

MUSSEL AND FISH POPULATION TRENDS RELATIVE TO WATER AVAILABILITY IN THE UPPER SUWANEE RIVER BASIN, FLORIDA (USGS Peninsular Florida LCC funds)

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Overview: The southeastern United States is renowned for high levels of aquatic biodiversity and endemism. A vexatious challenge facing all natural resource managers is how to best manage unique biodiversity in the context of increasing conflicts with human population growth and resource demands. The Suwannee River is one of the very few southeastern rivers without a major dam or city located on its mainstem, and it benefits from the Lower Suwannee NWR and five state parks. The basin is home to listed and candidate species of mussels and fishes: the Suwannee moccasinshell *Medionidus walkeri* (candidate for listing), the oval pigtoe *Pleurobema pyriforme* (federally endangered), the Gulf sturgeon *Acipenser oxyrinchus desotoi* (federally threatened), and the Alabama shad *Alosa alabamae* (eastern most population—candidate for listing). Inventory and monitoring research is needed to determine the present community composition of mussels and fishes in order to establish baseline data for all mussel and fish species. These data are the foundation needed to model abundance, recruitment, and persistence of mussels species and fish hosts at different flow regimes.

Project Objectives: This project is the inventory phase of a proposed 5-year intensive monitoring study of mussels in the Suwannee River system that will provide data needed to estimate probabilities of population persistence at given river discharges and changes in ground water levels. Each successive year that quantitative monitoring is conducted will increase the statistical power of the model, enabling more robust predictions of abundance and persistence. If the entire 5-year study is completed, refuge managers will be able to ascertain the effects of reduced flows on mussel and host fish populations in the upper basin and will have a vastly increased understanding of how proposed future water withdrawals will affect the biological integrity of the Suwannee River system. General project objectives include:

1. Establishing long term inventory and monitoring sites in the Upper Suwannee River basin to investigate impacts of water availability on fish and mussel populations.
2. Conducting quantitative inventory surveys to characterize fish and mussel diversity at a long term monitoring site in the Upper Suwannee River basin to provide a species inventory by size class as a yearly deliverable to the USFWS National Wildlife Refuge System.
3. Tagging and measuring all mussels to enable using quantitative mark-recapture techniques to estimate population abundance, growth, recruitment, and survival in subsequent years
4. Sampling fishes using multiple-pass depletion techniques to characterize species diversity and abundance.
5. Providing GIS coverage for past, present and projected human population growth, land use, surface and groundwater levels, water withdraws (agricultural and municipal), and precipitation for the Suwannee River basin.

Deliverables: Initial fish and mussel inventory and establishment of long term monitoring site will be completed during spring/summer of 2012.

Timeline:

Summer 2011	Identify study site
Spring 2012	Coordinate field sampling with Lower Suwannee NWR
Summer 2012	Sample selected site
Summer 2012	Summarize data; create species data base
September 2012	Submit final report and reapply for 2013 funding