

# Merging Traditional and Biological Criteria in Nme (Sturgeon) Stewardship

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Little River Band of Ottawa Indians



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of Ottawa Indians





# Cultural Indicators

"It (sturgeon) is an ancient fish; a person could only get knowledge from a large fish or mshiike (turtle) because they have been here so long" – Jay Sam



# Cultural Indicators

## Sturgeon and Grayling

- Communities migrated according to sturgeon/grayling
- Sturgeon populations declined along with sturgeon clan families
- Many songs, dances, and ceremonies lost



"When I was young, they used to talk about the sturgeon being harvested like grayling" – Jay Sam



# Over a Century of Change

## 1836 Treaty

### Great Lakes Fishery Changes

- Management focus shifted to sport fish/ non-native species
- Extinction and reduction of many cultural indicators



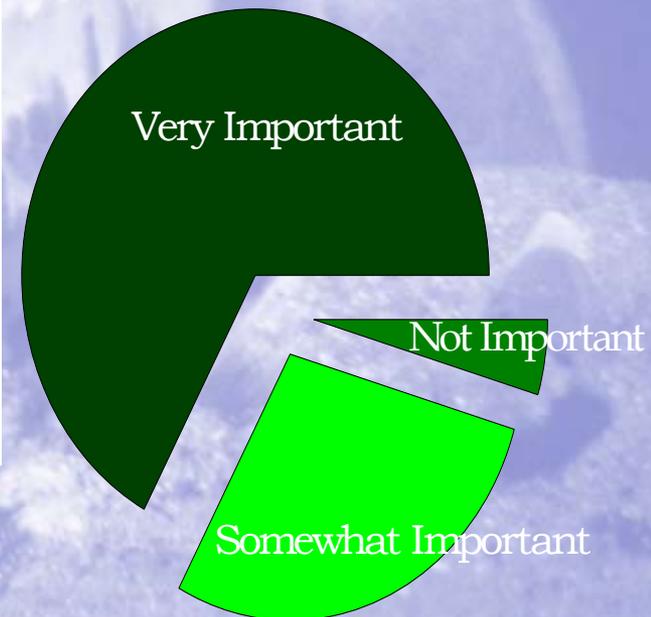
"You will not have the privilege to catch this fish (Sturgeon)" – Jerome Pheasant



# Tribal Natural Resources Management

## “Why do Tribes Have a Natural Resources Department?”

- Tribal needs not met
- Need for cultural integration into management
  - Example: Manistee River Sturgeon (Cultural Indicator Species)



“The sturgeon were the buffalo of the Odawa people” –  
Jimmie Mitchell



# Bridging Culture and Biology

## Biological Context:

- Small remnant population
- Little recruitment
- Marginal habitat
- Migrational barriers
- Marginal focus on sturgeon - Millions of dollars spent on non-indigenous fish
- Not a sportfish – no public involvement

## Cultural Context:

- Cultural connection to sturgeon diminished - Formation of Nme Cultural Task Group (the bridge)
- Nme Stewardship Plan
- Sturgeon and people increase in prosperity



"Our ancestors are here with us... The biologists were sent to us for a reason" – Jay Sam

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# Nmé (Lake Sturgeon) Stewardship Plan Goals

## Goal #1:

- Restore the harmony and connectivity between nme and the Anishinaabek and bring them *both back to the river*

Nmé  
(Lake Sturgeon)



Stewardship Plan  
for the  
Manistee River  
and  
1836 Reservation



# Nmé (Lake Sturgeon) Stewardship Plan Goals

## Goal #2:

- Restore the nme and reclaim the environment on which it depends for future generations of nme and Anishinaabek in perpetuity

*Nmé  
(Lake Sturgeon)*



*Stewardship Plan  
for the  
Manistee River  
and  
1836 Reservation*



# Nmé (Lake Sturgeon) Stewardship Plan Goals

## Goal #3:

- Emphasize strategies that promote natural reproduction and a healthy watershed



# Nmé (Lake Sturgeon) Stewardship Plan Goals

## Goal #4:

- Protect Tribal Sovereignty and Treaty Rights



# Nmé (Lake Sturgeon) Stewardship Plan Goals

## Target Goals:

25 year:

- Establish a self-sustaining, naturally reproducing nmé population with atleast 750 nmé capable of spawning...

7 Generation:

- Return the population to pre-1836 levels and/or to the contemporary carrying capacity...



“The grandfather fish...would sacrifice themselves during the sucker moon so the people would have food until the other crops were available” – Jay Sam

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# Issues/Objectives

1. Genetic Conservation and Stock Supplementation
2. Habitat Protection and Enhancement
3. Contaminants
4. Ecological Considerations
5. Law Enforcement and Harvest
6. Public Involvement and Cultural Education



“The grandfather fish...would sacrifice themselves during the sucker moon so the people would have food until the other crops were available” – Jay Sam



# Streamside Rearing Case Study

How the Plan was Applied



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# Streamside Rearing Case Study

## Population Needs...Increase Recruitment

### Biological

- Genetics
- Imprinting

### Cultural

- Removal of fish from natal river unacceptable
- Grandfather fish
- Protect eggs and larvae



# Results (Biological)

- SRF fish often exceed growth in hatcheries, similar to wild fish
- Movement patterns and habitat use similar between wild/reared
- SRF release fish recaptured and doing well!



# Results (Cultural)



Photos courtesy of Julie Quinn©

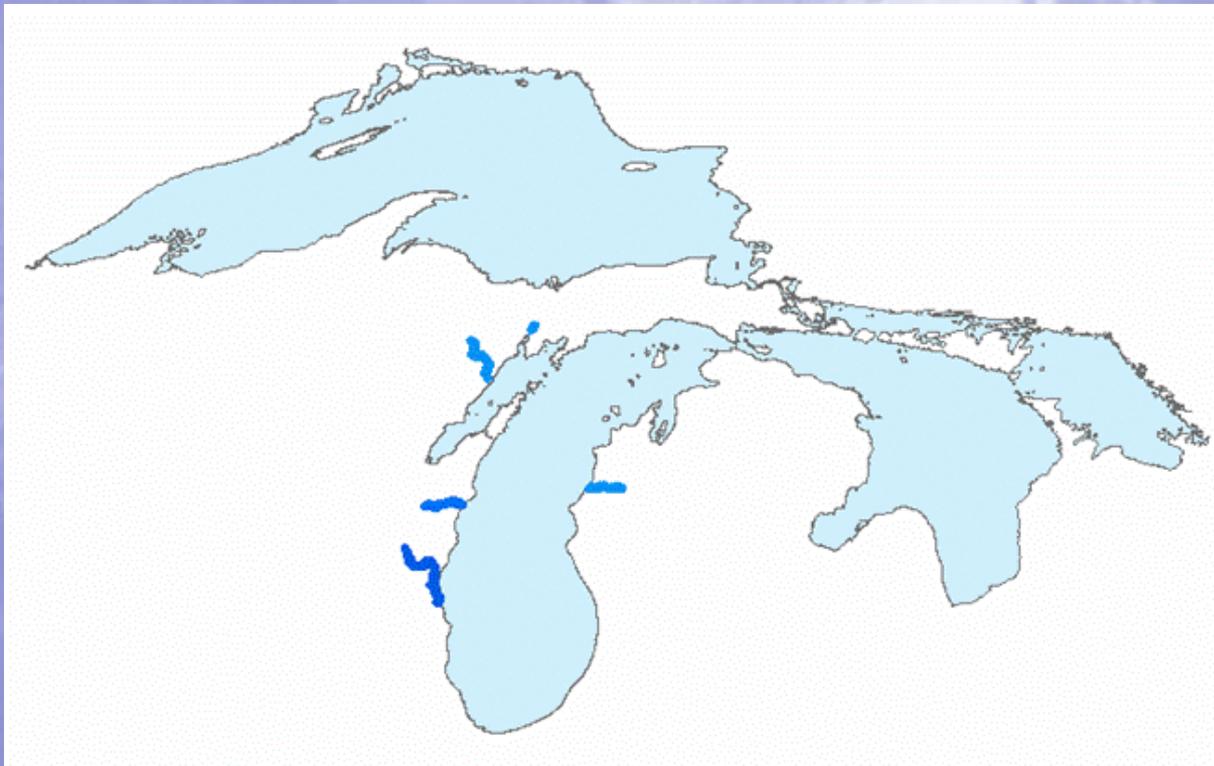
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# Successful Collaboration

## 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.



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# Any questions?



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[Technical Note]

## Design of a Portable Streamside Rearing Facility for Lake Sturgeon

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**Abstract**—A portable streamside rearing facility was designed and used by the Little River Band of Ottawa Indians during efforts to rehabilitate a remnant population of lake sturgeon *Acipenser fulvescens* in the Big Manistee River, Michigan, beginning in 2004. The streamside rearing facility facilitates rearing of wild-caught lake sturgeon larvae in their natal water. This rearing approach provides a cost-effective technique for small batch rearing, incorporates aspects of genetic conservation, and addresses concerns about imprinting and spawning site fidelity. This rearing method may be an important management tool for restoring remnant lake sturgeon populations. Successful rearing of lake sturgeon during the first 3 years of operation indicates that this portable design may be adapted and modified for other locations and fish species. Other management agencies in the Great Lakes basin are currently using this technology for lake sturgeon rehabilitation because of the demonstrated operational success of this facility.

Rehabilitation of remnant stocks of lake sturgeon *Acipenser fulvescens* within the Great Lakes basin is a priority for tribal, federal, and state agencies (Auer 1999). Fishery managers are seeking techniques to rehabilitate lake sturgeon stocks by increasing recruitment while maintaining natural population performance attributes and promoting genetic conservation. In fall 2003, the Little River Band of Ottawa Indians (LRBOI), Northern Environmental Technologies, Inc., and a fisheries propagation supervisor designed a streamside rearing facility (SRF) for the Big Manistee River lake sturgeon population. This strategy allows for the integration of cultural, biological, and financial concerns. Lake sturgeon maintain an important role in the culture of the LRBOI lake sturgeon removal from

the river of origin and transport to an off-site, traditional permanent hatchery were considered unacceptable by the tribe. A portable SRF was determined to be the most cost-effective, biologically sound option for use with this population.

Lake sturgeon managers lack critically needed information to determine appropriate methodologies for rehabilitating remnant stocks or separating extirpated stocks, including the application of SRFs. Under standard practices, gametes are collected, fertilized, hatched, and reared at an off-site hatchery and returned to the natal source when stocked. Concern has been expressed about straying, spawning site fidelity, and genetic conservation issues associated with this practice (Zollweg et al. 2003). The benefit of remnant stock rehabilitation is that it provides an opportunity to use existing fish as broodstock.

Remnant populations of lake sturgeon within the Great Lakes basin exhibit genetic structuring (DeHaan et al. 2006). Genetic conservation within these small, remnant stocks is a high priority for managers (Zollweg et al. 2003). Even though the annual lake sturgeon spawning population in the Big Manistee River is numerically depressed, estimated to range from 16 to 88 fish (T. Galorowicz, Central Michigan University, personal communication), it does not display low genetic diversity or high relatedness compared with larger populations (DeHaan et al. 2006). The genetic structuring in the Great Lakes basin suggests a high degree of philopatry to their natal streams and demonstrates the importance of imprinting and homing. Mechanisms for maintaining spawning site fidelity are not fully understood, but lake sturgeon are believed to imprint early in life. Previous studies have indicated that lake sturgeon often leave their river of origin within 4 months posthatch (Auer and Baker 2002; Holtgren and Auer 2004; Benson et al. 2005). A portion of shortnose

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