

Georgia Department of Natural Resources

1989 ANNUAL REPORT

RECEIVED

MAY 1 1990

DOCUMENTS
UGA LIBRARIES

Georgia Department of Natural Resources

A Message from the Commissioner


Dear Georgians:

The Department of Natural Resources' *Five-Year Management Strategy*, in combination with milestone legislation approved by the General Assembly, established major initiatives in fiscal 1989 to protect Georgia's natural and environmental resources well into the next century.

The year was one of significant progress for environmental protection. Enactment of Governor Harris' Growth Strategies legislation resulted in new laws authorizing protection of critical watersheds, freshwater wetlands and groundwater recharge areas; development of water supply reservoirs throughout north and central Georgia; and strengthened erosion and sedimentation regulations for improved water quality. The Department's *Five-Year Strategy* prioritized eliminating toxins in the environment, upgrading water quality, attaining clean air standards for ozone in Atlanta, completing a comprehensive groundwater management plan, and many other programs vital to the conservation and improvement of Georgia's air, land and water resources.

Funds from two consecutive bond sales approved by the General Assembly enabled the Department to purchase \$15 million in public wildlife lands in fiscal 1989 and to add an additional \$15 million in lands during fiscal 1990. Across-the-board upgrading of State parks and historic sites continued during the year, with new lodges, visitor centers and other facilities opened. State parks drew over 14 million visitors in fiscal 1989, another record, making an outstanding contribution to Georgia's tourism industry and stimulating citizen interest in these valuable resources. Coastal Resources continued programs to enhance Georgia's vast saltmarshes and recreational and commercial fishing. Special Programs continued successful efforts to restore nongame wildlife and provide wildlife-related educational opportunities.

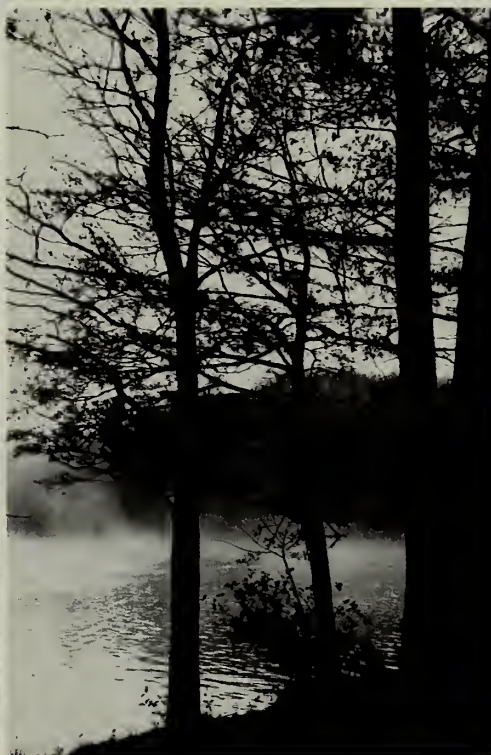
On behalf of the Department and the Board of Natural Resources, I am pleased to present this report of substantial achievement made in fiscal 1989 for the improvement and protection of Georgia's natural and environmental resources. I extend my sincere thanks for your continued support of programs to manage and protect these resources for present and future generations.



J. Leonard Ledbetter

Commissioner

Georgia Department of Natural Resources



Contents

2	Introduction	18	Parks, Recreation and Historic Sites
4	Special Programs	22	Coastal Resources
8	Environmental Protection	25	1989 Budget/ Funding Sources
14	Game and Fish		



Joe Frank Harris
Governor

J. Leonard Ledbetter
Commissioner

The Board of Natural Resources

James H. (Herb) Butler
Chairman, Member-at-Large

James Griffin, Jr.
Vice Chairman, Member-at-Large

Patricia C. Edwards
Secretary, Third District

Dolan E. Brown, Jr.
First District

J. Leonard Eubanks
Second District

Linda S. Billingsley
Fourth District

Marshall L. Mitchell
Fifth District

Felker W. Ward, Jr.
Sixth District

C.W. (Sonny) Jackson
Seventh District

J. Wimbric Walker
Eighth District

Donald J. Carter
Ninth District

C. Tom Griffith
Tenth District

Will D. (Billy) Herrin
Coastal District

John Lanigan
Member-at-Large

Glenn E. Taylor
Member-at-Large



Introduction

*The **Vision** of the Georgia Department of Natural Resources (DNR) is to guide and promote the wise use of the State's natural, environmental, historic, archaeological and recreational resources for the benefit of present and future generations. The Department's **Mission** is to continually implement programs established in a **Five-Year Strategy for Managing Natural and Environmental Resources**, an ongoing "business plan" that sets new priorities yearly, and is developed with participation of Department personnel and other interested individuals, in accordance with direction from U.S. Congress, the Georgia General Assembly, the Governor, the Judicial System, the Board of Natural Resources, and other government agencies.*

Organized as an agency of State government in 1972, the Department is governed by a 15-member Board, appointed by the Governor and approved by the State Senate, to serve staggered, seven-year terms. A Board-appointed Commissioner is the Department's Chief Executive. Major operating Divisions include Environmental Protection; Game and Fish; Parks, Recreation and Historic Sites; and Coastal Resources.

During fiscal 1989, the Georgia Department of Natural Resources revised its ongoing *Five-Year Strategy for Managing Natural and Environmental Resources* to meet the demands that will be placed on these resources in the coming decade. In combination with landmark Governor's Growth Strategies legislation enacted by the 1989 General Assembly, new priorities were set to improve Georgia's air, land, water, wildlife, recreational and coastal resources as expanding populations, development and land-use changes continue to have widespread impact. At the forefront of all new programs and objectives is the Department's commitment to help communities cope with rapid, growth-related changes that increasingly stress natural and environmental resources that are finite and irreplaceable.

New State laws require that criteria to protect natural and environmental resources be included in regional and local planning. The Department prepared to assist in the implementation of the **Growth Strategies Planning Act** in fiscal 1989, which authorizes protection of critical watersheds, freshwater wetlands and groundwater recharge areas. The **1989 Georgia Water Supply Act** authorized DNR to begin developing a network of **regional water supply reservoirs** for north and central Georgia. These reservoirs will serve multiple jurisdictions and ensure drinking water for communities to meet the demands of future growth and provide protection against drought. An amended **Erosion and Sedimentation Act** will further protect waters from a leading pollution problem, sedimentation in lakes, streams and rivers.

***Five-Year Strategy Goals.** Departmental goals set*



under the *Five-Year Strategy* during fiscal 1989 address Georgia's major resource protection challenges, and work in concert with new legislation. These goals include:

- **Reduction or elimination of any source of chemicals in the environment to levels below established standards for air, surface water, groundwater and community water systems, and solid waste management facilities.**
- **Meeting public needs for wildlife-oriented recreation by acquiring and developing lands for wildlife management and recreation.**
- **Maximizing the operational efficiency of existing sites and beginning management of new facilities in the Georgia State Parks and Historic Sites system.**
- **Implementing the Regional Reservoirs Program for the State, as funded.**
- **Implementing an expanded communications and public awareness program to inform the public of DNR programs and initiatives.**
- **Implementing a Coastal Waterbottoms Leasing Program.**
- **Implementing a Wetlands Management Program.**

With leadership provided by the Governor, the General Assembly, the Growth Strategies Commission and its successor, the Governor's Development Council, Georgia communities will be enabled to develop an adequate infrastructure to meet the demands of growth, in keeping with the goals of natural and environmental resource conservation.



Priorities set during fiscal year 1989 include reducing chemicals in air, land and water; acquiring lands for wildlife management and recreation; improving State Parks and Historic Sites; and implementing a coastal waterbottoms leasing program.



New laws authorize the establishment of programs to protect critical watersheds, groundwater recharge zones and freshwater wetlands.

DNR Special Programs

REGIONAL WATER SUPPLY RESERVOIRS PROGRAM

As set forth in the Department's *Five-Year Strategy*, the development of **regional water supply reservoirs**⁽¹⁾ throughout north and central Georgia is a major priority, made possible by the **1989 Georgia Water Supply Act**. This law, enacted as part of the Governor's 1989 Growth Strategies legislation package, authorized DNR to begin developing a network of approximately 12 regional reservoirs in north Georgia, each to serve multiple jurisdictions. During the 1989 legislative session, the General Assembly appropriated funds to study, select a site and acquire land for the first regional reservoir, to be located in West Georgia.

The importance of developing regional reservoirs cannot be overemphasized, as they will permit the State to support continued growth by supplementing community water systems that cannot meet increasing water demands. They will also facilitate the optimal use of Georgia's water resources by providing strategically placed, large-capacity water supplies for long-term needs.

⁽¹⁾ Regional reservoirs are distinct from community reservoirs being developed by local governments. DNR will build and operate the larger regional reservoir systems, while communities develop their own local reservoirs, which jurisdictions may elect to share. The Department assists development of local reservoirs with grants to fund siting studies, and technical advisement, and will continue providing this guidance.

In fiscal 1989, the Department successfully started up the Regional Reservoirs Program by identifying 12 potential reservoir sites, consolidating efforts to develop the reservoirs under the Commissioner's Office, and employing a program manager. When the reservoirs are built, DNR will maintain them for the State. Communities will pay for the water they withdraw, and these funds will be used for building and maintaining the reservoir system.

FRESHWATER WETLANDS & HERITAGE INVENTORY

Through the Natural Heritage Inventory Program, begun jointly with The Nature Conservancy in 1986, the Department has mapped, computerized and catalogued information on more than 2,100 occurrences of rare species and natural communities. Over 150 federal, State and private properties that provide some protection to these resources have also been mapped and entered in the program's computer-assisted data base.



The Heritage Inventory prepared nominations for State-registered natural areas including Crockford-Pigeon Mountain wildlife management area (left). A field survey resulted in the discovery of 18 new occurrences of the rare plumleaf azalea (inset).

During fiscal year 1989, the Heritage Inventory continued to expand its data bases through field surveys for rare species and natural communities and searches of museums and herbaria. Major progress was made on the managed areas data base, as 49 new site records for State Parks, Historic Sites and Wildlife Management Areas were added and 100 records were updated. Information on all mammals, reptiles and amphibians in Georgia was added to a data base of vertebrate natural history. The program's staff also responded to hundreds of requests for information and environmental review from the public, consulting firms, developers, local governments and planners, utility companies and federal agencies. The staff assisted in field evaluations of potential State Wildlife Management Area lands, as well.

The Heritage Inventory administers Georgia's Protected Plants, Natural Areas and Ginseng Management Programs. Accomplishments of these programs included management plans and nomination packages for two proposed State Registered Natural Areas; preserve design packages for 25 rare species/natural community sites; two federally funded status survey projects on rare plants; assistance with plant rescue operations; and projects for three federally protected plants. The booklet, "Georgia's Protected Plants" and

all reporting forms used in Ginseng management were revised; a ginseng annual status survey and harvest reports were completed, as well as field surveys of ginseng research plots in north Georgia.

The Freshwater Wetlands and Heritage Inventory Program was organized during fiscal year 1989 following the General Assembly's passage of the 1989 Growth Strategies Planning Act, which provided for the establishment of a program to manage Georgia's freshwater wetlands. The new program is intended to identify and map the State's freshwater wetlands and assess the effects of widespread land-use changes that alter or destroy freshwater wetlands and many types of rare or unique natural communities.

Georgia's approximate five million acres of wetlands provide flood and storm damage protection and erosion control, help maintain water quality and supply, recharge aquifers and provide significant wildlife habitat. During fiscal year 1989, the Department continued efforts to develop a program for the inventory and conservation of wetlands.

An inventory of freshwater wetlands and an extensive inventory of rare plants, animals and natural communities is being undertaken, to be maintained in a computer-assisted data base for easy retrieval. This information will especially benefit planners in local



Herb Cawthorne



Herb Cawthorne

governments and others involved in projects that could impact wetlands. During fiscal year 1989, staff assisted in assessing probable impacts on wetlands of proposed water supply reservoirs, public fishing areas and other planned developments, and evaluated State-owned lands for their potential use in mitigating wetland losses. A management plan for the State-owned portion of Phinizy Swamp near Augusta was also completed.

Information gathered by the Freshwater Wetlands and Heritage Inventory Program will benefit not only DNR's own resource management efforts, but those of local governments, private resource managers, developers and others involved in land-use planning. The development of data bases for all freshwater wetlands, rare plants, rare animals and natural communities will aid the Department and the State in protecting these important resources.

THE NONGAME WILDLIFE PROGRAM

The Nongame Wildlife Conservation and Habitat Acquisition Fund was established by the Georgia General Assembly and approved by Governor Harris in 1986, to raise funds to restore nongame wildlife species and their habitats in Georgia. Nongame species in the State include approximately 1,300 plants and 875 animals that are not legally hunted, trapped or fished, many of which are threatened or endangered.

The restoration and protection of these species is important because land-use changes continue to destroy habitats, and their welfare is important to the quality of life enjoyed by all Georgians. During fiscal 1989, staff from all Divisions worked with private citizens and corporations, promoting awareness of nongame wildlife, raising nearly \$500,000, and working to develop and promote a Statewide income tax checkoff donation program, to become effective for taxable year 1989. Through the donations of Georgians using the new income tax checkoff line as they file 1989 tax returns in 1990, the Nongame Wildlife Pro-



Programs to restore nongame wildlife included projects for (clockwise, from left) bluebirds, ospreys, gopher tortoises and peregrine falcons. Top, Georgia Power Co. participates in a peregrine urban hacking project atop the company's downtown Atlanta headquarters.

gram is expected to raise additional funds.

During fiscal 1989, the Department completed a 22-minute documentary entitled "Give Wildlife a Chance," which discusses nongame wildlife and the program's goals and accomplishments to date. A nongame Task Force and Speaker's Bureau were established to inform groups about wildlife restoration efforts and the income tax checkoff program. A wide variety of educational materials were produced, including a nongame wildlife poster, pamphlets on individual species and news releases. In a Raptor Restoration Project, nine bald eagles, 13 golden eagles, six peregrine falcons and four osprey have been reared and released in Georgia. Seventeen nongame research and survey projects were conducted through the Game and Fish Division, as well as numerous surveys by the Coastal Resources Division. The program funded nongame facilities at State parks and Wildlife Management Areas (WMAs) including Panola Mountain, Seminole, Watson Mill Bridge and Vogel State parks; and Arrowhead, Lake Burton and Grand Bay WMAs. The State Parks, Recreation and Historic Sites Division planted and maintained over 15 acres of butterfly and wildflower meadows and constructed and sold 2,000 bluebird nest boxes, from which an estimated 250,000 bluebirds were hatched in the spring.

CHANGE MANAGEMENT EMPLOYEE SEMINARS

Employees from throughout the Department began participation in Change Management workshops in fiscal 1989. These progressive seminars promote improved interdepartmental communication and facilitate employee involvement in establishing DNR priorities, under the *Five-Year Strategy* planning process.

The Department's *Five-Year Strategy* was first presented to Governor Joe Frank Harris in September 1986 by the Board of Natural Resources, and the document succeeded in getting many DNR objectives funded by the 1987 session of the General Assembly. The *Five-Year Strategy* represents DNR's commitment to meeting the mounting challenges of managing and promoting the wise use of Georgia's natural, environmental, cultural and recreational resources. By prioritizing the Department's programs, the *Five-Year Strategy* helps the agency evaluate current actions and determine which should be continued and which should not. Through the seminars DNR has gathered valuable input from all levels of personnel, to help guide the direction the *Five-Year Strategy* will take in years to come.



The Chattahoochee River supplies drinking water for more than two million Atlanta area residents. DNR prioritized programs to protect the quality of all Georgia's waters during fiscal year 1989.

Environmental Protection

During fiscal 1989, DNR established new Environmental Protection goals under the *Five-Year Strategy*, focusing on eliminating toxic chemicals in the environment, control of nonpoint water pollution, meeting air quality standards in metro Atlanta and other major challenges. The Environmental Protection Division (EPD) began implementing provisions of the Growth Strategies Planning Act to safeguard freshwater wetlands, critical watersheds and groundwater recharge areas. Water protection was significantly strengthened with the upgrading of State water quality standards and legislative amendments that placed stronger controls on activities that contribute to erosion and sedimentation of lakes, streams and rivers.

Working within the framework of 20 State and federal laws to protect, manage and improve Georgia's air, land and water resources, the Division continued assisting communities through ongoing programs, technical advisement, grants, loans and progressive leadership concerning alternatives for waste disposal, wastewater treatment and other environmental issues. Under the Department's *Five-Year Strategy*, Environmental Protection priorities set during the fiscal year include:

- **Reduction or elimination of any source of chemicals in the environment to levels below established standards for air, water, ground-**

water and community water systems and solid waste management facilities;

- **Completion of a comprehensive control program for nonpoint water pollution;**
- **Attainment of the federal ozone air quality standard in the Atlanta area;**
- **Completion of Georgia's comprehensive groundwater management program;**
- **Upgrading of high hazard Soil Conservation Service dams, for permitting under the Safe Dams Act.**

Grants and Loans. The Division distributed \$7.5 million under the Environmental Facilities Grants Program during the year, helping some 130 communities build or improve environmental facilities. Of these monies, \$1 million funded emergency water and sewer improvements; \$1.7 million funded solid waste management projects; and \$4.3 million supported economic development opportunities. Twelve of the 52 communities that received economic development grants were also assisted with loans from the Georgia Environmental Facilities Authority (GEFA). EPD also administers the State Revolving Loan Fund which provides low-interest loans to fund community wastewater treatment system improvements. During the fiscal year, approximately \$31 million was made available to Georgia communities through this program.

AIR PROTECTION

Except for the metropolitan Atlanta area, Georgia's air met all State and federal air quality standards during the year. For several days in the summer of 1988, Atlanta was among approximately 100 metropolitan areas in the U.S. that failed to meet federal air quality standards for ozone, an air pollutant formed when volatile organic compounds (VOCs) from auto emissions, industries and natural sources, combine with nitrogen oxides from fuel burning in the presence of intense sunlight.

EPD participated in research to better determine how ozone forms, and what types of additional controls will be needed to reduce ozone to meet federal standards, during the year. Conducted in cooperation with Georgia Tech, the University of Georgia and the U.S. Environmental Protection Agency (EPA), these studies revealed new information on the major role that natural VOC emissions (from trees or vegetation) play in ozone formation. Because emissions from trees had never been seriously considered, future plans to control ozone will take this important information into account. A sophisticated computer model that will estimate the impact of new controls on emissions that form ozone is also being developed.

Meanwhile, EPD required additional controls on approximately 100 more industries emitting VOCs in 11 metro Atlanta counties. By early 1990, all industries in the metro Atlanta area are scheduled to have installed controls to reduce emissions at the source, bringing them into full compliance with rules established by the Board of Natural Resources. An improved State Vehicle Inspection and Maintenance Program that requires computerized testing of automobile emissions in four metropolitan counties was continued. This program is administered by the Department of Public Safety. A new exhaust test method has resulted in more reliable testing, and State-licensed operators consistently have detected more emissions that fail to meet required exhaust levels.

Air Toxics. EPD obtained information on emissions of toxic chemicals from 350 industrial operations which emit 12 potentially toxic compounds during fiscal year 1989. The information was used to determine air quality levels around industrial plants and compare those against levels considered acceptable in the general atmosphere. Added emission controls were required for 13 of these operations. EPD continued to evaluate the toxicity of air emissions from new or expanded industry operations, using the air permit process; and requiring controls mandated under the Federal Clean Air Act.

Air sampling for **acid rain** continued through a statewide testing network. The annual average acidity of rainfall in Georgia is approximately 4.6. Unpolluted rainfall ranges from 4.8 to 5.6 pH.



During the year, DNR participated in studies determining that trees and other vegetation play an important role in ozone formation.

WATER RESOURCE MANAGEMENT

Water Supply. EPD encouraged community efforts to develop local water supply reservoirs, providing technical and financial assistance for siting studies. Grants were awarded to five communities to fund such studies. The reservoirs will be community-built and operated by single or multiple jurisdictions, and will provide for growing water needs while enabling communities to protect themselves from the damaging effects of drought. During fiscal 1989, 15 local reservoir projects were underway in Georgia. Of these, two were under construction, five were in the design or land-purchase phases, and eight were undergoing site selection studies.

Because protection of wetlands has become a major priority, an important consideration when selecting potential local reservoir sites is avoidance of disturbing wetlands. To assist local governments in selecting local reservoir sites, EPD formed a task force comprised of personnel from DNR, the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers.

Through further studies authorized by Congress, the U.S. Army Corps of Engineers has recommended reallocation of a portion of the hydropower storage

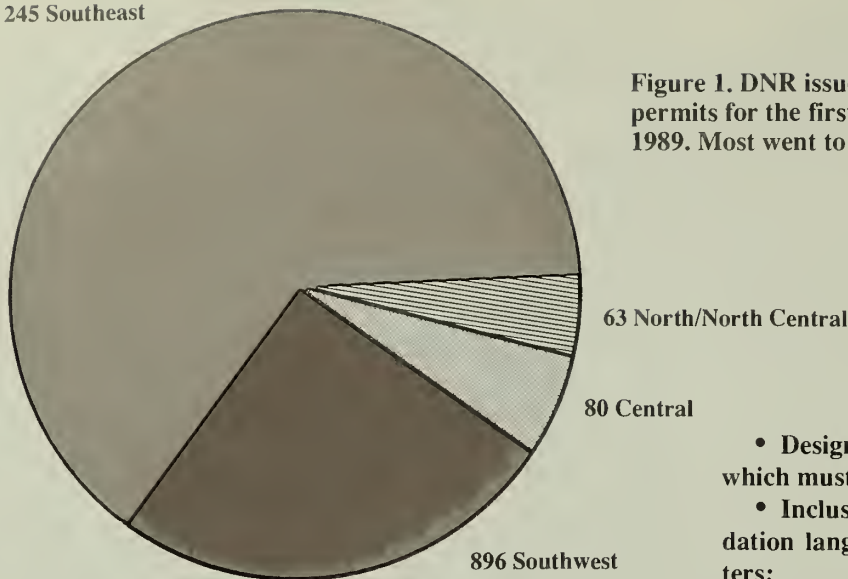


Figure 1. DNR issued agricultural water withdrawal permits for the first time during fiscal year 1989. Most went to farmers in southwest Georgia.

capacity of Lake Lanier to provide drinking water for the metro Atlanta area through the year 2010. The Corps' studies document no significant downstream impact.

The permitting of agricultural water withdrawals proceeded rapidly, as EPD issued 1,257 permits to farmers. DNR expects to issue an additional 10,000 agricultural permits over the next two years. Most permits issued went to farmers in southwest Georgia. (See figure 1.)

EPD continued monitoring public drinking water and tested 343 systems for volatile organic compounds (VOCs) during the fiscal year. These water supply systems serve approximately 4.3 million people, or 72 percent of Georgia's population. Monitoring revealed that four systems had concentrations of contaminants exceeding State and federal safe drinking water limits. All four were closed and communities tapped alternate water sources.

Under the Safe Dams Program, EPD inspected 258 dams for compliance with the Safe Dams Act. Five required repairs were completed. Three permits were issued for water supply reservoir dams.

WATER PROTECTION

During the past 15 years, the protection of water quality has been increasingly mandated by State and federal laws. Progress has been made, particularly in the area of wastewater treatment, to correct the number-one water pollution problem, inadequately treated municipal wastewater. During fiscal year 1989, the Division continued the clean-up of Georgia's rivers, streams and lakes through implementation of a comprehensive **Clean Water Strategy**. The year also saw major improvements in the State's water quality standards. These included:

- **Addition of higher standards for toxic pollutants in Georgia streams to protect fish from being contaminated by toxins, and protect human health by reducing the lifetime cancer risk from eating fish from any stream;**

- **Designation of shellfish growing waters, which must meet higher standards;**
- **Inclusion of tougher stream anti-degradation language to protect high-quality waters;**
- **Revision of acceptable bacteria levels for streams designated for fishing and used as swimming waters;**
- **Upgrading of Savannah Harbor's water quality status to a newly-established coastal fishing classification.**

Because of these improvements in the State's water quality standards, a total of 126 pollutants considered toxic under federal statutes, plus three additional pesticides/herbicides, are regulated. All Georgia's waters are classified for uses that meet the "fishable/swimmable" goals of the Federal Clean Water Act.

To implement these new standards, the Division required that 18 industries upgrade their systems to provide more extensive wastewater treatment. Approximately 40 additional industries will require upgrades to meet the new standards under amended permits during fiscal 1990. The Federal Clean Water Act requires that these upgrades be completed within three years.

Nonpoint Sources of Water Pollution. Other significant progress resulted from legislation that will impose more stringent regulations on land-disturbing activities that result in erosion and sedimentation, which carry pollutants into waterways. The General Assembly's passage of an amended Erosion and Sedimentation Act, also part of the Governor's Growth Strategies legislation, is expected to result in better control of this persistent water quality problem. (The Act is implemented by EPD's Land Protection Branch, and is discussed in detail under Land Protection.)

The State Revolving Loan Fund continued providing low-interest loans to help communities fund extensive municipal wastewater treatment plant improvements, to comply with the Federal Clean Water Act and provide capacity to support growth and development. The fund has loaned nearly \$57 million to 22 Georgia communities since its inception in 1988, including \$31 million during fiscal year 1989. Federal money will continue to capitalize the fund through 1994, when it will become self-perpetuating, through repayments of current loans. The State has contributed over \$11 million in 20-percent matching funds, to

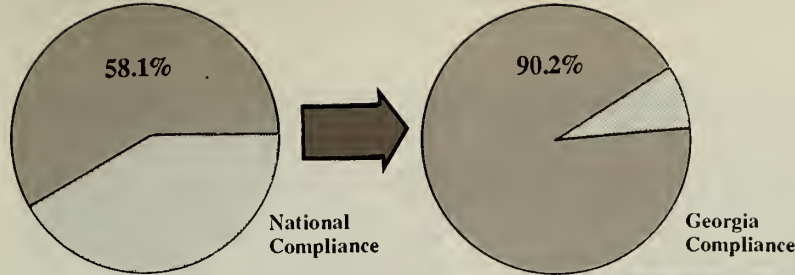


Figure 2. Ninety percent of Georgia's municipal water pollution control facilities have attained compliance with federal law, compared to 58 percent, nationally.

receive the federal monies for wastewater system upgrades.

As recently as 1985, 112 of the State's 539 municipal wastewater treatment facilities did not meet permitted wastewater discharge requirements. By 1989, all but 11 of these facilities had been brought into compliance with discharge permit requirements. All remaining facilities are under construction and under court order to complete improvements to meet permit requirements. Construction on all facilities is slated for completion by December 31, 1990. This record is outstanding compared to the national averages for municipal treatment facilities. (See figure 2.)

Georgia's Clean Water Strategy emphasized improving water quality in the Chattahoochee River and West Point Reservoir during the year. Major surveys of the river and the reservoir were completed, and an action plan was issued summarizing ongoing and future plans to monitor and protect the segment of the Chattahoochee River from Buford Dam, downstream to and including West Point Reservoir. Objectives included a comprehensive program to protect and improve water quality in the river and reservoir. Specific objectives included:

- **Reduction of phosphorus in the Chattahoochee River and West Point Reservoir through the ban of high-phosphate household laundry detergents;**
- **Additional phosphorous reductions through improved treatment at municipal wastewater treatment plants located on the river;**
- **Continued testing of fish in the river and reservoir for the presence of toxic chemicals, with public notice of results;**
- **Requirements for the City of Atlanta to take steps to stop combined sewer overflows to meet State water quality standards.**

As this ongoing plan is implemented and the public is kept informed of progress to correct the problems associated with this waterway, a significant improvement in water quality is expected.

LAND PROTECTION

Erosion and Sedimentation. Erosion and sedimentation, resulting from many types of land-disturbing activities, have caused increasing water quality problems in Georgia in recent years. Erosion and sedimentation displace stream flows, bury food supplies for fish and result in other forms of water degradation. Amendments in 1989 to the State Erosion and Sedimentation Act improved the law in many areas, including:

- **Reduction in the number of land-use activities exempted from regulation;**
- **Requirements that any project over 1.1**



A stronger State law will help improve control of erosion and sedimentation in rivers, lakes and streams.

acres in size be regulated as opposed to only those five acres and over;

- **More stringent performance criteria for control measures;**
- **Inclusion of undisturbed vegetative buffer requirements for projects adjacent to State waters;**
- **Requirements for developers to obtain variances for any land-disturbing activities within 100 horizontal feet of designated trout streams in 31 counties;**
- **Establishment of turbidity limits for stormwater runoff.**

EPD has certified 114 of 159 counties and 214 of 537 active municipal governments as local issuing authorities for land-disturbing activities. Full implementation of the amended Erosion and Sedimentation Act has been prioritized in DNR's *Five-Year Strategy*, and will play an important role in efforts to correct nonpoint sources of water pollution.

Solid Waste Management. Many areas in Georgia face a solid waste disposal crisis. Households and businesses continue to produce 10,000 tons of solid



DNR encourages waste reduction programs like this curbside operation in Duluth, which picks up aluminum, glass and paper for recycling. Project PETRO (right) encourages Georgians to recycle used motor oil.

waste per day, while 70 percent of existing municipal sanitary landfill space will be full within the next four years. Increasing difficulty in siting landfills and rising disposal costs mean that State and local governments, regional groups and the public must work cooperatively to solve this difficult challenge.

Since 1974, more than 750 grants totaling \$27.3 million have been awarded to Georgia cities and counties to improve solid waste management programs. During fiscal 1989, major amendments to the Rules for Solid Waste Management were adopted by the Board of Natural Resources. Important changes included:

- **Requirements for closure and post-closure care of sanitary landfills;**
- **Groundwater monitoring requirements at all sanitary landfills;**
- **A ban on liquid waste disposal at sanitary landfills;**
- **Requirements for proper handling of biomedical wastes.**

As emphasized in the *Five-Year Strategy*, DNR strongly supports and encourages waste reduction and recycling. In order of priority, the Department promotes:

- **Reducing the amount of waste generated at the source;**
- **Recycling of all that can be recycled;**
- **Proper incineration of wastes, employing energy recovery methods;**
- **Continued sanitary landfilling for wastes that cannot be reduced or recycled.**

During the fiscal year, the Department also assisted the Joint House/Senate Study Committee on Solid Waste Management established by the 1989 session of the General Assembly. The Committee's task is to prepare a comprehensive report and issue recommen-

dations for legislation and policies to deal with solid waste management in Georgia, for presentation to the 1990 session of the General Assembly.

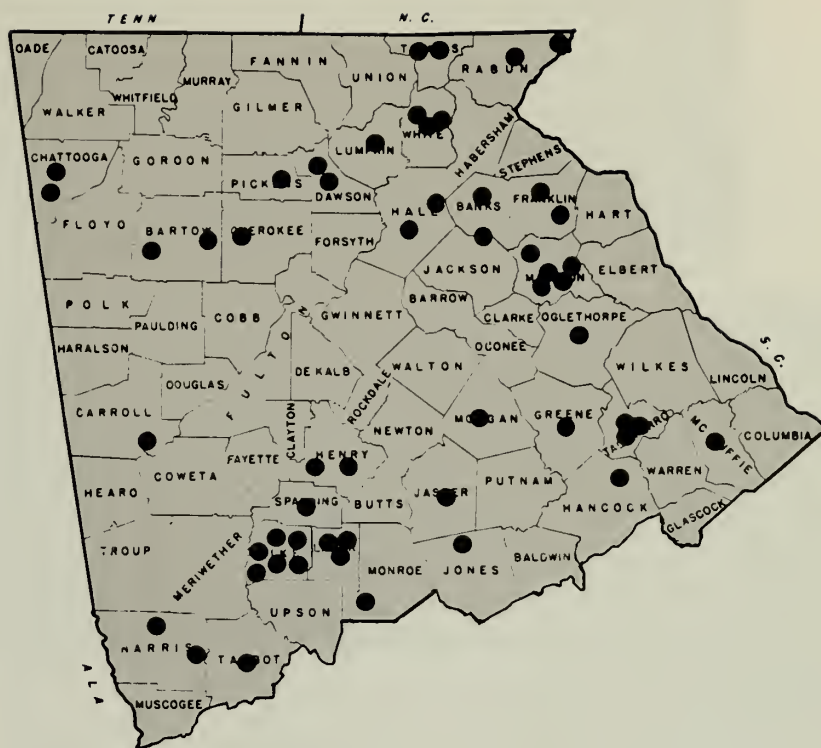
DNR initiated **Project PETRO**, encouraging people to recycle used motor oil. The program is intended to make the public aware of the advantages of collecting used motor oil and returning it to one of the more than 150 collection points in Georgia established to accept used oil. When negligently discarded, used motor oil can contaminate the environment.

Hazardous Waste Management. Under the 1984 Hazardous and Solid Waste Amendments to the Federal Resource Conservation and Recovery Act, all industries that treat, store or dispose of hazardous waste were to be operating under state permits by October 1992. EPD completed the permitting process for these industries in Georgia, well ahead of the federal deadline. The Division also continued its extensive inspection and compliance program to insure that facilities handling hazardous waste remain in compliance with environmental laws. EPD assessed over \$500,000 in fiscal year 1989 for violations of the State's Rules for Hazardous Waste Management and completed over 30 detailed site evaluations to identify and correct releases of toxic chemicals.

Underground Storage Tanks. Under authority of the 1988 Georgia Underground Storage Tank Act DNR promulgated rules regulating underground petroleum storage tanks, effective July 1, 1988. The program is equivalent to the federal program and establishes corrective action requirements to clean up leaking underground storage tanks. The Georgia program also provides owners/operators of petroleum-containing underground storage tanks with a state-funded financial assurance trust fund to partially cover their liabilities, as required by State and federal laws.

Funded by a voluntary one-tenth cent per gallon fee on petroleum products distributed to underground storage tanks, the State trust fund is growing at a rate of about \$320,000 monthly. As of fiscal 1989, the fund's principal was \$3.9 million. The State's existing underground storage tank facilities are estimated at 50,000 tanks. During the year, 315 tank leaks were reported, 87 of which involved groundwater contamination. Site investigation and correction procedures have been

Figure 3. DNR's north Georgia groundwater program helps communities locate supplemental water supply wells. Since the program's 1986 inception, the Geologic Survey has sited 55 wells in 48 communities.



initiated at 125 of release sites. Releases of petroleum products from underground tanks were reported at the rate of about 25 per month.

Surface Mining. Surface mining and rock quarry operations have become lucrative business in Georgia. The State ranked fourth nationally in 1988 in crushed stone aggregate production and remains the leading producer of kaolin, with 142 permitted operations as of fiscal 1989. Minerals production has continued to climb, and Georgia ranked 8th nationally in production of non-fuel mineral products, which bring over \$1.3 billion yearly to the State. DNR continued regulation of surface mining operations under the Georgia Surface Mining Act, which provides for environmental protection during surface mining site development and operation and for the timely reclamation of all disturbed lands.

Major rock quarry companies have begun siting new quarries in anticipation of major new highway construction in Georgia, resulting in significantly more permit applications. Most sites have been controversial, making it necessary to obtain public input during the permitting process. Mining land-use plans are also required of applicants before approval by the Department.

Minerals mined in the State include granite, kaolin, feldspar, barite, bauxite, brick clays, silica, gold, mica, sand and gravel, limestone, dolostone, beryl, shale, fullers earth and ochre. The Department currently permits 83 active rock quarry operations.

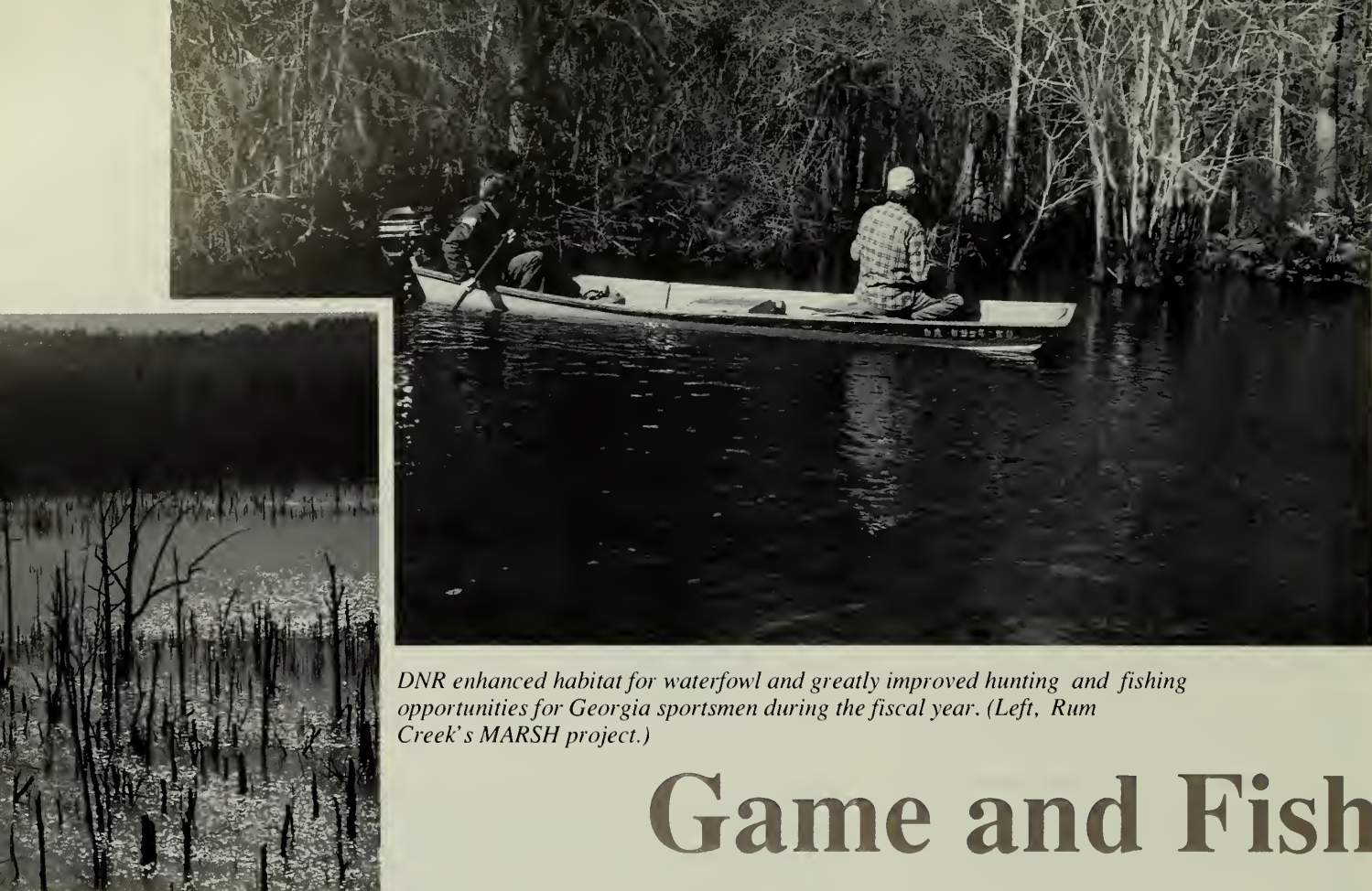
Geologic Survey. The Geologic Survey published 22 reports on technical investigations of Georgia's geologic, mineral and water resources during fiscal 1989. The State's comprehensive computer Geographic Information System was expanded to include 500 million soil information entries, bringing the system's total to 2.5 billion information entries. The Survey continued assisting communities in siting water wells, primarily in the Piedmont and Blue Ridge regions. Since 1987, the Survey has performed 55 site selection studies for public water supply wells. (See Figure 3.) To help enhance mining, the Geologic Survey investigated minerals that may have significant economic value, including titanium, gold, phosphate, copper and iron ore.

Program Coordination. Title III of the 1986 Federal Superfund Amendments and Reauthorization Act (SARA) requires that states gather information from industries identifying hazardous chemicals they use, which, if released into the environment, could pose significant danger to public health. The Act, known as the Community Right-to-Know Law, also requires local governments to prepare emergency response plans for handling hazardous chemical spills and accidents. All industries report information regarding toxic chemicals to EPD. More than 3,000 industries issued such reports to EPD on toxic substances used in 1987, the first year information was required by the federal government. EPD published this information, making it available to the public, in the State's first Toxic Release Inventory Report.

EPD's Emergency Response Team handles environmental emergencies and assists local communities with chemical accidents. More than 2,000 spill notifications were received, almost double those received in the previous fiscal year. The team responded to the field in 300 instances, a 100 percent increase over the previous year.

SUMMARY

Environmental Protection programs and objectives set forth in fiscal 1989, as part of the Department's *Five-Year Strategy*, work in concert with significant legislation that includes many new provisions for resource protection, and represent major progress for the effective conservation and management of Georgia's air, land and water resources. As communities cope with the increasing demands being placed on these resources, programs put into place during the year will enable them to sustain growth, in keeping with the goals of resource protection and the integrity of the environment.



DNR enhanced habitat for waterfowl and greatly improved hunting and fishing opportunities for Georgia sportsmen during the fiscal year. (Left, Rum Creek's MARSH project.)

Game and Fish

In fiscal 1989 DNR's Game and Fish Division continued managing, protecting and promoting the wise use of all Georgia's fish and wildlife resources, as remarkable progress was made in improving wildlife and related recreation. The State's wealth of fish, wildlife and native plant resources are intrinsically valuable and important to the quality of life citizens enjoy. During the past two years these resources have benefited from improved resource protection programs under the Department's *Five-Year Strategy*, and the appropriation of funds for acquiring wildlife lands. Under the *Five-Year Strategy*, goals set in fiscal year 1989 by the Game and Fish Division include:

- Continued acquisition and development of lands for wildlife management and related recreation;
- Protection of wildlife and fishery resources by improving the effectiveness and professional status of conservation law enforcement;
- Improvement of fishery resources with expanded fishery protection and development;
- The use of information to more effectively manage wildlife and protected plants;
- Management of the Sapelo Island National Estuarine Sanctuary (SINES) to encourage further scientific research and to offer additional educational programs to interested groups.

LANDS ACQUISITION

One of DNR's highest priorities is the acquisition of additional state-owned wildlife management lands, to offset the loss of public hunting and fishing areas due to private lease agreements not being renewed and the destructive effects of land-use changes on wildlife and natural habitats. Providing wildlife management lands is important to the State's economy, as hunters and fishermen spend nearly \$1 billion yearly in Georgia. Activities such as camping on natural areas, birding, wildlife observation, and outdoor photography are also popular, and hundreds of merchants depend on sales of equipment to those who hunt and fish, or enjoy wildlife recreation.

Made possible by the Governor's and the General Assembly's approval of two consecutive sales of \$30 million in general obligation bonds, Georgia's wildlife lands acquisition program is now one of the most active in the Southeast. The Lands Acquisition Program made major progress in fiscal 1989. With \$15 million from the first bond sale, the Department acquired 10 parcels of land totaling 27,194 acres at a purchase price of \$11.5 million. An additional 30,700 acres were under active negotiation as fiscal 1989 ended. DNR plans to purchase 50,000 to 60,000 acres over the next five years, which will be used as wildlife management areas (WMAs), public fishing areas (PFAs) and small game/field trial areas. (See Table I.)

The \$30 million allows the Department to purchase large tracts of land while prices and interest rates are low, and pay for it over a 20-year period. Bonds will be



With hunter participation, Game Management is successfully managing the State's deer population. Georgia's first Canada goose hunting season was approved in fiscal year 1989, the result of a 10-year restoration program.

Table I. Land acquisitions through fiscal year 1989.

Tract Name/County	Acreage	Type
Dodge County	441	PFA
Horse Creek/Telfair	845	WMA
Griffin Tract/Burke	7,360	WMA/PFA
Stewart County	4,690	WMA
Bullard Creek/Appling & Jeff Davis	8,442	WMA
Stewart County	258	WMA
Big Lazer/Talbot	633	WMA
Big Lazer/Talbot	1,600	WMA
Patrick's Fishing Lake		
Berrien	1,060	PFA
Blanton Estate	1,865	Waterfowl
Lowndes		
TOTAL ACREAGE	27,194	

repaid with revenues from a 1987 license fee increase. Revenues left after debt payments will help fund WMA operating expenses along with revenue from timber harvested on WMAs and public fishing areas. Management activities will expand as the timber matures and generates increasing revenues.

GAME MANAGEMENT

During 1989, Game Management served the nearly two-thirds of all Georgians who enjoy wildlife-related recreation, including those who enjoy birding, photography, nature walks and hunting. DNR operates 68 WMAs on 1.1 million acres of land, utilized by large and small-game hunters, fishermen and many others. Hunters have steadily increased in Georgia, and now number half a million. In fiscal 1989 more than 51,400 deer hunters used State WMAs, representing an increase of 13 percent over fiscal 1988.

Deer Hunting. Georgia's deer population reached a high of approximately 1.25 million in 1988-89. During fiscal 1989, DNR again took steps to promote increased doe harvests, the best known method of controlling the size of the herd. Increased either-sex hunting days implemented for the 1988-89 season resulted in a doe harvest of 130,000, or 40 percent of a total of 326,000 deer harvested. The most does taken were in the upper coastal plain and piedmont areas of the State, where deer-related damage reports have been highest. A total reduction in the herd of 100,000 deer occurred as a result of additional either-sex days implemented in fiscal 1989. This decline will continue during the 1989-



Herb Cawthorne

90 hunting season. Because of the value of deer hunting in Georgia, estimated at \$346 million yearly, the Department's goal is to maintain a viable herd for recreational purposes while controlling deer populations through effective game management. Hunter participation remains central to the success of controlling deer populations.

Turkey and Goose Restoration. Game Management released 345 wild turkeys on 32 sites in 27 counties in fiscal year 1989, as part of a successful 20-year stocking program. The program is coming to a close, since more than 250,000 turkeys now reside in Georgia. Spring gobbler seasons were scheduled in 132 counties for 1990.

DNR's 10-year Canada goose restoration program has, since 1978, stocked 13,000 Canada geese. Currently, a minimum of 20,000 birds occur in Georgia. The first eight-day goose hunting season was approved during the fiscal year, for six locations in January 1990. The limited season and bag limits will allow a modest harvest of geese.

Alligators. During fiscal 1989, Game Management authorized Georgia's first alligator harvest in over 20 years. Alligator agent-trappers took 190 nuisance alligators.

Nongame Activities. Game Management's role in the Department-wide Nongame Wildlife Program expanded in fiscal 1989 through funds from the Georgia Nongame Wildlife Fund. The Section developed wildlife trails on eight WMAs; created educational materials about various nongame species; raised and released

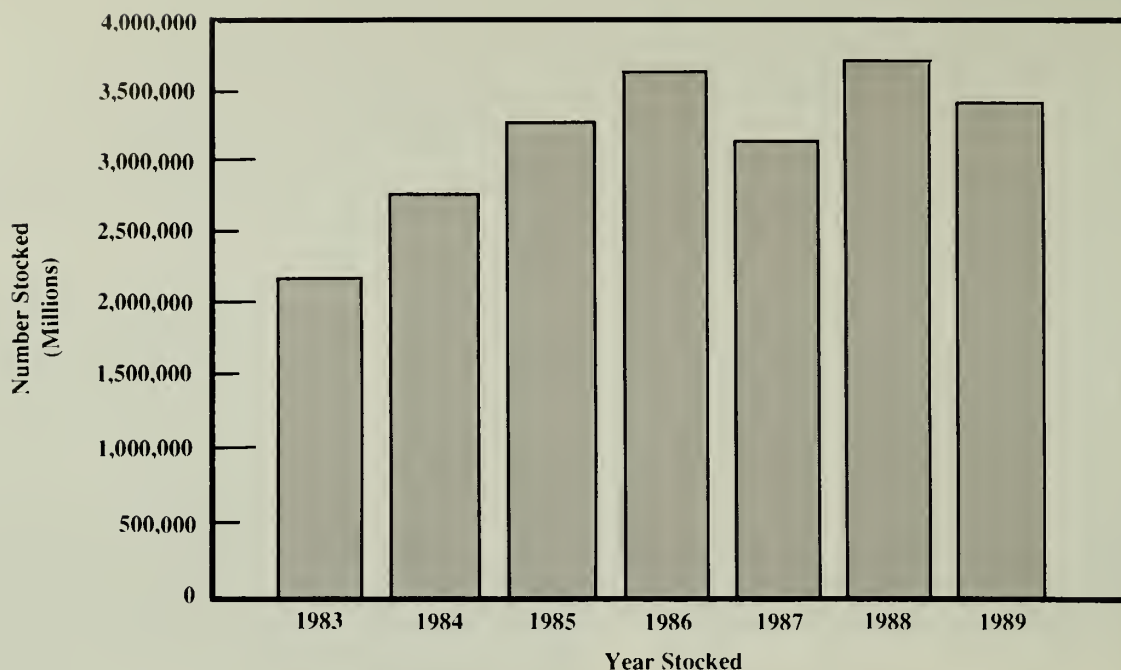


Figure 4. Total striped bass and white bass hybrids stocked annually since 1983.

bald and golden eagles, peregrine falcons and osprey; and performed surveys and research on gopher tortoises, alligator snapping turtles, hummingbirds and other wildlife species.

The Department has enhanced wetlands by building waterfowl impoundments funded through Ducks Unlimited's Matching Aid to Restore States' Habitat (MARSH) Program. During fiscal year 1989, projects were completed on four WMAs and begun on Dixon Memorial and B.F. Grant WMAs. Game Management also cleared goose grazing areas on Clarks Hill and West Point WMAs, began distributing wood duck nest boxes to landowners with habitat suitable for rearing wood duck broods and began MARSH projects on two other WMAs.

Game Management continued surveying all major wildlife species to detect and solve specific wildlife management problems and to form a scientific basis for hunting season recommendations. Landowners were helped to manage their property to enhance wildlife populations and resolve wildlife nuisance problems.

Game Management foresters managed forested lands on WMAs, public fishing areas and parks during fiscal 1989. Timber harvest activities improved wildlife habitat and the forests, with revenues going toward area management costs.

FRESHWATER FISHERIES

Fishing is the most popular wildlife related activity in Georgia, enjoyed by every age group. The State's diverse freshwater fishery resources offer over 4,000 miles of trout streams, 12,000 miles of warmwater streams and half a million acres of impoundments, used by more than 1.5 million fishermen. Anglers spend approximately \$1 billion yearly on fishing in Georgia,

a major contribution to the State's economy. The ongoing programs of DNR's Fisheries Section to augment freshwater fishing during fiscal year 1989 included developing and managing public fishing areas and private and public waters; constructing boat ramps; producing and stocking trout and warmwater fish; and conducting research and surveys to benefit these resources.

The Department's *Five-Year Strategy* calls for the construction or renovation of at least one public fishing lake each year for the next five years, to meet increasing demands for recreational fishing. In June 1989, the 195-acre Big Lazer Creek public fishing lake was opened for public use, the first new lake completed under the plan to expand public fishing areas and put fishing within easy access of every Georgian. Over 800 fishermen landed 11,700 bluegill, channel catfish and redear sunfish during Big Lazer Creek's first three days of operation. Total weight of fish caught exceeded 5,000 lbs. This new public fishing area will provide excellent freshwater fishing all year.

During fiscal 1989, the Fisheries Section assisted the owners of private ponds by conducting more than 1,724 pond investigations and providing 5.7 million fish for stocking over 2,500 ponds from the State's seven warmwater hatcheries. Fisheries continued sampling Georgia's major reservoirs and added several major streams in southeast Georgia to the sampling program, including the Altamaha, Ocmulgee, Ohoopsee, Satilla and Saint Marys. Scientific sampling enables the Fisheries Section to detect potential problems and recognize effective management practices. Improving fishing access, DNR built one new boat ramp and purchased two additional ramp sites.

About 100,000 fishermen in Georgia take more

DNR continued to improve the effectiveness and professional status of Conservation Law Enforcement rangers during the year. Here, rangers perform a boat check.

than 3.8 million trout fishing trips each year. The limited trout habitat and native trout population cannot support this demand without the trout stocked by State hatcheries. Accordingly, the Fisheries Section raised more than 800,000 trout to catchable size and stocked them into suitable waters, in addition to the 269,000 catchable trout raised and stocked by the U.S. Fish and Wildlife Service. Fisheries produced about 1.2 million striped bass and 2.2 million hybrids at the State's warmwater hatcheries and stocked them into Georgia waters, primarily reservoirs in which these fish do not reproduce naturally. The demand for these species, and consequently their production by Georgia hatcheries, has steadily increased since 1983. (See figure 4.)

While the stocked striped-bass fisheries are prosperous, native striped-bass populations are declining in several areas, from causes not yet fully understood. Under the *Five-Year Strategy*, the Department is committed to protect native striped-bass habitat and increase research into the fish's decline. Preliminary research on the Savannah striper populations have prompted DNR to close the Savannah River downstream of Clarks Hill Reservoir to striped bass fishing.

DNR's Fisheries Research and Survey Program continued to assess the condition of certain fisheries, identify management needs and evaluate program effectiveness during the fiscal year. Projects included surveys of fish populations, stocking evaluations, hatchery production studies and others.

LAW ENFORCEMENT

The Game and Fish Division re-emphasized its commitment to improve the effectiveness and professional status of Conservation Law Enforcement rangers. Conservation rangers, who enforce laws concerning native game and nongame animals and fish, non-native animals, protected plants, boating safety, and mandatory hunter safety, also support other law enforcement agencies on request. Hundreds of volunteers, such as hunter safety instructors and the U.S. Coast Guard Auxiliary and U.S. Power Squadron in support of Georgia's Boating Safety Program, assist Law Enforcement activities.

Mandatory in-service training was conducted during 1989 for all Law Enforcement personnel. A profile of the typical violator, furnished by Albany State College, is expected to increase the number of violators apprehended, and will be used in future operational planning. Albany State College also began a new research project to evaluate the effectiveness of Georgia's Boating Safety Program.

DNR's Emergency Operations Center, staffed by Law Enforcement, assisted in providing 24-hour



communications during the year involving environmental emergencies or violations of game and fish laws. The Center ensures a prompt, professional response to violation reports and emergency calls made to DNR's toll-free emergency number.

Strict enforcement of Georgia's boating-under-the-influence (BUI) law continued proving effective in removing intoxicated boat operators from the water before accidents occur. An increase in the number of BUI arrests has contributed to a reduction in the number of serious boating accidents. Three additional boating safety officers, funded through federal appropriations, were assigned to high activity lakes. Several special task force details were instrumental in dealing with boating safety problems on targeted waterways.

Law Enforcement's ability to perform off-road operations was greatly enhanced by the donation of 255 all-terrain vehicles in fiscal year 1989, by American Honda Corp. The section has assigned a vehicle to each officer and provided the necessary safety equipment and training.

SUMMARY

The Game and Fish Division made substantial progress during fiscal 1989 concerning two major DNR goals, important to wildlife and all who enjoy it — the acquisition of lands for wildlife management and the upgrading of conservation law enforcement to meet new challenges. Current trends in land-use and public recreation have made it important to invest in public lands for hunting and fishing and to upgrade conservation rangers' skills. Programs conducted during fiscal 1989 will help ensure that high quality wildlife habitat and recreation will be available as Georgia's growth continues.

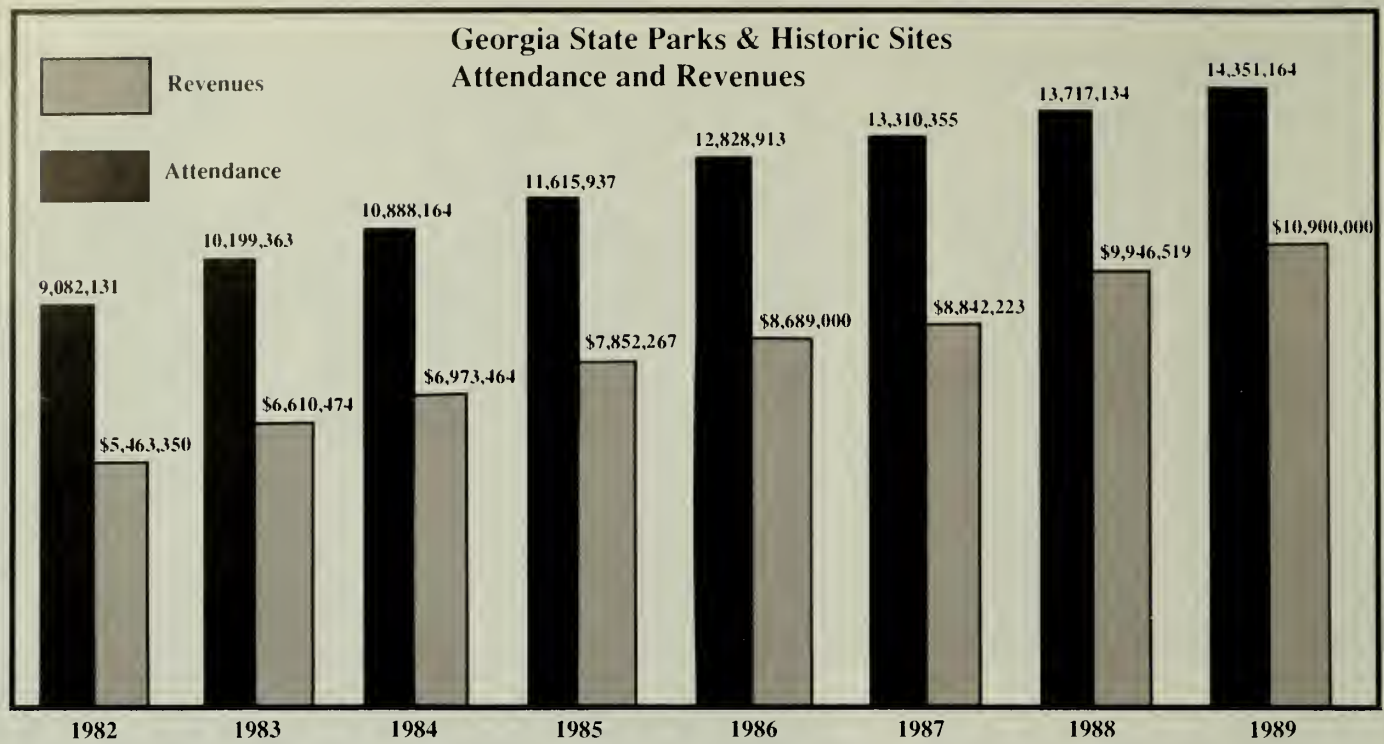


Figure 3. State Park and Historic Site attendance has risen steadily since 1982.

Parks, Recreation and Historic Sites

The Parks, Recreation and Historic Sites Division made important strides toward meeting Georgia's increasing outdoor recreation, preservation and education needs in fiscal 1989. Widespread improvements to State parks and historic sites continued to enhance the experience of visitors. Parks and historic sites play an increasingly important role in the State's tourism industry and new facilities spark economic interest in all regions of the State. Visitation in fiscal 1989 was the highest yet recorded, topping 14.3 million. Revenues generated by these facilities have nearly doubled in the past seven years, reaching \$10.9 million in fiscal 1989. (See Figure 5.) Interest in historic preservation has also steadily risen.

Georgia's 44 parks and 14 historic sites, on more than 61,000 acres of land, offer the public some of the finest recreational, cultural and historic resources available. While DNR is pledged to protect and manage these resources for present and future generations, the demand for outdoor recreation by Georgia residents and visitors is placing a heavy burden on these assets. Under the Department's *Five-Year Strategy*, the Parks, Recreation and Historic Sites Division is slated to add additional lands to the system and continue to expand and upgrade existing parks and historic sites. Priorities set under the *Five-Year Strategy* during fiscal 1989 include:

- Maximizing operational efficiency of existing parks and sites and beginning management of new facilities;
- Maintaining parks, historic sites and recreation services at a high standard of quality;

recreation services at a high standard of quality;

- Meeting the demand for on-site guest services, as well as general public services for historic preservation and outdoor recreation;
- Maintaining effective communication and coordination with appropriate local, regional, State and federal organizations and the general public.

Grants. The Division administered grants totaling \$410,000 to 18 local governments in Federal Land and Water Conservation Funds (LWCF) during fiscal 1989 and awarded a total of \$500,000 from the Recreation Assistance Fund to 74 community projects for development of local recreational facilities. Federal Historic Preservation Fund grants totaling \$139,000 were administered for 18 Georgia communities for activities that encourage the preservation of historic buildings, districts and archaeological sites. DNR also provided \$275,000 in State funds for regional preservation services in 13 of Georgia's 18 Regional Development Centers.

OPERATIONS

The Operations Section operates and maintains all 58 parks and historic sites, which include 319 cottages, 2,605 campsites, 1,800 historic markers, 22 museums, three regulation golf courses, three lodges, and Roosevelt's Little White House. It assists the five region offices in budgeting, personnel management, training, visitor services, concessions management and inter-



Special events such as Old Timer's Days and Indian cultural festivals draw increasing numbers of visitors each year. Another attraction of State parks is their outstanding natural beauty, exemplified by Unicoi (top).



pretive programs, as well as provides exhibit design and fabrication, historic marker maintenance and artifact preservation and repair.

Two new lodges were opened during fiscal 1989, L.L. "Pete" Phillips Lodge at Little Ocmulgee near McRae and Lake Walter F. George Lodge at George T. Bagby near Ft. Gaines. Lodges at Red Top Mountain in Cartersville and Amicalola Falls near Dawsonville are scheduled to open in fiscal 1990. These new facilities will create a system of five State park lodges, providing an alternative to campsites or cottages for overnight accommodations at State parks.

Outdoor and interpretive programs were popular and included over 8,000 special events, recreation programs, interpretive activities, and exhibits during the year. Music festivals, mountain rendezvous, living history demonstrations, wildflower programs, canoeing and backpacking trips and Indian heritage activities brought record numbers of visitors to parks and historic sites. Over 400,000 participants enjoyed opportunities to learn about Georgia heritage, the outdoors, or gain new leisure skills.

MAINTENANCE AND CONSTRUCTION

The Maintenance and Construction Section carries out all major maintenance and construction activities at State parks and historic sites. Many tasks are performed by skilled craftsmen employed by DNR, while larger projects often require the services of architects,

engineers and contractors. Maintenance and Construction has the important responsibility of ensuring that all facilities are maintained in accordance with standards that give all visitors a quality experience. Growing visitation and usage by the public have created a challenge to meet these high standards.

Implementation of a five-year capital outlay schedule for major maintenance and new construction projects received emphasis during the fiscal year. Priority was given to recurring maintenance needs such as roofing, floor covering, painting, paving and lodge furnishings, furniture, and equipment. The new schedule will assist DNR in achieving the five-year goal of attaining a high quality standard at all State facilities.

Several major construction projects were completed, including lodges at Little Ocmulgee State Park and George T. Bagby. The relocation of the George T. Bagby facility was carried out, including the construction of a 24-slip marina, two new residences, a park office and swimming beach bathhouse, as well as the relocation of five cottages, a maintenance facility and a staff residence. (See Table II.)

Many other projects were finished on schedule, including a new visitor center at Jarrell Plantation Historic Site; a family and group shelter at Fort McAllister Historic Park; and major renovations to the Smith Creek cottages at Unicoi. Construction continued on a 57-room lodge at Amicalola Falls, and construction began on a 33-room lodge at Red Top Mountain.

Providing high-quality golf courses also was em-

PARK IMPROVEMENTS

Amicalola Falls	58-room lodge and meeting center with restaurant. Completion winter 1990. Cost: \$7.6 million. Walk in lodge for hikers. Design begun September 1989. Cost: \$895,000.
Florence Marina	Visitors center, rest station, fishing pier. Completion September 1989. Cost: \$570,901.* Two new cottages. Construction begun fall 1989. Cost: \$150,000.
Fort McAllister	Family and group shelter. Completion, July 1989. Cost: \$240,000.
George T. Bagby	30-room lodge and meeting center with restaurant, 24-slip marina. Completion July 1989. Cost: \$3.2 million.
Georgia Veterans	18-hole championship golf course, club house, maintenance barn, cart storage barn. Opening summer 1990. Cost: \$2.9 million.
Gordonia-Alatamaha	Nine-hole golf course. Opening fall 1990. Cost: \$650,000.
Hard Labor Creek	Renovations to nine holes including new greens, tees and fairway bunkers. Completion September 1989. Cost: \$273,000.
Indian Springs	Day use area improvements including sidewalks, paving, parking and rest station. Begun fall 1989. Cost: \$500,000.
Jarrell Plantation	Visitors center. Completion, February 1989. Cost: \$200,000.
Little Ocmulgee	Design of 18 additional holes, new club house, related facilities. Completion, March 1989. Cost: \$150,000.
Mountain Resort	Design for a \$30 million mountain resort in Towns County. Design complete winter 1989.
Picketts Mill	Visitors center and related development. Opening spring 1990. Cost: \$540,000.
Red Top Mountain	33-room lodge and meeting center with restaurant. Completion October 1989. Cost: \$3 million.
Unicoi	Major renovations to restaurant. Begun, September 1989. Cost: \$400,000. Renovations to 10 cabins at Smith Creek. Completion March 1989. Cost: \$270,000.
Victoria Bryant	New golf course irrigation system. Completion, fall 1989. Cost: \$199,000.

*(Financed primarily through a private family foundation.)

Table II. Projects underway to improve Georgia State Parks and Historic Sites during fiscal year 1989.

phasized during fiscal 1989. Projects included design of an 18-hole course and related facilities at Little Ocmulgee; renovations at Hard Labor Creek for new greens, tees and fairway bunkers on nine holes; a championship 18-hole golf course at Georgia Veterans; a nine-hole golf course at Gordonia-Alatamaha; and a new irrigation system at Victoria Bryant State Park.

Other projects under construction during the fiscal year were major kitchen renovations at Unicoi Lodge, a new visitor's center at Picketts Mill Historic Site; improvements at Florence Marina including a new visitor center, rest station and fishing pier; and major campground renovation projects at High Falls, Red Top Mountain, Hart, and Elijah Clark State Parks. Design work commenced on several projects including a proposed Mountain Resort in Towns County which includes plans for a 175-room lodge, 18-hole championship golf course, and clubhouse. Design work was also completed for day-use improvements at Indian Springs; a new assembly shelter at Hard Labor Creek; and two new cottages at Florence Marina. Planning was begun on a very unique project, a walk-in lodge at Amicalola Falls. When completed, the facility providing food and lodging for hikers only will be accessible via a five-mile hike.

HISTORIC PRESERVATION

The Historic Preservation Section administers State and federal grants and provides a variety of information and technical services to federal, state, and local governments, local preservation and historical organizations, educational institutions and citizens, to assist them in protecting, preserving, and utilizing Georgia's historic and archaeological resources. During fiscal 1989, 23 Georgia nominations were accepted for listing in the National Register of Historic Places, including 10 historic districts, 12 individual properties, and one archaeological site. The State's Certified Local Governments increased also, jumping from 17 to 20 with the addition of Madison, Cedartown and Grantville.

Historic Preservation was involved during the year in meeting the Department's goal of preserving and enhancing historic resources in Georgia, and assisted the Division with projects at Wormsloe Plantation, the Dahlonga Gold Museum and Indian Springs State Park. The Office of the State Archaeologist assisted many parks and historic sites, and assisted DNR's Game and Fish Division with plans for boat ramps, public fishing ponds and wildlife management areas.

A long awaited five-year strategic plan that presents statewide preservation goals and policies, "A

Vision for the Future: the Georgia Historic Preservation Plan," was completed during fiscal 1989, and contains a wealth of information on Georgia's historic properties, preservation programs and organizations, and other factors that influence preservation efforts. Georgia is one of the first states to develop such a plan and the Department has received many favorable comments since its publication. The document culminates three years' work by the Historic Preservation staff, incorporating input from the public, State and federal agencies, and other preservation organizations.

Completion of the DNR film "Patterns of Change: Historic Preservation in Georgia" was another important accomplishment in fiscal 1989. Produced by the film unit of the Department's Communications Office in coordination with Section staff, the film depicts preservation activities in 15 Georgia communities. Through the Georgia Trust for Historic Preservation, the film is being shown to every county. A teacher's guide was developed and distributed to accompany the film for classroom use. The film has helped heighten public awareness of historic preservation, and has garnered awards for excellence. It has been shown on the Atlanta and statewide public television networks, as well as the national Cable Network's *Learning Channel*.

The first round of statewide surveys of historic structures was completed during the year, as part of DNR's revitalized Historic Structures Survey Program. A total of 33 surveys were either completed or begun during fiscal 1989, a marked increase over those carried out in the previous 10 years. Benefits of the survey program have included an improved data base for preservation program activities and a significant contribution to public awareness of historic resources.

A special project, "Georgia's Living Places—Historic Houses in Their Landscaped Settings" also was begun during the fiscal year, and is expected to be of long-term importance to the preservation of historic homes and neighborhoods in Georgia. The two-year project will work to involve the public on a broader scale with historic preservation through statewide surveys, research, reports, and technical packages and workshops.

TECHNICAL SERVICES

Technical Services provided administrative, informational and planning support through the Division's Budgeting, Funding, Marketing, Personnel, Long-Range Planning, and Site Planning units during the fiscal year.

The Funding Unit administers Federal Land and Water Conservation Funds (LWCF) and the Recreation Assistance Fund (RAF) for development of local recreation facilities, and aided a total of 18 local government LWCF projects and 74 local projects with RAF funds. (See *Grants*.)

The Marketing Unit continued implementing a comprehensive marketing and promotion plan for State parks, historic sites and lodges during fiscal 1989. The Unit succeeded in increasing public awareness with the "Georgia Parks On My Mind" theme and promoted the use of toll-free park information phone lines. The Unit



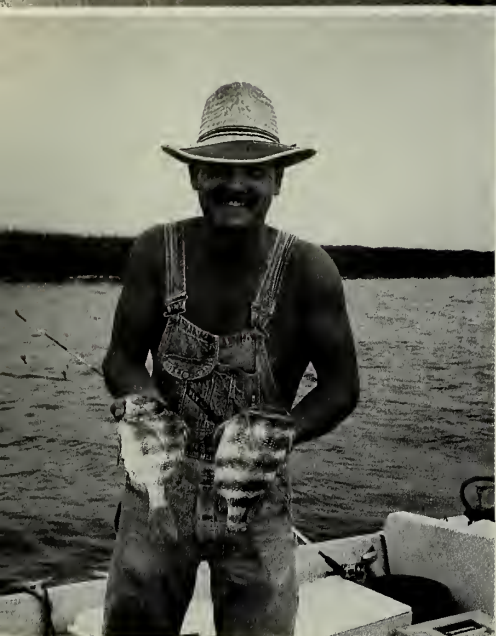
Downtown Demorest, Ga., exemplifies community revitalization through historic preservation. The district is now on the National Register of Historic Places.

conducted group meetings marketing for lodges, and trained staff to develop an increased internal marketing orientation. Special promotion projects included the "July Is" poster, which was distributed in conjunction with the Georgia Recreation and Parks Society; a special insert in *Georgia On My Mind* magazine, the official travel guide for Georgia; participation in the Georgia Department of Industry, Trade and Tourism's "Stay and See Georgia" show; and working with businesses such as McDonald's, Coca-Cola and Original Appalachian Artworks (makers of Cabbage Patch dolls) to promote Georgia parks and historic sites.

The Division funded the Recreation Technical Assistance Program in cooperation with the University of Georgia, and provided staff support to the Governor's State Needs Assessment Committee during the year. The Committee issued recommendations on creating a stable funding source for acquisition, development, and rehabilitation of state and local parks, historic resources, and natural areas.

SUMMARY

As State parks and historic sites steadily progress toward achieving the highest quality standards possible through major renovations and new park amenities, and preservation programs continue to flourish, residents and visitors to Georgia will enjoy outstanding outdoor and cultural recreation opportunities. The Parks, Recreation and Historic Sites Division remains dedicated to promoting Georgia's exceptional natural beauty, preserving its unique cultural heritage, and presenting programs to improve the public's awareness of these resources, for citizens of today and of the future.



Fish aggregating devices (top) have improved inshore fishing opportunities on the coast. Offshore fishing has been improved by DNR's outer continental shelf program.

Coastal Resources

Georgia's 100-mile scenic coastline, with 80 miles of beaches, attracts millions of visitors yearly. Whether they come to experience the region's unique history or a sunny vacation, coastal tourists contribute over \$1 billion to the State's economy every year, and coastal tourism provides over 25,000 jobs. Commercial fisheries are lucrative in Georgia, providing livelihoods for approximately 3,850 people, and bringing fishermen about \$22 million annually in commercial catches.

During fiscal 1989, the Brunswick-headquartered Coastal Resources Division set new goals and continued numerous programs under the *Five-Year Strategy*, designed to enhance and protect Georgia's marshes, beaches and sandsharing systems, and improve opportunities for commercial and recreational fishermen in Georgia's coastal waters. Specific goals set under the *Five-Year Strategy* include:

- **Implementation of Georgia's Coastal Waterbottoms Leasing Program;**
- **Maintaining the biological productivity of marine fishery resources to meet the needs of Georgia's growing coastal population;**
- **Improving research, management and protection efforts for threatened and endangered marine species;**
- **Providing technical advice to coastal communities suffering from beach erosion.**

The Coastal Resources Division also began work on a new coastal regional headquarters complex in Brunswick during fiscal 1989. Construction of this \$2.5 million facility began in January and the completed building will house all Coastal Resources Division staff, as well as other DNR regional personnel. The building is planned for completion in spring 1990.

MARSH AND BEACH SECTION

The coastal region is characterized by a delicate ecosystem particularly susceptible to the influence of human activities. Because it is fragile, Georgia's relatively undeveloped shores and saltmarshes must be safeguarded. To preserve the coast and its many valuable resources, the Department operates a strong marsh and beach protection program that includes reviews of proposed developments and measures to enhance sand-sharing systems and beaches.

Beach Renourishment. When the State and the U.S. Army Corps of Engineers initiated the Tybee Island Beach Renourishment Project in 1987, over 1.3 million cubic yards of sand had been placed on the beach at a cost of over \$2.2 million. After completing the project under budget during fiscal 1989, DNR, contracting with the City of Tybee Island, used remaining funds to implement a dune stabilization project to hold the sand on the beach thereby extending the period between renourishments. Designed by the City of Tybee, the Soil Conservation Service and DNR, the project included the placement of more than 3,400 yards of snow fencing, construction of a bollard fence and eight crossover structures, as well as the planting of 60,000 dune stabilizing plants.

Continued erosion of developed beaches in Glynn County has generated concern from the local government, shoreline property owners, and the coastal tourism industry. Georgia's "Golden Isles" beaches — Jekyll, St. Simons and Sea Island — make up about 15 miles of the Georgia coastline, but in the past 25 years, erosion has begun to threaten many of the condominiums and hotels originally built more than 400 feet from the ocean. Public beach access also has been threatened in many areas as erosion has completely removed the high-tide beach.

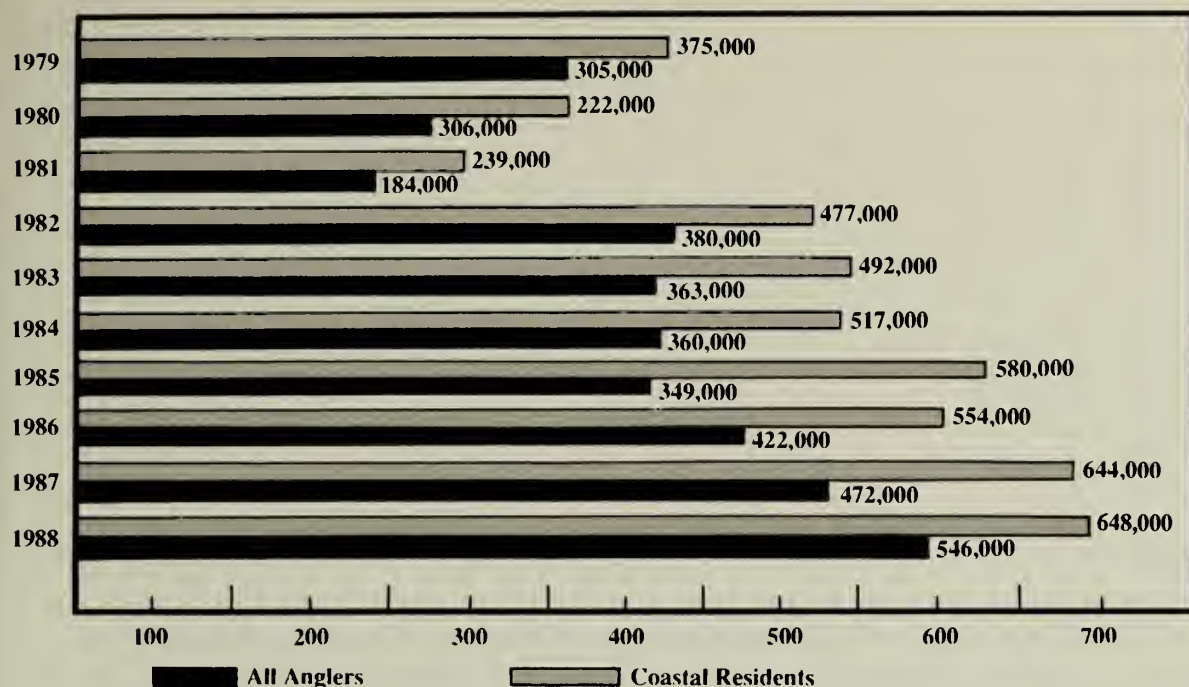


Figure 6. The estimated number of fishing trips by marine recreational anglers in Georgia has steadily risen since 1979. (Source: National Marine Fisheries Service Marine Recreational Fisheries Survey.)

During fiscal 1989, Olsen Associates, Inc., a coastal engineering firm working with funds provided by DNR, Governor Joe Frank Harris and the Glynn County Commission, completed a study of erosion in the Golden Isles entitled, "Feasibility Study of Glynn County, Georgia Beach Restoration." Results included recommendations for a beach renourishment strategy for the three islands.

The Shore Assistance Committee granted Freddie Fields Productions/Glory Productions, Inc. a permit to construct a replica of Ft. Wagner on the south end of Jekyll Island. The site was used during production of a film detailing the exploits of the Union Army's 54th Massachusetts Regiment during the Civil War. Dunes on the site were restored and replanted, and the site will be monitored through fiscal 1990. A 900-ft. dune crossover built to transport actors and film crews to the site remains an important and needed public beach access on Jekyll Island.

The Coastal Marshlands Protection Committee and the Shore Assistance Committee continued to review coastal developments, and exercise authority to grant, suspend, revoke or deny permits for developments that would alter marshes or beaches. DNR's Marsh and Beach Section serves as the staff for both committees.

COASTAL FISHERIES

During the fiscal year, the Coastal Fisheries Section made major strides toward meeting the goals framed under the *Five-Year Strategy* to enhance recreational fishing on the coast and improve management of Georgia's commercial fisheries. The four programs carried out by Coastal Fisheries include Recreational Fisheries, Outer Continental Shelf, Shellfish and Commercial Fisheries.

Coastal Fishing Improvements. In December, the Outer Continental Shelf Program supervised the sinking of the 55-ft. ex-Navy tug, *Delta Diamond* at Artificial Reef "L", 23 nautical miles east of Ossabaw Island. In June, the former U.S. Coast Guard Cutter *Sagebrush* was sunk on Artificial Reef "J", 17 nautical miles east of St. Catherine's Island. Sunken vessels, such as the *Delta Diamond* and the *Sagebrush*, attract invertebrate species and create fish habitat on Georgia's otherwise barren ocean floor. Many fish congregate around these artificial reefs seeking food and shelter. Marked by DNR buoys, the artificial reefs provide excellent opportunities for Georgia's offshore anglers and divers.

The Recreational Fisheries Program completed two inshore artificial reefs at Joe's Cut in Wassaw Sound and Half Moon River in Chatham County. These reefs, made of Fish Aggregating Devices (FADs), improve fishing opportunities in inshore waters. Fishing success at the reefs is being monitored to help CRD biologists determine if such reefs can improve sportfishing in other locations.

Recreational Fisheries staff also conducted research studies during the fiscal year on red drum and spotted seatrout. Results of the movement-migration and life history studies will add insight into the effectiveness of Georgia's minimum size regulations for red drum and spotted seatrout, which have been in effect since 1985. A cooperative DNR/National Marine Fisheries Service (NMFS) Marine Recreational Fisheries survey indicated an increase in both the number of saltwater anglers and the number of saltwater fishing trips. (See Figure 6.) Georgia's fishermen caught record numbers of spotted seatrout, red drum and Spanish mackerel during the year.

During fiscal 1989, Coastal Resources received



The manatee is one of many marine animals benefitting from DNR's programs to help endangered coastal species.

\$38,350 in federal Interjurisdictional Fisheries Act monies to continue the monitoring and management of important shrimp and blue crab stocks, an increase of \$14,581 over 1988 funds primarily because of increased Georgia seafood landings over the most recent three-year period.

Shellfish. Shellfish Program personnel initiated a clam stocking project to improve public recreational harvesting opportunities during the year. Under this program, more than 25,000 clams were moved into public harvest areas in Chatham, Bryan, Glynn and Camden Counties, to establish reproducing populations of clams within these areas.

For the third consecutive year, DNR gained national recognition for operating a Shellfish Program in total compliance with the National Shellfish Sanitation Program's guidelines. The Coastal Fisheries Advisory Commission's Shellfish subcommittee recommended amendments to shellfish laws to enhance law enforcement and habitat management. Revisions will also provide added health protection for the public.

Atlantic Sturgeon. Coastal Resources convened the Coastal Fisheries Advisory Commission's Atlantic Sturgeon Subcommittee during the fiscal year, to develop a proposal for better management of the Atlantic sturgeon commercial fishery. Consensus was to shorten the length of the commercial season from 166 days to 60 days and implement a 75-inch minimum size limit. The Atlantic sturgeon recommendations as well as recommendations for regulating 16 other saltwater finfish were adopted by the DNR Board and became effective October 1, 1989.

Coastal Endangered Species. During the year, the Coastal Resources Division worked diligently to maintain and restore populations of endangered species in coastal Georgia. Staff patrolled several barrier island beaches during sea turtle nesting season, protecting freshly laid eggs from predators. The project was funded by the U.S. Fish and Wildlife Service and Georgia's Nongame Wildlife Program. Coastal Resources personnel also worked with the National Marine Fisheries Service Sea Turtle Stranding and Salvage Network to monitor the number of dead sea turtles that washed ashore on Georgia beaches during the fiscal year.

On January 3, a newborn right whale was beached

on Cumberland Island. Efforts by Coastal Resources Division biologists, a local veterinarian, National Park Service Rangers and New England Aquarium researchers to save the rare, endangered whale were hampered by high winds and an ebbing tide. Following the whale's death, Coastal Resources staff helped organize the evacuation of the carcass for research. This was the first newborn right whale carcass that scientists have been able to preserve immediately after death in over 15 years. Atlantic waters off south Georgia and north-east Florida are the only known calving areas for right whales, fewer than 400 of which remain in the north-west Atlantic, making the species the most endangered of the world's great whales.

Coastal Resources researchers assisted the U.S. Fish and Wildlife Service in a cooperative manatee tagging effort in Fernandina Beach, Florida. Three manatees were successfully tagged with transmitter belts, bringing to five the total number of tagged manatees in Georgia. The Division is assisting these researchers as they track these endangered mammals in Georgia waters and has also begun regular aerial surveys to identify important habitats and travel routes of manatees. The Division produced a poster displaying a toll-free number for reporting manatee sightings and urging fishermen not to remove tags. A brochure on what people can do for manatees is available from DNR.

Coastal Resources' Saltwater Gamefish Records staff recognized new Georgia saltwater records and outstanding catches during the fiscal year. Exceptional catches of Spanish mackerel, blackfin tuna, grouper, snapper, porgy and African pompano highlighted the season. The program maintains men's and women's records for 52 species of fish.

Shrimping. Hard-pressed by a near record low brown shrimp harvest in 1988 and prices depressed by imports, many shrimpers and seafood industry leaders urged DNR to take a less conservative approach toward the opening of Georgia's sounds. Throughout October, DNR Commercial Fisheries staff conducted intensive coastwide sampling to determine whether Georgia's sounds should be opened to commercial shrimpers. Sampling showed an abundance of large shrimp, sufficient to support commercial trawling, and in early November, six of Georgia's nine sounds were opened to commercial shrimpers for six days. Overflights on opening morning revealed 490 boats, or approximately 91 percent of all licensed operators, working in the sounds. Commercial shrimpers caught \$1.6 million worth of shrimp during the six-day opening.

SUMMARY

The Coastal Resources Division continued to safeguard and enhance Georgia's coast and marshlands in fiscal 1989, as prolific growth and development continued to draw increasing attention to this region. Under the guidance of the Department's ongoing *Five-Year Strategy*, the Coastal Resources Division will implement programs to strengthen recreational and commercial fishing, while protecting beaches, sand-sharing systems, and the unique plant and animal life of Georgia's coast, for present and future generations.

Department of Natural Resources

Annual Operating Budget, Fiscal Year 1989



	Internal Administration	Parks, Recreation & Historic Sites	Coastal Resources	Game & Fish	Environmental Protection	Total Department
EXPENDITURES						
Positions	84	491	27	483	326	1,411
Personal Services	\$3,270,836	14,391,121	1,198,348	18,660,658	13,799,748	51,320,711
Operating Expenses	1,302,862	9,456,777	398,670	5,753,739	3,778,947	20,690,995
Capital Outlay	211,500	4,216,185	24,000	932,831		5,384,516
Contract Payments	2,813,591	1,719,405			435,000	4,967,996
Federal Grants		900,000				900,000
State Grants		775,000			7,000,000	7,775,000
TOTAL EXPENDITURES	\$7,598,789	31,458,488	1,621,018	25,347,228	25,013,695	91,039,218
FUND SOURCE						
State Funds						
Appropriated	\$7,230,039	19,290,525	1,542,018	22,018,985	21,435,611	71,517,178
Federal Funds		1,299,342	79,000	3,283,000	3,518,084	8,179,426
Self-Generated Funds*		10,868,621		45,243	60,000	10,973,864
Other Funds**	368,750					368,750
TOTAL FUND SOURCES	\$7,598,789	31,458,488	1,621,018	25,347,228	25,013,695	91,039,218

*(Self-generated funds included \$10,718,621, park fee collections; \$150,000, parks timber sales; \$2,976, McIntosh County transportation; \$28,000, Sapelo Island boat fares; \$9,267, Sapelo mail delivery, U.S. Postal Service; \$5,000, Ossabaw Island rent; and \$60,000, Environmental Protection Division map sales. Total: \$10,973,864.)

** (Other Funds included \$53,750 (Jekyll Island payback) and \$315,000 (Stone Mountain payback) for a total of \$368,750, Internal Administration.

Total Funds, Fiscal Year 1989

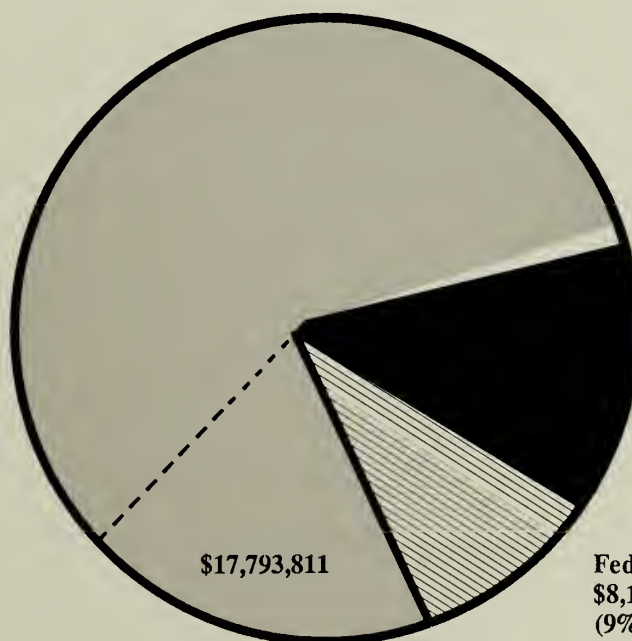
\$91,039,218

State Funds
Appropriated*
\$71,517,178
(78.6%)

Other Funds
(See above)
\$368,750 (.4%)

Self-Generated
Funds (See above)
\$10,973,864 (12.1%)

Federal Funds
\$8,179,426
(9%)



*\$17,793,811 of the State Appropriation was derived from sales of hunting and fishing licenses and permits and recreational/commercial boating fees (\$16,035,279); asbestos removal license fees (\$456,800); water well drilling permits (\$49,580); fines (\$1,250,900); and miscellaneous permits, etc. (\$1,252).

For more information
on programs to enhance and
protect Georgia's natural
resources, call or write:

**Georgia Department of Natural Resources
205 Butler Street S.E.
Suite 1252 East Tower
Atlanta, Ga. 30334
(404) 656-3500**