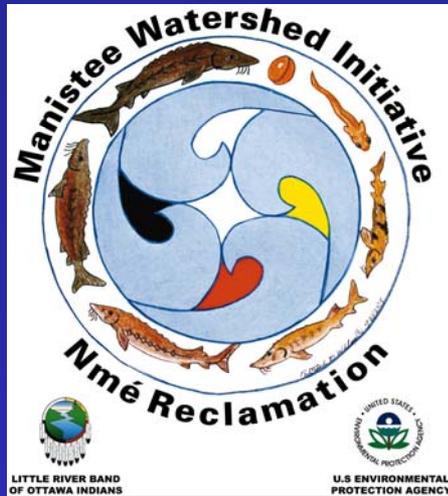


Implementation of a Streamside-Rearing Facility for Sturgeon Rehabilitation



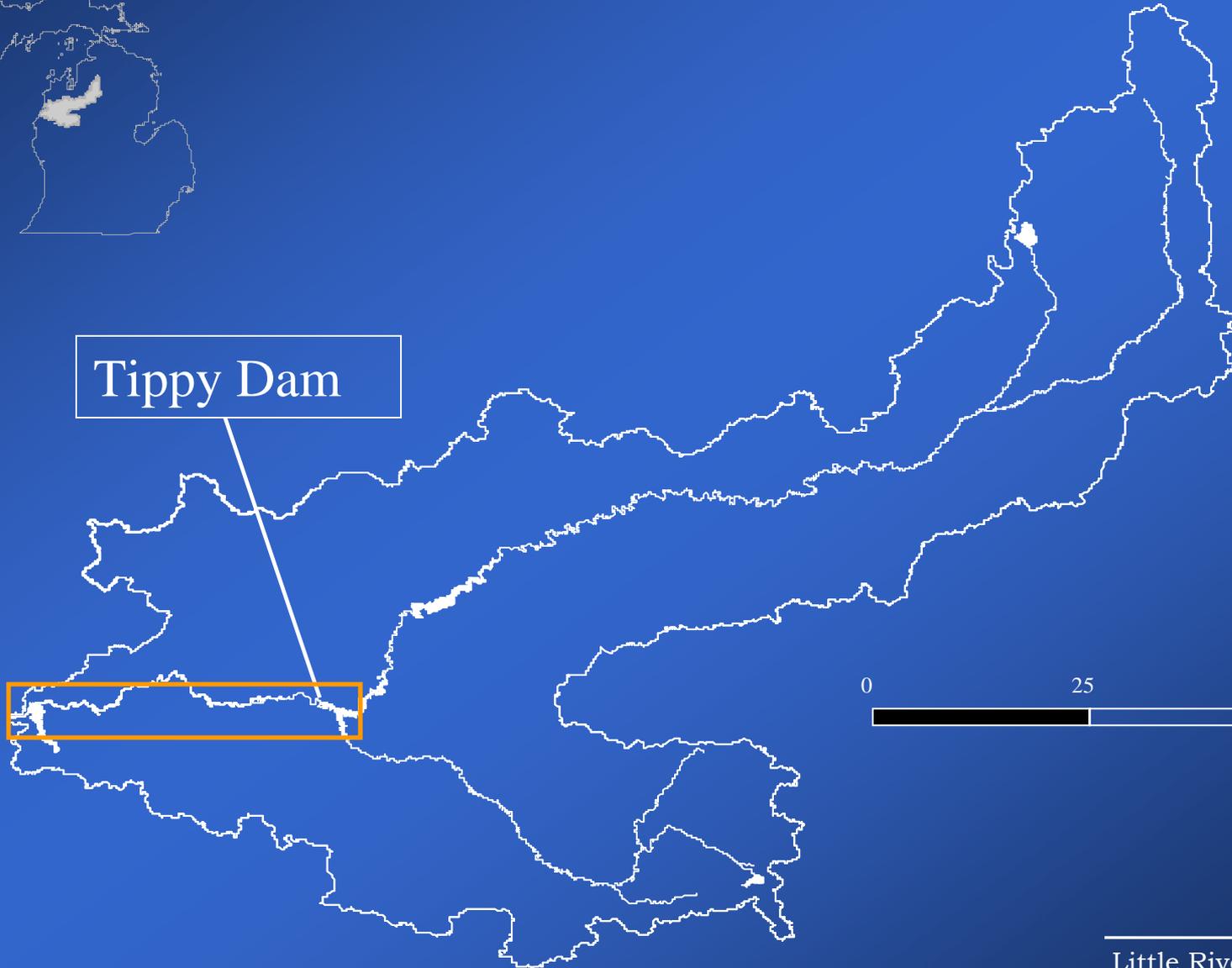
Marty Holtgren and Stephanie Ogren
Little River Band Of Ottawa Indians

Aaron Paquet
Northern Environmental Technologies, Inc.

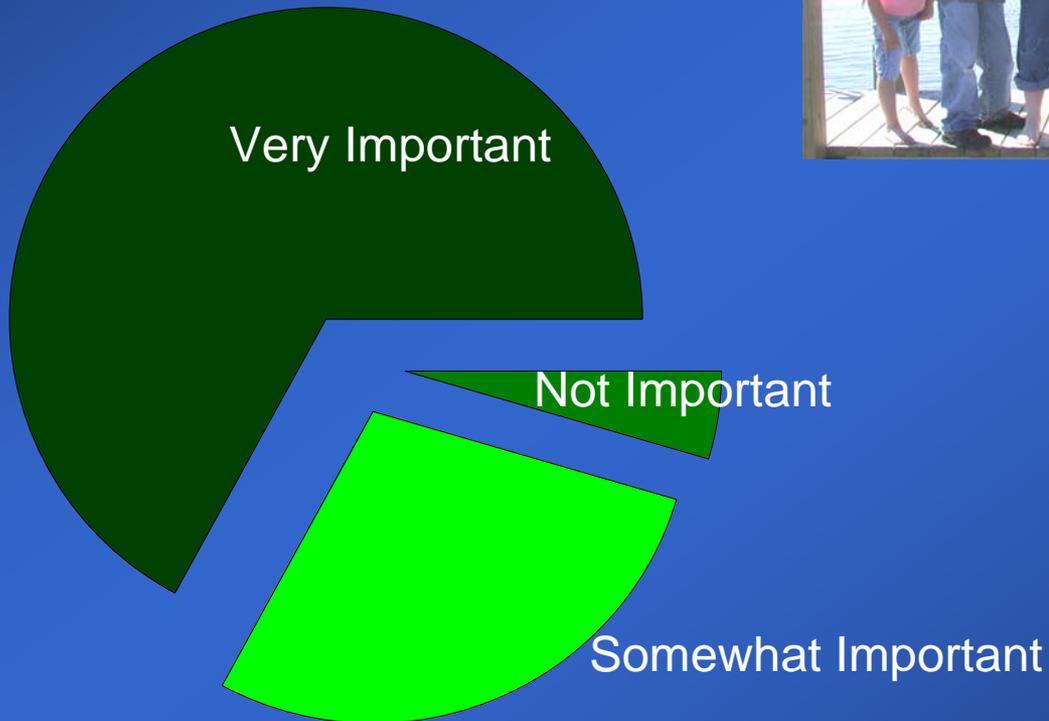
Nancy Auer and Kevin Mann
Michigan Technological University



Manistee River Watershed



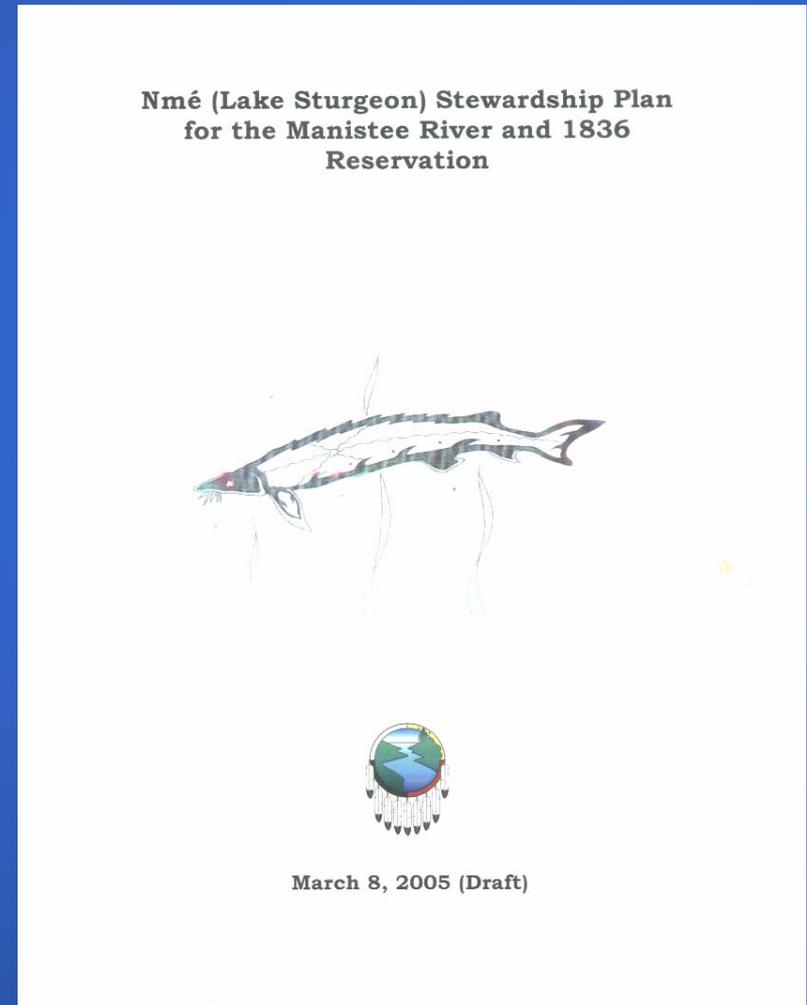
Importance of Sturgeon Program



Nmé (Lake Sturgeon) Stewardship Plan

Goal 1:

Restore the harmony and connectivity between nmé and the Aníshinaábek people and bring them both back to the river.



Assessment Needs Determined

- Are they spawning
 - ~ Document spawning location and habitat
- Are they naturally reproducing?
 - ~ Find larvae
- Are they surviving



What is the prescription?



Considerations for Rehabilitation

- Appropriate broodsource
- Genetics
- Imprinting and straying concerns
- Reasons for decline
- Cost



Why the Manistee Population?

Remnant Population

1. Habitat Improvement Efforts

- Recent and upcoming spawning site improvement
- EPA Watershed Initiative - Watershed scale habitat improvement

2. Population Status:



Captured Larvae Used for Rearing

Approximately
10% of larvae
collected



Why Stream-side Rearing?

1. Cost Effective
2. Portable
3. Exposure to natal water source
 - a. Temperature, DO, minerals, sediment, etc.
 - Maintain imprinting and physiological/metabolic attributes



Why Stream-side Rearing?

2. Genetics

- a. Maintain within-population diversity
- b. Maintain among-population diversity

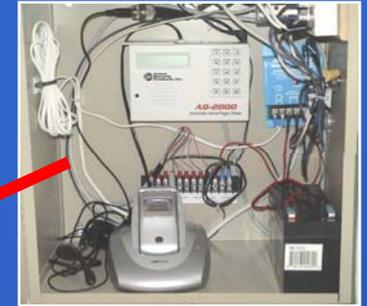


Design of Facility – External Features

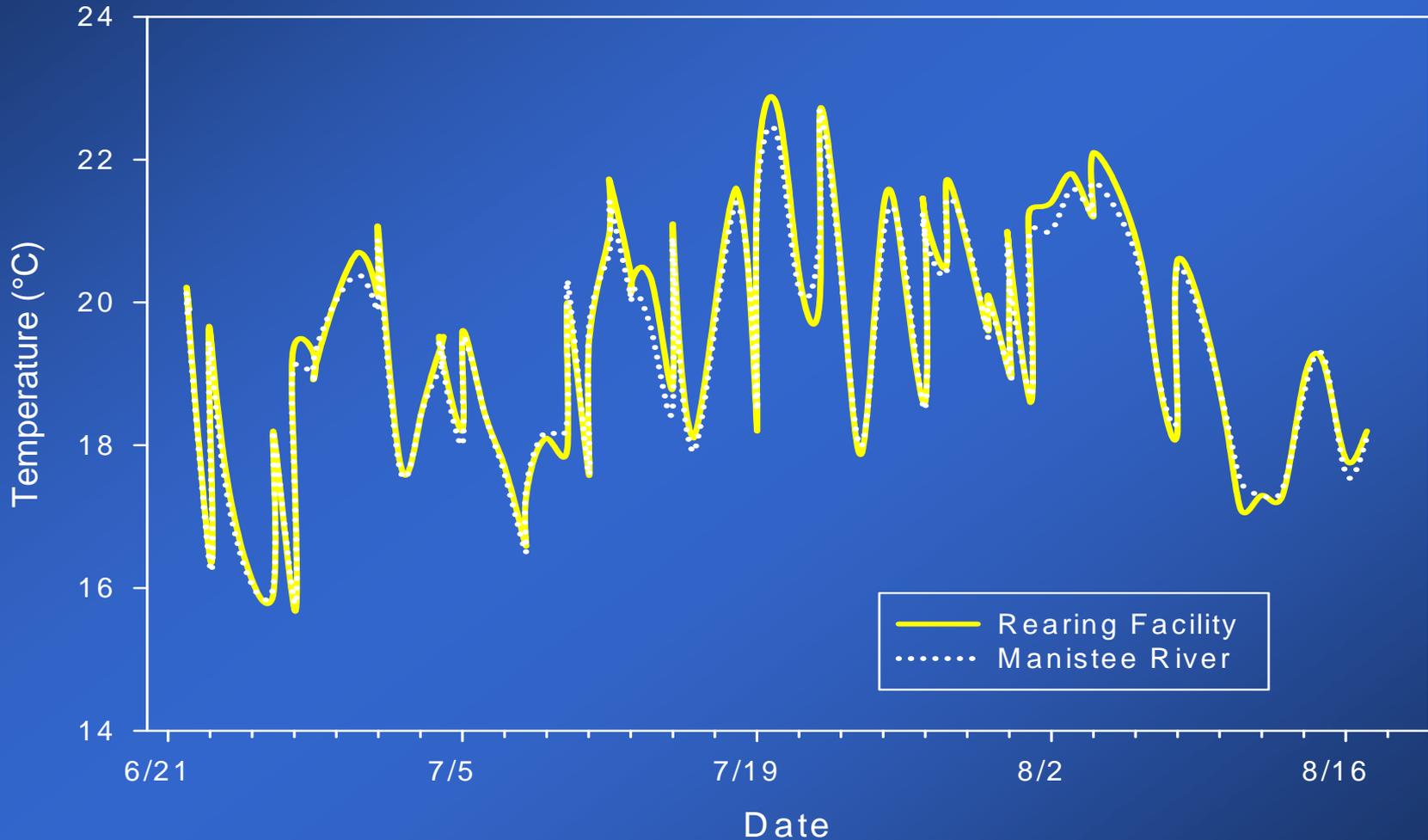
Northern Environmental™
Hydrologists • Engineers • Geologists



Design of Facility – Internal Features



Design of Facility – Internal Features



Feeding, Growth and Disease

1. Feeding protocol similar to Wild Rose

- Larvae fed brine shrimp *Artemia* sp.
- Juveniles *Artemia* sp. & chironomids
- 24-h feeding
- Measured Weekly
- Preventative disease treatments





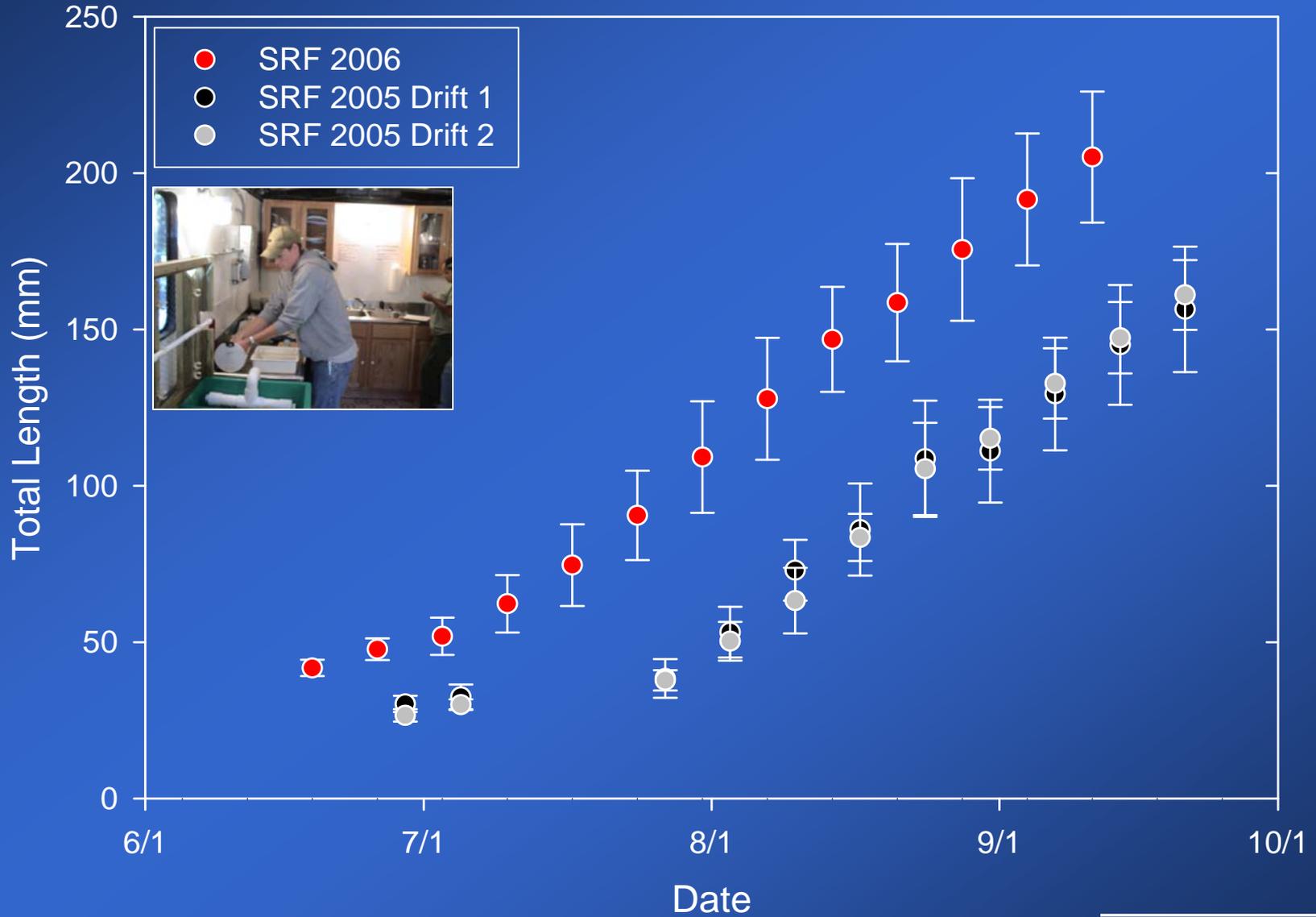
Monitoring Plan

“Comparative Performance in Early-life History of Streamside and Wild-Reared Lake Sturgeon...”

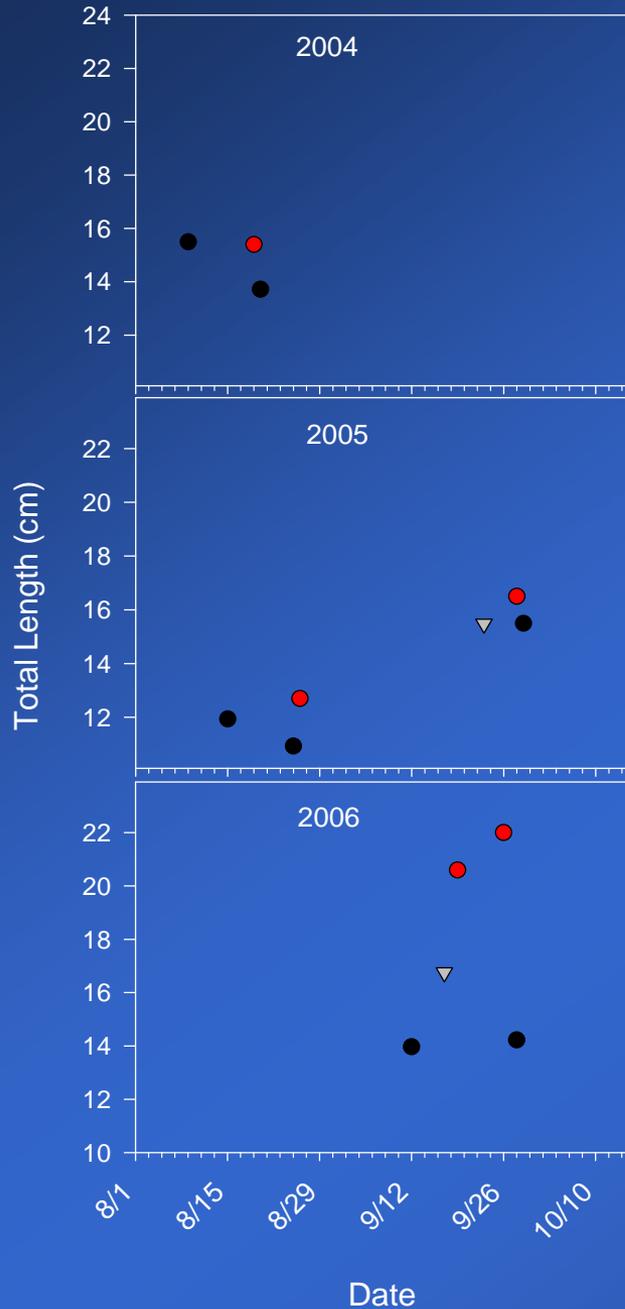
- Compare growth and condition, movement patterns, habitat use and river residence time
- Compare progeny genotypes and parental contribution



Growth



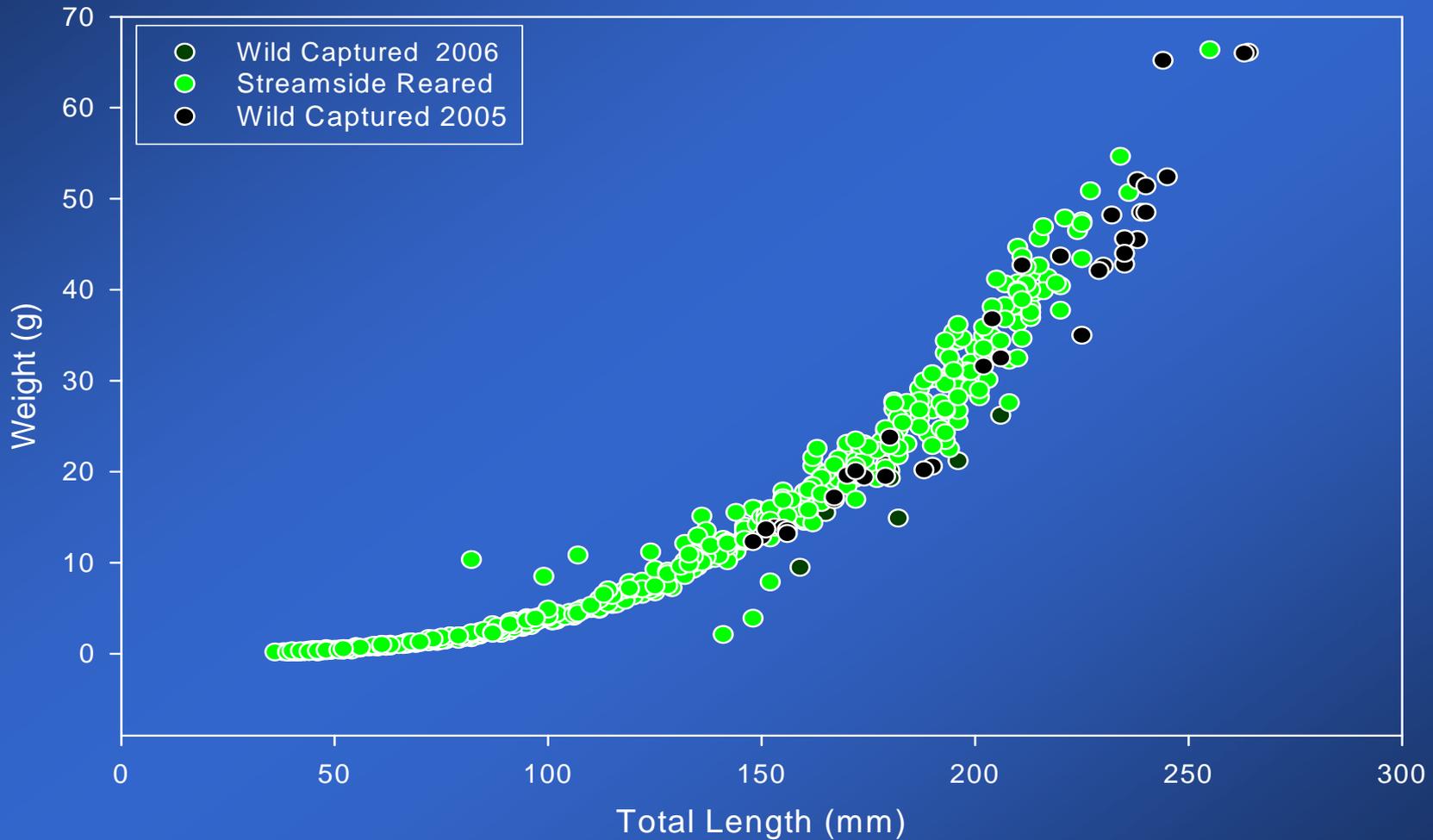
Sturgeon Total Length at Release



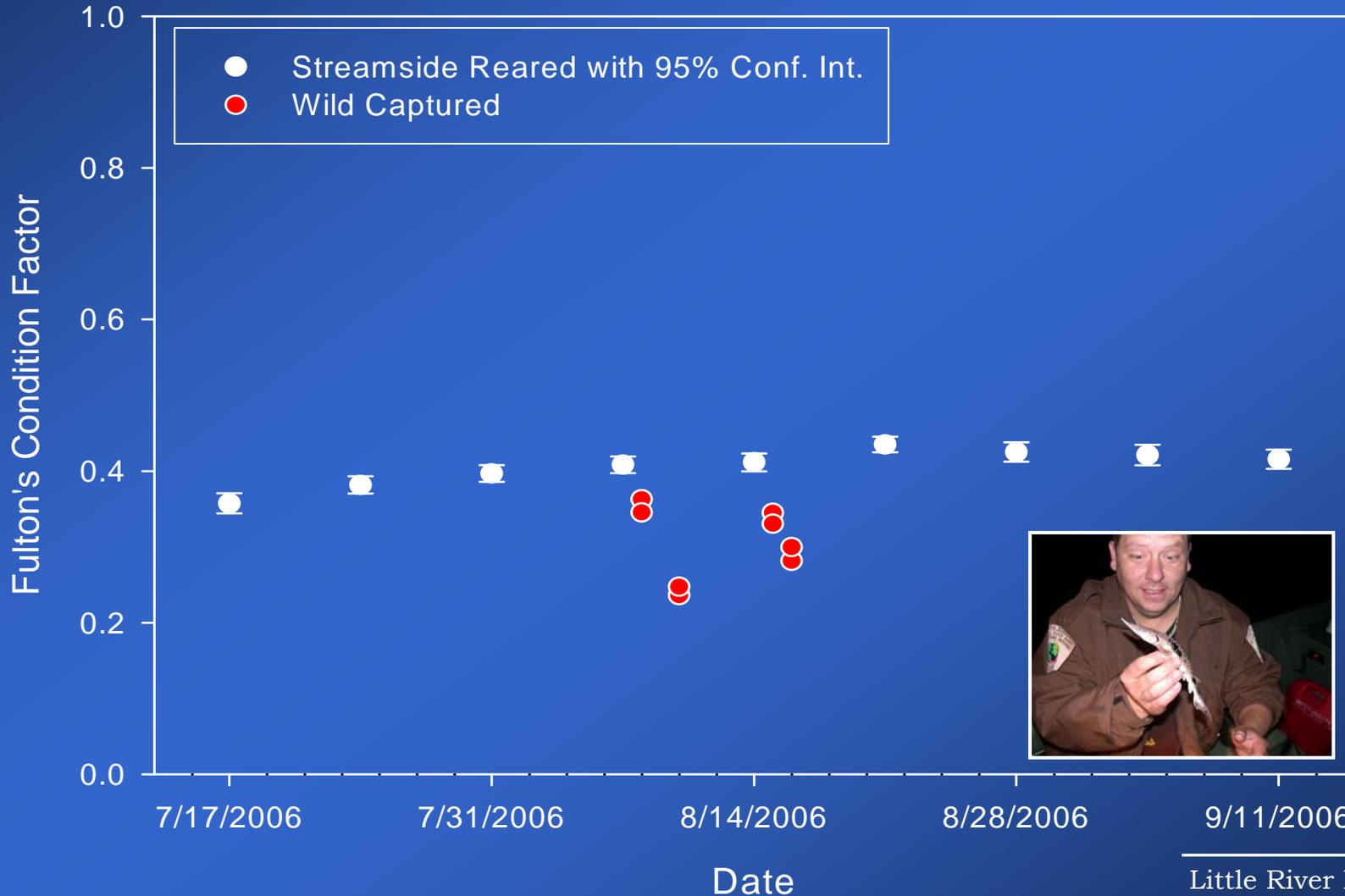
- Little River Band - SRF
- Wisconsin DNR - Wild Rose
- ▼ Michigan DNR - Wolf Lake



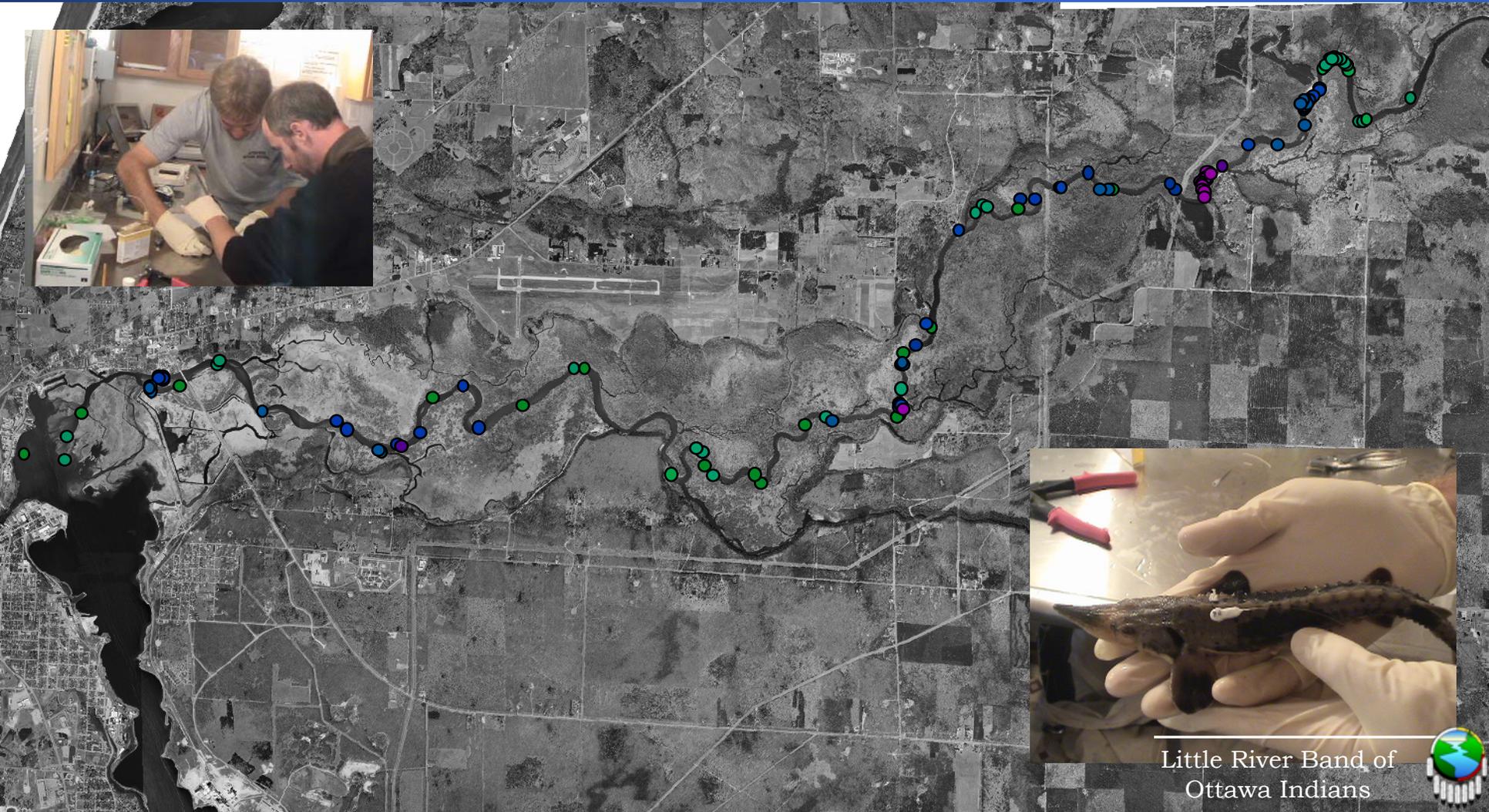
Growth Comparisons



Growth Comparisons



Evaluating Movement Patterns



Community Involvement

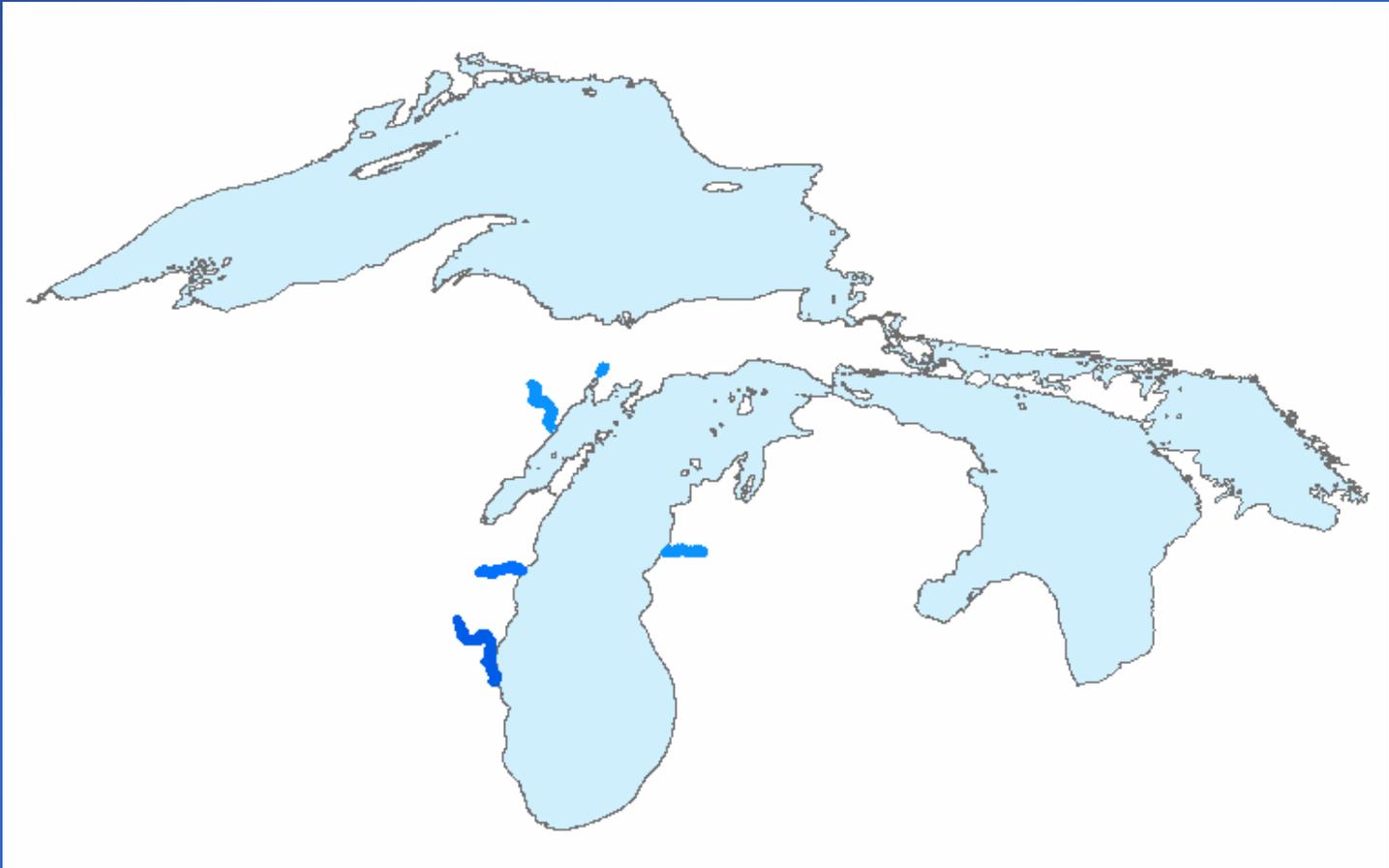


Photos courtesy of Julie Quinn©



Lake Michigan Collaborative Initiative

- Multi-Agency (5 systems)
 - Wisconsin DNR, Little River Band of Ottawa Indians, Michigan DNR, US Fish and Wildlife Service, US Geological Survey, and Rivers Edge Nature Center.



Acknowledgements

- LRBOI Tribal Council and Natural Resource Commission, Tribal Ogema
- John Bauman, Darrin Griffith, Justin Chiotti, Rob Elliot, Karen Karash, Bob Sanders, Grant Poole, Mike Dilloway, Brandon Gerig, and Mark Bowen.
- US Forest Service, US Fish and Wildlife Service

