

P24

# South Carolina Department of Natural Resources



October 15, 1997

Paul A. Sandifer, Ph.D.  
Director

Mr. George Dorn, Jr.  
Director - Office of State Budget

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Mr. Donald B. Hottel, Jr.  
Governor's Office

STATE DOCUMENTS

Dear Sirs:

In accordance with Sections 1-1-810 and 1-1-820 of the 1996 Code of Laws, as amended, attached you will find the Annual Accountability Report for FY 1996/97 for the South Carolina Department of Natural Resources. This report is being submitted to include our agency's mission, objectives to accomplish the mission, and performance measures regarding the objectives in our Department.

The mission statement and objectives in our Annual Accountability Report have been developed as a result of the development of the DNR's Strategic Plan which was approved by the S.C. Department of Natural Resources' Board in July, 1996. This Strategic Plan was a comprehensive effort involving input from all aspects of the public and constituents that we serve as well as our internal from all divisions in the agency. Our DNR Board felt it was important to develop a Strategic Plan following the Restructuring Act of 1993 and this Strategic Plan was developed for the newly created S.C. Department of Natural Resources. The enclosed performance measures have been developed by the staff in our various divisions and program areas based upon available data and technology in the agency. We have utilized current data bases to submit these performance measures and are in the process of evaluating our performance measures further through workshops and training in this arena for our staff. In addition, performance measures will be included in the evaluation process for the DNR Operational Plan which is currently being developed and such performance measures will be enhanced through the development of this operational planning process and a comprehensive management information system in the Department.

Thank you for the opportunity to present this information and contact us if you have any questions or additional needs.

Sincerely,

Paul Sandifer  
Director

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Enclosure

**MISSION STATEMENT**  
**SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES**  
**OCTOBER 15, 1997**

“The South Carolina Department of Natural Resources is the advocate for and steward of the state’s natural resources. The DNR develops and implements policies and programs for the conservation, management, utilization, and protection of the state’s natural resources based upon scientifically sound resource assessment and monitoring, applied research, technology transfer, comprehensive planning, public education, technical assistance and constituent involvement. The DNR is pro-active in protecting the state’s natural resources for use and enjoyment by future generations of South Carolinians.”

**EXECUTIVE SUMMARY**  
**1996/97 ANNUAL ACCOUNTABILITY REPORT**  
**SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES**  
**OCTOBER 15, 1997**

For FY 96-97, the South Carolina Department of Natural Resources had thirty-four (34) program areas that were reported through our budgetary process. In this Annual Accountability Report, we have taken these 34 programs and developed the program description, priority ranking, program costs, goals, objectives and performance measures. The priority ranking for these 34 programs has been developed through a team approach with the Director and Deputy Directors in the agency. These 34 programs have been fully evaluated and discussed and through this process, a priority rank evolved based upon its relative importance to the agency's mission, statutory and legislative mandates, relative customer focus importance from public opinion surveys, and constituent group input on major problems and areas as it relates to the development of the Department's strategic plan which was adopted by the DNR Board in 1996. Through these factors, the agency is providing a realistic approach to the diversity of natural resource management and stakeholder interest with which we deal on a daily basis and we feel this priority ranking reflects the major thrust and focus for the Department's programs for FY 96-97.

The quality of South Carolina's natural resources creates a natural wealth that is unsurpassed by many other states and regions of the country. These resources bring an enviable quality of life to our citizens which attracts and sustains business and tourism which translates to economic wealth for all South Carolinians. The South Carolina Department of Natural Resources serves as the guardian of the state's natural resources and insures these resources are conserved for future generations. The 34 programs in this Annual Accountability Report reflect this commitment to maintain a healthy natural resource base for the quality of life in this state and also to insure that these resources are conserved for the future well being for the State of South Carolina. It is these major program goals through our agency that provide a diversity of outcomes as noted in this report which sustain a viable natural resource base for our state. All of these 34 programs translate primarily into the follow strategic goals for the DNR:

- a) Resource Management Assessment and Monitoring

- b) Education and Communications
- c) Comprehensive Planning and Human Dimensions
- d) Environmental Coordination
- e) Internal Management and Operations

Through these strategic goals, the DNR is able to provide a customer focus to all of the citizens of the state and provide services and benefits that relate to all areas of the state's natural resource base.

In order to maintain a reasonable balance between conserving our state's resources for future generations, sustaining traditional uses, increasing support for other user demands, and accommodating the economic development required to sustain an adequate quality of life, it is incumbent upon the DNR to further develop partnerships and cooperative efforts among other state as well as federal agencies. The DNR has worked diligently in this arena for a number of years and has and will continue to develop such partnerships with other state agencies to deal with natural resource problem areas of mutual concern. Examples of these partnerships and cooperative efforts in other state agencies have included the South Carolina Department of Health and Environmental Control, South Carolina Forestry Commission, Department of Parks, Recreation and Tourism, Sea Grant Consortium, Medical University of South Carolina, Francis Marion University, College of Charleston, University of South Carolina, Clemson University, State Technical Education System, to name a few. Through the maintenance of these cooperative efforts, the DNR feels that potential natural resource problems can be solved before they require costly remediation or other actions. The implementation of this strategy of cooperation requires the use of available information management technology to develop and disseminate the best information possible relating to the condition of the state's natural resources, their economic and ecological values, and factors effecting their integrity and health. The DNR seeks to enhance the partnering and cooperative relationships with other agencies and appreciates the opportunity to be a player in improving the quality of life in the State of South Carolina through its natural resources.

# South Carolina Department of Natural Resources



Paul A. Sandifer, Ph.D.  
Director

Larry D. Cartee  
Assistant Director for  
Planning & Development

## SCDNR Program Areas for 1996-97

1. Law Enforcement Operations (Law Enforcement)
2. Regional Wildlife Projects (Game)
3. District Operations - Statewide (Fish)
4. Titling and Registration (Administration)
5. Fisheries and Marine Resource Conservation (Marine)
6. Conservation Districts (Land)
7. Education (CEC)
8. Hydrology (Water)
9. Hatcheries (Fish)
10. Mission Oriented Research (Marine)
11. Statewide Wildlife Projects (Game)
12. Endangered Species
13. Climate (Water)
14. Hunter Safety (Law Enforcement)
15. Rediversion Project (Fish)
16. Heritage Trust
17. National Flood Insurance Program (Land)
18. Resource Assessment & Planning (Water)
19. Boating Safety (Law Enforcement)
20. Land Resources Planning & Information (Land)
21. Lakes Maintenance (Fish)
22. Magazine (CEC)
23. Geology
24. Professional Licensing Program (Land)
25. Support Services (CEC)
26. Environmental Affairs (Water)
27. Support Direction & Administration (Marine)
28. Heave Equipment Project (Game)
29. Clemson Cooperative Project (Game)
30. Forest Stewardship Project (Game)
31. Congaree/Wateree Field Station (Fish)
32. Coastal Reserves & Public Outreach (Marine)
33. Nonpoint Source Pollution Control ((Land)
34. County Funds (Law Enforcement)

Priority Ranking: 1

Program Name: Law Enforcement Operations (Patrol Districts and Marine Patrol)

Program Cost: \$10,507,257.50 (See Investigations Cost - not included in this total)

Program Goal:

The enforcement of the state's wildlife, fish, litter, trespass, boating, commercial fisheries, archeological, and related laws through arrest and issuance of violation summons, and/or arrest warrants. The deterrence of violations through the issuance of warning tickets, officer patrol and presence, and public presentations. Conducting search and rescue missions and providing assistance to other law enforcement agencies. The maintenance of criminal records, criminal statistics, and development and analysis of criminal intelligence.

The law enforcement sub-program consists of six (6) functional areas: (1) Investigations; (2) Operation Game Thief; (3) Records and Crime Analysis; (4) Patrol Districts; (5) Deputy Law Enforcement Officers; and (6) Marine Patrol. Law enforcement operations are administered through two organizational components which are: (1) Field Operations for inland territories, and (2) Marine Law Enforcement for coastal waters.

Program Objectives:

- To apprehend and prosecute people who violate the state's wildlife, fish, litter, trespass, boating, commercial fisheries, archeological, and environmental laws through officer patrols and investigations.
- To deter violations of the law through the issuance of warning tickets, officer patrol and presence, and public presentations.
- To collect and compile information relative to violation citations and warning tickets issued by the Division.
- To collect, analyze, and develop criminal intelligence related to violations.
- To promote sportsmanship, the law enforcement function, and the ethical use and conservation of the state's natural resources through community presentations and active interaction with landowners, sportsmen, and conservation organizations.
- To work with all other Divisions within the department and all conservation organizations to ensure the resource is being enhanced and protected.
- To conduct search and rescue missions for missing and overdue persons, and persons in distress.
- To assist other local, state, and federal law enforcement agencies.

Performance Measures:

Workload:

- Enforcement of Federal wildlife and fish laws.
- 31,000 square miles of land and water to patrol.
- 460,000 acres of lakes to patrol.
- 8,000 miles of rivers to patrol.

- 3,000 miles of saltwater coastline to patrol.
- 570 square miles of state territorial waters to patrol.
- 629,500 licensed hunters and fishermen to monitor.
- 6,758 saltwater commercial fishing license holders to monitor.
- 426,038 registered boats to monitor.
- Estimated 900,000 boaters.
- 1,976 public programs were presented by DNR law enforcement officers.
- 39,197 boating hours.
- 121,180 boats checked.
- Over 10,220 unit directed and individual patrols were conducted by DNR law enforcement officers.
- Over 14,682 separate investigations involving violations of state wildlife, fish, boating, and other related laws were conducted by DNR law enforcement officers.

Efficiency:

- 94.7% of all wildlife, fish, boating, and other related violation summons issued by DNR law enforcement officers resulted in guilty verdicts.
- An on-going "Citizen Survey" conducted by the Law Enforcement Division in accordance with national accreditation standards indicates that the public is overall satisfied with the service(s) provided by DNR law enforcement officers.

Outcomes:

- 5,233 game and fish summons, 2,440 boating summons, 436 commercial fisheries summons, and 514 litter summons were issued by DNR law enforcement officers.
- 6,059 warning tickets were issued.
- \$769,051.91 fines collected.
- 26,237 individuals received information concerning wildlife management and conservation, outdoor ethics, and boating/hunting safety through public presentations made by DNR law enforcement officers.
- 1,290 Man hours of search and rescue.
- 6,568 Man hours assisting other law enforcement.
- 1,434 Nuisance animal calls answered.

It must be noted that measuring the actual deterrence value of law enforcement is difficult. The number of persons deterred from violating the law because they were checked by an officer on patrol, or had recently attended a program presented by an officer who explained the importance of conservation and ethics, is difficult to determine without extensive analysis of multiple interconnected variables.

Priority Ranking: 1A

Program Name: Investigations Section

Program Cost: \$65,802.95

Program Goal:

For the fiscal year 1996-97 the primary goal of Investigations was to conduct covert and overt investigations into unlawful activities related to: commercialization of wildlife, fish, and commercial fisheries species; boat and motor theft; aquaculture activities; archeological theft and vandalism. Secondly the Section is responsible for the collection, analysis, and development of intelligence related to these activities; and conducting background investigations on new law enforcement division hires.

Program Objectives:

- To conduct covert one time buy/bust cases, and short term and long term investigations into the illegal commercialization of wildlife and fish through the use of covert officers, informants, and video and audio surveillance.
- To initiate investigations into, and assist other state wildlife agencies, and the U.S. Fish and Wildlife Service in activities involving the illegal intra and interstate commercialization of wildlife and fish.
- To conduct titling inspections and theft investigations on boats and motors.
- To conduct inspections on boats and motors for compliance with registration and titling laws.
- To conduct inspections of aquaculture industry facilities for compliance with laws.
- To conduct investigations into the unlawful theft and vandalism of archeological sites.
- To collect, analyze, synthesize, and develop intelligence related to the illegal commercialization of wildlife and fish, archeological theft and vandalism, boat and motor theft, and aquaculture through the use of officers, computer data bases, informants, and Operation Game Thief reports.
- To conduct background investigations on new law enforcement division hires.
- To provide training for investigators in special areas of investigations.

Performance Measures:

Workload:

- Conducted 321 potential criminal investigations.
- Inspected 550 boats or motors for violations.
- Inspected 27 aquaculture facilities.
- Investigated 4 reports of archaeological vandalism.
- Taught 3 classes on marine equipment theft.
- Completed 11 background investigations.
- Responded to 2 requests for emergency equipment deployment.
- Attended training courses for investigative personnel.



Efficiency:

- Spent 4,040 hours conducting criminal investigations.
- Spent 1,606 hours inspecting boats or motors.
- Spent 173 hours inspecting aquaculture facilities.
- Spent 65 hours investigating complaints of archaeological vandalism.
- Spent 125 hours conducting background investigations.
- Spent 72 hours deploying and maintaining emergency equipment.
- Spent 108 hours related to command functions in support of state EPD.
- Spent 760 hours in training courses for investigators.
- Spent 15 hours teaching marine theft programs.

Outcomes:

- Successfully prosecuted 13 cases involving the unlawful importation/sale of protected wildlife in Federal Court..
- Successfully prosecuted 126 cases for violations of game and fish laws in state courts.
- Successfully prosecuted 26 cases for the theft of marine equipment or titling violations.
- Recovered 12 stolen boats and 10 stolen motors with a value of \$120,000.00.
- Completed a criminal intelligence assessment for the period from 1994-96.
- Completed a computer generated 30 minute video production of the programs and activities of the Law Enforcement Division.

Priority Ranking: 1B

Program Name: Operation Game Thief

Program Cost: See Investigations Program Cost (includes OGT)

Program Goal:

To apprehend violators of wildlife, fish, and trespass laws, and successfully prosecute, based on information secured from the public through the Operation Game Thief hotline as prescribed by S.C. Code of Laws.

Program Objectives:

- To process hotline calls received from the public related to wildlife and fish violations.
- To provide the vehicle for public participation in this program while protecting anonymity of the source.
- To heighten the public awareness of wildlife and fisheries violations through programs.
- To secure funding for rewards from private sources.

Performance Measures:

Workload:

- 1,824 calls received concerning unlawful acts.
- 4 programs presented to encourage support of the program.

Efficiency:

- 277 cases made 15% rate of apprehension (cases made divided by calls received).

Outcomes:

- 98% conviction rate on cases made
- Number of calls received increased by 12%
- Prosecution rate increased by 0%.

Priority Ranking: 1C

Program Name: Records and Crime Analysis

Program Cost: This is a new program set up during June 1996. No substantial costs were incurred by this program during FY 96-97. Projected costs for FY 97-98 are First Sergeant salary, equipment and vehicle, Administrative Specialist B salary, 1 new PC, gasoline, officer out of town expenses, and a new computer (mini-frame) required for records.

Program Goal:

To provide a central records system to allow efficient and timely access to data for enforcement purposes and to provide better programs for day to day enforcement activities.

Program Objectives:

- To establish a central location and repository for all closed law enforcement records.
- To provide crime analysis to field services and investigations on areas of criminal activity such as suspension violations, license fraud, area saturations, commercial fishing activities.
- To establish a central location for warrant service concerning DNR cases.
- To maintain suspensions and provide lists as enforcement tools for field services and to provide technical support to DNR enforcement officers.

Performance Measures:

Workload:

- New program (06/96) will be included in FY 97-98.

Efficiency:

- New program (06/96) will be included in FY 97-98.

Outcomes:

- New program (06/96) will be included in FY 97-98.

Priority Ranking: 1D

Program Name: Deputy Law Enforcement Officers

Program Cost: Minimal Cost to Administer (DLEO's are required by statute to purchase their own equipment.)

Program Goal:

Maintain a professional volunteer force that will assist regular salaried officers.

Program Objectives:

- Establish a data base containing information for each DLEO.
- Ensure that all DLEO's meet criteria set forth in §50-3-315 of the South Carolina Code of Laws.
- Ensure that DLEO's comply with blood borne pathogen training and vaccination under OSHA standards.

Performance Measures:

Workload:

- Submit quarterly reports of hours worked and which includes: man-hunts, search and rescue, and hours spent assisting local officers with land or water patrols and other assistance.

Efficiency:

- Submitting quarterly reports will be effective for FY 97-98.

Outcomes:

- To determine effectiveness of the volunteer force.

Priority Ranking: 2

Program Name: Regional Wildlife Projects

Program Costs:      Appropriated FY97: \$ 33,227  
                         Revenue FY97:      \$3,941,963  
                         Federal FY97:      \$1,469,876

Program Goal:

Provide the best possible hunting opportunities for the sportsmen of South Carolina while ensuring the well being of all wildlife species.

Program Objectives:

To provide public hunting lands. To protect, conserve and enhance South Carolina's wildlife resources.

Performance Measures:

Workload:

- 1,253,314 acres maintained in Wildlife Management Area.
- Provided technical information for 2090 requests.
- 382 public presentations made.
- 1382 nuisance wildlife investigations conducted.

Efficiency:

- \$2.62/acre payment for corporate WMA land.
- \$0.41/acre payment for Forest Service WMA land.
- \$0.92/acre to lease public dove fields.

Outcomes:

35. Wildlife Management Area Program. Quality public hunting opportunities were provided on 1,253,314 acres. Although total land base decreased 4%, hunter participation remained stable as measured by permit sales. Provided 5,260,000 man days hunting.
2. Technical Assistance. Management advice was provided to the public and other agencies on numerous wildlife species for 2090 requests. Implementation of management advice will result in improved conditions for wildlife throughout the state.
3. Public Information. Information is provided through news releases, slide presentations, lectures and workshops provided by staff. Presentations reached audiences of over 22,000 and news releases were prepared on 59 topics. A better informed public results.
4. Nuisance Wildlife Investigations. The public is frequently provided assistance in dealing

with nuisance wildlife from snakes to bears. The outcome is an educated public which better tolerates wildlife or who learn to minimize or eliminate damage from wildlife. During FY97 1382 individuals were assisted with nuisance wildlife complaints.

5. Habitat Management. Habitat management was conducted on 65,941 acres of DNR owned property and 53 public dove fields.

Priority Ranking: 3

Program Name: District Operations

Program Costs: Appropriated FY97: \$ 33,990  
Revenue FY97: \$ 665,716  
Federal FY97: \$1,237,646

Program Goal:

The protection, conservation and enhancement of South Carolina's aquatic resource, and providing the citizens of South Carolina with recreational angling opportunities.

Program Objectives:

To project, conserve and enhances South Carolina freshwater fishery resources.  
To provide recreational angling opportunities.

Performance Measures:

Workload:

- Conducted survey and inventory activities on 35 lakes and reservoirs in South Carolina.
- Conducted survey and inventory activities on 27 rivers and streams in South Carolina.
- Conducted 844 on site pond management consultations.
- Reviewed 37 environmental permit requests.
- Investigated 85 fish kill events.
- Maintained 208 fish concentration areas in South Carolina lakes and streams.

Efficiency:

- Lake and reservoir survey and inventory activities were completed at an average cost of \$11,165 per water body.
- River and stream survey and inventory activities were completed at an average cost of \$12,511 per water body.
- On site pond management consultations were conducted at an average cost of \$303 per pond or \$76 per surface acre.
- Environmental permit requests were review for an average cost of \$751 per review.
- Fish Kills were investigated at an average cost of \$436 per event.
- Fish concentration areas were maintained at an average cost of \$580 per site.

Outcomes:

6. Survey and Inventory. The following are examples of results from implemented recommendations based on survey and inventory data.
  - f. The S.C. General Assembly's enactment of 5 fish creel and 21 inch size limit for striped bass in the Santee Cooper system has resulted in an increase in the number of striped bass greater than 18 inches by 360%. The application of the recommended size limit did not, however, increase the number of striped bass reaching trophy size or the number of female obtaining sexual maturity. (Reference: Freshwater Fisheries District V, Annual Progress Report, 1997)





assistance during the reporting period show highly acceptable levels of approval for the activity, employees' performance and results of implemented management recommendations. Survey results showed the following responses:

- 99% indicated employees were courteous
- 76% received the needed paperwork for a consultation
- 72% indicated that the required paper work was clear
- 93% indicated that employees were timely in responding
- 98% indicated that employees were on time for an appointment
- 99% said the employees were professional and attentive
- 98% believe the employees offered advise based on their (the owner) needs
- 82% said that the management recommendations addressed their problems
- 97% said management recommendations were clear
- 83% received follow up information to help them with their problem
- 95% said that the written recommendations were clear
- 90% carried out either all of the recommendations or some of them
- 71% said that the recommendations were either successful (57%) or some of them were (22%)
- Those that did not carry out the recommendations were deterred by cost, labor or time. Only 9% said they could not understand the instructions
- 74% requested a follow up call
- 78% said the program was very important and 20% said it was moderately important
- Most owners found out about the program from DNR, word of mouth or their extension agent
- Results have been used to change those aspects of the program that need addressing

(Reference: Private Pond Technical Guidance Program Customer Survey, 1995)

8. Development Activities. Activities include improvements on selected bodies of water for access and fishing success.
  - a. Previously developed angler access and fish attractors give resource users a means to fish agency impoundments, access stream habitats and find productive fishing sites on unfamiliar bodies of water. These sites must be maintained to insure that the original intent and expenses are not lost. In those areas where observations suggest a need for additional access or attractors, managers take action to make needed improvements. Pre and post evaluations of this straightforward activity are not needed, and employee initiative is the predetermining factor in providing the service and, when needed, ceasing the service.

Priority Ranking: 4

Program Title: Titling & Registration

Program Cost: \$962,254 (Other Funds)

Program Goal:

To process each application for title & registration within five (5) days of receipt and to provide increased access for the public at local DNR offices.

Program Objectives:

- 9) Provide training to all district law enforcement office personnel to assist boating public with boat titling/registration process.
- 2) Offer registrations/renewals processing of documents at selected offices across the state in an effort to improve efficiency and customer service by end of FY97.
- 3) Eliminate paperwork and redesign boating documents for easier processing thus improving turnaround and customer satisfaction in all areas during FY97.
- 4) Increase public awareness of requirements necessary to promptly process necessary customer transactions.

Performance Measures:

Workload:

426,038 Boats registered in FY96/97  
18,229 New boat registrations  
71,922 Boat registrations renewed  
22,796 Boat transfers

Efficiency:

\$2.25 per boat registered for total boats in FY96/97

Outcome:

- 1) All district law enforcement personnel now offer boating information and assist with all paperwork.
- 2) Forms have been redesigned and made less complex to enhance understanding of existing laws.
- 3) Three law enforcement district offices now issue renewals on site, thereby eliminating waiting several days for official documents.
- 4) Periodic news releases are now being released to all current boat owners advising them as changes occur.
- 5) Legislation has been amended thus eliminating certain requirements no longer considered necessary.

Priority Ranking: 5

Program Name: Office of Fisheries Management

Program Cost: State: \$1,198,425 Federal: \$ 490,079 Other: \$687,837

Program Goal:

To provide the necessary management and monitoring efforts to ensure sustainable use of the state's marine fisheries and associated habitat.

Program Objectives:

- To monitor and assess the stock condition of priority marine species
- To develop new artificial reefs and expand existing reef sites along the South Carolina coast.
- To actively encourage the public to conserve the state's fishery resources.
- To collect fisheries dependent data on the state's marine fisheries.
- To manage the state's shellfish growing areas
- To secure adequate funding to support fisheries management and assessment activities from non-state sources

Workload Indicators:

- 1a. Number of stock monitoring programs and activities: 41
- 1b. Number of species under active management: 94
- 2. Number of artificial reef construction/improvement projects completed: 13
- 3. Number of tagging kits and tags distributed to anglers participating in the public tag and release program: 1,983 kits/16,500 tags
- 4. Number of visits by port agents to fishing docks: 190
- 5. Number of acres of actively managed shellfish grounds : 7,542
- 6. Number of extramural grant proposals submitted in support of fisheries management: 12

Efficiency Measures:

- 1. State cost per monitoring program: \$54,000
- 2. Cost per reef construction/improvement project: \$24,761
- 3. Cost per fish tagged: \$4.60
- 4. Cost per port agent visit: \$193.66
- 5. Cost per acre of managed shellfish grounds: \$34
- 6a. Amount of extramural grant proposals funded in support of fisheries management: \$806,713
- 6b. Percent of extramural grant proposals funded in support of fisheries management: 75%

Outcomes:

- 1a. Total pounds of seafood product landed in South Carolina: 23,092,000 lbs.
- 1b. Total value of seafood product landed in South Carolina: \$34,077,000
2. Volume of new productive bottom made available to anglers: 400,000 ft<sup>3</sup>
3. Number of fish tagged and released under the Marine Game Fish Tagging program: 11,029
4. Number of finfish checked and measured at fishing docks: 19,847
- 5a. Number of shellfish permit harvest permits issued: 112
- 5b.. Number of recreational shellfish harvesters: 36,924
6. Number of staff supported by grants: 18

Priority Ranking: 6

Program Name: Conservation Districts

Program Cost: State: \$1,139,757.40; Others: 0; Federal: 0

Program Goal:

To sustain and enhance South Carolina's land and related natural resources through grassroots involvement, technical assistance, technology transfer, education, and land resource policy development.

Program Objectives:

To sustain and enhance South Carolina's land and related natural resources. To increase the public's interest in understanding the need for land and related natural resource conservation and stewardship. To strengthen the role of Conservation Districts as the focal point for grassroots land and related natural resource conservation. To coordinate efforts to address and resolve land and related natural resource issues and policy within the state. To provide land users and land professionals with conservation technology and technical assistance to sustain and enhance South Carolina's land and related natural resources. To promote efforts to achieve effective watershed management.

Performance Measures:

Workload:

- Number of conferences, workshops, clinics and field demonstrations	223
- Number of land resource planning and management projects assisted	39
- Number of units of conservation equipment provided to conservation districts and land users	87

Efficiency:

- Ratio of state funds to non-state funds and in-kind services	1:19.86
- Cost per acre under conservation plan	\$0.21
- Ratio of staff to clients assisted	1:2,109

Outcomes:

- Percent of total cropland and pasture with adequate soil and water conservation management	69.3
- Acres under conservation plan	7.1 million
- Number of partnerships with agencies and other organizations	107

Priority Ranking: 8

Program Name: Hydrology

Program Cost: State: \$1,542,995.68; Other: \$4,547.80; Federal: \$60,313.50

Program Goal:

To assess the State's water resources as to spatial and temporal availability, quality, and demand. To provide technical assistance in the development and implementation of new and innovative water resources strategies. To develop general policies and procedures to sustain the availability of water in an environmentally consistent manner. To provide real-time information about river flow and stage, lake levels and ground water levels to enhance the use of South Carolina's water resources.

Program Objectives:

To improve the quality and increase the quantity of hydrologic data. To systematically monitor local and regional changes of the surface-water and ground-water systems. To model these systems to formulate management alternatives that minimize competing and conflicting demands and promote the conjunctive use of surface and ground water. To minimize the socio-economic and environmental impact of extreme events such as floods and droughts.

Performance Measures:

Workload:

- Aquifer Delineation. Drill coreholes and monitoring wells across the Coastal Plain of South Carolina. Drill coreholes and monitoring wells in the vicinity of the Savannah River Site. Prepare reports documenting data collected.
- Availability Requests. Provide information and technical assistance to the general public in the development and use of the State's water resources. Provide a near real-time status for surface and ground water flow and stage on the DNR home-page (Internet).
- Black Water Study. Study structure and chemical composition of humic substances and their relation to lead and byproducts of disinfection, mostly those that are carcinogenic.
- Flood/Drought Study. Develop hydrologic computer models for predicting high flows during floods and low flows during droughts. Collect hydrologic data (streamflows and precipitation) for flood and drought analysis.
- Geophysical Well Logging. Obtain geophysical data to assist in defining water bearing units.
- Hilton Head Project. Estimate impact of shallow-aquifer development on wetlands, saltwater intrusion, and recharge to upper Floridian aquifer.
- Piedmont Study. Evaluate the ground-water supply potential of Piedmont aquifers. Review literature and available data, select study areas, obtain permission to use existing wells and install additional piezometers, install piezometers, install monitoring equipment, collect water-level and streamflow data, interpret data, prepare reports.
- Santee River Conductivity Study. Define the relationship between salinity, specific conductance, river discharge, and tide stage in the North and South Santee Rivers.
- Spring Inventory. Inventory springs in South Carolina. This includes contacting owners and other sources, marking sites on maps, finding springs (locate, conduct field tests, sample,

Program Ranking: 7

Program Name: Education

Program Cost: Appropriated FY97 284,207  
Revenue FY97 16,226

Program Goal:

Provide programs, training, and staff development to educators, schools, youth organizations, and other audiences interested in the conservation and wise use of natural resources.

Program Objective:

To provide a variety of natural resource education programs in the state. DNR education programs include Project/Aquatic WILD, SC MAPs, Conservation Education programs, Jr. Duck Stamp and Camp Wildwood.

Performance Measures:

Workload:

- 3 education staffers provide 203 conservation education programs (animal related programs) to various groups throughout the state.
  
- 4 education staffers provide 66 in-service training sessions to educators using Project WILD and SC MAPs curriculum materials.
  - b. Project WILD.....49 programs
  - b. SC MAPs.....17 workshops

Efficiency:

- Cost per conservation education program given.....\$159.00
- Cost to train each educator attending a program/workshop
  - a. Project WILD.....\$7.00
  - b. SC MAPs.....\$41.00

Outcomes:

- 37,717 individuals reached with conservation education programs providing these individuals direct contact with the DNR and a better understanding of animals native to our state.
- 91,410 individuals educated to the value of our natural resources
  - a. Project WILD.....29,850
  - b. SC MAPs.....61,560

- photograph, measure flow), recording historical information, and adding to data base.
- State Water Plan. Work with DNR staff and external groups to discuss all issues addressed in the Water Plan. Four drafts of the Water Plan were prepared and submitted for review.
  - Water Use and Demand Assessment. Assess present use and forecast future water demand to evaluate ability of water-supply facilities to adequately meet future demands. Where demand may exceed supply, provide a series of viable water-resources alternatives.
  - Water Well Network. Collect and maintain piezometric data base for the major aquifers in the Coastal Plain of South Carolina.
  - Wadmalaw Shallow Aquifer Study. Evaluate the effects of ground-water withdrawals from agricultural irrigation ponds on the shallow sand aquifer and nearby residential wells.

#### Efficiency:

- Aquifer Delineation. A deep well (1,138 ft) was completed at Orangeburg at a cost of \$49 per foot. A deep well (2,900 ft) was completed at Gillisonville in Jasper County at a cost of \$114 per foot. Ten water level recorders were installed at a cost of \$2,360 per recorder. One-hundred and thirty-one water samples were analyzed at a cost of \$90 per sample.
- Availability Requests. More than 485 requests for information were processed, including technical assistance and environmental-permit review. The average cost was \$47 per request. The number of users of the real-time hydrologic data was more than 84,000. The average cost was \$0.02 per use.
- Black Water Study. An open-file report was prepared that included an extended bibliographic reference to current techniques and procedures for isolation and analysis of organic matter. The cost of the report and related work to obtain funding was \$25,000.
- Flood/Drought Study. Seven hydrologic computer models were evaluated at a cost per model of \$2,024. A computer software package containing four hydrologic models and two GIS applications was purchased at a cost of \$1,995. A plan to establish a comprehensive hydrologic data-collection system in Lexington County was finalized. The equipment cost for 10 rainfall and five stream-flow gages was \$18,655.
- Geophysical Well Logging. 61,000 feet of geophysical logs were obtained at a cost of \$0.35 per foot.
- Hilton Head Project. Drainage basins were sampled to determine the salinity of canals and streams; 120 samples were collected and analyzed. Two observation wells were completed at the Harbor Town study area; a pumping test and analysis of collected data were completed. Seven continuous cores to a depth of 52 feet were collected. Lithology was determined and described. Seven Harbor Town test-site wells were sampled and analyzed. Water level monitoring was continued through December 1996 at the Harbor Town site; the cost was about \$50,000.
- Piedmont Study. Literature and existing data were reviewed. Five basins were chosen for study (\$184/basin) and work was begun on the upper Middle Saluda River basin. Permission was obtained to monitor three existing wells (\$306/site) and to install piezometer nests at two sites (\$2,318/site). Four wells were installed, totaling 404 feet in depth (\$3,850/well, \$38/foot). Instruments were installed on three wells (\$1,628/well) and 102 manual measurements were made in 19 wells (\$50/measurement). Locations were obtained by GPS (50 locations, \$40/location). Preliminary data comparisons were made.
- Santee River Conductivity Study. An ADR to record specific conductance and temperature was installed in the South Santee River (purchase, installation and maintenance: \$5,000). Nine profiles of salinity and conductance with river depth on the North and South Santee



Rivers were conducted at high and low tides (\$560 per survey, including equipment purchases and labor). Relationships between river stage and specific conductance were analyzed.

- Spring Inventory. Over 100 springs were searched for and 43 of these were found and added to the inventory (33 in the Piedmont, 10 in the Sandhills and Pee Dee area) at a cost of about \$460 each.

- State Water Plan. Ten meetings were held in reference to the State Water Plan. The cost of holding the meetings was about \$100 per hour. Four drafts were prepared at a cost of about \$10,000 per draft.

- Water Use and Demand Assessment. A draft report and a map of the distribution and rate of water use for the State in 1994 was prepared. The cost of acquiring and processing the data for the report and map was \$40,000.

- Water -Well Network. Historical water levels for six Black Creek aquifer wells were examined. The final report on the potentiometric surface of the Black Creek aquifer--November 1995 was prepared (\$9,600). More than 120 well sites were visited in November and December 1996 for the Middendorf aquifer potentiometric run (\$65 per well). ADRs are maintained at six wells (not including DOE sites) (\$640 per well).

- Wadmalaw Shallow Aquifer Study. Final edits to report were made at a cost of \$960.

#### Outcomes:

- Aquifer Delineation. 40 percent of the drilling operations and 25 percent of the analytical work were completed.

- Availability Requests. Information requests increased by more than 25 percent from the previous year. About 8,000 (monthly) fishermen, recreation users, water suppliers, and others accessed the DNR Home Page to retrieve water resources related information.

- Black Water Study. Several municipalities and water utilities were contacted to secure funding and support for the project. However, the project was postponed until a group of cooperators sponsoring the project could be assembled.

- Flood/Drought Study. Evaluation of hydrologic models is ongoing with actual stream flow data. Task completion was 50 percent. Plan for a comprehensive hydrologic data collection system was finalized with the Lexington County Department of Planning and Development. This project is one year ahead of schedule. Equipment needed for this project was purchased and gaging sites were determined. Task completion 30 percent. The Hydrology Section acquired the capabilities and equipment to measure streamflow and rainfall.

- Hilton Head Project. Data collection for the project is essentially complete. Results of the pumping test and water-level data have been incorporated into the framework of the numerical model; project personnel are completing analysis of data and are presently writing a report of the findings.

- Geophysical Well Logging. There was a 15 percent increase in the total linear footage of logs run this year with a 15 percent decrease in the unit cost.

- Piedmont Study. Literature and data review are on schedule. Piezometer installation and data collection in the proposed schedule will require an accelerated rate to be completed in 1997.

- Spring Inventory. The project is 50 percent complete; 43 springs were added to the inventory which includes location, historical information, flow rate, photographs, and water quality. The project is now three to six months behind schedule, but new location information is expected to accelerate the process of locating the remaining springs.

- State Water Plan. A draft of the Water Plan is complete and under review by the DNR Board.
- Water Use and Demand Assessment. Program objectives and tasks were completed as scheduled. Report and map are ready for publication.
- Water-Well Network. The report on the potentiometric surface of the Black Creek Aquifer-November 1995 was completed and prepared for publication. The Middendorf well network was completed. Analysis of data from November 1996 Middendorf water-level run is 30 percent complete.
- Wadmalaw Shallow Aquifer Study. The report has been completed and prepared for publication.

Priority Ranking: 9

Program Name: Hatchery Operations

Program Costs:	Appropriated	FY97	\$200,361
	Revenue	FY97	\$842,430
	Federal	FY97	\$377,810

Program Goal:

To maintain hatchery facilities in sufficient number and in proper repair as to allow for the production of various species of adequate number and size to meet program objectives.

Program Objectives:

- To propagate those species of fish in sizes required to accomplish fishery management objectives.
- To provide pond owners, at cost, largemouth bass, shellcrackers and bluegill for private pond management purposes.
- To maintain and improve hatchery facilities.

Performance Measures:

Workload:

- Production of catchable and sub-catchable sized trout for stocking into public waters.
- Production of striped bass and hybrid fingerlings for stocking into public waters.
- Production of largemouth bass fingerlings for public water stocking and to provide fish, at cost to private pond owners.
- Production of bluegill and shellcrackers for public water stocking and to provide fish, at cost to private pond owners.
- Maintenance and improvement of:
  - Six warmwater fish hatcheries with a total of 76 acres of water in 118 production ponds.
  - One coldwater fish hatchery with six production raceways and a hatching facility.

Efficiency:

- Produced and stocked 487,000 trout into public waters at an average cost of approximately \$0.52 each.
- Produced and stocked approximately 3,800,000 striped bass fingerlings at an average cost of \$0.12 each.
- Produced approximately 870,000 largemouth bass fingerlings at an average cost of \$0.07 each.
- Produced approximately 3,000,000 bluegill and shellcrackers at an average cost of \$0.07 each.
- Repaired storm damage at the Walhalla State Fish Hatchery at a cost of approximately \$170,000.
- Upgraded the liquid oxygen storage facilities at the Walhalla State Trout Hatchery at a cost of approximately \$30,000.
- Replaced the risers in 29 Dennis Center production ponds at a cost of \$2,500 per pond.

Outcomes:

1. Private Water Stockings

- a. A survey of private pond owners that purchased fish for stocking into their pond during the reporting period indicate highly acceptable levels of approval for the activity, employees' performance and the quality of the fish they purchased. Survey results showed the following responses:
  - 82% felt the cost of the fish was fair and 10% felt that the cost was too high
  - Only 30% said that they would be willing to pay more for the fish they purchased
  - 68% were satisfied with the size of the fish and 92% were satisfied with the condition of the fish at the time of delivery
  - Only 1% felt that the number of fish they received was not accurate
  - 92% indicate the employees were courteous and helpful
  - 91% received good instruction concerning fish delivery, and 90% felt the delivery site was convenient
  - 92% said the program was important, and 91% would recommend it to their friends(Reference: Private Pond Stocking Program Customer Survey, 1995)

2. Public Water Stocking

- a. South Carolina has a \$12,500,000 trout fishery that serves an estimated 43,000 anglers. Due to the State's limited coldwater resources, only six streams have viable reproducing trout populations capable of sustaining limited fishing pressure. The remaining streams and reservoirs must be stocked with either harvestable size fish or, when conditions allow, fish that are less than six inches in length. The Walhalla State Fish Hatchery produced fish of quality and these were stocked based on sound biological principals, thereby, maintaining the fishery and its benefits. (References: The Economic Benefits of Freshwater Fishing in South Carolina; The Future of Trout in South Carolina)
- b. South Carolina has a \$100,597,000 striped bass and hybrid bass fishery that serves an estimated 183,299 anglers. While limited naturally reproducing populations exist in selected coastal rivers and Santee Cooper, the ultimate viability of the sport fishery is dependent on the "put-grow and take" stocking of fingerling striped bass. Hybrid striped bass do not provide any reproduction to the fishery, therefore, this fishery is totally dependent upon stocking. All of the DNR's warmwater fish hatcheries produce striped bass and/or hybrids that are eventually stocked in appropriate waters, by that, maintaining the fishery and its benefits.  
(References: The Economic Benefits of Freshwater Fishing in South Carolina; Freshwater Fisheries District II, III, IV and V Annual Progress Report, 1975 - 1997; Hatchery Management Plan, 1993)
- c. Following a major fish kill in public water, restoration stocking is often conducted with fish from DNR hatcheries. Since these events are unpredictable, hatcheries maintain an appropriate level of surplus fish in order to complete the stocking when needed. While data do not exist to quantify the success of these stockings, the rapidity with which the impacted area recovers is evident to the biological staff that conducts routine sampling in these areas.

3. Hatchery Maintenance.

- a. All DNR hatcheries conduct routine maintenance to retain the financial investment, function, appearance and life the facilities. As required, specific and significant maintenance is required to repair unanticipated damage or deterioration.
- b. The Walhalla State Fish Hatchery received major repairs to areas damaged by tropical storm Beryl. The repair was completed in a way that will reduce a similar threat in the future.
- c. The Dennis Wildlife Center replaced 29 deteriorating risers. The replacement of these risers insures the continued operation of the ponds and the continued production of fish from the ponds.

Priority Ranking: 10

Program Name: Marine Resources Research Institute

Program Cost: State: \$1,560,945 Federal: \$2,899,140 Other: \$ 233,722

Program Goal:

To provide the scientific knowledge required to manage and conserve the state's marine resources.

Program Objectives:

1. To obtain the scientific information needed to manage and conserve living marine resources and the habitats required to sustain them.
2. To seek extramural funding for conducting the research and monitoring activities of the Marine Resources Research Institute.
3. To provide undergraduate and graduate education and research opportunities and seaside facilities for state universities and colleges.

Workload Indicators:

- 1a. Number of research and monitoring projects conducted: 47
- 1b. Number of proposals submitted for extramural funding: 59
- 2a. Dollar value of research and monitoring projects conducted: \$ 4,693,809
- 2b. Dollar value of extramural funding requested: \$10,606,378
- 2c. Number of technical staff managed: 109

Efficiency Measures:

1. Federal dollars captured per state dollar expended: \$2.01
- 2a. Percent of staff supported by extramural grants: 71%
- 2b. Percent of proposals funded: 54%
- 2c. Publications per project: 1.68
- 2d. Percent of operating costs obtained through grants: 84%
- 2e. Percent of publications that were peer reviewed: 51%

Outcomes:

- 1a. Number of technical reports and general publications prepared: 40
- 1b. Number of peer reviewed publications published: 39
- 1c. Number of scientific and general presentations performed: 124
2. Number of professional staff supported by grants: 77
- 3a. Number of students supervised: 58
- 3b. Number of students participating in training programs: 7

Priority Ranking: 11

Program Name: Statewide Wildlife Projects

Program Costs: Appropriated FY97: \$ 154,336  
Revenue FY97: \$ 959,038  
Federal FY97: \$ 107,465

Program Goal:

To protect, conserve, and enhance specific wildlife species in South Carolina through statewide projects for deer, turkey, small game, furbearers, waterfowl and alligators.

Program Objective:

To monitor wildlife population status and health. To provide annual harvest and biological data. To provide for the controlled harvest of antlerless deer.

Performance Measures:

Workload:

- Conducted 14 dove call count surveys, 52 quail surveys, 164 furbearer surveys, 32 waterfowl surveys, 12 alligator surveys and multiple mast surveys.
- Analyzed harvest data for deer, turkey and waterfowl.
- Provided for antlerless deer harvest through the coastal plain antlerless deer quota program and the Piedmont tag program.
- 75,006 antlerless deer tags were issued to 2688 cooperators on over 4.5 million acres of land. \$140,000 revenue generated.
- 76,515 Piedmont antlerless deer tags were issued to 22,320 applicants. \$375,000 revenue generated.
- Provided woodduck nest box structures to the public. 1500 nest boxes were constructed and 1,291 nest box units distributed to 161 landowners.
- Provided a private lands alligator harvest program.
- Conducted an educational program for small game through 4-H activities. 34 counties participated in the 4-H Food and Cover Establishment for Wildlife Program (FACE).  
134 food plots were entered in the contest.
- Distributed lespedeza seedlings to the public for habitat improvement.

Efficiency:

- 916,000 lespedeza seedlings were produced and sold to the public. Cost of production was \$21.45 per 1000, revenue received equaled \$25/1000.
- Turkey project utilized \$143,000 of private funds during 1996/97 from the National Wild Turkey Federation Super Fund.

Outcomes:

1. Surveys. All surveys were conducted as planned with doves and quail showing small decreases, furbearers and waterfowl remained stable. Alligator surveys are used to set harvest quotas and only reflect local populations.

2. Harvest Data Analysis. Data analysis indicates increasing populations of deer and turkey. Deer harvest on WMA's increased 1% to 62,116. Deer harvest statewide increased 11% to 163,758. Turkey harvest increased 10% to 13,984. 1647 hunters participated in 94 public waterfowl hunts with a harvest of 2655 ducks. Waterfowl harvest remains stable.
3. Antlerless Deer Quota Program. Interest in harvesting doe deer through the program remains high. 75,006 antlerless deer tags were issued to 2688 cooperators on over 4.5 million acres of land. \$140,000 revenue generated.
4. Piedmont Antlerless Deer Tag Program. Tags issued increased although surveys indicate somewhat low use rate. 76,515 Piedmont antlerless deer tags were issued to 22,320 applicants. \$375,000 revenue generated.
5. Woodduck Nest Boxes. The demand for nest boxes remains stable. The construction cost of boxes is funded by State Duck Stamp funds and the boxes provided at no cost to the landowners. 1500 nest boxes were constructed and 1,291 nest box units distributed to 161 landowners. The program results in increased nesting habitat for woodducks.
6. Alligator Harvest. The controlled harvest of alligators reduces the nuisance of large alligators near developments.
7. Shrub Lespedeza Distribution. Seedlings provided to landowners provide improved habitat for quail. The price charged for the seedlings covers the cost of production and distribution.



Priority Ranking: 12

Program Name: Endangered Species Program

Program Cost: State: \$544,895 Other: \$269,607 Federal: \$91,660

Program Goal:

Maintain all of South Carolina's native plants and animals in their natural habitats and preserve the archaeological record on the land.

Program Objectives:

- Service requests for data on endangered species and critical ecosystems, and make technical consultations as required.
- Carry out research, survey, and management projects on at least 20 high-priority species and ecosystems
- Resolve wildlife assistance calls as required

Performance Measures:

Workload:

- Serviced approximately 525 request for data and reviewed over 450 environmental permits
- Made 145 technical consultations and presentations
- 37 individual research, survey and management projects were in progress during the year
- 5,775 wildlife assistance calls were resolved
- Approximately 350 inquiries pertaining to and/or possession of nongame wildlife permits were handled; resulting in 71 permits of various types being issued

Efficiency:

- Average per project cost of research, survey or management projects: \$972.00

Effectiveness Measures:

	<u>1995-96</u>	<u>1996-97</u>
- Contributions to Check for Wildlife	17,157	15,334
Average per Contribution	\$ 7.54	\$ 6.47
- Major technical papers and reports delivered	6	4

Outcomes:

- In cooperation with the Dept. Of Defense and TNC/SC, the survey of Longleaf Pine communities resulted in the first-time documentation of 3 species listed under the U.S. Endangered Species Act, 5 species of federal concern and 12 species of state concern, at least one of which hasn't been collected in South Carolina for over 100 years.
- A survey of swallow-tailed kite populations, conducted at the current northern-most nesting population in the world--Francis Marion National Forest, has resulted in stable numbers this year for the first time since the damage by Hurricane Hugo. In addition,

there have been more frequent sightings each year of nesting birds in Georgetown, Horry, Marion and Williamsburg counties.

- Two new wood stork colony sites were located this year, extending the nesting range of this species further north (within 15 km of North Carolina) than previously thought.

- The Mid-Winter Bald Eagle Survey not only resulted in the continued increase of bald eagle populations in SC but also in a nearly 10% increase over last year's numbers.

- During the state-wide Wading Bird Survey and Census this year, a small colony of Great Blue Herons was located on Lake Hartwell in Pickens County, representing an inland nesting record for this species in SC.

Priority Ranking: 13

Program Name: State Climate

Program Cost: State: \$265,367.24; Other: \$23,190.32; Federal: \$250,732.54

Program Goal:

To provide and maintain a comprehensive State climatic service. To serve as the Southeast Regional Climate Center host.

Program Objectives:

To serve as the weather and climate activities focal point within the state. To acquire, quality control, and archive climate records. To prepare and publish climate information and data summaries necessary for monitoring environmental change. To develop and monitor drought indices, disseminate drought information, and coordinate local and state drought conditions responses. To assist State and Federal agencies in data acquisition and interpretation before, during, and after severe weather periods. To conduct applied climatological studies which provide information relating to inter-annual and seasonal weather prediction affecting the State's economy and environment.

To provide a climate products and services suite, including Southeast region climate data and information dissemination, as host of the Southeast Regional Climate Center. Member entities include the states of Virginia, North Carolina, South Carolina, Georgia, Alabama, and Florida, as well as Puerto Rico and the U.S. Virgin Islands. To assist users in climate data and information interpretation and best use with an inter-annual and seasonal predictions emphasis. To monitor and assess regional climatic conditions and natural resources impacts. To obtain, quality control, and maintain appropriate datasets to support climate services and applied studies.

Performance Measures:

Workload:

- 3500 climate information requests (average of 70 requests/week) were answered with approximately 10 percent invoiced.
- 140 monthly climate records were collected; 2700 received daily through the National Weather Service (NWS) wire.
- Four severe weather investigations conducted which facilitated the South Carolina severe weather documentation as part of the annual NWS agreement to prepare the Storm Data report.
- 425 weekly weather summaries were published and distributed.
- Over 200 briefing hours were provided to the SC Emergency Preparedness Division, keeping them abreast of weather situations, some possibly severe. Other assistance was provided with respect to hazard mitigation efforts and technical support training exercises, e.g., HURRTRAK, SAS, and Surfer.
- Completed two publications: "General Characteristics of South Carolina's Climate," and "Pan Evaporation in South Carolina."
- Presentation made to the South Carolina Academy of Science (SCAS): "Multivariate Analysis of El Niño/Southern Oscillation and South Carolina Drought."

- Database Development: CIRRUS: In an effort to provide better service to users, a new, Web-based CIRRUS was developed during the period to become operational in 1998. The new system will operate from a new Oracle database where all the historical climatological data will be archived. A committee composed of climatologists and NRIMA computer specialists met monthly to review, coordinate, and supervise the new system development. Other: The State Climate Office made major improvements in severe weather significant events graphics capability this past year. Using HURRTRAK, SAS, and Surfer, extensively detailed maps and contours provided better and more timely weather information to users.

#### Efficiency:

- Cost per analog request such as telephone, personal visit, facsimile, delivery service, and mail (including cost recovery for materials and personnel) is calculated to be \$5.18. Electronic information provisioning of electronic data requests is estimated to cost \$0.45 per request. Emphasis will continue to be upon developing future electronic information delivery means.
- Archival cost of the estimated 7.3 million new electronic data records acquired during the past year is estimated to be about \$0.0092 per record (less than one penny).
- The cost of the four severe weather investigations during the year is estimated to be about \$18.00 per event. This cost was reduced during the past year due to the events being in close proximity to Columbia, thus considerably reducing travel costs.
- Publications costs were considerably reduced during the year by electronic reporting concentration. Costs of the estimated 700 publications have thus been reduced to about \$18.50 per publication.
- CIRRUS database development costs for the SCO during the year are estimated to be approximately \$9,000.

#### Outcomes:

- User response concerning services: Service comments continued to be generally favorable. Provision of data and information to state and county users was enhanced in FY 1996-1997 through NWS Doppler Radar access.
- Ninety-five percent of special climate information requests were satisfied; the five percent not serviced were referred to the National Climatic Data Center or to private meteorologists. The majority of unsatisfied requests were related to expert legal testimony and were handled by private meteorologists. The remainder of the requests were related to radar or lightning information.
- Related unofficial severe weather events were documented in the monthly climate summary, as contrasted with the lag time of six-eight months in its NWS publication.
- More than 1500 Web pages were added to the DNR SCO Home Page site. Examples of Web pages now available are: SC Weekly Weather and Climate Reports; SC Climate, including Extreme and Current Weather; SC Drought Information; SCO Server and Access Statistics, including interactive Clickable Traffic Graphs.

#### Southeast Regional Climate Center

##### Performance Measures:

##### Workload:

- 5,098 (1,877 invoiced) special climate data and information requests were processed.

These included statistical programming for hourly weather elements, especially dew point, wind speed, and direction. Datasets compiled for several users in the academic community related to climate change, heavy precipitation, and wind speed. Some requests involved research and programming that extended daily and hourly database uses.

- The following publications were produced and disseminated:

Semi-Annual Reports: May 1, 1996, to October 31, 1996, and November 1, 1996, to April 30, 1997.

Efficiency:

- Cost per analog request such as telephone, personal visit, facsimile, delivery service, and mail (including cost recovery for materials and personnel) is calculated to be \$5.18. Electronic information provisioning of electronic data requests is estimated to cost \$0.45 per request. Emphasis will continue to be upon developing future electronic information delivery means. Web information deliveries are not included in the above figures.

- Archival cost of the estimated 36 million new electronic data records acquired during the past year is estimated to be about \$0.00022 per record (considerably less than one penny).

- Publications costs were considerably reduced during the year by concentration upon electronic reporting. Costs of the estimated 2000 datasets and special publications were reduced to about \$16.00 per publication. That cost is primarily personnel time with some document preparation and editing phases expenditures.

Outcomes:

- User requests: Total: 1,877 invoiced of the 5,098 handled. Many requests were handled by phone and did not meet invoicing criteria.

- Two (2) percent decrease in billed user requests over FY 1995-1996 (1,921 requests billed). This slight decrease was primarily due to more available *free* information on the Internet SERCC Home Page.

- Almost all requests were completed within 48 hours.

- Internet use has stabilized over the past year. More than 2000 Web pages have been added to the DNR SERCC Home Pages. Examples of Web pages now available are: Publications, including Periodicals and Research Papers, with Administrative and Special Reports and Technical Papers to follow; Data, Products, and Services to include Recent Meteorological Observations, Selected Historical Climate Data, and El Niño/Southern Oscillation information, Custom Requests and Severe Weather Preparedness Page, the CIRRUS Home Page and Education Resource Pages. The SERCC Education Center pages include Schools on Line, Weather information by subject, Southern AER, Severe Weather Preparedness, and a weekly Weather Quiz. These latter pages contain items of interest to teachers and students in grades K-12.

- Completed two publications: "The Relationship of El Niño/Southern Oscillation and Agricultural Drought in the Southeast" and "Evaluation of the Standard Precipitation Index and Palmer Drought Severity Index Performances in the Southeast."

- Presentations: Two papers were presented to the South Carolina Academy of Science (SCAS): "SERCC and Southern AERAs Cooperative Educational Outreach" and "Hazard Mitigation of Coastal South Carolina." American Meteorological Society (AMS): "SERCC and Southern AERAs — Reaching and Teaching" was presented to the Sixth Symposium on AMS Education.

Priority Ranking: 14

Program Name: Marine Law Enforcement/Education Affairs (Hunter Education)

Program Cost: \$660,822.76

Program Goal:

To provide the administrative and logistical support necessary to conduct a statewide hunter education program that is accessible to all interested individuals. Successful completion of the department's hunter education program should impact participants (hunter/non-hunters) in a manner that will:

- Reduce hunting and other firearms related accidents.
- Effect the performance of hunters in a manner that will reduce game violations, and enhance their ethical standards.
- Increase public awareness of the need for responsible management and utilization of our natural resources.
- Foster better relations between hunters, non-hunters and landowners to ensure continued public access to private and public lands for recreational purposes.

Program Objectives:

- To increase the number of hunter education programs in response to passage of legislation requiring persons born after June 30, 1979 to complete a hunter education course before obtaining a hunting license. This legislation took effect July 1, 1995.
- To increase the number of bowhunter education classes.
- To reduce the number of firearm related hunting incidents.
- To increase the number of certified volunteer instructors.
- To operate shooting ranges that are safe and accessible to the public.

Performance Measures:

Workload Indicators:

- Two hundred fifty hunter education courses conducted by full-time and volunteer hunter education instructors.
- Two bowhunter education courses conducted.
- Operate two public shooting ranges (Pickens and Spartanburg Counties) that support hunter education activities as needed, and provide a safe environment for recreational shooters. No accidents were reported during this time period.
- One hundred eighty six safety/ethics talks made by hunter education and law enforcement personnel.
- Conducted training that certified forty new volunteer instructors.

Efficiency Measures:

- Cost per student participating in the hunter education course - \$5.40
- Cost per student participating in the bowhunter education course - \$6.50
- Cost per individual participating in safety/ethics talks - \$1.00
- Cost per individual for volunteer instructor certification - \$250.00

Outcomes:

	1995-96	1996-97
- Number of students certified in hunter education	10,287	10,500
- Number of students certified in bowhunter education	100	57
- Number of hunter education courses conducted	280	250
- Number of volunteer instructors - Active	143	173
- New	57	40

Priority Ranking: 15

Program Name: Cooper River Rediversion

Program Costs:	Appropriated FY97	\$ 29,006
	Revenue FY97	\$ -0-
	Federal FY97	\$185,304

Program Goal:

To restore anadromous fish passage into the Santee Cooper Lake system to levels that existed before the construction of the Cooper River Rediversion Project.

Program Objectives:

- To pass fish from the Santee and Cooper rivers into the Santee Cooper lake system.
- To evaluate and implement, through cooperation with the USACOE, modifications to improve efficiency of the St. Stephen's fish lift.

Performance Measures:

Workload:

- Operate the fish lift at the St. Stephen Power Plant.
- Produce estimates of the number of fish passed at the St. Stephen Fish Lift and at the Pinopolis Lock.
- Monitor the effects of fish lift modifications on the number of fish passed

Efficiency:

- An estimated 390,495 herring units (117,082 pounds) passed through the lock at Pinopolis during the year ending in October 1997. This passage was achieved in 183 lock operations.
- Approximately 1,957,700 fish of various species were passed during 897 lift operations at St. Stephen during the year ending in October 1997.

Outcomes:

1. Passage of Anadromous Fish Species.
  - a. The passage of migratory fish species (mostly blueback herring and American shad) provides an allochthonous source of prey for the predators of lakes Marion and Moultrie. Each body of water has its own carrying capacity that can be expanded only through outside influences. The influx of additional prey without having to artificially increase nutrients is a benefit to the reservoir's predators enabling them to maintain and exceed expected condition, growth and density. The passage of fish into Santee Cooper predates DNR's survey and inventory efforts and this project, but the system is the state's most fished and one that has the greatest reputation for angling success. These facts were among the justifications for the construction of the St. Stephen Fish Lift following the Corps of Engineer's Cooper River Rediversion Project. (References: U.S. Senate Document 88, Cooper River, South Carolina (Shoaling in Charleston Harbor); South Carolina's Striped Bass, 1968; Rediversion Project Annual Progress Report, 1985 - 1996)



- b. The passage of migratory fish species (mostly blueback herring and American shad) increases their available spawning area and spawning success, thereby, contributing fish stocks to the Atlantic Coast fish populations. The Cooper and Santee rivers were impounded during the 1940's. The construction of Wilson and Pinopolis dams prevented selected anadromous fish species from using their historical spawning grounds which effectively reduced their spawning success. These changes occurred before DNR's involvement in fish population monitoring. Passage of some anadromous fish did occur at the boat lock on Cooper River, however, the Cooper River Rediversion Project reduced the effectiveness of this pathway. Construction of the St. Stephen Fish Lift was justified and constructed on the premise that the reduced Cooper River passage could be supplemented by a fish lift on Santee River, and anadromous species would again be able to reach spawning areas.

The St. Stephen Fish Lift has been effective in passing as many as 1,900,000 anadromous fish to their historical spawning areas. Sampling has revealed that juvenile herring and shad are produced and out-migrate to rejoin Atlantic Coast stocks. The passage, spawning and eventual out-migration are important outcomes for this limited area of the fishes' range. Although their total contribution cannot be measured against the total Atlantic Coast population, its importance is judged to be relative to the habitat and number of adults using the system. (Rediversion Project Annual Progress Report, 1990 - 1996)

2. Evaluation of St. Stephen Fish Lift Modifications.
  - a. Inefficiencies at the St. Stephen Fish Lift resulted in a \$4,500,000 modification to make improvements. These improvements are partially completed, but this program has begun an evaluation through survey and research. Data resulting from these activities will determine the need and approach for any additional modifications or operational adjustments.

Priority Ranking: 16

Program Name: Land Acquisition Program

Program Cost: State: \$266,509 Other: \$7,017 Federal: \$263,606

Program Goal:

Maintain all of South Carolina's native plants and animals in their natural habitats and preserve the archaeological record on the land.

Program Objectives:

- Dedicate at least 5 new Heritage Preserves and additions
- Maintain habitats and facilities as required on the system of Heritage Preserves, including 15 high-priority projects

Performance Measures:

Workload:

- 4 new Heritage Preserves and 1 addition to an existing preserve were dedicated
- 29 habitat management and facilities improvement projects carried out on Heritage Preserves

Efficiency:

- Average per acre cost of land acquisition: \$ 524.00

Effectiveness Measures:

	<u>1995-96</u>	<u>1996-97</u>
- Rare habitat elements protected	75	93
on new land acquisitions	13	18

Outcomes:

- Property and cash donations totaled approximately \$1,067,000.00
- The 4 new heritage preserves and one addition acquired this year totaled 3,755 acres and protected 2 rare animal species, 9 rare plant species, 1 rare bird species and six rare plant communities.
- Also protected were 2 important archaeological sites, one of which is documented as the second most important Civil War site in South Carolina and the other is one of the oldest coastal sites in the state with features ranging from 10,000 BC to 500 AD.
- Several individuals and organizations agreed to accept stewardship and/or monitoring responsibilities for at least 5 heritage preserves.

Priority Ranking: 17

Program Name: National Flood Insurance

Program Cost: State: \$68,774; Other: 0; Federal: \$148,371

Program Goal:

To ensure community compliance with the National Flood Insurance Program (NFIP) regulations, which ultimately leads to the reduction of future flood losses. To provide leadership, education, technical and engineering assistance for the development of innovative methods for the reduction of future flood losses. To reduce or eliminate the long-term risk of flood damage to the built environment through mitigation planning, compliance, and mitigation projects.

Program Objectives:

To establish a State Interagency Hazard Mitigation Committee to coordinate the development and implementation of a strategic mitigation plan and to coordinate pre- and post-disaster mitigation activities/opportunities. To develop for states and communities a comprehensive program of education, awareness and outreach on mitigation for public and private sectors to reduce risks. To promote partnerships with insurance interests to enhance the availability and affordability of insurance and encourage mitigation. To develop for the State and local jurisdictions a sustained hazard mitigation capability to support mitigation activities whenever possible. To reduce through risk reduction measures both State and local jurisdiction vulnerabilities identified through the completion of their risk assessments.

Performance Measures:

Workload:

- Number of walk-ins, technical assistance requests	2,280
- Number of workshops, conferences and presentations	38
- Number of Community Assistance Visits (CAV)	25
- New Communities enrolled in the NFIP Program	2
- Number of Flood Insurance policies	100,781
- Number of communities in Community Rating System (CRS) Program	25
- Number of identified flood hazard communities with flood insurance ordinances	193

Efficiency: (Unit Costs Are Averaged)

- CAV Unit Costs	\$1477.00
- Workshop Unit Costs	\$1458.00
- Technical Assistance Unit Costs	\$41.00

Outcomes:

- Percentage of policy holders receiving CRS discount	82%
- Percentage increase in flood insurance policies	10%

Priority Ranking: 18

Program Name: Resource Assessment

Program Cost: State: \$582,504.59; Other: \$21,028.36; Federal: \$598,401.87

Program Goal:

To provide technology and information management and applications development services and support to the Division.

Program Objectives:

To develop a technological infrastructure that provides office automation, data base access, applications software, and communications services to all staff. To develop a statewide digital spatial data base of soils, wetlands, land use, hydrography, transportation, and hypsography at 1:24,000-scale and develop Digital Orthophoto Quarter-Quadrangles (DOQQs) at 1:12,000-scale for the coastal plain. To integrate the divisional data bases into a comprehensive information management system. To provide applications programming, analysis and cartographic support through the development of geographic information system and image processing capabilities. To provide access to GIS, satellite imagery, and other data to the science and public sector through the Internet. To establish and promote implementation of standards and procedures for digital data base development and applications that are adopted statewide.

Performance Measures:

Workload:

- The work performed during the project year is identified by the requirements of a Memorandums of Understanding between the SCDNR/WRD and the National Oceanic and Atmospheric Administration (NOAA) and through operational directives from the Division Deputy Director.

Reports, Products, and Services Delivered:

- The public access data server was upgraded to support DNR World Wide Web homepages and data dissemination.

- The SCDNR GIS Data Clearinghouse was developed and installed on the public access server to distribute GIS data to the public across the Internet.

- The Oracle data base management system software was installed to integrate various GIS, hydrologic, and climatological data into a comprehensive system.

- Two Windows NT servers were installed to centralize word processing, spreadsheet, and desktop publishing, desktop mapping and PC-based software management.

- Five printer servers were installed to promote use of shared printer resources.

- The internal division communications and computing network was redesigned to provide multi-server access to various PC and workstation-based office automation and data analysis applications software. All PCs are now standardized with regard to operating system, memory, disk storage, communications, and configuration.

- Data digitization was completed for 159 Digital Line Graphs and soils data for the Pee Dee and Lower Savannah River basins. Scanning of 600 Digital Orthophoto Quarter Quadrangles (DOQQs) was completed for the Coastal Plain. Contracts for wetlands/land use are continuing into FY 1997-98.

- Data edgematching, attributing, and quality review were completed for 200 Digital Line Graphs,

soils, and wetlands for the Edisto, Ashley-Cooper, Combahee-Coosawhatchie, & Lower Santee basins. These data were placed in the GIS Data Clearinghouse and are being accessed by the public.

- Approximately 175 maps, tables, charts, and graphics were digitized or otherwise generated for inclusion into reports, slides, or other presentation media.
- Staff participated in DNR and statewide committees addressing systems security, GIS data standards & coordination, strategic planning, inter- and intra-agency cooperation in addressing natural resource issues, and the State Mapping Advisory Committee.

#### Efficiency:

- Quality review for adherence to standards
- Development of and adherence to systems configuration and implementation plans
- Monthly operations directives and reports of accomplishments
- Directives and evaluations by the Division Director
- Financial reporting requirements (for Memoranda of Understanding)

First semi-annual report due 11/30/96, submitted 10/30/96

Second semi-annual report due 5/30/97, submitted 5/05/97

- Movement to client-server based office systems has reduced the operating system and applications software maintenance costs from \$850.00 to \$125.00 per workstation/unit.
- Use of common print stations has decreased support cost from \$100.00 to \$40.00 per unit and has increased the quality of the printed product to a postscript standard.

#### Outcomes:

- The major portion of data base development is jointly funded with federal government mapping agencies or is awarded to private sector vendors through a quality-based technical bid evaluation process. This has allowed the division to retain minimal staff while obtaining high quality data mapped to National Map Accuracy Standards for a 35-50% cost savings.
- Installation of various applications software servers has allowed the division to significantly reduce the number of software programs purchased and maintained through use of shared resources resulting in the savings indicated above.
- Following the installation of the SCDNR GIS Data Clearinghouse, more than two thousand digital map products were downloaded over the Internet within the first six months of its existence. Digital files were obtained by a wide variety of educational institutions, state, local and regional government agencies, private consulting firms, and private citizens. Dissemination of data over the Internet has allowed access to a wide range of uses with minimal allocation of staff time. Prior to the implementation of the Clearinghouse, data transfer was achieved by tape transfer which consumed substantial staff time and media costs.

Priority Ranking: 19

Program Name: Education Programs (Boater Education)

Program Cost: \$769,824.14

Program Goal:

Reduce boating accidents and produce a safer boating environment through:

- Providing boating education opportunities to all individuals interested in participating in a boating safety course.
- Implement the new boating safety act as required by law, which provides that any boater under the age of 16 that wishes to operate a motorized boat alone must complete a boating safety course.

Program Objectives:

- To increase the number of boating education programs offered.
- To make boating certification more convenient to the public.
- To certify new volunteer instructors.
- To find testing locations for the home study boating education program.
- To develop partnerships with other boating safety organizations.

Performance Measures:

Workload Indicators:

- Two hundred sixty boater education courses conducted by instructors.
- Identified home study testing location at Department of Public Safety, Motor Vehicle Division's driver's license offices.
- One hundred sixty five boating safety talks done by officers.
- Boating education video courses produced in partnership with the U.S. Power Squadron (U.S.P.S).
- Conducted forty two boating safety classes in conjunction with the (U.S.P.S).

Efficiency Measures:

- Cost per student participating in instructor taught classes - \$4.75.
- Cost per student participating in a home study course and tested at Department of Motor Vehicle's center - \$5.25
- Cost per student participating in video course - \$4.00.
- Cost per student participating in a safety talk - \$1.00.

Outcomes:

	1996-97
- Number of students participating in boating education course.	11,321
- Number of boating education classes conducted.	260
- Number of volunteer instructors	182
- Number of new instructors	40

Priority Ranking: 20

Program Name: Land Resource Planning and Information

Program Cost: State: \$541,055.32; Other: \$244,506.50; Federal: \$268,695.23

Program Goal:

To provide land resource planning information and planning assistance to sustain and enhance South Carolina's land and related natural resources.

Program Objectives:

To provide increased assistance to land users and policy makers in the use of accurate and up-to-date information for wise land management, sustainable development, and effective resource planning decisions in the state. To collect and analyze information on the existence and use of the state's land based natural resources and disseminate this information in the form of resource studies, inventories, maps, and direct public assistance. To further develop the use and application of remote sensing (satellite imagery and aerial photography) and image based data analysis as a resource planning tool. To operate the S.C. Land Resources Information Center (LRIC), South Carolina's affiliate office of the U.S. Geological Survey's Earth Science Information Center, and expand this center's technical assistance services to meet the increasing demands of a diverse and growing user community. To coordinate South Carolina's National Aerial Photography Program (NAPP), to be flown every five years, and manage the distribution and application of this product through the LRIC. To provide technical soils assistance and coordinate the division's responsibility related to the Cooperative Soil Survey Program and the Soil Classifiers Advisory Council. To promote environmentally compatible development through the Stewardship Development Program, effective natural resource planning through the Comprehensive Planning process, natural resource educational efforts through the South Carolina Maps and Aerial Photography Systems (SCMAPS) Program and other ongoing educational efforts, and provide input into DNR's Environmental Review Program.

Performance Measures:

Workload:

- Number of State and Regional Conference/workshops coordinated and/or assisted	44
- Number of land resource planning & management projects assisted	170
- Number of cartographic products sold to customers	16,429
- Approximate number of educational/informational products provided free	9,300
- Number of staff days of technical assistance provided	2,268
- Number of Land Trust Organizations assisted	19
- Number of Stewardship Development Projects designated	3
- Number of projects provided Stewardship Development technical assistance	14
- Number of major image based digital analysis projects/products	32

Efficiency:

- The ratio of staff to clients assisted	1:1,464
- Average cost to operate LRIC per product provided	\$1.89

Outcomes:

- Percentage of requests for planning & resources information satisfied by existing information/data	95%
- Number of individuals/entities assisted through the LRIC	4,329
- Number of individuals assisted through the Southeast Remote Sensing Center	240
- Number of partnerships with agencies and organizations	476
- Number of exhibits/displays	8
- Number of people directly assisted through exhibits/displays	3,300



Priority Ranking: 21

Program Name: State Lake Maintenance

Program Costs:      Appropriated FY97    \$ -0-  
                         Revenue      FY97    \$211,863  
                         Federal      FY97    \$ 84,794

Program Goal:

To provide DNR operated public lake facilities for recreational fishing opportunities

Program Objectives:

- To provide quality fishing opportunities through management of water quality and fish population structure.
- To provide maintenance of DNR operated lake facilities.

Performance Measures:

Workload:

- Managed fertility and other water quality and treated aquatic weeds at 15 public fish lakes containing 1,390 surface acres of water.
- Maintained the support facilities (boat ramps, parking lots, picnic areas, trails, grounds, etc) at 15 public fish lakes.

Efficiency:

- Maintenance and management of 15 public fishing lakes was accomplished at an average cost of \$213 per surface acre of water.

Outcomes:

1. Maintenance of DNR operated public fishing lakes provided a preferred public fishing opportunity. A 1990 survey of licensed anglers in South Carolina indicated that over 32% of the respondents usually fished in SCDNR public fishing lakes.
2. The assets and investments associated with the construction and/or development of agency operated public fishing impoundments must be maintained if the structures and their public enjoyment are to continue. Without routine maintenance negative actions may include, but not limited to:
  - increased liability associated to personal and property injury
  - loss of initial investments if structures are not maintained
  - loss of usage due to unsafe and unappealing conditions
  - loss of dam certification that could lead to the loss of the impoundment
  - loss of trust from those partners that share a cooperative agreement with DNR for management of their impoundment for public use
  - loss of public support for the agency's fishing lake program
3. Without proper maintenance of water quality, the DNR's public fishing impoundments would lose their ability to provide enjoyable and productive fishing experiences to the users of the resource. Maintenance of productive waters through fertilization is an essential component to managing intensively fished small impoundments, managing aquatic vegetation and managing the balance of fish populations. Water level and water

quality must be maintained to insure that the fishery is not harmed by negative impacts associated with poor water quality or fluctuating water levels. Management of aquatic vegetation is essential if the impoundment is to be accessed by anglers and if the fish population is to remain in a balanced healthy condition.

Priority Ranking: 22

Program Name: Magazine

Program Cost:      Appropriated FY97 \$507,187  
                         Revenue      FY97 \$495,722

Program Goal:

Provide educational information through a periodical designed for sales to citizens interested in outdoor recreation and the conservation of natural resources.

Program Objective:

To produce, promote and distribute six magazine issues per year to an audience of in-state and out-of-state paid subscribers, providing a variety of natural resource related article topics ranging from conservation and management issues to species and habitat requirements to outdoor recreation opportunities.

Performance Measures:

Workload

-6 *South Carolina Wildlife* staff members produce 6 sixty-page issues each containing 6-7 feature articles, 6 regular columns and 7-8 news items. The *South Carolina Wildlife* magazine is distributed to South Carolina school libraries and subscribers.

Efficiency

- \$0.62 cost per reader per issue

Outcomes

- Average number of readers reached per issue (not including schools) 224,000

Priority Ranking: 23

Program Name: Geological Survey

Program Cost: State: \$308,193.51; Other: \$39,145.29; Federal: \$77,302.82

Program Goal:

To serve the geologic needs of the citizens via a service-oriented program which collects, studies, interprets, and reports all information pertaining to the geology and mineral resources of the state.

Program Objectives:

To improve the quality and quantity of geologic data by systematically collecting surface and subsurface geologic information applicable to land-use planning, non-renewable natural resource conservation, waste disposal, geologic hazards assessment, geologic influences on potable water resources, waste clean-up problems, coastal change, and local availability of building materials. To provide this geologic information in the form of maps, bulletins, charts, economic statistics, and related series and open file reports to assist in planning, economic development, and ecosystem management.

Land Use/Environmental Studies

Performance Measures:

Workload:

- Geologically map and publish as open-file reports a number of 1:24,000 scale quadrangles from a variety of areas. Map area selection based on socio-economic needs for geologic information.
- I-85 growth corridor mapping: To produce seven (7) maps of the surface geology in Greenville and Spartanburg counties.
- Lake Marion mapping: To produce four (4) maps of the surface geology in the vicinity of Lake Marion north of the I-95 bridge.
- SRS Mapping: To complete and submit to Westinghouse two (2) maps of the surface geology on the SRS site.

Efficiency:

- Meetings. Meetings were held with county planners to determine areas where geologic information was needed.
- I-85 Growth Corridor mapping: Field work was completed, mylars drafted, and seven (7) quadrangles were placed on open-file. The cost per square mile mapped was \$396.00.
- Lake Marion mapping: Both auger and core drilling were completed, mylars drafted, and four (4) quadrangles were placed on open file. The cost per square mile mapped was \$398.00.
- SRS Mapping: Auger drilling was completed, logs and reports prepared, mylars drafted, and two (2) quadrangles placed on open file. The cost per square mile mapped was \$223.00.

Outcomes:

- Quadrangles to be mapped were successfully completed.

## Hazard Analysis

### Performance measures:

#### Workload:

- To design and develop a map to be used as a tool for use by emergency managers in planning for the response to and recovery from a major earthquake disaster in the Coastal Plain.

#### Efficiency:

- Meetings: Meetings were held with the South Carolina EPD to discuss the map design.
- Data were compiled from 443 7.5-minute quadrangle maps, existing geology maps, and maps showing liquefaction features.
- Compilation was completed, digitization of the data was completed, and the map was printed. The cost to prepare the map per copy was \$38.00.

#### Outcomes:

- The map was successfully completed, printed, and distributed to emergency managers.

## Education

### Performance measures:

#### Workload:

- To solicit and gather technical geology articles, have these articles referred by experts in the field, and publish a volume of *South Carolina Geology*.

#### Efficiency:

- Three articles were received, referred, and published. One article was prepared by the staff of the Geological Survey at a cost of \$27.00 per hour. Editing costs were \$24.00 per hour.
- Volume 39 of *South Carolina Geology* was published at a cost of \$3.10 per copy.

#### Outcomes:

- The 1996-97 volume of *South Carolina Geology* was successfully published and distributed.

Priority Ranking: 24

Program Name: Professional Licensing

Program Cost: State: \$3,223.37; Other: \$40,069.99; Federal: 0

Program Goal:

To protect the public health, safety, and welfare through the registration of qualified professionals and the regulation of the practice as mandated by Section 40-28-10, SC Code of Laws, 1976, as amended, and by Section 40-65-10, SC Code of Laws, 1976, as amended.

Program Objectives:

To provide for registration of qualified professionals and for regulation of the practice. To provide for the efficient and effective management of the registration process.

Performance Measures:

Workload:

- Number of Advisory Council Meetings	4
- Number of active practitioners	453
- Number of active firms	65
- Number of December exam candidates	16
- Number of June exam candidates	17
- Number of exam reviews (December exam)	3
- Number of requests for information	700
- Number of complaints investigated	1

Efficiency:

- Average cost/registrant	\$63.33
- Average cost/exam candidate	\$418.50

Outcomes:

- % of applications processed within 30 days	100%
- % of expenditures as compared to revenue generated	82%
- Total revenue generated	\$54,545.71

Priority Ranking: 25

Program Name: Support Services

Program Cost: Appropriated FY97 568,075  
Revenue FY97 32,356

Program Goals:

Provide timely and accurate news and information services to audiences of concerned citizens and the state's general public on behalf of all S.C. Department of Natural Resources' divisions.

Program Objectives:

To produce news releases, fishing trend reports, a quarterly newspaper, publications and videos. To provide support in the areas of mail services, duplicating and media relations.

Performance measures:

Workload:

- 3 news staffers produce 449 news releases which are distributed to newspapers, TV/radio stations, magazines and agency personnel.
- 2 video staffers produce 15 videos ranging in time from 30 seconds to 2 hours covering a variety of natural resource topics such as boater safety, SC MAPs, and nature preserves.
- One media staff member produces and records radio announcements; generally 5 to 8 announcements per disc, per quarter.
- 5 graphics/publications staff members produce 260 publications ranging in scope from in-house forms to multi page reports, brochures and posters.

Efficiency:

- Average cost for production, distribution and follow-up on a news release...\$237
- Average cost per video produced.....\$4,663
- Cost each quarter to produce disc.....\$2,087
- Average cost in staff salaries to produce 260 publications....\$549. (Printing and production cost are paid by the requestor).

Outcomes:

- Individuals reached through 19 daily newspapers (620,528 readers); 115 non-daily newspapers (882,066 readers); 103 radio stations; 29 television stations; and 28 magazines; the public is updated on programs and services, informed of important meetings where their input is needed and of changes in hunting, fishing and other outdoor regulations.

- Audiences are reached with the DNR message through PSA's, classroom training, and presentations to various groups and civic organizations.

Based on industry surveys which estimate that 60% of the total adult population (approximately 2,600,000 18 yrs of age or older) listen to the radio each day (based on 1990 census figures), 780,000 adults are reached with DNR public service announcements daily.

- Target audiences for the 260 publications produced annually range from 75 (technical reports) to 425,000 (hunting/fishing rules and regulations). Audiences are properly informed on rules, regulations and activities of the DNR.



Priority Ranking: 26

Program Name: Environmental Affairs

Program Cost: State: \$421,995.39; Other: 0; Federal: \$237,316.65

Program Goal:

To protect the environmental integrity of the State's water resources through a) conservation of riverine resources, b) prevention of water use impairment by nuisance aquatic plants and animals, c) influencing the decisions of environmental regulatory agencies and other entities taking actions affecting natural resources, and d) development of analytical chemical data needed for natural resource protection and management.

Program Objectives:

To assist local communities with watershed and river corridor planning. To designate and manage qualifying rivers as State Scenic Rivers. To promote stewardship of the State's rivers through education and citizen involvement activities. To prevent the introduction and spread of non-native aquatic plants and animals that impair beneficial water uses. To survey and monitor for the presence of nuisance aquatic plants and animals. To reduce the abundance of aquatic plants that interfere with the use of public waters. To coordinate agency-wide review of environmental permit applications and other environmental actions affecting natural resources for the 38 inland counties of the State. To provide water resource input to the environmental review process. To provide analytical laboratory support services to all divisions of the agency.

Performance Measures:

Workload:

- Watershed and river corridor planning projects included the Edisto and Reedy Rivers.
- State Scenic River projects included the Broad, Lower Saluda, Lynches and Little Pee Dee Rivers.
- River stewardship projects included River Sweep cleanup at 85 sites, Adopt-a-Landing projects at 40 landings, coordination of 38 events for S.C.Rivers Month and 58 river conservation presentations to public and private interest groups.
- 26 water bodies were surveyed/monitored for nuisance aquatic plants and zebra mussels.
- 19 water bodies (9,971 acres) were treated to control nuisance aquatic plants.
- Coordinated the activities of the Aquatic Plant Management Council and Zebra Mussel Task Force.
- 21 plant nurseries and pet shops were inspected for illegal aquatic plant sales.
- Nuisance plant and animal outreach activities included oral presentations, distribution of brochures and displays at the State Fair, Palmetto Sportsmen's Classic, Myrtle Beach Wildlife Exposition and Marine Fishing Fair.
- 882 environmental review requests were received, coordinated agency-wide and timely responses provided. Electronic and hard copy files were maintained for each review.
- 874 chemical analysis samples were analyzed, many for multiple parameters, for various agency programs.
- 57 zebra mussel monitoring samples were analyzed for larval and adult stages.

#### Efficiency:

- Average cost to manage State Scenic Rivers--\$702/river mile
- Average cost per River Sweep site cleaned--\$53/site.
- Average cost of watershed/river corridor planning projects--\$11/square mile.
- Average cost for nuisance plant and animal surveying/monitoring--\$77 per water body.
- Average cost for nuisance aquatic plants controlled--\$115/acre of water.
- Average cost of illegal aquatic plant sale inspections--\$9/site inspected.
- Average cost to coordinate and complete requested environmental reviews--\$46/review.
- Average cost to perform analytical laboratory service--\$51/sample analyzed.

#### Outcomes:

- 94 miles of South Carolina's most outstanding rivers are protected through State Scenic Rivers status.
- River outreach and stewardship activities have resulted in significant increases in public awareness of river values and participation in river conservation.
- Local governments and river interest groups are actively implementing recommendations developed in river corridor and watershed planning projects for the Lower Saluda, Catawba and Edisto Rivers.
- 57% (9,971 acres) of waterways infested with nuisance aquatic plants were controlled and made available for public use. (In addition, over 40,000 acres controlled in previous years remained weed-free and available for public use.)
- Public awareness of nuisance aquatic plant and animal problems increased as a result of outreach activities.
- Zebra mussels are not known to occur in South Carolina waters even though they are widely distributed throughout the eastern United States.
- Approximately 95% of DNR environmental review recommendations were accepted and implemented by the agency or entity requesting the review.
- 95% of all samples processed by the analytical laboratory were completed by the requested deadline.

Priority Ranking: 27

Program Name: Marine Resources Support Services

Program Cost: State: \$1,804,579 Federal: \$54,975 Other: \$535,050

Program Goal:

Provide the vessel, licensing, administrative resources and assistance to support the division's obligation for carrying out programs conducted by staff and the public

Program Objectives:

1. Operate four large vessels in support of research, management, and education projects
2. Administer applicable commercial and recreational fisheries licenses
3. Administer registration and titling of watercraft and outboard motors
4. Administer and oversee extramural funds in support of research, management, and education projects

Workload Indicators:

- 1a. Number of vessel days completed on inshore and offshore cruises: 291.5
- 1b. Number of projects supported by vessel operations: 15
- 2a. Number of commercial and recreational fisheries licenses issued: 20,917
- 2b. Number of man-hours spent to provide commercial and recreational fisheries licenses: 6,782
- 3a. Number of watercraft registered: 6,577
- 3b. Number of and outboard motors titled: 4,811
- 3c. Number of man-hours spent to register and title watercraft and outboards: 5,753
4. Number of extramural grants administered: 45

Efficiency Measures:

1. Average cost per operating day for all vessels: \$713.21
- 2a. Cost per commercial and recreational fisheries license issued: \$4.84
3. Percentage of extramural funds supporting personnel: 56%

Outcomes:

1. Rental fees generated from project vessel costs: \$319,670
2. Revenue generated by commercial and recreational fisheries licenses: \$643,649
3. Dollar amount of extramural funds administered (incl. fringe benefits & indirect): \$4,455,031

Priority Ranking: 28

Program Name: Heavy Equipment

Program Costs:	Appropriated FY97:	\$	0
	Revenue FY97:	\$	0
	Federal FY97:	\$	102,612

Goal:

To provide heavy equipment assistance in support of a wide variety of land based projects of the Department of Natural Resources.

Program Objective:

Develop and maintain DNR field projects to protect valuable resources and enhance access for public use.

Performance Measures:

Workload:

Construction projects throughout the state on DNR owned properties to reduce the need for contractual work. Construction Projects Included:

- Removing a boat ramp at John D. Long Lake.
- Dam repairs at Campbell Fish Hatchery.
- Major renovations to ponds and drainage ditches at Spring Stevens Fish Hatchery.
- Habitat enhancement to protect rare plants at Windmill Highpond Heritage Preserve.
- Access improvement at Waccamaw River and Cartwheel Bay Heritage Preserves.
- Road establishment on recently acquired Draper WMA.

Efficiency:

Equipment operator costs were approx. \$12.00/hour

Overall project costs were approx. \$25.00/hour (1/3 the cost of private contractors).

Outcomes:

-Construction projects completed during FY97 will ensure continued operation of fish hatcheries, enhance threatened plant populations and provide access to DNR properties.

Priority Ranking: 29

Program Name: Clemson Cooperative Program

Program Costs:	Appropriated FY97:	\$	0
	Revenue FY97:	\$	38,500
	Federal FY97:	\$	0

Program Goal:

To assist the DNR with cooperative research, extension, and educational programs concerning our state's natural resources.

Program Objectives:

To conduct research on priority natural resource issues; to provide educational assistance to Clemson University students in natural resource management; and to inform the public about natural resource issues.

Performance Measures:

Workload:

- Conduct cooperative research on deer, dove and striped bass
- Conduct training workshops on mandatory hunter education and nuisance wildlife control
- Provide training for graduate and undergraduate students in natural resource management

Efficiency:

Over 700 man days of work was performed utilizing interns at minimum wage.

Outcome:

1. Undergraduate students received job relating training to assist them in career planning. 14 undergraduate students were provided internships with the DNR 2 students were provided masters degree assistantships
2. Mandatory hunter education courses assured safer and better educated sportsmen. 500 citizens received mandatory hunter education courses at Extension Service offices.
3. High priority research assures that management decisions on natural resources are based on sound, scientific data. 94 people attended a Nuisance Wildlife Control workshop.

Priority Ranking: 30

Program Name: Forest Stewardship

Program Costs:	Appropriated FY97:	\$	0
	Revenue FY97:	\$	0
	Federal FY97:	\$	49,972

Program Goal:

To assist and encourage non-industrial private landowners in active management of natural resources on their property.

Program Objectives:

To provide resource management plans for and encourage implementation of habitat management practices to benefit wildlife on private lands in South Carolina.

Performance Measures:

Workload:

- Conduct on site habitat evaluations. 83 site visits were conducted.
- Write habitat management plans. 56 stewardship management plans were written.
- Consult with other resource professionals in development of multiple resource management plans. 11 plans reviewed for other professionals.

Efficiency:

- Project costs per completed plan was approx. \$130/plan.
- Private consultant plans in the same program average \$400/plan.

Outcome:

Technical wildlife management plans are provided to private landowners with a commitment to multiple resource management. The citizens and wildlife benefit through improved habitat conditions and enhanced environmental quality.

Priority Ranking: 31

Program Name: Congaree/Wateree Field Station

Program Costs:      Appropriated FY97 \$ -0-  
                         Revenue      FY97 \$107,114  
                         Federal      FY97 \$153,941

Program Goal:

To collect and evaluate all relevant data, disseminate information and make recommendations to support management and conservation of the freshwater fisheries of South Carolina.

Program Objectives:

- To provide supportive analytical services.
- To conduct field, laboratory, literature research.
- To provide technical assistance and technology transfer to other programs within the freshwater fisheries section.

Performance Measures:

Workload:

- Genetic evaluation of largemouth bass and bluegill from South Carolina reservoirs.
- Evaluate larval growth and food habits of striped bass in Lake Marion.
- Evaluate growth and survival of two different largemouth genetic strains in South Carolina ponds and lakes.
- Genetic evaluation of coastal river striped bass populations.
- Genetic evaluation of redeye bass populations in South Carolina streams.
- Provide technical assistance in aging flathead catfish from South Carolina coastal streams.
- Evaluate the quality and consistency of largemouth bass population assessment data for eight fishery districts from 52 lakes reservoirs and streams.

Efficiency:

- Lake and reservoir studies were carried out at a cost of \$88,750.
- River and stream projects were carried out at a cost of \$49,600.
- Largemouth bass data evaluation was carried out at a cost of \$78,000.

Outcomes:

1. The technical assistance provided by this activity gives the Section access to support services not routinely available. The centralization and coordination of the projects' support services insure a needed level of consistency and quality control between the projects and the many resource partners that the Section works with on a daily basis. Examples include, but are not limited to:
  - assuring that graduate students are obtained for projects needing specific bodies of work. This project assures that the research is well designed and completed as required. This project also assures that the research fits into the DNR's needs and is of the highest priority.
  - this project coordinates the activities of regional cooperative units that

provide services to the Section and its projects. The Southeastern Genetics Cooperative Unit, Southeastern Fish Disease Project, Clemson Statistical Cooperative Project and the regional effort to obtain FDA clearance to use selected chemical are all projects that require coordination if their value to the agency is to remain.

- access to specialized services at universities, other research institutions and through private industry is obtained by the activities of this project.

2. Research. All research is mission oriented.
  - a. Research on the genetic makeup of selected fish species is continuing. The identification of any distinct genetic characteristics is then used as part of the management decision making process. Unique genetic stocks are left undisturbed by not taking immediate management action until it is determined that the best interest of the resource is considered. These data are used routinely to manage striped bass, black bass and trout resources. In addition, ongoing research on the performance characteristics of South Carolina's unique largemouth bass strains is providing information that will be used to decide if segregated stocks of brood fish will result in healthier fish populations.
  - b. The Section's large data base of largemouth bass data has routinely been used to address localized areas of interest. This program is responsible for compiling, analyzing and reporting the finding of the data on a statewide basis. Upon completion of this project it is expected that discrete regional variations will lead managers to view the resource in a more holistic manner.



Priority Ranking: 32

Program Name: Coastal Reserves, Education, and Outreach

Program Cost: State: \$90,000 Federal: \$175,000 Other: \$18,000

Program Goal:

To educate and provide technical assistance services to citizens of South Carolina to ensure the sustainable use of the state's marine fisheries and associated habitat

Program Objectives:

1. To provide information and education to the public on marine resources activities and programs
2. To provide educational experiences for K-12 educational groups
3. To develop and manage protected coastal habitats
4. To provide outreach support through the regional biologist program to the coastal areas of the state
5. To work with the three citizen's advisory committees pertinent to the Division

Workload Indicators:

- 1a. Number of news releases completed and distributed: 50
- 1b. Number of publications prepared: 7
- 2a. Number of individuals participating in educational tours and activities: 20,000
- 2b. Number of educational tours and activities: 197
- 3a. Number of acres managed in coastal reserve system (Capers Island, ACE Basin NERRS, and Victoria Bluff): 142,100
- 3b. Number of permits issued to overnight users of coastal reserves: 205
4. Number of requests for technical assistance through the regional biologist program: 1,228

Efficiency Measures:

1. Cost per publication: \$0.15
2. Cost per individual participating in educational tours and activities: \$3.05
- 3a. Cost per acre to manage coastal reserve system: \$11.07
- 3b. Cost per permitted overnight visitor to coastal reserve system: \$1.37
4. Cost per assistance call by regional biologist: \$16.29

Outcomes:

1. Number of individual teacher per educational tour/activity: 102
2. Number of individuals reached per educational tour/activity: 243
3. Improvements to coastal reserve system (additional acreage, capital improvements, grants to conduct programs, etc.): Docking facilities (\$60,000) and land acquisition (\$174,200)
4. Number of individuals benefiting from regional biologist assistance: 3,050

Priority Ranking: 33

Program Name: Nonpoint Source

Program Cost: State: \$36,113.22; Other: 0; Federal: \$81,999.04

Program Goal:

To assist land users and the general public with preventing nonpoint source (NPS) pollution from land use activities.

Program Objectives:

To conduct projects in priority watersheds. To conduct education and training. To implement demonstrations of Best Management Practices (BMPs) that prevent NPS pollution. To develop educational materials for statewide use. To provide planning, technical and other assistance. To conduct activities in cooperation with other agencies and organizations when conducive to achieving the purpose of the activities more effectively and efficiently.

Performance Measures\*

Workload:

- 10 projects were implemented, including five watershed projects in high priority watersheds.
- Planning, technical, or other assistance was provided to 165 individuals and organizations.
- Fourteen BMP demonstrations were implemented.
- 64 educational and training workshops were conducted.
- Education or training was provided for 3,845 people.
- The remaining 50 percent of the agricultural nonpoint source handbook was completed, and the handbook was published.
- Drafts of 19 educational brochures were developed.

Efficiency:

- The ten projects were coordinated by one person.
- The ratio of State to non-state funds and in-kind services for the program was 1:2.3.
- Projects were conducted in cooperation with 81 agencies and organizations.

Outcomes:

- 52% of the targeted land users in the watershed projects were reached through education, training, or technical assistance.
- 96% of the land users who were provided technical assistance implemented BMPs.
- 96% of the BMPs that were implemented were effective in reducing NPS pollution.

\* Most projects are generally from three to five years long. Statistics may vary significantly from year to year according to the phases of the projects each year.

Priority Ranking: 34

Program Name: County Fund Operations

Program Cost: \$217,660.14

Program Goal:

To adequately equip DNR law enforcement officers with equipment, supplies and services that promote officer safety and improve their ability to enforce the wildlife, fish, boating and other related laws and regulations that protect our states natural resources.

The equipment, supplies, and services are intended to support the basic goals and objectives of the Law Enforcement Field Operations section as outlined in the Law Enforcement Operations portion of this report.

Program Objectives:

- To utilize County Funds to purchase approved items of equipment, supplies, and services (boats, ATV's, pagers/paging service, computers, and specialized clothing) for patrol districts for which department revenue, state appropriations, or federal funds are not available. The aforementioned equipment, supplies, and services are needed in order for DNR law enforcement officers to effectively and efficiently conduct law enforcement operations.

Performance Measures:

Workload:

- 6 boats, motors and trailers were purchased with County Funds for DNR law enforcement.
- 11 ATV's and 4 ATV ramps/trailers were purchased for DNR law enforcement.
- 5 computers and 4 computer up-grades were purchased for law enforcement district offices.
- 2 cameras, 1 video recorder, 3 laser range finders, 1 set of night vision goggles and a variety of speciality clothing items were purchased for DNR law enforcement.

Efficiency:

- See "Efficiency Measures" listed in the Law Enforcement Field Operations portion of this report. (Equipment purchased by the Law Enforcement Division with County Funds is used primarily for law enforcement purposes).

Outcomes:

- See "Efficiency Measures" listed in the Law Enforcement Field Operations portion of this report.