Developing Fisheries Objectives For Lake Huron AOCs

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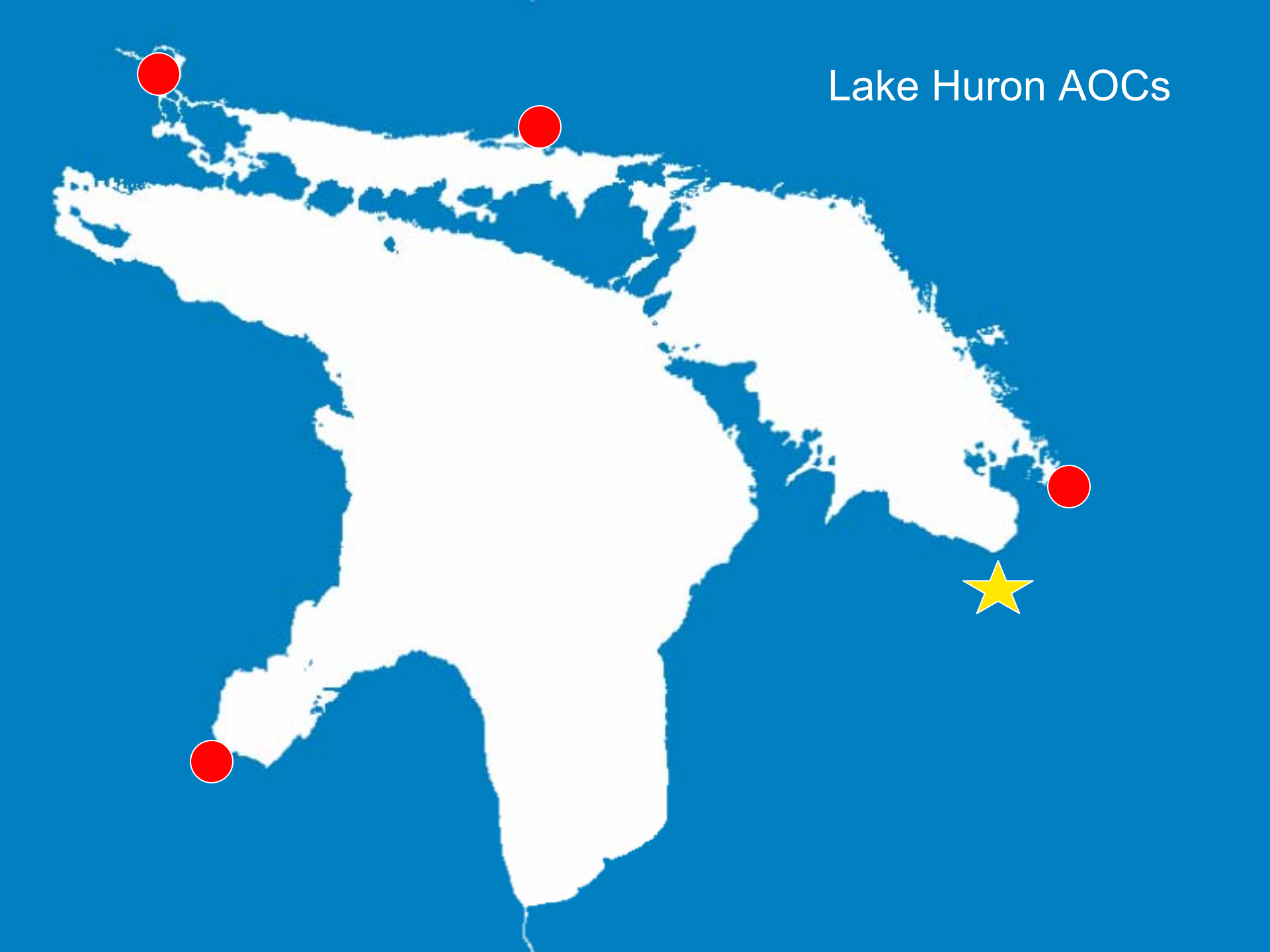
Fish related BUIs

Beneficial Use Impairments

- ✓ Restrictions on Fish & Wildlife Consumption
- ✓ Tainting of Fish & Wildlife Flavor
- ✓ Degradation of Fish & Wildlife Populations
- ✓ Fish Tumors or Other Deformities
- ✓ Bird or Animal Deformities or Reproductive Problems
- ✓ Degradation of Benthos
- ✓ Restrictions on Dredging Activities
- ✓ Eutrophication or Undesirable Algae
- ✓ Restrictions on Drinking Water Consumption, or Taste & Odor
- ✓ Beach Closings
- ✓ Degradation of Aesthetics
- ✓ Degradation of Phytoplankton & Zooplankton Populations
- ✓ Added Cost to Agriculture & Industry
- ✓ Loss of Fish & Wildlife Habitat


Lake Huron AOCs

Delisting Principles

- Goals & Objectives with measurable indicators
- Written in environmental terms rather than bureaucratic
- Locally derived
- Include temporal component for frequency and longevity
- Meet minimum requirements of GLWQA & agency standards

"We must be able to balance our collective desire to clean up and delist AOCs while maintaining the integrity of the RAP program and our role as environmental stewards. "

Goals

Targets

Indicators

Objectives

- Goal: is to restore to a level of recovery allowing delisting entire AOC.
- Target: is to delist individual BUIs.
- Objective: end points within targets (can be multiple).
- Indicators: How we measure objectives and ultimately targets.

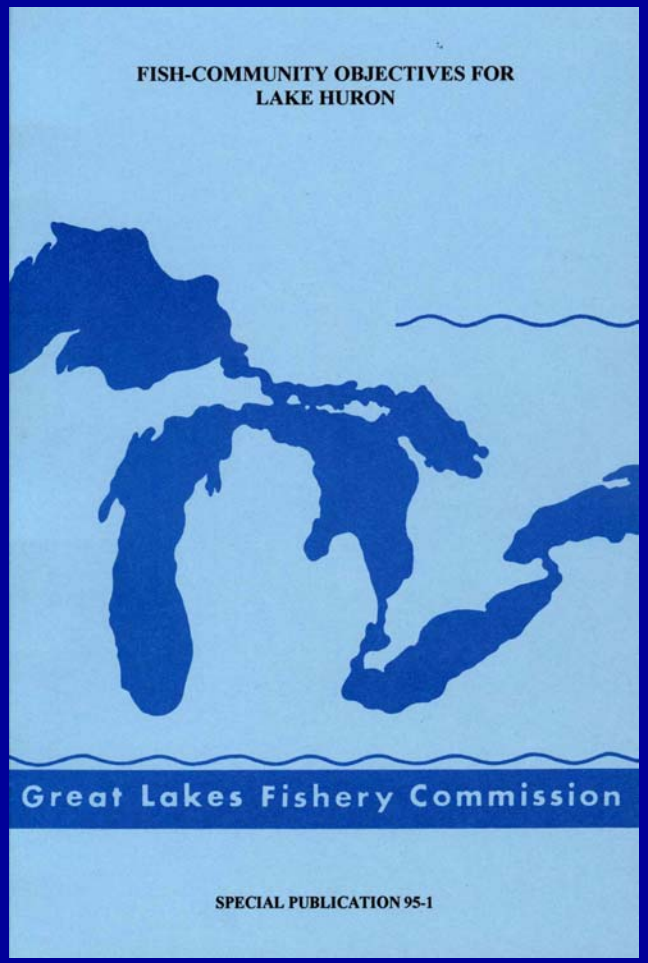
Some suggested guidelines in fishery objective or Indicator selection

- Either measure directly the degree of impairment or select indictors of impairment.
- Consult fishery professionals and adopt their existing fish community recovery objectives (if they have them).
- State objectives and indicators in commonly measured parameters.
- Stick to key stone issues and species.
- Resist temptation to chase after every trophic level.

Great Lakes Fishery Commission's Fish Community Objectives (FCOs)

- Limited application for most AOCs because;
  - written on lake wide basis
  - based on historic yield in most cases

- Some talk of establishing FCOs specific for St. Marys River
- GLFC working on developing Environmental Objectives (EOs) to supplement FCOs



Challenges to defining fishery based objectives

- Fishery problems specific to the AOC have not always been defined.
- Fishery specific (including habitat) recovery goals have not always been preestablished by fishery managers.

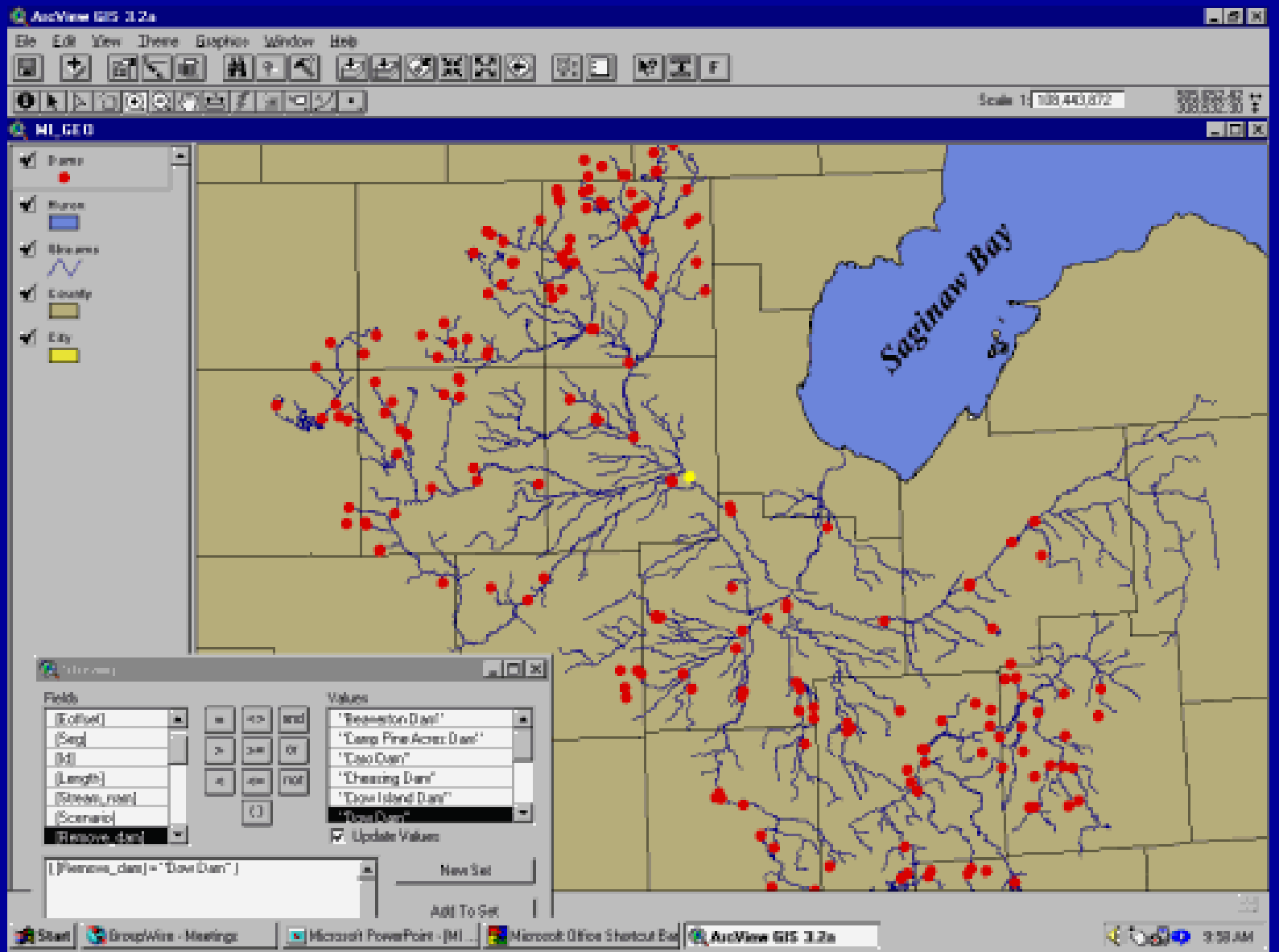
St. Marys River

- Habitat issues specifically diminishment of Rapids area
- Degradation of fish populations not well defined at present

Saginaw Bay

- Objectives have been aligned with DNR walleye recovery objectives and indicators.
  - Increase in walleye abundance such that growth rates decline to approximate state average levels.
- Sustained annual harvest of yellow perch of 750,000 lbs and comprised of faster growing individuals.
- Documented lake sturgeon reproduction.
- Still needs some additional fish based habitat objectives, specifically river spawning access.

Lake Huron GIS Project; a powerful tool for measuring & representing AOC progress



Fish community based objectives might be among the most indicative of recovery progress because they represent the overall health of the environment.

If the local fishery is comprised of abundant, edible, naturally reproduced fish, everything else has to be in pretty good order.

Quantitative fish-related indicators for measuring progress toward restoring beneficial uses and delisting for Saginaw Bay

- Currently there are 8 identified indicators stemming from the Measures of Success effort.
- Mostly adequate but need an additional criterion representing river habitat fragmentation from dams (impedes fish migration).
- Suggested criterion: Connectivity of river habitat within the Saginaw Bay watershed is restored to the level that permits natural reproduction targets for walleye, lake sturgeon, and other fish species.
  - Specific measurable objective: At least 60% of the bay's tributary river miles should be accessible to migrating fishes (currently only 28%).
- Additional suggested quantifiable objectives specific to gauging walleye recovery are available upon request.
- Off shore reef habitat is another habitat element that is degraded (covered with sediment). Options for recovery or mitigation are uncertain and role in walleye recovery is also uncertain.

Quantitative fish-related indicators for measuring progress toward restoring beneficial uses and delisting for The St. Marys River

- Local fish community issues have been described but need more quantitative representation.
- Some know issues are:
  - Rapids habitat is diminished and would benefit from either restoration or augmentation.
  - Walleye natural reproduction appears inadequate and requires supplementing (stocking).
  - Lake Sturgeon reproduction is also in question and needs quantification.
  - There is some evidence that wetland habitat (nursery and spawning areas for fish) has recessed and needs restoration or at least arresting.
  - Navigation and channelization (dredging) issues.
  - Exploitation concerns.