

# Assessing Restoration Progress in the Everglades Using Aquatic Animals

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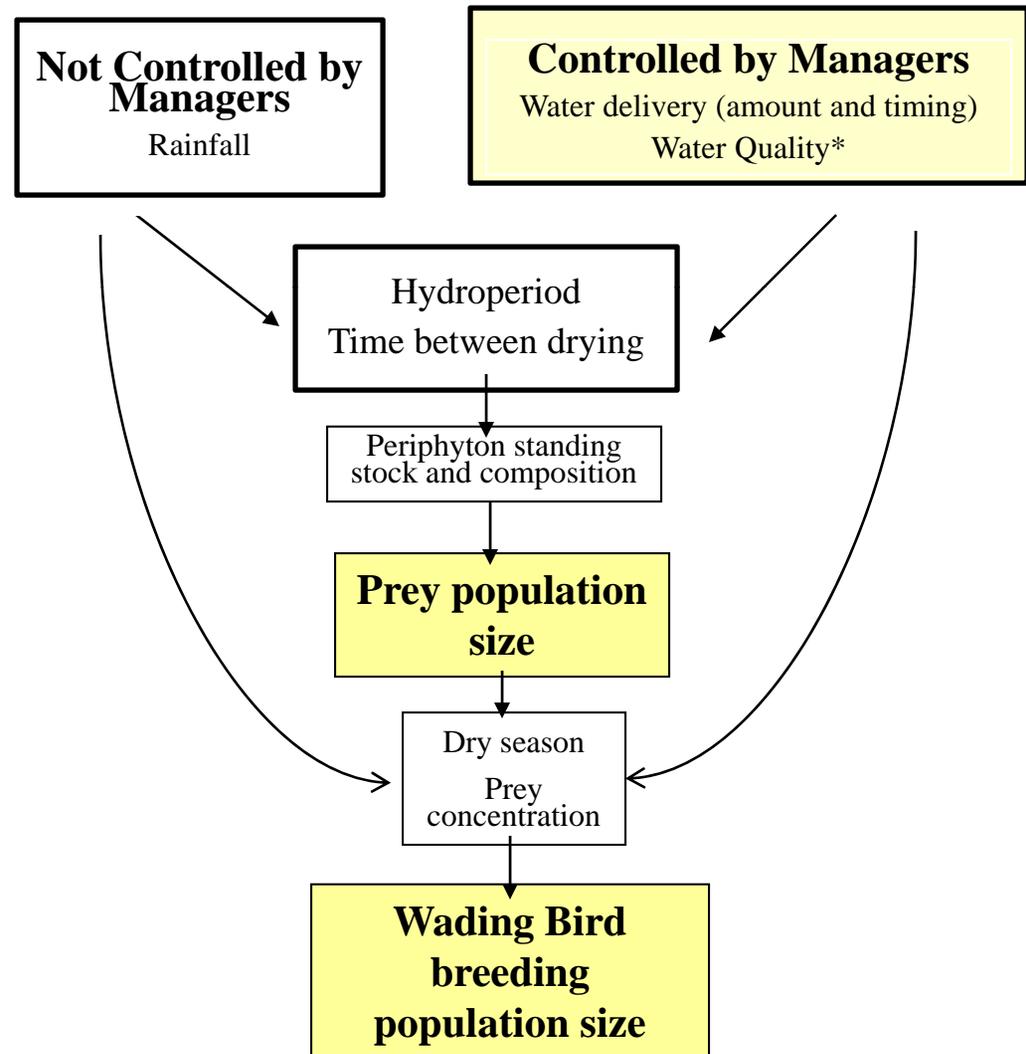
FLORIDA COASTAL EVERGLADES  
LONG TERM ECOLOGICAL RESEARCH



<http://www.fiu.edu/~trexlerj/publications.htm>

# Fish, Crayfish, and Shrimp = Bird Food!

- Fish, crayfish, and shrimp are tracked because they are eaten by wading birds and other large animals of the Everglades
- Goal: Separate impacts controlled by management from those that are not

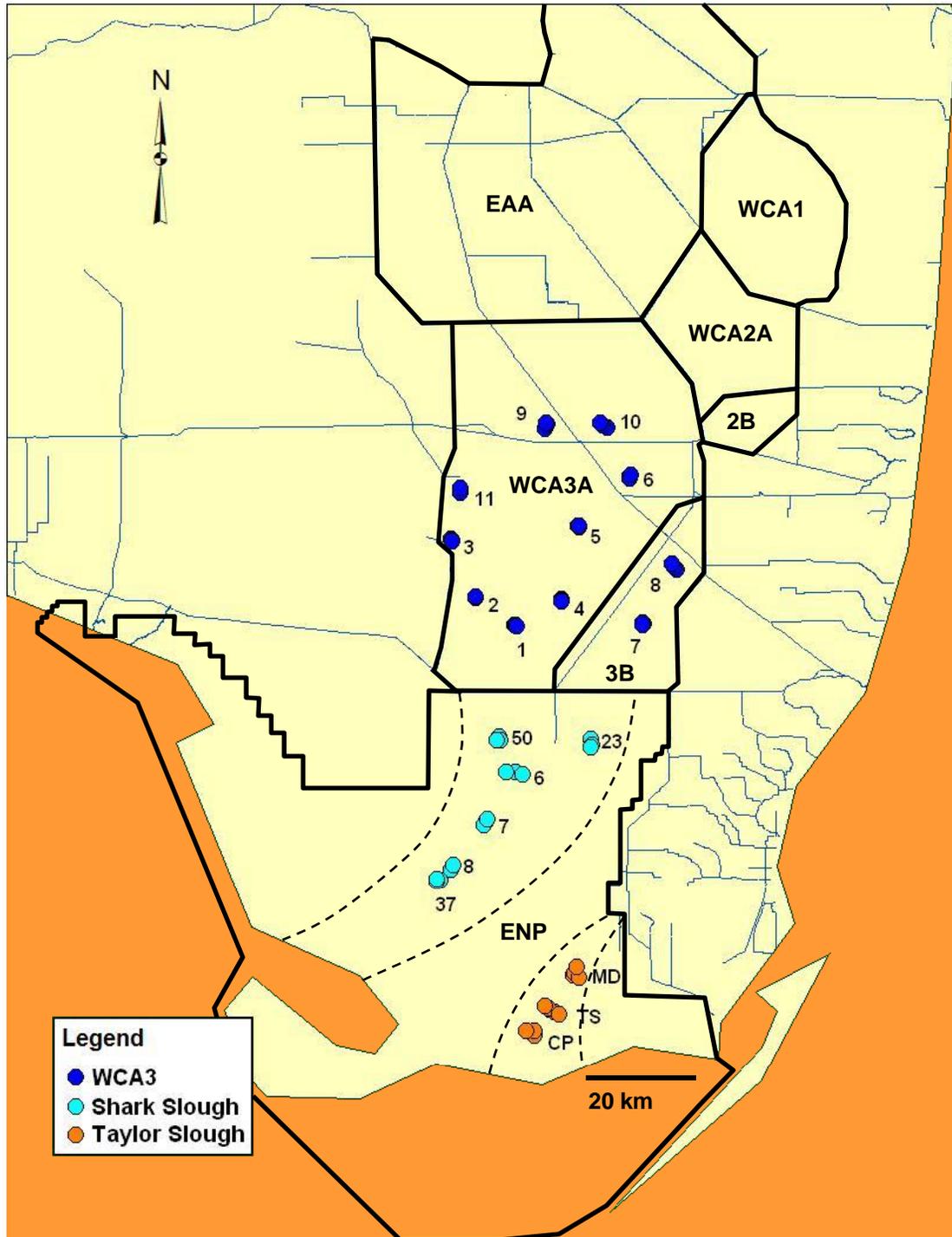


# Data for Assessment

## Six Performance Measures

- Four species selected as Performance Measures to represent different life histories related to effects of marsh drying
- Total fish as a measure of fish availability for higher trophic levels
- Frequency of non-native fish species





Twenty sites

Sampled by throw trap



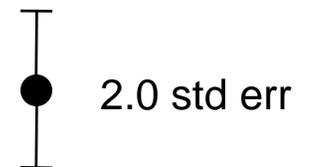
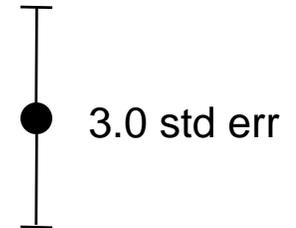
Site-level data produced  
by 15 to 21 throw-trap  
samples per visit per year

Sample in Feb, April, July,  
Oct, Dec

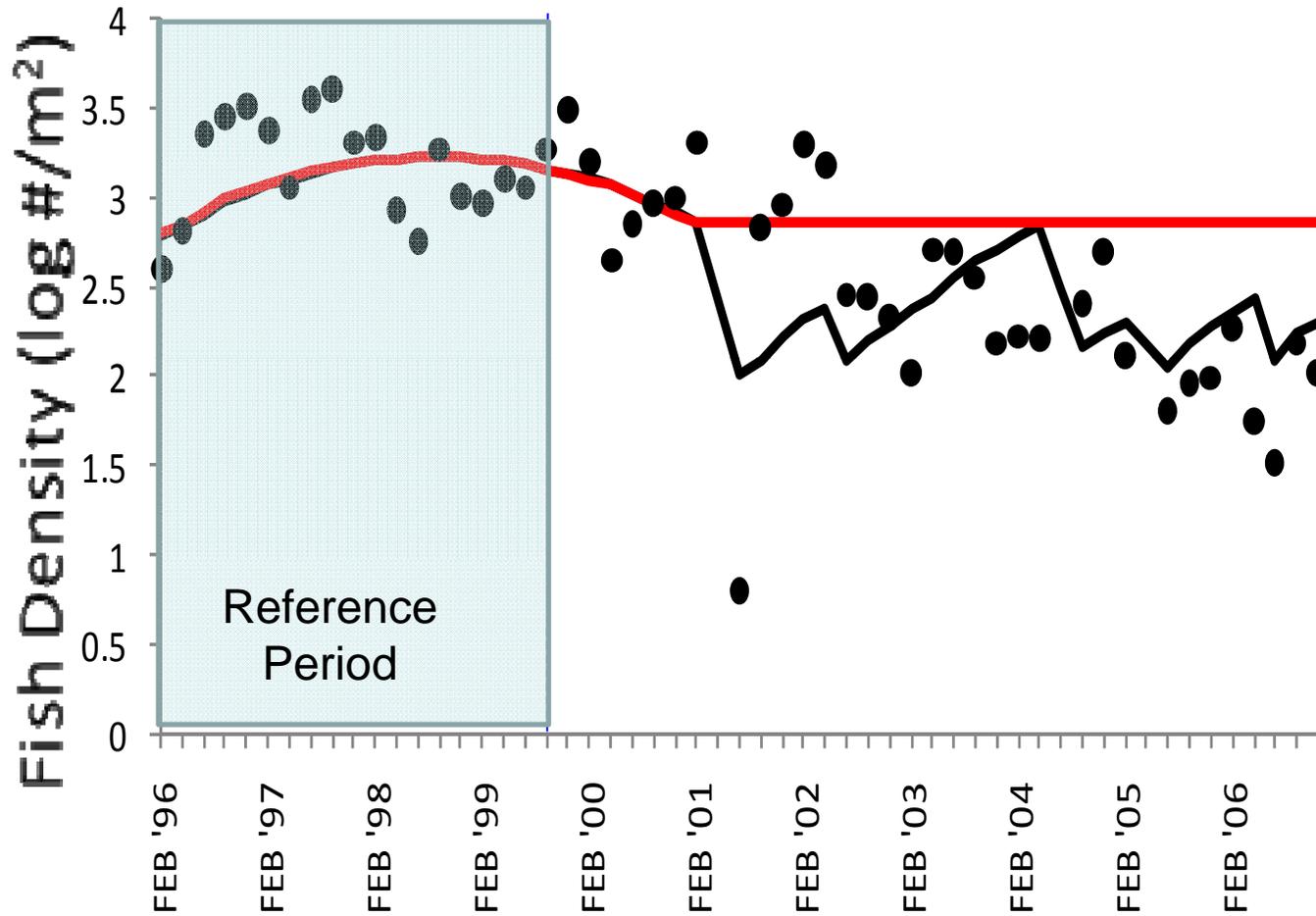
# Criteria for Red Stoplights

Deviation from Target

- Type A: one year at least three standard errors above/below limits of objective interval
- Type B: two out of three consecutive years at least two standard errors above/below limits of objective interval
- Type C: four out of five consecutive years with at least 1.5 standard errors above/below limits of objective interval



# Total Fish



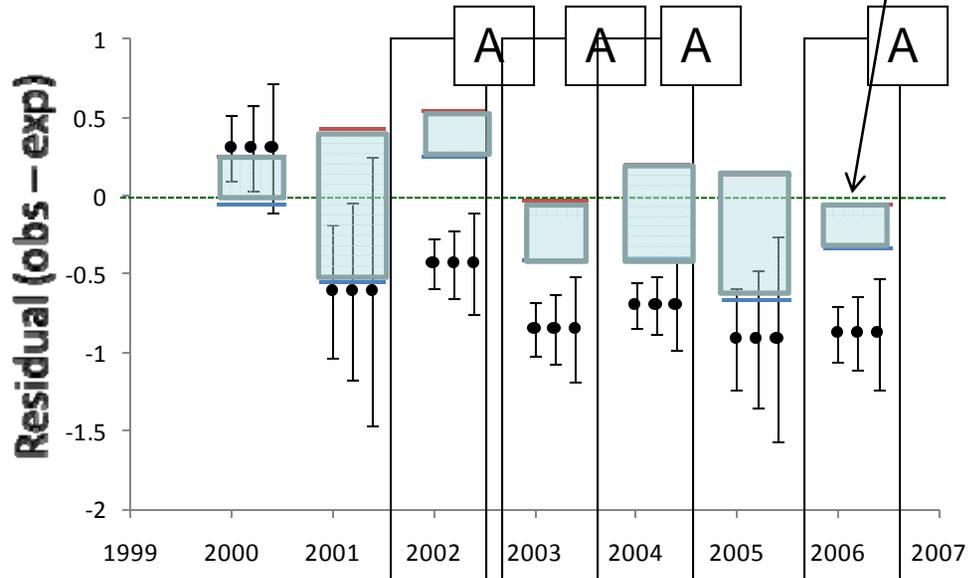
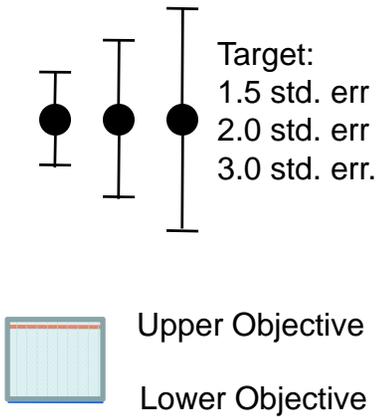
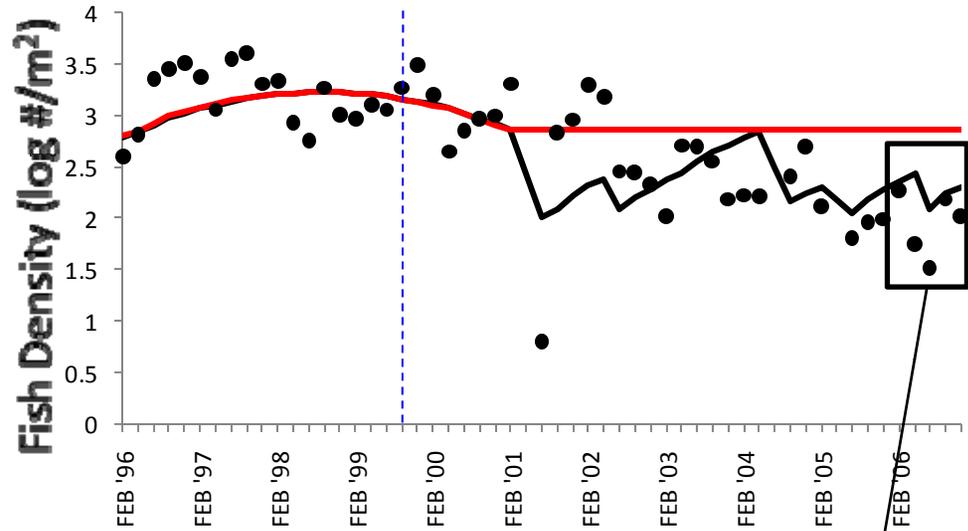
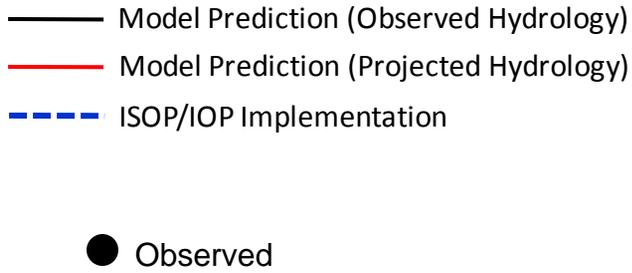
● Observed

— Model Prediction (Observed Hydrology)

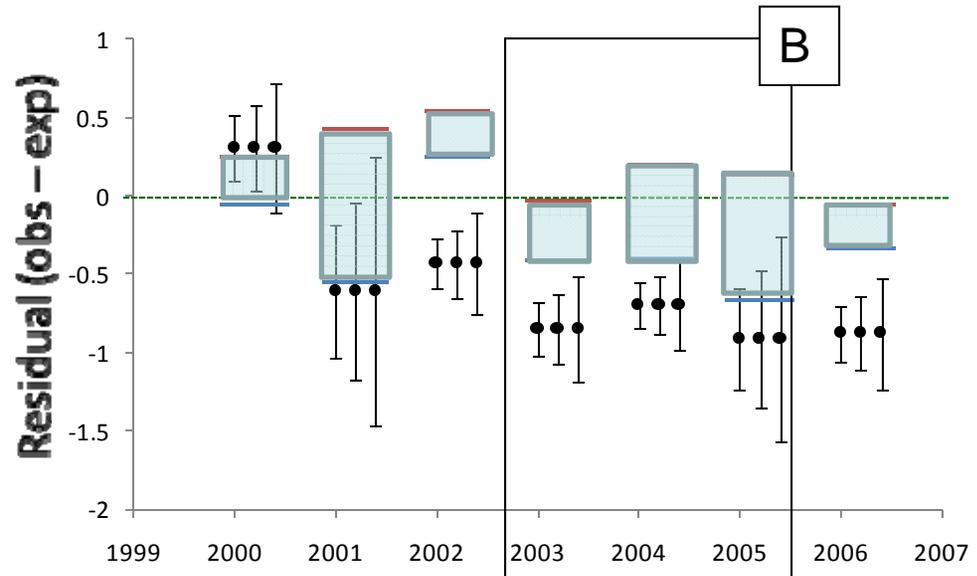
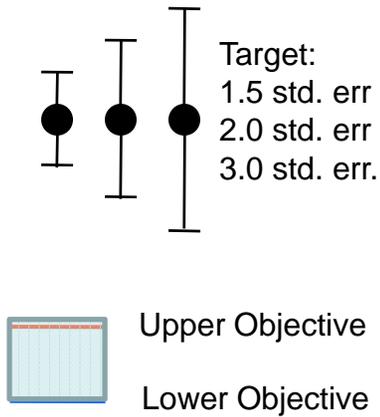
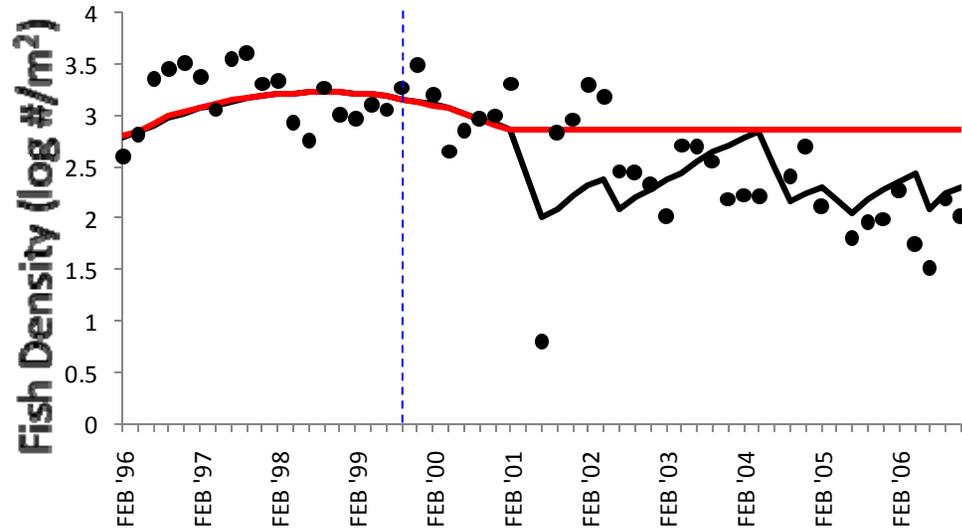
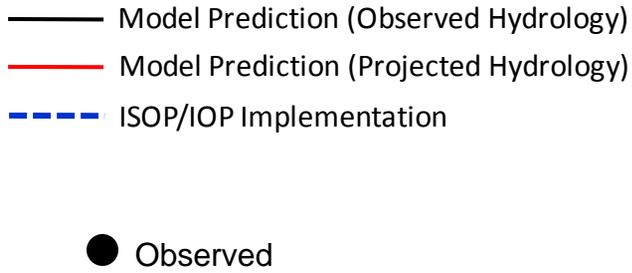
— Model Prediction (Projected Hydrology)

--- ISOP/IOP Implementation

# Total Fish

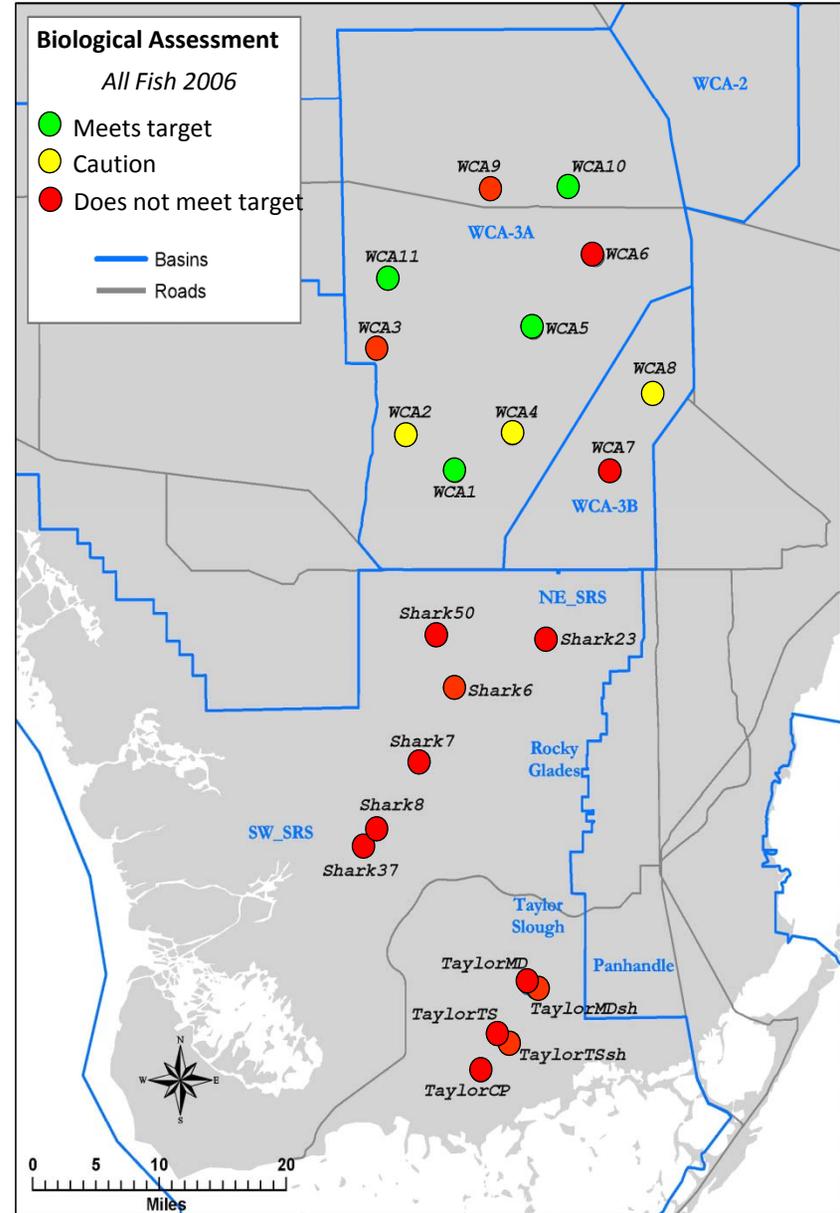


# Total Fish



# Total Fish

- Assessments are done for each performance measure at each site
- These site-level analyses are averaged for a region



# Stoplight Annual Assessments

Performance Measure	2000	2001	2002	2003	2004	2005	Current status
<b>Shark River Slough</b>							
eastern mosquitofish	●	●	●	●	●	●	●
flagfish	●	●	●	●	●	●	●
bluefin killifish	●	●	●	●	●	●	●
<b>total fish</b>	●	●	●	●	●	●	●
Everglades crayfish	●	●	●	●	●	●	●
Non-native fishes	●	●	●	●	●	●	●
<b>Taylor Slough</b>							
eastern mosquitofish	●	●	●	●	●	●	●
flagfish	○	○	○	○	○	○	○
bluefin killifish	●	●	●	●	●	●	●
total fish	●	●	●	●	●	●	●
Everglades crayfish	●	●	●	●	●	●	●
Non-native fishes	●	●	●	●	●	●	●

## Summary and Conclusions

- Assessment involves comparing monitoring data for performance measures to targets
- We recommend use of 'dynamic targets' for assessments in CERP when possible
  - Dynamic targets are adjusted for environmental variation outside the controls of managers
- Rainfall is a key environmental driver outside of the control of managers that effects hydrological conditions critical to aquatic fauna
- Targets need to capture management goals that can be used as standards for assessments

# Acknowledgments

- Cooperative Agreements to FIU from the
  - **Everglades National Park** and
  - **South Florida Water Management District**
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