

Biomanipulation Impacts on Gizzard Shad Population Dynamics, Lake Water Quality, and a Recreational Fishery

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Support

- SJRWMD
- FWC
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- Lake County Water Authority
- Harris Chain of Lakes Restoration Council





Summit



Project Components

1. Gizzard shad population response to harvest
2. Harvest strategies for shad
3. Gizzard shad feeding
4. Changes in water quality
5. Bycatch impacts for black crappie fisheries

Lakes: Dora, Eustis, Harris



Commercial Harvest

- Two commercial fishing years
- Estimated a 40% reduction in total gizzard shad biomass



Biomanipulation Strategies

Literature indicates that 75-80% biomass reductions are needed to achieve water quality improvements

Using gill net fisheries, such reductions could only be achieved by:

- smaller mesh
- very intensive fishing
- fishing every year



Concentration ($\mu\text{g L}^{-1}$)

0 50 100 150 200



Date



Changes in Water Chemistry

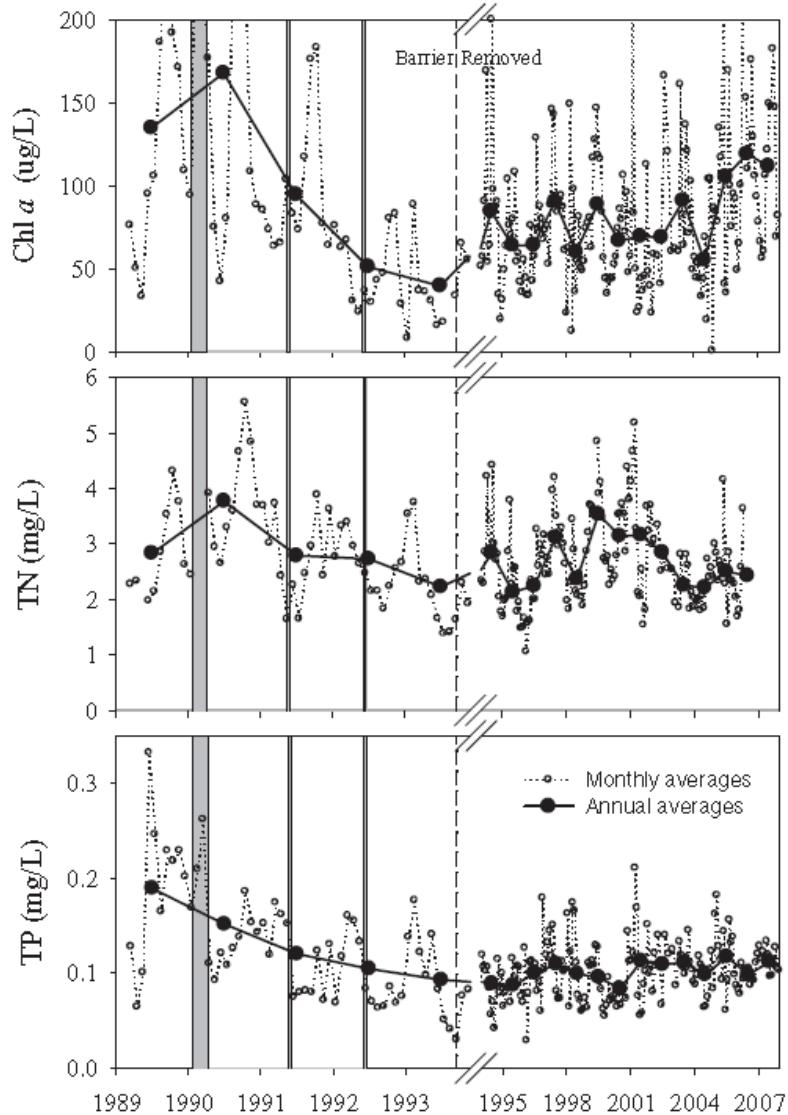
- 40% reduction over two years had no impact at Lake Dora water chemistry
- Could require a stronger manipulation
- Objective 5...



Changes in Water Chemistry

- No change in chlorophyll, phosphorus, or zooplankton at Lake Dora





Godwin et al. 2011

Worked at Lake Denham

80% biomass reduction achieved



Management Recommendations

- Literature suggests that large shad biomass reductions are needed to cause water quality changes
- Our results show that this is unlikely with current fishery configurations

Must achieve higher biomass reduction

Fishery implications



Management Recommendations

- Bycatch is an important consideration, would increase with smaller mesh sizes
- Future projects should set biomanipulation as the primary objectives, with fisheries objectives secondary
- Lake Dora experiment did not optimize either objective (biomanipulation or fisheries)



Thank You!



Lake Apopka Restoration Summit

