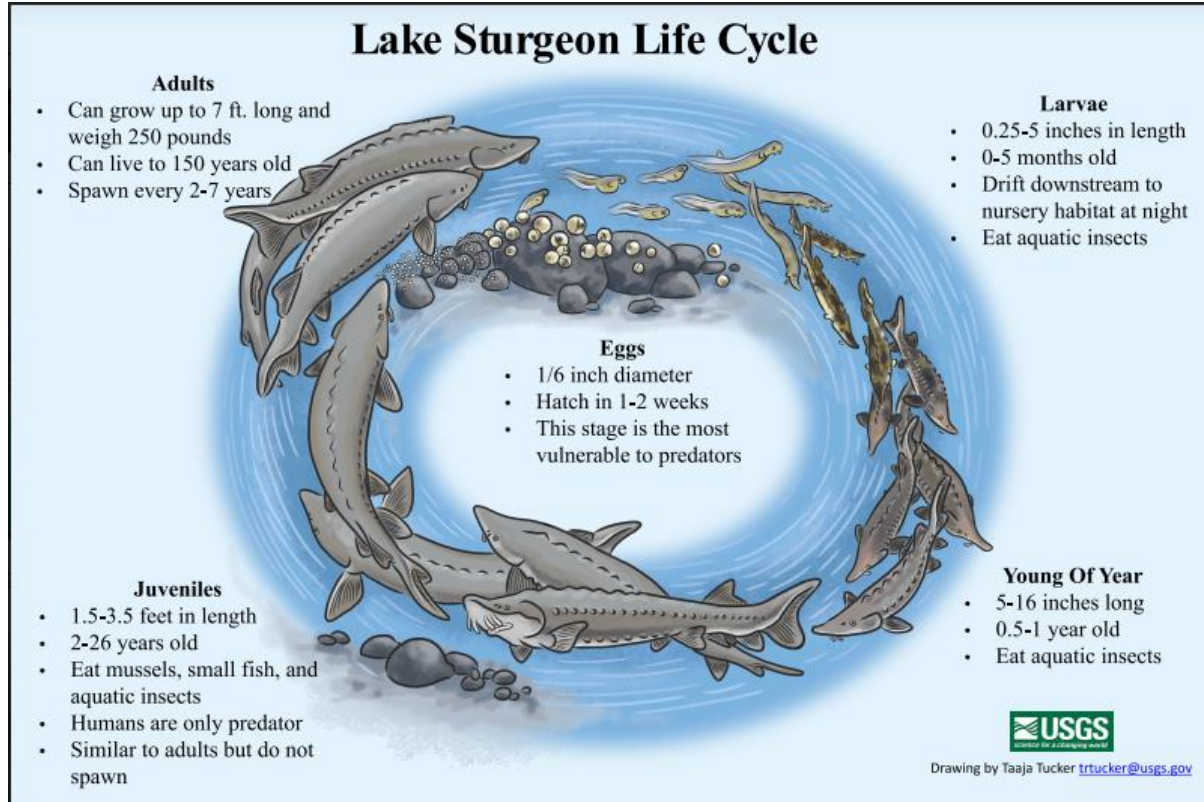


# Living Fossil?





# To Be a Sturgeon



- Males begin spawning at 8-12 years old
- Females begin spawning at 20 – 26 years old
- Spawn every 2-7 years only



# Sturgeon history in the Great Lakes



- Before 1850 - Nuisance species
- Mid-1800s – commercially valuable
  - Caviar
  - Meat
- 1880 – over 4 million pounds harvested
- 1928 – less than 2000 pounds harvested
- *What happened?*



# Sturgeon History in the Great Lakes

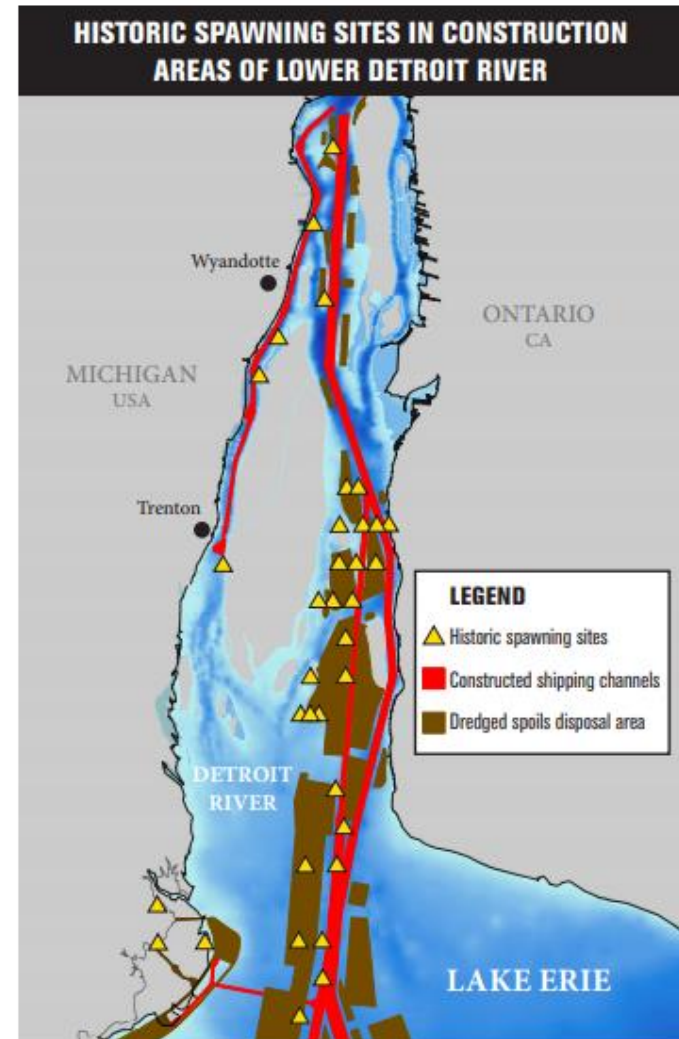
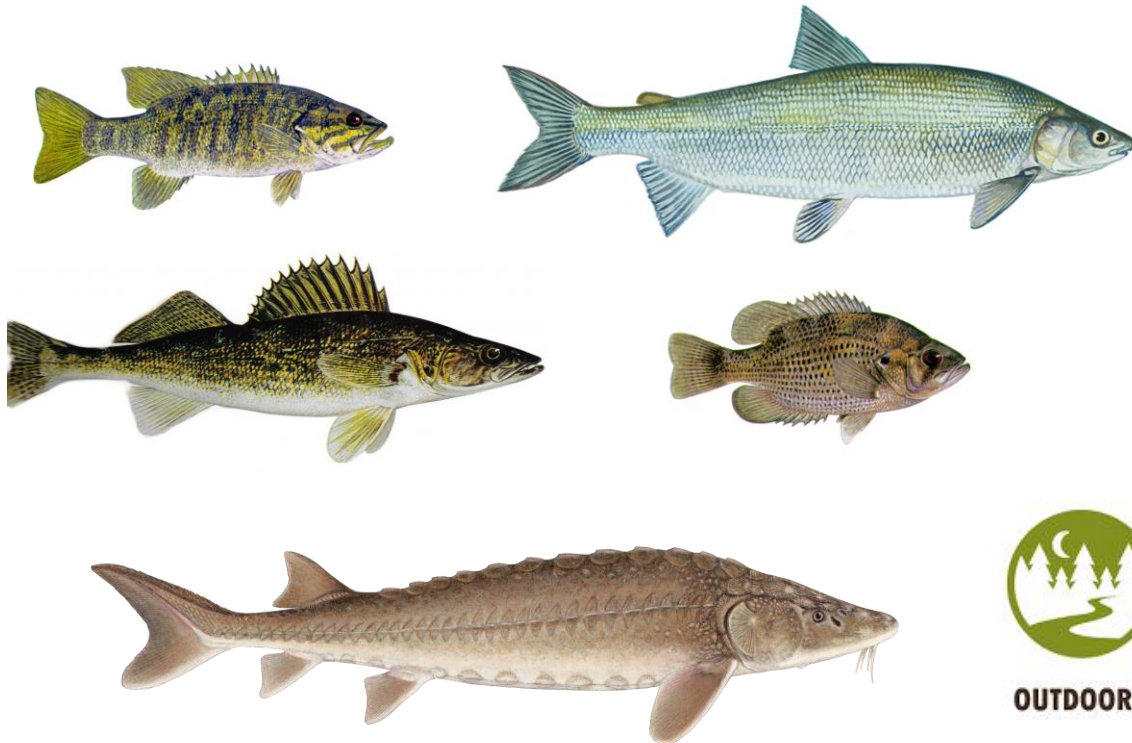
*Why did Sturgeon decline?*

- Overfishing
- Construction of dams
- Sedimentation from farming and logging
- Shipping channels
- Breeding characteristics



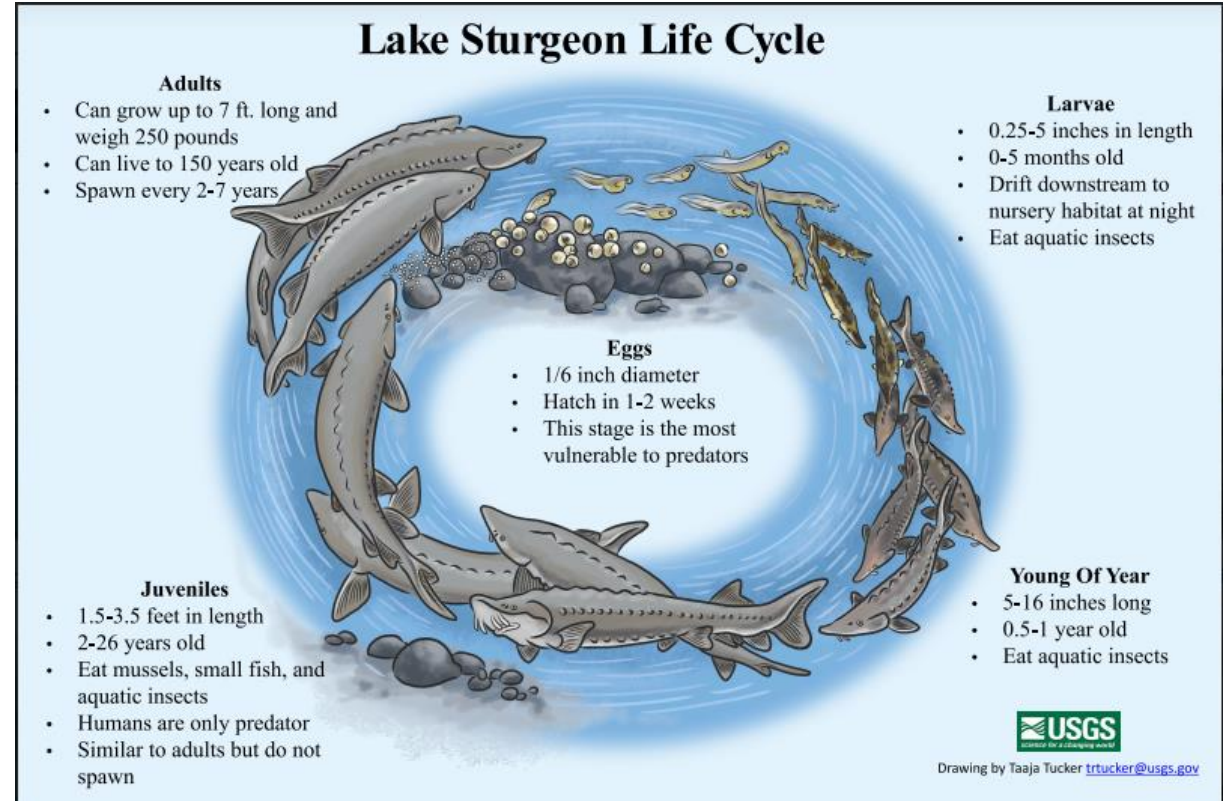
# Sturgeon History in the Great Lakes

- 35 natural spawning areas damaged from shipping channel construction
- 28 species of fish likely used these



# Sturgeon Habitat Restoration

- What habitat needs would a fish have throughout the life cycle?
- Places to:
  - Hide / Rest
  - Get food
  - Lay eggs \*



# Creating Sturgeon Spawning Reefs



- Interest began in 2001 to begin creating spawning reefs for Lake Sturgeon and other native fish with similar spawning habits in the Detroit River area
- How does a project like this begin?



# Creating Sturgeon Spawning Reefs

- Goal – restoring and creating spawning reefs
- Scientists would need to know:
  - Where have Lake Sturgeon spawned before?
  - River conditions:
    - Water temperature
    - Depth
    - Velocity
    - Bottom substrate



# What conditions would attract Sturgeon?

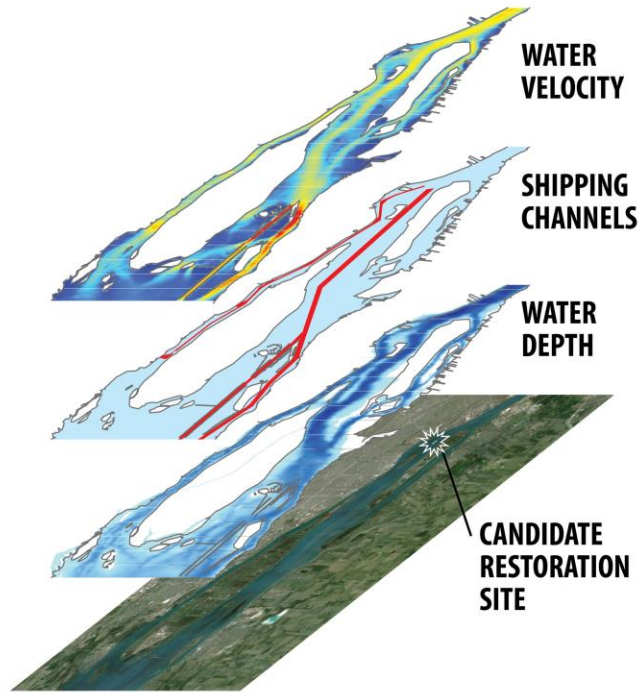
- **Lake Sturgeon (in the Detroit River area) tend to like:**
  - Deep water – 25-50ft
  - Fast flow – at least .5 meters / sec
  - Bottom free of vegetation





# Identifying the right areas

Physical river characteristics mapped and compared using GIS:



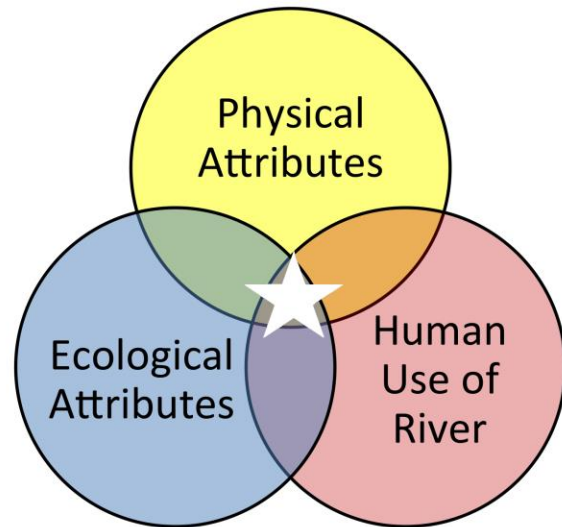
If the physical characteristics all line up properly – it could be a candidate site!



OUTDOOR ADVENTURE CENTER



# A Balancing Act



# Building the Reefs

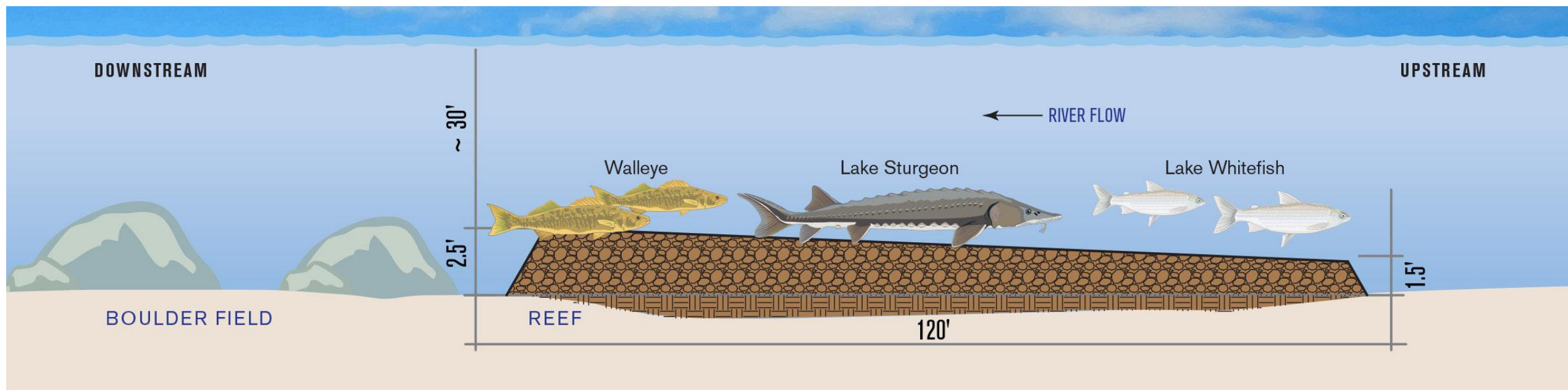
- Quarried limestone 4-8 inches in diameter
- Keeps out: Sea Lamprey and Round Goby



# Building the Reefs



# What does this actually look like?



# Where have reefs been created?



# How do we know if they work?

Monitoring and research!



# How do we know if they work?

- 1 – Adult fish
- Survey for adult fish using the reef – how many and what species?





# Research in action...

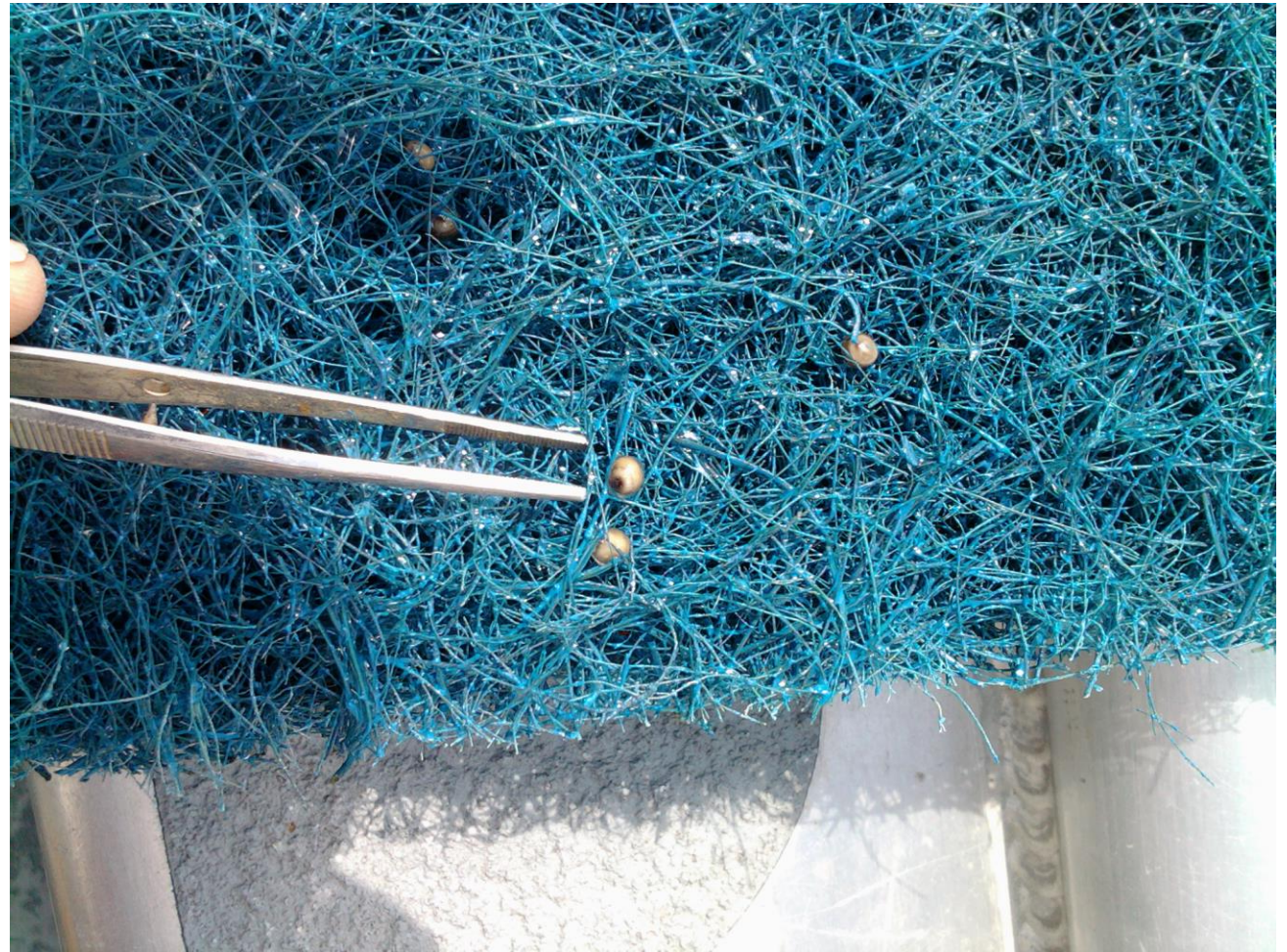


# How do we know if they work?

- 2 - Eggs
- Are the adult fish laying eggs on the reef?



# How do we know if the reefs work?



# How do we know if they work?

- 3 - Larval fish survival
- What kinds and how many larval fish are downstream of the reef?



# How do we know the reefs work?

Larval Lake Sturgeon



# What are the results? (as of 2015)

## REEF PROJECT SPECIFICATIONS AND LAKE STURGEON SPAWNING OBSERVATIONS

REEF PROJECT NAME	BELLE ISLE	FIGHTING ISLAND	MIDDLE CHANNEL	POINTE AUX CHENES	HARTS LIGHT	GRASSY ISLAND
<b>Project Specifications</b>						
<b>River</b>	Detroit	Detroit	St. Clair	St. Clair	St. Clair	Detroit
<b>Community</b>	Detroit, MI	La Salle, ON	Clay, MI	Algonac, MI	East China, MI	Wyandotte, MI
<b>Year Built</b>	2004	2008, 2013 (expanded)	2012	2014	2014	2015
<b>Size (acres)</b>	0.3	2.0	1.0	1.5	3.8	4.0
<b>Lake Sturgeon Spawning Observations</b>						
<b>Before Restoration</b>	Absent	Absent	Absent	Absent	Few eggs	Absent
<b>After Restoration</b>	Adult fish, but no spawning detected	Spawning confirmed ★	Spawning confirmed ★	Spawning confirmed ★	Spawning confirmed ★	No data yet ★

← Spawning confirmed in 2016



# Spawning on the Middle Channel Reef



# Organizations involved:

## Restoration Team:

- US Fish and Wildlife Service
- US Geological Survey
- Michigan DNR
- Michigan Sea Grant
- University of Michigan Water Center
- SmithGroup JJR
- Essex Region Conservation Authority
- Ontario Ministry of Natural Resources and Forestry
- Michigan Wildlife Conservancy
- St. Clair – Detroit River Sturgeon for Tomorrow



## Funding Partners:

- Great Lakes Restoration Initiative
- National Oceanic and Atmospheric Administration
- Sustain Our Great Lakes
- US Fish and Wildlife Service Coastal Program
- Great Lakes Fishery Trust
- Michigan Coastal Zone Management
- Environment Canada
- Canada-Ontario Agreement
- Ontario Ministry of Natural Resources
- BASF
- DTE Energy
- Michigan Wildlife Conservancy





# Stations Exploration!

- 8 groups
- 3 minutes per station

