

# Lake Sturgeon Restoration Using Streamside Rearing Facilities on Four Lake Michigan Tributaries

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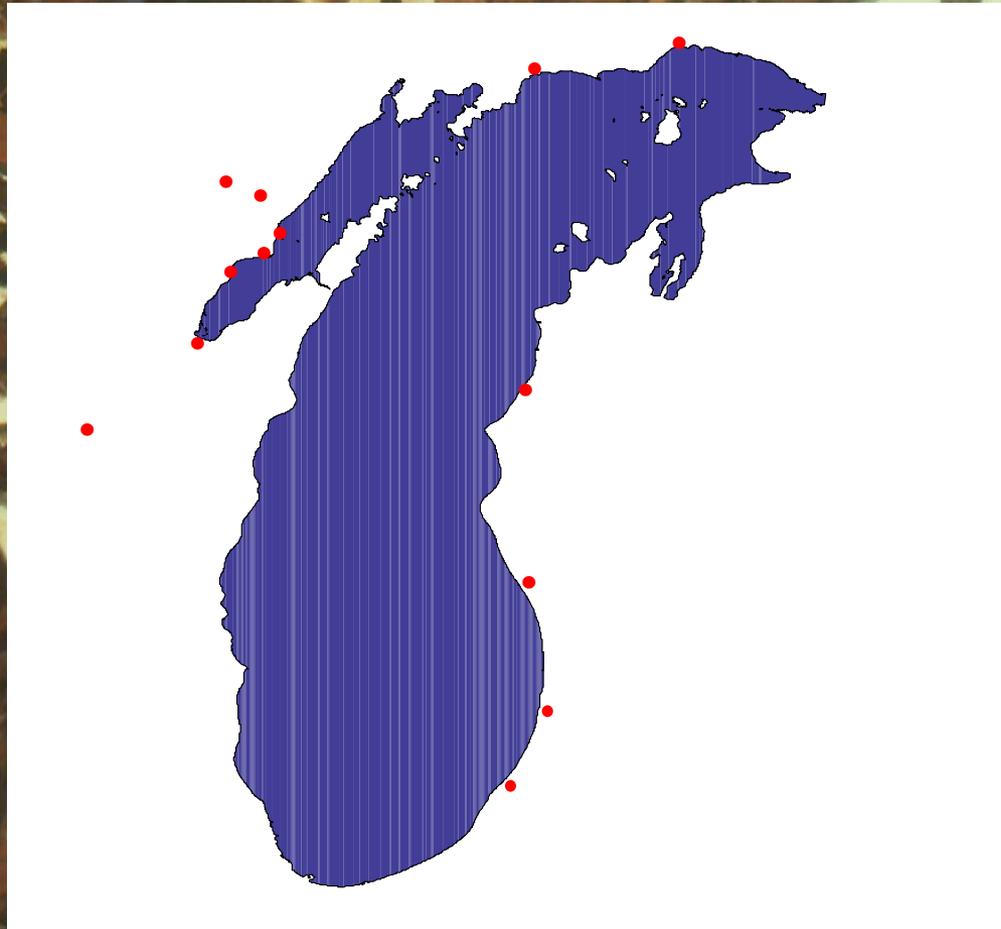
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# Background:

- Lake Michigan historically supported lake sturgeon populations in many tributaries
- Some rivers still support remnant populations but many populations are extirpated



## Lake Sturgeon Rehabilitation Strategy

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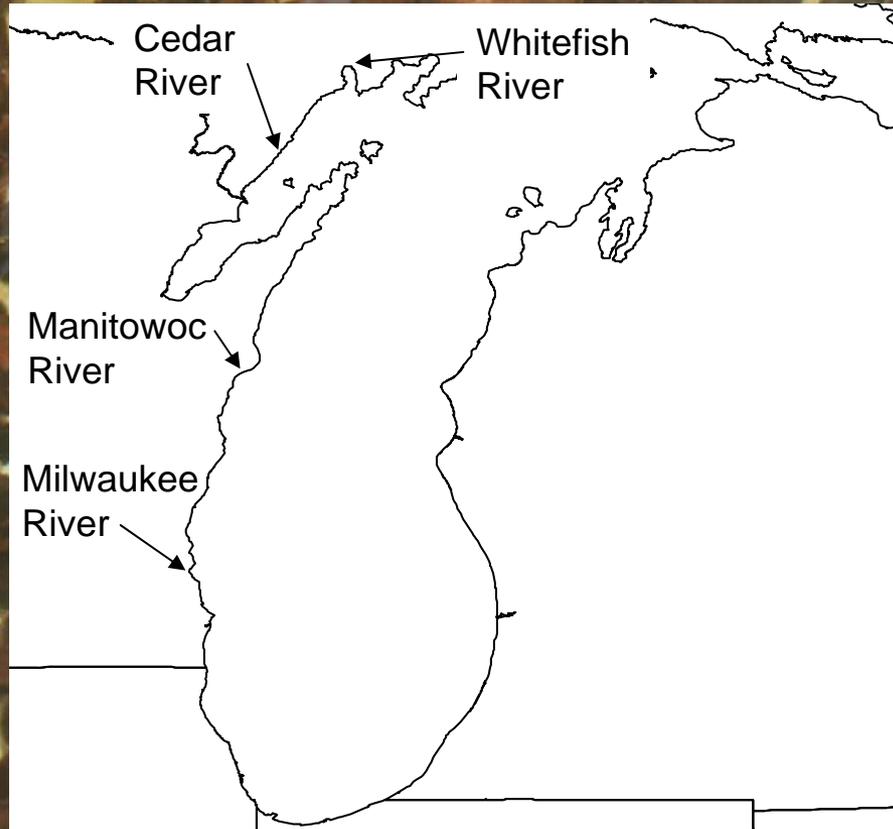
THE LAKE STURGEON  
*Acipenser bicaudatus*, Le S. (p. 661.)  
Drawing by H. L. Todd, from No. 10252, U. S. National Museum, collected at Ecorse, Michigan, by J. W. Miller.  
From The Fisheries and Fishery Industries of the United States 1884.

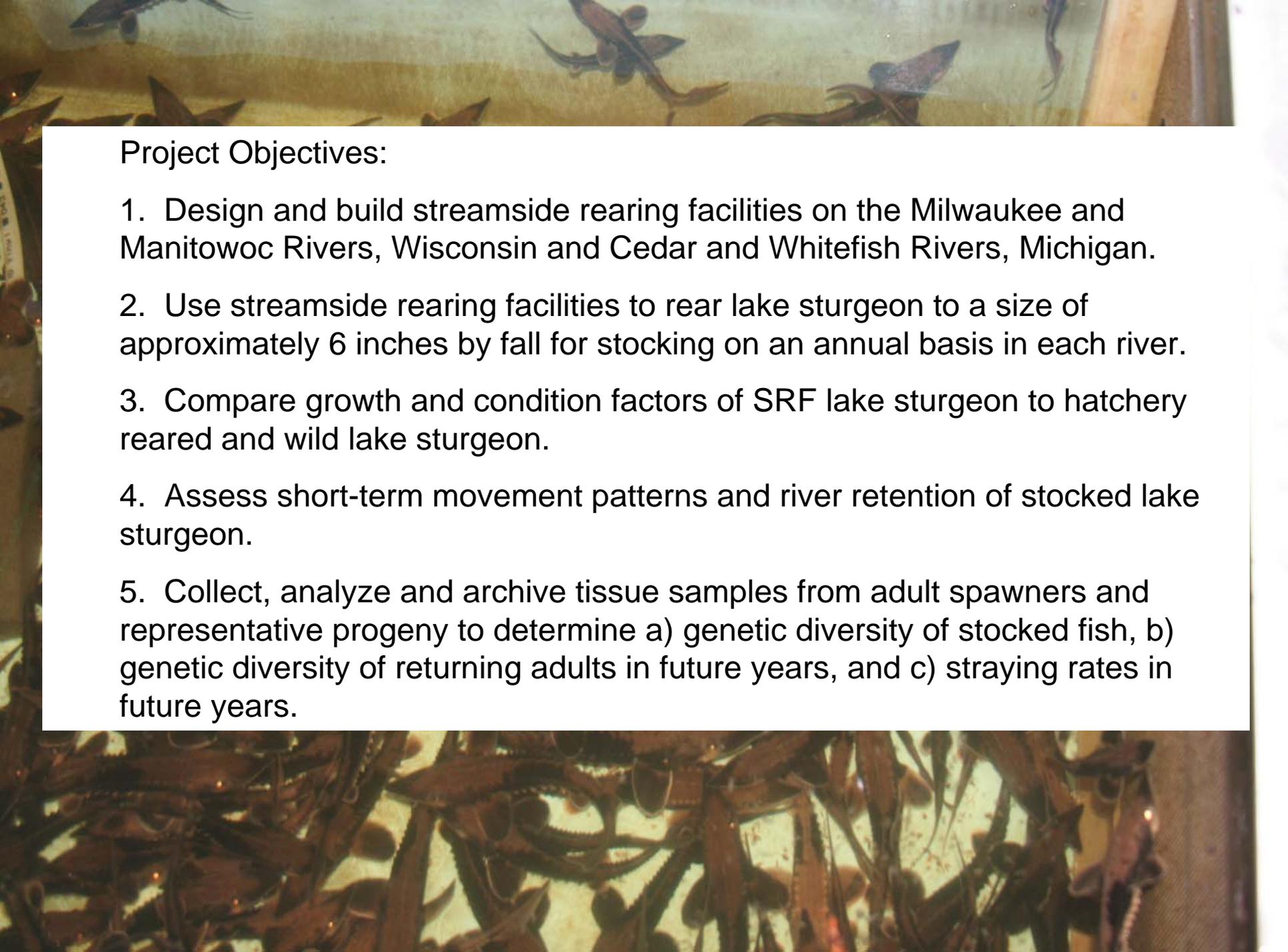
Sub-goal #2. Where populations have been extirpated, re-establish self-sustaining lake sturgeon populations when possible to their known former range;

Objectives:

- identify genetically suitable brood stocks,
- inventory known and potential spawning habitat,
- identify obstacles to rehabilitation and sustainability,
- reestablish a self-sustaining population through transfer or hatchery fish,
- inventory population size and structure, every 5 years, to monitor the success of population building and once sustainability is achieved, every 10 years,
- protect population until such a time that it reaches a minimum of 500 breeding adult fish, after which a harvestable fishery may be considered,
- where a harvest-oriented fishery is developed, maintain fishing mortality below 3% for an expanding population and below 6% to maintain lake sturgeon abundance.

Proposal to Great Lakes Fishery Trust for streamside rearing facility evaluation on 4 streams, 2 in WI and 2 in MI



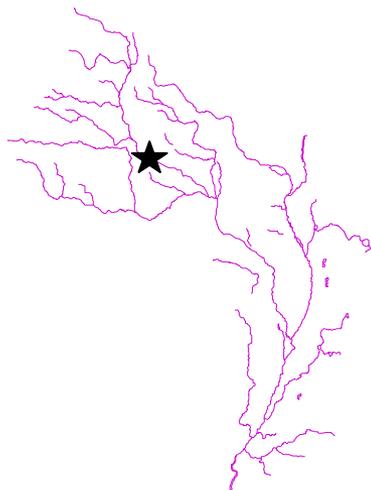
The background of the slide is a photograph of a stream. In the upper portion, several blue-colored fish are visible swimming in the water. The lower portion shows a dense thicket of brown, leafy aquatic plants. The overall scene is brightly lit, suggesting a natural outdoor environment.

## Project Objectives:

1. Design and build streamside rearing facilities on the Milwaukee and Manitowoc Rivers, Wisconsin and Cedar and Whitefish Rivers, Michigan.
2. Use streamside rearing facilities to rear lake sturgeon to a size of approximately 6 inches by fall for stocking on an annual basis in each river.
3. Compare growth and condition factors of SRF lake sturgeon to hatchery reared and wild lake sturgeon.
4. Assess short-term movement patterns and river retention of stocked lake sturgeon.
5. Collect, analyze and archive tissue samples from adult spawners and representative progeny to determine a) genetic diversity of stocked fish, b) genetic diversity of returning adults in future years, and c) straying rates in future years.

## West Branch Whitefish River Facility

- Relatively difficult to setup because of distance from river, power, and phone line and also permitting issues
- Good water quality due to relatively undisturbed state of watershed and morphology/hydrology of river

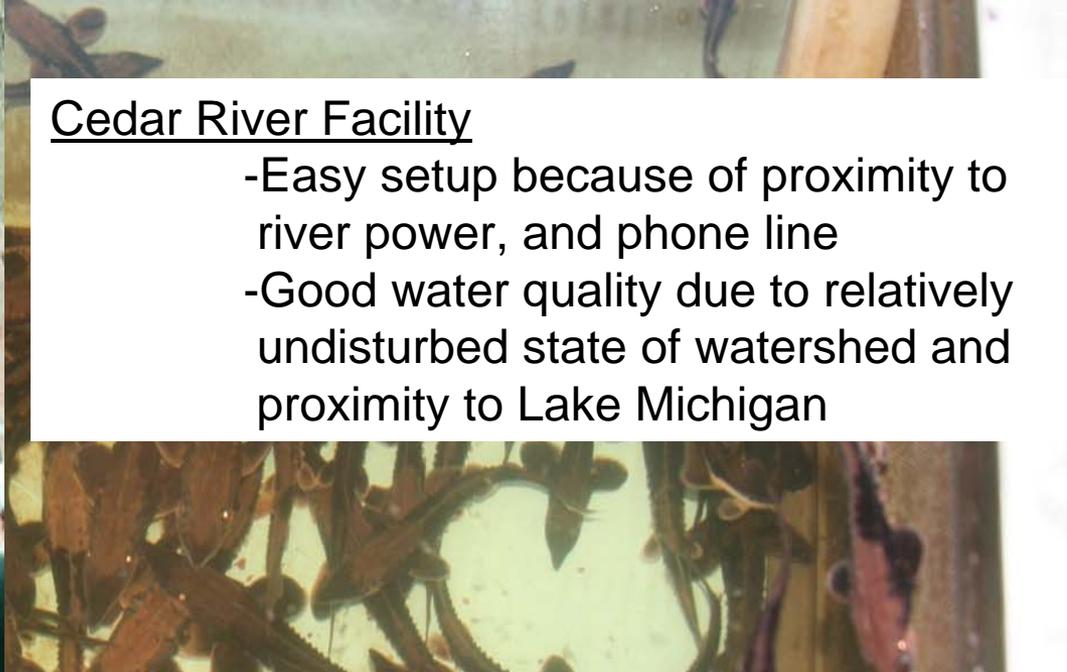


Bay de Noc



## Cedar River Facility

- Easy setup because of proximity to river power, and phone line
- Good water quality due to relatively undisturbed state of watershed and proximity to Lake Michigan



Milwaukee River at Riveredge Nature Center



## Milwaukee River Facility

- More difficult to setup because of distance from river
- Relatively poor water quality due to watershed development

## Manitowoc River Facility

- Setup was not completed in 2006 but will be operational in 2007



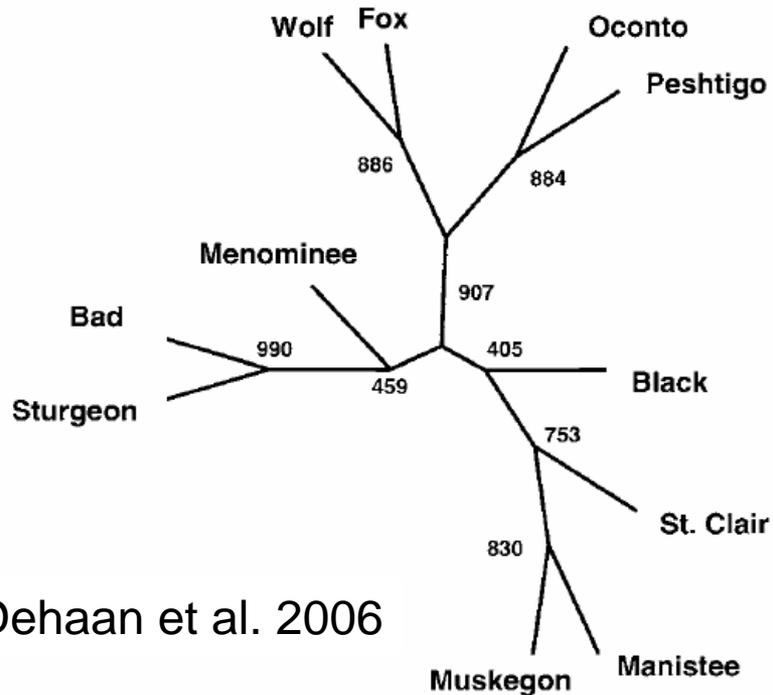




## Gamete Sources:

- Lake Winnebago used for Milwaukee and Manitowoc rivers
- Menominee River used for Cedar and Whitefish rivers

## Decision based on genetics data of Great Lakes lake sturgeons



Dehaan et al. 2006

FIGURE 4.—Neighbor-joining tree based on Cavalli-Sforza and Edwards' (1967) chord distance that describes the genetic affinities among 11 lake sturgeon populations, upper Great Lakes basin, 1999–2003. Bootstrap values associated with specific nodes represent the number of replicates out of 1,000 where these groupings were evident.

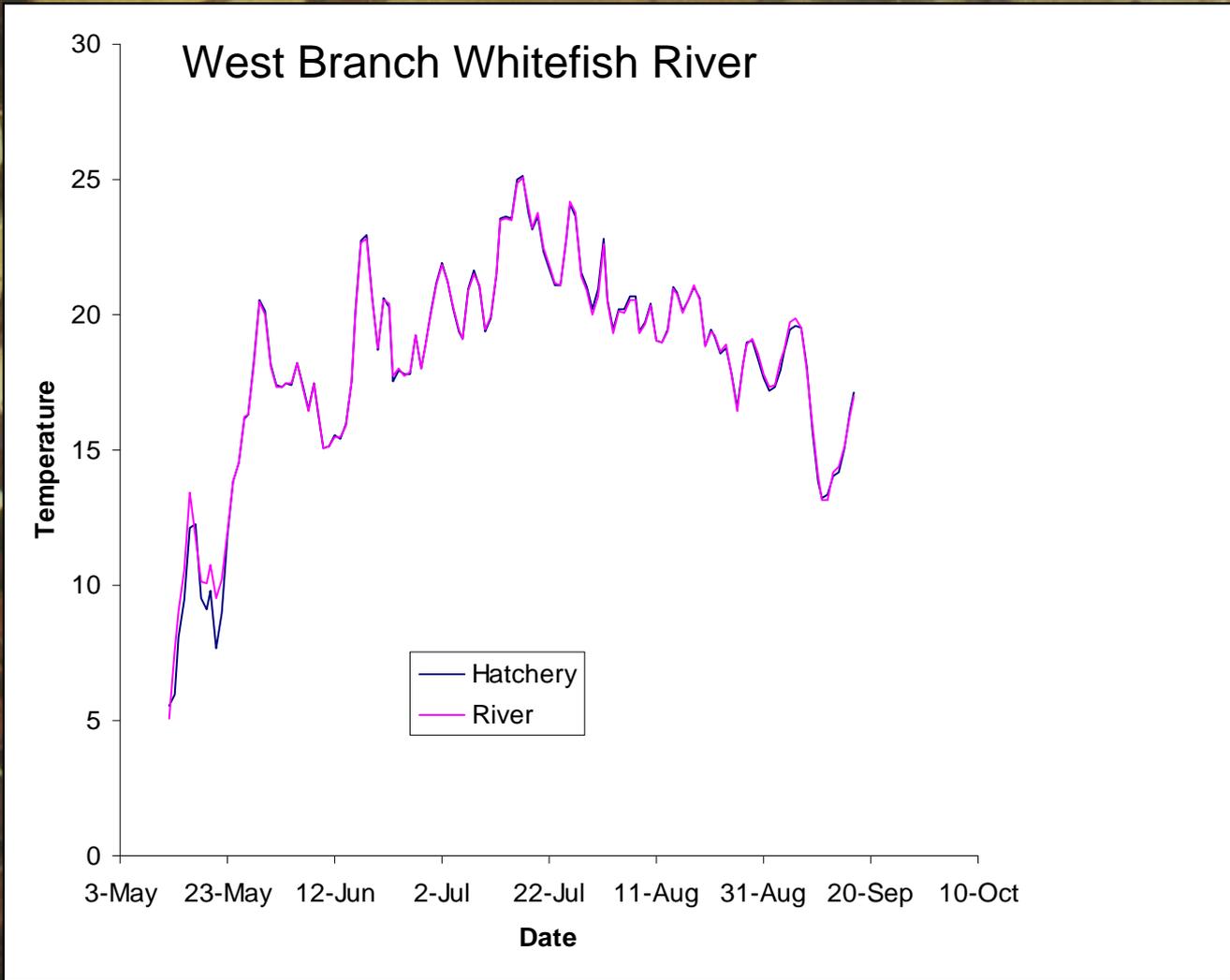


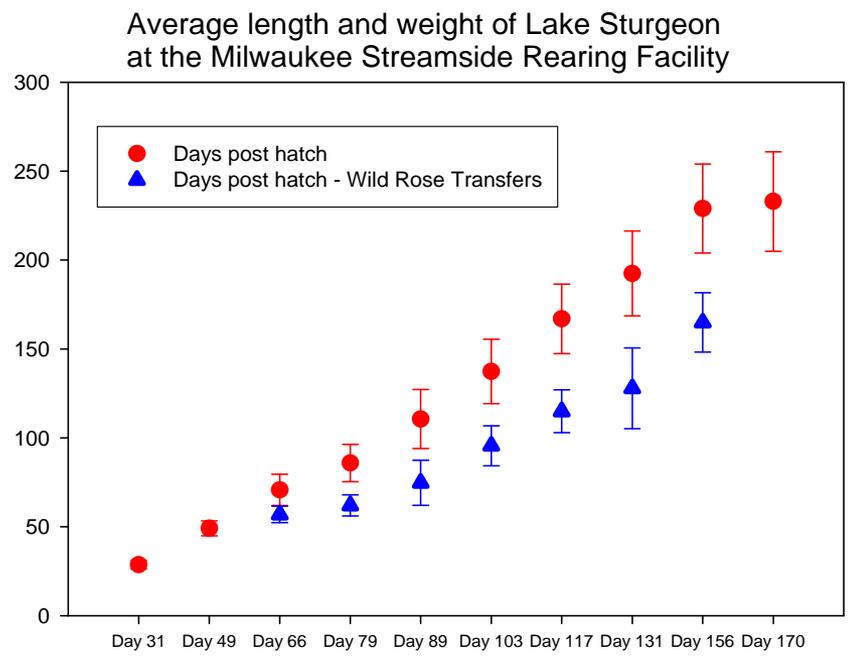
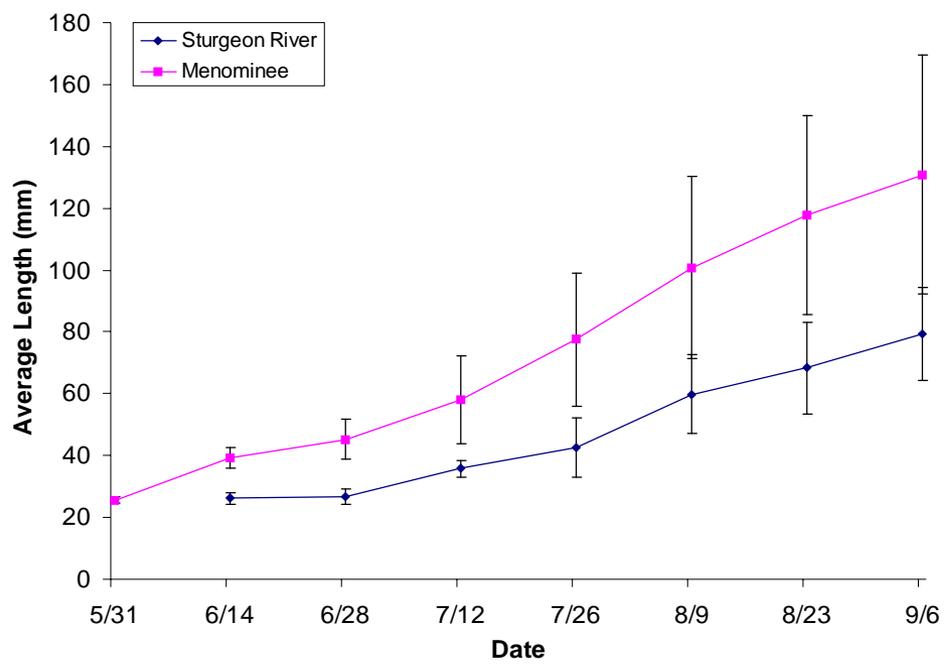
## Results:

- Problems encountered included turbidity (Milwaukee River), failed gamete collection efforts (Menominee River), flooding (Whitefish River), autodialer malfunctions, etc.
- Despite problems we did successfully raise and stock 52 lake sturgeon, 27 in Milwaukee River and 25 in Whitefish River
- The Cedar River trailer was only operated for a couple of weeks in early spring but was shut down because of gamete collection failure
- Fish stocked in Whitefish River were collected as larvae from Menominee River by Todd Kittel (UWSP)

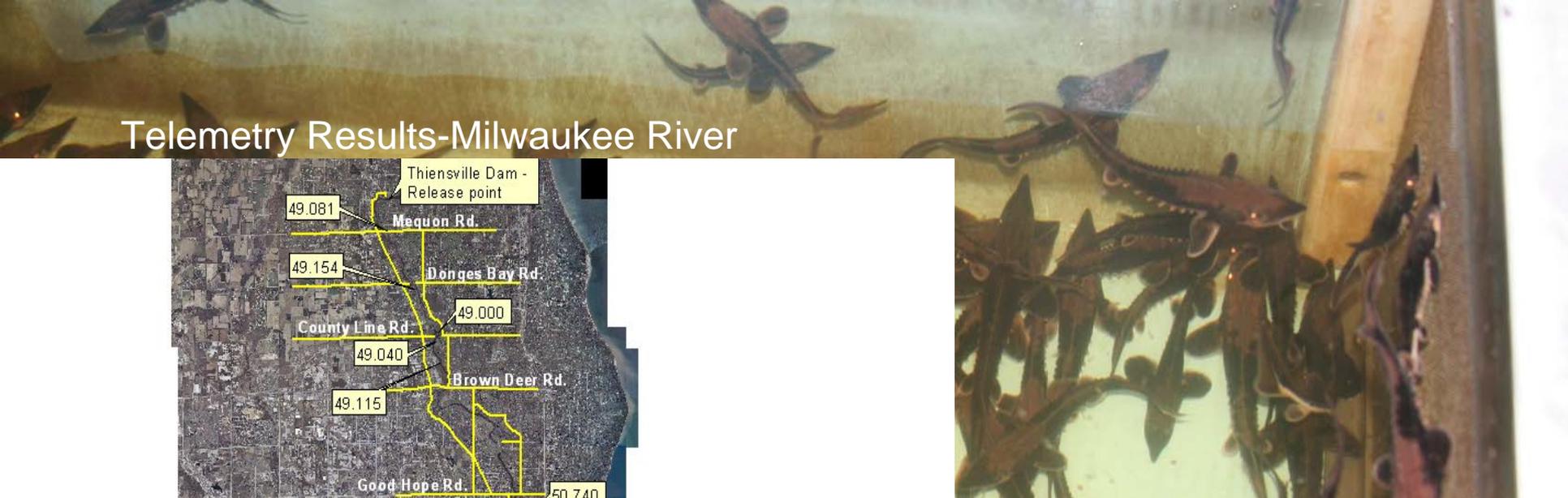
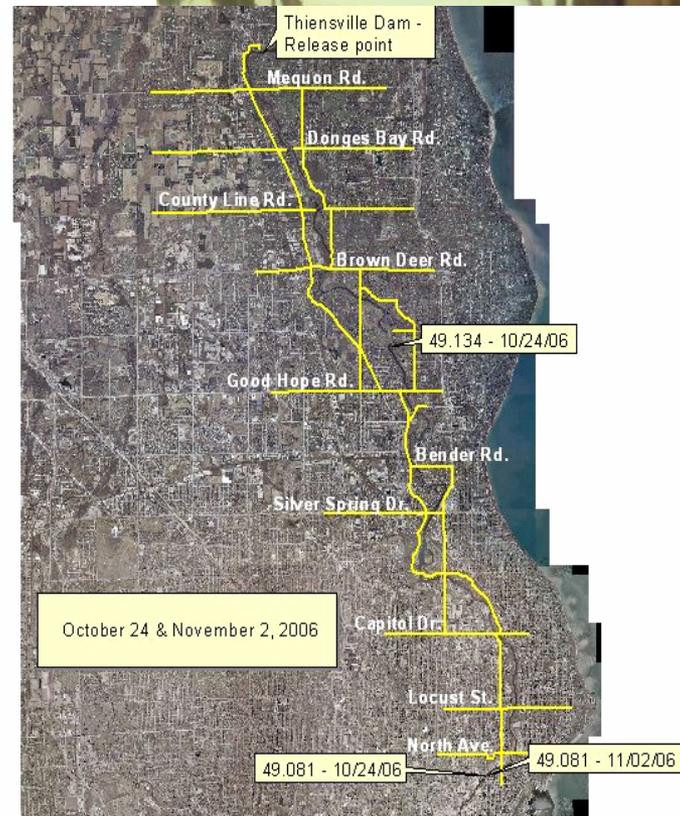
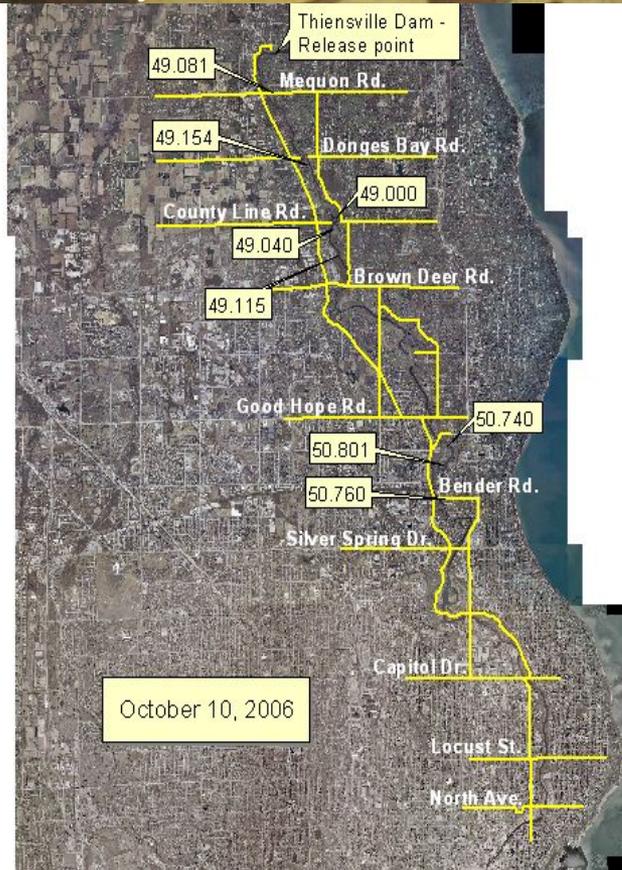








# Telemetry Results-Milwaukee River



## Things To Do For Year 2 of Project:

- Devise recirculation system for incubation and early larval stage (flooding, fungus)
- Improve blood worm feeder design
- Develop (or adopt) a feeding table
- Mouseproof trailer





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Great Lakes Fishery Trust  
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