

# USGS Contributions to FWS Aquatic Resource Protection and Management in the Southeast

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## Rare and Imperiled Species Surveys

- Tallapoosa River at-risk aquatic taxa, surveys and predictive models (M. Freeman, PWRC; J. Peterson, GCFWRU; E. Irwin, ACFWRU; B. Freeman, UGA)
- Carolina Sandhills National Wildlife Refuge, Carolina pygmy sunfish surveys (M. Freeman, PWRC)



## Technical Assistance to Support Habitat Conservation Plan Development, Etowah River, Georgia

- Guidelines for relating declining species occurrence to jeopardy
- Development and testing of monitoring protocols for rare fishes
- Options for adaptive management in HCP implementation (M. Freeman, PWRC; S. Wenger, B. Freeman, UGA; J. Peterson, GCFWRU)
- Guidelines and ordinances to protect and recover rare and imperiled species in the Etowah basin (Etowah HCP staff and other experts within the basin)
  - Stormwater runoff limits
  - Maintenance of stormwater facilities
  - Stormwater ordinance and better site design guidelines
  - Road crossing and culvert design
  - SOP for sediment and erosion control
  - Stream buffer ordinance
  - Mass grading ordinance
  - Utility line crossing and construction



Retain runoff on site



Better site design

## Science Support for the Upper Coosa Basin, Alabama, Georgia, Tennessee



- Non-biased methods for estimating stream-fish abundance and distribution (J. Peterson, GCFWRU; B. Freeman, UGA; M. Freeman, PWRC)
- Prioritized GIS inventory of culverts, dams and impediments to fish passage in priority watersheds (J. Peterson, GCFWRU; B. Freeman, UGA; M. Freeman, PWRC)

Listed fish to be covered under the HCP:



Etowah darter, *Etheostoma etowahae*



Amber darter, *Percina antessella*

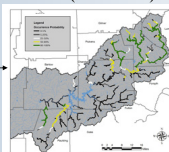


Cherokee darter, *E. scotti*

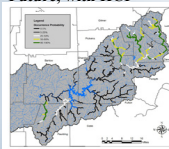
## Research to Support Habitat Conservation Plan Development, Etowah River, Georgia

- Modeling to predict species occurrence in relation to land use scenarios (S. Wenger, UGA; M. Freeman, PWRC; B. Freeman, UGA; J. Peterson, GCFWRU)
- Reach-scale effects of riparian forest cover on urban stream ecosystems (A. Roy, UGA; C. Faust, CSHS; M. Freeman, PWRC; J. Meyer, UGA)
- Can riparian forests mediate impacts of urbanization on stream fish assemblages? (A. Roy, UGA; M. Freeman, PWRC)
- Investigating hydrologic alteration as a mechanism of fish assemblage shifts in urbanizing streams (A. Roy, UGA; M. Freeman, PWRC; B. Freeman, S. Wenger, J. Meyer, UGA; W. Ensign, KSU)
- Genetic population structure and life history of the federally threatened Cherokee darter (C. Storey, B. Porter, B. Freeman, UGA; M. Freeman, PWRC)

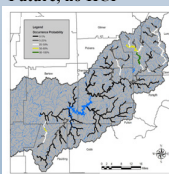
Current (2001 cover)



Future, with HCP



Future, no HCP



## FY 2006 Science Thrust – Water Availability for Ecological Needs: A Pilot Study on the Upper Flint River System, Georgia

- Develop conceptual ecological models linking hydrologic change to biological condition in a Piedmont river system;
- Parameterize the conceptual ecological models using available data, and determine additional data needs;
- Demonstrate development of a decision-support system for use in evaluating options for water-supply development
- Develop a long-term monitoring plan to allow model refinement and guide adaptive management relative to water supply



## Research and Technical Support for Water Resource Development Options

- Estimating effects of reservoir options on imperiled fishes in the Etowah River basin, in support of HCP development (M. Freeman, PWRC; S. Wenger, UGA, B. Rashleigh, EPA)
- Assisting FWS with evaluation of impacts of various flow regimes downstream of proposed reservoirs (M. Freeman, PWRC; J. Peterson, GCFWRU; R. Jackson, B. Freeman, UGA)

