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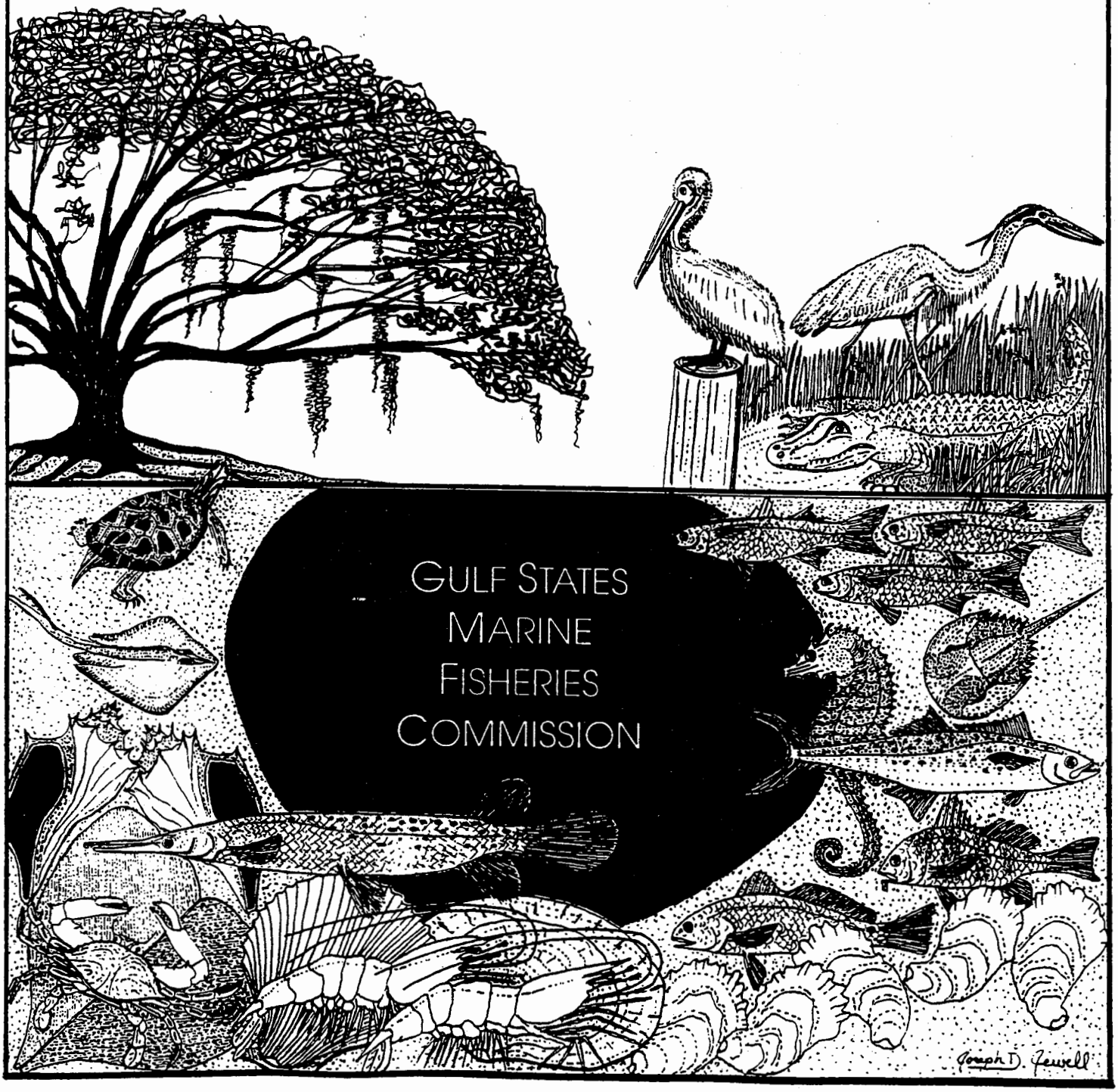
FORTY-FOURTH ANNUAL REPORT (1993)



The GULF STATES MARINE FISHERIES COMMISSION is an organization of the five states whose coastal waters are the Gulf of Mexico. This Compact, authorized under Public Law 81-66, was signed by the representatives of the Governors of the five Gulf States on July 16, 1949, at Mobile, Alabama. The Commission's principal objectives are the conservation, development, and full utilization of the fishery resources of the Gulf of Mexico to provide food, employment, income, and recreation to the people of these United States.

GULF STATES MARINE FISHERIES COMMISSION

FORTY-FOURTH ANNUAL REPORT
(1993)

To the

Congress of the United States

And to the

Governors and Legislators

Of

Alabama, Florida, Louisiana, Mississippi, and Texas

Presented in compliance with the terms of the Compact and State Enabling Acts Creating such Commission and Public Law 66 - 81st Congress assenting thereto

GULF STATES MARINE FISHERIES COMMISSION
P.O. Box 726
Ocean Springs, Mississippi 39566-0726
(601) 875-5912

ACKNOWLEDGEMENT

In submitting this Forty-fourth Annual Report, the Commissioners wish to express their most sincere appreciation for the splendid cooperation of the Members of Congress and the Governors and Legislators of the Compact states. The Commission fully appreciates that such measure of success as has been attained in the past forty-four years could not have been possible without such valued assistance. This acknowledgement is also extended to the directories and staffs of federal, state and interstate agencies, and to representatives of all organizations and individuals who have contributed toward the realization of the objectives of the Gulf States Marine Fisheries Commission.

Respectfully submitted,

Rudy Rosen, Chairman
Joe Gill, 1st Vice Chairman
Larry B. Simpson, Executive Director

GULF STATES MARINE FISHERIES COMMISSION

Forty-Fourth Annual Report
(1993)

Contents

Roster of the
GULF STATES MARINE FISHERIES COMMISSION
January 1, 1993 - December 31, 1993

Chairman: Rudy Rosen

Vice Chairman: Joe Gill

Commissioners
(order of listing - Administrator, Legislator, Governor's Appointee)

ALABAMA
- Charley Grimsley
  - AL Department of Conservation and Natural Resources, Montgomery, AL
- Taylor Harper
  - State of Alabama
  - Grand Bay, AL
- Chris Nelson
  - Bon Secour Fisheries, Inc.
  - Bon Secour, AL

FLORIDA
- Virginia Wetherell
  - FL Department of Environmental Protection
  - Tallahassee, FL
- Sam Mitchell
  - State of Florida
  - Chipley, FL
- Hans Tanzler, III
  - Jacksonville, FL

LOUISIANA
- William Perret
  - LA Department of Wildlife and Fisheries
  - Baton Rogue, LA
- Frank Patti
  - State of Louisiana
  - Belle Chasse, LA
- Leroy Kiffe
  - Lockport, LA

MISSISSIPPI
- Sam Polles
  - Mississippi Department of Wildlife, Fisheries and Parks
  - Jackson, MS
- Tommy Gollott
  - State of Mississippi
  - Biloxi, MS
- George Sekul
  - Gulf Central Seafoods, Inc.
  - Biloxi, MS

TEXAS
- Andrew Sansom
  - Texas Parks and Wildlife Department
  - Austin, TX
- Robert Saunders
  - State of Texas
  - Austin, TX
- Jan Harper
  - Lake Jackson, TX

Staff

Larry B. Simpson
Executive Director

Ronald R. Lukens
Assistant Director

Richard L. Leard
IJF Program Coordinator

David M. Donaldson
SEAMAP Coordinator

Virginia K. "Ginny" Herring
Executive Assistant

Nancy K. Marcellus
Administrative Assistant

Cynthia D. Bosworth
Staff Assistant

Cheryl R. Noble
Staff Assistant

COMMISSION OFFICERS ELECTED FOR FISCAL YEAR 1993

Chairman:	Rudy Rosen succeeding Taylor Harper
1st Vice Chairman:	Joe Gill
2nd Vice Chairman:	Edwin Conklin

COMMITTEE CHAIRS

Executive Committee ..... Rudy Rosen

Technical Coordinating Committee ..... William S. "Corky" Perret
- Anadromous Fish Subcommittee ..... Gary Tilyou
- Crab Subcommittee ..... Tom Wagner
- Data Management Subcommittee ..... Henry "Skip" Lazauski
- SEAMAP Subcommittee ..... Walter Tatum

Commercial Fisheries Advisory Committee ..... Chris Nelson (moderator)

Law Enforcement Committee ..... Jerald Waller

State-Federal Fisheries Management Committee ..... Larry Simpson (moderator)
- Menhaden Advisory Committee ..... Borden Wallace

GULF STATES MARINE FISHERIES COMMISSION

ACTIVITIES

This year, the Commission's main topic was data. For many years, I have observed the direct problems (or as an optimist might characterize as challenges) of marine fisheries management related to data. Scientists are never satisfied with the quantity and quality of the data and don't realize managers' and users' concerns over how variable the data are. Scientists find comfort in statistical process and models. The public is concerned with variations, any variations. The managers want to do the right thing but have experience which tells them to get a feel for "real world" events and signs. Long-term problems are not simple marine issues. If you take core issues and layer on legal concerns, burdens to the public, and costs and priority of expenditures, then you have a taste of what is involved.

I have heard the problems, I have seen the problems, and I have experienced the problems. We talk about it, we agonize over it, and then patch it - just make do. For several years now, I have felt a need to quit treating the symptoms of the disease. Lets go directly toward a cure. The program which the states and staff have worked on have a recreational and commercial component. These efforts are the Recreational Fisheries Information Network (RecFIN) and the Commercial Fisheries Information Network (ComFIN).

RecFIN(SE)

The Southeast Recreational Fisheries Information Network [RecFIN(SE)] is a three year pilot project to establish a state-federal cooperative program to collect, manage, and disseminate statistical data and information on the recreational fisheries of the Southeast Region.[1]

The RecFIN(SE) Strategic Plan is the result of combined efforts of program partners which include states and territories of the Region; the National Marine Fisheries Service (NMFS); the U.S. Fish and Wildlife Service; the National Park Service; the South Atlantic, Gulf, and Caribbean Fishery Management Councils; and the Atlantic and Gulf States Marine Fisheries Commissions.

The need for a comprehensive and cooperative data collection program has never been greater because of the magnitude of the recreational fisheries and the differing roles and responsibilities of the agencies involved. Many southeastern stocks targeted by anglers are now depleted, due primarily to excessive harvest, and habitat loss and degradation. The information needs of today's management regimes require data which are statistically sound, long-term in scope, timely, and comprehensive. A cooperative partnership between the state and federal agencies is the most appropriate mechanism to accomplish these goals.

Efforts by state and federal agencies to develop a cooperative program for the collection and management of recreational fishery data in the Region began in the mid to late 1980s. In 1992, the National Marine Fisheries Service formally proposed a planning activity to establish the RecFIN(SE). Planning was conducted by a multi-agency Plan Development Team through October 1992 at which time the program partners approved a Memorandum of Understanding (MOU) which established clear intent to implement the RecFIN(SE). Following signing of the MOU, a RecFIN(SE) Committee was established and met in January and March 1993 to complete a Strategic Plan and develop an Operations Plan.

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[1] The Southeast Region (the Region) includes the states of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas, and the territories of Puerto Rico and the U.S. Virgin Islands.

The scope of the RecFIN(SE) includes the Region's recreational fisheries for marine, estuarine, and anadromous species, including shellfish. Constituencies served by the program are state and federal agencies responsibilities for management of fisheries in the Region. Direct benefits will also accrue to federal fishery management councils, the interstate marine fisheries commissions, the National Park Service, the U.S. Fish and Wildlife Service, and the NOAA Marine Sanctuaries Program. Benefits which accrue to management of fisheries will benefit not only recreational fishermen and the associated recreational fishing industry, but the resources, the states, and the nation.

A variety of recreational fisheries data collection programs and projects have been conducted in the past, many of which continue to operate through state and federal agencies. While these programs are useful in meeting a variety of needs, there are many identifiable deficiencies, such as:

- lack of data base compatibility;
- lack of estimate comparability;
- duplication of effort;
- inadequate precision and accuracy of estimates;
- lack of shellfish data; and
- insufficient social and economic data.

The mission of the RecFIN(SE) is to cooperatively collect, manage, and disseminate marine recreational fisheries statistical data and information for the conservation and management of fishery resources in the Region, and to support the development and operation of a national program. The four goals of the RecFIN(SE) include:

- planning, management, and evaluation of data collection and management activities;
- implementation of data collection activities;
- establishment and maintenance of a data management system; and
- support for the establishment of a national program.

To carry out the RecFIN(SE) mission, an organizational structure has been created which includes the RecFIN(SE) Committee; South Atlantic, Caribbean, and Gulf subcommittees; various other subcommittees and working groups; and administrative and coordination support.

The pilot RecFIN(SE) is a three-year program extending through December 31, 1995. The first year will include:

- development and adoption of the Strategic Plan;
- development and adoption of operations plans for 1993 and 1994;
- establishment of administrative and coordinating staffing; and
- development of funding proposals.

The second year will include:

- continuation of planning activities;
- implementation of changes in state-federal data collection, management, and dissemination of activities; and
- initiation of internal program evaluation in preparation for an external program review and evaluation in 1995.

The third year will include:

- continuation of planning and implementation activities;
- external program review; and
- evaluation to determine the program's future.

ComFIN

The Commercial Fisheries Information Network (ComFIN) is a cooperative effort among agencies to collect, manage, and disseminate statistical data and information on the Region's commercial fisheries of the Southeast Region. The goal of ComFIN is to provide sound scientific information on catch, effort, and participation that managers need to prudently conserve and manage marine commercial fisheries resources in the Region.

The ComFIN Framework Plan is a combined effort of state, territorial, and federal agencies. It was developed under the premise that a cooperative statistics program for marine commercial fisheries in the Region will avoid duplication of effort, reduce overall costs, and provide a more reliable base of information for formulating management policies, strategies, and tactics.

The need for a comprehensive program to cooperatively collect and manage statistics on marine commercial fisheries in the Region is critical. A long-standing partnership exists among fishery management organizations in the Region, which have similar or related mandates to conserve and manage living marine resources in their respective jurisdictions. Fishery management agencies in the Region recognize the need for and benefits of a cooperative program for marine commercial fisheries statistics.

In the 1990s, state and federal fishery managers in the Region agreed there was an urgent and compelling need for coordinated collection of comprehensive data on the marine commercial fisheries resources and recommendations were made through a series of workshops and meetings. It is anticipated that the NMFS will initiate a formal process to develop a cooperative state/federal program to collect and manage commercial fishery statistics in the Region. Due to previous work and NMFS action, the Southeast Cooperative Statistics Committee (SCSC) will develop a MOU and a draft strategic plan for the ComFIN.

The scope of the ComFIN includes the Region's commercial fisheries for marine and estuarine species. The constituency served by the ComFIN are state and federal agencies in the Region concerned with conservation and management of marine commercial fisheries. Primary data users will be MOU signatories that assess stocks, forecast trends, and monitor fishery regulations. Also benefiting from the ComFIN will be other agencies responsible for the conservation and management of living marine resources in the Region.

A variety of commercial fisheries data collection programs and projects have been or are being conducted through state and federal agencies. While these programs are useful in meeting a variety of needs, there are many identifiable deficiencies, such as:

- lack of data base compatibility;
- duplication of effort;
- inadequate catch and effort estimates;
- insufficient social and economic data; and
- lack of forum to plan, coordinate, and evaluate data collection and management activities.

The mission of the ComFIN is to cooperatively collect, manage, and disseminate marine commercial and anadromous fishery data and information for the conservation and management of fishery resources in the Southeast Region and to support the development of an inter-regional program. The four goals of the ComFIN are:

- to plan, manage, and evaluate commercial fishery data collection program;
- to implement a commercial fishery data collection program;
- to establish and maintain commercial fishery data management system; and
- to support the development and operation of an inter-regional program.

To implement the ComFIN mission, an organizational structure will be created which includes the ComFIN Committee, three regional geographic subcommittees, ad hoc subcommittees, technical work groups, and administrative support. Resources will be required to support ComFIN administrative and programmatic functions. Funds will be needed for administrative, travel, and meeting expenses for the committee, geographic subcommittees, ad hoc subcommittees, and technical work groups. Ongoing data collection, management, and dissemination activities are agency-funded. Additional funding will be required to maintain current level of the CSP activities as well as for new or augmented ComFIN needs.

The ComFIN is a comprehensive program comprised of coordinated data collection activities, an integrated data management and retrieval system, and procedures for information dissemination. Implementation of annual operations plans will be the means of accomplishing the goals and objectives of the ComFIN. A detailed annual operations plan for each year will present tasks to be accomplished that year and the approaches for their implementation.

Periodically, the committee will arrange for formal external review of the program. The review will be a critical evaluation of the effectiveness of the program in achieving the stated goals and objectives. A report will be prepared and presented to all the ComFIN signatory agencies, with recommendations concerning improvements of the ComFIN.

OTHER ACTIVITIES

In addition, the Commission accomplished the normal functions of coordination and administration of its interstate program which includes striped bass, mullet, artificial reefs, habitat activities, office administration, etc. I felt good about the Commission's progress in 1993.

Larry B. Simpson
Executive Director

MEETINGS/ACTIVITIES OF THE EXECUTIVE DIRECTOR

GULF STATES MARINE FISHERIES COMMISSION

Marine Fisheries Advisory Committee (MAFAC), Department of Commerce, New Orleans, Louisiana, February 1993
Menhaden Industry Meeting, New Orleans, Louisiana, February 1993
Interstate Commission Executive Directors Meeting, Ocean Springs, Mississippi, February 1993
Commission Auditor, FY92 Budget, Ocean Springs, Mississippi, February 1993
Garland Pardue/Doug Frugé, Commission/FWS Programs, Ocean Springs, Mississippi, March 1993
Gulf States Marine Fisheries Commission Spring Meeting, Palm Beach, Florida, March 1993
Conference Call of the Three Interstate Executive Directors, Ocean Springs, Mississippi, March 1993
Louisiana Department of Wildlife and Fisheries Commission Meeting, Setting of the Shrimp Season, New Orleans, Louisiana, May 1993
Marine Fisheries Advisory Committee (MAFAC), Department of Commerce, Washington, DC, June 1993
Interstate Commissions Executive Directors Meeting, Habitat Programs, Sisters, Oregon, August 1993
Gulf States Marine Fisheries Commission Annual Meeting, San Antonio, Texas, October 1993
SEAMAP Meeting with Scott Nichols and Walter Tatum, Ocean Springs, Mississippi, November 1993
Habitat Program Meeting with Steve Renfroe, Chevron USA, Inc., Pascagoula, Mississippi, November 1993

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL (GMFMC)

January 1993	Corpus Christi, Texas
March 1993	New Orleans, Louisiana, National Symposium - MFCMA Issues
March 1993	New Orleans, Louisiana
April 1993	Tampa, Florida, Mackerel Social/Economic Issues
May 1993	Tampa, Florida
July 1993	San Antonio, Texas
September 1993	New Orleans, Louisiana
November 1993	Biloxi, Mississippi

MARINE FISHERIES INITIATIVE (MARFIN) PROGRAM STEERING COMMITTEE

May 1993	Tampa, Florida
July 1993	Conference Call, Ocean Springs, Mississippi
September 1993	Washington, DC
October 1993	Atlanta, Georgia (Principal Investigator's Conference)

OTHER MEETINGS AND ACTIVITIES

Louisiana Shrimp Association Annual Meeting, New Orleans, Louisiana, February 1993
International Association of Fish and Wildlife Agencies Mid-Year Meeting, Washington, DC, March 1993
Gulf and South Atlantic Fisheries Development Foundation, Inc. (GSAFDF), Workshop on Observer Bycatch Data, Tampa, Florida, July 1993
Atlantic States Marine Fisheries Commission Annual Meeting, MFCMA Amendments, New Port, Rhode Island, November 1993

CONGRESSIONAL MEETINGS

Office of Management and Budget Meeting, Anadromous Fisheries Research, Washington, DC, January 1993

Congressional Staff Meetings on Gulf Programs, Washington, DC, January 1993

Interstate Commissions Executive Directors Testimony Before House Appropriations Subcommittee on State, Justice, Commerce and Judiciary, Washington, DC, May 1993

Congressional Staff Meetings on Gulf Programs, Washington, DC, September 1993

SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a state/federal/university program for collection, management, and dissemination of fishery-independent data and information in the southeastern United States. The program presently consists of three operational components; SEAMAP-Gulf of Mexico, which began in 1981; SEAMAP-South Atlantic, implemented in 1983; and SEAMAP-Caribbean, formed in 1988. Each SEAMAP component operates independently, planning and conducting surveys and information dissemination in accordance with administrative policies and guidelines of the National Marine Fisheries Service's Southeast Regional Office (SERO).

In FY1993, SEAMAP operations continued for the twelfth consecutive year. SEAMAP resource surveys included the Fall Shrimp/Groundfish Survey, Winter Ichthyoplankton Survey, Louisiana Seasonal Trawl Surveys, Spring Plankton Survey, Spring Reef Fish Survey, Summer Shrimp/Groundfish Survey, Fall Plankton Survey, and plankton and environmental data surveys. Special projects for FY1993 consisted of the Status and Trends Benthic Surveillance Project. Other FY1993 activities included SEAMAP information services and program management.

SEAMAP RESOURCE SURVEYS

In FY1993, collection of resource survey information continued for the twelfth consecutive year. The surveys conducted during the year address distinct regional needs and priorities and provide information concerning the marine resources in the Gulf of Mexico.

Fall Shrimp/Groundfish Survey

The Fall Shrimp/Groundfish Survey was conducted from September 28 to November 23, 1992, from off Mobile, Alabama, to the U.S.-Mexican border. Vessels sampled waters out to 60 fm, covering a total of 344 trawl stations, in addition to plankton and environmental sampling.

The objectives of the survey were to sample the northern Gulf of Mexico to determine abundance and distribution of demersal organisms from inshore waters to 60 fm, obtain length-frequency measurements for major finfish and shrimp species to determine population size structures, collect environmental data to investigate potential relationships between abundance and distribution of organisms and environmental parameters, and collect ichthyoplankton samples to determine relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.

During the survey, the NOAA Ship OREGON II sampled 221 stations in offshore waters and territorial Louisiana and Texas waters. The R/V VERRILL sampled 8 stations in Alabama territorial waters. The R/V TOMMY MUNRO sampled 15 stations in Mississippi territorial and offshore waters. The R/V PELICAN sampled 20 stations in Louisiana territorial and offshore waters. And Texas vessels sampled 80 stations within their territorial waters.

Ichthyoplankton data were collected by NMFS and Louisiana vessels at sample sites occurring nearest to half-degree intervals of latitude/longitude. A total of 35 stations was sampled with bongo and/or neuston nets as encountered along cruise tracks. NMFS completed 30 ichthyoplankton stations, and Louisiana completed 5 stations. The samples, except those taken by Louisiana, will be sorted by the Polish Sorting and Identification Center (PSIC). Once sorted, the specimens and data will be archived at the SEAMAP Archiving Center (SAC).

Louisiana Seasonal Day/Night Surveys

The Louisiana Department of Wildlife and Fisheries (LDWF) conducts seasonal day and night surveys as part of its continuing effort to provide comparative information on the abundance and distribution of critical life stages of major Gulf species, especially shrimp and associated environmental parameters. The sampling design for these surveys has changed little from similar day/night surveys in past years.

Sampling was conducted in October and December 1992 and March and July 1993 aboard the R/V PELICAN. A stratified random station selection design was maintained, varying from the transects previously surveyed. A total of 48 stations was sampled during day and night at depths up to 20 fm. The July sampling was completed as part of the SEAMAP Summer Shrimp/Groundfish Survey.

All seasonal trawls were completed with the standard SEAMAP 40-ft net and doors. All organisms captured were identified, counted, measured, and weighed. Environmental data and plankton/neuston sampling were conducted at trawl stations as well. Plankton samples were archived and sorted at the LDWF Plankton Laboratory. Specimens and data will be shipped to the SAC in St. Petersburg, Florida. The area sampled covered Louisiana territorial and EEZ waters from 89°30′ to 91°30′ W longitude.

Winter Ichthyoplankton Survey

The Plankton Work Group has expressed some interest in conducting a winter plankton survey since there is no SEAMAP plankton information during this time period. In an effort to collect samples in the winter, a SEAMAP ichthyoplankton survey was piggybacked on a winter marine mammals cruise. The plankton survey was conducted from January 5, to February 13, 1993. The NOAA Ship OREGON II sampled offshore waters from Mobile Bay, Alabama, to the Texas-Mexico border. A total of 222 bongo, 111 neuston, and 32 Tucker trawl samples were collected.

Plankton collections were generally taken only during night hours when marine mammal observations could not be made. Plankton samples were taken with standard SEAMAP bongo and neuston samplers. The bongo sampler consisted of two conical 60-cm nets with 335-micron mesh. Tows were oblique, surface to near bottom (or 200 m), and back to surface. Wire angle was maintained at 45 degrees. Neuston samples were taken with 947-micron mesh nets on 1 x 2-meter frames towed at the surface for ten minutes. The Tucker trawl used for discrete depth sampling has a 1 m^2 mouth opening and was fitted with three, 335-micron mesh nets. Right bongo and neuston samples were initially preserved in 10% buffered formalin and after 48 hours were transferred to 95% ethyl alcohol for final preservation. Left bongo samples were preserved via an ethanol/ethanol transfer to aid in preservation of larval otoliths. In addition, hydrographic data was collected at all stations included surface chlorophyll, salinity, temperature, and dissolved oxygen from surface, midwater and near bottom, and forel-ule color.

Right bongo and neuston samples collected by the NMFS from SEAMAP stations will be transshipped to the PSIC. Left bongo samples will be archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC) which is located at the Gulf Coast Research Laboratory in Ocean Springs, Mississippi.

Spring Plankton Survey

For the eleventh year, plankton samples were collected during the spring in the northern Gulf of Mexico. The NOAA Ship OREGON II and Florida's R/V HERNAN CORTEZ II sampled offshore waters from the western edge of the West Florida Shelf to the Texas-Louisiana border from April 24 to June 15, 1993. A total of 236 stations was sampled. The OREGON II sampled 217 stations and the R/V HERNAN CORTEZ II sampled 19 stations along the west Florida shelf.

Plankton samples were taken with standard SEAMAP bongo and neuston samplers and collected and preserved using standard SEAMAP gear and methods as described in the Winter Plankton Survey. In addition, hydrographic data was collected at all stations included surface chlorophyll, salinity, temperature, and dissolved oxygen from surface, midwater and near bottom, and Forel-ule color.

Right bongo and neuston samples collected by NMFS and Florida from SEAMAP stations will be transshipped to the PSIC. Left bongo samples will be archived at the SIPAC. Salinity data from the Florida vessel were sent to the NMFS Mississippi Laboratories for interpretation.

Spring Reef Fish Survey

The second Spring Reef Fish Survey was started on May 17 and continued into October 1993. Vessels from the NMFS, Mississippi, Alabama, and Florida sampled inshore and offshore waters, covering approximately 190 stations, in addition to plankton and environmental sampling. Randomly selected sites from Brownsville, Texas, to Key West, Florida, are chosen from known hard bottom locations. The objectives of the survey are to assess relative abundance and compute population estimates of reef fish using a video/trap technique, determine habitat using an echo sounder and video camera, determine if bioacoustics assessment methodology can be applied to reef fish communities, collect environmental data at each station, and collect ichthyoplankton samples at selected reef sites.

The primary purpose of this survey is to assess the relative abundance and compute population estimates of reef fish. Stations are randomly-selected 100 m^2 sites which are designated as "reef areas." There are several aspects of the reef fish survey: (1) locating and compiling known hard bottom reef habitat locations, (2) survey site selection, (3) sampling protocol using a fish trap and video camera, and (4) analyses of video records. Data is collected using the trap/video methodology where a fish trap containing a video camera is deployed onto the selected reef site. Trap soak time is one hour. After trap deployment, hydrographic data including a STD/light meter, transmissometer drop, secchi disk reading, and surface chlorophyll samples will be collected. Also, after the last trap/camera set, one ichthyoplankton station will be completed each day with a surface neuston net and Tucker trawl. Environmental and plankton samples collected will use established SEAMAP protocols and plankton samples will be transshipped to the PSIC.

Final analyses of video tapes are accomplished at the Pascagoula Laboratory, where data is recorded onto standard SEAMAP forms. Tapes are analyzed either in their entirety or by randomly-selected one minute intervals. The determinant factors for sampling are based on whether the reader can identify and count fish entering the camera field of view and record the data.

Summer Shrimp/Groundfish Survey

A planning meeting of the Shrimp/Bottomfish Work Group was held in April 1993 to examine the design for the Summer Shrimp/Groundfish Survey and determine the random station locations for each participant. Objectives of the survey were to monitor size and distribution of penaeid shrimp during or prior to migration of brown shrimp from bays to the open Gulf, aid in evaluating the "Texas Closure" management measure of the Gulf Council's Shrimp Fishery Management Plan, and provide information on shrimp and bottomfish stocks across the northern Gulf of Mexico from inshore waters to 50 fm.

The overall sampling strategy during the 1993 SEAMAP summer survey was to work from the eastern Gulf to the Texas/Mexico border in order to sample during or prior to migration of brown shrimp from bays to the open Gulf area. The survey occurred from June 1 to July 18, 1993. During the survey, the NOAA Ship OREGON II and R/V TOMMY MUNRO sampled offshore and inshore Gulf waters with 40-ft trawls. Alabama's R/V VERRILL sampled offshore Alabama waters with 40-ft trawls. The R/V PELICAN sampled both Louisiana state waters and offshore waters with 40-ft trawls, and Texas vessels sampled Texas state waters and offshore waters with 20-ft trawls. A total of 336 trawl samples

was taken from coastal and offshore waters out to 50 fm from Mobile Bay, Alabama, to Brownsville, Texas. All vessels took environmental data, including temperature, salinity, oxygen, and chlorophyll at each station.

Fall Plankton Survey

The first fall ichthyoplankton survey to assess abundance and distribution of king mackerel eggs and larvae occurred in August 1984. No sampling survey was conducted in 1985; however, expanded surveys in 1986-1992 and in the current year covered Gulf waters from Florida Bay to Brownsville, Texas. Vessels from Florida, Alabama, Mississippi, Louisiana, and the NMFS surveyed from August 29 to October 9, 1993.

The NOAA Ship OREGON II sampled stations from Tampa Bay, Florida, to Brownsville, Texas, at depths from 5 to 100 fm. Florida's R/V HERNAN CORTEZ sampled stations from off Tampa Bay south to the Florida Straits area. An Alabama vessel sampled stations at the mouth and outside Mobile Bay. The R/V TOMMY MUNRO sampled stations south of Mississippi Sound along a 30-minute grid. The R/V PELICAN sampled stations in Louisiana territorial waters.

Stations were sampled with standard SEAMAP bongo nets with 333-micron mesh and/or 1 x 2-meter neuston nets fitted with 947-micron mesh. Hydrographic sampling included chlorophyll, salinity, temperature, and dissolved oxygen from surface, mid-water, and bottom water transparency, and water color. Right bongo samples collected by NMFS and the Gulf States will be transshipped to the PSIC. Left bongo and neuston samples will be stored at the SIPAC at the Gulf Coast Research Laboratory for possible future sorting. Louisiana plankton samples will be sorted by the LDWF according to SEAMAP protocols and specimens and data provided to the SAC.

Plankton and Environmental Data Surveys

As in previous years, plankton samples and environmental data were collected routinely during most SEAMAP trawling surveys. During the Summer Shrimp/Groundfish Survey, plankton tows were piggybacked on the NMFS and state vessels, sampling randomly generated trawl stations within the standard 30-minute SEAMAP grids. Plankton and environmental data were also taken by Louisiana at all of its seasonal day/night survey stations. Samples were taken by participants with a 60-cm bongo net and a standard SEAMAP neuston net.

Objectives of these piggybacked surveys were: (1) to collect plankton samples throughout the survey area and (2) to collect associated hydrographic and environmental data at each plankton station. Additionally, environmental data (salinity, temperature, and oxygen from surface, mid-depth and bottom waters, and chlorophyll from surface and bottom waters) were collected during the shrimp/groundfish surveys. Wind direction, wind speed, and wave height were taken at all trawl stations.

Samples from the right side of the bongo nets and neuston samples were shipped to the NMFS-Pascagoula Laboratory for transshipment to Poland, where they will be sorted to the family level (both ichthyoplankton and selected crustacean and molluscan species). The left bongo sample from each station is retained as a back-up in the event of damage or loss of the specimens and maintained at the SIPAC.

Chlorophyll samples were filtered at each station using GF/C filters. All filters were put in petri disks and wrapped in foil for onboard storage in the freezer. Chlorophyll analysis will be completed ashore. Preservation of plankton samples was in buffered formalin prior to transfer to ethanol.

In addition to these piggybacked surveys, two major SEAMAP plankton surveys were conducted in FY1993, as detailed earlier.

FY1993 SEAMAP SPECIAL PROJECTS

In addition to the regularly-scheduled surveys, SEAMAP participates in a variety of other projects. The SEAMAP provides guidance, personnel, and other contributions to these studies for enhancement and protection of the marine resources in the Gulf of Mexico.

Status and Trends Benthic Surveillance Project

For the tenth year, the SEAMAP actively participated in the nationwide sampling for contaminants in coastal fishes and sediments as part of the NOAA National Status and Trends Benthic Surveillance Project. Both SEAMAP-Gulf of Mexico and SEAMAP-South Atlantic supplied personnel from state fishery management agencies to provide guidance in locating concentrations of the target species, Atlantic croaker and spot.

Sampling methodologies in the 1993 Benthic Surveillance Project were identical to those of the previous surveys. Gulf of Mexico sites included: Charlotte Harbor (FL), Tampa Bay (FL), Apalachicola Bay (FL), St. Andrews Bay (FL), Choctawhatchee Bay (FL), and Pensacola Bay (FL). South Atlantic sites sampled in 1993 included: Cape Fear (NC), Charleston Harbor (SC), Savannah River (GA), Sapelo Sound (GA), St. Johns River (FL), St. Lucie River (FL), and Biscayne Bay (FL).

Sampling occurred from August 2 to October 1, 1993, with the NOAA Ship FERREL serving as the primary platform. Analyses of trace metals, aromatic and chlorinated hydrocarbons, and other contaminants in fish tissues and sediments are coordinated by the NMFS Beaufort (NC) Laboratory.

A list of publications produced under NOAA's National Status and Trends Program is available from NOAA, National Status and Trends Program, N/OMA32, 11400 Rockville Pike, Rockville, MD 20852.

INFORMATION SERVICES

Information from the SEAMAP activities is provided to user groups through the program administration and three complementary systems: the SEAMAP Information System (SIS), SAC, and SIPAC. Products resulting from SEAMAP activities can be grouped into two major categories, data sets (including broadly, digital data, and collected specimens) managed by SIS, SAC, and SIPAC and program information.

SEAMAP Information System

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SIS, managed in conjunction with NMFS-SEFSC. Raw data are edited by the collecting agency and verified by the SEAMAP Data Manager prior to entry into the system. Data from all SEAMAP-Gulf surveys during 1982-1991 have been entered into the system and data from 1992 and 1993 surveys are in the process of being verified, edited, and entered for storage and retrieval. Verified, non-confidential SEAMAP data are available conditionally to all requestors, although the highest priority is assigned to SEAMAP participants.

Requested SEAMAP data were used for a multitude of purposes in FY1993:

- Evaluating the abundance and size distribution of penaeid shrimp in federal and state waters to assist in determining opening and closing dates for commercial fisheries.
- Assessing shrimp and groundfish abundance and distribution and their relationship to such environmental parameters as temperature, salinity, and dissolved oxygen.
- Identifying environmental parameters associated with concentrations of larval finfish.

- Compiling the 1990 and 1991 SEAMAP Biological and Environmental Atlases.
- Comparing catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets.

Data Management

The requirements report for an integrated data system, *Data Management System Design Study for Gulf and South Atlantic, 1987*, was completed in March 1987. The document identifies the high-level design specifications and recommended implementation plan for a module-based SEAMAP Data Management System (DMS).

Work was completed during FY1990 on the new distributed SEAMAP DMS. New modules completed include those for data entry, edit, upload, data query, and download has been completed. Delivery of the remaining PS/2's has been completed, and all of the Gulf States are now equipped with the necessary computer hardware and software. The new system is decentralized, i.e., distributed. Thus, the SEAMAP users are able to locally and directly enter and retrieve data. Software for the system has been distributed to participants for trial runs of data input. This new system overcomes the deficiencies of the old system (i.e., the time necessary to enter and retrieve data) and provides powerful and flexible local data analysis and display capabilities. Under the new system, each SEAMAP site enters, verifies, and edits their data, eliminating the mail-oriented loop necessary to enter/edit/verify data under the old system. Secondly, each site has the capability of locally accessing SEAMAP data, utilizing a user-friendly system. Local data retrieval allows the data to be accessed in a timely manner with a minimum amount of effort and programming skills.

Under the new system, outside users (e.g., Minerals Management Service, U.S. Army Corps of Engineers, etc.) may continue to request special data sets for research or study. The outside users submit the request to the SEAMAP Subcommittee through the SEAMAP-Gulf Coordinator for approval to proceed. Once the request is approved, the information is provided by the Data Manager and staff members through a priority-based, mail-oriented system. Also, SEAMAP participants may use the Special Request mechanism for data sets too large for economical downloading by telephone. These requests will be handled by a Central Operations staff in the same priority-based, mail-oriented manner as noted above.

Real-time Data

A major function of the SIS in FY1993 was the processing of catch data from the Summer Shrimp/Groundfish Survey as near-real-time data. Data were transmitted three times weekly via cellular phone to the NMFS Mississippi Laboratories from the NOAA vessel, while the states' data were entered into the system weekly. Plots of station locations and catch rates of shrimp, squid, and dominant finfish species were prepared and edited at the NMFS Mississippi Laboratories and processed by GSMFC for weekly distribution to management agencies, fishermen, processors, and researchers. Management agencies also received comprehensive data listings showing penaeid shrimp length frequencies, sampling parameters, and environmental conditions.

SEAMAP Archiving Center

Larval fish and fish egg samples sorted to the family level by the PSIC are returned to the SAC for archiving and loan to researchers. Data entry for most of the returned sorted samples is completed in an improved and simplified information management system. All data are now managed by a dual microcomputer/mainframe program which eliminates coding errors and facilitates faster data entry. Samples cataloged to date represent 18 orders, 125 families, 234 genera, and 244 species.

The SAC is managed in conjunction with Florida Department of Environmental Protection (FDEP) in St. Petersburg, Florida, and processes both specimen loans and requests for associated plankton survey environmental data. Currently, the SAC is being reorganized and lines of supervisory responsibilities are

being changed due, in part, to the departure of Dr. John V. Gartner, Jr. A new collection manager and half-time assistant for the collection manager have been hired. The backlog of uncatalogued samples has been eliminated, and all new samples are being processed as they arrive.

SEAMAP Invertebrate Plankton Archiving Center

With the determination in 1985 by the SEAMAP-Gulf Subcommittee that the retained "back-up" bongo collections also contain valuable research materials, the SIPAC was established and is managed in conjunction with Gulf Coast Research Laboratory in Ocean Springs, Mississippi. Curation and management of SEAMAP zooplankton samples and sorting for selected invertebrates continues at the SIPAC for the seventh consecutive year. The SIPAC continues to provide both sorted and unsorted SEAMAP zooplankton samples and data on those samples to researchers and other user groups as requested.

During FY1993, 92 unsorted SEAMAP samples were received and catalogued at SIPAC. To date, a total of 4,978 unsorted fish larvae samples is held at SIPAC. In an effort to limit the space and costs of curating the growing SIPAC collection of unsorted samples, a protocol was adopted to retain only a 1/4 aliquot of samples that are more than 7 years old. To date, 1,500 samples were aliquoted including all of the 1982-1984 samples and retained in the collection. The remaining volumes of the samples have been donated to several educational organizations for use as instructional materials. Data on SEAMAP samples added to the SIPAC collection and samples aliquoted for long-term storage has been entered into the SIPAC data base. Updated computer files on the SIPAC holdings have been requested by and provided to NMFS-Pascagoula personnel.

During FY1993, a total of 160 SEAMAP samples have been sorted for selected invertebrate taxa by the SIPAC and the PSIC following established protocol. A total of 607 lots were obtained from these samples. To date, a total of 5,415 lots of invertebrates have been sorted from 1,278 samples. All portunid crab megalopae from the sorted samples have been further identified to the lowest possible taxonomic level. A substantial data base has been established on the occurrence and distribution of blue crab and other portunid megalopae from the northern Gulf of Mexico. This data is available to researchers upon request.

During the next fiscal year, the SIPAC collection will continue to be maintained and additional samples will be sorted for invertebrates, contingent on funding. Activities will include: aliquoting of low priority samples for long-term archiving, recycling old sample jars, and maintaining data on unsorted and sorted samples. Emphasis will be placed on building a substantial data base on the occurrence and distribution of megalopae blue crabs and postlarval penaeid shrimp.

PROGRAM MANAGEMENT

The SEAMAP program is administered by the SEAMAP Subcommittee of the TCC through the SEAMAP Coordinator, who is under the technical direction of the subcommittee chairman and administrative supervision of the GSMFC's Executive Director. Personnel associated with SEAMAP program management include the Coordinator, Data Manager, SAC Curator, SIPAC Curator, and the NMFS-Pascagoula Laboratory Director, serving as Program Manager.

Planning

Major SEAMAP-Gulf Subcommittee meetings were held in October 1992 and March 1993, in conjunction with the Annual Fall and Spring Meetings of the GSMFC. All meetings included participation by the work group leaders, Coordinator, Data Manager, curators, and the GSMFC Executive Director. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in August 1993 to discuss respective program needs and priorities for FY1994.

SEAMAP-Gulf work groups met this past year to provide recommendations to the subcommittee for survey and data management needs. The Environmental Data Work Group met in March and September (via conference call) 1993 to address some of the problems encountered by SEAMAP personnel in sampling environmental data during the surveys. The Shrimp/Groundfish Work Group met in April 1993 to discuss the finalizations of the Summer Shrimp/Groundfish Survey. The Reef Fish Work Group met in September 1993 (via conference call) for their first meeting to discuss the sampling protocol and methodology for the SEAMAP Reef Fish Survey. Where additional discussion was needed, the subcommittee also deliberated plans and needs via conference calls.

Coordination of program surveys and distribution of quick-report summaries of a Gulf-wide survey to management agencies and industry were major functions of SEAMAP management in FY1993. Other important management activities included coordinating data provision and specimen loans, preparing publications and documents, and assisting in the preparation of state-federal cooperative agreements, including amendments to permit extension of activities previously not detailed in the agreements.

Information Dissemination

The following documents were published and distributed in FY1993:

- *1993 SEAMAP Marine Directory.* Inventories of marine agency contacts (state, federal, and university) concerned with fishery research in the Gulf of Mexico and summaries of information provided by these organizations: target species, types of fishery-independent sampling gear and platforms, annual sampling effort, and other materials.

- *SEAMAP Subcommittee Report to the GSMFC Technical Coordinating Committee - October 1, 1992 to September 30, 1993.* A detailed summary of program accomplishments, emphasizing survey design, material collected, data dissemination, budget information, and future survey activities.

- *Annual Report of the SEAMAP Program - October 1, 1991 to September 30, 1992.* A summary of 1992 activities and proposed 1993 events for the SEAMAP-Gulf, South Atlantic, and Caribbean Programs.

- *Environmental and Biological Atlas of the Gulf of Mexico, 1990.* A compilation of information obtained from the 1990 SEAMAP surveys including catch rates of shrimp and finfish, abundance and distribution of plankton in the Gulf of Mexico, and environmental data from all surveys.

- *Environmental and Biological Atlas of the Gulf of Mexico, 1991.* A compilation of information obtained from the 1991 SEAMAP surveys including catch rates of shrimp and finfish, abundance and distribution of plankton in the Gulf of Mexico, and environmental data from all surveys.

David M. Donaldson
SEAMAP Coordinator

COOPERATIVE INTERSTATE FISHERY MANAGEMENT IN THE TERRITORIAL SEA OF THE GULF OF MEXICO

The Gulf States Marine Fisheries Commission (GSMFC) provided administrative support for "Cooperative Interstate Fishery Management in the Territorial Sea of the Gulf of Mexico," FWS Grant Agreement No. 14-48-0009-93-1231. GSMFC furnished services, qualified personnel, materials, equipment, and facilities as needed to perform required duties.

During the period covered by this report (January 1, 1993 - December 31, 1993), the Program Coordinator sponsored and/or attended/participated in several meetings and planning development activities pertinent to carrying out responsibilities of this grant agreement. GSMFC arranged and paid expenses for appropriate personnel to attend and participate in selected activities. Minutes, general correspondence, meeting notices, agendas, and other required materials were prepared and distributed to the appropriate persons. Persons authorized to travel have been reimbursed. Minutes of all meetings conducted by the GSMFC under this program are available upon request. A brief report on program progress follows.

Anadromous Fish Restoration Activities

The primary activity during this program year was the collection of striped bass genetic samples by the state and federal agencies participating in the striped bass restoration effort and the analysis of those samples by Dr. Ike Wirgin. As of the close of 1993, a total of 132 samples were collected by the Gulf States and the U.S. Fish and Wildlife Service, all of which have been analyzed by Dr. Wirgin. Samples submitted by the state of Alabama were damaged during shipment and could not be analyzed. Preliminary analysis of the data indicate that all fish sampled were of Atlantic coast origin, with the exception of several fish from the Apalachicola River in Florida. This report marks the completion of the first year of a planned three year effort to collect striped bass DNA data.

Another activity funded under this program for 1993 was to develop a study plan to use remote sensing technology to locate thermal refuges on the Apalachicola River (Florida), Lake Seminole (Florida and Georgia), and the Flint River (Georgia). In 1988, the GSMFC conducted a pilot project to use the thermal infrared multispectral scanner (TIMS) to accomplish the task. While the technology worked in locating thermal anomalies, there were several problems with practical application of the data for locating thermal refuges. Included are the altitude of the overflight, time of year of the overflight, and a lack of data processing capability, among others. The current project to develop a study plan is intended to address those earlier problems. If the study plan receives funding in the future, the data collection and processing will be conducted by the Earth Resources Laboratory of the Stennis Space Center using the Atlas Scanner which is a refined version of the TIMS.

Other activities undertaken with respect to striped bass restoration include an effort to establish a length-weight formula for Gulf of Mexico striped bass that would allow field samplers to collect length data and assign weight data to fish collected. A preliminary analysis of available length and weight data indicate that there are some complexities regarding establishing a single formula for the entire Gulf region. For instance, there are differences in length-weight relationships during different times of the year which also may be related to sex of the fish during gonadal development periods. There also seems to be a different length-weight relationship between coastal striped bass and reservoir fish. Another useful benefit of the exercise is to establish general length-weight relationships so that fish from different areas could be compared regarding their general condition. For this application, the formula(s) would not have to be so precise.

The development and distribution of a status report on Alabama shad was of particular interest to the Anadromous Fish Subcommittee which met on October 19, 1993, in conjunction with the annual

GSMFC meeting in San Antonio, Texas. The subcommittee expressed an interest in following up on the issue to determine if a fishery management plan for the species should be developed.

The subcommittee discussed the possibility of supporting a demonstration striped bass restoration project on a single river. It was suggested that the Pascagoula River in Mississippi would serve as a good study area, because the river historically supported a striped bass population, it has relatively good habitat quality, and has recently been the recipient of stocking efforts by the state of Mississippi and the U.S. Fish and Wildlife Service. The subcommittee agreed to support such a study on the Pascagoula River and authorized commission staff to work with the U.S. Fish and Wildlife Service to identify funds to carry it out.

Artificial Reef Activities

The TCC Recreational Fisheries Management Subcommittee consists of the artificial reef program managers in each state, a representative of the Artificial Reef Development Center, a representative each from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, and a representative from the South Carolina artificial reef program, who provides an Atlantic coast perspective to the subcommittee. The primary activity of the subcommittee during this program year was to develop discussion materials and literature references on a variety of artificial reef materials that have been used in the United States. The ultimate goal of this activity is to produce a report that provides artificial reef program managers and others interested in developing artificial reefs with information on the benefits and drawbacks of using certain materials and recommendations on the most effective and efficient ways to use those materials.

Each subcommittee member has been assigned several materials and have compiled a list of available literature references to the use of those materials. This was the fulfillment of the planned activities related to this project for fiscal year 1993. Plans for the second year of activities to complete this project were discussed during the above referenced meeting. Those plans include each subcommittee member developing an outline, as earlier approved by the subcommittee, related to the literature references compiled, and to begin making contacts with individuals that are known to have used the assigned materials and seeking information from those individuals. As a reference document, each subcommittee member was provided with a copy of the artificial reef materials document developed by the Atlantic States Marine Fisheries Commission's Artificial Reef Advisory Committee. That document provides a listing of materials that have been used by the Atlantic coast programs, along with a description of their use.

Other important issues discussed by the subcommittee include the use of coal combustion and municipal solid waste incineration ash in artificial reef materials, the establishment of special management zones for artificial reefs, the use of video technology to assess fish populations on artificial reefs, the use of army tanks as artificial reef material, and social and economic studies of artificial reefs, among others. The subcommittee will hold another meeting early in 1994, perhaps in conjunction with the Atlantic States Marine Fisheries Commission's Artificial Reef Advisory Committee.

Fishery Data Activities

The primary activity conducted related to fishery data programs was the completion of the proceedings of a workshop entitled "The Commercial Fisheries Information Network" (ComFIN). The ComFIN currently is a data initiative to investigate ongoing commercial fishery data collection and data management activities and to recommend ways to improve those activities. The final ComFIN document provides a description of a variety of programs ongoing as well as recommendations for future actions. Also included is a mission statement, goals, and objectives for a ComFIN program. The initial activity of such an effort will be to establish an organizational structure through which the ComFIN will operate.

Also of vital interest to this program is the Southeast Recreational Fisheries Information Network [RecFIN(SE)]. While no meetings of the RecFIN(SE) Committee were held during this reporting period, work was ongoing to complete several activities under the Biological and Environmental Work Group, the Social and Economic Work Group, the Data Base Work Group, and the Administrative Subcommittee.

Other important issues addressed by the subcommittee include data confidentiality, the development of the proceedings of a workshop on Geographic Information Systems (GIS), and stock assessments for fisheries.

Interjurisdictional Fisheries Management Activities

During this program year, inter-office plans were made to coordinate with the GSMFC Interjurisdictional Fishery Management Program and conduct activities related to the development of an interstate fishery management plan for spotted seatrout, an important recreational species in the Gulf of Mexico. Ultimately, these plans will result in the development of a stock assessment for the species. These activities will be conducted during 1994.

The Anadromous Fish Subcommittee initiated efforts to develop a regional, interstate fishery management plan for Gulf sturgeon. That species was listed as threatened under the Endangered Species Act effective October 30, 1991. At that time, the subcommittee agreed to cooperatively develop a recovery/management plan for the species. During this program year, the plan has been completed in final draft form and made available for both technical and broad public review. It is anticipated that the plan will be approved by the appropriate federal agencies through the recovery plan process and by the GSMFC through the interstate fishery management plan process early in 1994.

During this program year, the GSMFC sponsored a stock assessment training workshop for state scientists. A total of 12 state fisheries scientists participated in the 3-day workshop which was held in Tallahassee, Florida, at the Florida Department of Natural Resources. Certificates of participation in and completion of the workshop were distributed to each participant, and an evaluation report was developed. Another stock assessment training workshop is planned for the 1994 program year.

Miscellaneous

During this reporting program year, the Program Coordinator attended and/or participated in several meetings related to the program. A brief listing of those meetings follows.

The Program Coordinator participated in a meeting with the President's Office of Management and Budget to discuss coordination of Gulf of Mexico striped bass restoration activities and progress to date.

The Program Coordinator provided a presentation of the RecFIN(SE) to a data review workshop sponsored by the Caribbean Fishery Management Council in Puerto Rico.

The Program Coordinator attended the annual *Morone* Workshop which is relevant to striped bass restoration activities being coordinated by the GSMFC.

The Program Coordinator attended the Annual Meeting of the Mississippi Wildlife Federation. This group is involved in influencing a number of important recreational fishery issues in Mississippi, including red drum and spotted seatrout management and the establishment of a marine recreational fishing license.

The Program Coordinator attended the mid-year meeting of the International Association of Fish and Wildlife Agencies in Washington, D.C.

The Program Coordinator attended a meeting with the U.S. Fish and Wildlife Service related to work proposed by the U.S. Army Corps of Engineers on the lower Pearl River and its potential impact on striped bass and Gulf sturgeon stocks.

The Program Coordinator attended a meeting of the Mississippi Wildlife Federation related to the Pearl River issue mentioned above, among other important recreational fisheries issues.

The Program Coordinator presented the key-note address at the Third Florida Artificial Reef Summit in Tallahassee, Florida.

The Program Coordinator participated in an American Fisheries Society meeting to provide information and guidance to the Cable News Network (CNN) regarding a special program on fisheries.

The Program Coordinator made a presentation at a National Fishing Week event sponsored by the Ocean Springs Fisheries Coordination Office of the U.S. Fish and Wildlife Service.

The Program Coordinator participated in the Living Aquatic Resources Committee meeting of the Environmental Protection Agency's Gulf of Mexico Program.

The Program Coordinator attended a meeting of the Board of Directors of the Mississippi Wildlife Federation.

The Program Coordinator participated in a meeting in Portland, Oregon, with the other two marine fisheries commissions regarding a national habitat education program. The Program Coordinator also attended and made a presentation at the annual conference of the American Fisheries Society.

The Program Coordinator attended a meeting of the Board of Directors of the Mississippi Wildlife Federation.

The Program Coordinator attended the annual fall meeting of the Gulf States Marine Fisheries Commission.

The Program Coordinator participated in the meeting of the Living Aquatic Resources Committee of the Environmental Protection Agency's Gulf of Mexico Program.

The Program Coordinator attended the Mississippi Wildlife Federation meeting of the Board of Directors.

Ronald R. Lukens
Assistant Director

INTERJURISDICTIONAL FISHERIES MANAGEMENT PROGRAM

In 1993, the Gulf States Marine Fisheries Commission (GSMFC) continued to coordinate and facilitate the development of fishery management plans (FMPs) among the five Gulf States. This effort was authorized by Public Law 99-659, the Interjurisdictional Fisheries (IJF) Act of 1986 and was supported by funding from the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS).

PROGRAM ACTIVITIES

During the year, IJF planning activities focused on black drum, striped mullet, and menhaden; however, activities associated with interjurisdictional management of other fisheries were also conducted. The following is a brief discussion of IJF activities and accomplishments during 1993.

Black Drum

Final editing and review of the Black Drum FMP was completed in early 1993, and agreement was reached among technical task force (TTF) members and the Technical Coordinating Committee (TCC) on conclusions regarding the status of black drum stocks in the Gulf. At the March 16-18, 1993, meeting of the GSMFC, both the State-Federal Fisheries Management Committee (S-FFMC) and the Commission gave final approval of the plan. It was printed in May 1993, and distribution to agencies, universities, libraries, trade associations, and other individuals, groups, and organizations was initiated. Copies are currently being distributed on request.

Mullet

Much of this year's work focused on the Mullet FMP, and significant progress was made following the completion of the Black Drum FMP. Early efforts primarily involved gathering data for the stock assessment and developing Section 5.0 (Description of the Fishery). Sections dealing with the biology, habitat, and laws (Sections 3.0 and 4.0) have previously been drafted.

The Stock Assessment Team met in March 1993 to consider available data and to determine additional needs as well as chart the direction of the assessment. Assignments for gathering and supplying the needed data were also made; however, monetary and time constraints on key personnel slowed this process.

While data for the stock assessment was being pursued, the Program Coordinator and TTF developed a draft of Section 5.0, and it was distributed for review in April 1993. Information regarding mullet dealers and processors, particularly in Florida, was also solicited so that critical data on the social and economic characteristics of the fishery could be drafted in Sections 6.0, 7.0, and 8.0.

Reviews of Sections 3.0 and 5.0 resulted in some time-consuming literature review and other work to accurately and consistently describe the "fish" and fishery. By mid-summer, these sections were substantially complete.

Delays in getting necessary information for the stock assessment, economic, and social parts of the FMP persisted through the summer due to the previously mentioned lack of money and personnel time. By late summer, however, the Program Coordinator had developed initial drafts of management considerations and potential management measures (Sections 9.0 and 10.0, respectively), and these sections were distributed to TTF members for review. We anticipate having a completed copy of the draft Mullet

FMP in early 1994. Afterwards, the review and approval process will be initiated, and we expect the plan to be published shortly thereafter.

Menhaden

Having initially been developed in 1978, the Menhaden FMP has been revised previously on five-year cycles (1983 and 1988). In continuation of this effort, a third revision was initiated in 1993. Because format, presentation, and content of the FMP has changed drastically from the first plan, a completely restructured revision was planned for 1993. A partial draft was completed and reviewed by the S-FFMC Menhaden Advisory Committee (MAC) in March 1993. It was noted at this meeting that additional information describing the changes that have occurred in the industry (reduction of vessels and plants, economic problems, social structures, etc.) was needed. Also, a revised stock assessment in a more contemporary format and updated information for the biological description were scheduled.

In conjunction with state, federal, and industry members of the MAC, the Program Coordinator drafted a revised, completed FMP that was reviewed by the MAC at their October 19, 1993, meeting. The stock assessment was also completed and distributed to the SAT for their review and comments. Due to the onset of the fishing season and the associated constraints on time of industry personnel, the updated information on fishing operations, economic and social aspects, and problems were not fully completed in this draft.

The MAC set January 15, 1994, as a target date for completing review of the draft and providing it and all additional information to the Program Coordinator. We anticipate that review of the stock assessment will also be completed in January 1994, and the Menhaden FMP will be completed and published later in the year.

OTHER ACTIVITIES

The TCC Crab Subcommittee completed development of "A Profile for the Western Gulf Stone Crab, *Menippe adina*" in 1993. Publication is expected in 1994. The subcommittee also met in March and October 1993 to review research and management efforts regarding blue crabs and each state's progress in implementing IJF management recommendations.

Dr. Chrisopher Dyer and the program coordinator completed a book chapter entitled "Folk Management in the Oyster Fishery of the United States' Gulf of Mexico" that will be published in 1994 in a book entitled Folk Management in the World Fisheries by the University Press of Colorado. The information in the chapter was developed during our development of the Oyster FMP.

In summary, the IJF FMP development and review program of the GSMFC continues to provide the Gulf States with quality information and recommendations for interstate management of fisheries that are being used by the state in their respective programs. Work will escalate in 1994 as spotted seatrout, *Cynoscion nebulosus*, is added as the next priority species for FMP development.

Dr. Richard L. Leard
Program Coordinator

ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

MARINE RESOURCES DIVISION

The Marine Resources Division is responsible for management of Alabama's marine fisheries resources through research and enforcement programs. Three division facilities supported an average of 42.13 employees of the Administrative, Enforcement, and Fisheries sections during fiscal year 1993. A total expenditure of $2,160,497 was made from the approved budget of $2,448,773. Revenue of $2,164,597 was made up from federal aid (26.5%), license fees (50%), marine gas tax (16.4%), general fund appropriation for oyster shell planting (4.5%), and other sources (2.6%).

ADMINISTRATIVE SECTION

Responsibilities and Functions

The Administrative Section provides supervision, clerical, purchasing, and general administrative support for the two operational sections; supervises state seismic activities; and coordinates with other state, federal, and regional agencies on fisheries and environmental matters.

Facilities and Personnel

The Administrative Section consisted of the division director, six clerical employees, and one marine mechanic. Offices were maintained at Dauphin Island, Gulf Shores, Bayou La Batre, and Montgomery.

Budget and Expenditures

The Administrative Section expended $555,028 on salaries and operational expenses for division activities, part of which was reimbursed under federal aid to fisheries programs. The oyster planting expenditure was under the Administrative Section.

Accomplishments

Legislation was introduced and passed creating a resident trip fishing license for saltwater and a resident trip fishing license for freshwater. The trip license allows anglers who fish only occasionally in saltwater or freshwater to purchase less expensive licenses for both fresh and saltwater. Legislation was introduced to eliminate a loophole allowing nonresidents to purchase resident gill net licenses.

Future Plans

If funding is available, license sales at each of the division's offices will be computerized to reduce personnel time on double entry and create near real time data base access. Legislation will be introduced to create a lifetime saltwater fishing license with price proportional to the freshwater lifetime license.

ENFORCEMENT SECTION

Responsibilities and Functions

The Enforcement Section patrols Alabama's coastal waters, enforcing state and federal rules on conservation and protection of marine resources. Officers also enforce rules pertaining to boating safety and freshwater fishing and hunting, conduct search and rescue missions, and participate in drug interdiction operations.

Facilities and Personnel

Facilities consisted of headquarters at Dauphin Island and district offices in Bayou La Batre and Gulf Shores. At the beginning of fiscal year 1993, the section consisted of 14 enforcement officers, 8 stationed in Mobile County, 5 in Baldwin County, and the Chief Enforcement Officer at division headquarters at Dauphin Island. One officer retired in September.

Budget and Expenditures

Expenditures during the year totaled $670,003, of which $25,000 was reimbursed by a grant from the National Marine Fisheries Service. Other expenses for shared services and material such as utilities and gasoline were paid by the Administrative Section.

Accomplishments

Enforcement officers conducted 22,463 hours of boat and shore patrol, made 19,809 boat checks, 773 seafood shop inspections, and issued 475 citations for illegal activities. An officer attended meetings of the Gulf States Marine Fisheries Commission Law Enforcement Committee, the Gulf of Mexico Fishery Management Council Law Enforcement Advisory Panel, and the Interstate Shellfish Sanitation Conference Patrol Committee. An officer was elected chairman of the Gulf States Marine Fisheries Commission's Law Enforcement Committee. Officers attended courses on fish identification, firearms instruction, boating safety, and other state and federal agency law enforcement programs.

Significant Problems/Solutions

The lack of sufficient personnel and sustained funding for purchase of necessary equipment to adequately monitor commercial and recreational fishing activities continues to be the most significant problem.

Future Plans

Programs to upgrade performance of officers, maintain adequate equipment and personnel, and effectively conduct operations are included in fiscal year 1994 plans.

FISHERIES SECTION

Responsibilities and Functions

The activities of the Fisheries Section are directed toward management of commercial and recreational fisheries in Alabama's marine waters. These activities are mostly funded through federal aid programs of the U.S. Departments of Commerce (National Marine Fisheries Service) and Interior (U.S. Fish and Wildlife Service). Biological programs not covered by federal aid (fish kills, oyster management, and pollution investigation) are supported by commercial and recreational license fees.

Facilities and Personnel

Facilities consisted of the Claude Peteet Mariculture Center in Gulf Shores and the Marine Resources Laboratory on Dauphin Island. Personnel consisted of one Biologist V, two Biologists IV, one Biologist III, one Biologist II, five Biologist Aides III, three Biologist Aides II, five Biologist Aides I, one Data Entry Operator II, two biweekly laborers, and two temporary laborers.

Budget and Expenditures

Expenditures in the Fisheries Section were $939,565 which consisted of funds from six federal aid programs and required state matching funds. Federal aid projects varied in state match requirements from 0 to 25 percent.

Accomplishments

Funds provided by the state general fund enabled the division to conduct an oyster shell gathering/planting program that served as a biological enhancement of the oyster resource and a positive interaction between resource users and management. The oyster resources have fully recovered from the record low 1989 harvest of 20,000 pounds to approximately the 30-year average annual harvest of 1 million pounds. Favorable weather conditions conducive to oyster growth coupled with management measures were responsible for the recovery. Both fishery-dependent and fishery-independent data were collected from the resource and resource users and used extensively in development of management strategies.

While the roe-mullet fishery is still quite controversial, management progress in the past year has been quite good. Plans developed by the division in cooperation with roe-mullet fishermen have been incorporated into the division's first fishery management plan, and the plan became ready for publication. This plan spelled out key management measures and accessible population indicators, allowing adequate response time to prevent overharvest of mullet in coastal Alabama.

Progress was made toward resolving user conflicts between crab fishermen and an array of other resource users from shrimp fishermen to duck hunters. The division contracted with a professor from the University of South Alabama to develop a series of public meetings with all user groups to present suggested solutions to the division. From this information the division will initiate a blue crab fishery management plan to minimize user conflicts while allowing a viable blue crab fishery.

Federal Aid

Wallop-Breaux - Wallop/Breaux funds were administered through the U.S. Fish and Wildlife Service. These funds were directed toward rearing, tagging, and release of striped bass and red drum; spawning and larvae rearing experiments with red snapper; development of juvenile indices for selected finfish stock in coastal Alabama; maintenance of equipment and facilities in Gulf Shores and Dauphin Island; creating public artificial fishing reefs in the Gulf of Mexico off Alabama; management of general permit areas for artificial reefs in the Gulf of Mexico off Alabama; evaluating Section 404 and Section 10 Corps of Engineer permits in coastal Alabama and coastal consistency permits through the Alabama Coastal Zone Management Program.

Marine Fisheries Initiative (MARFIN) - Funds from this program were administered through the National Marine Fisheries Service, Department of Commerce, to determine accuracy of log book catch information provided from the charter boat industry to the Marine Resources Division. Division personnel intercepted charter boat trips and gathered information from the trip as was required in the log book program. Information was compared with data collected by Marine Resources Division personnel, and the results showed no difference between the two.

Interjurisdictional Fisheries - Federal aid funds for this program were administered by the National Marine Fisheries Service, Department of Commerce and were to develop options for a blue crab fishery management plan.

Cooperative Statistics - Federal aid funds for this program were administered by the National Marine Fisheries Service, Department of Commerce and used by the division to collect data on commercial shrimp, oyster, crab, and finfish landings. Additionally, information on processed seafood (picked crab meat) and biological data on fishing trips for a particular species were collected. Two Alabama port agents, a data entry operator, and a fisheries statistician were involved with this project, and the National Marine Fisheries Service has a port agent involved with the project in Mobile County. All landings were processed monthly for inclusion in Alabama's data base and forwarding to the National Marine Fisheries Service.

Southeast Area Monitoring and Assessment Program (SEAMAP) - Funds from this program were administered by the National Marine Fisheries Service, Department of Commerce, and used in Alabama to develop a long term fishery-independent data base on recreationally and commercially important marine and estuarine fishery stocks. This project provided funds to manage Alabama shrimp fishery and evaluate spawning success and juvenile survival for important recreational and commercial species. The shrimp season in Alabama opened almost three weeks later than normal because of unseasonable cold water associated with the spring "blizzard of '93." Despite late opening and failure of certain waters to open at all, the 1993 shrimp harvest was 8% greater than the 1992 harvest, and the white shrimp harvest was thought to be the best in over a decade.

Gulf America - Gulf America funds originated in the Environmental Protection Agency but were administered in Region IV by the U.S. Fish and Wildlife Service. Three projects were funded by this program: creation of a salt marsh to treat pond discharge water at the Claude Peteet Mariculture Center, development of alternative cultch material for oyster setting, and marking oyster reefs in Mobile Bay. All three projects were important, and without Gulf America funds, would not have been possible.

Non-Federal Aid

Six "fish-kills" were investigated by the Division, all associated with either low dissolved oxygen, jubilees, or cold water kills. Only two of the six "fish-kills" investigated involved over 1,000 fish -- one associated with a jubilee on the eastern shore of Mobile Bay and the other involving a menhaden kill due to low oxygen in a small tributary stream to the Bon Secour River.

Enforcement and biological personnel worked together to collect data at oyster checkpoints, data from which enabled development of sound management for sustaining oyster resources. The biological section monitored shell pick-up and planting activities in which 6,000 cubic yards of shop shell were planted on Cedar Point reefs and on plant areas in Portersville Bay.

Significant Problems/Solutions

Red snapper fishing off the coast of Alabama in its artificial reef general permit area was the most productive in the Gulf of Mexico. Problems in administering the program created by reef builders' failure to comply with in-house policies threatened to force the U.S. Army Corps of Engineers to cancel our general permit area. Cancellation of the program would have been a major blow to our very successful artificial reef program and subsequently to Alabama offshore fishermen. The Division worked closely with the Corps of Engineers and the U.S. Coast Guard in developing an artificial reef regulation empowering Division enforcement personnel to fine unpermitted artificial reef operations in Alabama waters. With this effort, the Corps dropped their proposed cancellation of the general permit area.

Future Plans

Future plans for the biological section include development of a fishery management profile for the Alabama blue crab fishery, initiation of data gathering for developing a flounder fishery management plan, and establishment of permanent checkpoints to secure obsolete military M-48 and M-60 tanks for use as artificial reefs. Approximately 3,500 obsolete tanks are presently located in Anniston, Alabama. Previous methods of disposal involved cutting the tanks for scrap metal. Utilizing the tanks as artificial reef habitat will provide long term resource enhancement and increase recreational and commercial fishing opportunities. Plans have been made with the military, Corps of Engineers, and the Environmental Protection Agency to deploy approximately 100 tanks offshore of Alabama. Long term funding through a congressional appropriation is anticipated to ensure the continued deployment of the tanks.

FINFISH

Gamefish and Directed Life History Studies

During 1994, we provided preliminary stock assessments on pompano, permit, and tripletail to the Florida Marine Fisheries Commission (FMFC). We have examined over 1,000 pompano. Spawning occurs during February-April and a maximum age of about 7 years is attained. Sampling of juvenile pompano and permit has been conducted in sandy beach habitats since 1992. We examined a single sample of 105 tripletail obtained on March 22, 1994, from a commercial fish house on Florida's east coast. Preliminary ages were estimated for 94 fish and ranged from 1-7 years. Only 3 fish were estimated to be more than 4 years old. Tripletail are fast growing and probably reach sexual maturity at a relatively young age of 1-2 years. We received MARFIN funding to do black grouper research in the Florida Keys.

During 1994, we provided stock assessments on tarpon and snook to the FMFC. These assessments included estimates of life history parameters and mortality rates. In addition, we provided the FMFC with estimates of long-term trends in snook abundance.

From 1988 to 1993, we examined over 2,000 tarpon. Tarpon are capable of living to an age of at least 55 years and reach sexual maturity at a relatively old age and large size. These life history characteristics suggest that tarpon populations could be susceptible to over harvesting. Our mortality estimates and current estimates of the statewide harvest suggest that the highly restricted nature of Florida's fishery is sufficient to prevent overfishing.

We have examined 480 bonefish collected in the Florida Keys. Studies of age, growth, and reproduction are in progress. Sampling for juvenile bonefish is being conducted on a monthly basis.

About 4,500 snook were examined from east- and west-coast study ares during 1988-1992. Snook can reach an age of 20 years, and attain sexual maturity at 2-3 years. Snook are hermaphrodites; they begin life as males and later transform into females. This previously unreported finding will affect our calculations of total mortality rates. Snook abundance has remained unchanged or has increased over time at east- and west-coast monitoring sites. During 1994, the FMFC considered reducing snook bag limits in Florida but decided that a reduction was unwarranted at this time. The current snook management plan is based principally on the results of Florida Marine Research Institute (FMRI) gamefish research.

Four manuscripts resulting from tarpon and snook work have been accepted for publication in peer-reviewed journals and several others are in preparation or review at FMRI. We regularly present our results to angler and conservation groups.

Stock Assessment and Population Modeling of Florida's Inshore Species

Since December 1992, stock assessments for red drum, common snook, spotted seatrout, and sheepshead were completed and forwarded to the FMFC. Of these species, red drum and common snook meet or exceed the FMFC management targets. Sheepshead doe snot have a management goal yet, but its SPR is about 30%, and spotted seatrout SPR is less than half the FMFC target of 35%. Although data were insufficient to evaluate the status of *Paralichthys* flounders, their life history, commercial and recreational landings, and a model to evaluate changes in exploitation were supplied to the FMFC. An

assessment of Florida pompano is scheduled for early next year. The remaining species in the initial list, Atlantic croaker, is scheduled for later in 1995-1996.

Monte Carlo/bootstrap hybrid models have been developed to estimate harvest reductions associated with bag limits, spawning potential ratios (SPR) under different management schemes, and growth of spotted seatrout. These techniques have been used to evaluate over 200 management options for spotted seatrout, evaluating aggregate bag limits, and recovery trajectories for Florida's red drum populations. These results have been incorporated into reports for FMFC deliberations.

A general linear model (GLM) using analysis of covariance has been developed to identify temporal recruitment trends by removing the confounding effects of temperature, salinity, bottom vegetation, different gears, zones, and months within a season using fishery independent random survey juvenile data. We helped Debbie Leffler at the Fort Walton Beach laboratory apply this method to analyze spotted seatrout recruitment trends. Juvenile sheepshead, from the fishery independent survey were compared to estimates of 1-year old fish from a sequential population model to evaluate whether recruitment trends of juvenile fish indicate later recruitment into a fishery.

Other activities include developing an inshore trends report for the FMFC to fulfill a cabinet mandate, participation in the Stock Enhancement Research Facility report to the legislature, participation on federal stock assessment panels such as red drum, mackerels, and reef fish and on the Gulf States Marine Fisheries Commission's Stock Assessment Team, Red Drum Task Force, and Spotted Seatrout Task Force. We modeled effects of hermaphrodism on red hind SPR for the Caribbean Council.

Baitfish

Spanish sardine data on stock structure (genetic composition), size/age distribution, growth rates, and reproductive and spawning frequency were analyzed for stock assessment. We used information collected on seasonal and spatial distribution of commercial purse seine catch, species composition, fishing grounds, and gear and vessel type to provide a report on the description of the purse seine baitfish fishery in Florida. We completed a hydroacoustic and trawl survey in cooperation with the NMFS's small pelagic program to provide estimates of spatial and temporal distribution and abundance of baitfish stocks along the west coast of Florida. The monthly hydroacoustic-purse seine survey of baitfish stocks in the Tampa Bay region continued, and data are being processed for future analysis. The adult life history work on thread herring and scaled sardine continued with monthly sampling in the Tampa Bay, Panhandle, and east coast of Florida. These samples are being processed at the present time.

Mullet

We provided two stock assessment reports on striped mullet to the FMFC. These assessments included estimates of life history and population dynamics parameters, mortality rates, and a fishery simulation model. Based on the results of scientific studies on mullet, the FMFC has adopted several management regulations (i.e., trip limits, area closures, season closures, and gear restrictions) to protect and manage mullet resources in the state of Florida. We have also analyzed data from the fishery-independent juvenile and adult survey program to assist the FMFC in evaluating the impacts of the management regulations.

BIVALVE FISHERIES RESEARCH

Bay scallop research results have been instrumental to the FMFC in their successful efforts to revise bay scallop management policies in Florida. Stock abundance patterns were applied in determining the location of the fishing closure line, reproduction and recruitment data were used to support a revision in the season opening and closing dates, and fishing effort survey results were useful in determining bag

limits and season opening dates. One peer-reviewed publication has been accepted, and we expect more publications in the future.

Hard clam research results have been used by the FMFC in the development of minimum size limits for harvest of cultured and wild hard clam stocks, and for the economic analysis of the Indian River hard clam fishery. Results also have been used by the aquaculture industry and the Bureau of Resource Regulation and Development to determine appropriate lease site locations. Four manuscripts have been published in peer-reviewed journals, one is in press, one is in revision, and two are in preparation.

Calico scallop research results have been used by the industry in their attempts to develop export channels to France. We have one peer-reviewed publication describing the parasite that may be responsible for calico scallop populations collapses that occurred in 1989 and 1991. The information will be used in an attempt to develop a calico scallop parasite monitoring program. Additional publications are anticipated as time permits.

CRUSTACEAN FISHERIES RESEARCH

During the year, a manuscript was published describing the population structure and aspects of the life history of blue crabs in Tampa Bay, Florida. A manuscript was published (in collaboration with two researchers from the University of South Florida), documenting the lethal dosage (LD50) for postsettlement juvenile stone crabs of a petroleum-based antifoulant used on stone crab traps. Manuscripts are in preparation describing (1) the effects of temperature and salinity on postsettlement juvenile stone crabs, (2) the timing of spawning and gonad maturation of stone crabs in northwest Florida, (3) the proportion of stone crabs afflicted with a debilitating barnacle gill parasite, (4) the effects of trap soak-time on the catch, population structure, and mortality of trapped stone crabs, (5) the population structure and aspects of the biology of blue crabs in Florida Bay, and (6) the migration patterns of blue crabs in the Florida Gulf of Mexico. We provided the FMFC with information on the degradation time of pressure-treated wooden slats used in building stone crab traps and on by-catch in stone crab traps, and on stone crab by-catch. We presented information concerning population structure and migration patterns of blue crabs and concerning the configuration of blue crab traps to the FMFC, Gulf States Marine Fisheries Commission Crab Subcommittee, and the South Atlantic States Marine Fisheries Commission Crustacean Work Group. We also participated in workshops, conducted statewide, on blue crab trap configuration and by-catch. We participated in the preparation of shrimping-zone maps for the waters off the Big Bend region of Florida; preliminary maps have been prepared for northeast Florida and southeast Florida waters.

From 1987 to 1994, we have examined over 35,000 stone crabs from northwest Florida waters and the Tampa Bay region. For all of these crabs, we have documented body size, claw size, sex, reproductive state, injuries, and coloration (for species identification purposes). We have documented postsettlement juvenile recruitment grounds in three regions of the Florida Gulf of Mexico. We are developing a long-term data base useful for determining whether a stock-recruitment relationship can be developed for stone crabs and whether interannual variations in temperature affect reproduction and recruitment in stone crabs. The manuscripts we are preparing that will describe the population structure of blue crabs in Florida Bay and the migration patterns of blue crabs in the Florida Gulf of Mexico are based on field work, accomplished from 1982 to 1984, in which we examined and tagged over 15,000 blue crabs.

FISHERIES GENETIC RESEARCH

During 1994, we published manuscripts defining the genetic stock structure of blue crabs and Spanish sardines. Our analysis of blue crabs was performed using only a single, traditional molecular genetic technique. Because controversies rage among states regarding the "ownership" of blue crab stocks, we are continuing the analysis of blue crabs using state-of-the-art genetic techniques to further clarify blue crab genetic stock structure. Staff conducted morphometric analyses of the Spanish sardines and

discovered the underlying reasons for morphological differences seen between juvenile sardines found in embayments and those found in the open ocean. Elucidating the nature of the morphological variation in these fish resulted in a second manuscript, currently in review. Also in review is a manuscript comparing the utility of two molecular genetic markers (allozymes and mitochondrial DNA restriction fragment patterns), coloration, and morphometrics in identifying stone crab species and their hybrids and a manuscript describing the genetic stock structure of common snook. Manuscripts describing the genetic stock structure of tarpon (two manuscripts), hard clams (one manuscript), and deep-sea lobsterettes (one manuscript) are in preparation. The FMFC are provided copies of all manuscripts for management considerations, upon their acceptance to journals. Copies of our papers will be provided to other management agencies if they are considering management of any targeted species. Regularly scheduled presentations are made to present research results at public forums, including meetings of user-groups.

The FMRI staff are defining the genetic variation in wild redfish populations by identifying the genetic variability of each brood released by the hatchery in 1993. Progress has been made toward defining genetic tags for the broods. A hatchery breeding protocol has been drafted, designed to maximize genetic diversity of hatchery-reared fish.

FISH AND INVERTEBRATE ASSESSMENT

The Florida Bay Faunal Assessment Program, designed and initiated in 1994, includes four components: (1) a throw-trap study to compare fish and crustacean assemblages of seagrass-covered banks at six locations with assemblages sampled at the same locations a decade ago, (2) a study to define benthic faunal zones using macromullusks as indicators, (3) a survey of potential juvenile nursery habitat for common snook, (4) a study of the role of tidal creeks in faunal exchange between Florida Bay and freshwater habitats of the Everglades. Throw-trap samples have been obtained as scheduled during both wet and dry seasons. Fifteen benthic core samples were taken at each of 101 stations evenly distributed throughout the bay for analysis of faunal zonation. Three surveys of potential snook nursery habitat have been conducted. Preliminary site evaluations have been conducted for the tidal creek study. Preliminary results of these studies were presented at the Florida Coastal Management Conference in September 1994.

Little Manatee River Fish Community Survey consists of two related components: (1) fish distribution along the salinity gradient in the estuarine portion of the river and (2) fish community structure in seagrass beds at the mouth of the river and in nearby Cockroach Bay. From the first component, 115 species of fish were identified after examination of 1.6 million individuals captured in 1,440 seine hauls and 1,160 trawl hauls. Preliminary results have been presented at eight meetings and symposia, and one paper was published in the Tampa BASIS II Symposium Proceedings volume. From the second component, 57 species of fish were identified based on examination of 364 collections. Preliminary results have been presented at two meetings.

The East Coast Benthic Faunal Mapping Study sampled over 400 stations with trawls and dredges between 1983 and 1987. All crustaceans and mollusks from the samples have been identified and enumerated, and the data have been computerized and verified. During 1994, the last major group of echinderms will be identified and enumerated, and that data also will subsequently be computerized; analyses will begin immediately after all data have been verified. All computer data files verified to date were submitted to the funding agency (NOAA) this year.

A SEAMAP Hard-Bottom Mapping Study has just begun. A work plan was developed during October 1994, and the identification of data sources has commenced.

In the SEAMAP Reef Fish Assessment Program, fourteen trips to evaluate reef-fish assessment methodology and enumerate species abundances were made from 1989 to 1994. A report on assessment methodology has been completed. Analyses of community dynamics are underway.

The Gulf of Mexico Ichthyoplankton Survey was initiated in 1982. The Institute is the designated specimen repository for this program, which is funded by SEAMAP. Thus far, 150,000 lots of larval fishes have been archived. Three cruises have been successfully completed this year. All samples collected during 1992/1993 were received from the sorting center recently, and data are being entered into computer files. All environmental data collected to date have been archived in the NOAA data base management system.

Work on the EPA Environmental Monitoring and Assessment Program - Estuaries began during Summer 1994. Invertebrates from thirty-eight benthic grab samples taken at 19 estuarine and tidal freshwater sites along the eastern coast of Florida will be identified and counted. Currently, all benthic invertebrates are being extracted from the samples and sorted to higher taxon levels in preparation for identifying them to the lowest possible taxon.

The Institute's fish and invertebrate collections contain approximately 75,000 catalogued lots of about 5,000 species. Specimens are lent to other investigators for reference, research, or educational purposes. Last year, 3,347 invertebrate specimens were lent to 22 investigators at 11 domestic and 4 foreign institutions, and 5 other loans of 122 specimens were used for educational purposes. Similarly, 24 loans of fishes (including 3 to foreign institutions) were sent for reference or research uses, and 15 loans were made for educational purposes.

A guide for the identification of colomastigid amphipod crustaceans of the eastern Gulf of Mexico was submitted for publication in 1994 and is currently undergoing final revisions after peer review. The illustrations for a guide to the identification of lysianassoidean amphipod crustaceans of Florida were completed in 1994, and the rough-draft manuscript is nearing completion. Similarly, the illustrations for a guide to the identification of juvenile fishes in the families Sciaenidae, Cyprinodontidae, and Gerreidae have been drafted and are undergoing revision.

Coral Reef and Hard Ground Monitoring and Assessment

During the year, monitoring continued at all current sites at Tortugas National Park. Selected sites at Looe Key, sampled in 1983, were reestablished and sampled in July 1994. We continued to monitor a transplanting experiment at the MAVRO VETRANIC grounding site at Dry Tortugas where a small area of reef was transplanted to evaluate effects on recruitment (settlement) of organisms onto scarified habitat. The hypothesis was that the transplanted organisms would provide progeny or their chemical signals would provide a stimulus for outside settlement. The transplanting procedure proved to be successful; however, survival of transplants was influenced by a major storm during March 1993, which dislodged many organisms and excavated the control site and one experimental site.

We also surveyed damages to coral reefs caused by groundings to the motor vessel MS. BEHOLDEN, attack submarine SSN MEMPHIS, the motor yacht JACQUELYN L, and the research vessel COLUMBUS ISELIN. The legal proceedings in the case of the MS. BEHOLDEN were completed. SSN MEMPHIS actions include a damage assessment and an effort to negotiate with the Navy to pay for damages and restoration. The damage assessment for the JACQUELYN L grounding is a joint state-federal responsibility, and the case is currently in litigation.

Nine liverock aquaculture site surveys were compiled this year, and we participated in numerous hearings, meetings, and workshops on liverock issues.

The National Park Service was provided with a report on trends in coral populations at Dry Tortugas from 1989 to 1993. Reports on our research were published in the *Proceedings of the 7th International Coral Reef Symposium*, Guam; *Proceedings of the Florida Keys Regional Ecosystem*, Miami; and *Proceedings of the Colloquium on Global Aspects of Coral Reefs: Health, Hazards, and History*, Miami.

FISHERIES STATISTICS

Fisheries Independent Monitoring Program

Fisheries independent monitoring of fishes continues in the Tampa Bay, Charlotte Harbor, Indian River Lagoon, and Ft. Walton Beach areas. The Florida Bay area has recently been added and preliminary work is being completed. The program is designed to collect status and trends information on recreational fishes from Florida's estuaries. The program uses a systematic scientific sampling strategy to collect fish free from the biases associated with collecting data from recreational and commercial fisheries. Data has been used for stock assessment for mullet, red drum, spotted seatrout, and sheepshead.

Commercial Landings Statistics

Commercial harvest of fish and invertebrates information is processed into Florida's Marine Fisheries Information System, through which approximately 400,000 trip tickets are processed annually. This data is used in stock assessments, quota monitoring, sampling program design, summaries of landings and trips by species, qualifications of fishermen for state and federal license endorsements and determination of participation in fisheries. From 1992-1995, these data were used to qualify fishermen for red snapper federal permits in 1992-1993 and 1994-1995. An analysis of fishermen and dealers potentially affected by the proposed marine net fishing limitation referendum as well as numerous analyses of landings, effort, and gears used in a wide spectrum of Florida fisheries. Much of these data are incorporated into state and federal fishery management plans and stock assessments.

Biostatistical Sampling

FMRI staff obtain fish and invertebrate species length-frequency measurements and characteristics (gears used, duration, effort, area fished, etc.) directly from commercial fishing trips. Samplers are located in St. Petersburg, Pt. Charlotte, Marathon, Melbourne, and Ft. Walton Beach with program expansion to the Cedar Key Field Laboratory scheduled during FY1995-1996. This program provides many otoliths and otolith processing used for age-determination and age-length regression keys for some species (i.e., spotted seatrout, sheepshead) currently undergoing stock assessment at the FMRI. Additionally, staff in this program have participated in the East Coast gill net observer trip sampling, initial characterization of northeast Florida fisheries with significant weakfish and silver seatrout catches in response to the FMFC/ASMFC management needs, mercury (in fish) sampling program participation, and measurement of more than 172,000 fish from 2,423 trip interviews over the last 3 years.

Recreational Surveys - License Monitoring and Statistics

Information on marine recreational fishing in spreadsheet format has been provided to requestors since 1989. Most recently, it was summarized in a report originally prepared for the FMFC. This report has been provided to many individuals and groups interested in comparing fisheries landings and trends over the last decade. The license databases have been provided to many requestors. Many groups have used these data for mailing lists, various surveys, licensing and management issues, and other purposes.

Recreational Surveys - Angler Interviews and Access Site Survey

Recreational access site surveys are on-going in all coastal counties of Florida, primarily those located near existing FMRI field labs in St. Petersburg, Ft. Walton Beach, Pt. Charlotte, and Melbourne. This program has identified 1,973 primary or secondary marine recreational fishing access sites around the state which are resurveyed at least once every four years. Eight marine recreational access site maps produced by the department have provided valuable information on sites and facilities for the Boating Access Guides to Tampa Bay (1993) and Charlotte Harbor (1994) and were developed from these data. Ongoing angler interviews are providing valuable information on fishing preferences (types of fishing,

preferred modes, average time spent at sites, numbers of individuals, baits, etc.) and usage patterns at these state-wide access sites.

SOUTH FLORIDA REGIONAL LABORATORY

A full-scale mail survey of the recreational sector of the lobster fishery has revealed that recreational harvesters captured about 350,000 pounds of lobster statewide during the 1993 special sports season, and about 1,442,000 pounds statewide during the first month of the regular season. This harvest was 3% greater than that during the 1992 season.

The queen conch stock assessment program completed another stock monitoring year, and the surveys detected no increase in the conch population.

About 1,000 juvenile conch were released in field experiments during 1993. Mortality rates of released conch were still high. Mortality was greatest at full moon. Future tests will examine timing of release and conch size at release in order to increase survival.

PLANKTON BLOOMS

Florida Bay is now experiencing persistent and dense microalgal blooms, often dominated by cyanobacteria (=blue-green algae). These blooms discolor the surface water a dark, yellow, green to brown color. The chlorophyll levels range from values comparable to open Gulf water (<5 ug/liter) to values similar to the most fertile estuaries and nuisance microalgal blooms (>20 ug/l). High pigment and abundance values in the growing seasons of spring and fall are common in healthy, fertile bays, but continuously high pigment and biomass of small microalgae (<5 um) are not normal for healthy systems. These blooms are being mapped and studied monthly to determine indicator species and their distribution and requirements, variations in environmental conditions that favor high abundance of microalgae, and how bottom sediments and communities influence bloom development and persistence.

The central west Florida coast has experienced a red tide bloom caused by *Gymnodinium breve*, which was first detected in September. Fish kills were minimal. Alongshore effects diminished during October, but residual *G. breve* populations are lingering alongshore and at the few offshore locations that have been sampled.

STOCK ENHANCEMENT RESEARCH

The Cooperative Marine Fish Stock Enhancement Research Program concluded eight years of enhancement and assessment research with a Legislative Executive Summary and Report in March 1994. The report was positive and well received. The research in Volusia County and Tampa Bay was reduced, and all of our enhancement efforts with red drum were shifted to the restoration of Biscayne Bay for the next three years. In addition, in July 1994, a new cooperative snook enhancement and assessment project was initiated for three years with a possible two years extension to develop snook enhancement technology.

Hatchery Operations

Fall 1993 Production

Egg Production - The fall 1993 red drum egg production for Florida's east coast broodstock was 95,132,600 eggs from eight tanks of brood fish. In addition, one tank was maintained for egg production for a research request from the University of Florida's Whitney Lab. Eight-one thousand eggs were transferred to the University of Florida/Whitney Lab.

Fingerling Production - Ten 1-acre and one ¼-acre ponds were stocked with a total of 2,545,900 2-day old fry for phase I production. Four 1-acre and one ¼-acre ponds produced 271,216 phase I fingerlings. There were 99,941 fingerlings released into Biscayne Bay, 106,630 were transported to the University of Miami Experimental Hatchery (UMEH) for phase II and III grow out, and 500 went to the Institute's genetics group. There were 97,630 phase II fingerlings produced from five 1-acre and one ¼-acre ponds. There were 32,135 phase II fingerlings released into Biscayne Bay, 16,200 were transported to the Florida International University (FIU) grow out facility, 36,600 went to the UMEH, 35 to The Living Seas, and 112 to genetics.

In March 1994, 4,844 phase III west coast fingerlings were harvested from two ¼-acre ponds, tagged by SERF and juvenile fish personnel (½ with T-bar and ½ with dart tags), and all but 300 (held for a tag-retention study) were released into the Alafia River. There were 1,410 phase III fingerlings internal anchor-tagged and released into Tampa Bay at a Surface Water Improvement and Management (SWIM) restoration site at E.G. Simmons Park north of Ruskin, Florida. The remaining phase III fish were freshwater-dipped as a treatment for the parasitic copepod *Caligus*, restocked in another ¼-acre pond until May 19 when the fish were used for the Florida Boating and Fishing Buddies event at Fort DeSoto Park, Florida.

In April 1994, 491 phase III west coast red drum were harvested from a 1-acre pond. Fifty fish went to FMRI genetics, and 441 were tagged with internal anchor tags and released at a SWIM site, Mangrove Bay, in northeast St. Petersburg.

Spring 1994 Production

Egg Production - The total spring east coast red drum egg production was 90,106,000 from two brood tanks of red drum. There were 60,000 eggs shipped to the UF Whitney Lab, and 120,000 eggs were shipped to the UMEH by Federal Express.

Fingerling Production - Seven 1-acre ponds were stocked with 1,242,000 2-day old fry between May 28 and June 14, 1994, for the UM, FIU, and for direct release into Biscayne Bay. The ponds were stocked before 6:00 a.m. to avoid high temperatures.

A total of 351,355 phase I fingerlings were harvested from the seven ponds (average 50,194/pond; 28.1% survival). Of this total, 288,136 were transferred to the UMEH; 20,085 to the FIU; and 66,106 were used by Fish Health for oxytetracycline studies.

Fall 1994 Production

Egg Production - The fall east coast red drum egg production at the end of September 1994 was 90,458,400 from five tanks of broodstock.

Fingerling Production - Eleven 1-acre ponds were stocked by October 14, 1994, with 1,942,109 2-day old fry. On October 6, 1994, the first 1-acre pond was harvested. The 49,278 phase I fingerlings were divided between two ¼-acre ponds. There were 72,274 phase I fingerlings released into Biscayne Bay.

Three ¼-acre ponds were filled, fertilized, and maintained from the end of July to the beginning of September 1994 for culturing zooplankton for larval snook rearing at Mote Marine Laboratory and for possible pond stocking of pre-fed snook if the larvae were available. No ponds were stocked with snook.

Assessment

A 168-day coded wire tag (CWT) retention study was completed utilizing juvenile (84 mm TL) red drum as the test species. Both tagged and control (non-tagged) treatments were utilized to determine tag retention as well as assess growth, food conversion rates, and survival. The two treatments were differentiated by clipping either right or left pectoral fins. CWT retention was 97.8% after one week and dropped to 95.0% after 168 days.

Hatchery staff routinely sample aliquots of all CWT fish after tagging operations have been completed and prior to delivery of the tagged fish to the field for stocking. From 1989 through fall 1993, 8,500 individual fish have been checked for short-term tag retention with a mean retention rate of 97.3%.

Primary stock enhancement assessment areas are Volusia County, Tampa Bay, and Biscayne Bay. Volusia County field sampling by biological crews was terminated in February 1994, but fishery-dependent returns continue to be received from anglers. A total of 16,001 internal anchor tagged red drum were released into Volusia County waters, and 502 returns or 3.1% have been recovered. One particular release of 952 fish into the primary Volusia County assessment area of Spruce Creek has currently yielded 94 recaptures (9.9%). Tampa Bay releases have yielded about 1% returns, and Biscayne Bay has yielded about 0.3% recaptures to date.

The emphasis for red drum enhancement will be on Biscayne Bay for the next three years. The FMRI has four fishing-license funded contracts in place with Biscayne Bay area cooperators including the University of Miami (UM) and Florida International University (FIU). Current plans are to release over 400,000 one inch, 114,000 three inch, and 35,000 six to seven inch fingerlings into Biscayne Bay from the fall 1994 production season. Assessment will be by fishery-independent means through UM and FIU under contract and by fishery-dependent means through angler recovery.

ENDANGERED SPECIES

Sea Turtles

The Florida Department of Environmental Protection's (FDEP) marine turtle conservation goals, responsibilities, and program direction promote the recovery of the five species of marine turtles that occur in Florida. The overall approach is to develop the scientific information that will guide recovery efforts (research), and to minimize human impacts which result in increased mortality, degrade habitat, and impede recovery of listed turtle species (management). The current FDEP program is divided into six major components: (1) recovery program planning, management, and administration; (2) biological/ecological research and population assessment; (3) coordination of research and management activities; (4) assessment of mortality factors; (5) habitat protection; and (6) education.

Research carried out by program staff during 1993/1994 addressed the following topics: (1) the distribution, abundance, life history, and ecology of marine turtles in Florida and contiguous Western Atlantic and Caribbean waters; (2) assessment of population status and trend of loggerhead, green, and leatherback turtle nesting populations in Florida; (3) identification of genetic stocks of marine turtles utilizing Florida's nesting beaches and foraging habitats; (4) development of reliable sex determination techniques for marine turtles; (5) the nesting ecology of loggerhead turtles; (6) the effects of artificial lights on marine turtles; and (7) the dispersal behavior and lost-year ecology of marine turtles hatching on Florida's east coast. The various research projects greatly enhance the Department's ability to carry out effective management on behalf of marine turtles.

The FMRI continued to coordinate the Florida portion of the Sea Turtle Stranding and Salvage Network (STSSN), an 18-state program coordinated at the federal level by the NMFS. From 1980 through 1993, 8,686 stranded turtles have been recorded by the Florida network. The FMRI staff coordinate

statewide activity of permitted volunteers, as well as data entry and verification. Data analyses contribute significantly to management decisions such as the regulation of fisheries that impact marine turtles.

The FMRI staff also coordinate the statewide collection of data on marine turtle nesting activity. Staff recently competed a 14-year summary of results which will be published in the *Florida Marine Research Publication* series. The Index Nesting Beach Survey program, which involves systematic monitoring of nesting on 27 selected beaches in the state, entered its sixth year. This program was initiated to allow evaluation of long-term trends in population status and nest success.

The FDEP's marine turtle program contributes to the protection of marine turtles and their habitat by staff participation in decisions regarding coastal construction activities, land acquisition, and management of nesting beaches and foraging habitats. Staff serve on local, state, federal, and international panels, recovery teams, and specialist groups.

Manatees

Manatee research projects are conducted from the FMRI St. Petersburg Lab, the Marine Mammal Pathobiology Lab in St. Petersburg, and four field stations in Port Charlotte, Tequesta, Melbourne, and Jacksonville. Major program areas include carcass salvage and necropsy, population assessment/aerial surveys, satellite telemetry, and geographic information systems (GIS).

During 1993, the salvage and necropsy program recovered 145 manatee carcasses in Florida, a decrease from the 161 deaths recorded in 1992. Two additional animals were recorded from outside the state (1 in Texas and 1 in South Carolina). Watercraft-related manatee deaths totalled 35, a slight decrease from the 38 recorded in 1992. All field stations have refrigerated trailers for transporting carcasses to the new Pathobiology Lab were necropsies are performed. Samples collected during necropsies are stored for analyses to detect metals and organic compounds. Other samples are shared with outside research groups for a variety of cooperative studies, including the identification of pathogens. Salvage staff also coordinate the capture and rescue of injured manatees with logistic assistance from participating oceanaria.

Twice-monthly aerial surveys for manatee distribution were conducted in 1993 in several areas: St. Johns, Flagler, and Volusia counties; St. Johns River and tributaries in Duval County; St. Lucie and Martin counties; Tampa Bay; and Ten Thousand Islands of Collier County. The FMRI is jointly sponsoring surveys with Palm Beach County and Everglades National Park. During the summer, strip-transect aerial surveys were conducted in the Banana River and the Ten Thousand Islands to develop survey procedures for measurement of manatee population trends in the warm season. Scientists from the FMRI and the University of Wisconsin conducted statistical analyses of winter manatee counts at power plants from 1977 to 1992. Trends in counts were assessed after adjusting counts for temperatures prior to each flight.

Telemetry project staff continued to tag and track manatees along Florida's west coast using satellite transmitters. Twenty animals were tracked during the year including three manatees released from rehabilitation programs. As in previous years, some of the animals tagged in Tampa Bay ranged north to the Suwanee River and south to Charlotte Harbor and Ft. Myers. Preliminary data analyses suggests that long distance movements on the west coast increase with animal size except during times when females have accompanying small calves. Other research projects occur in conjunction with the capture of manatees for tagging. Passive integrated transponders (PIT tags) are implanted in the head region of each animal to provide long term identification markers. Blood and tissue samples, ultrasound measurements of blubber thickness, scar sketches, and photographs are also taken from each animal captured.

The Manatee GIS project continued to build a maintain data bases of manatee aerial survey observations, mortality locations, telemetry data, and maps representing physical features of coastal Florida. GIS capabilities were expanded with the hiring of a manatee GIS coordinator in September, the

purchase of an additional work station, and upgrading existing hardware. Spatial analyses of mortality, aerial survey sightings, and telemetry data were tested and refined in conjunction with input from project scientists and managers. The first two meetings of the GIS Coordinating Team were convened in 1993 to develop and implement an operational plan for an interagency GIS containing manatee data. The group is comprised of representatives from the FDEP, USFWS, National Biological Survey, Marine Mammal Commission, and an independent GIS expert.

COASTAL VEGETATIVE HABITAT ASSESSMENT

Projects in this study are designed to restore, enhance, or assess vegetative marine fisheries habitats such as seagrass beds, saltmarsh communities, and mangrove stands. Staff are involved in developing facilities at the Port Manatee hatchery to provide plants for study and enhancement, designing planting units to facilitate seagrass replantings, evaluating die-offs of salt marsh plants in the Panhandle and seagrasses in Florida Bay, and developing the techniques and analyses necessary to continue these studies. Staff are also frequently required to prepare or evaluate various research proposals and to provide information on coastal plants and habitats to managers and the public.

COASTAL AND MARINE RESOURCE ASSESSMENT

The FMRI's Coastal and Marine Resource Assessment (CAMRA) group continues to support the FMFC through the creative application of GIS and remote sensing technologies. Issues relative to habitat protection, user conflict, and seafood quality vary among regions requiring geographically targeted policy responses. CAMRA, Invertebrate Section, and the FMFC staff continue to develop the Resource Impact Map (RIM) series of eight chart-size maps to assist the FMFC statewide in making resource decisions. Each map includes coastline, depth contours, and aids to navigation. Benthic communities such as mangroves, saltmarshes, seagrasses, oyster reefs, coral reefs, hard bottom, and bare bottom are included, as are managed area boundaries. Bathymetric depth curves are shown because depth is an important controlling factor for human and marine resources. Channels and navigation aids such as buoys are displayed to help users orient themselves, like road networks on land-based maps.

To tailor the maps for policy analysis, additional thematic information is added such as bycatch volumes or shrimp nursery areas. These maps have been used in the complex process of developing shrimp management plans and rules for the Big Bend and northeast regions and analyzing bycatch reduction issues. In August 1994, the FMRI staff took computers and these data bases to a FMFC meeting in Ft. Walton Beach in place of traditional paper maps. The computer system was used to provide interactive policy analysis capabilities by displaying alternative shrimp zone closure alternatives on an overhead projector for open debate by the FMFC, FDEP, citizens, and industry representatives. The representation of the shoreline conditions relative to the proposed zones reduced confusion and fostered more expedient policy analysis.

BUREAU OF MARINE RESOURCE REGULATION AND DEVELOPMENT

The primary responsibilities of the Bureau include the classification and monitoring of shellfish growing waters, the inspection of shellfish and blue crab processing plants, resource assessment, and resource rehabilitation and development. Sections 20.06(4), 20.56(6), 370.021, 370.071, and 370.16, Florida Statutes (FS), and Chapters 381 and 286 FS set forth the FDEP's responsibilities in management of shellfish resources and the public health protection aspects of the shellfish industry.

Accordingly, under the mandate provided in Section 370.16(12) FS to "improve, enlarge, and protect the oyster and clam resources of the state," the FDEP is actively engaged in collecting oyster shell from processing plants and constructing and restoring oyster reefs on public bottoms. Through September 1994, the Shellfish Association and Enhancement Section collected 133,008 bushels of shucked oyster shells

and processed calico scallop shells and planted 108,185 bushels of shells to restore approximately 25 acres of oyster reefs in Apalachicola Bay.

The Florida Legislature appropriated $459,400 as part of a statewide commitment to rehabilitate and develop productive shellfish resources for FY1993-1994. Funding was allocated among seven coastal counties, including Levy, Dixie, Wakulla, Franklin, Bay, Okaloosa, and Santa Rosa. During FY1993-1994, 151,908 bushels of live oysters and 105,120 bushels of dredged shell (mud clam and oyster) were planted during resource development projects in these counties.

Marine Resources Information System statistics (unedited data) showed statewide oyster landings in 1993 were 3.1 million pounds valued at $7.5 million. Franklin County landings accounted for 2 million pounds and were valued at $4.7 million in 1993. Landings in 1994 are expected to decline as a result of flooding and associated low salinity in Apalachicola Bay resulting from the passage of Tropical Storm Alberto in July 1994. To date in 1994, the FDEP has issued 749 Apalachicola Bay Oyster Harvesting Licenses generating $74,900 in user fees for the Apalachicola Bay Conservation Trust Fund (FY1994-1995).

Preliminary reports indicated that hard clam landings in 1993 remained relatively stable at about 1 million pounds with an approximate value of $7.7 million. Production trends suggest that landings will continue to increase over the short term, as harvesters continue to harvest from a set of hard clams in Body C of the Indian River. Brevard County, which produces the majority of Florida's hard clam landings, is also the center of the hard clam aquaculture industry. This emerging industry is expected to contribute substantially to hard clam production during 1994.

Hard clams harvested from waters classified as restricted or conditionally restricted must be processed through relaying and depuration activities rigorously controlled by the Division of Marine Resources. The Division has promoted depuration as a practical method for cleansing potentially contaminated shellfish, ensuring product quality, and protecting public health. In 1994, the Division issued 33 Special Activity Licenses to relay shellfish to private leases, and one license was issued to a depuration facility using controlled purification methods.

During 1994, 320 Special Activity Licenses were issued to promote shellfish aquaculture activities, including exemptions for aquaculture products below the minimum size, bag limits, and harvesting seasons. The FDEP has entered into 10 wet storage agreements for on-lease wet storage of oysters and/or hard clams.

Provisions of Section 370.16(1)-(11) FS allows leasing sovereign submerged bottom for cultivation of oysters and clams. In 1994 there were 150 shellfish leases in effect totalling 2,000 acres. Additionally, 187 aquaculture leases issued under the provisions of Chapter 253 FS are in effect (750 acres), and another 92 aquaculture leases are in the review process. Cultivation of hard clams and oysters offers a technically feasible and economically practical alternative to increase shellfish production in Florida.

Nearly 50% of Florida's 2.4 million acres of coastal waters have been classified in 58 shellfish harvesting areas (SHA). In 1994, 10 comprehensive shellfish surveys have been completed and two shellfish management areas have been reclassified as part of continuing efforts to maintain proper classifications in all SHAs. The Shellfish Laboratory analyzed 275 shellfish meat samples, 31 crab meat samples, 14,856 SHA water samples, and 380 potable water and ice samples to ensure shellfish quality during 1994. Additionally, 7,959 SHA water samples were analyzed by independent laboratories that contract with the FDEP. The Division certified 126 shellfish processing plants in 1994.

OFFICE OF FISHERIES MANAGEMENT AND ASSISTANCE SERVICES

The major responsibilities of the Office of Fisheries Management and Assistance Services (OFMAS) are: (1) to serve as the FDEP liaison to the FMFC; (2) the state artificial reef program; (3) to monitor and evaluate the accuracy of the marine fisheries trip ticket reporting system requirements through audits of applicable fish house records; (4) to improve and expand distribution of the FMFC rules, the FDEP regulations, and information on marine resources to sport and commercial fishermen; (5) the issuance and reconciliation of recreational and commercial fishing licenses; (6) the administration of lobster trap certificate allocations; (7) the oversight of landings for fisheries managed by quota with closure of the fishing season as quotas are reached; (8) aquatic resource education; and (9) to act as FDEP technical liaison with local government mosquito control programs.

The OFMAS has produced four editions of the *Saltwater Sportfishing Report Newsletter* to provide the fishing public with information on the saltwater fishing license, revenues generated and expended from the sale of licenses, the Sport Fish Restoration Program, and Marine Resources' fisheries research efforts. The newsletter also provides information on fish identification and other topics of interest to anglers. The OFMAS also receives and answers a large number of calls from anglers, both residents and visitors, wanting to know where to go to catch a particular species, when to go and how to catch it as well as any applicable regulations. The OFMAS developed and distributed approximately 70,000 "Know Your Fish" and "Angling Smart" posters to county tax collectors, Florida Sea Grant agents, and the general public.

The OFMAS worked in cooperation with the FDEP Office of Communications to develop a magazine, Fishing Lines - Angler's Guide to Florida's Marine Resources, to provide information on marine habitat, fisheries management and regulations, fishing ethics, and fish identification. The latter section comprises approximately half the magazine and includes scientifically accurate color illustrations of 75 species by artist Diane Rome Peebles. One million copies of this magazine were initially printed for free distribution to the public; a second printing one year later provided an additional 500,000 copies for distribution.

The Artificial Reef Program is in the final stages of drafting the proceedings from Artificial Reef Summit '93. Reef program staff have allocated and overseen approximately 25 reef construction grants, including surplus army tanks, as well as delineated and permitted of large area sites off two panhandle counties. The Artificial Reef Dive Team evaluated various state-funded, county-built artificial reefs to assess the effectiveness of different materials used in the reef.

The OFMAS is coordinating and overseeing the final stages of the Lobster Trap Certificate Program allocations and appeals. The program was implemented to reduce the number of traps in the fishery; fishermen received an allocation of trap certificates based on their reported and recorded landings. The Appeals Board heard the last of the appeals of certificate allocations and informal hearings for those fishermen who challenged the agency's final allocation decision have been completed.

THE BUREAU OF COASTAL AND AQUATIC MANAGED AREAS

The Bureau of Coastal and Aquatic Managed Areas (CAMA) was created in the Division of Marine Resources upon reorganization of the FDEP on July 1, 1994. The new bureau administers the National Estuarine Research Reserve (NERR), the National Marine Sanctuary (NMS), and the state's Aquatic Preserve (AP) programs. The NERR program was created under the Coastal Zone Management Act of 1972, and Florida has designated sites at Apalachicola and Rookery Bay. The NMS program is authorized under the Marine Protection, Research, and Sanctuaries Act of 1972. The 2,800 square nautical mile Florida Keys National Marine Sanctuary is Florida's representative site. The AP program has 43 sites

designated throughout the state under the authority of Chapter 258 FS. Each of these programs are involved with protection of the natural resources on the sovereign submerged lands and the state-owned uplands within their boundaries.

Florida Marine Patrol officers patrol the Florida Keys National Marine Sanctuary and investigate and enforce violations of the Marine Protect, Research, and Sanctuaries Act. Officers also participate in activities to educate the public on protection of the resources of the sanctuary. Enforcement actions are conducted in cooperation with federal attorneys.

Marine Patrol Officers enforce state regulations with authority under Section 370.021(5)(a) and Chapter 253 FS in the National Estuarine Research Reserves. They cooperate with Reserve managers to determine major resource management problems that can be addressed by better focus of patrol and enforcement activities. These activities include damage to state lands, illegal fishing, disturbance of critical wildlife areas, etc.

Marine patrol aircraft and pilots are available to assist sanctuary and reserve staff with aerial resources surveys and management activities.

Sanctuary and reserve staff are available to marine patrol officers to provide identification of marine organisms, to assist with rescue and care of injured animals, and to provide information on handling toxic materials.

Sanctuary and reserve staff are available to provide environmental training to marine patrol officers and trainees.

OFFICE OF PROTECTED SPECIES MANAGEMENT

The FDEP manatee program is funded principally by the Save the Manatee Trust Fund which receives the majority of its funds from voluntary contributions. Additional support is provided by the USFWS, the Save the Manatee Club, the Marine Mammal Commission, and other groups in the form of equipment loans.

RULE-MAKING

Prior to FY1993-1994, manatee protection speed zone rules were approved in 11 of the 13 counties designated by the Governor and Cabinet in 1989 as key counties - Brevard, Broward, Citrus, Collier, Dade, Duval, Indian River, Martin, Palm Beach, Sarasota, and Volusia counties. During FY1993-1994, rule development continued for Lee and St. Lucia counties, the two remaining key counties; additional rulemaking was also undertaken in Volusia and Brevard counties.

Effective July 1, 1993, the Florida Department of Natural Resources and the Florida Department of Environmental Regulation were merged to form the Florida Department of Environmental Protection. Prior to the merger, manatee protection rules were approved by the Governor and Cabinet. Since this merger, these rules are approved by the Secretary of the FDEP. FY1993-1994 was the first year in which this approval process was in place.

A manatee protection rule for St. Lucie County was published in FY1993-1994 and prepared by consideration by FDEP Secretary Virginia Wetherell. Approval had not occurred by the end of the fiscal year but was expected to occur early in FY1994-1995.

A preliminary rule for Lee County was also drafted during FY1993-1994. Subsequent to providing the draft to the county for comment, the county held 27 public workshops during spring 1994 to gather public input. At the close of FY1993-1994, FDEP staff were in the process of reviewing the results of these

workshops as well as comments provided by Lee County staff. A comprehensive, countywide rule is anticipated to be in place by early 1995.

In FY1992-1993, following a local court ruling which had nullified the original Volusia County rule and the passage of an emergency rule to reinstate the rule and provide clarifying language, FDEP proposed a modified rule to replace the original rule. This rule (16N-22.0121, Florida Administrative Code) was approved in the early part of FY1993-1994 but was subsequently repealed after the local court ruling which had nullified the original rule was reversed (in favor of the FDEP) by the Fifth District Court of Appeals. Concurrent with the repeal of Rule 16N-22.0121, F.A.C., FDEP amended the original rule to incorporate most of the changes included in Rule 16N-22.0121, F.A.C. with the exception of zones within the vicinity of the Lake Woodruff National Wildlife Refuge where the original slow speed zones were retained. Approval of the amendments and repeal occurred in May 1994. Volusia County and a local boating group appealed FDEP's actions to the Florida Land and Water Adjudiciary Commission. Resolution of the appeal was scheduled to occur early in FY1994-1995.

Also in FY1994-1995, FDEP initiated rulemaking to amend the Brevard County manatee protection rule to increase protection in the vicinity of the Canaveral Barge Canal and Sykes Creek. The proposal was published late in FY1993-1994 and was expected to be finalized early in FY1994-1995.

Numerous conditional exemptions were issued during FY1993-1994 to commercial fishermen and professional guides in accordance with provisions provided in the specific county rules and Rule 16N-22.003, F.A.C. Site-specific exemptions were also issued to several boat/motor manufacturers for testing purposes as well as to individuals for access to residences located within state-designated No Entry or Motorboats Prohibited zones.

SIGN POSTING

As manatee protection zones are established, appropriate regulatory signs must be posted. If such zones are to be enforced, the signs must be properly designed, located, and maintained. As of 1989, approximately 20 such ares had been designated and posted, and more areas were proposed. Prior to 1983, the Florida Marine Patrol was responsible for posting and overseeing the maintenance of regulatory signs. Between that time and late 1990, the Marine Mammals Section of the FMRI assumed the responsibilities and recommended zone designations, posting of approved areas, and maintenance of signs. In 1990, by act of the Legislature, the Florida Inland Navigation District and the West Coast Inland Navigation District were assigned responsibility for posting and maintaining manatee regulatory signs for duly approved zones within their counties. The FDEP must still post the other counties and coordinate, review, and approve sign plans submitted by the navigation districts.

The process of posting protection zones general requires that a contractor with special equipment and personnel obtain the necessary environmental permits, post the new signs, and replace damaged or missing pilings and signs. These areas must then be inspected on a regular basis, preferably quarterly, to ensure the signs are maintained in place and do not pose a significant hazard to navigation.

The Florida Manatee Recovery Plan also recommends drawing the public's attention to areas where manatees are vulnerable by posting "Caution - Manatee Area" signs. Such areas include boat ramps adjacent to warm-water outfalls or refugia, the refugia themselves, and marinas and docks manatees are known to frequent. In conjunction with the permit review process, applicants are often required to post appropriate signs during and/or after construction projects. In areas where boating speed zones have been approved by the Governor and Cabinet, additional signs may be required to be posted at marinas, docks, and boat ramps located on state leased lands in the boating speed for the area. In fact, some counties have posted at marinas and boat ramps an enlarged map of the boating speed zones for that area.

During the fiscal year, responsibility for the FDEP manatee sign posting program was transferred from the Office of Protected Species Management to the Office of Waterway Management. Posting regulatory signs on waters of the state of Florida, particularly those in or adjacent to federally maintained channels, requires cooperation from a host of state and federal agencies and is often complicated by jurisdictional ambiguity. Disagreement between agencies over the number of signs needed as well as the location, size, and text of some signs has caused unfortunate delays in the completion of posting these zones.

During this fiscal year, zones in Dade, Sarasota, and Indian River counties were posted and work had begun in Duval and Broward counties. Maintenance and improvement of sign plans in other counties were also done, although much work still needs to be done in most counties. An unexpected benefit from the combined efforts on rule-making and sign posting has been an increase in public awareness with the signs serving not only as reminders of the speed zones but also as educational and informational reminders of the existence of this endangered species in the posted waters.

MANATEE PROTECTION PLANS

The FDEP's manatee protection plan (MPP) staff continued coordinating the development of countywide MPPs and assisting counties with these efforts. The focus of the FY1993-1994 effort was again to concentrate time and resources in the 13 key counties. In Citrus County, which has an adopted MPP, staff efforts have focused on implementing the plan, attending local coordination meetings by the USFWS, coordinating aquatic plant management efforts, and making recommendations on various permits.

The MPP program is unique in that it is a cooperative program and not one established under a mandate with a dedicated funding source. This has been one factor influencing priorities for funding and staff allocations over the past three years. Priorities have been set based on known mortality problems, interest from key counties, pressure from development interests, and local funding. Due to the cooperative nature of the program, changing priorities, and limited resources, there is much variety in the status of the 13 county programs.

Broward, Brevard, Dade, Collier, and Duval counties have been the most active; all but Brevard County have draft plans. Broward County's Board of County Commissioners approved a MPP in April 1993, and implemented some provisions of the plan, such as speed zones and education programs. However, since the plan did not address boat facility siting, it cannot be approved by the FDEP.

Two counties, Brevard and Dade, completed boating studies prior to FY1993-1994, two are underway (Indian River and Volusia counties), and two others (Collier and Palm Beach counties) have been completed during FY1993-1994. Additionally, a boat facility siting study for Palm Beach County was contracted by the FDEP with the Treasure Coast Regional Planning Council. MPP staff continued to lend support and technical expertise to the development of speed zone rules in St. Lucie, Lee, and Brevard (Barge Canal) counties.

Although only one county, Citrus, has an official plan, substantial progress has been made in the process of developing the other plans. For instance, through this program, areas of mortality problems have been identified and steps taken to correct them. The Miami Airport Canal deaths offer one example; two permanent barriers were installed to prevent access to the underground canals at the Miami Airport where manatees were getting trapped and drowning or starving to death. Other issues come up that are addressed without having to be included in a manatee protection plan.

One of the most positive spinoffs of the MPP is that the Office of Protected Species Management (OPSM) has developed local awareness and expertise in each of the 13 key counties. OPSM hired either someone temporarily or the county-dedicated staff who are gaining technical expertise in manatee and ecosystem concerns. OPSM has initiated dialogue and coordination meetings with local planners and environmental staff, permit issuers, aquatic preserve staff, and others having marine resource concerns. Through the MPPs, the OPSM has facilitated interagency coordination among all levels of government from federal to local. Another positive result of MPP development is MPP education committees are coming up with many ideas which address not only manatee mortality, but environmental preservation as well.

Other FDEP MPP related activities included: developing comments on the state water policy, ecosystem management program, and FDEP and other agencies' planning documents; ranking P-2000 (CARL) projects for manatee value; and providing input on the Endangered Species Act reauthorization and the new permitting process resulting from the merger of the FDNR and FDER.

PERMITTING

The Office of Protected Species Management (OPSM) continued the evaluation of permit/lease applications for marine and coastal projects and events, and the preparation of protection recommendations for those projects/events which could result in significant adverse effects to manatees and/or manatee habitat during FY1993-1994. Mortality, abundance, and distribution data were used in the review of proposed projects to determine potential adverse effects. SAS software, GIS-generated maps, and ARCView were used to access these data. Meetings with applicants and their agents, as well as other government agency personnel, were also part of the review process. Data entry of project information for tracking purposes was accomplished by an OPS staff assistant using dBase IV.

Over 1,200 permit/lease applications and associated correspondence were received for review in FY1993-1994. Of these projects, 108 were determined to be "critical" because of size, location, complexity, or potentially deleterious effects of manatees or manatee habitat. Thirteen Developments of Regional Impacts were reviewed, and recommendations were sent to the Department of Community Affairs (DCA) or the appropriate regional planning council. Twenty-two marine events were reviewed, and recommendations were submitted to the U.S. Coast Guard.

Special projects assigned to the permitting staff during FY1993-1994 included: (1) assist in the development and review of the proposed Boating Facility Construction/Expansion rule, (2) draft internal policy criteria for DCA's Development of Regional Impact (Chapter 380 FS) concerning the determination of adverse impacts on an endangered species, (3) prepare comments concerning DCA's Rule 9J-2 F.A.C. regarding the determination of adverse impacts on an endangered species and possible mitigation alternatives, (4) draft requirements for permanent manatee information signs required by permits/leases, (5) review permanent sign plans required by leases/permits until the sign posting position was filled, (6) assist in capture and tagging of manatees at Tampa Bay, and (7) review proposed rules for the Environmental Resource Permit.

HABITAT CHARACTERIZATION, ASSESSMENT, AND PROTECTION

The manatee habitat protection section is responsible for coordinating reviews of manatee habitat-related issues for the FDEP including collection and assimilating reference information concerning manatee habitat issues, review of pertinent inter- and intradepartmental efforts dealing with manatee habitat protection, coordinating agency working groups in areas of special concerns for manatees, and presenting current information regarding manatee habitat research to public and agency groups. In FY1993-1994, the section published a summary report identifying all known manatee habitat components

in both freshwater and marine systems in Florida, and identified anthropogenic threats to seagrass systems. The report is entitled, "Manatee Habitat and Human-Related Threats to Seagrass in Florida: A Review," and is available upon request from the Office of Protected Species Management. Information and literature concerning manatee habitat use and foraging behavior and the ecology of seagrasses and aquatic macrophytes continue to be obtained and assimilated to provide managers with access to information needed for manatee habitat management efforts. The FDEP staff also coordinated with the FMRI and Water Management District offices to obtain GIS information for the development of seagrass maps in regions of the state used by manatees.

The FDEP staff began the development of an administrative rule for the protection of seagrass as manatee foraging habitat under the authority provided in Section 370.12(n) FS and continued participation in the Crystal River Interagency Working Group which establishes aquatic herbicide work plans for Kings Bay and Homosassa River based on seasonal manatee use. Coordination of the Blue Spring Interagency Working Group was continued to ensure manatee habitat in this area will be sustained and monitored on a biannual basis. Both working groups are comprised of representatives from the FWS, COE, respective counties, Game and Freshwater Fish Commission, and the FDEP's Division of Recreation and Parks, Bureau of Aquatic Preserves, Bureau of Plant Management, and Office of Protected Species Management.

The habitat section also coordinated with the permitting and manatee protection plan sections on issues concerning development-related degradation of seagrass systems and water quality, and developed manatee habitat-related evaluations of lands proposed for state acquisition with P-2000 funds (CARL and FCT projects). To facilitate the CARL project review process, a criteria matrix ranking system based on pertinent manatee habitat value (feeding areas, accessible water depths, use patterns, etc.) was used for the 1993 CARL proposal list. The habitat section also acted as an information resource by reviewing and providing comments or requested information for numerous extra- and intradepartmental projects dealing with manatee habitat concerns.

MARINE RESOURCES GEOGRAPHICAL INFORMATION SYSTEM

"Geographical Information System" is generic terminology for a computer system that analyzes and handles spatial or geographical data. It is designed to handle large volumes of such data from different sources and then manipulate, analyze, and ultimately display the data as directed by the user. A key function is utilizing coreferenced layers of data to create files that either pictorially or numerically present answers to queries.

The Marine Resources Geographical Information System (MRGIS) is a geographic information system containing spatial databases dealing with marine, freshwater, and wetland natural resources in Florida. It also contains certain hydrologic and human-related features. The complete system will give other agencies access to data to be used in project planning and review with a view toward minimizing negative effects on the manatee population and its habitat. Local governments are using the geographic information system in the production and implementation of their comprehensive growth management plans.

Within the endangered and protected species program, the MRGIS allows research and management personnel to explore protection and management options more fully before they are implemented. Layers available for manatee-related uses may include aerial sighting locations, radio and satellite telemetry locations, carcass recovery sites, water depths, vegetation coverage, channel and regulatory sign locations, boating speed zones, and shoreline development characteristics. The data and mapping provided by the geographic information system are used extensively in the preparation of manatee protection speed zone rules and manatee protection planning efforts.

Two meetings of the Manatee GIS Coordinating Team were held in October and February of FY1993-1994. The group is comprised of representatives from the FDEP, FWS, National Biological Survey, the Marine Mammal Commission, and an independent GIS expert. The Coordinating Team was created to develop and implement an operational plan for the Manatee GIS. To assist this task, the Coordinating Team organized the Manatee GIS Working Group and held the initial meeting in June. The Working Group is composed of representatives from agencies and organizations likely to contribute to or use the Manatee GIS. Goals for the first meeting were to inform Working Group participants about the Manatee GIS and identify issues that members want to resolve. These issues fell into categories including data base development and use, analytical techniques, ecosystem management and participant's expectations for the group. Over seventy people attended the Working Group meeting; future meetings will deal with GIS topics identified from the initial meeting. Data base development continued with routine entry of monthly mortality records. Data for most of the aerial surveys flown within the state over the last ten years have been entered and the verification process is nearly complete. Additional small waterways were digitized to extend the statewide base map. Other relevant spatial data sets continue to be created and incorporated into the MRGIS including the 42 Aquatic Preserve boundaries and aerial survey flight paths from historic data. Integration of coordinates from global positioning system receivers was also used to create data layers for ongoing aerial surveys. Data from the ongoing west coast satellite telemetry project were also processed and preliminary analyses were initiated.

Spatial analyses of mortality, aerial survey sightings, and telemetry data were tested, reviewed, and refined in conjunction with input from project scientists, managers, and the GIS Coordinating Team. Aerial survey data analysis focused on transforming data points indicating individual sightings to abundance patterns within the survey route. A similar approach using mortality data was conducted. Both analyses show potential for increasing the ability of both research and management personnel to better visualize and quantify the distribution of deaths and sightings. Refinement of the techniques is ongoing. Using telemetry data, programs were developed to estimate minimum travel distances between known animal locations while keeping the travel path in the water. Travel distances were used to test the effect of spatial filter size on the aerial survey analyses and to examine the relationship between animal size and movement patterns.

The manatee program's Tallahassee GIS section received GIS data from the FMRI as they completed it. Map format was standardized using criteria established by the Manatee GIS Coordinating Group. An OPS CAD technician was hired in May 1994. In addition to working on AutoCAD rule maps, the position will be used to work with the newly acquired 35 mm slide maker and several newly acquired graphic programs. The Tallahassee GIS section distributed 540 GIS maps, 30 AutoCAD maps, 42 SAS prints, and 41 digital data sets. The process of converting speed zone maps from AutoCAD to ARC/INFO has been started and should be finished in the 1994-1995 fiscal year. In addition, technical assistance was provided to GIS groups in Law Enforcement, Recreation and Parks, State Lands, and the Georgia Department of Natural Resources.

PUBLIC INFORMATION AND EDUCATION

During FY1993-1994, many steps were taken by staff to educate the public concerning the endangered manatee. Close to 1,000 requests from around the world were responded to; press releases were issued on a regular basis addressing issues such as annual mortality figures, the Voluntary Contribution Campaign, and Manatee Awareness Month. Educational materials were updated on a continuing basis throughout the year. Manatee information was distributed to newcomers through interested local chambers of commerce. Samples of our educational and informational materials were supplied to various county governments for their use in preparing the educational components of their manatee protection plans.

A press conference with Governor Chiles and Jimmy Buffet was held on the steps of the Capitol to emphasize the importance of continued support of the Save the Manatee License Plate.

The Information Specialist again spearheaded a very successful Voluntary Contribution Campaign (VCC) with the enthusiastic participation of county registration offices. In order to promote sales of the manatee decal, a contest between county tax collectors is held every June, the month vessel registrations are renewed. This year, over $92,000 was raised through sales of the decal and voluntary contributions at the tax collector's offices, with Palm Beach County winning the contest by collecting over $21,000. Additional decals will continue to be sold. Approximately 40% of the funds raised through sale of the decals are disbursed to the oceanaria for their efforts in the rescue, rehabilitation, and release of wild manatees.

RIGHT WHALE STATUS

In addition to the manatee, the FDEP has responsibility for other endangered marine animals, including the North Atlantic right whale, the most endangered great whale in the world. The NMFS has lead responsibility for recovery of the right whale. The Georgia and northeast Florida coastal waters are the only known calving area for this whale and were designated as critical habitat by the NMFS on June 3, 1994. Accordingly, aerial surveys were conducted to monitor the seasonal presence of right whales and to determine the number of calves. Individual whales were identified, and movements were tracked based on a scar catalogue. Permit applications which may affect the right whale and/or its habitat were reviewed by FDEP staff, and specific conditions were recommended to minimize adverse effects. FMRI staff participate in a multi-agency task team to implement tasks to minimize ship collisions with right whales such as assisting in educational seminars for harbor pilots and the port community. The FDEP received $14,999 from the NMFS during the period from October 1993 through September 1994 to assist in right whale recovery efforts and the FMRI continues to work on a cooperative agreement with the NMFS that will provide additional funding for future efforts.

MARINE TURTLE PROGRAM

The FDEP marine turtle conservation goals, responsibilities, and program direction promote the recovery of the five species of marine turtles that occur in Florida. The overall approach is to develop the scientific information that will guide recovery efforts (research) and to minimize human impacts which result in increased mortality, degrade habitat, and impede recovery of listed turtle species (management). The current FDEP program is divided into six major components: (1) recovery program planning, management, and administration; (2) biological/ecological research and population assessment; (3) coordination of research and management activities; (4) assessment of mortality factors; (5) habitat protection; and (6) education.

Research carried out by program staff during 1993/1994 addressed the following topics: (1) the distribution, abundance, life history, and ecology of marine turtles in Florida and contiguous Western Atlantic and Caribbean waters; (2) assessment of population status and trends of loggerhead, green, and leatherback turtle nesting populations in Florida; (3) identification of genetic stocks of marine turtles utilizing Florida's nesting beaches and foraging habitats; (4) development of reliable sex determination techniques for marine turtles; (5) the nesting ecology of loggerhead turtles; (6) the effects of artificial lights on marine turtles; and (7) the dispersal behavior and lost-year ecology of marine turtles hatching on Florida's east coast. The various research projects greatly enhance the FDEP's ability to carry out effective management on behalf of marine turtles.

Coordination of research and management activities is accomplished through various means, including the administration of a marine turtle permit system. Through a cooperative agreement with the FWS, the FDEP reviews, issues, and administers permits for both research and management activities within the state. Staff also monitor marine turtles held in captivity. To date for 1994, 106 permits have

been issued, including 23 in-state and 8 out-of-state permits issued to public aquaria or marine science centers to display marine turtles for public education. The management program included drafting a revision of Rule 62R-1, Florida Administrative Code. Coordination of research and management activities was also accomplished through the continued participation of FDEP staff on local, state, federal, and international conservation panels, recovery teams, and specialist groups.

The FDEP continued to coordinate the Florida portion of the Sea Turtle Stranding and Salvage Network (STSSN), an 18-state program coordinated at the federal level by the NMFS. From 1980 through 1993, 8,686 stranded turtles have been recorded by the Florida network. Staff coordinate statewide activity of permitted volunteers, as well as data entry and verification. Data analyses contribute significantly to management decisions such as the regulation of fisheries that impact marine turtles.

The FDEP also coordinated the statewide collection of data on marine turtle nesting activity. Staff recently completed a 14-year summary of results which will be published in the *Florida Marine Research Publication* series. The Index Nesting Beach Survey program, which involves systematic monitoring of nesting on 27 selected beaches in the state, entered its sixth year. This program was initiated to allow evaluation of long-term trends in population status and nest success.

The FDEP's marine turtle program contributes to the protection of marine turtles and their habitat by staff participation in decisions regarding coastal construction activities, land acquisition, and management of nesting beaches and foraging habitats. Staff reviewed and commented on permits for coastal construction activity, dredge and fill permits, renourishment projects, beach lighting ordinances, and beach cleaning practices. Field evaluations of proposed and permitted activities to recommend and evaluate the success of marine turtle protection measures were also conducted.

Educational activities included distribution of brochures, informational booklets, and responses to numerous requests for information from interested parties; attendance at and participation in coastal related conferences and forums; providing slide shows and lectures to groups; and general promotion of the program and its fund-raising activities. Staff served on local, state, federal, and international panels, recovery teams, and specialist groups.

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

The Mississippi Department of Marine Resources (MDMR) is a technically and functionally diverse state agency with responsibilities that include saltwater fisheries and coastal wetlands' management and the promulgation and enforcement of state and federal laws that pertain to the regulation of the use and harvest of coastal, estuarine, and marine resources.

DEPARTMENT OBJECTIVES

Although the MDMR's public image is typically linked to its regulatory functions, much of the organization's activity is centered about assistance, development, and public education regarding the wise use and conservation of coastal resources. Providing liaison between the state and the U. S. Department of Interior Minerals Management Service, the MDMR offers technical assistance to the Department of Environmental Quality and the Office of the Governor with regard to environmental issues pertaining to offshore oil and gas exploration and development activities. The MDMR also administers grant and contractual monies that are made available through the Coastal Zone Management Program and the Dingell-Johnson, Sportfish Restoration Act for a variety of recreational, public works, and developmental programs that support local governments, universities, and other public institutions. Furthermore, the MDMR also provides technical assistance to individuals, small businesses, and industry in the coastal region in the areas of aquaculture and mariculture, pollution abatement, product development, and waste treatment to name a few.

The agency's regulatory functions, of course, are not to be overlooked. In concert with the Alabama Department of Natural Resources and the Louisiana Department of Wildlife and Fisheries and through its active roll as a participant in the Gulf States Marine Fisheries Commission and the Gulf of Mexico Fisheries Management Council, the MDMR's fisheries management program is geared toward providing for the continued wise utilization of fisheries resources while at the same time ensuring the health and vitality of the state's valuable renewable marine resources. Working jointly with scientists of the Gulf Coast Research Laboratory in Ocean Springs and the National Marine Fisheries Service, department biologists continually monitor shellfish and finfish stocks in state waters and both sports and commercial harvest levels in order to provide the Mississippi Commission on Marine Resources with the best available scientific information on which to base its management decisions. Staff biologists work in cooperation with the U. S. Food and Drug Administration to provide a shellfish management program that is in full compliance with all applicable federal guidelines.

Regulations of wetlands activities is similarly accomplished in cooperative fashion as the MDMR reviews and assesses each such proposed action in concert with the U. S. Army Corps of Engineers and the U. S. Fish and Wildlife Service through a regional permitting system.

The MDMR's strong enforcement program - a cooperative agreement with the Enforcement Division of the Mississippi Department of Wildlife, Fisheries and Parks - is committed to ensuring compliance with all state and federal rules and regulations that apply to the coastal zone. In particular, enforcement of federal laws associated with the Lacy Act and investigation of incidents involving both marine mammals and endangered marine turtles has gained increased emphasis in recent years.

The following narratives provide a brief description of each of the major programs and projects within the Department of Marine Resources highlighting the principal objectives and accomplishments of each during the past fiscal year.

ADMINISTRATIVE DIVISION

The principal objective of this project is to provide the necessary administrative support services for Department of Marine Resources operations along the coast. While this project is largely one of providing maintenance services for existing agency activities, there were a number of developmental activities pursued over the fiscal year that will ultimately serve to improve overall agency function.

Support services over the past fiscal year included data-processing and microcomputer support for day-to-day department activities. A new time accounting system for federal grants administration was implemented during this fiscal year. Acquisition of additional computer support was also accomplished during this time frame. This additional equipment should enable the MDMR to increase both the timeliness and efficiency of its response to both in-house and public requests for support assistance.

Routine staff meetings and briefings were also conducted throughout the fiscal year to provide staff with updates on legislative developments and other information relevant to the overall mission of the Mississippi Department of Marine Resources.

MARINE FISHERIES DIVISION

By statute, the public policy of the state regarding seafood is "to provide...modern, sound, comprehensive...law to be administered by specialists...to take action as may be necessary to help protect, conserve and revitalize seafood..." The Marine Fisheries Division provides this level of specialization to the Commission on Marine Resources in carrying out its authorized jurisdiction over all marine aquatic life, including the regulating of fishing seasons, setting size limits and gear for taking all finfish, crabs, shrimp, oysters, and other marine species.

Overall division objectives encompass all marine management objectives, i.e., to design and initiate projects for data collection and analysis of that data to produce stock size estimates, develop management recommendations based on those stock estimates, monitoring of stocks through fishery-independent and fishery-dependent methods, act as liaison between state and regional or federal management programs, and any non-management activities including public education and technical assistance to individuals and government agencies.

During FY93, the Marine Fisheries Division recommended management regulations for adoption either through ordinance amendment or public notice. Changes were initiated through statutory requirements, participation in regional fishery management plans, or through findings from research projects conducted on local marine populations. Effects from previous regulations, most notably on red drum stocks, have been monitored. Planning and project development, as well as actual work, continue on seventeen fisheries projects, ranging from red drum larvae to shrimp to oysters to cobia. Funding for research projects is sought through the Sport Fish Restoration Act (Wallop-Breaux funds), the Interjurisdictional Fisheries Act, the Anadromous Fisheries Act, the Marine Fisheries Initiative, and the Coastal Zone Management Act. Efforts from these funding sources provided data used to open, close, and regulate the state's multimillion menhaden, shrimp, oyster, crab, and finfish seafood industry - and the valuable marine recreational fishing industry. Division personnel not only gathered and analyzed fisheries data but also served on regional committees and task forces dedicated to improve marine management, judged science fairs, helped at fishing rodeos, spoke to various civic and professional groups, investigated environmental perturbations, and generally responded to the fishing public.

MARINE FISHERIES MANAGEMENT

The saltwater fisheries projects and activities coordinated through this program include:

1. To design and initiate projects for the collection and analysis of data required for population dynamics estimates and other fisheries management related projects as may be required.
2. To develop management recommendations based on specific criteria.
3. To monitor the existing condition of the stock and the fisheries that depend on them.
4. To provide information transfer and liaison activities with regional fisheries management entities and others.
5. To provide technical support to the Mississippi Commission on Marine Resources in developing fishery management plans, amendments, stock assessments, and technical analysis.
6. To provide a state representative to serve on fisheries related boards, committees, panels, etc. as may be required.
7. To provide for administrative services, general maintenance, the locating of suitable funding sources, and other fisheries management support services as may be required.

Bag and possession limits for establishing regulations on sharks and reef fish which comply with federal regulations. Public notices were published on opening and closing commercial fishing seasons for king mackerel, large coastal sharks, red drum, and red snapper.

Saltwater Fisheries personnel served on regional management activities of the Gulf States Marine Fisheries Commission including: the Technical Coordinating Committee (TCC), the Black Drum and Mullet Technical Task Forces, the TCC Artificial Reef Subcommittee, the TCC Data Management Subcommittee, and the State-Federal Fisheries Management Committee. Saltwater fisheries personnel also participated in the GSMFC's Southeast Area Monitoring and Assessment Program (SEAMAP). The division was instrumental in preparing grant documents and proposals to secure funding for fisheries management projects through the Marine Fisheries Initiative (MARFIN), Sport Fish Restoration Act, Cooperative Fishery Statistics Program, and the Interjurisdictional Fisheries Act. Division personnel also responded to various requests from other governmental agencies and the general public.

MARINE FISHERIES STATISTICS

1. To collect commercial fisheries landings and catch data for Mississippi in a timely manner.
2. To collect biological data for selected commercially important finfish species.
3. To obtain boat trip information and biological statistics on migratory pelagic and reef fishes such as red snapper, grouper, and amberjack.

Fisheries landings data have been collected weekly and monthly according to schedule. The data was processed, edited, and submitted to the National Marine Fisheries Service in accordance with established data handling procedures. Fisheries landings data are an important part of the fisheries management process, both as an indicator of potential problem areas and as a gauge of the success of existing fisheries regulations and practices.

Biological data for selected commercially important finfish species was collected from the major fish houses along the Mississippi Gulf Coast. Some processing of this data was accomplished, while the remainder will be processed as personnel time permits. Some of the information collected will be utilized in the development of various fishery management plans, both on a state and regional level.

Information for selected pelagic and reef fishes was collected from major landing sites for these species on a monthly basis. This information was submitted to the National Marine Fisheries Service for inclusion in their Trip Information System. This data is utilized by both state and federal fisheries managers to properly manage these valuable resources.

MONITOR AND ASSESS SHRIMP POPULATIONS

1. To conduct, in a timely fashion, an on-going standardization shrimp sampling program that provides needed biological information.
2. To perform data analysis on the biological information.
3. To make recommendations on shrimping seasons and area openings and closings.

Shrimp sampling was conducted as required for commercial, recreational, and live bait shrimping. Shrimp season north of the Intracoastal Waterway was opened for commercial and recreational shrimpers in April after sampling showed that shrimp present were of legal size. The regular shrimp season was opened in June after data analyses of an extensive sampling program projected the date shrimp would reach the required sixty-eight shrimp-per-pound count. A few areas where shrimp remained sublegal-size were kept closed as sampling of those areas continued. These areas were later opened.

Sampling for live bait shrimping was also conducted in St. Louis Bay, Biloxi Back Bay, and in the Pascagoula River System. These areas were opened and closed in accordance with established criteria and state statute.

OYSTER PROGRAM

Oysters, as sessile organisms, are subject to a great deal more to the whims of the environmental conditions than are the mobile fisheries. Consequently, oyster landings over the last ten years have fluctuated from 365,000 sacks in 1983 to a low of 5,000 sacks in 1988. In addition to fluctuations caused by either too much or too little rain, are the problems with upland pollution rendering even plentiful supplies unusable. Over 220,000 sacks of oysters were harvested in FY93. Water quality samples were obtained throughout the year to classify shellfish growing waters significant rain events until it was determined that water quality samples were obtained throughout the year to classify shellfish growing waters. Oyster harvesting was closed after significant rain events until it was determined that water quality had improved to allow continued harvesting.

MISSISSIPPI SOUND CREEL SURVEY

The primary objective of this project is to conduct a point access creel survey of sportboat fishermen. Specifically, this project is designed to provide information on relative pressure at boat launch site and piers along the Mississippi Gulf Coast. Data on species composition of the catch, size frequency distribution of economically and recreationally important finfish, estimates of total fishing pressure, estimates of total catch and estimates of catch-per-unit effort (CPUE).

MONITORING AND ASSESSMENT, MISSISSIPPI SOUND

The project objectives are the monitoring and assessment of adult and large juvenile finfish species comprising fisheries resources in Mississippi's estuarine and marine territorial waters.

In FY93, the MDMR received federal funds made possible from the Interjurisdictional Fisheries Act in 1986 (P.L. 99-659) and subcontracted with the Gulf Coast Research Laboratory for the work conducted by this project. This is an on-going project that samples the estuarine and marine biota with gill nets, dredges, trawls, and seines. Monthly samples utilizing variable mesh sizes and located at different habitats yielded information on various life history stages of the major species exploited in Mississippi estuarine and marine waters. Investigations of biological and environmental data in this project include collection and analysis if data on commercial species of marine shellfish and finfishes in Mississippi territorial waters; biological data collection of certain select fishes with emphasis on mark/recapture studies, reproductive state assessment, otolith collections for age and growth studies; monitoring shrimp postlarvae and juveniles in coastal Mississippi waters; sampling survey of portunid

crabs; live bait and commercial shrimp monitoring; and analysis of the roe mullet fishery in Mississippi waters.

COBIA STUDY

Project objectives for the cobia study are to determine age and growth, to determine movement patterns, to describe the reproductive biology and food habits of cobia, and to develop techniques on maintaining and culturing cobia occurring within Mississippi and adjacent Gulf waters.

In FY93, the MDMR received federal funds made possible by the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 669-669i) 50 CFR Part 80, from the U. S. Fish and Wildlife Service. Part of these funds were utilized for a study of cobia at the Gulf Coast Research Laboratory.

In a previous segment, the Gulf Coast Research Laboratory staff collected, sliced, and read otoliths for age determination and back calculating lengths at annular formation for growth estimates. Aspects of reproductive biology which have been completed include: (1) time of peak spawning, (2) ovarian maturation phases, and (3) egg counts for fecundity estimates. Stomach contents have been examined and prey items identified and enumerated. Tagging fish to study movement patterns is being accomplished by GCRL staff, private fishermen, and charter boat fishermen along the Gulf Coast and will be the primary objective in future segments.

RED DRUM STUDY

The objectives of the red drum study are to study the population age structure and emigration dynamics of inshore subadult red drum in coastal Mississippi waters.

This project is federally funded by monies made available through the MDMR to the Gulf Coast Research Laboratory by the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 669-6698) 50 CFR Part 80. The Gulf Coast Research Laboratory is continuing to monitor the age of the inshore red drum population by collecting, sectioning, and reading otoliths. Tagging of red drum for study of movement pattern and emigration of the offshore spawning stock was done and is ongoing.

STRIPED BASS STUDY

The primary objective of the striped bass study was to restore the striped bass population to coastal waters of Mississippi. Secondary objectives include monitoring and evaluation of the stock effort.

The project is funded through monies made available through the MDMR to the Gulf Coast Research Laboratory by the Anadromous Fish Act (P.L. 89-304) and the Federal Aid in Sport Fish Restoration (15 U.S.C. 669-669i) 50 CFR Part 80. The project is ongoing, and in FY93 striped bass fingerlings were tagged and stocked in the coastal tributaries of Mississippi. Evaluation of tag returns from fish tagged in previous years and interviews with sport fishermen, commercial fishermen, and fish camp operators indicate an increase in the striped bass population as a result of the restocking program.

RED DRUM REPRODUCTION STUDY

The objectives of the red drum production study are:

1. To continue monitoring changes in the offshore red drum population that resides in coastal waters between the Mississippi River delta and Mobile Bay, i.e., the spawning stock that produces fish which support the nearshore/estuarine Mississippi red drum sport fishery;
2. To continue the time series of spawning biomass estimates which were begun in 1986;
3. To further refine and improve these spawning biomass estimates; and

4. To continue tracking the effects of both state and federal management regulations, in particular, Mississippi's size and bag limits which have been designed to increase escapement of maturing red drum from inshore sportfishing pressure.

This project is partially funded through monies made available through the MDMR to the Gulf Coast Research Laboratory by the Federal Aid in Sport Fish Restoration Act (Wallop-Breaux). These funds were determine the abundance and densities of red drum larvae in coastal waters between the Mississippi River delta and Mobile Bay, as well as to complete analyzing previous samples.

SPOTTED SEATROUT STUDY

Project objectives for the spotted seatrout study are:

1. Develop and implement a fishery independent sampling protocol for the assessment of the population of adult/subadult spotted seatrout in Mississippi coastal waters;
2. Develop a length-at-age estimate and population age structure for the population of adult/subadult spotted seatrout in Mississippi coastal waters;
3. Compile, analyze, and summarize available data for the development of a stock assessment for the population of spotted seatrout in Mississippi coastal waters; and
4. Develop and coordinate a series of public workshops to provide for exchange of information on fishery research and management procedures regarding the spotted seatrout sport fish fishery in Mississippi coastal waters.

The project began in December 1991. Sampling in the major estuarine areas in Mississippi is currently ongoing. One public workshop was held in January at the J. L. Scott Marine Education center in Biloxi. The purpose of the workshop was to exchange information with the public on fisheries research and to advise them on management procedures regarding the spotted seatrout sport fish fishery.

OIL AND GAS TECHNICAL ASSISTANCE

The project's primary objectives include the review of all oil and gas activities in Mississippi's coastal zone to ensure compliance with state policy, the development of regulatory guidelines to protect coastal resources from impacts associated with oil and gas development, and the preparation of a comprehensive oil spill response plan for Mississippi's coastal waters.

During FY93, the Coastal Management staff conducted reviews, participated in meetings, and initiated revisions to the state's oil spill contingency plan. Staff continued to track changes in federal oil spill legislation for potential application to the Mississippi Sound and other state waters and coastal wetland areas. Because of the limited oil and gas activities within the state's coastal waters much of the staff's attention was directed to activities occurring in federal waters in the Outer Continental Shelf.

COASTAL ZONE MANAGEMENT ASSISTANCE

The primary objective of this project is to implement the provisions of the Mississippi Coastal Program (MCP). The MCP is legislatively mandated in Mississippi Code Section 51-15-6 and was approved by the federal government under provisions of the Coastal Zone Management Act (CZMA) of 1972 as amended and adopted as state policy. Coupled with coastal management responsibilities are those needed to carry out the mandates of the amended Marine Litter Act of 1989.

During FY93, the MDMR received $757,000 in federal funds from the Office of Ocean and Coastal Resource Management to meet coastal management objectives. Funds were used to provide administration support, purchase equipment, and cover the coast of various office expenses and travel. Funds were used for legal assistance through the Attorney General's office. The Coastal Management staff

participated in two coastwide beach cleanups and reviewed all major federal actions in the coastal zone to determine if the activities were consistent with the state's coastal management plan. This review included dredging projects and oil and gas activities in the Outer Continental Shelf.

Grants were given to the two marine museums to conduct public outreach and public education programs in the coastal area. Public access sites along the coast were constructed and public service announcements were produced.

A contract was let for part-time assistance for the marine debris efforts. Management staff made an assessment of the MCP as required by the amended Coastal Zone Management Act. This assessment is a precursor to strategies to improve the MCP through program enhancement or program changes. Work on the assessment and strategy will continue into the next fiscal year. Major efforts were also made to develop a "Coastal Preserves" system for the state which incudes 20 potential sites in the coastal area. These areas provide unique habitat, erosion control and storm buffers, groundwater, and recharge areas. These sites also provide habitat for rare and endangered plant and animal life.

A contract was also developed with Mississippi State University to monitor size and nesting phenology of the least tern colonies on the Mississippi sand beaches. Results of this study will be evaluated and recommendations incorporated into the management of the least tern colony. A contract was also developed with the National Audubon Society to develop a publication for wetlands.

WETLANDS EDUCATION AND PROTECTION

This project's primary objective is the protection and management of the state's coastal wetlands resources. Secondary objectives include policy development and implementation, habitat enhancement, regulatory guidance, and public education.

The Coastal Management staff achieved project objectives during FY93 by administering the provisions of the Costal Wetlands Protection Law and the Mississippi Coastal Program. Staff began to review project applications for dockside gaming facilities in coastal areas during this reporting period with the anticipation of several more gaming projects' reviews to follow. Significant staff efforts were made to develop aquaculture guidelines to address permitting requirements for both net pen operations proposed for an area south of Horn Island and for oyster culture near Cat Island. These guidelines resulted from the FY93 publication "Offshore and Sub-tidal Aquaculture Environmental Activities." There was a high level of cooperation among state and federal resource agencies and significant emphasis was placed on habitat restoration and enhancement activities during FY93. The wetlands staff developed a research project that will address historic erosion rates at Bellefontaine in Jackson County as well as continuing a cooperative effort in determining the value of wetlands via and EPA grant in Jackson County for future mitigation or wetlands replacement purposes.

Part of the state's fledgling "Coastal Preserves" reported under Coastal Zone Management Assistance and one of the first actions of the program was the transfer from the Nature Conservancy to the Department of Marine Resources/Department of Marine Resources, of approximately 575 acres of wetlands within the Graveline Bay system of Jackson County. Graveline Bay is a small estuarine system that serves an important role as a nursery area for commercial and recreationally important species. The staff conducted site inspections and environmental assessments, sponsored meetings, and acted on a total of 300 wetland cases in FY93.

PUBLIC TIDELANDS TRUST

Mississippi Code Annotated 29-15-9 (Rev.1990) provides for the disbursement of Public Trust Tidelands Funds to the MDMR for certain activities for new programs for tidelands management. Such

programs may include wetland research, acquisition, conservation, and the enhancement of public access to the public trust tidelands status report.

Portions of the tidelands funds were used to match a U. S. Fish and Wildlife Service grant for pine savanna acquisition and for a wetlands research project.

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES

OFFICE OF FISHERIES

The Office of Fisheries' mission is to manage, protect, conserve, and enhance the fishery resources and associated aquatic habitat of the state of Louisiana to provide maximum biological, social, economic, commercial, and recreational benefits for Louisiana and the nation. Program activities in support of these goals are described as follows:

SHELLFISH PROGRAM

The Marine Fisheries Division continues its longterm fishery independent trawl sampling throughout coastal Louisiana. Data from these samples were used to set season frameworks for both the fall and spring inshore shrimp seasons and the winter offshore shrimp season closure. Additionally, a special spring pink shrimp season for a portion of Breton and Chandeleur Sounds and a special white shrimp season for Calcasieu Lake were set.

SHRIMP SEASONS

Offshore

A portion of the state's offshore territorial waters were closed on February 12, 1994. The closure encompassed that region from the beach out to three miles from the Mississippi/Louisiana state line west to South Pass of the Mississippi River and from Bayou Lafourche west to Freshwater Bayou. Most of the area was reopened on May 2, 1994, with that area from the Atchafalaya River west to Freshwater Bayou closed until the inshore season opened on May 16, 1994. This action was taken to protect small white shrimp.

Special Season Calcasieu Lake

A special 5 day season was held in Calcasieu Lake April 23-27, 1994. This season allowed fishermen to harvest overwintering white shrimp. Total landings for the 5 day period were approximately 100,000 pounds of 31/35 to 50/60 count white shrimp.

Spring Inshore Shrimp Season - Zone 2

Zone 2, from the Mississippi River and South Pass to the Western shore of Vermillion Bay and Southwest Pass, opened at 6 a.m. Monday, May 16, 1994. Preliminary reports indicated that the number of boats fishing on opening day was fewer than normal and that the shrimp taken were generally small. Marine Fisheries Division personnel conducted interviews at marinas and seafood docks on opening day. Early indications from this year's interviews show that the majority of shrimp landed were in the 80/100 count per pound size range. Department staff also indicated that the numbers of both commercial and recreational boats were down as compared to previous years.

Along the Mississippi River from Lake Hermitage down river to Venice, catches of brown shrimp were poor. The size of shrimp taken ranged from 60/70's to 80/100's. Some large white shrimp were landed. Average observed dockside price per pound in this area was as follows:

Count (Heads on)	Price	Count	Price
100+	$ .35	36/40	$1.40
80/100	.50	31/35	1.60
70/80	.60	26/30	1.80
60/70	.80	21/25	2.30
50/60	1.00	16/20	2.60
40/50	1.20	10/15	3.25

Reports from the area around Grand Isle and Barataria Bay were mixed. Most boats reported poor catches of small shrimp. Only those boats fishing the upper reaches of the Barataria Bay system reported good catches, although those shrimp were also small. The sizes landed generally ranged from 60/70's to 100/120's count per pound, with the majority being 80/100's. There were also some large white shrimp. Prices in this area were similar to those listed above.

Reports from the area from Bayou Lafourche west to Cocodrie indicated poor catches of shrimp from the upper marsh areas. The shrimp in those areas also ranged from 60/70's to 100/120's, with the majority being 80/100's. Some fishermen reported catching a few large white shrimp that were mixed with very small brown shrimp that were discarded.

The area from Cocodrie west to the Atchafalaya River produced very few shrimp. Catches were very poor and the size of brown shrimp was small, averaging 80/100's and 100+ to the pound. A few boats caught some large white shrimp. Some of those interviewed had as much as 200 pounds of white shrimp. Many boats in this area reported culling out only the white shrimp and discarding the browns. Larger commercial vessels had not returned to dock during these interviews.

In Vermilion Bay (Zone 2), fair catches of overwintering white shrimp were reported. Commercial shrimpers reported catches of 65 pounds per hour of 60/70 count per pound white shrimp. There were no brown shrimp caught in this area due to salinities of less than 2 ppt throughout the area. A count of trailers revealed that effort was down among recreational fishermen. During the spring season in Vermilion Bay, the Commission established a temporary rule banning night shrimping. Many local fishermen are opposed to night shrimping in Vermilion Bay. The temporary rule will allow the evaluation of the benefits of establishing a permanent ban to night shrimping in that area.

Spring Inshore Shrimp Season - Zones 1 and 3

The 1994 inshore shrimp season in Zones 1 and 3 opened as scheduled at 6 a.m., May 30, 1994. Preliminary reports have indicated that the catches in both zones were fairly good on opening day and continued to be adequate throughout the first week. In Coastal Study Area I there were two concentrations of vessels fishing on opening day, one in Lake Borgne and another along the upper edge of Chandeleur Sound. The commercial boats fishing Lake Borgne were catching approximately 200 to 1500 pounds of 50/60 count per pound shrimp after culling. Recreational boats were taking from 20 to 100 pounds of shrimp. Most of the boats fishing Chandeleur Sound were commercial double riggers and their catches were similar to those in the Lake Borgne area. Most of these boats landed 500 pounds and up on opening day. The interior of the Biloxi marsh produced 80/100 and smaller shrimp and effort in that area was very low. Overall effort by recreational fishermen was higher than that observed the last few years. Commercial effort was also down slightly.

In Coastal Study Area II, effort was very low. There were very few fishermen observed throughout the area. There were very few commercial vessels in the area, most of the fishing was by recreational fishermen. Generally this area did not produce many shrimp and most of those interviewed were not pleased. This is not unusual for this area since the area to the northeast of the MRGO generally produces most of the shrimp in Zone 1.

By the end of the first week, fishermen throughout Zone 1 were reporting catches approximately one half that of opening day.

In Coastal Study Area VII, located in Zone 3, most of the fishermen were catching 15/20 and 31/35 white shrimp. Effort was very low with a total of 152 boats fishing in the area. On opening day, only one recreational boat was encountered. No skimmers were observed in use on opening day.

Task Forces

The Marine Fisheries Division provided technical support to two industry task forces. The Governor's Task Force on Shrimp Management was established by Governor Edwards' Executive Order No. EWE 92-22. The Shrimp Task Force consists of industry members from across coastal Louisiana and has been reviewing management of shrimp resources in Louisiana. During March 1994 the Task Force sponsored eight public meetings to receive input related to the shrimp industry. Approximately 1,000 questionnaires were completed at these meetings.

The Marine Fisheries Division also provides technical support to the Crab Task Force. The Crab Task Force was set up by the crabbing industry and is made up of members of that industry. The Crab Task Force has been reviewing management of Louisiana's crab resources and has been working on resolving conflicts between crabbers and shrimpers.

MOLLUSC PROGRAM

Oyster Seasons

The 1993-94 oyster season on Louisiana's public oyster seed grounds began on September 8, 1993, except for the Bay Junope Oyster Seed Reservation in Terrebonne Parish which remained closed. The Calcasieu and Sabine Lake public tonging reefs were opened November 1, 1993 and remained open through April 1994. The Bay Gardene Oyster Seed Reservation, Plaquemine Parish, the Sister Lake Oyster Seed Reservation, Terrebonne Parish, and an area in Plaquemine Parish referred to as Bay Crab, were closed February 1, 1994. The season on the remaining public grounds on the east side of the Mississippi River was extended and remained open until May 1, 1994.

Lease Auction

The Department's oyster leasing section accepted 656 applications and 334 new leases were issued during the period ending June 30, 1994. An auction of all delinquent oyster leases was held on March 29, 1993. The auction included oyster leases on which rent was delinquent for 1993.

Disaster Oyster Restoration Program

As a result of Hurricane Andrew (August 1992), the Department received federal funding to restore shellfish habitat. Oyster reef cleansing was completed in the Sister Lake and Bay Junope Oyster Seed Reservations in June 1993. Reef mapping in Sister Lake and Hackberry Bay Seed Reservations has been completed, and the cultch deposition is approximately 1/4 of the way complete.

Oyster Task Force

The Oyster Task Force held three Coastal hearings, initiated by the chairman. The hearings developed suggested legislative changes.

FINFISH PROGRAM

The major objective of the finfish program is to develop and maintain a database of scientific information which can be used to make recommendations for the management of coastal finfish stocks.

Monitoring

A comprehensive monitoring program was developed in 1985 to protect or enhance these valuable resources by providing information regarding the status of fish stocks that occur in the coastal waters of Louisiana at some time during their life cycle. Three gear types are used coastwide to sample various year classes of estuarine dependent fish. A bag seine is used to sample young of the year and provide information on growth and movement. The seine is 50′ in length, 6′ in depth and has a 6′x 6′ bag as an integral part of and midway the length of the net. The mesh size for this seine is 1/4" bar, 1/2" stretched, Delta 44 knotless mesh. A gill net is used to sample juvenile, sub-adult, and adults and provide information on relative abundance, year class strength, movement, and gonadal condition. The gill net is 750′ in length, 10′ in depth, and constructed of monofilament. The net is composed of 5 panels, each of the following mesh sizes: (1) 150′x10′, 1" bar, 2" stretched mesh, 0.4 mm diameter filament; (2) 150′x10′, 1/4" bar, 2 1/2" stretched mesh, 0.52 mm diameter filament; (3) 150′x10′, 1/2" bar, 3" stretched mesh, 0.52 mm diameter filament; (4) 150′x10′, 1 3/4" bar, 3 1/2" stretched mesh, 0.52 mm diameter filament; and (5) 150′x10′, 2" bar, 4" stretched mesh, 0.52 mm diameter filament. A trammel net is used to provide information on relative abundance, standing crop, and movement. The trammel net is 750′ in length, 6′ in depth and constructed of nylon. The net has a 2:1 sag, and the mesh sizes are as follows: inner wall - 1 5/8" bar, 3 5/8" stretched, number 6 twine; outer wall 6" bar, 12" stretched, number 9 twine. Gill net samples are taken semi-monthly from April through September, and monthly from October through March; trammel net samples are taken monthly from October through March, and seine samples are taken monthly from January through August, and semi-monthly from September through December. Hydrological readings (conductivity, salinity, and water temperature) are taken each time a biological sample is taken. Also, estimates of cloud cover, sea state, tide, wind direction, and speed are taken each time a biological sample is taken. Samples are taken at specific locations arranged in such a manner so as to cover the beach, mid-marsh, and upper marsh areas of all major bay systems throughout coastal Louisiana. The catch and hydrological information is summarized for each coastal area on a monthly basis to give the resource managers information as to the current condition of the resource. The pertinent life history information for the important species is also used in developing analytical and predictive models.

Spotted Seatrout

Effective February 20, 1992, the Louisiana Wildlife and Fisheries Commission enacted rules concerning the commercial harvest of sotted seatrout. These rules established a season, to run from 12:01 a.m., September 15 of each year until midnight, April 30 of the following year. The rules also set the commercial quota for spotted seatrout at one million pounds, and stated that the season would be closed if the quota was reached before the established ending date.

The commercial harvest of spotted seatrout in state territorial waters was halted at 12:01 a.m., April 16, 1993. The closure prohibited the commercial harvest, purchase, barter, trade, and sale of spotted seatrout taken from Louisiana waters but did not prohibit dealers from possessing spotted seatrout legally taken prior to the date of the closure if appropriate records were maintained. Commercial mesh sizes for gill nets, trammel nets, and seine nets other than strike nets increased to a minimum of 4 1/2 inches once

the commercial spotted seatrout season was closed. Commercial harvest for the 1992-93 season was 1,049,453 pounds.

Recreational harvest of spotted seatrout in 1993, as measured by the Marine Recreational Fishery Statistics Survey, was near average for the period since the imposition of the present length (12" TL) and creel (25/person) limits in 1987. The harvest was estimated as 5,447,324 fish, with an average weight of about 0.93 pounds. The average size was smaller than any other year since 1987.

Red Drum

Red drum is designated as a recreational fish in Louisiana. Recreational harvest of red drum in 1993, as measured by the Marine Recreational Fishery Statistics Survey, was substantially above average for the period since the imposition of the present length (16" TL) and creel (5/person) limits in 1988. The harvest was estimated as 1,998,313 fish, with an average weight of about 3.57 pounds. The weight was near the mean of years since 1987. The size of the recreational harvest was attributed to the very large 1990 and 1991 year-classes.

Menhaden

In addition to opening and closing the shrimp seasons, information from LDWF trawl samples is used each year to develop a forecast for menhaden production. Meetings are held every year with menhaden industry personnel prior to the opening of the menhaden season to present catch forecasts and to discuss other matters relative to the menhaden industry.

The predictive models for earlier menhaden forecasts were based on 1964-1977 temperature (Guillory et al., 1983) and juvenile menhaden (Guillory and Bejarano, 1980) data. The availability of nine additional years (1979-1987) of commercial harvest data allowed the earlier predictive models to be updated and refined. This model has been used to project catch per unit effort, harvest of age-1 fish, and total harvest by number and weight since the 1989 menhaden season. A major advantage of these new and updated predictive models is that total harvest, not just catch-per-effort, can be estimated. Effort was used in conjunction with juvenile indices, environmental factors, and commercial harvest statistics in multiple regression equations. A forecast was made for an average 1992 year class (age-1's in 1993) and a below average 1991 year class (age-2's in 1993) to enter the fishery in 1993. The projected Louisiana menhaden landings were in the 300,000 - 350,000 MT range. The 1993 menhaden landings for Louisiana were actually approximately 440,000 MT. The low forecast was attributed to the actual fishing effort being 10% higher than estimated for the harvest model.

Black Drum

A fishery management plan for the black drum fishery in Louisiana has been completed, and implementation began in early 1990. Permanent rules, effective September 1, 1990, established a recreational minimum size limit of 16 inches total length with possession of no more than one over 27 inch total length. The recreational daily creel limit and possession limit was set at 5. The commercial fishery is required to operate under two separate annual quotas. A quota of 3.25 million pounds was established for 16 inch to 27 inch fish and a 300,000 fish quota for fish over 27 inches. Commercial fishermen who harvest black drum over 27 inches are required to possess an annual "Special Black Drum Permit" and are also required to report monthly the number of black drum taken during the previous month. The fishing year was established as September 1 to August 31 of each year.

In Fishing Year 92-93 (September 92 - August 93), figures from bull drum permit reports indicate a harvest of about 82,004 drum over 27". At an average of 15 pounds each, this translates to 1,230,060 lbs. of bull drum. No figures for harvest of drum less than 27" are available from this source. Data from landings reports of black drum are not reliably separable by size. Estimates of the numbers of black drum

included in the harvest are subtracted from dealer reports, based on average prices and knowledge of the fishery. These estimates do not precisely coincide with the reports from the bull drum permit reports. Based on these estimates, about 2,091,588 pounds of drum under 27 inches were landed over the fishing year. Preliminary landings data indicate total landings of about 3,138,740 lbs. of black drum for the September 92 - August 93 period.

ARTIFICIAL REEFS

Louisiana's Artificial Reef Program, based within the Department of Wildlife and Fisheries, began in 1987 with the legislature's acceptance of a comprehensive plan for citing artificial reefs in both state and federal waters. The first reef was created in October of 1987 when Oxy Corporation donated the jacket of a large eight-pile structure. The structure, located in South Marsh Island-146, was toppled in place in one of the eight planning areas selected by the Artificial Reef Council. In addition to the structures, the participating companies donate half of their savings realized through participation in the program. These monies are placed into a trust fund for administration of the program and maintenance of the reefs.

Several other oil and gas companies participated in the program. These companies, including CNG, Kerr McGee, Odeco, Chevron, Forest Oil, Kirby Offshore, Exxon, Shell, E.L.F., and AGIP abandoned structures between 1990-1993. The jackets from sixteen structures converted into artificial reefs between July 1993 and June 1994.

Currently the program is conducting side scan, ROV, and hydro-acoustic research as part of it's compliance monitoring program in cooperation with LSU. These efforts are designed to evaluate deterioration rates and effectiveness of the reefs.

The program has completed three inshore artificial reefs from clam shell. Each reef is approximately one acre in size and has two feet of relief.

The Department is currently producing a series recreational fishing maps for the entire coast Louisiana. These maps feature bathymetry, oil, and gas platforms, OCS lease blocks, and local marinas as well as information that would help anglers have safe and productive fishing trips. Currently, three in the series of six are available which include Venice to Fourchon, Fourchon to Point Au Fer, and Lake Pontchartrain to the Chandeleur Islands.

STATE/FEDERAL COOPERATIVE FISHERY STATISTICS

Since 1990, Louisiana has collected commercial monthly landings statistics with the exception of shrimp and menhaden, which are currently collected by the NMFS. Landings are reported by wholesale/retail dealers licensed to purchase fish in Louisiana. Louisiana also participates in the collection of trip interviews (TIP). Port samplers obtain interviews in Plaquemines, St. Bernard, Lafourche, Jefferson, and Terrebonne Parishes. The information provided by landing statistics and trip interviews have been used by the NMFS, the LDWF, the GSMFC, and the GMFMC to evaluate the status of various species currently under intensive management. The continuing goal of the program is to collect commercial fisheries data necessary to better manage those species of concern.

Sport Fish Restoration Program

In 1993-94, Louisiana used the marine share of its Sport Fish Restoration Funds in two activities; development of boat ramps to create access for fishermen and finfish research (described under the Research Subprogram).

HABITAT PROGRAM

Louisiana Offshore Oil Port (LOOP) Environmental Monitoring

The LDWF's monthly environmental monitoring of LOOP facilities and operations continued into the fifteenth year. Demersal nekton, zooplankton, sediment, benthos, water chemistry, and hydrographic parameters were sampled along a transect from the Gulf Intracoastal Waterway to the marine terminal located 18 miles offshore from Grand Isle. Incidents of controlled discharges of supersaturated brine solutions and of oil spills were also monitored. The Department participated in planning activities for oil spill response. The preparation of a long-term trends analysis technical report continues.

Department of Energy (DOE)

Field sampling, data analysis, and reporting for the brine discharge aspect of the project have been completed. Once discharges have ceased for a continuous period of 12 months a recovery sampling program will be initiated.

Southeast Area Monitoring and Assessment Program (SEAMAP)

Louisiana's participation in this NMFS-funded cooperative program continued in its twelfth year with seasonal sampling of shrimp/groundfish, zooplankton, and associated environmental parameters. The study area covers the Territorial Sea and nearshore EEZ from the Mississippi River to Atchafalaya Bay. Summer and fall cruises coincide with the NMFS annual resource survey shrimp/groundfish samples.

During the 1994 summer shrimp/groundfish survey, LDWF personnel collected water samples to aid in the investigation of fish kills along the Louisiana and Texas coasts. The purpose of the sampling was to identify and quantify the presence of dinoflagellates that were a suspected cause of the kills. Because the suspected causal organism was associated with low salinity waters, Department personnel also were sampling in coastal bays and over shellfish beds at the same time.

Caernarvon Biological Monitoring

The U.S. Army Corps of Engineers, with support from the Louisiana Department of Natural Resources and the LDWF, has developed a project for the controlled diversion of freshwater from the Mississippi River into the Breton Sound Estuary. The diversion structure is located in the mainline Mississippi River levee at Caernarvon, Louisiana, and has a design flow capacity of 8,000 cubic feet per second. The effect of the diversion on the estuary's ability to support wildlife and fisheries resources is expected to be significant. Diversion of nutrient and sediment-rich freshwater will rejuvenate existing marsh, significantly reduce dependence on local rainfall as the principle source of freshwater input to the estuary, reduce peak salinities, and induce more regularity in the seasonal salinity pattern. Project benefits involve reducing land loss rate and increasing fish and wildlife production.

The LDWF conducts extensive monitoring activities in the Breton Sound Estuary. It has undertaken a biological monitoring program to accurately measure the success of the diversion project. In 1991, the LDWF began the first year of the four-year, post-diversion on oyster, crab, shrimp, finfish, waterfowl, wildlife, and vegetation. These studies are designed to gather both fishery dependent and fishery independent data.

For the first time, the Caernarvon Freshwater Diversion Structure was in operation for an entire year in 1992. During this year a minimum flow rate of 500 cubic feet per second was adopted by the Caernarvon Interagency Advisory Committee in order to achieve maximum benefits to the upper marsh. The structure was open for a total of 255 days, during which time approximately 169 billion gallons of

water were diverted into the basin. The average discharge rate for the year was 714 cfs, with a maximum peak flow of 5,777 cfs.

In 1993, the Caernarvon Interagency Advisory Committee modified the operations schedule for the Caernarvon Freshwater Diversion Structure. The new operations schedule called for the structure to be operated at maximum flow during December through February and maintain a minimum flow of 700 cubic feet per second during the remainder of the year.

Bonnet Carré Controlled Freshwater Diversion Project

During 1994, the Department of Wildlife and Fisheries continued to negotiate the project cooperation agreement with the U.S. Army Corps of Engineers and the state of Mississippi.

In response to additional concerns from groups in Louisiana, the states of Louisiana and Mississippi, the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, The Coalition to Restore Coastal Louisiana, and the Lake Pontchartrain Basin Foundation began a reanalysis of various aspects of the project. This reanalysis has as its goal:

1. Investigate the feasibility of overflowing all or part of the diversion through wetlands.
2. Initiate development of operational guidelines for the project to ensure the ecological protection of the upper Pontchartrain Basin.
3. Investigate projected effects of 1) and 2) on the capacity of the completed project to control salinities in the target area of Mississippi Sound.

The reanalysis study is expected to be completed in 1994.

Coastal Wetlands Restoration

In 1990 Congress passed the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). Commonly referred to as the Breaux-Johnston Act, CWPPRA provides funds for coastal restoration projects in Louisiana. Additionally CWPPRA established a state-federal task force whose purpose is the conservation and restoration of vegetated wetlands.

The CWPPRA Task Force is required to develop an annual priority list of projects and prepare a comprehensive plan for the restoration of the Louisiana coast. The CWPPRA comprehensive plan was submitted to Congress in December of 1993. In 1994, the CWPPRA Task Force began work on two major feasibility studies for coastal restoration in Louisiana. The Mississippi River Comprehensive Diversion Study will investigate the feasibility of rerouting the Mississippi River through a series of major river diversions and the Barrier Island Feasibility Study will investigate the benefits of restoring the state's chain of barrier islands.

The Marine Fisheries Division is interfacing with the members of the CWPPRA Task Force and evaluating this year's list of priority projects being considered under CWPPRA as well as the two major feasibility studies.

In addition to the CWPPRA comprehensive plan, the state is in the final stages of developing a 50+ year plan for coastal restoration. The Marine Fisheries Division has been actively participating in the development of the state's plan.

RESEARCH PROGRAM

The research program of the Marine Fisheries Division is primarily conducted at the Lyle S. St. Amant Marine Laboratory on Grand Terre Island. The primary mission of the program is to

conduct the research needed to manage Louisiana's marine fisheries. However, there has always been interest by other sections of the Department, and by non-Department groups, in use of the lab facilities for research and educational purposes. There are very few facilities along the Louisiana coast which can support the needs of those interested in coastal research or marine educational activities. Therefore, the Department assists those persons doing marine research or marine education. Part of our mission is to support and provide a base of operations for research or educational groups wishing to work in the area. We actively invite all who could benefit to consider making use of the lab facilities. We do require, however, that such cooperators either reimburse the Department for operational expenses or contribute in-kind equipment, repairs, or supplies in return for their use of our facility.

The artificial ponds continue to be important tools for research. We have signed a cooperative agreement with the Soil Conservation Service allowing them to use some of the ponds in their work of growing cordgrass which will be transplanted to marsh restoration sites. Three Louisiana State University professors have indicated an interest in using the remaining ponds for research projects. Several LSU research groups have used the lab as a base of operations for studies in Barataria Bay. We have also hosted field trips by university ecology classes and by secondary school groups. The facility has also proven to be of use by other units within the Department.

Two marine finfish research projects are currently under way at the lab:

1. Mortality of hooked and released red drum and spotted seatrout.
2. Creation of an age and growth lab to gather information needed for age structured stock assessments.

An organized, comprehensive project for obtaining age and fecundity data on spotted seatrout and red drum will enhance the Department's ability to manage those species. Sufficient data will be obtained to investigate the need and feasibility of areal management strategies. This data will increase our confidence in the results of the stock assessments.

Coastwide finfish sampling crews and lab personnel are obtaining measurements and otoliths from spotted seatrout and red drum. Specimens are obtained from the Marine Finfish Monitoring Program's fishery independent samples and from the commercial and recreational fisheries. Otoliths are extracted and transported to the lab where they are sectioned; age of the fish will be determined from examining growth rings on the otoliths.

Louisiana State University's Coastal Fisheries Institute, which has operated an age and growth lab since 1985, has provided training for project personnel and will provide verification and consultation services to ensure that correct procedures are being used, and will investigate new aging technologies and transfer those technologies to the project.

The project will provide age, growth, and fecundity data to the Department for incorporation in to future spotted seatrout and red drum stock assessments.

An extensive hook-and-release mortality study has been ongoing at the Marine Laboratory since the spring of 1993. This is the first such study on the survival of hooked-and-released red drum and spotted seatrout to be conducted in Louisiana. Conditions similar to typical sportfishing capture, handling, and release of specks and reds are employed, except that fish are held to assess survival rate. Fish are taken with each of four techniques, single hook artificial (i.e., sparkle beetle), treble hook artificial (i.e., spoon), single hook with bait, and treble hook with bait so that mortality from each technique can be evaluated separately.

TEXAS PARKS AND WILDLIFE DEPARTMENT

Texas Parks and Wildlife Coastal Fisheries Research Management Programs

The Coastal Fisheries Branch of the Texas Parks and Wildlife Department (TPWD) is responsible for making management recommendations regarding the state's saltwater fishery resources within the bays and estuaries and out to 9 nautical miles in the Gulf of Mexico. Texas has 4 million acres of saltwater utilized by about 20,000 commercial and over 1,000,000 recreational fishermen with an estimated economic impact of $1.9 billion annually.

The goal of the Coastal Fisheries program is to develop management plans for selected fisheries within the concept of optimum yield. These plans include recommended harvest regulations, resource stock enhancements or habitat enhancements based on monitoring program data and the best scientific information available. The objectives of the Coastal Fisheries Branch are: 1) to recommend management strategies for the aquatic marine resources to the Division Director, the Executive Director, the Parks and Wildlife Commission, and the legislature based on the results of the scientific studies; 2) to determine the sizes and changes in the sizes of finfish and shellfish populations caused by environmental conditions and fishing; 3) to determine the landings of marine species and the associated social and economic characteristics of the fisheries; 4) to restore, manage, and enhance existing fishery populations through stock identification, life history, genetic, and reproductive physiology research; establishing appropriate stocking ratios for selected marine organisms in Texas bays; and assessing impacts of stocking on present populations and existing fisheries; and 5) to promote, develop, maintain, monitor, and enhance the artificial reef potential in the marine waters off Texas.

To achieve these objectives, the Branch is organized into four major functions: Administration, Ecosystem Monitoring, Science, and Enhancement. In FY93, a total of 20 technical reports, scientific journal articles, and magazine articles about various aspects of the Texas coastal fishery resources were completed to aid in meeting the objectives.

Effective management of finfish and shellfish resources must be based on a thorough knowledge of the population dynamics and stability of the resources. Long-term trend data based on routine monitoring are necessary to assess changes in abundance and stability. Landings information from both sport and commercial fishermen is necessary to assess the impacts of user groups on the fisheries and to determine the economic importance of the fisheries of the state.

Monitoring of the relative abundance of adult finfishes in Texas waters is accomplished using 600′ long gill nets with individual 150′ sections of 3", 4", 5", and 6" stretched mesh. Bag seines (60′ long) and 20′ trawls are used to determine the abundance of juvenile finfish as well as shrimp, blue crabs, and associated organisms. Oyster dredges (19.5" wide) are used to collect oyster samples. Beach seines (200′ long) and standard 60′ foot long bag seines are used to sample the Gulf surf zone.

Sport landings and fishermen activities are estimated from on-site creel interviews of sport boat fishermen at the completion of their trip. Samples are selected in proportion to the activity at a site (probability sampling) thus the higher use sites are sampled more frequently. Roving trailer and wet slip counts are used to assess relative pressure at sampling sites to ensure that proper sampling probabilities are maintained. The charter fishery is randomly sampled on a continual basis within each of the bay systems of the coast by intercepting boats when trips are completed (party boats). Commercial landings are obtained from commercial seafood dealers through submission of Monthly Marine Products Reports.

The Perry R. Bass Marine Fisheries Research Station at Palacios provides information and techniques necessary for the improvement of Texas fisheries management plans. Effort is directed toward

methods for improving fisheries management techniques and spawning, and rearing marine fish. Coastal Fisheries personnel cooperate with other coastal states in marine fisheries enhancement efforts through the transmittal of information and supply of available fishes.

FY93 ACTIVITIES

The Branch participated in the development, review, and revision of Gulf of Mexico Fishery Management Council and Gulf States Marine Fisheries Commission fishery management plans. Personnel participated in workshops and advisory meetings as state representatives on the Council and Commission as well as on other management authorities.

Recommended changes in regulations were adopted by the Parks and Wildlife Commission to ensure stability of the resource. The king mackerel minimum size limit was increased from 14" to 23" total length. Crab trap design modifications were approved so that traps contain at least two escape vents (minimum 2 3/8" inside diameter) in each crab-retaining chamber and located on the lower edge of the outside trap walls. This will allow for the escapement of undersize crabs.

A total of 1,014 survey-days was spent to estimate landings and pressure of private and party boat fishermen. There were 760 gill net samples; 2,929 bag seine samples; 252 beach seine samples; 3,288 bay and Gulf trawl samples; and 1,080 oyster dredge samples collected. A total of 7,896 fishes was tagged and released. About 8% were returned for rewards. The percent of tags returned was consistent with prior years.

Bycatch characterization studies for the commercial bay shrimp fishery were conducted during May-July and August-December in Aransas Bay, Corpus Christi Bay, and lower Laguna Madre. Information will be used to assess impacts of shrimping on bay marine fish and shellfish populations.

A sport-boat bycatch characterization study was initiated in all bay systems in conjunction with the ongoing harvest monitoring program. Information obtained will be used to estimate the magnitude of bycatch and the species comprising the bycatch.

Gulf of Mexico waters from Alabama to the Rio Grande were sampled to a depth of 300 feet during November 1992 and June-July 1993 with other Gulf States and the NMFS. This effort, entitled the Southeast Area Monitoring and Assessment Program (SEAMAP), was coordinated by the GSMFC. Results of sampling were used to evaluate the closure of Gulf waters to shrimping and determine relative abundance of associated organisms.

Preliminary electrophoretic analyses of black drum and southern flounder were conducted. MtDNA work on southern flounder continued. Initial stockings of gene-marked and chemically-marked red drum were accomplished and baseline samples from the stocked bay were acquired. Samples of shark species from the Atlantic Ocean and the Gulf of Mexico were collected and analyzed using isoelectric focusing. Life history studies of red drum, black drum, spotted seatrout, and red snapper continued and similar studies were begun on southern flounder.

Routine collection, editing, summarization, and publication of self-report commercial landings data continued through a formal cooperative statistics agreement with the NMFS. The TPWD collected commercial landings statistics on crabs, oysters, and finfish, while the NMFS continued to gather landings statistics on shrimp.

Effort directed toward spawning and rearing marine fish was continued. Controlled photoperiod and temperature regime to induce sexual maturity and spawning resulted in about 20 million red drum fingerlings, 214 million red drum fry, 2 million spotted seatrout fingerlings, and 32 million spotted

seatrout fry being stocked into marine water. Technical information concerning fish hatchery development was provided to other coastal states in a cooperative effort to enhance coastal marine fisheries.

Texas placed as artificial reefs in the Gulf of Mexico, 7 donated rig jackets and welded pipe from petroleum companies, and 500 2-ton concrete blocks from a local power company. Included in these donations were over $1.0 million to the Texas Artificial Reef Fund. These monies were used to operate the program, maintain the sites, conduct artificial reef research, and cover liability.

A persistent algal (brown tide) continues to bloom in the upper Laguna Madre area. This algal bloom began in 1990 and continues unabated. The extensive seagrass beds are at risk because of reduced light penetration. Larval fishes are negatively impacted by the brown tide, whereas larger individuals are not. Research continues on the affects of this record setting bloom.

NATIONAL MARINE FISHERIES SERVICE SOUTHEAST REGION

NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

The National Marine Fisheries Service (NMFS) is an agency of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). The mission of the NMFS is stewardship of the Nation's living marine resources. Through conservation and wise use, these resources and their habitats can be managed to benefit the Nation without jeopardizing future options.

The NMFS administers programs to promote the conservation, management and development of living marine resources for commercial and recreational use. The program includes services and products to support the administration of fisheries management operations; international fisheries affairs, fishery development and industry assistance activities; protected species and habitat conservation operations; law enforcement activities for marine mammals, endangered species and regulated fisheries; and scientific and technical aspects of marine fisheries research programs.

NMFS is comprised of five regional offices and five centers located along the United States coast. The Southeast Region covers the coastal states from Texas to North Carolina (including Louisiana, Mississippi, Alabama, Florida, Georgia, and South Carolina); Puerto Rico and the U.S. Virgin Islands; and the inland states of Arkansas, Iowa, Kansas, Kentucky, Missouri, Nebraska, New Mexico, Oklahoma, and Tennessee.

The Southeast Regional Office is located in St. Petersburg, Florida. The Regional Director serves as the regional representative of the Assistant Administrator with state conservation agencies, recreational interests, commercial industries, consumers, environmentalists and the general public. The Region is responsible for planning, organizing, and implementing fishery management and conservation programs including regulatory requirements, fishery management plans, recreational fisheries, international fisheries, and services throughout the range of NMFS programs. It provides administrative and technical support to Regional Fishery Management Councils and is responsible for program planning and evaluation, budgeting, and administrative support services. These support services are also provided to other NOAA and NMFS elements collocated with the Regional Office.

The Southeast Fisheries Science Center is located in Miami, Florida, with laboratories located in Miami and Panama City, Florida; Pascagoula and Stennis Space Center, Mississippi; Beaufort, North Carolina; Charleston, South Carolina; and Galveston, Texas. The Center conducts multidisciplinary research programs to provide management information to support national and regional programs of NMFS, and to respond to the needs of Regional Fishery Management Councils and other user groups. The Center develops the scientific basis required for status of stocks and status of fisheries reports, environmental assessment and environmental impact statements for management plans and/or international negotiations; and pursues research to answer specific needs in the subject areas of habitat conservation, aquaculture, fishery engineering, marine mammals, endangered species, fishery oceanography, food sciences, and fishery economics.

Southeast Region's Report of significant FY 93 fishery actions follows:

FISHERY RESOURCE CONSERVATION AND MANAGEMENT

Managed king mackerel under the Coastal Pelagics FMP by emergency action to suballocate commercial quota equally between Florida's east and west coast fisheries, and reopened the east coast fishery to provide a supplemental catch.

Managed red snapper under the reef fish FMP by establishing 2000/200 pound limits based on historical landings.

Prepared and assisted in the preparation of the required documents to approve the Fishery Management Plan for Sharks of the Atlantic Ocean including the Gulf of Mexico.

Completed revisions to the permitting process whereby (1) permits expire at the end of the birth month of the vessel owner or dealer; (2) applications and permits are combined for all fisheries; and (3) application and permit processing are done on a computer network, rather than on single computers, thus increasing efficiency, accuracy and versatility.

PROTECTED SPECIES MANAGEMENT

Published and implemented comprehensive TED regulations.

Initiated major efforts to conduct workshops and to work cooperatively with the inshore/nearshore shrimp industry, state fishery management agencies, and Sea Grant on TED technology transfer. These efforts greatly enhanced the acceptance of TEDs by the inshore/nearshore fishing fleet, which has been mandated to use them by the new TED regulations.

Conducted TED training for foreign nations to assist them in their compliance with P.L. 101-162 Sec 609, the sea turtle conservation bill. Comprehensive training was provided to Mexico (3 trips), El Salvador, Colombia, Venezuela, and Nicaragua. In addition, a gear specialist from Trinidad and Tobago was trained in the U.S. TED use in Honduras and Guyana was verified for the State Department. TED enforcement training for Belize is scheduled.

Developed a proposal which resulted in $400,000 in funding from the State Department to conduct foreign TED technology transfer. Additional foreign TED training for Mexico, Colombia, Venezuela, and Trinidad and Tobago was funded by A.I.D. or the individual country, thereby conserving agency dollars for other purposes.

HABITAT PROTECTION

Reviewed more than 3,000 individual actions - all within established time limits. These included requests for federal permits or licenses, federal water development projects, and review of NEPA documents. The NMFS recommended the conservation or creation of thousands of acres of wetlands proposed for alteration.

Elevated the first project nationally under the new Clean Water Act Memorandum of Agreement with the Corps of Engineers (the 3,500-acre Point Au Fer Project, LA). This issue was successfully resolved in NMFS's favor and was the first such action approved and cleared by NOAA's new management team.

Worked on numerous interagency agreements during fiscal year. The Federal Highway Administration, Minerals Management Service, COE and other state and federal agencies were involved. Various agreements involving interagency cooperation, mitigation and mitigation banking are in place. A generic area-wide local operating agreement, required in the Clean Water Act Memorandum of Agreement with the COE, is close to final. The Fish and Wildlife Service and the Environmental Protection Agency also are participating in the development of this agreement.

Assisted the NMFS Restoration Center and/or NOAA in issues related to: Coastal America, the NOAA/COE Memorandum of Agreement to Restore Fish Habitats (MOA), Coastal Wetlands Planning Protection and Restoration Act (CWPPRA), the Greenhill petroleum spill, the St. Helena National Priority List site, French Limited Superfund Site, Lavaca Bay mercury issue, PPG Industries, Winyah Bay dioxin problem, the City of Charleston contamination issue.

Received approval under CWPPRA for 5 projects sponsored by NMFS. About $7 million will be allocated by CWPPRA to restore about 8,000 acres of fishery habitat. The NMFS has seven more projects under consideration for this year's priority list.

INDUSTRY SUPPORT SERVICES

Conducted 11 workshops for U.S. shrimpers on use of TEDs and regulatory requirements. These focused on new requirements for inshore waters. Three workshops were presented in each North Carolina, Louisiana, and Texas, and one each in Mississippi and Alabama.

Answered approximately 200 requests from the public, media, fishermen, and environmentalists for information on protected species. Notable of these is a feature story on TEDs in National Geographic magazine.

Used the habitat program's National Marine Fisheries Service Guidelines For Proposed Wetland Alteration in the Southeastern United States as the foundation for a public service video produced by Headquarters in cooperation with Georgetown University.

Supported Headquarters' position paper with written input on benefits to be received from NAFTA (North American Free Trade Agreement).

TEAMWORK AND COOPERATION

Administered nine Federal grant and cooperative agreement programs that resulted in the award of over 100 grants and cooperative agreements that obligated about $15 million in Federal grant funds.

Worked with Headquarters Fisheries Habitat Protection (F/HP) and the Southeast Fisheries Research Center (SEC) to develop a study, in cooperation with the Fish and Wildlife Service, to more definitively determine the effects of marsh management on fishery resources in Louisiana. This study will be a major program element for the Lafayette Laboratory (yet to be built).

Coordinated issues involving Florida Bay between F/HP, SEC, and Southeast Regional Office (SEO).

Established ties with NOS, CS/EC, DARP, Strategic Assessment Branch, NOAA GC, NOAA Sanctuaries, OCRM, NOAA Congressional Affairs. Coordinated on an ad hoc basis with other NOAA elements. The habitat program is frequently targeted for handling actions on behalf of NOAA because it has the only real field structure and local expertise on issues that involve NOAA.

Worked cooperatively with the newly formed F/HP to develop program goals for the new office. F/HP was also assisted in the review of environmental legislation, guidelines, and policy documents; in the preparation of an annual report; on issues related to the Federal Energy Regulatory Commission; and in deliberations relative to a permit tracking system.

Implemented significant restructuring of the habitat program without addition of new personnel or base funds. Offices were opened in Charleston, SC; Miami, FL; and St. Petersburg, FL. These new offices will allow the habitat program to implement the new interagency agreements for habitat and to comply with Headquarters guidance related to preapplication planning. The expanded structure will also allow the SEO to readily implement Administration environmental policies as well as work more efficiently on major issues such as the Florida Bay problems.

Processed 104,000 pieces of mail in 20 months at a cost of $100.0K. This is the highest volume and dollar amount in NOAA, excluding the Administrative Support Centers and headquarters. The use of postage stamps has been implemented in the field offices of NMFS.

Completed the automation of the SF-424, Application for Federal Assistance, and provided complete documentation for the program. The project was funded by a Pioneer Fund grant. The program was presented to NOAA Grants Office and received an excellent evaluation by this group. The final report will be made available to all applicants.

Implemented procedures whereby trap/pot fishermen pay directly to the contractor for trap/pot tags, thereby saving $24,192 of budgeted funds.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

NMFS STATUS REPORT ON RULES IMPLEMENTING FMPs

In FY1993, the western zone commercial king mackerel fishery was closed. Amendment 6 to the FMP was implemented. The commercial trip limit for Atlantic group Spanish mackerel was reduced for the duration of the season. Emergency rule reopened the commercial fishery for Gulf group king mackerel under quota and vessel trip limit off Florida's east coast, and the fishery was subsequently closed on March 27, 1993. A control date for entry into the commercial king and Spanish mackerel fisheries was published; and TAC, bag limits, and commercial quotas for king and Spanish mackerel were implemented for the 1993-1994 season. A proposed emergency rule for allocating Eastern Zone Gulf group king mackerel between northern and southwestern areas was published for comment.

In FY1993, the proposed rule implementing red snapper TAC was published. Notice of intent to prepare an EIS and hold scoping meetings on a limited access system for red snapper was published. The emergency rule was implemented to revise the opening date or the commercial red snapper fishery. The emergency rule was implemented to establish commercial trip limits for red snapper for 1993. The emergency rule for red snapper endorsement and trip limits was extended, and the final rule establishing TAC, commercial quota, and bag limits for red snapper was implemented. The proposed rule for Reef Fish Amendment 6 was published for comment and implemented. Notice of availability of Reef Fish Amendment 5 was published.

In FY1993, the NMFS Shark FMP was implemented and the commercial fishery for large coastal sharks closed. Semiannual commercial quota for large coastal sharks was taken in 31 days, and the fishery closed.

In FY1993, the proposed rule for Shrimp Amendment 6 was published and the amendment (partially disapproved) was implemented.

In FY1993, the regulatory amendment to the Spiny Lobster FMP was implemented, establishing a limited access system for that fishery and revising other rules. The proposed rule revising recreational special season for spiny lobster was published for comment, and the final rule revising recreational special season for spiny lobster was published.

In FY1993, the notice of intent to prepare an EIS on bluefin tuna and scoping meetings was announced. The harpoon fishery was closed, and the reporting rules for bluefin tuna were implemented and quotas changed. Notice of granting an affirmative finding on yellowfin tuna import regulations was published.

Scoping meetings to obtain public comments on regulation of shark, swordfish, and the bluefin tuna fisheries were held.

The technical rule clarifying commercial closures in the coral, shrimp, and mackerel fisheries was implemented.

COUNCIL ACTION OF FMPs

Billfish FMP*

No action.

Butterfish FMP

A stock assessment for the butterfish fishery was prepared by the NMFS for review by the Council. The assessment was submitted to the SSC for peer review and to the AP for advice on development of a FMP. The Council staff is proceeding with development of a FMP for the fishery.

Coral FMP

Florida rules on harvest of "live rock" were subjected to litigation, and the Council requested to manage harvest of those organisms. Council staff prepared an options paper for an amendment to regulate live rock. SAFMC held a scoping meeting on the live rock issue and acted on the options paper provisions. Council staff prepared draft Amendment 2 to regulate live rock. The Council and SAFMC reviewed the amendment and selected preferred alternatives.

Mackerel

In 1993, the western zone commercial king mackerel fishery was closed and subsequently the eastern zone commercial king mackerel fishery was closed before any fish migrated north of the Monroe County, Florida, on the Florida east coast. Fishermen residing north of Monroe County petitioned the Council to reopen the fishery on an emergency basis. The Council recommended, and the Secretary approved an emergency rule to allow harvest under a 259,000-pound quota and vessel trip limit of 30 fish.

A scoping meeting was held by the Mackerel Management Committee with fishermen on the east coast of Florida to consider alternatives for vessel trip limits for implementation by regulatory or plan amendment. The Council requested the NMFS implement by emergency rule areal commercial allocations for Gulf group king mackerel and vessel trip limits for northern and southern areas of the east commercial zone. The NMFS subsequently rule the trip limits could not be implemented by emergency rule but proceeded with implementation of the areal allocations. The Mackerel Management Committee held a workshop (scoping meeting) with the industry to seek long-term solutions for areal trip limits. Staff drafted an options paper for an amendment to address trip limits which was submitted to SAFMC for action.

Staff prepared Draft Amendment 7 which proposes commercial trip limits for Gulf group king mackerel in Northern and Southwestern areas of the Eastern Allocation Zone. The draft amendment was reviewed and revised by the Council and SAFMC. Staff was instructed to modify the framework measure to provide for implementing TAC by Notice Action.

Red Drum FMP

In 1993, the SEFC completed the stock assessment for red drum. The Stock Assessment Panel (SAP) reviewed the assessment and recommended that ABC for set at zero. The assessment and SAP report did indicate the escapement level (30 percent) of juveniles to the spawning stock had been achieved (42 percent) and the stock should be fully restored by 1997. The SAP also developed a research protocol to assess the size and age composition of the spawning population that is necessary to complete the assessment of this population. The SSC and Red Drum AP reviewed the assessment information, SAP report, and research protocol and provided their recommendations to Council. The Council reviewed the reports and recommendations and requested the GSMFC develop a research plan and funding initiative for red drum.

Reef Fish FMP

In 1993, the Council's Appeals Board completed review of vessel harvest records for all persons appealing a decision by the NMFS on which vessels qualified for 2,000-pound limits of red snapper in 1993. The commercial red snapper fishery was opened on February 16.

Based on positions taken at workshops held with the industry, staff prepared an options paper including alternatives for several types of limited access systems for red snapper and other types of management alternatives. The Reef Fish Management Committee was convened for two days to review and tentatively select options. The Council reviewed the options paper and committee recommendations in January and a preliminary draft amendment (Amendment 7) in March, selecting as their preferred alternative an ITQ system for the fishery. Public hearings were scheduled in June.

Amendment 6 was approved by the Council and submitted to the NMFS for implementation. The SEIS for Amendment 5 was completed and the amendment submitted to the NMFS for implementation and the SEIS for filing with EPA. The Law Enforcement Advisory Panel was convened to provide recommendations on the enforceability of alternatives proposed in the preliminary draft Amendment 7.

The Council completed and approved for public hearing draft Amendment 7, which addressed primarily short-term and long-term (limited access) alternatives for regulating the commercial red snapper fishery. Copies were provided to all vessel operators/owners holding reef fish endorsements (131) and all reef fish vessel permitees (2,200) were notified of the availability of the draft amendment. The draft amendment was reviewed by the SSC, Reef Fish AP, and Law Enforcement AP, and their recommendations provided to the Council. Twelve public hearings were held on the amendment and public comments summarized for the Council. An Ad Hoc AP consisting of red snapper fishermen reviewed Amendment 7.

Amendment 6, extending the red snapper vessel endorsement and trip limits through 1994 was implemented. The Regional Director of the NMFS requested the Council withdraw Amendment 5 to provide additional impact analyses, and the Council concurred. The draft SEIS for the reef fish fishery and Amendment 5 was distributed to agencies, associations, and public for review.

The Council reviewed the public hearing comments and recommendations of the Reef Fish AP, Ad Hoc Red Snapper AP, Law Enforcement AP, and Scientific and Statistical Committee (SSC) on the public hearing draft of Amendment 7 which primarily addressed limited access for the commercial red snapper fishery. Council instructed staff to revise the portion of the amendment addressing limited access for further public review at workshops as Draft Amendment 8. Other elements addressing enhanced enforcement and permit/endorsement transfer were included as Amendment 7 and submitted to the NMFS for implementation. Following agency and public comment, the SEIS for Amendment 5 was revised and Amendment 5/SEIS submitted to the NMFS for implementation.

The Reef Fish Quota Review Panel was convened in August to assess and project grouper landings data for 1993. The Reef Fish Stock Assessment Panel (SAP) reviewed stock assessments for red grouper, red snapper, and vermilion snapper, as well as stock information on amberjack, gag grouper, red porgy, and triggerfish. The Reef Fish SAP prepared a report and set ABC ranges for shallow-water grouper and red snapper. The Socioeconomic Panel (SEP) reviewed the Reef Fish SAP report and drafted a report recommending TAC levels and size limits. The Reef Fish AP and SSC reviewed these reports and stock assessment and commercial quotas for shallow-water grouper and red snapper and submitted these via regulatory amendment to the NMFS for implementation.

Council staff submitted a regulatory amendment to the NMFS for implementation that would modify the boundary of the longline/buoy restricted area off Florida. The Council deferred a decision

on whether to withdraw this amendment until November, pending presentation of updated information on 1993 shallow-water grouper landings and to allow additional public comment on the issue.

Shark FMP*

In 1993, the Final Secretarial Shark FMP was implemented and the commercial fishery for large coastal sharks closed until July 1, 1993. The semiannual commercial quota for large coastal sharks was taken in 31 days and the fishery closed. Council representatives participated in the Shark Operations Team (OT) meeting to address management issues. The NMFS held scoping meetings on the management issues.

Shrimp FMP

In 1993, the Shrimp AP and SSC reviewed the NMFS' assessments on the effectiveness of the cooperative Texas shrimp closure. The Council heard public testimony on this issue and extended the cooperative closure to 200 miles for the 1993-1994 season. Amendment 6 was implemented, permanently modifying areas and periods that are open to shrimping in the Tortugas Sanctuary. The Shrimp Stock Assessment Panel, along with state shrimp biologists, was convened and reassessed the definitions of overfishing for stocks of brown, pink, and white shrimp. A scientific/industry tack group was convened to examine current data collection systems and the need for vessel logbooks. The Council reviewed the Shrimp Stock Assessment Report on overfishing definitions for brown, white, and pink shrimp and adopted their recommendations. The new definition for overfishing of white shrimp will be submitted to the NMFS in the next amendment. They also reviewed and accepted the recommendations of the task group on vessel logbooks. The Council reviewed the Tortugas Sanctuary report and annual reports assessing overfishing of each major stock prepared by the NMFS. The Shrimp Management Committee and Council reviewed summaries of the progress on the cooperative shrimp trawl bycatch research program presented by the NMFS and other participants in the program. The Council concluded that insufficient progress had been made to begin developing an amendment addressing shrimp trawl bycatch and deferred that action until 1994. The Council discussed the shrimp vessel effort collection system and deferred the issue for further discussion in November when additional data and analyses would be available.

Spiny Lobster FMP

Proposed rules for a regulatory amendment to extend the effort reduction system adopted by the Florida Legislature to the EEZ was published for public comment. The Council considered a request by the Regional Director that the FMP be withdrawn. Action on this issue was deferred pending a court decision in Southeast Fishery Association versus the state of Florida.

Information, public hearing and workshop records, and economic analysis submitted by the Florida Marine Fisheries Commission in support of changing the period and bag limits for the special recreational season was provided to the Spiny Lobster AP and the SSC for review. The Gulf and South Atlantic Councils submitted a regulatory amendment to the NMFS to implement the proposed changes. The proposed rule for the regulatory amendment changing recreational special season dates and bag limits was published for public comment. The final rule for the regulatory amendment changing recreational special season dates and bag limits was published.

Stone Crab FMP

No action.

Swordfish FMP*

In 1993, TAC for the fishery for 1993-1994 was set by the NMFS rule. The NMFS held scoping meetings to discuss management issues with the public.

Tuna FMP*

In 1993, the NMFS held scoping meetings to discuss management issues with the public.

Generic Amendment

The Council and committee took final action on a draft amendment to standardize the permitting and data collection provisions of the seven FMPs administered by the Council. This document was submitted to the South Atlantic Council for action.

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*FMPs under the regulatory authority of the NMFS. The Council has a consultation role in the development of FMPs, amendments and rules, and may convene SSC, AP, or committees for advice.

OTHER ACTIONS

Habitat Protection

In 1993, a detailed COE plan of study on open water disposal conducted in Mississippi Sound was given to Council members.

Support agencies and projects that would reestablish sheet flow fresh water through the Everglades to Florida Bay.

Oppose open-water spoil disposal from maintenance dredging projects in Laguna Madre. The NMFS Regional Director was asked to notify the Council of all proposed activities that would potentially decrease available light to the seagrass ecosystem.

Staff investigate the proposed permit for Formosa Plastics Corporation to discharge waste water into Lavaca Bay, Texas, and report findings to the Council's Habitat Protection Committee. Detailed project information was forwarded to Council members, and they will comment on the project at the appropriate time.

The Habitat Protection Committee will be briefed on anticipated 1993 legislation potentially impacting marine fisheries. The briefing will be presented to the habitat protection subpanels during their joint meeting in August. Following this meeting their action(s) will be reported to the Habitat Protection Committee.

A meeting of the three Habitat APs was scheduled to address habitat issues including the problem in Florida Bay. A meeting of the three Habitat APs was held to address habitat issues. The Council reviewed these recommendations and took the following actions:

> When requested to comment by the House Merchant Marine and Fisheries Subcommittee for Oceanography, the Gulf of Mexico and Outer Continental Shelf notified them that the Council supports strengthening the Gulf of Mexico EPA Program that includes the following:

a. Statutorily recognizes a Gulf of Mexico Program with dedicated funding to ensure that actions can in fact be implemented;

b. A partnership approach including all state and federal agencies, local government, citizen groups, and scientific input;

c. A mechanism to set Gulf-wide goals aimed at highest priority problems;

d. Authority to implement actions that address goals and objectives;

e. Includes a program on an international level to include Mexico, Cuba, and other Caribbean areas. The Council requests the opportunity to review related bills.

Urge the NMFS and USFWS to allocate additional funding to conduct coordinated fisheries studies complementing marsh management research being conducted by the USFWS's National Wetlands Research Center in Lafayette, Louisiana, and specifically address:

a. Potential effects on marine fisheries productivity, and

b. The design of water control structures that allow adequate ingress and egress of marine organisms while facilitating other multi-purpose marsh management objectives.

Staff coordinate with the NMFS, FWS, FDEP, and Park Service to develop a report regarding Florida Bay problems for the next Council meeting that includes:

a. Economic impacts on species for which Council has management responsibility;

b. Draft resolution calling attention to Council's concerns with the impacts of continued degradation of the ecosystem.

Advise the Chairman of the Louisiana Coastal Wetlands Task Force of the Council's support for the general restoration strategies described in their draft plan, while reserving the opportunity to review and comment on the individual projects recommended in that plan, prior to their authorization and/or implementation.

Write to the regional and national offices of the Corps of Engineers and EPA requesting a review of performance of their memorandum of agreement concerning mitigation policy under the Clean Water Act, Section 404(b) (1) Guidelines, since the Council's last correspondence in February 1991.

Express concerns to the Chief of Engineers regarding Corps of Engineers' rate of progress with Section 216 studies and the reduced funding and delaying scheduling of studies. Copies sent to district and division engineers

Staff should tract administration's wetlands policy, especially mitigation sequencing, water dependency, and other factors of the mitigation process.

Budget Council funds to allow at least one joint session of the habitat protection advisory panels in addition to at least one meeting per year by each of the three regional panels.

Invite a representative of the Texas Water Development Board to update the Texas Habitat Protection Advisory Panel on Texas water mitigation plans during the next meeting of the Habitat Protection AP.

Invite the state of Louisiana and the U.S. Fish and Wildlife Service members of the Mississippi/Louisiana Habitat Protection Advisory Panel to be included in the Texas Water Plan briefing.

Florida Keys Marine Sanctuary

The Council considered and approved proposed fishing rules that would apply to the Sanctuary and a rule-making procedure for implementing Sanctuary rules in the future. These recommendations were submitted to NOS for the Sanctuary public hearing document.

Limited Access

Staff completed the first draft of a limited entry options paper of the shrimp fishery. The NMFS (Washington) initiated contractual agreements with fishery economists for developing the shrimp limited entry system for the Gulf. The Ad Hoc Limited Entry Committee reviewed and modified the options paper. The Council submitted the discussion paper for the limited access system for the shrimp fishery to the AP for review and revision, for advice on plans for effort control systems for state waters, and for holding workshops with the industry.

In 1993, a moratorium for participants in the commercial reef fish trap fishery was submitted for implementation as part of Amendment 5. An amendment on limited entry for the red snapper commercial fishery was prepared.

Law Enforcement

The Law Enforcement AP reviewed Reef Fish Draft Amendment 7. An additional meeting of the Law Enforcement AP for review of Reef Fish Draft Amendment 7 was scheduled.

Magnuson Act Amendment

The Council Chairman and Executive Director attended a NMFS workshop on amendments to the Act. The Council Chairman testified before the House Subcommittee on Fisheries Management. Council members attended a symposium on the Magnuson Act that was held in conjunction with the Council's March meeting. The Council reviewed alternatives for amendments to the Act and made their recommendation to Congress. The Council Chairman and Vice Chairman attended a meeting of the chairmen of the eight councils and developed recommendations to be submitted to Congress. Staff prepared a conservation report on the status of Gulf fishery stocks which also will be submitted to Congress along with similar reports by the other Councils.

U.S. FISH AND WILDLIFE SERVICE

ANADROMOUS FISHERIES

Lower Mississippi River Coordination

Continuing with efforts that began in 1991, the Gulf Coast Fisheries Coordination Office (FCO) acted as a point of contact and facilitator in forming the Lower Mississippi River Conservation Committee (LMRCC) which should develop into an important partner organization in anadromous fish restoration in the lower Mississippi River system. Drafts of a mission statement, goals, objectives, constitution, and by-laws were developed in January 1993. A work group, consisting of state agency representatives, reviewed and modified the drafts in May 1993, and these were distributed to state agency directors for review during summer 1993.

Apalachicola-Chattahoochee-Flint Rivers Coordination

The Panama City Fisheries Resource Office (FRO) continued serving as coordinator of the Apalachicola-Chattahoochee-Flint (ACF) River Striped Bass Restoration Committee. The annual *Morone* workshop was again held by the committee in February 1993. The Committee initiated discussions at that meeting on developing striped bass restoration goals for the ACF system.

Striped Bass Fry Production

U.S. Fish and Wildlife Service (FWS) personnel assisted state agencies with broodstock collection for striped bass fry production in Florida, Georgia, and Louisiana. National fish hatcheries produced almost 8.6 million striped bass fry for distribution to other hatcheries or research institutions or retained for grow-out to fingerlings.

Striped Bass Fingerling Production and Stocking

Over 850,000 Phase I striped bass fingerlings and over 100,000 Phase II striped bass fingerlings were produced by NFHs and stocked in various streams as part of the anadromous striped bass restoration effort.

Striped Bass Phase II Stocking Evaluation, Lower Apalachicola River

Panama City FRO staff, with assistance from Florida Game and Fresh Water Fish Commission (FGFWFC) biologists, tagged and/or fin-clipped 29,000 Phase II striped bass for stocking in the Apalachicola River and Bay. The FGFWFC has an ongoing study on the success of stocking Phase II versus Phase I fish. Preliminary results indicate better returns on the Phase II fish.

Phase I Striped Bass Post-Stocking Evaluation, Lower Apalachicola River

The Panama City FRO and FGFWFC initiated a cooperative study in July 1993 to evaluate survivability of 430,100 Phase I fingerling striped bass stocked in the lower Apalachicola River and bay in May and June 1993.

Striped Bass Handling Survey

The Panama City FRO surveyed 27 field stations in the southeastern United States in 1992 to determine the various procedures used to transport and stock fingerling striped bass. The survey was expanded to include 38 facilities in 1993 including fish hatcheries located in midwestern and far western

states. A report was presented to the Anadromous Fish Subcommittee and sent to all hatcheries involved in striped bass restoration activities.

Apalachicola River Striped Bass Contaminant Analysis

Muscle and liver tissue from eight striped bass broodfish collected in the Apalachicola River during Spring 1993 were analyzed for heavy metals by the Panama City Ecological Services Field Office (ESFO). Tissues from eight additional fish collected at the same time will be analyzed for heavy metals and organic contaminants during 1994.

Striped Bass Age and Growth in the Mississippi River

The Baton Rouge FRO, with assistance from the Louisiana Cooperative Fish and Wildlife Research Unit, continued collecting length, weight, and age data on striped bass from the lower Mississippi River. Age, length, and weight data were provided to the Alabama Department of Conservation and Natural Resources, Marine Resources Division (AMRD) for developing age-weight-length curves for striped bass in Gulf of Mexico drainages.

Striped Bass Movements and Habitats in the Sabine River

The Baton Rouge FRO and Gulf Coast FCO had drafted an investigation plan for the study of striped bass critical habitats and movements in the Sabine River and submitted it to the FWS regional office in October 1992 for review and approval. The investigation plan was approved by the regional office in February 1993. The Baton Rouge FRO continued field tracking and hydrological data gathering for the study throughout the year. Ten additional adult striped bass were captured, implanted with radio tags, and released during January. A draft progress report was completed on October 15 and submitted to the regional office.

Other Striped Bass Activities

The Panama City FRO met with several representatives of Georgia state agencies to discuss the need to protect striped bass thermal refuge habitat and ways to predict impacts of increasing groundwater withdrawals in the ACF rivers system. The Baton Rouge FRO consulted with the Federal Energy Regulatory Commission in Atlanta, Georgia, and Washington, DC, concerning relicensing of the Toledo Bend Dam hydroelectric station on the Sabine River with respect to developing possible striped bass enhancement measures. The Baton Rouge and Panama City FROs collected various tissues from striped bass broodfish and submitted them to Dr. Ike Wirgin at the University of New York Medical Center, New York (UNYMC) for mitochondrial and nuclear DNA analyses.

Gulf Sturgeon Recovery

The Panama City ESFO distributed the Gulf Sturgeon Recovery Plan for technical review to approximately 80 individuals with sturgeon expertise. A Gulf Sturgeon Recovery Team meeting was held at the Panama City ESFO on August 18-19 to discuss the comments and redraft the plan for public review. The recovery plan is scheduled to be completed in 1994. The Panama City FRO placed emphasis on high priority action items contained in the draft recovery plan during 1993. This included collection of tissue samples for genetic analyses. Communication and coordination among persons interested in Gulf sturgeon were enhanced by the Panama City FRO's national compilation of biologists working with paddlefish or sturgeon species.

Personnel of the Gulf Coast FCO, three other FWS offices, Louisiana Department of Wildlife and Fisheries (LDWF), and the GSMFC attended a meeting in Baton Rouge, Louisiana, on April 21 to discuss possible impacts of the U.S. Army Corps of Engineers's (COE) West Pearl River Navigation Project on the

Gulf sturgeon. There were concerns that the COE's biological assessment of impacts was inadequate, and formal consultation under Section 7 of the Endangered Species Act was possibly needed. Following the meeting, the Vicksburg ESO advised the COE of the above. The Gulf Coast FCO reviewed and sent comments on the revised biological assessment to the Vicksburg ESO on August 24. The FWS' biological opinion was issued in December 1993.

Gulf Sturgeon Movement and Ecology Studies

The National Fisheries Research Center, Gainesville, Florida (NFRC-G), neared completion of a multi-year study on the life history, movement, food habits, and population structure of Gulf sturgeon in the Suwannee River, Florida. Dr. James Clugston presented a paper on this research at the "Second International Symposium on the Sturgeons" and participated in a special program designed to facilitate exchange of scientific information and coordination of sturgeon research worldwide on September 5-16, 1993, in Russia. One hundred forty-four scientists from 21 countries attended the symposium.

Pascagoula River Gulf Sturgeon Survey

The Gulf Coast FCO and GSMFC met with Mississippi State University (MSU) Coastal Aquaculture Unit personnel on March 3 to discuss MSU's proposed Gulf sturgeon survey for coastal Mississippi. Gulf Coast FCO assisted MSU personnel with the project in April and May. Two Gulf sturgeon were netted and fitted with radio-transmitters during May.

Gulf Sturgeon Stock Identification

Dr. Ike Wirgin of the UNYMC was contracted to conduct analyses of mitochondrial DNA from Gulf sturgeon collected in river drainages of the northern Gulf of Mexico. The goal was to collect at least 20 samples from 10 river systems. Results from the first 60 fish analyzed (Suwannee, Ochlockonee, Apalachicola, and Choctawhatchee rivers in Florida, and the Pearl River in Louisiana) indicated a difference between the Apalachicola, Ochlockonee, and Suwannee River populations compared with populations to the west. They also indicated that the Choctawhatchee River population may be discrete, and a third subdivision may exist in western Gulf rivers. Dr. Wirgin suggested that Gulf sturgeon populations may be region-specific and perhaps river-specific.

Samples were also collected from the Yellow River, Florida; Pascagoula River, Mississippi; Bogue Chitto River, Lake Pontchartrain, and Rigolets, Louisiana. All were shipped to UNYMC, but none were analyzed during 1993.

Gulf Sturgeon Artificial Propagation Activities

Panama City FRO personnel collected Gulf sturgeon sperm and egg samples to send to the National Fisheries Research Center, Wellsboro, Pennsylvania, for a cryopreservation study. Panama City FRO personnel transported Gulf sturgeon broodstock to the Welaka NFH, Florida, and the NFRC-G, for induced spawning. The sturgeon broodstock were collected by the Caribbean Conservation Corporation in the Suwannee River, Florida. Attempts to induce two females to ovulate were unsuccessful. Welaka NFH began a feeding and growth study on captive Gulf sturgeons in July 1993.

The Panama City FRO completed a report, "Guidelines for artificially spawning Gulf sturgeon *Acipenser oxyrinchus desotoi*," was completed during 1993. The document was based on the FWS' efforts to artificially spawn Gulf sturgeon from 1989 through 1991 and on the *Hatchery Manual of White Sturgeon*. The report was formulated in order to provide guidelines for spawning Gulf sturgeon and identify data gaps encountered during the three-year sturgeon spawning program conducted by the Panama FRO. Subjects addressed in the document included broodstock holding and handling, broodstock evaluation, hormones, hormone injection schedule, spawning, and egg incubation.

Gulf Sturgeon Historic and Recent Sightings Survey

The Panama City FRO began compiling data on historic Gulf sturgeon sightings data in 1992 and completed the summary in 1993. One objective of this project was to solicit sturgeon sightings information from the public to help document the present and historic ranges of the species in the Gulf. This information will assist researchers in locating and monitoring extant populations -- a high priority need identified in the draft Gulf Sturgeon Recovery Plan. Almost 500 signs, 5,000 fliers, and several hundred news releases were mailed to marinas, fish markets, conservation organizations, universities, government agencies, newspapers, and radio and television stations from Miami, Florida, to Brownsville, Texas. Public response to the survey was excellent. The data collected were invaluable in helping to identify river systems that need to be evaluated.

The Gulf Coast FCO coordinated with personnel of the National Marine Fisheries Service (NMFS) and the Gulf and South Atlantic Fisheries Development Foundation, Inc. (GSAFDF) regarding the potential for shrimp fishery by-catch monitoring personnel to gather information on Gulf sturgeon in marine waters. Letters were sent to the NMFS and the GSAFDF on August 23 requesting their assistance.

Gulf Sturgeon Population Survey in the Choctawhatchee River

The Panama City FRO collected 25 Gulf sturgeon in Choctawhatchee Bay and equipped them with external radio transmitters. This project to develop a population assessment model for Gulf sturgeon in the river was initiated through a cooperative research work order with North Carolina State University. This model will help to evaluate the status of Gulf sturgeon populations and will provide information on statistically valid population sampling designs.

Gulf Sturgeon Contaminants Studies

The Panama City Ecological Services Field Office (ESFO) completed a draft of the report, "Environmental contaminants in Gulf sturgeon," for in-house review. The report included residue analysis data on Gulf sturgeon that were collected from 1985 through 1991 from waters in northwestern Florida. The final report was completed and distributed in the third quarter of 1993.

The Panama City ESFO initiated a Suwannee River sturgeon contaminants evaluation project in 1993. Tissues from incidental mortalities and broodstock will be collected and analyzed for mercury and other metals. Age, sex, and stomach analysis of Age I fish will be done by the NFRC-G.

Alabama Shad Status Report

A draft status report on Alabama shad in Gulf of Mexico river systems was prepared, distributed for review, and presented at the American Fisheries Society Symposium on Endangered Marine Finfish in Rapid City, South Dakota, by the Panama City FRO.

Hybrid Telemetry Transmitter Development

Work continued under a contract awarded by the FWS in 1991 to develop an interrogator/transponder fish tracking system capable of operation in both freshwater and saltwater. The tags would have a minimum range of five miles in marine waters and a life span of at least two years. Technical possibilities include a 10-mile range and a 3 to 10-year battery life. The tag is expected to be delivered in 1994.

OTHER COASTAL FISHERIES

From September 1992 to September 1993, the NFRC-G gathered information on the status of spotted seatrout *(Cynoscion nebulosus)* and their food habits in the northeast Gulf of Mexico to assist in managing the fishery in the rapidly developing area near Cedar Keys, Florida.

FISH HABITAT PROTECTION/ENHANCEMENT

Contaminants Studies

The Panama City ESFO completed final reports on studies of mercury in fishes of the Chassahowitzka, Crystal River, J.N. "Ding" Darling, and St. Marks National Wildlife Refuges (NWR).

South Florida Ecosystem

Dr. Jim Weaver, Director of the NFRC-G, met with the Interagency Task Force on the South Florida Ecosystem to present a proposal, which was approved, to establish a South Florida Science Working Sub-Group. The Task Force is composed of Assistant Secretaries from the U.S. Departments of Interior, Commerce, Army, Justice, Agriculture, and the Environmental Protection Agency. The purpose of the Task Force is to coordinate the development of consistent approaches for restoration and maintenance of the South Florida Ecosystem.

Gulf of Mexico Program

The FWS continued involvement with the Gulf of Mexico Program (GMP) at various levels during 1993. The Gulf Coast FCO developed a proposal for a cooperative project with the Gulf Coast Research Laboratory (GCRL) to evaluate the relative performance of Gulf and Atlantic race striped bass in coastal Mississippi streams. Another proposal was developed for a joint project with the LDWF to gather fishery independent data on striped bass and Gulf sturgeon populations in the lower Mississippi and Pearl rivers as well as the Tchefuncte and Tangipahoa rivers in southeastern Louisiana. The proposals were submitted to the GMP under the *Success in '93* initiative on March 22. Although the proposals were not funded, they were held for future consideration.

Gulf Coast FCO personnel attended the GMP Nutrient Enrichment and Living Aquatic Resources Committee meetings in New Orleans, Louisiana, and Tallahassee, Florida, in June. Meetings of both committees at the first GMP "mega-meeting," held in November 1993 were also attended.

Bay/Estuary Programs

The Panama City ESFO completed a Citizen's Handbook for the St. Andrew Bay Environmental Study Team (BEST) in 1993. Participants in a public forum were randomly selected as a cross section of citizens to read the handbook and then express their views about management approaches for two issues: (1) impacts of chemical contaminants and (2) losses of seagrasses and wetlands. The handbook was also distributed to all members and associates of the BEST and will be used as an educational tool. The BEST will continue to meet and address critical estuarine management issues through 1994.

Other Habitat Protection Activities

The FWS's Ecological Services Field Offices, Fisheries Resource and Coordination Offices, and Refuges and Wildlife personnel were involved in various anadromous and coastal fisheries habitat issues during the year. These included:

- water quality improvement and sediment control features in the Upper Grand River Flats area of the Atchafalaya Basin, Louisiana;
- surveying elevations and water levels for the Warner Lake Diversion Project in Louisiana to improve fishery habitat;
- developing a biological opinion on the effects of the West Pearl River Navigation Project on the Gulf sturgeon;
- Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) activities;
- evaluation of a mitigation banking proposal, designed to compensate forested wetland losses associated with Section 404 activities in the Vicksburg Corps District and in southwestern Louisiana;
- completion of three preliminary natural resources surveys for sites in Tampa and Tarpon Springs, Florida;
- continued work with the U.S. Coast Guard to develop an advance spill response funding agreement as part of the Area Contingency Plan for oil spill response and releases of hazardous materials;
- an interagency Wetland Value Assessment to determine credits that would derive from implementation of wetland restoration features in the Lake Boudreaux Basin, Louisiana;
- a Wetland Value Assessment and mitigation proposal for the proposed Bayou duLarge hurricane protection levee, Louisiana;
- planning with Louisiana Department of Natural Resources for a marsh creation demonstration project using abandoned pipelines to transport sediment;
- comments on artificial reef construction in the Gulf of Mexico off the Louisiana coast;
- comments on a COE study of the Atchafalaya River from Morganza to the Gulf of Mexico;
- comments on use of obsolete oil rigs as artificial reefs in the Gulf of Mexico;
- comments on potential fisheries applications of geographic information system.

PUBLIC OUTREACH/EDUCATION

The Gulf Coast FCO made a presentation on January 13 to the Optimists Club of Gulfport, Mississippi. The program introduced those present (approximately 20) to the FWS' fisheries activities and covered several fisheries topics of interest in coastal Mississippi, including: a proposed cage mariculture project south of Horn Island; artificial reefs in Mississippi Sound; nearshore Gulf of Mexico by-catch; and anadromous fish restoration.

The Baton Rouge FRO presented a slide presentation on March 2 to 35 Evans High School students at Evans, Louisiana, concerning the on-going Sabine River striped bass radiotelemetry study. The students had been involved in a May 1992 media event at the LDWF's Toledo Bend Research Facility to mark the beginning of the study.

The Gulf Coast FCO wrote an article on Gulf sturgeon restoration efforts for a local periodical, the *Gulf Coast Sea Press* in March. An article entitled *Your Guide to Fishing on National Wildlife Refuges* was published in the same periodical in August. The article referenced the new FWS publication by the same name.

The Gulf Coast FCO coordinated a "Pathway to Fishing" event in Biloxi, Mississippi, in June. The event's purpose was to teach young people basic techniques and ethics of sport fishing. There were approximately 75 participants.

The Gulf Coast FCO participated in the Jackson County Soil and Water Conservation District's "Conservation Field Day" at Gulf Islands National Seashore in Ocean Springs, Mississippi, on September 28-29. Approximately 770 fifth grade students attended the event, representing 10 elementary schools. The life history and restoration of Gulf sturgeon were the topics presented at this event.

Personnel of Bayou Sauvage NWR and the Gulf Coast FCO staffed an information booth at the "Pass Christian Celebrates the Gulf" festival in Pass Christian, Mississippi, on October 23. A large number of people turned out for the event, and many brochures were distributed and personal contacts made. Approximately 1,000 persons contacted the Service's exhibit at the event.

The Gulf Coast FCO set up fishing line recycling bins at bait shops along the Mississippi coast in December. The recycling program was jointly sponsored by the FWS and Berkley Outdoor Technology Group. A news release to inform local residents of the program and locations of the bins were submitted to local newspapers.

The St. Andrew BEST co-hosted a "Health and the Sea Day" event for the public to emphasize the importance of the marine environment to human health. Panama City FRO participation included: static exhibits on fisheries field studies; informational literature distribution; display of field equipment; and a mobile contaminants laboratory. The FCO also provided touch pools for a hands-on marine life exhibit. The event was widely supported by federal, state, county, and municipal governments, businesses, industries, educational institutions, civic organizations, and the medical community. Approximately 3,000 people attended the event. Presentations were given on coastal barrier habitats and Gulf sturgeon.

The Panama City FRO presented information about the Gulf sturgeon and striped bass to two marine science classes at Bay High School and a Boy Scouts event at the Apalachicola National Forest in Panama City, Florida.

FEDERAL AID FUNDING

The Service provided funds to Gulf of Mexico states for a number of anadromous, estuarine, or marine sport fish restoration projects under the Federal Aid in Sport Fish Restoration Act. Projects funded during 1993 included the following:

Alabama Department of Conservation and Natural Resources, Marine Resources Division

- Enhancement of recreational fishing in coastal Alabama

Florida Department of Natural Resources

- Artificial reef planning, construction, and maintenance
- Marine recreational statistical data collection
- Marine animal health and contamination assessment
- Investigations into nearshore and estuarine gamefish
- Coastal production and sportfish plankton dynamics off the Florida shelf
- Application of population genetics to gamefish species for fishery management

Louisiana Department of Wildlife and Fisheries

- Public access and boating facilities

Mississippi Department of Wildlife, Fisheries and Parks, Bureau of Marine Resources

- Spotted seatrout sport fish studies
- Creel survey of Mississippi Sound and adjacent waters
- Mississippi saltwater sportfishing access development program
- Investigations of cobia, (*Rachycentron canadum*), in Mississippi Gulf waters

Texas Parks and Wildlife Department

- Monitoring of Texas coastal finfish resources for sport fish management
- Statewide fish culture facility construction and renovation
- Spotted seatrout spawning and culture
- A comparison of fingerling production and environmental tolerances between red drum from North Carolina and Texas coasts
- Juvenile red drum scale pattern analysis
- Genetic marking of red drum
- Genetic marking of spotted seatrout
- Morphometric and biochemical analyses of the population structure in the southern flounder inhabiting the Texas Gulf coast
- Determination of selected life history characteristics of tarpon along the Texas Gulf coast
- Determination of selected life history characteristics of snook along the Texas Gulf coast
- Determination of selected life history characteristics of red snapper along the Texas Gulf coast
- Determination of selected life history characteristics of black drum along the Texas Gulf coast
- An evaluation of spotted seatrout subpopulations from selected Texas Bay systems with emphasis on the Galveston Bay Complex
- Age and growth of Texas red drum
- Allozyme analysis of the population structure in black drum inhabiting the Texas Gulf coast
- Identification of marine fish by isoelectric focusing
- Development of Perry R. Bass Marine Fisheries Research Station
- Environmental assistance and technical guidance for protection of game fish resources

GULF STATES MARINE FISHERIES COMMISSION
Ocean Springs, Mississippi

Report on Examination of Financial Statements, Supplemental Data,
Internal Control and Compliance

for the year ended
December 31, 1993

We have retained the original page numbering sequence on the following pages.

GULF STATES MARINE FISHERIES COMMISSION
DECEMBER 31, 1993

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Fountain, Seymour, Mosher & Associates, P.A.

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INDEPENDENT AUDITOR'S REPORT

To the Board of Commissioners of
Gulf States Marine Fisheries Commission

We have audited the accompanying balance sheet of Gulf States Marine Fisheries Commission (a non-profit organization) as of December 31, 1993, and the related statement of revenue, expenditures and changes in fund balance and cash flows for the year then ended. These financial statements are the responsibility of **Gulf States Marine Fisheries Commission's** management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards, **Government Auditing Standards**, issued by the Comptroller General of the United States, and the provisions of Office of Management and Budget Circular A-133, "Audits of Institutions of Higher Education and Other Non-profit Institutions". Those standards and OMB Circular A-133 require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit, in accordance with these standards, includes examining on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of **Gulf States Marine Fisheries Commission** as of December 31, 1993 , and the results of its operations and cash flows for the year then ended in conformity with generally accepted accounting principles.

Fountain, Seymour, Mosher & Assoc.

D'Iberville, Mississippi
September 20, 1994

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GULF STATES MARINE FISHERIES COMMISSION
BALANCE SHEET
DECEMBER 31, 1993

	UN-Restricted Fund	Restricted Funds	TOTAL All Funds
ASSETS			
CURRENT ASSETS:			
Cash	153,667		153,667
Certificate of Deposit	17,000		17,000
Grants Receivable		31,155	31,155
Due from other Funds		14,842	14,842
Deferred Amounts	26,408		26,408
	197,075	45,997	243,072
PROPERTY AND EQUIPMENT			
Fixed Assets	72,678	52,730	125,408
Less Accumulated Depreciation	< 50,061>		<50,061>
Less Contra Account		< 52,081>	<52,081>
	22,617	649	23,266
TOTAL ASSETS	219,692	46,646	266,338
LIABILITIES AND FUND BALANCE			
CURRENT LIABILITIES:			
Deferred Amounts		4,630	4,630
Note Payable	4,861		4,861
Due to Other Funds	14,842		14,842
Accrued Payroll Withholding	944		944
TOTAL CURRENT LIABILITIES	20,647	4,630	25,277
FUND EQUITY			
Fund Balance Unrestricted	199,045		199,045
Fund Balance Restricted		42,016	42,016
TOTAL FUND EQUITY	199,045	42,016	241,061
TOTAL LIABILITIES AND FUND EQUITY	219,692	46,646	266,338

The notes to Financial Statements are an integral part of this Statement.

GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
For The Year Ended December 31, 1993

	UN-Restricted Fund	Restricted Funds	TOTAL All Funds
REVENUES			
Member State Appropriations	146,250	417,249	146,250
Grants and Agreements			417,249
Interest Earned	4,758		4,758
Miscellaneous Income	5,035		5,035
Total Revenue	156,043	417,249	573,292
EXPENSES			
Salaries	64,955	178,845	243,800
Health Insurance	10,886	29,811	40,697
Retirement	4,791	13,035	17,826
Office Rental	4,648	15,821	20,469
Equipment Rental	60	216	276
Office Supplies	760	8,899	9,659
Postage	2,251	4,646	6,897
Travel	9,780	77,738	87,518
Telephone	1,718	7,059	8,777
Copying Expense	551	8,929	9,480
Printing	1,042	12,972	14,014
Meeting Cost	7,148	5,709	12,857
Dues and Subscription	1,112	993	2,105
Auto Expense	824	1,094	1,918
Insurance	2,633		2,633
Maintenance and Repairs	1,099	4,164	5,263
Courtesies	832		832
Professional Services	1,667	5,888	7,555
Depreciation	8,576		8,576
Taxes-Payroll	4,998	13,877	18,875
Other Taxes	333	928	1,261
Contractual		31,211	31,211
Interest	711		711
Total Expenses	131,375	421,835	553,210

The Notes to Financial Statements are an integral part of this statement.

GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
For The Year Ended December 31, 1993

	UN-Restricted Fund	Restricted Funds	TOTAL All Funds
Excess of Revenue over Expenses	24,668	<4,586>	20,082
Fund Balance, Jan. 1, 93	174,377	46,602	220,979
Fund Balance, Dec. 31, 93	199,045	42,016	241,061

The Notes of Financial Statements are an integral part of this Statement.

GULF STATES MARINE FISHERIES COMMISSION
STATEMENTS OF CASH FLOWS - ALL FUND TYPES
For The Year Ended December 31, 1993

CASH FLOWS FROM OPERATING ACTIVITIES:	
Net Increase in Fund Balance	47,831
Adjustments to Reconcile Net Decrease in Fund Balance to Net Cash Used By Operating Activities -	
Depreciation	8,574
Changes in Operating Assets and Liabilities -	
Decrease in Receivables	13,407
Increase in Deferred Amounts	<34,320>
Net Cash Used by Operating Activities	35,492
CASH FLOWS FROM FINANCING ACTIVITIES:	
Proceeds from loan	
Principal payments on loan	< 6,848>
Net Cash Provided by Financing Activities	< 6,848>
Net Increase in Cash	28,644
Cash at Beginning of Year	125,023
Cash at End of Year	153,667

The Notes to Financial Statements are an integral part of this Statement.

GULF STATES MARINE FISHERIES COMMISSION
NOTES TO FINANCIAL STATEMENTS
December 31, 1993

NOTE 1 - ORGANIZATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

(a) Organization - The Gulf States Marine Fisheries Commission, a non profit organization, was formally created, with the consent of the 81st Congress of the United States, granted by Public Law 66 and approved May 19, 1949. Congress authorized an interstate compact relating to the better utilization of the fisheries of the Gulf of Mexico. Parties to the agreement are the states of Alabama, Florida, Louisiana, Mississippi and Texas. The Commission's office is centrally located in Ocean Springs, Mississippi.

The Commission receives and expends such sums of money as shall from time to time be appropriated for its use by the participating governing authorities, and makes application for and receives and expends funds available under appropriate Federal Programs. The Commission may also receive and expend funds from any other sources not "prohibited by law".

(b) Basis of Accounting - Basis of accounting refers to when revenues and expenditures are recognized in the accounts and reported in the financial statements. Basis of accounting relates to the timing of the measurements made, regardless of the measurement focus applied.

The financial statements have been prepared on the accrual basis in accordance with principles of fund accounting. Under the accrual method, revenues and expenditures are recognized when incurred without regard to actual receipt or disbursement of cash. Funds are established according to their nature and purpose. Separate accounts are maintained for each fund. However, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups. Accordingly, all financial transactions have been recorded and reported by fund groups as follows:

Restricted Fund
Unrestricted Fund

(c) Fund Accounting - In order to assure observance of limitations and restrictions placed on the use of the resources available to the Commission, the accounts are maintained in accordance with the principles of "fund accounting". This is the procedure by which resources for various purposes are classified

for accounting and reporting objectives specified. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups. Accordingly, all financial transactions have been recorded and reported by fund group.

Within each fund group, funds restricted by outside sources are so indicated and are distinguished from unrestricted funds designated for specific purposes by action of the Board of Commissioners. Externally restricted funds may only be utilized in accordance with the purposes established by the funds over which the Board retains full control to use in achieving any of its purposes.

(d) **Grants Receivable** - In accordance with the accrual basis of accounting, revenues are recognized when earned. In the case of grant revenue, amounts are earned when the related expenditures are incurred. At December 31, 1993, expenditures in the amount of $25,062 has been incurred for which the commission had not been reimbursed.

(e) **Deferred Amounts** - Deferred amounts in the restricted fund results from current year receipts of grant revenue for which no expenses have been incurred. Revenue in the restricted funds is recognized only to the extent that related expenses have been incurred.

(f) **Fixed Assets** - Fixed assets purchased from unrestricted funds are properly capitalized and set up as fixed assets on the books. Fixed assets purchased from (restricted funds) are expensed at the time of payment, and additionally are capitalized on the books with an offsetting Contra Account. Depreciation recorded in the operating fund is recorded using the straight-line method. Lives used are summarized below:

TYPE OF ASSET	LIFE (years)
Office Equipment and Furniture	5 & 10
Automotive	5

Depreciation recorded for the year ended December 31, 1993, was $8,576.

NOTE 2 - LEASE COMMITMENTS

The Commission occupies space under long-term lease agreements which expires in the year 2002. The monthly lease payment is $925.00. The monthly lease payment will be adjusted every three (3) years using the consumer price index as a guide.

The approximate minimum future annual rental commitments under such lease as of December 31, 1993 are as follows:

1994	15,335
1995	15,720
1996	15,720
1997	15,720
1998-2002	78,600
TOTAL	141,095

NOTE 3 - RETIREMENT PLAN

The Commission has a tax sheltered annuity plan for all employees that have been employed for at least six (6) months. The Commission contributes seven (7) percent of each eligible employee's base pay with the amounts being fully vested upon payment by the Commission. The total expense for the year ended December 31, 1993 was $17,826.

NOTE 4 - ALLOCATION OF EXPENSES

The expense of providing the various grants and agreement programs and activities are summarized in the Combined Statement of Revenue, Expenditures and Changes in Fund Balances. Accordingly, certain expenses have been allocated among the grants, agreements, and the Commission activities based upon the benefited program. In some instances, the expenses were allocated based upon an equitable and equal distribution.

NOTE 5 - INCOME TAXES

The Commission has filed for a tax-exempt status, and will be exempt under Section 501 (c) of the Internal Revenue Code. Their revenue comes from federal grants and agreements and member states appropriations.

SUPPLEMENTARY INFORMATION

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INDEPENDENT AUDITOR'S REPORT ON SCHEDULE OF FEDERAL AWARDS

To the Board of Commissioners
Gulf States Marine Fisheries Commission

We have audited the financial statements of **Gulf States Marine Fisheries Commission** (a non-profit organization) for the year ended December 31, 1993, and have issued our report thereon dated September 20, 1994. These financial statements are the responsibility of **Gulf States Marine Fisheries Commission's** management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards and **Government Auditing Standards**, issued by the Comptroller General of the United States, and the provisions of Office of Management and Budget Circular A-133, "Audits of Institutions of Higher Education and Other Non-Profit Institutions". Those standards and OMB Circular A-133 require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit in accordance with these standards includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

10080 Gorenflo Rd D'Iberville, MS 39532 Fax (601) 392-6354

Our audit was made for the purpose of forming an opinion on the financial statements of **Gulf States Marine Fisheries Commission** taken as a whole. The accompanying schedule of federal awards is presented for the purpose of additional analysis and is not a required part of the financial statements. The information in that schedule has been subjected to the auditing procedures applied in the audit of the financial statements and, in our opinion, is fairly presented in all material respects in relation to the basic financial statements taken as a whole.

Fountain, Seymour, Mosher & Assoc.

D'Iberville, Mississippi
September 20, 1994

GULF STATES MARINE FISHERIES COMMISSION
SCHEDULE OF FEDERAL AWARDS
For The Year Ended December 31, 1993

Federal Grantor/Program Title	Award #	Federal CFDA Number	Program Award Amount Federal Share	Accumulated Revenue at Jan. 1, 1993 Federal Share	Current Federal Revenue Received	Accumulated Disbursements/ Expenditures at Jan. 1, 1993 Federal Share	Current Disbursements/ Expenditures Federal Share	Cash/Accrue of (Deferre Revenue at Dec. 31, 199
MAJOR PROGRAMS								
Department of Commerce								
Southeast Area Monitoring and Assessment Program	NA90AAHSM211	11.300	98,476	98,476	0	93,846	0	<4,630>
	NA27FS0028-02	11.300	91,345	0	91,345	0	91,345	0
Interjurisdictional Fisheries Management Plans	NA26FI0026-02	11.300	93,500	0	88,924	0	93,500	4,576
TOTAL DEPARTMENT OF COMMERCE			283,321	98,476	180,269	93,846	184,845	< 54>
Department of Interior								
Cooperative Interstate Fishery Management in the Territorial Seas of the Gulf of Mexico	14-16-0009-90-1211	15.605	270,155	265,981	2,925	268,912	0	0
Sports, Fish Restoration Program	14-48-0009-93-1231	15.605	181,947	0	169,386	0	175,529	7,386
TOTAL DEPARTMENT OF INTERIOR			452,102	265,981	172,311	268,912	175,529	7,386
NON-MAJOR PROGRAMS								
Department of Commerce								
Administration Support of Marine Fisheries Initiative	50-WCNF-0-06053	11.300	50,349	27,552	22,797	50,349	0	0
Gulf of Mexico Fishery Management Council	93-65-07600	11.300	31,250	31,250	8,660	22,590	8,660	0
	94-65-07600	11.300	27,410	0	16,340	0	21,112	4,772
Department of Interior								
The Development and use of Restriction Fragment Length DNA Polymorphism Probes for Striped Bass Identification	14-16-0004-91-920	15.605	65,000	35,000	14,000	47,424	10,200	8,624
Cooperative Agreement to Provide Clerical Support	14-16-0004-91-904	15.605	13,797	11,103	2,694	11,997	1,800	0
	14-16-0004-93-904	15.605	12,000	0	9,306	0	11,103	1,797
TOTAL NON-MAJOR PROGRAMS			199,806	104,905	73,797	132,360	52,875	15,193

See accompanying Independent Auditor's Report on Federal Awards.

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INDEPENDENT AUDITOR'S REPORT
ON ADDITIONAL INFORMATION

To the Board of Commissioners
Gulf States Marine Fisheries Commission

Our report on our audit of the basic financial statements of **Gulf States Marine Fisheries Commission** (a non-profit organization) for 1993 appears on page 1. We conducted our audit in accordance with generally accepted auditing standards **Government Auditing Standards** issued by the Comptroller General of the United States, and the provisions of Office of Management and Budget Circular A-133, "Audits of Institutions of Higher Education and Other Non-Profit Institutions", for the purpose of forming an opinion on the basic financial statements taken as a whole. The schedule of expenses on restricted funds is presented for the purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

Fountain, Seymour, Mosher, Assoc.

D'Iberville, Mississippi
September 20, 1994

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GULF STATES MARINE FISHERIES COMMISSION
SCHEDULE OF EXPENSES - RESTRICTED FUNDS
For The Year Ended December 31, 1993

	Council Funds	DNA	Fish & Wildlife Services	Inter Juris-dictional	SEAMAP Funds	Sportfish Restoration	Total All Funds
Salaries	21,022	1,775	3,464	48,446	44,054	60,084	178,845
Payroll Taxes	1,622	157	355	3,728	3,391	4,624	13,877
Health Insurance	3,078	507	773	8,547	7,309	9,597	29,811
Retirement	1,359	190	317	3,527	3,242	4,400	13,035
Office Rent	1,043	176	4,766	2,950	2,942	3,944	15,821
Equipment Rental	14			57	54	91	216
Office Supplies	43	6	572	2,235	2,605	3,438	8,899
Postage	200			1,065	2,812	569	4,646
Travel - Committee				9,412	19,110	38,559	67,081
Travel - Administrative	436		8	1,600	105	8,508	10,657
Telephone	145	43	344	2,096	1,503	2,928	7,059
Copy Expense	650	124	5	2,546	2,377	3,227	8,929
Printing			785	4,159	5,197	2,831	12,972
Meeting Costs	49		95	1,379	1,634	2,552	5,709
Subscriptions & Dues			10	98	330	555	993
Auto Expense			12	533	186	363	1,094
Maintenance	13	48	124	980	1,009	1,990	4,164
Professional Services	20	4	118	1,418	1,459	2,869	5,888
Other Taxes	72	6	23	253	228	346	928
Contractual		7,211				24,000	31,211
TOTAL	29,766	10,247	11,771	95,029	99,547	175,475	421,835

See accompanying Independent Auditor's Report on Additional Statements

AUDITOR'S REPORTS ON INTERNAL CONTROLS

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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL STRUCTURE REQUIRED BY OMB CIRCULAR A-133

To the Board of Commissioners
Gulf States Marine Fisheries Commission

We have audited the financial statements of **Gulf States Marine Fisheries Commission** (a non-profit organization) for the year ended December 31, 1993, and have issued our report thereon dated September 20, 1994. We have also audited the Organization's compliance with requirements applicable to major federal financial assistance programs and have issued our reports thereon dated September 20, 1994.

We conducted our audit in accordance with generally accepted auditing standards, Government Auditing Standards, issued by the Comptroller General of the United States, and Office of Management and Budget (OMB) Circular A-133, "Audits of Institutions of Higher Education and Other Non-Profit Institutions." Those standards and OMB Circular A-133 require that we plan and perform the audit to obtain reasonable assurance about whether the misstatement and about whether the Organization complied with laws and regulations, noncompliance with which would be material to a major federal financial assistance program.

In planning and performing our audit of the financial statements of **Gulf States Marine Fisheries Commission** for the year ended December 31, 1993, we considered its internal control structure in order to determine our auditing procedures for the purpose of expressing opinions on the financial statements and on its compliance with requirements applicable to major federal financial assistance programs and not to provide assurance on the internal control structure.

The management of **Gulf States Marine Fisheries Commission** is responsible for establishing and maintaining an internal control structure. In fulfilling this responsibility, estimates and

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judgements by management are required to assess the expected benefits and related costs of internal control structure policies and procedures. The objectives of an internal control structure are to provide management with reasonable, but not absolute, assurance that assets, are safeguarded against loss from unauthorized use or disposition, that transactions are executed in accordance with managements authorization and recorded properly to permit the preparation of financial statements in accordance with generally accepted accounting principles, and that federal assistance programs are managed in compliance with applicable laws and regulations. Because of inherent limitations in any internal control structure, errors, irregularities, or instances of noncompliance may nevertheless occur and not be detected. Also, projection of any evaluation of the structure to future periods is subject to the risk that procedures may be inadequate because of changes in conditions or that the effectiveness of the design and operation of policies and procedures may deteriorate.

For the purpose of this report, we have classified the significant internal control structure policies and procedures in the following categories:

Cycles of Activity
- Treasury or Financing
- Revenue/Receipts
- Purchases/Disbursements
- Payroll
- External Financial Reporting

General Requirements
- Political Activity
- Allowable Costs/Cost Principles
- Civil Rights
- Cash Management
- Federal Financial Reports
- Drug Free Workplace Act
- Administrative Requirements

Specific Requirements
- Types of Services Allowed or not Allowed
- Eligibility
- Federal Financial Reports and Claims for Advances and Reports
- Cost Allocation

For all of the internal control structure categories listed above, we obtained an understanding of the design of relevant policies and procedures and determined whether they have been placed in operation, and we assessed control risk.

During the year ended December 31, 1993, **Gulf States Marine Fisheries Commission** expended 91 percent of its total federal financial assistance under major federal financial assistance programs. We performed tests of control, as required by OMB Circular A-133, to evaluate the effectiveness of the design and operation of internal control structure policies nd procedures that we considered relevant to preventing or detecting material noncompliance with specific requirements, general requirements, and requirements governing claims for advances and reimbursements and amounts claimed for advances and reimbursements and amounts claimed or used for matching that are applicable to each of the Organizations major federal financial assistance programs, which are identified in the accompanying schedules of federal awards. Our procedures were less in scope than would be necessary to render an opinion on these internal control structure policies and procedures. Accordingly, we do not express such as opinion.

The report is intended for the information of the Board of Commissioners, Management and relevant federal agencies. This restriction is not intended to limit the distribution of this report, which is a matter of public record.

Fountain, Lyman, Miller & Reese.

D'Iberville, Mississippi
September 20, 1994

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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL STRUCTURE IN ACCORDANCE WITH GOVERNMENT AUDITING STANDINGS

To the Board of Commissioners
Gulf States Marine Fisheries Commission
Ocean Springs, Mississippi

We have audited the financial statements of **Gulf States Marine Fisheries Commission** (a non-profit organization) for the year ended December 31, 1993, and have issued our report thereon dated September 20, 1994.

We conducted our audit in accordance with generally accepted auditing standards and **Government Auditing Standards**, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about the whether the financial statements are free of material misstatement.

In planning and performing our audit of the financial statements of **Gulf States Marine Fisheries Commission** for the year ended December 31, 1993, we considered its internal control structure in order to determine our auditing procedures for the purpose of expressing an opinion on the financial statements and not to provide assurance on the internal control structure.

The management of **Gulf States Marine Fisheries Commission** is responsible for establishing and maintaining an internal control structure. In fulfilling this responsibility, estimates and judgments by management are required to assess the expected benefits and related costs of internal control structure policies and procedures. The objectives of an internal control structure are to provide management with reasonable, but not absolute, assurance that assets are safeguarded against loss from

unauthorized use or disposition, and that transactions are executed in accordance with management's authorization and recorded properly to permit the preparation of financial statements in accordance with generally accepted accounting principles. Because of inherent limitation in any internal control structure, errors or irregularities may nevertheless occur and not be detected. Also, projection of any evaluation of the structure to future periods is

subject to the risk that procedures may become inadequate because of changes in conditions or that the effectiveness of the design and operation of policies and procedures may deteriorate.

For the purpose of this report, we have classified the significant internal control structure policies in the following categories:

Cycles of Activity
- Treasury or Financing
- Revenue/Receipts
- Purchases/Disbursements
- Payroll
- External Financial Reporting

General Requirement
- Political Activity
- Allowable Costs/Cost Principles
- Civil Rights
- Cash Management
- Federal Financial Reports
- Drug-Free Workplace Act
- Administrative Requirements

Specific Requirements
- Types of Services Allowed or Not Allowed
- Eligibility
- Federal Financial Reports and Claims for Advances and Reports
- Cost Allocation

For all of the control categories listed above, we obtained an understanding of the design of relevant policies and procedures and whether they have been placed in operation, and we assessed control risk.

Our consideration of the internal control structure would not necessarily disclose all matters in the internal control structure that might be material weakness under standards established by the American Institute of Certified Public Accountants. A material weakness is a reportable condition in which the design or operation

of the specific internal control structure elements does not reduce to a relatively low level the risk that errors or irregularities in amount that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. We noted no matters involving the internal control structure and its operations that we considered to be a material weakness as defined above.

This report is intended for the information of the Board of Commissioners, Management and the relevant federal agencies. This restriction is not intended to limit the distribution of this report, which is a matter of public record.

Fountain, Seymour, Mosher & Carr.

D'Iberville, Mississippi
September 20, 1994

AUDITOR'S REPORTS ON COMPLIANCE

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INDEPENDENT AUDITOR'S REPORT ON COMPLIANCE WITH LAWS AND REGULATIONS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH GOVERNMENT AUDITING STANDARDS

To the Board of Commissioners
Gulf States Marine Fisheries Commission

We have audited the financial statements of **Gulf States Marine Fisheries Commission**, a non-profit organization, as of and for the year ended December 31, 1993, and have issued our report thereon dated September 20, 1994.

We conducted our audit in accordance with generally accepted auditing standards and Government Auditing Standards, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

Compliance with laws, regulations, contracts, and grants applicable to **Gulf States Marine Fisheries Commission**, is the responsibility of **Gulf States Marine Fisheries Commission's** management. As part of obtaining reasonable assurance about whether the financial statements are free of material misstatements, we performed tests of the **Gulf States Marine Fisheries Commission's** compliance with certain provisions of laws, regulations, contracts, and grants. However, our objective was not to provide an opinion on overall compliance with such provisions.

The results of our tests indicate that, with respect to the items tested, **Gulf States Marine Fisheries Commission** complied, in all material respects, with the provisions referred to in the preceding paragraph. With respect to items not tested, nothing came to our attention that caused us to believe that the Commission had not complied, in all material respects, with those provisions.

This report is intended for the information of the Board of Commissioners, Management and relevant federal agencies. This restriction is not intended to limit the distribution of this report, which is a matter of public record.

Fountain, Seymour, Mosley & Assoc.

D'Iberville, Mississippi
September 20, 1994

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INDEPENDENT AUDITOR'S COMBINED REPORT ON COMPLIANCE WITH GENERAL REQUIREMENTS APPLICABLE TO FEDERAL FINANCIAL ASSISTANCE PROGRAMS AND SPECIFIC REQUIREMENTS APPLICABLE TO MAJOR AND NONMAJOR PROGRAM TRANSACTIONS

To the Board of Commissioners
Gulf States Marine Fisheries Commission

We have audited **Gulf States Marine Fisheries Commission's** (a non-profit organization) compliance with the requirements governing types of services allowed or unallowed; eligibility; matching, level of effort or earmarking; reporting; claims for advances and reimbursements; and amounts claimed or used for matching that are applicable to each of its major federal financial assistance programs, which are identified in the accompanying schedule of federal awards, for the year then ended December 31, 1993. The management of **Gulf States Marine Fisheries Commission** is responsible for the Organization's compliance with those requirements. Our responsibility is to express an opinion on compliance with those requirements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards, Government Auditing Standards, issued by the Comptroller General of the United States, and the provisions of Office of Management and Budget Circular A-133, "Audits of Institutions of Higher Education and other Non-Profit Institutions". Those standards and OMB Circular A-133 require that we plan and perform the audit to obtain reasonable assurance about whether material noncompliance with the requirements referred to above occurred. An audit includes examining, on a test basis, evidence about the organization's compliance with those requirements. We believe that our audit provides a reasonable basis for our opinion.

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In our opinion, **Gulf States Marine Fisheries Commission** complied, in all material respects, with the requirements governing types of services allowed or unallowed; eligibility; matching, level of effort, or earmarking; reporting; claims for advances and reimbursements; and amounts claimed or used for matching that are applicable to each of its major federal financial assistance programs for the year ended December 31, 1993.

In connection with our audit of the December 31, 1993 financial statements of **Gulf States Marine Fisheries Commission**, and with our obtaining an understanding of the Organization's internal control structure elements related to administering federal financial assistance programs, as required by OMB Circular A-133, we selected certain transactions applicable to certain non-major federal financial assistance programs for the year ended December 31, 1993. As required by OMB Circular A-133, we have performed auditing procedures to test compliance with the requirements governing types of services allowed or unallowed; and eligibility that are applicable to those transactions. Also, we have applied procedures to test **Gulf States Marine Fisheries Commission's** compliance with the following requirements applicable to each of its federal financial assistance programs, the major programs of which are identified in the accompanying schedule of federal awards, for the year ended December 31, 1993.

Our procedures for testing the requirements that are listed in the preceding paragraph were limited to the applicable procedures described in the Office of Management and Budget's "Compliance Supplement for Audits of Educational Institutions and Other Non-Profit Institutions." Our procedures for testing compliance with the general requirements and the specific requirements applicable to the non-major programs which are listed in the schedule of federal awards were substantially less in scope than an audit, the objective of which is the expression of an opinion on **Gulf States Marine Fisheries Commission's** compliance with the requirements. Accordingly, we do not express such an opinion.

With respect to the items tested, the results of those procedures disclosed no material instances of noncompliance with the requirements listed in the fifth paragraph of this report. With respect to items not tested, nothing came to our attention that caused us to believe that **Gulf States Marine Fisheries Commission** had not complied, in all material respects, with those requirements.

This report is intended for the information of the Board of Commissioners of Gulf State Marine Fisheries Commission, management and the relevant federal agencies. This restriction is not intended to limit the distribution of this report, which is a matter of public record.

Fountain, Seyman, Mader & Evans.

D'Iberville, Mississippi
September 20, 1994