**FINAL PERFORMANCE REPORT**
**South Carolina State Wildlife Grant T-8-P-1**
South Carolina Stream Conservation Planning Project
October 1, 2005 – September 30, 2007
*Note: This project later became T-25.*

## GRANT OBJECTIVES

Develop spatially-explicit models using data from appropriate scales that will allow SCDNR to design and recommend effective and efficient management strategies to protect, conserve, and restore the aquatic resources of the State. In keeping with the Freshwater Fisheries Section's desire to be recognized as a primary source of information on freshwater ecosystems in the State, our vision is to develop predictive watershed models using landscape- to site-level data that will put SCDNR at the forefront of proactive conservation. The assessments are intended to provide us with the ability to understand causal pathways of threats to aquatic resources, communicate aquatic resource status and trends to interested stakeholders, and to recommend strategies for resource conservation at the planning stages of land management and development projects. Our goal is to quantify, in probabilistic terms, anthropogenic stressors and their ecological responses while taking into account natural variability. The level of scientific understanding we hope to develop through the planning project will enable SCDNR to recommend and implement management actions that effectively mitigate threats to aquatic resources with high efficiency. Specific conservation strategies we expect to optimize may include size and extent of riparian buffers to be maintained or restored, greenspace ratios and optimal location on the landscape, and guidance for usage of transferable development rights (TDRs) that will steer development into minimally-damaging configurations. The potential positive impact of this type of science-based aquatic resource conservation extends beyond freshwaters to our coastal estuarine and marine resources as well.

## ACTIVITY OVERVIEW:

Activities associated with the grant are described below, according to the original tasks and subtasks in the Project Statement for this grant.

**Tasks**
**I. Develop a statewide database of stream points and design a user interface for random site selection**

**Activity:** Geographic Information Systems (GIS) specialists from Clemson University were contracted to design the site selection database. The database and user interface were completed in Spring 2006, enabling the selection of random stream sites according to spatial criteria for stream assessment sampling objectives.

**Significant deviations:** None.

## II. Collect desired biological, physical, and chemical data from randomly selected wadeable streams within the ecobasins of South Carolina.

**Activity:** Thirty-three randomly selected sites from within four ecobasins were sampled through April 2007 (Table 1s), at which time this grant was exhausted. This activity represents the first year of a multi-year project continuing on a subsequent grant (T-25-R). Parameters measured at each site include:

- Fish assemblage structure
- Macroinvertebrate assemblage structure
- Crayfish species composition
- Mussel species composition
- Herpetofaunal distribution
- Mean wetted channel width
- Channel depth
- Current velocity
- Substrate composition
- Channel gradient
- Channel geomorphology
- Water temperature
- Dissolved oxygen
- Conductivity
- pH
- Salinity
- Turbidity
- Ions, nutrients, and suspended solids
- Metals (water column, sediment)
- Contaminants (fish tissue)

Table 1. Randomly selected streams sampled through April 2007 for the South Carolina Stream Conservation Planning Project (T-8-P1-P), by watershed area within ecobasins. The number of sites per ecobasin is proportional to ecobasin area.

| River Basin | Level-IV Ecoregion | Site Number | Sample Date | Stream Name | Latitude | Longitude | Watershed Area (km$^2$) |
|---|---|---|---|---|---|---|---|
| Saluda | Sand Hills | 207511 | 5/24/2006 | Long Branch | 33.99107 | 81.26844 | 5.29 |
|  |  | 205370 | 5/30/2006 | Double Branch | 34.00502 | 81.09119 | 6.23 |
|  |  | 216167 | 5/24/2006 | Twelvemile Creek | 33.94643 | 81.29340 | 59.74 |
| Savannah | Sand Hills | 346456 | 6/13/2006 | Gantts Mill Creek | 33.17216 | 81.45010 | 5.07 |
|  |  | 289522 | 6/6/2006 | Sand River | 33.55402 | 81.80125 | 38.97 |
|  |  | 287580 | 6/6/2006 | Little Horse Creek | 33.56462 | 81.87298 | 63.01 |
|  |  | 309818 | 6/7/2006 | Upper Three Runs | 33.43627 | 81.60522 | 81.92 |
| Lower Santee | Carolina Flatwoods | 354455 | 6/22/2006 | Trib. to Mechaw Creek | 33.11570 | 79.53317 | 8.03 |
|  |  | 322692 | 6/21/2006 | Trib. to Cedar Creek | 33.33989 | 79.62838 | 13.15 |
|  |  | 316253 | 6/21/2006 | Wee Tee Branch | 33.38702 | 79.73762 | 35.03 |
|  |  | 354133 | 6/20/2006 | Mechaw Creek | 33.13544 | 79.52372 | 80.55 |
| Pee Dee | Atlantic S. Loam Plains | 258489 | 8/1/2006 | Home Branch | 33.73895 | 80.31462 | 4.11 |
|  |  | 89192 | 8/24/2006 | Trib. to Martins Branch | 34.58167 | 79.47741 | 4.31 |
|  |  | 98871 | 9/13/2006 | Trib. to Little Pee Dee R. | 34.52654 | 79.38184 | 4.62 |
|  |  | 87719 | 9/6/2006 | Trib. to Muddy Creek | 34.58005 | 79.69834 | 5.12 |
|  |  | 142478 | 8/23/2006 | Trib. to Little Pee Dee R. | 34.30009 | 79.24415 | 5.17 |
|  |  | 177533 | 8/9/2006 | Cane Branch | 34.13659 | 79.67572 | 5.35 |
|  |  | 178408 | 8/9/2006 | Trib. to Alligator Branch | 34.12706 | 79.82150 | 6.52 |
|  |  | 108484 | 9/7/2006 | Rogers Creek Canal | 34.47689 | 79.60016 | 6.55 |
|  |  | 143880 | 8/15/2006 | Trib. to Gully Run | 34.30175 | 80.19142 | 7.03 |
|  |  | 114174 | 9/13/2006 | Trib. to Bear Swamp | 34.44013 | 79.31690 | 8.89 |
|  |  | 163545 | 8/23/2006 | White Oak Creek | 34.19163 | 79.23698 | 9.40 |
|  |  | 155269 | 8/17/2006 | High Hill Creek | 34.26095 | 79.94437 | 16.78 |
|  |  | 145731 | 8/16/2006 | Gum Swamp | 34.28217 | 79.52395 | 24.50 |
|  |  | 132724 | 8/2/2006 | Catfish Canal | 34.35708 | 79.51189 | 26.65 |
|  |  | 159553 | 8/16/2006 | Trib. canal to Tobys Cr | 34.22031 | 79.48608 | 30.76 |
|  |  | 215668 | 8/22/2006 | Mush Branch | 33.94879 | 80.41985 | 32.79 |
|  |  | 236192 | 8/3/2006 | Nasty Branch | 33.86467 | 80.39501 | 59.38 |
|  |  | 125509 | 8/2/2006 | Rogers Creek Canal | 34.39219 | 79.67761 | 61.73 |
|  |  | 100467 | 8/15/2006 | Muddy Creek | 34.51595 | 79.74564 | 72.09 |
|  |  | 145650 | 9/27/2006 | Back Swamp | 34.28546 | 79.68657 | 78.56 |
|  |  | 153122 | 8/8/2006 | High Hill Creek | 34.24792 | 79.76696 | 92.94 |
|  |  | 231143 | 8/1/2006 | Cane Savannah Creek | 33.87917 | 80.41662 | 129.74 |

**Significant deviations:** The sites reported herein represent the first year's sampling of a multi-year project designed to provide statewide random stream sampling coverage. Sampling is scheduled to continue through 2010 on SWG grant T-25-R.

### III.  Develop spatially-explicit predictive watershed models quantifying the impairment of aquatic ecosystems given land management scenarios.

**Activity:**  Preliminary analyses are in progress.  Complete analysis will require sufficient data from all ecobasins of the state, at which time final conclusions will be reported (2010).

**Significant deviations:**  None.

**Estimated Federal Cost (grant level):**  $136,447 … This grant has been spent out.

**Recommendations:**  Close this grant (funds exhausted in April 2007).  This is a multi-year project continuing on a subsequent grant (T-25-R; January 1, 2007 – December 31, 2009).