

Lessons Learned about Coordinating a Collaborative and Adaptive Habitat Restoration Initiative



Photo Credit: Adam Lintz

Lynn Vaccaro and Jennifer Read
University of Michigan Water Center

On behalf of the Reef Team

Science and Coordination Team



Mike Thomas,
Todd Wills, Jim Francis,
Jeff Braunscheidel



Bruce Manny, Ed Roseman,
Greg Kennedy, Jaquie Craig,
Dave Bennion, Jason Fischer



Jim Boase,
Justin Chiotti



Paul Evanoff, Rachel Echtenaw



Jim Diana,
Mary Bohling



Jen Read, Lynn Vaccaro



Aline Cotel, Laura Alford

Partners, Sponsors and Funders



Ministry of Natural Resources



Michigan Coastal Management Program



The St. Clair – Detroit River System



St. Clair – Detroit River System

Historically

- ◆ Huge runs of fish spawned here.
- ◆ Largest commercial GL fishery in late 1800s.

Today

- ◆ Origin of much of Lake Erie's fishery, \$2 billion/yr.
- ◆ More than 65 species of fish.
 - 16 are threatened or endangered.
- ◆ Largest remaining population of lake sturgeon in the Great Lakes.

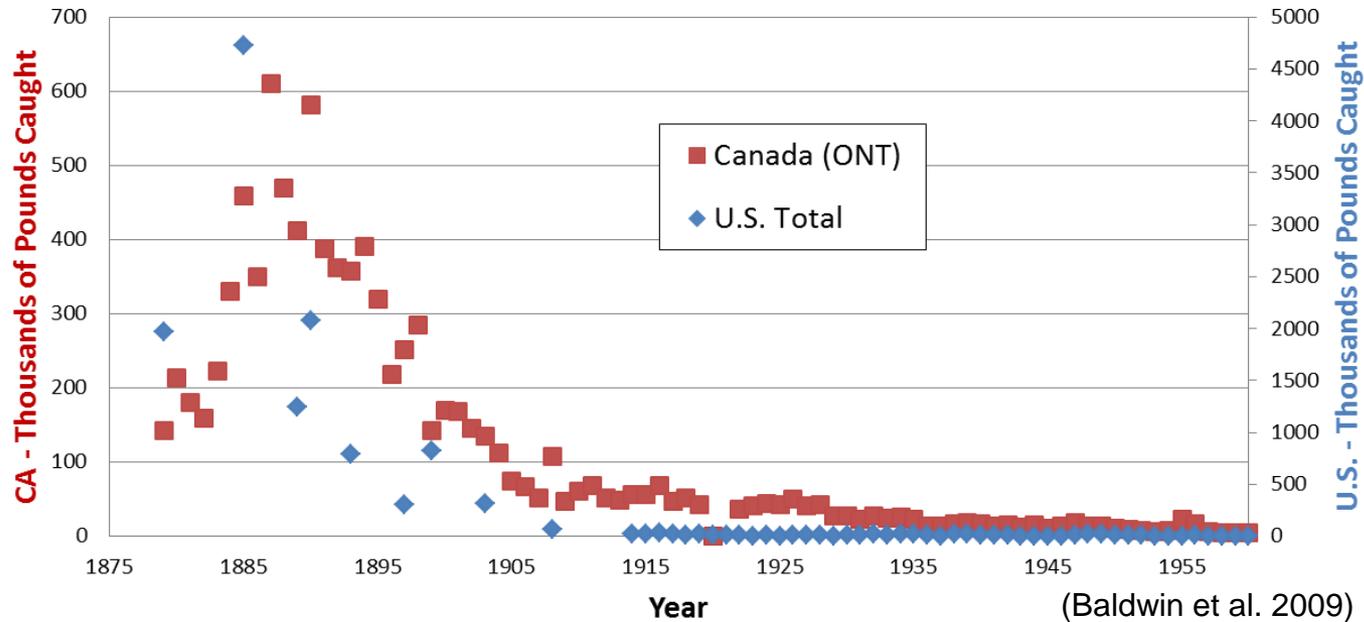


Lake Sturgeon: Unique and Vulnerable

- Largest Great Lakes fish
- Longest-lived freshwater fish
- Females begin reproducing ~20-25 years old
- Deposit nearly 1 million eggs every 4 years



Lake Sturgeon Commerical Catch in Lake Erie



- ◆ Huge declines 1880 – 1910
- ◆ Very slow recovery since, still 1% of historic levels
- What happened?
 - Overfishing - Commercial fishery closed in 1977 (U.S.)
 - Pollution - Big improvements
 - Habitat - Seen as biggest problem today

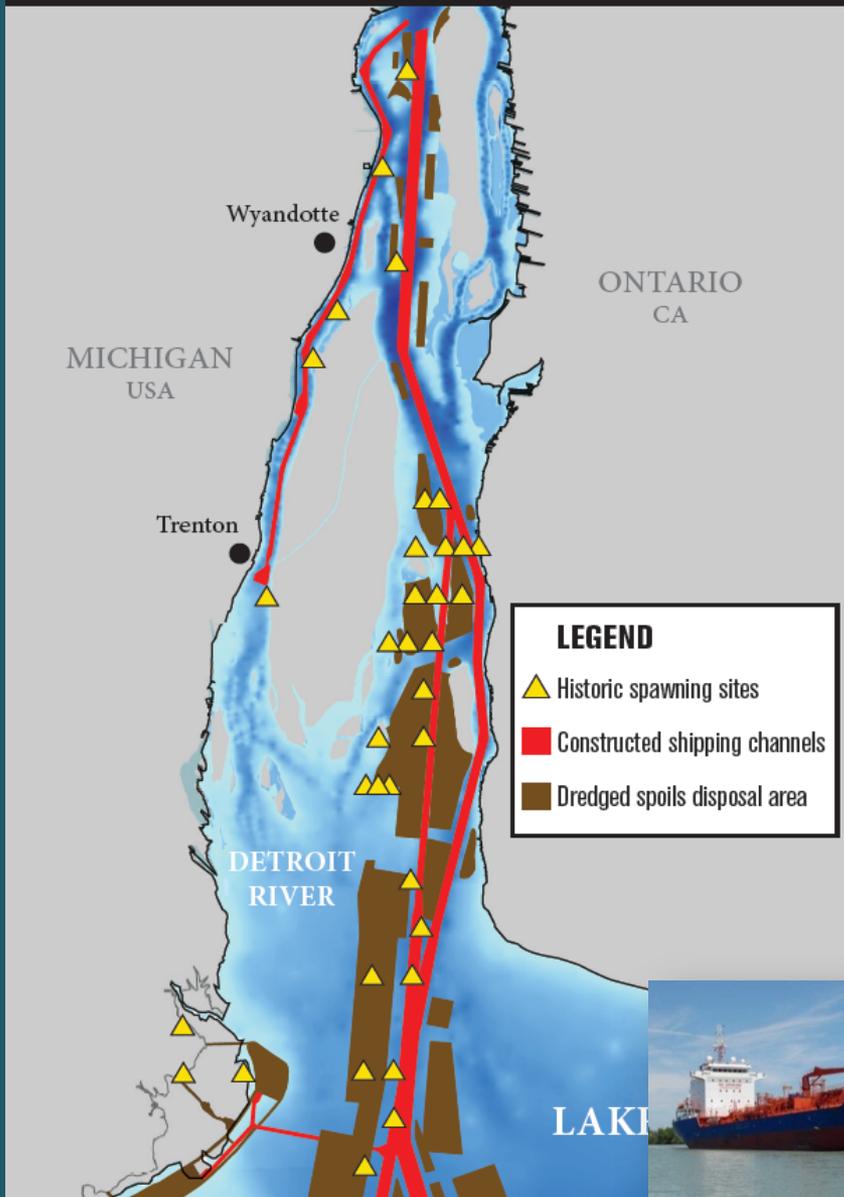
(Holey 2000, Haxton 2014)

Loss of Spawning Habitat





HISTORIC SPAWNING SITES IN CONSTRUCTION AREAS OF LOWER DETROIT RIVER



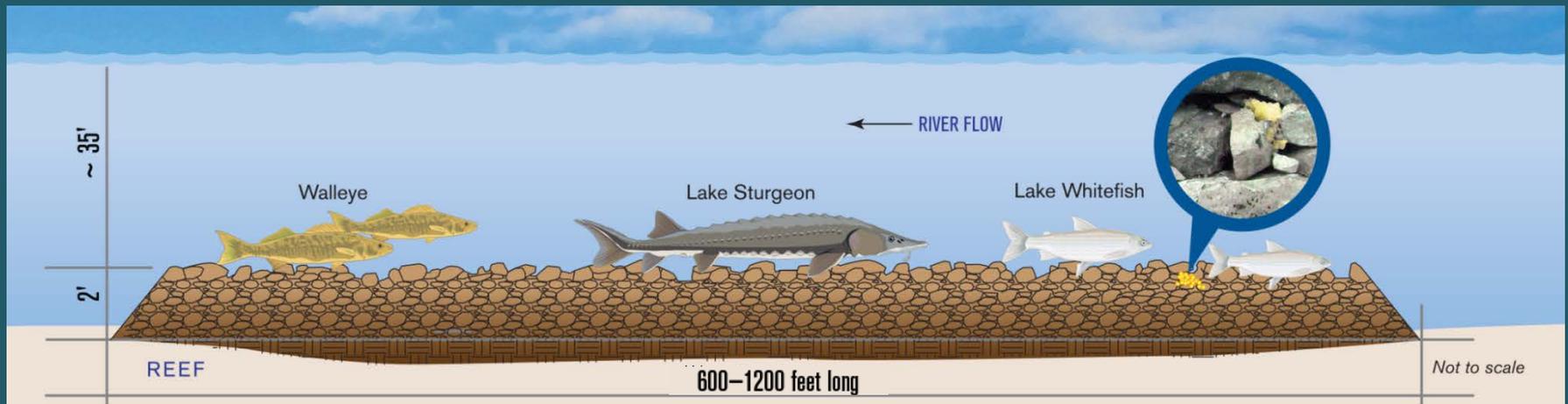
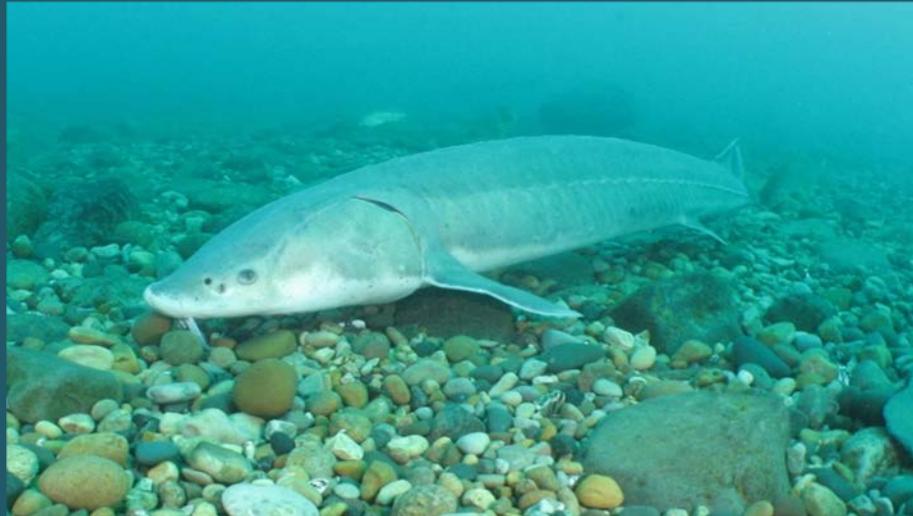
Navigation Channels

Detroit River, 1874 - 1968:

- Created 60 miles of shipping channels
- Removed more than 60 million cubic yards of material
- Covered 15.5 square miles of river bottom

Bennion and Manny 2011, 2013

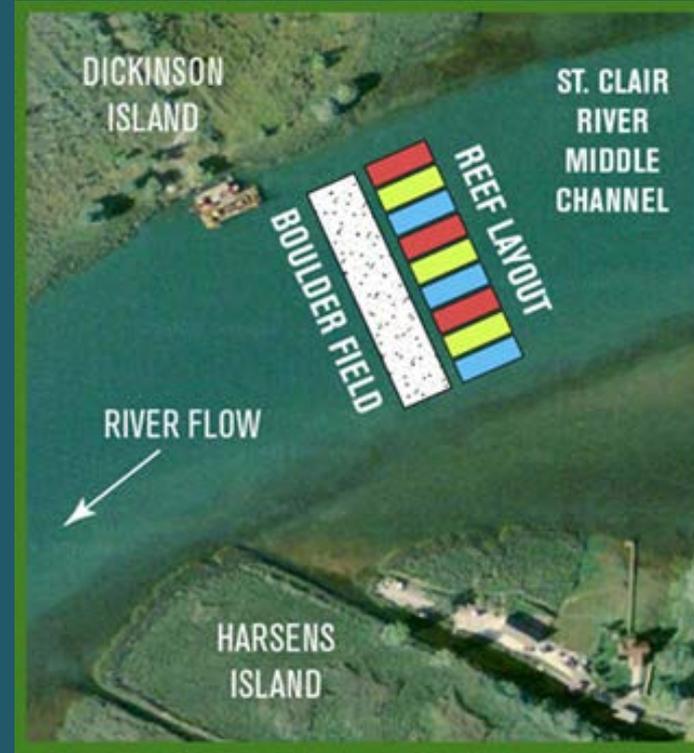
One Approach – Constructed Spawning Reefs



Six Completed Reef Projects



Middle Channel Reef, St. Clair River (2012)



Video Footage on the Middle Channel Reef (2012)



Initial Results from Middle Channel Reef

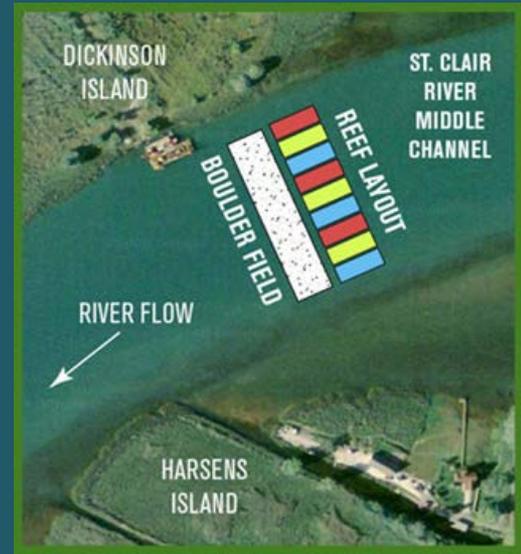
Collected in 2012 and 2013:

- Adult Fish
- Eggs
- Fish Larvae

Reef also attracts walleye, logperch, channel catfish, suckers and others



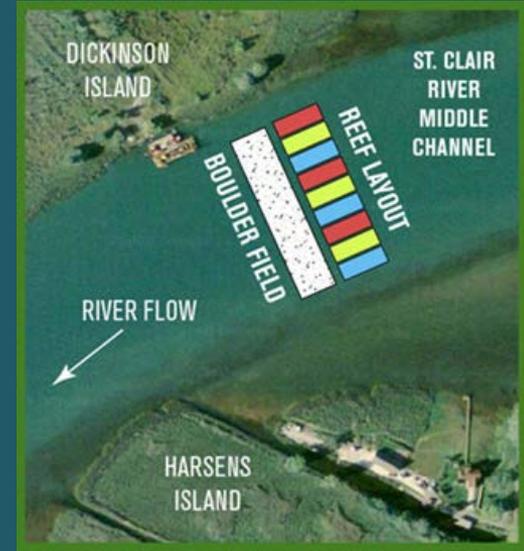
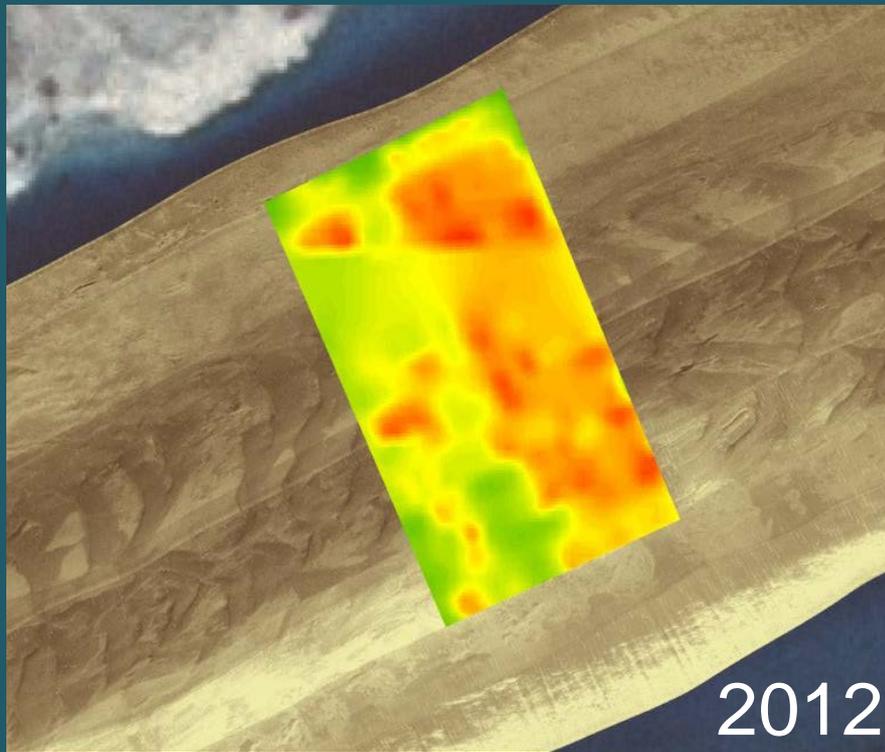
Sonar Imagery - MDNR



2013

2012

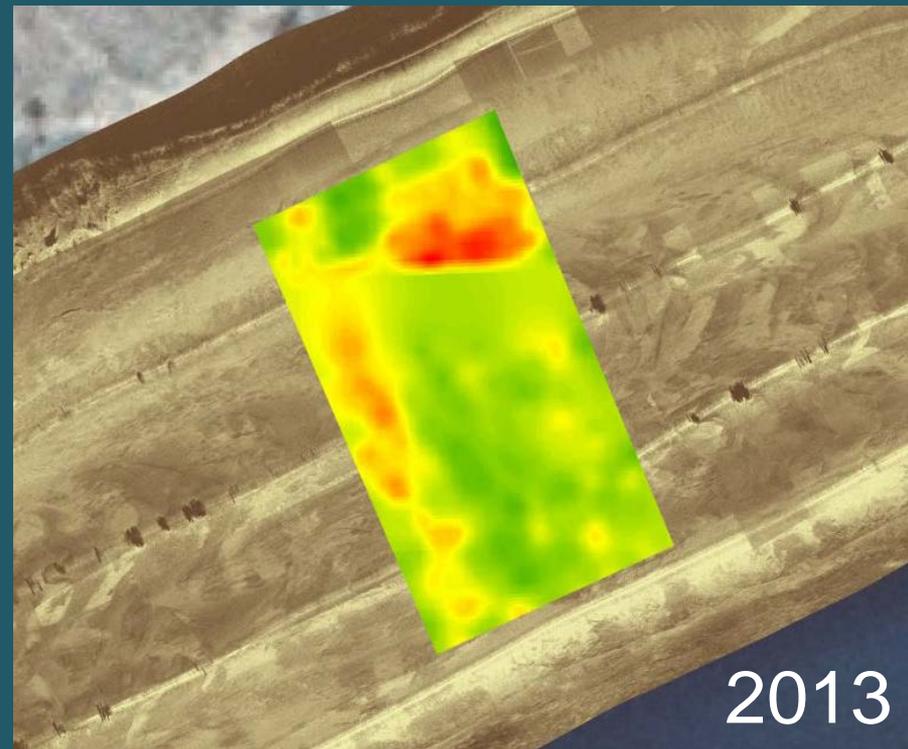




Hardness Index

(Todd Wills, MDNR)

Red – most hard
Green – least hard
1 meter² resolution



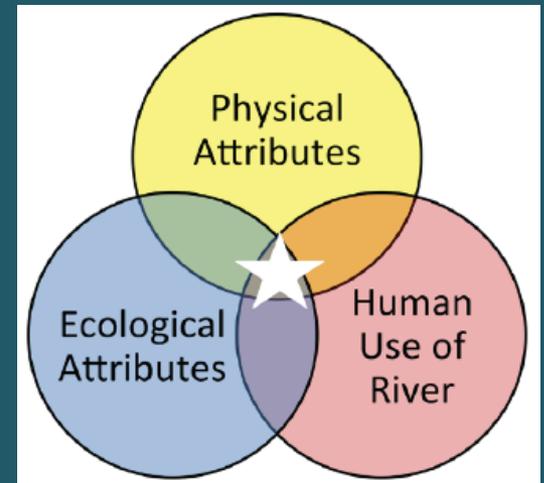
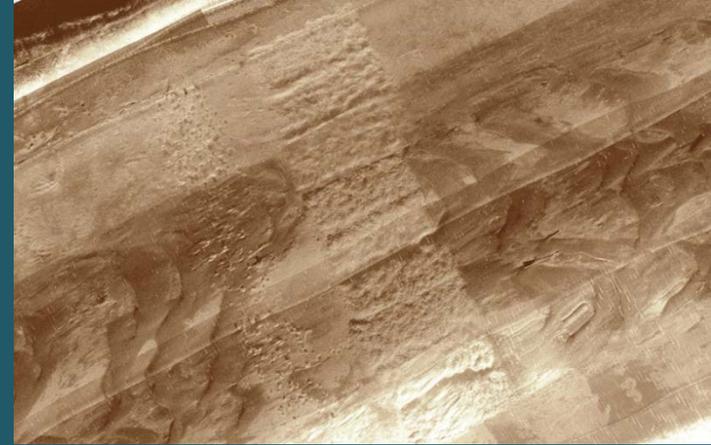
Many Lessons Learned

Integration of ecological and physical sciences

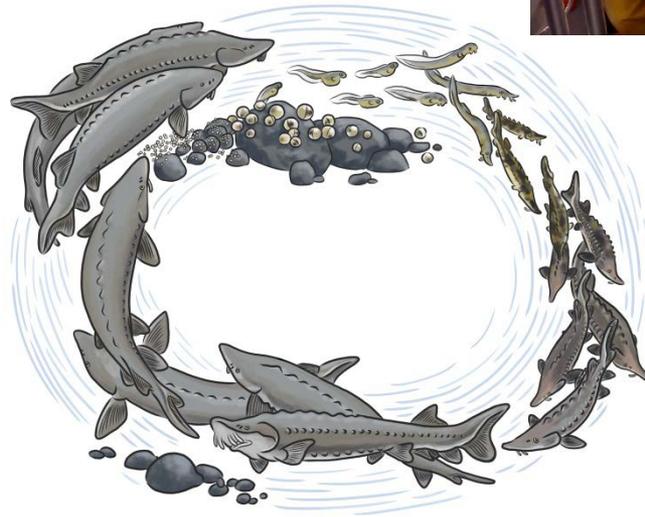
- Siting and design
- Monitoring and evaluation

Social dynamics

- Team process
- Engagement and consultation



Extensive Biological Monitoring



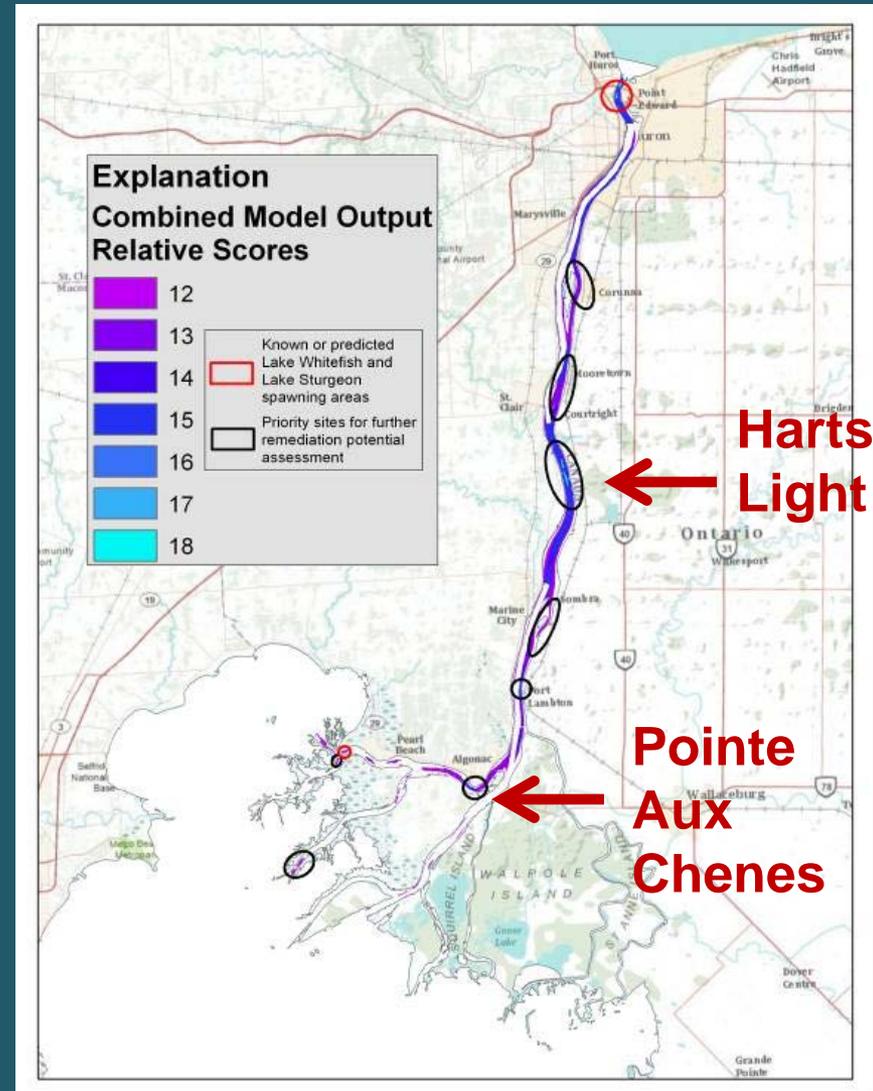
Improved Site Selection

- Hydrodynamic model developed to identify candidate sites:

- Water depths
- Water velocity
- Shipping channels

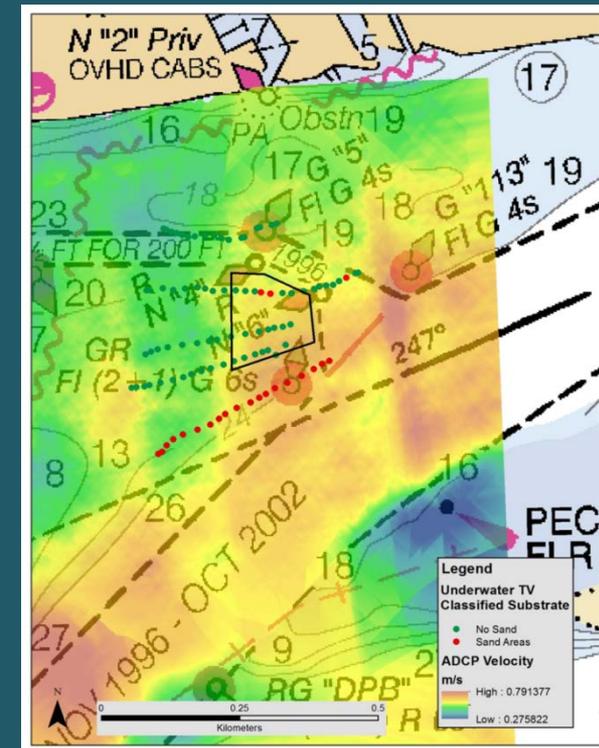
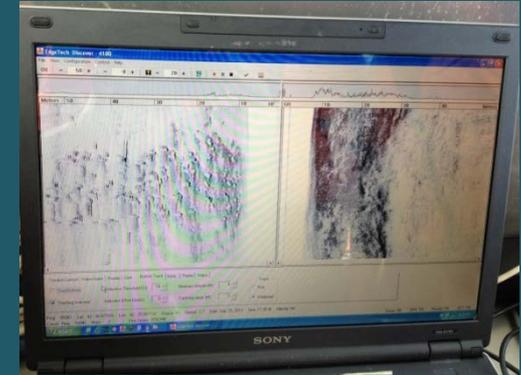
Other Factors:

- Contamination
- Nursery grounds
- Known spawning areas
- U.S. waters



Enhanced Physical Assessment

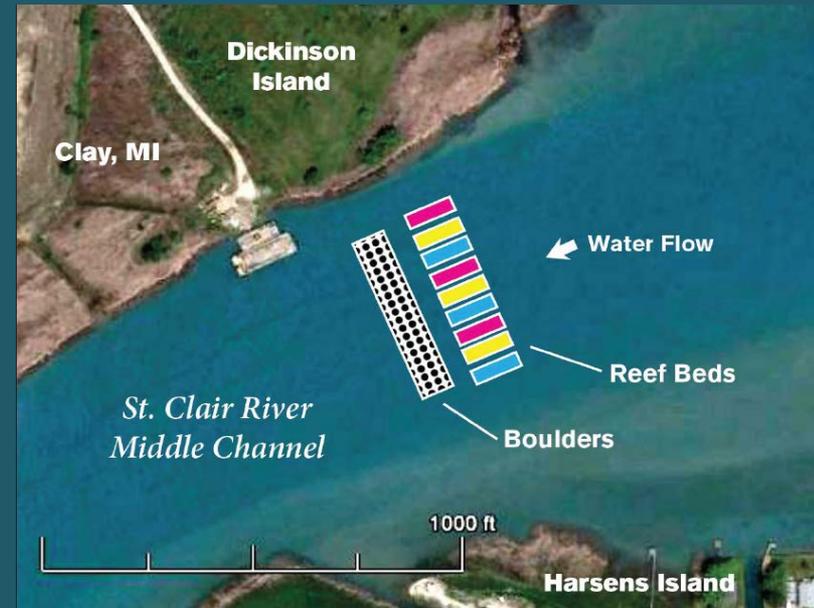
- Side scan sonar
- Underwater video
- ADCP (flow)
- Hydrodynamic modeling
- Scuba diving
- Upstream sediment sources
- Dredging records



Revised Reef Design

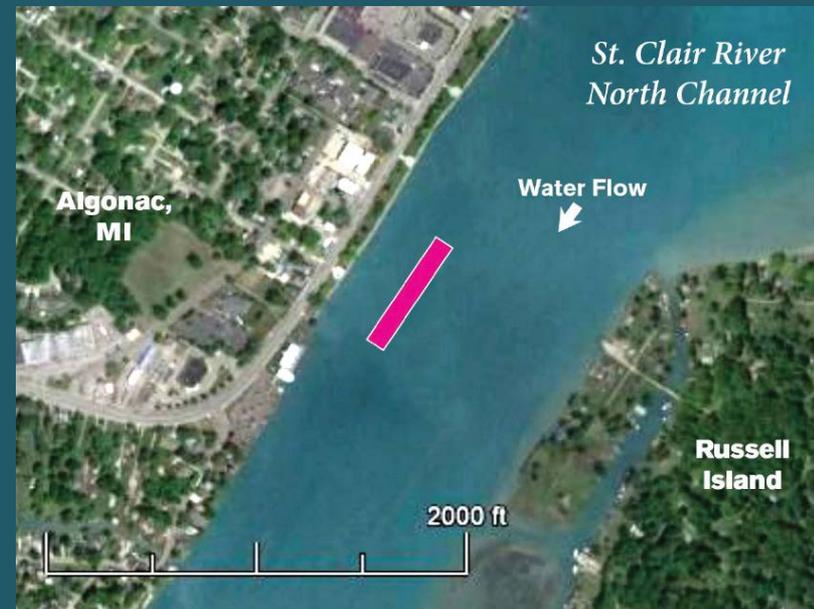
Earlier projects

- Experimental
- Multiple beds, spanned channel

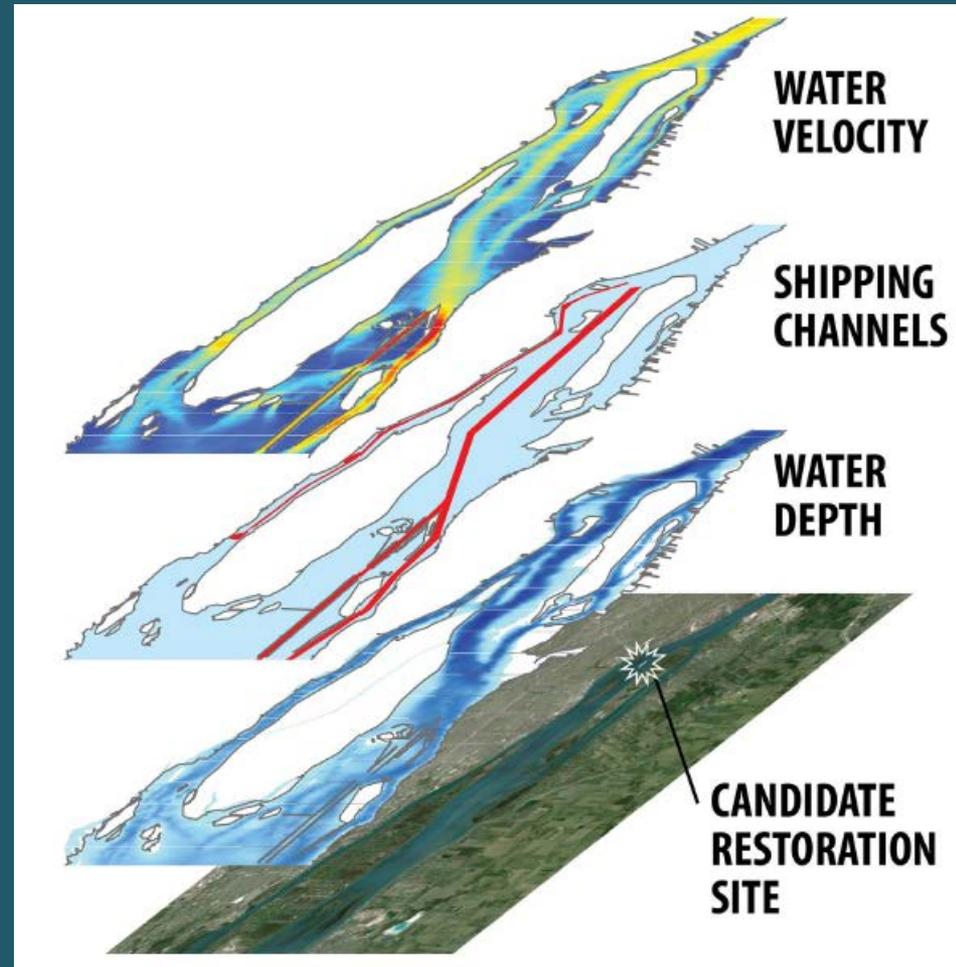


Recent projects:

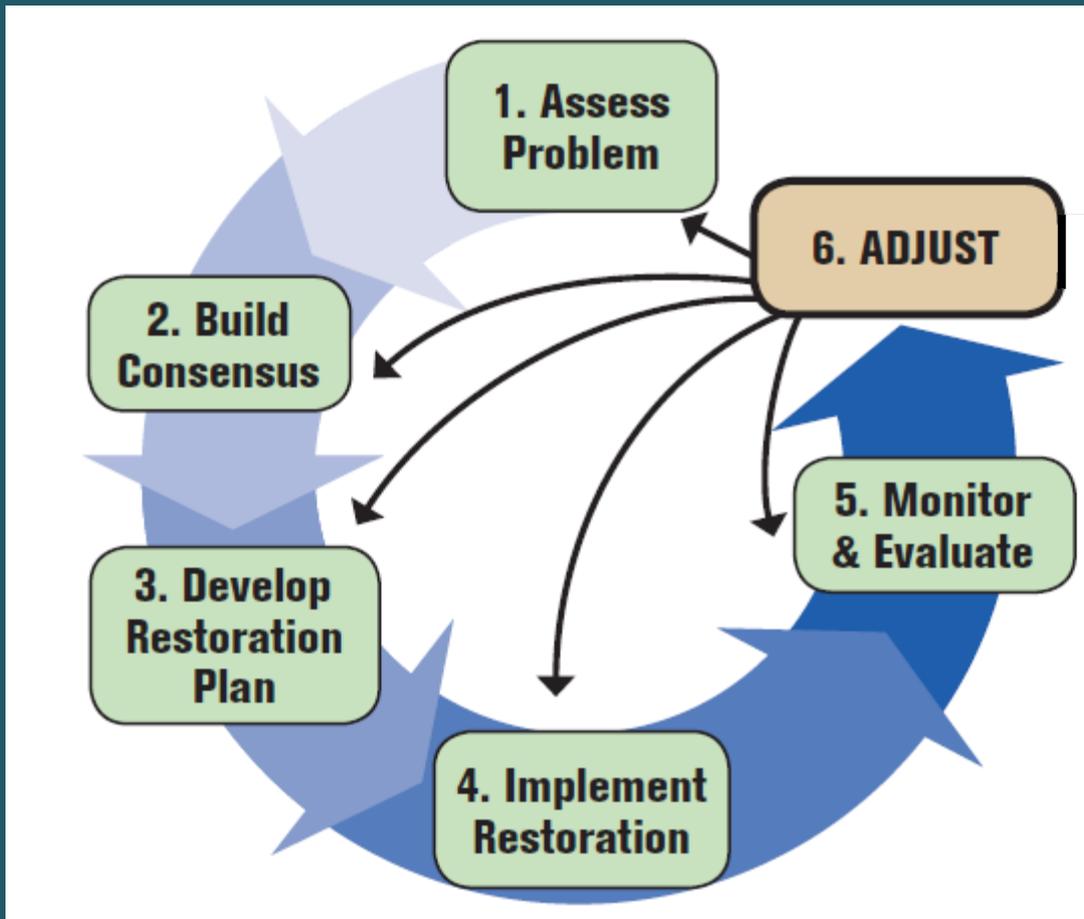
- Single, large reef unit
- Located in most optimal spot in channel



How to Best Integrate all the Pieces?



Lessons Learned – Collaborative Planning



- Adaptive management
- Team composition
- Group decision making
- External factors

A Well Rounded Restoration Team



Scientists
USGS, FWS, MDNR, U-M



Team Facilitators
UM Water Center and Michigan
Sea Grant

Design Engineers
SmithGroup JJR



Fishery Managers
MDNR, FWS



Outreach Specialists
Michigan Sea Grant



Local Champions & Partners
Sturgeon for Tomorrow, DTE
Energy, AOC Council



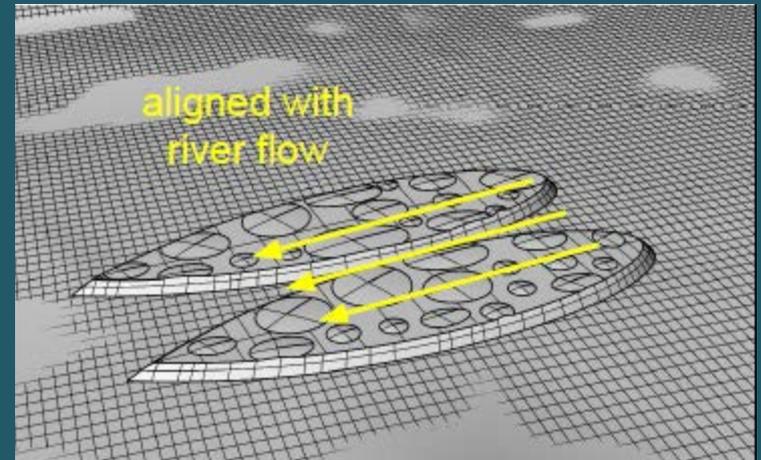
Grant Managers
UM Water Center and Michigan
Sea Grant



Advisors
Fluvial Geomorphologists, Lake
Carriers Association



New Advisors



Tips for Managing and Sustaining a Team

- Develop appropriate and rewarding roles.
- Dedicate resources for coordination and facilitation
- Accommodate different styles of participation.
- Visit and re-visit decisions. Talk openly about concerns.
- Consistently acknowledge everyone's contributions.



The Right Context for Collaboration

- Regional, cross-agency initiatives
- Proximity and relationships
- Early successes and challenges
- Recent funding - Great Lakes Restoration Initiative



Lessons Learned - Engagement

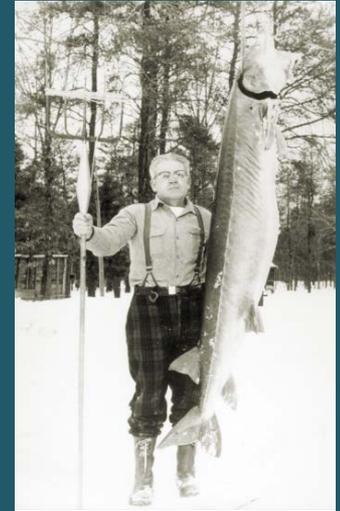
Good communication with funders and stakeholders

- Transparency, appropriate messaging
- Cultivate local champions
- Consult with different river users

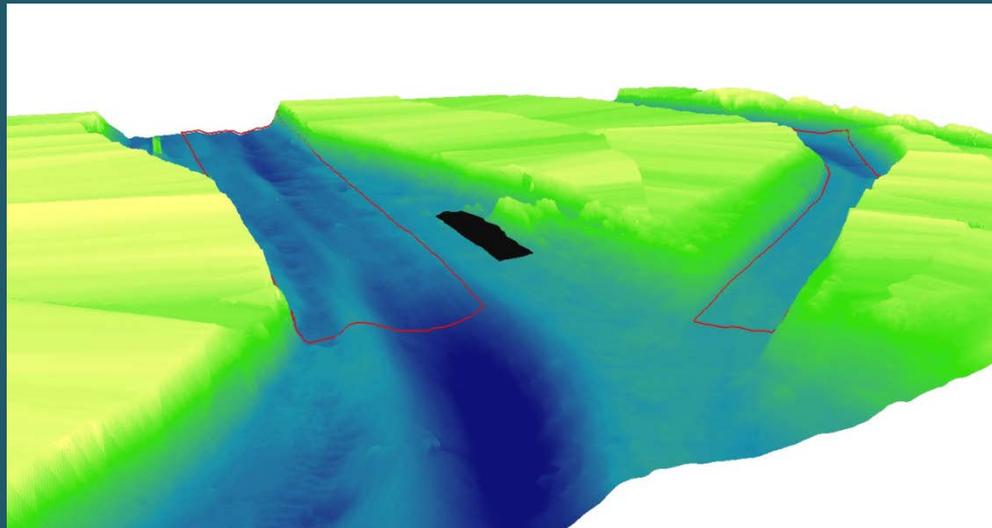


Consistent and Honest Answers

- What have we learned?
- What can we expect?
- How will the reefs benefit me?



Consider a Wide Range of Locations → Understand Potential Conflicts



Consultation with Users



Lessons Learned – Adaptive Management

