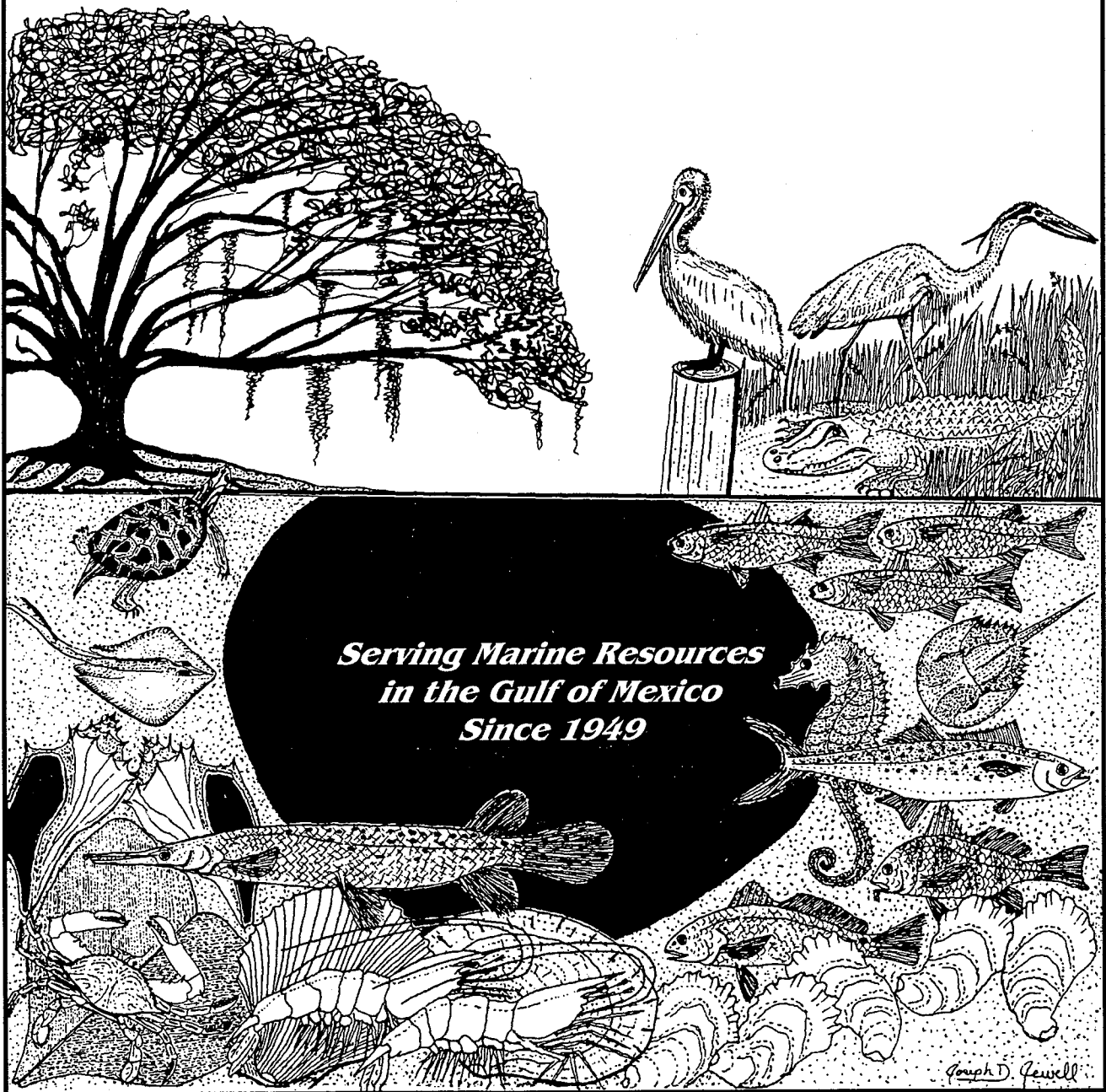


Forty-Eighth Annual Report
of the
GULF STATES MARINE FISHERIES COMMISSION

FOR THE YEAR 1997



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-EIGHTH ANNUAL REPORT
(1997)

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
Larry B. Simpson, Executive Director
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Ocean Springs, Mississippi 39566-0726
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Acknowledgments

In submitting this Forty-eighth 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-eight years could not have been possible without such valued assistance. This acknowledgment is also extended to the director and staffs of federal, state, and interstate agencies, and to representatives of all organizations and individuals who have contributed to the realization of the objectives of the Gulf States Marine Fisheries Commission.

Respectfully submitted,

Walter Penry, *Chairman*
Gene McCarty, *First Vice Chairman*
George Sekul, *Second Vice Chairman*
Larry B. Simpson, *Executive Director*

Table of Contents

Acknowledgments	ii
Table of Contents	iii
Commission Roster	iv
Commission Officers	v
Director's Report	1
Southeast Area Monitoring and Assessment Program (SEAMAP)	3
Cooperative Interstate Fishery Management in the Territorial Sea of the Gulf of Mexico	9
Interjurisdictional Fisheries Management Program	12
Commercial Fisheries Information Network (ComFIN) and Southeast Recreational Fisheries Information Network [RecFIN(SE)]	14
Joint GSMFC/Gulf of Mexico Fishery Management Council Habitat Program	18
Alabama Department of Conservation and Natural Resources, Marine Resources Division	19
Florida Department of Environmental Protection, Division of Marine Resources	23
Louisiana Department of Wildlife and Fisheries, Office of Fisheries	36
Mississippi Department of Marine Resources	42
Texas Parks and Wildlife Department	48
National Marine Fisheries Service, Southeast Region	52
Gulf of Mexico Fishery Management Council	56
U.S. Fish and Wildlife Service	57
Report on Examination of Financial Statements, Supplemental Data, Internal Control, and Compliance for the year ended December 31, 1997	62

Commission Roster

Commission Officers

Chairman: Walter Penry
First Vice Chairman: Gene McCarty
Second Vice Chairman: George Sekul

Commissioners

(order of listing - administrator, legislator, governor's appointee)

ALABAMA

James Martin
Alabama Department of
Conservation & Natural Resources
Montgomery, AL
Walter Penry
Alabama House of Representatives
Daphne, AL
Chris Nelson
Bon Secour Fisheries, Inc.
Bon Secour, AL

FLORIDA

Virginia Wetherell
Florida Department of Environmental
Protection
Tallahassee, FL
Patrick K. McFarland
Port Saint Joe, FL

LOUISIANA

James H. Jenkins, Jr.
Louisiana Department of Wildlife &
Fisheries
Baton Rouge, LA

Warren Triche
Louisiana House of Representatives
Thibodaux, LA
Frederic L. Miller
Shreveport, LA

MISSISSIPPI

E. Glade Woods
Mississippi Department of Marine
Resources
Biloxi, MS
Ed Ryan
Mississippi House of Representatives
Biloxi, MS
George Sekul
Gulf Central Seafoods, Inc.
Biloxi, MS

TEXAS

Andrew Sansom
Texas Parks & Wildlife Department
Austin, TX
Robert Saunders
Texas House of Representatives
Austin, TX
L. Don Perkins
Houston, TX

Staff

Larry B. Simpson
Executive Director

Ronald R. Lukens
Assistant Director

David M. Donaldson, Program Coordinator
Steven J. VanderKooy, Program Coordinator
Jeffrey K. Rester, Program Coordinator
Virginia K. "Ginny" Herring, Executive Assistant

Nancy K. Marcellus, Administrative Assistant
Cynthia B. Yocom, Staff Assistant
Cheryl R. Noble, Staff Assistant
Madeleine A. Travis, Staff Assistant

Committee Officers

Executive Committee	Walter Penry, Commission Chairman
Commercial Fisheries Advisory Committee	Chris Nelson (moderator)
Law Enforcement Committee	Jerald Waller, Chairman
Recreational Fisheries Advisory Committee	vacant
State-Federal Fisheries Management Committee	Larry B. Simpson, Chairman
Blue Crab Technical Task Force	Vince Guillory, Chairman
Flounder Technical Task Force	Mike Johnson, Chairman
Menhaden Advisory Committee	Randy Rader, Chairman
Spotted Seatrout Technical Task Force	Harry Blanchet, Chairman
Stock Assessment Team	Joe Shepard, Chairman
Technical Coordinating Committee	William S. "Corky" Perret, Chairman John Roussel, Vice Chairman
TCC Anadromous Fish Subcommittee	Doug Frugé, Chairman Charles Mesing, Vice Chairman
TCC Artificial Reef Subcommittee	Jon Dodrill, Chairman Mike Buchanan, Vice Chairman
TCC Crab Subcommittee	Vince Guillory, Chairman
TCC Data Management Subcommittee	Henry S. "Skip" Lazauski, Chairman Joe Shepard, Vice Chairman
TCC Habitat Subcommittee	vacant
TCC SEAMAP Subcommittee	Richard Waller, Chairman Jim Hanifen, Vice Chairman

GULF STATES MARINE FISHERIES COMMISSION

DIRECTOR'S REPORT

The Gulf States Marine Fisheries Commission's (GSMFC) efforts in data collection and administration are to meet the ever-increasing research, characterization, monitoring, and management needs of important marine, estuarine, and shellfish resources of the Gulf of Mexico. The need for quality data with timely availability for fisheries management transcends jurisdictional boundaries. The interjurisdictional nature of most fish and shellfish stocks in the Gulf require the cooperation of both state and federal agencies with the shared authority to manage those stocks through regulatory programs. To address that challenge, the Commission has developed the Fisheries Information Network (FIN). Two equal components make up FIN, the Recreational Fisheries Information Network (RecFIN) and the Commercial Fisheries Information Network (ComFIN).

In 1997, the Commission implemented the charter boat pilot survey to improve effort estimates for that segment of the Gulf fishery.

Those efforts will continue into 1998 and ultimately be evaluated along with the current Marine Recreational Fisheries Statistical Survey charter boat component and Florida panhandle logbook pilot study to determine how best to collect this data in the future.

The Commission, dedicated to the improvement of state/federal data collection and the management of that data, was encouraged in this task by the activities of recreational and commercial groups, the Councils, and universities. In the past, data collection and management did not have the proper attention or emphasis. Management and biological analysis, so important to the citizens of the Gulf Coast, are only as good as the data on which decisions are made. The entire Commission staff strives for a better system. In the future, perhaps when I am no longer involved in marine fisheries, my hope is that our efforts toward better data collection and management are lauded.

MEETINGS/ACTIVITIES OF THE EXECUTIVE DIRECTOR

GULF STATES MARINE FISHERIES COMMISSION

GSMFC Law Enforcement Committee Meeting on Interstate Shipment - January 1997
GSMFC Law Enforcement Committee Meeting on the Federal Penalty Schedule - January 1997
RecFIN/ComFIN Public Input and Congressional Staff Meetings, Washington, D.C. - March 1997
GSMFC 47th Spring Meeting, Biloxi, MS - March 1997
Blue Crab Issues Discussion with Louisiana and Texas, Ocean Springs, MS - May 1997
Closing on the Purchase of the GSMFC Building, Ocean Springs, MS - May 1997
Charter Boat Public Hearings on the Pilot Project, Orange Beach, AL - June 1997
GSMFC Law Enforcement Committee Meeting, Key West, FL - June 1997
State Directors' Meeting, Apalachicola, FL - June 1997
Emergency Disaster Funds Meeting, New Orleans, LA - September 1997
GSMFC 48th Annual Meeting, Gulf Shores, AL - October 1997
State Directors' Meeting, Vicksburg, MS - December 1997
Data Program Overview Meeting, New Orleans, LA - December 1997

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

Corpus Christi, TX - January 1997
Gulf Shores, AL - March 1997
New Orleans, LA - May 1997
Duck Key, FL - July 1997
Mobile, AL - September 1997
Longboat Key, FL - November 1997

CONGRESSIONAL MEETINGS

Gulf of Mexico Issues Discussion with the staff members of Senators' Breaux, Lott, and Livingston, Washington, DC - January 1997

Gulf of Mexico Issues Discussion with the staff of Senator Lott, Ocean Springs, MS Field Office - February 1997

OTHER MEETINGS AND ACTIVITIES

Marine Issues Discussion with the Director, USFWS, Washington, D.C. - January 1997

State/Federal Marine Issues Discussion with the Assistant Administrator for Fisheries and the three Commission Executive Directors, Washington, D.C. - January 1997

Texas Shrimp Association Meeting, Data Program Presentation, Galveston, TX - May 1997

Menhaden Port Samplers Meeting, Ocean Springs, MS - May 1997

Booker Fowler Hatchery Dedication, Alexandria, LA - June 1997

Gulf of Mexico Program Nonindigenous Species Panel, New Orleans, LA - June 1997

MARFIN Steering Committee, St. Petersburg, FL - July 1997

Secretary of Commerce's Marine Fisheries Advisory Committee, Seattle, WA - July 1997

GCRL Fisheries Management Class Guest Lecture, Ocean Springs, MS - July 1997

Tulane Law School, Magnuson/Stevens Act Presentation, New Orleans, LA - September 1997

MARFIN Principle Investigators Meeting, Tampa, FL - December 1997

*Larry B. Simpson
Executive Director*

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 (NMFS).

In 1997, SEAMAP operations continued for the sixteenth consecutive year. SEAMAP resource surveys included the Fall Shrimp/Groundfish Survey, Louisiana seasonal trawl surveys, Spring Plankton Survey, Reef Fish Survey, Summer Shrimp/Groundfish Survey, Fall Plankton Survey, and plankton and environmental data surveys. Other 1997 activities included SEAMAP information services and program management.

RESOURCE SURVEYS

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 aboard the R/V PELICAN during July 1997. A stratified random station selection design was maintained, varying from the transects previously surveyed. During each segment, 24 stations were sampled during day and night at depths from 5 to 20 fm. The June sampling was completed as part of the SEAMAP Summer Shrimp/Groundfish Survey.

All seasonal trawls were completed with the standard SEAMAP 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 SEAMAP Archiving Center in St. Petersburg, Florida. The area sampled covered Louisiana territorial and EEZ waters.

Spring Plankton Survey

For the fifteenth year, plankton samples were collected during the spring in the northern Gulf of Mexico. The National Oceanic and Atmospheric Administration's (NOAA) ships CHAPMAN and OREGON II and Florida's R/V SUNCOASTER sampled offshore waters from the western edge of the West Florida Shelf to the Texas-Louisiana border from April 16 to June 10, 1997. A total of 187 stations was sampled. The CHAPMAN and OREGON II sampled 169 stations and the R/V SUNCOASTER sampled 18 stations along the west Florida shelf.

Plankton samples were taken with standard SEAMAP bongo and neuston samplers. The bongo sampler consisted of two conical 61-cm nets with 333-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. 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 (surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom, and Forel-ule color) were collected at all stations.

Right bongo and neuston samples collected from SEAMAP stations will be transshipped to the Polish Sorting and Identification Center. Left bongo samples will be archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC). Salinity data from the Florida vessel were sent to the NMFS Mississippi Laboratories for interpretation.

Reef Fish Survey

The sixth Reef Fish Survey was conducted from June - October 1997. Vessels from the NMFS, Texas, and Alabama sampled inshore and offshore waters, in addition to plankton and environmental sampling. A total of 230 stations have been sampled throughout the Gulf of Mexico. Randomly selected sites from Brownsville, Texas to Key West, Florida were chosen from known hard bottom locations. The objectives of the survey were to:

- 1) assess relative abundance and compute population estimates of reef fish using a video/trap technique;
- 2) determine habitat using an echo sounder and video camera;
- 3) determine if bioacoustics assessment methodology can be applied to reef fish communities;
- 4) collect environmental data at each station; and
- 5) collect ichthyoplankton samples at selected reef sites.

The primary purpose of this survey was to assess the relative abundance and compute population estimates of reef fish. Stations were randomly-selected 100 m² sites which are designated as "reef areas." There were several aspects of the reef fish survey including: 1) locating and compiling known hard bottom reef habitat locations; 2) surveying site selection; 3) sampling protocol using a fish trap and video camera and 4) analyzing the video records. Data are collected using the trap/video methodology where a fish trap containing a video camera was deployed onto the selected reef site. Trap soak time was one hour. After trap deployment, hydrographic data including a STD/light meter, transmissometer drop, secchi disk reading and surface chlorophyll samples were collected. Also, after the last trap/camera set, one ichthyoplankton station was completed each day with a surface neuston net and Tucker trawl. Environmental and plankton samples collected used established SEAMAP protocols and plankton samples were transhipped to the Polish Sorting and Identification Center.

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

Summer Shrimp/Groundfish Survey

During spring 1997, there was communication between the Shrimp/Groundfish Work Group members 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:

- 1) monitor size and distribution of penaeid shrimp during or prior to migration of brown shrimp from bays to the open Gulf;
- 2) aid in evaluating the "Texas Closure" management measure of the Gulf Council's Shrimp Fishery Management Plan; and
- 3) provide information on shrimp and groundfish stocks across the northern Gulf of Mexico from inshore waters to 50 fm.

The overall sampling strategy during the 1997 SEAMAP summary 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 entire survey occurred from June 2 to July 16, 1997.

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 315 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.

In June, catch rates of brown shrimp east of the river were very low, with a maximum catch of 10.1 lb/hr of 66-count shrimp. White shrimp catches east of the river were all less than 1.0 lb/hr. The largest pink shrimp catch rate east of the river was 9.0 lb/hr of 26-count shrimp taken in 13 fm of water off the Mobile Bay. Finfish catch rates east of the river were low, with the largest catch of 870 lb/hr with longspine porgy predominating.

In July's samples west of the river (Louisiana) brown shrimp catches were also low with the largest catch rate of 18.3 lb/hr of 41-count shrimp occurring

off Vermilion Bay in 16 fm. Catches of white shrimp were extremely low, with all catches less than 2.0 lb/hr. Finfish catch rates were also low with the largest catch rate of 2,330 lb/hr taken on July 10 with Atlantic croaker predominating.

Moderate catches of brown shrimp were made off Texas from June 2 to July 7. The largest catch rate occurred June 29 in waters off Matagorda Bay in 16 fm (57.1 lb/hr of 71-count shrimp). White shrimp catches off Texas were low with the largest catch, 26.5 lb/hr of 15-count shrimp, also taken off Matagorda Bay in 6 fm. Catch rates for pink shrimp were also low off Texas, though the largest catch was 69.3 lb/hr of 32-count shrimp off the lower Laguna Madre in 8 fm. Finfish catch rates were low in Texas inshore and offshore waters. The largest catch of finfish was 2,115 lb/hr in 6 fm off Matagorda Bay with Atlantic croaker predominating.

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 1986-1996 and in the current year covered Gulf waters from Florida Bay to Brownsville, Texas. Vessels from Florida, Alabama, Mississippi, Louisiana, and the NMFS surveyed Gulf waters from September-October. Stations are located along a 30-minute latitude/longitude grid from inshore waters to the shelf edge.

The NOAA Ship CHAPMAN sampled stations from Tampa Bay, Florida to Brownsville, Texas at depths from 5 to 100 fm. The R/V VERRILL 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. And Florida's R/V SUNCOASTER sampled stations off Tampa Bay south to the Florida Straits area.

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. In addition, hydrographic sampling included chlorophylls, salinity, temperature and dissolved oxygen from surface, mid-water, and bottom, and water transparency and water color was conducted at each station. Right bongo samples collected by the NMFS and the Gulf States will be transshipped to the Polish Sorting and Identification Center. 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 will be provided to the SEAMAP Archiving Center.

Fall Shrimp/Groundfish Survey

The Fall Shrimp/Groundfish Survey was conducted from October - December 1997, from off Mobile, Alabama to the U.S.-Mexican border. Vessels sampled waters out to 60 fm, covering a total of 359 trawl stations, in addition to plankton and environmental sampling.

Sampling design was similar to the Summer Shrimp/Groundfish Survey. The objectives of the survey were to:

- 1) sample the northern Gulf of Mexico to determine abundance and distribution of demersal organisms from inshore waters to 60 fm;
- 2) obtain length-frequency measurements for major finfish and shrimp species to determine population size structures;
- 3) collect environmental data to investigate potential relationships between abundance and distribution of organisms and environmental parameters; and
- 4) 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 stations in offshore waters and territorial Louisiana and Texas waters. The R/V VERRILL sampled stations in Alabama territorial waters. The R/V TOMMY MUNRO sampled stations in Mississippi territorial and offshore waters. The R/V PELICAN sampled stations in Louisiana territorial and offshore waters. Texas vessels sampled stations within their territorial waters.

In addition, ichthyoplankton data were collected by NMFS and Louisiana vessels at sample sites occurring nearest to half-degree intervals of latitude/longitude. The samples, except those taken by Louisiana, will be sorted by the Polish Sorting and Identification Center. Once sorted, the specimens and data will be archived at the SEAMAP Archiving Center.

INFORMATION SERVICES

Information from SEAMAP activities is provided to user groups through the program administration and three complementary systems: the SEAMAP Information System, SEAMAP Archiving Center 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 the SEAMAP Information System, SEAMAP Archiving Center and SIPAC; and program information.

SEAMAP Information System

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, managed in conjunction with the NMFS Southeast Fisheries Science Center (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 1982-1996 have been entered into the system, and data from 1997 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 requesters, although the highest priority is assigned to SEAMAP participants. A total of 206 SEAMAP data requests have been received and processed. In some instances, requests were filled promptly; in many cases, however, a substantial lag occurred because of the extremely large amount of data being collected on an increased number of surveys over those of past years. Requested SEAMAP data were used for a multitude of purposes in 1997 including 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 1994 and 1995 SEAMAP Biological and Environmental Atlas; and comparing catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets.

The 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 system decreases the time necessary to enter and retrieve data and provides powerful and flexible local data analysis and display capabilities.

Under the system, each SEAMAP site enters, verifies, and edits their data, eliminating the mail-oriented loop necessary to enter/edit/verify data. 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 system, outside users (e.g., Minerals Management Service, U.S. Army Corps of Engineers, etc.) may 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.

A major function of the SEAMAP Information System in 1997 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. These plots were also available through the SEAMAP home page. 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 lowest taxa level possible by the Polish Sorting and Identification Center are returned to the SEAMAP Archiving Center for archiving and loan to researchers. For 1997, approximately 12,870 vials have been returned from the Polish Sorting and Identification Center. Data entry for 6,407 of the returned sorted samples has been completed in an improved and simplified SEAMAP data management system. Samples cataloged to date represent 18 orders, 126 families, 235 genera, and 245 species.

The SEAMAP Archiving Center, which is managed in conjunction with Florida Department of Environmental Protection (FDEP) in St. Petersburg, Florida, processes both specimen loans and requests for associated plankton survey environmental data. The FDEP has completed renovations on the existing building which houses the SEAMAP Archiving Center, which will allow for expansion of the climate-controlled storage area and upgrading to current fire codes. The SEAMAP Archiving Center personnel, in cooperation with other staff from FDEP, have completed the spring and fall ichthyoplankton surveys.

SEAMAP Invertebrate Plankton Archiving Center

The SIPAC is in its thirteenth year of operation. The overall mission of the SIPAC, to archive and manage the large collection of plankton samples acquired during SEAMAP cruises and to obtain specimens and/or data on selected invertebrate larval stages from those samples, continued during 1997. The SIPAC continues to provide unsorted plankton samples and data or specimens of larval invertebrates to qualified researchers upon request.

During 1997, a total of 655 SEAMAP plankton samples were received and logged into the SIPAC database. The number of samples currently cataloged in the SIPAC collections is 6,268, and there are currently 146 samples on loan to various personnel throughout the Southeast Region

In an effort to keep the space required to house the SIPAC collection of unsorted plankton samples to a minimum, samples that have been in the collection for over seven years and duplicate samples sorted and received from the Polish Sorting and Identification Center are aliquoted. During 1997, approximately 100 samples from 1986 SEAMAP cruises were aliquoted. To date, approximately 1,550 samples collected from 1982 - 1986 have been aliquoted and prepared for long-term storage. Due to the recent addition of samples to the collection during 1997, there is currently no space available for additional samples to be deposited into the SIPAC archives.

During 1997, an inventory of sorted SEAMAP materials was prepared which summarizes holdings by cruise and taxa. A total of 36 samples was sorted, bringing the total number of samples sorted for invertebrates to 1,494, consisting of 6,333 lots. Unfortunately, due to lack of funding, SIPAC invertebrate sorting activities has been suspended.

During the next year, the SIPAC will continue to manage SEAMAP plankton collections, accession samples, and provide unsorted samples, sorted specimens and data from the collection to qualified researchers as requested. However, due to the resignation of the SIPAC post-graduate student and continual difficulties in retaining trained personnel to process samples, it is anticipated that no additional SEAMAP samples will be sorted for invertebrates in 1998. Efforts with sorted materials will concentrate on curation and analysis of current holdings and publication of distribution patterns of selected taxa by cruise.

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 included the Coordinator, Data Manager, SEAMAP Archiving Center Curator, SIPAC Curator, and the NMFS-Pascagoula Laboratory Director, serving as Program Monitor.

Planning

Major SEAMAP-Gulf Subcommittee meetings were held in March and October 1997 in conjunction with the spring and annual meetings of the GSMFC. All meetings included participation by various work group leaders, Coordinator, Data Manager, Program Monitor, and the GSMFC Executive Director. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in August 1997 to discuss respective program needs and priorities for FY1998.

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 1997. 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 1997:

-
- *1997 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, 1996 to September 30, 1997*. 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, 1995 to September 30, 1996*. A summary of FY1996 activities and proposed FY1997 events for the SEAMAP-Gulf, South Atlantic, and Caribbean Programs.
 - *Environmental and Biological Atlas of the Gulf of Mexico, 1994*. A compilation of information obtained from the 1994 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, 1995*. A compilation of information obtained from the 1995 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.
 - *Real-time Data Summaries, 1997*. Data summaries which show pounds/hour and counts of brown, pink and white shrimp caught and finfish catches during the SEAMAP Summer Shrimp/Groundfish survey.

David M. Donaldson
Program Coordinator

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

During the period covered by this report (January 1, 1997 - December 31, 1997), the GSMFC coordinated recreational fisheries programs throughout the Gulf of Mexico through funding provided by the administrative portion of the Federal Aid in Sport Fish Restoration Program, administered by the U.S. Fish and Wildlife Service. As a part of the program activities, the Program Coordinator sponsored and/or attended and participated in meetings and planning and development activities pertinent to carrying out responsibilities of this program. Minutes, general correspondence, meeting notices, agendas, and other required materials were prepared and distributed to the appropriate persons. A brief report on program progress follows.

ADMINISTRATIVE ACTION

By mutual agreement, beginning in June 1996, the GSMFC began providing the Region 4 Office of Federal Aid of the U.S. Fish and Wildlife Service with two reports per year regarding Grant Agreement GS-96 rather than quarterly reports as in past years. The first report each year will cover the period between January 1 and June 30, while the second report will cover the entire project year, from January 1 through December 31. There is a sixty day period following the reporting period to allow for report preparation and transmittal.

On December 9, 1996, the GSMFC submitted a grant amendment request to extend the 1996 grant period through December 31, 1997. The purpose for the requested time extension is to allow us to complete several of the activities that were scheduled for completion during 1996, but due to a number of unforeseen conflicts were not completed. Individual projects that were not completed during 1996 but will be completed in 1997 under the time extension amendment will be identified below in the project narratives.

1996 ACTIVITIES

Several activities scheduled for completion in 1996 were not completed and had to be extended into 1997. Those activities include:

- Pascagoula River contaminants study - This study was initiated in early 1997 and has been completed. A final report from that study will be available within the first 90 days of 1998.
- Artificial reef data base - The TCC Artificial Reef Subcommittee has been working throughout 1997 to enter selected data elements into a regional artificial reef data base. The data bases have been transferred to the GSMFC. Work will be done to make sure that entries are compatible, and final data base formats will be established. The data base is expected to be available for use within the first 90 days of 1998.
- Striped bass data base - The striped bass data base was established in May 1997. The GSMFC expects to update the data base periodically. Many of the data elements are related to striped bass collected during routine striped bass production and monitoring activities.
- Bibliographic data base - This project was designed to enter annotated bibliographic information into ProCite, a literature data base program. The data represent all references that were used to complete interjurisdictional fishery management plans developed under the auspices of the GSMFC Interjurisdictional Fisheries Management Program. Also included in this data base will be all other publications developed by the GSMFC. The first stage of this project has been completed.

All 1996 projects that were carried over into 1997 have been completed.

Artificial Reef Activities

In 1993, the GSMFC TCC Artificial Reef Subcommittee began a three year initiative to develop guidelines for the use of materials of opportunity for artificial reef development. At the end of 1995, the final scheduled year, the document was not complete, and we requested the opportunity to complete the document during 1996. We received approval to continue to work on the document, and as of the end of 1996, it was completed. During the GSMFC 1996 Annual Meeting, the Commission approved the document and authorized staff to proceed with publishing. The GSMFC received 600 published copies of the document in April 1997 and distributed the bulk of those copies to the states for distribution. By July 1997, supplies were largely exhausted, and requests were continuing to be received by the GSMFC office and the states. Due to the overwhelming demand for the document, the GSMFC is using some of the 1997 funds to reprint an additional 600 copies of the document.

In conjunction with establishment of the data base as described above, we planned to republish the document entitled *A Profile of Artificial Reef Development in the Gulf of Mexico*. That document cannot be republished until after the data base has been established, because the data will be used to develop the tables that make up the content of the publication.

The TCC Artificial Reef Subcommittee began planning in late 1995 to revise the National Artificial Reef Plan. A number of meetings took place during 1996 in pursuit of that task. The Subcommittee is working in conjunction with the Artificial Reef Advisory Committee of the Atlantic States Marine Fisheries Commission (ASMFC) to complete this work. Also, the GSMFC is involving representatives from Puerto Rico, the Virgin Islands, and California in the revision process, since the plan must be national in scope. A full final draft of the revision has been completed. Activities will continue during 1998 to provide full federal and public reviews of the document, after which adoption of the newly revised plan will be requested. The GSMFC, the ASMFC, and the NMFS have been sharing in the costs of the activity.

Fishery Data Activities

As a part of the Recreational Fisheries Information Network (RecFIN), which was established in large part through the use of Federal Aid in Sportfish Restoration Administrative Funds, the Data Management Subcommittee (DMS) oversaw the development of a strategy for the Gulf States, through the GSMFC, to conduct the NMFS Marine Recreational Fishery Statistics Survey (MRFSS) in the Gulf of Mexico. While that goal has not yet been attained, developments during 1997 indicate that it will likely be attained beginning in January 1999. During 1998, the Program Coordinator will continue to work through the RecFIN to provide a transition from the current organizational configuration to conducting the survey through the states and coordinated by the GSMFC. Timely and reliable fisheries data will continue to be a high priority for the states and federal agencies charged with the management of marine, estuarine, and anadromous fishery resources in the Gulf of Mexico. In that regard, the GSMFC, through its programs, will continue to provide coordination of those important activities.

In July 1997, the GSMFC took delivery of the publication entitled *GIS Applications for Fisheries and Coastal Resources Management*. This publication is the proceedings of a symposium sponsored by the

GSMFC Sport Fish Restoration Administrative Program.

Anadromous Fish Activities

During February 4-9, 1997, the Program Coordinator attended and participated in the annual Morone Workshop, held in Chattahoochee, Florida. The purpose of the workshop is to annually discuss activities related to collection of striped bass brood stock, stocking of progeny, and evaluation of stocking efforts for the Apalachicola-Chattahoochee-Flint River System. This program is particularly important to the Gulf of Mexico coordinated effort to restore striped bass in coastal waters, because the states prefer using fish of Gulf genetic origin for stocking if they are available. Also, there is an effort underway to establish several reservoir systems in Louisiana and Texas as brood stock sources for future striped bass restoration work.

The allelic heterozygosity for striped bass samples collected in Gulf of Mexico drainages are being evaluated during 1997, the second year of a three year study. The project is on schedule, and a second year interim report of 1997 activities will be available during the first 90 days of 1998.

The FWS Regional Office in Atlanta provided funding to assist in sponsoring a workshop to examine management and restoration activities for striped bass in the Gulf of Mexico region over the past several years. The Subcommittee discussed timing and content of the workshop for recommendations to the Regional Office. Due to issues discussed below, the GSMFC recommended to the FWS that the workshop be delayed until fall 1998. The funds for that activity will be carried over and utilized during 1998.

The survey to identify and document non-point and point sources of pollution in the Pascagoula-Leaf-Chickasawhay River system was scheduled to be completed during 1996; however, due to unforeseen circumstances, the work was not initiated. That project was initiated early in 1997 and has been completed. As discussed above, a completion report will be available within the first 90 days of 1998.

Through the efforts of the FWS, Recreational Fishery Stewardship Program funds were made available to conduct field work related to striped bass restoration in the Apalachicola-Chattahoochee-Flint, Pascagoula-Leaf-Chickasawhay, and Pearl River Systems, all Gulf drainages. The TCC Anadromous Fish Subcommittee is providing coordination of those

activities through the GSMFC. Projects began in July 1997 and are slated to run for three years. The delaying of the workshop, mentioned above, was necessary because the states wanted to complete at least one year of the stewardship projects before holding a workshop.

The Program Coordinator met several times with representatives of the U.S. Geological Survey in Jackson, Mississippi, to discuss the temperature survey of the Pascagoula River System. The project was conducted during August and September 1997, and all resulting products have been delivered to the GSMFC. The data collected are in GIS format to allow for mapping of the distribution of temperatures. The data from this project will be combined with the data from the contaminants study, discussed above, to enhance evaluation of the Pascagoula River System as striped bass habitat.

Fisheries Habitat

In 1996, the U.S. Congress passed significant amendments to the Magnuson-Stevens Fishery Conservation and Management Act, including provisions to identify, describe, enhance, and protect essential fish habitat (EFH). While the Act establishes federal fishery management policies, fisheries habitat is largely located within state jurisdictional waters, a situation which represents the potential for conflict if there is not close coordination between the federal agencies and the states. Also, the GSMFC plans to incorporate the activities related to EFH into GSMFC programmatic activities. In that regard, during 1997, the Program Coordinator has been integrally involved in developing guidelines to implement the EFH provisions. The Program Coordinator has been instrumental in establishing a joint habitat program between the GSMFC and the Gulf of Mexico Fishery Management Council to address EFH and other, broader habitat issues. Among the activities of this program will be to establish habitat content requirements for interstate fishery management plans for the GSMFC.

Miscellaneous

January 13, 1997. The Program Coordinator provided a briefing to the Gulf of Mexico Program, sponsored by the Environmental Protection Agency at Stennis Space Center, regarding the programs of the GSMFC, including the Sport Fish Restoration Administrative Program.

March 14-16, 1997. The Program Coordinator attended and participated in the mid-year meeting of the International Association of Fish and Wildlife Agencies held in Washington, D.C.

March 17-21, 1997. The Program Coordinator attended and participated in the Spring Meeting of the Gulf States Marine Fisheries Commission held in Biloxi, Mississippi.

April 3, 1997. The Program Coordinator attended a meeting at the Gulf Coast Research Laboratory to identify data sources for inclusion in a large, national data base for environmental and habitat assessment.

July 1, 1997. The Program Coordinator met in Biloxi, Mississippi with representatives from Mississippi and Louisiana to discuss issues related to liability and artificial reef development.

July 23, 1997. The Program Coordinator participated in a symposium on essential fish habitat at Coastal Zone 97 Conference.

August 25, 1997. The Program Coordinator participated in an artificial reef symposium associated with the 1997 American Fisheries Society Meeting.

September 5-8, 1997. The Program Coordinator attended and participated in the annual meetings of the International Association of Fish and Wildlife Agencies.

October 13-17, 1997. The Program Coordinator attended and participated in the 48th Annual Meeting of the Gulf States Marine Fisheries Commission held in Gulf Shores, Alabama.

October 21, 1997. The Program Coordinator participated in a meeting sponsored by the Florida Department of Community Affairs to discuss artificial reef permitting.

*Ronald R. Lukens
Assistant Director*

INTERJURISDICTIONAL FISHERIES MANAGEMENT PROGRAM

The GSMFC Interjurisdictional Fisheries (IJF) Program staff continued to review previously developed FMPs and to monitor each state's progress in implementing management recommendations. The State-Federal Fisheries Management Committee (S-FFMC) reviews these findings annually at the annual meeting of the GSMFC. This is accomplished through activities that are described as follows for individual fisheries under IJF fishery management plan (FMP) development, revision, and review:

BLUE CRAB

The Blue Crab Technical Task Force (TTF) met formally twice in 1997 and three times as an informal work group. Actions included the discussion of current problems/possible solutions, compilation of recent data for descriptive and stock assessment purposes, and revision of the TTF roster to include potential candidates for the sociology section. A preliminary stock assessment was begun utilizing the Chesapeake Bay blue crab stock assessment as a template for the Gulf of Mexico. A request for proposals (RFP) was sent out for sociologic expertise in accordance with previous FMP recommendations. The TTF anticipates the completion of the blue crab FMP revision by fall 1998.

SPOTTED SEATROUT

The Spotted Seatrout TTF met once in September in conjunction with the Stock Assessment Team (SAT) to go over the spotted seatrout stock assessment. The spotted seatrout FMP continued to be drafted and revised. The TTF welcomed the addition of Dr. Robert Ditton as the sociology representative to the roster. The TTF moved the completion date to early - mid 1998.

FLOUNDERS

The GSMFC continued to facilitate the development of a FMP for flounder. The TTF for flounders met on three occasions during 1997 to review progress on assignments. The FMP sections regarding basic biology, fishery prosecution, fishery description, jurisdiction, and the economics of the fishery were drafted and reviewed. It was agreed upon by the TTF to petition the SAT to attempt an un-speciated stock assessment by geographic area. The TTF plans on a 1998 publication date.

STOCK ASSESSMENT TEAM

The SAT met twice during 1997. The first meeting was dedicated almost entirely to spotted seatrout with discussions of the progress on individual state assessments being the primary focus. The feasibility of a flounder stock assessment was also discussed. It was decided that due to the lack of speciated data, a stock assessment for the gulf and southern flounders was neither appropriate nor possible. The stock assessment would be limited to the southern flounder. A stock assessment has already been completed by Louisiana, and the GSMFC agreed to fund a Texas assessment. The SAT agreed to summarize data for Mississippi, Alabama, and Florida to describe the flounder stock east of the Mississippi River.

At the second meeting, the SAT reviewed the completed individual state stock assessments for spotted seatrout. The SAT worked out the final details with the Spotted Seatrout TTF and determined remaining data needs and developed a time-line for completion of the stock assessment. In addition, they reevaluated the flounder stock assessment and reported on the progress by Texas. It was agreed that since the existing data was poor for a Gulf-wide assessment of flounder, Texas would complete its state stock assessment for flounder. Florida's stock assessment for flounder, although crude, would also be included in the summary for the northern Gulf.

HABITAT SUBCOMMITTEE

The TCC Habitat Subcommittee convened at the GSMFC Spring Meeting. The TCC discussed the three FMPs which are currently being developed or revised. There was some discussion with regard to the structure of the habitat sections which will depend on the federal requirements set by EFH provisions. Progress was made in securing Habitat Subcommittee representation on FMP TTFs and in coordinating development/revision of habitat sections of FMPs by that subcommittee.

The Blue Crab TTF had indicated concern that habitat might be a limiting factor for blue crabs and would require a more extensive treatment than the previous FMP. As a result, the revision of the habitat section was halfway to being complete. It was agreed that water quality would be addressed in much greater detail in the revision of the habitat section of the FMP.

The habitat section of the spotted seatrout FMP would glean information from the spotted seatrout profile for Louisiana. Habitat characteristics and the associated environmental data was received from Mississippi's fishery independent monitoring data set housed at the Gulf Coast Research Laboratory. This data will be the template for the remaining Gulf States fishery independent data.

OTHER ACTIVITIES

The Law Enforcement Committee met in January regarding regulation of interstate transportation of marine products. The group was presented with several transportation scenarios and possible resolutions and discussed the impact of the Lacey Act on state's rights to prosecute fish and wildlife offences.

An Ad Hoc Legal Panel also convened in January to discuss and eliminate confusion over the NOAA/NMFS Fisheries Penalty Schedules Revision.

Mr. James J. Duffy and Mr. Steven J. VanderKooy served as IJF Program Coordinator during 1997. The position of coordinator was vacant for

approximately three weeks in June 1997. The transition from Mr. Duffy to Mr. VanderKooy was rapid with no impact on the progress of the program and no compromise in budget period accomplishments. Ms. Cynthia B. Yocom served as the program assistant during 1997. During 1997, the IJF Program staff continued to provide numerous copies of existing FMPs, profiles, amendments, and revisions and distributed information upon request.

In addition, the GSMFC IJF staff conducted all administrative aspects of TTF and other committee work as proposed. Program administration included financial and logistic support for all IJF-related meetings; production, duplication, and distribution of all documentation and correspondence related to FMP development; and provision of accountability reporting to the funding agency.

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. Additionally, this information is continually being used by the states in their respective programs.

*Steven J. VanderKooy
Program Coordinator*

**COMMERCIAL FISHERIES INFORMATION NETWORK (ComFIN)
and
SOUTHEAST RECREATIONAL FISHERIES INFORMATION NETWORK [RecFIN(SE)]**

The Commercial Fisheries Information Network (ComFIN) and the Southeast Recreational Fisheries Information Network [RecFIN(SE)] are programs to establish a state-federal cooperative program to collect, manage, and disseminate statistical data and information on the marine commercial and recreational fisheries of the Southeast Region.¹

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, 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 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 commercial and recreational fishery data in the Region began in the mid to late 1980s. In 1992, the NMFS 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). Upon signing the MOU, a RecFIN(SE) Committee was established.

In 1994, the NMFS initiated 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) developed a MOU and a draft framework plan for the ComFIN. During the development of the ComFIN MOU, the SCSC, in conjunction with the RecFIN(SE) Committee, decided to combine the MOU to incorporate the RecFIN(SE). The joint MOU creates the Fisheries Information Network (FIN) which is

composed of both the ComFIN and RecFIN(SE). The MOU confirmed the intent of the signatory agencies to participate in implementing the ComFIN and RecFIN(SE).

The scope of the ComFIN and RecFIN(SE) includes the Region's commercial and recreational fisheries for marine, estuarine, and anadromous species, including shellfish. Constituencies served by the program are state and federal agencies responsible 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 (NPS), the U.S. Fish and Wildlife Service, and the NOAA National Marine Sanctuaries Program. Benefits which accrue to management of fisheries will benefit not only commercial and recreational fishermen and the associated fishing industries, but the resources, the states, and the nation.

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 Region and to support the development of an inter-regional program. The four goals of the ComFIN include to plan, manage, and evaluate commercial fishery data collection activities; to implement a marine commercial fishery data collection program; to establish and maintain a commercial fishery data management system; and to support the establishment of a national program.

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) are to plan, manage, and evaluate recreational fishery data collection activities; to implement a marine recreational fishery data collection program; to establish and maintain a recreational fishery data management system; and to support the establishment of a national program.

PROGRAM ORGANIZATION

The organizational structure consists of the FIN Committee, the ComFIN and RecFIN(SE)

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

Committees, three geographic subcommittees (Caribbean, Gulf, and South Atlantic), standing and ad hoc subcommittees, technical work groups, and administrative support.

The ComFIN and RecFIN(SE) Committees consist of the signatories to the MOU or their designees, and are responsible for planning, managing, and evaluating the program. Agencies represented by signatories to the MOU are the National Marine Fisheries Service, U.S. Fish and Wildlife Service, National Park Service, Alabama Department of Conservation and Natural Resources, Florida Department of Environmental Protection, Georgia Department of Natural Resources, Louisiana Department of Wildlife and Fisheries, Mississippi Department of Marine Resources, North Carolina Department of Environment, Health, and Natural Resources, Puerto Rico Department of Environmental and Natural Resources, South Carolina Department of Natural Resources, Texas Parks and Wildlife Department, U.S. Virgin Islands Department of Planning and Natural Resources, Caribbean Fishery Management Council, Gulf of Mexico Fishery Management Council, South Atlantic Fishery Management Council, Atlantic States Marine Fisheries Commission, and Gulf States Marine Fisheries Commission.

The ComFIN and RecFIN(SE) Committees are divided into three standing subcommittees representing the major geographical areas of the Region: Caribbean, Gulf, and South Atlantic. These subcommittees are responsible for making recommendations to the Committees on the needs of these areas. Standing and ad hoc subcommittees are established as needed by the ComFIN and RecFIN(SE) Committees to address administrative issues and technical work groups are established as needed by the Committees to carry out tasks on specific technical issues. Coordination and administrative support of the ComFIN and RecFIN(SE) is accomplished through the Gulf States Marine Fisheries Commission.

PROGRAM ACTIVITIES

The ComFIN and RecFIN(SE) are comprehensive programs comprised of coordinated data collection activities, an integrated data management and retrieval system, and procedures for information dissemination. Activities during 1997 were associated with addressing issues and problems regarding data collection and management and developing strategies for dealing with these topics. In addition to ComFIN and RecFIN(SE) activities,

ongoing marine commercial and recreational fisheries surveys were conducted by the various state and federal agencies involved in these programs. The ComFIN and RecFIN(SE) Committees reviewed and evaluated progress towards the integration of these surveys into the respective programs.

ComFIN and RecFIN(SE) Committees

Major ComFIN and RecFIN(SE) meetings were held in March and September 1997. The major issues discussed during these meetings included:

- identification and continuation of tasks to be addressed in 1997 and instruction to Committees, Administrative Subcommittee and the Data Collection, Future Needs, Biological/Environmental, Social/Economic, and ad hoc work groups to either begin or continue work on these tasks;
- development and completion of the 1997 ComFIN and RecFIN(SE) Operations Plans which presented the year's activities in data collection, data management, and information dissemination as well as development of a five-year time table;
- development of the 1998 ComFIN and RecFIN(SE) Operations Plans;
- review of activities and accomplishments of 1997;
- continued evaluation of adequacy of current marine commercial and recreational fisheries programs for ComFIN and RecFIN(SE) and development of recommendations regarding these programs;
- review findings of and receive recommendations from technical work groups for activities to be carried out during 1998;
- preparation and submission of a proposal for financial assistance to support activities of the ComFIN and RecFIN(SE); and
- continued internal evaluation of the program.

Subcommittee and Work Groups

ComFIN and RecFIN(SE) subcommittees and work groups met this year to provide recommendations to the Committees to formulate administrative policies, address specific technical issues for accomplishing many of the ComFIN and RecFIN(SE) goals and objectives, and examine other issues as decided by the Committees. Their activities included:

- RecFIN(SE) MRFSS Data Review Work Group met in February 1997 to develop a process for the annual review of the MRFSS data. This process will outline the criteria, protocols, and time frames

that will be used to review the data before they become final.

- RecFIN(SE) Social/Economic Work Group met in June 1997 (via conference call) to review the data elements of the market module for the commercial data collection program designed by the ComFIN and discuss RecFIN(SE) participation in the ASMFC Economic and Social Sciences workshop.
- RecFIN(SE) Biological/Environmental Work Group met in July 1997 to elect a new work group leader, discuss the development of a data collection funding initiative in the Caribbean, review the RecFIN(SE) Quality Assurance/Quality Control (QA/QC) document, review and develop metadata criteria, and examine the duplicative marine recreational data collection activities in the Southeast Region.
- ComFIN Future Needs Work Group met in August 1997 to develop a generic trip ticket system for the collection of commercial fisheries data as well as to discuss the development of the NMFS Fishery Information System (FIS). Information regarding the trip ticket programs of Florida and North Carolina, the proposed trip ticket system for Louisiana, the trip ticket program developed by the Atlantic Coastal Cooperative Statistics Program (ACCSP), and information developed by the Gulf of Mexico Subcommittee concerning a trip ticket system was provided to the group to assist in the development of the system. The purpose of the trip ticket program is to identify the universe of commercial fishermen. The group also discussed the use of a single versus multiple forms for the trip ticket system. It was decided that the number of forms that would be used should be determined by the state as long as at least the minimum data elements for the system were collected.
- ComFIN Data Collection Work Group met in August 1997 to develop a bycatch module for the commercial fisheries data collection program in the Southeast Region, discuss the market module of the commercial data collection program being developed by ComFIN, compare Louisiana's proposed trip ticket data elements to the NMFS Gulf Shrimp Program and discuss the Fishery Information System (FIS).
- FIN Administrative Subcommittee met in September 1997 (via conference call) to discuss the development of a criteria for marine recreational fishing licenses and development of a justification document which outlines the need for marine recreational fishing licenses and develop a list of potential candidates to serve on an advisory work group for RecFIN/ComFIN.
- ComFIN Data Collection Procedures Work Group

met in September 1997 (via conference call) to discuss the further development of a data collection procedures document for commercial fisheries. The group will continue working on this issue in 1998.

- RecFIN(SE) Data Review Work Group met in September 1997 (via conference call) to develop guidelines for reviewing the MRFSS data. The group has already developed a process for reviewing the data which was approved by the RecFIN(SE) Committee and needs to determine the mechanisms to review the data.

Coordination and Administrative Support

Working closely with the Committees in all aspects of program coordination, administration, and operation was a major function of ComFIN and RecFIN(SE) coordination and administrative support. Other important coordination and administrative activities included but were not limited to providing coordination and logistical support, including communications and organization of meetings for the Committees, subcommittees, and work groups; serving as liaison between the Committees, other program participants, and other interested organizations; preparing annual operations plans under the direction of the Committees; preparing and/or supervising and coordinating preparation of selected documents, including written records of all meetings; and distributing approved ComFIN and RecFIN(SE) information and data in accordance with accepted policies and procedures.

Information Dissemination

Committee members and staff provided program information in 1997 via a variety of different methods such as distribution of program documents, presentation to various groups interested in the ComFIN and RecFIN(SE), and the Internet:

- ComFIN Committee. 1996. *1997 Operations Plan for Commercial Fisheries Information Network (ComFIN)*. Gulf States Marine Fisheries Commission, Ocean Springs. 8 pp + appendix.
- FIN Committee. 1997. *Annual Report of the Fisheries Information Network for the Southeastern United States (FIN) January 1, 1996 - December 31, 1996*. No. 44 Gulf States Marine Fisheries Commission, Ocean Springs. 16 pp + appendices.
- RecFIN(SE) Committee. 1997. *1997 Operations Plan for Recreational Fisheries Information Network for the Southeastern United States*

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- RecFIN(SE)*. Gulf States Marine Fisheries Commission, Ocean Springs. 17 pp + appendix.
- ComFIN and RecFIN(SE) articles in the ASMFC and GSMFC newsletters.
 - Variety of informal discussions occurred throughout the year during ASMFC, GSMFC, NMFS, and other participating agencies meetings and workshops.
 - NPS personnel periodically provided information concerning the ComFIN and RecFIN(SE) (meeting

notices, available documents, etc.) to the EPA's Gulf of Mexico Program computer Bulletin Board System.

- The NMFS has begun the development of an user-friendly data management system for the MRFSS.
- The GSMFC has developed a homepage for the world wide web which provides programmatic information regarding ComFIN and RecFIN(SE).

*David M. Donaldson
Program Coordinator*

**JOINT GSMFC/GULF OF MEXICO FISHERY MAANGEMENT COUNCIL (GMFMC)
HABITAT PROGRAM**

A joint Habitat Program between the GSMFC and GMFMC began in 1997. This program was developed to better enable habitat protection in the Gulf of Mexico.

The first responsibility of the joint program was to assist the GMFMC in drafting Essential Fish Habitat (EFH) amendments as directed by the Magnuson-Stevens Fishery Conservation and Management Act. Writing the marine habitat section of the EFH amendment was the primary focus of the Habitat Program. In November, the first draft was distributed to a special EFH Technical Review Panel appointed by the Council.

The Joint Habitat Program coordinated the GMFMC Habitat Protection Advisory Panels. The Texas and the Florida/Alabama Habitat Protection Advisory Panels met in November 1997. Both meetings were productive, and timely and interesting issues were discussed.

In December 1997, the EFH Technical Review Panel met to review the draft EFH amendment. This was the first review of the amendment, and all reviewers felt that the amendment was headed in the right direction. State representatives to the Technical Review Panel agreed to revise sections with current state information. The EFH amendment will be returned to the EFH Technical Review Panel in March 1998. The second draft will be reviewed during meeting in April 1998. The EFH amendment will be distributed for public comment in summer 1998, and the finalized EFH amendment will be submitted to the NMFS for approval in early October 1998.

The program also monitored the GMFMC Habitat Protection Committee, and the responsibility of working with this committee grew during the year. The GSMFC TCC Habitat Subcommittee scheduled a meeting in March 1998 to review the EFH amendment. This meeting should provide critical comments and updated information to improve the EFH document.

*Jeffrey K. Rester
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 41 employees of the Administrative, Enforcement, and Fisheries sections during fiscal year 1997.

SIGNIFICANT ACCOMPLISHMENTS

Red snapper were successfully raised at the Claude Peteet Mariculture Center again this year. Samples were taken throughout the experiment to determine the food utilized by the snapper fry. This information will enable the division to raise more snapper for use in future experiments to improve the mariculture of this animal and learn more about its behavior in the wild.

The artificial reef zones offshore from Alabama were expanded almost 100 percent. This will enable fishermen to create more artificial reefs in a greater variety of depths. The artificial reef protocol was modified to enhance reef construction and greater cooperative procedures were developed with the U.S. Army Corps of Engineers, Marine Police Division and the United States Coast Guard to increase surveillance and enforcement of reef building activities.

A survey of recreational anglers was conducted and the information collected will be used in an assessment of the adult fish populations.

A cooperative survey of Alabama's charter boat industry was begun with the GSMFC to increase the amount of data collected to characterize Alabama's reef fish fishery.

BUDGET AND EXPENDITURES

A total expenditure of \$3,043,477 was made from the approved budget of \$3,265,416. Revenue of \$2,822,244 was made from federal aid (25%), license fees (52%), marine gas tax (13%), and other sources (10%).

The Administrative Section expended \$788,028 of salaries and operational expenses for division activities. Portions were reimbursed under federal aid to fisheries programs.

Expenditures for the Enforcement Section totaled \$886,801, of which \$25,000 was reimbursed by a grant from the NMFS.

Fisheries Section expenditures were \$886,976 which consisted of funds from five federal aid programs and required state matching funds. Federal funds reimbursed \$797,267 of the total expenditures. Federal aid projects varied in state match requirements from zero to 25%. Included in these expenditures, in addition to the normal expenditures, were shell planting activities, and boating access area upkeep and renovation.

SIGNIFICANT PROBLEMS AND SOLUTIONS

Negotiations began this year to close a portion of Mobile Bay to shrimping and address a number of other gear related problems. A set of proposals was presented to various concerned user groups for their input. These comments and consideration are being summarized for use in developing regulations to correct problems.

Abuse of the privileges granted under the live bait law continue to cause tremendous user conflict between recreational fishermen, commercial shrimp fishermen, and live bait fishermen. Meetings between the different groups failed to produce consensus toward development of regulation and legislative changes to reduce the present abuse. Efforts will continue to find solutions to the problems.

The northern Gulf of Mexico including Alabama experienced its first "red tide" during the late fall of 1996. This caused closure of the oyster reefs for five weeks due to the presence of the organisms and toxins. The cause of "red tide" are not known though it is the result of a bloom of a toxic dinoflagellate plankton. Cooperative efforts with the Alabama Department of Health monitored the event and prevented any human health problems. The Department of Health continues to monitor for any future occurrence of such an event.

Hurricane Danny caused a 57% loss of oyster resources this year. This was due to a combination of physical stress created by the severe surf conditions on the reef and being washed from the reef into surrounding mud. The oyster resources will be aided in their recovery by planting cultch material on the reef

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- Continue to review enforcement policies and procedures for consistency and uniformity.
 - Improve coastal enforcement coordination and cooperation with other divisions and federal agencies.

FISHERIES SECTION

The activities of the Fisheries Section are directed toward management of commercial and recreational fisheries in Alabama's marine and estuarine waters. This involves cooperative efforts with the National Marine Fisheries Service in near shore federal waters in the Gulf of Mexico and with other Gulf of Mexico state agencies to develop cooperative fisheries management programs. These activities are mostly funded through federal aid programs of the U.S. Departments of Commerce (NMFS) and Interior (U.S. Fish and Wildlife Service). Biological programs not covered by federal aid such as fish kills, oyster management, shrimp management and pollution investigations are supported by commercial and recreational license fees.

Fisheries' facilities consist of the Claude Peteet Mariculture Center in Gulf Shores and the Marine Resources Laboratory on Dauphin Island. Personnel consisted of one biologist V, one biologist IV, one biologist III, one biologist II, one biologist I, four biologist aides III, seven biologist aides I/II, one administrative support assistant, two biweekly laborers, and three temporary laborers.

Accomplishments

Funds provided by the sale of oyster tags enabled the Marine Resources Division to conduct an oyster shell gathering/planting program that served both as a biological enhancement to the oyster resource as well as a positive interaction between resource users and management. The division planted 4,000 cubic yards of oyster shell on areas of Cedar Point Reef and in Portersville Bay in the summer of 1997. The shell had been collected from Alabama oyster processors as part of Alabama's ongoing oyster reef enhancement project.

Red snapper, one of Alabama's most valuable reef fish, were raised at the Claude Peteet Mariculture Center during a joint project with Auburn University for the second year. This year the project concentrated on investigations of the diets of the fry and in improving their survival. Further plans include overwintering to achieve taggable size fingerlings.

This will create new opportunities both in mariculture and management of the species.

A cooperative project with Auburn University at the Claude Peteet Mariculture Center investigated the possibility of raising shrimp in ponds at increased densities using auxiliary aeration techniques. This resulted in a harvest of an average of approximately 2,500 pounds of large shrimp per pond for a total of 10,950 pounds.

During the year, 889 fisheries assessment samples were taken, 169 habitat assessments were performed, and 2,614 fishermen were interviewed during creel surveys.

Federal Aid

Sports Fish Restoration. These funds are administered through the U.S. Fish and Wildlife Service. The Marine Resources Division directed funds toward a creel survey of Alabama's saltwater recreational anglers; construction of artificial fishing reefs in the Gulf of Mexico offshore from Alabama; maintaining equipment and facilities in Gulf Shores and Dauphin Island; managing the public artificial fishing reef permits issuing system in the Gulf of Mexico off Alabama; holding public meetings on making artificial reefs; maintaining and enhancing boat ramps for boating access; and conducting the cooperative red snapper project with Auburn University.

Cooperative Statistics. Federal aid funds for this program are administered by the NMFS, Department of Commerce and are utilized by the Marine Resources Division to collect data on commercial shrimp, oyster, crab, and finfish landings. Additionally, information on processed seafood such as picked crab meat is compiled. Landings information was collected on fish, shrimp, crabs, and oysters. Biological information was collected on blue crabs, striped mullet, red snapper, and Spanish mackerel. Commercial license information was kept in a computer data base. The cooperative statistics project began monthly dealer mail-in forms for those dealers not visited by port agents. Two Alabama port agents, an administrative support assistant, and a fisheries statistician are involved with this project, and the NMFS has a port agent involved with the project in Mobile County. All landings are processed on a monthly basis for inclusion in Alabama's data base and forwarded to the NMFS.

and along the edges of the reef next spring to catch the fresh spat.

ADMINISTRATIVE SECTION

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.

Staff for the Administrative Section consisted of the division director, four administrative support assistants, one clerk, one account clerk, one laborer, and one marine mechanic employee for the majority of the year. Offices are maintained at Dauphin Island, Gulf Shores, Bayou La Batre, and Montgomery.

Accomplishments

Working in a liaison capacity between commercial fishermen, sports fishermen, U.S. Army Corps of Engineers, Minerals Management Service, and the U.S. Coast Guard, a significant expansion was created to Alabama's artificial reef development area in the Gulf of Mexico.

Coordination with federal and other state agencies resulted in nearly 2.5 million dollars in federal disaster funding for restoration of Alabama's marine resources affected by natural disasters including hurricanes and red tide.

A computerized commercial license system was improved and installed at each of the three division offices. The system will reduce double entry and increase accuracy.

Future Plans

Legislation will be introduced to accomplish the following:

- Create a lifetime saltwater fishing license, with price proportional to the freshwater lifetime license. Contained in the proposed legislation will be a section providing an option for senior citizens to purchase a Lifetime Saltwater Fishing License similar to that now available for freshwater senior citizen fishermen.
- Increase the penalty for illegal deployment of artificial reef material in Alabama's territorial seas.
- Create authority for the Commissioner to establish by regulation new live bait areas.

- Create a cast net and gig license.
- Incorporate a saltwater spear fishing license into the current law and allow the sale at state license agents.

ENFORCEMENT SECTION

The Enforcement Section patrols Alabama's coastal waters, enforcing state and federal laws and regulations relating to the conservation and protection of marine resources. Officers also enforce laws and regulations relating to boating safety and freshwater fishing and hunting, conduct search and rescue missions, and participate in drug interdiction operations. Officers are cross-trained and deputized as NMFS enforcement officers and U.S. Customs agents. The Enforcement Section cooperates extensively with these and other federal agencies in the coordination of joint enforcement operations, investigative and fisheries enforcement expertise, training, public safety, and other natural resource issues.

Facilities for the Enforcement Section consist of headquarters at Dauphin Island and district offices in Bayou La Batre and Gulf Shores. There are a total of 15 enforcement officers in the section, nine stationed in Mobile County, five stationed in Baldwin County, and the Chief Enforcement Officer stationed at Dauphin Island headquarters. A critical need exists for additional personnel in both counties.

Accomplishments

Enforcement officers conducted 22,745 hours of boat and shore patrol; 17,360 boat checks; 1,001 seafood shop inspections; 11,079 recreational fishermen checks; and issued 695 citations for illegal activities. Forty-four percent of the citations issued were for violations of recreational fishing laws and regulations (304). Violations of commercial fishing laws and regulations (203) comprised 29% of the citations issued. Officers also issued citations for violations of boating safety (118), game and fish (37), and other state (31) and federal (2) laws and regulations.

Officers attended training courses on boat handling, criminal investigations, supervision, and other state and federal agency law enforcement programs.

Future Plans

- Develop mechanisms to improve public relations and better communicate important information.

Southeast Area Monitoring and Assessment Program (SEAMAP). Funds from this program are administered by the NMFS, Department of Commerce and are utilized in Alabama for the development of a long-term, fishery-independent data base on recreational and commercially important marine and estuarine fishery stocks. This project provides funds to manage the Alabama shrimp fishery and evaluate spawning success and juvenile survival for important recreational and commercial species. It also provides funds for a project to independently assess red snapper population by video camera and fish trap work. This study is being conducted in Alabama's offshore artificial reef permit areas in the Gulf of Mexico.

Non-Federal Aid. All reported "fish kills" were investigated by the division during the fiscal year, all were associated with low dissolved oxygen and principally affected menhaden.

Biological and enforcement personnel worked together to collect data at oyster checkpoints, enabling the development of sound management measures for sustaining the oyster resources. Data collected resulted in a brief closure of a portion of the public reefs to allow undersized oysters to reach harvestable size. The biological section monitored shell pick-up and planting activities in which 4,000 cubic yards of shop shell were planted on Cedar Point Reef.

Meetings were held with oil company representatives periodically to discuss options for completion of various projects. Biological personnel checked areas of proposed drilling platform locations

and associated pipeline corridors for potential impact to oyster resources for two oil companies.

A multifaceted cooperative project was accomplished with Auburn University involving the culture of shrimp, tilapia, and oysters. Shrimp culture concentrated on the high density production of shrimp with auxiliary aeration. Oyster research involved off bottom culture in ponds in conjunction with tilapia.

FUTURE PLANS

- The Fisheries Biological Section will collect appropriate data and work with recreational and commercial fishermen and other resource user groups to provide administrators with recommendations for strategies and regulations for management.
- Development of fishery independent assessment and monitoring of adult finfish by using multi-panel variable mesh gill nets will continue.
- Development of mariculture procedure for commercially important marine organisms will continue.
- Cooperative projects will be initiated with Auburn University, the Dauphin Island Sealab, and the University of South Alabama to investigate artificial reef materials suitability, red snapper production enhancement, oyster research, and crab larval settlement and survival.
- An enhanced monthly system for obtaining commercial fish dealer landings and out of state landings from Alabama waters will be continued.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF MARINE RESOURCES

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 Florida Department of Environmental Protection's (FDEP) liaison to the Florida Marine Fisheries Commission (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 FMFC rules, FDEP regulations, and information on marine resources to sport and commercial fishermen, (5) the issuance and reconciliation of commercial fishing licenses, (6) the administration of the lobster trap certificate program, (7) the oversight of landings for fisheries managed by quota with closure of the fishing seasons as quotas are reached, (8) civil penalty assessments for violations of certain fisheries regulations, (9) aquatic resource education and angler outreach, and (10) to act as FDEP technical liaison with local government mosquito control programs. Highlights of staff efforts in 1997 include the following:

Angler Outreach. Staff continued to provide information on fishing license requirements (both commercial and recreational), fishing opportunities, and locations, fish identification, and expenditure of revenues generated from the sale of fishing. During 1997, the outreach team participated in more than 26 scheduled outreach events. An estimated one million people were provided with educational material and marine ecological literature. Over 25,000 fish identification posters were distributed, and one million copies of "Fishing Lines" were distributed. An additional 60,000 brochures on marine resource related issues were distributed.

Aquatic Resource Education. During 1997, over 1,000 teachers completed an EcoVentures workshop. The Aquatic Resources Education Program was presented to various fishing clubs and interested parties. The marine resource's network was expanded through interaction with fishing clubs, civic clubs, and angler groups from around the state including the Florida League of Anglers and Coastal Conservation Association (CCA). Staff conducted ten Kids' Fishing Clinics where approximately 3,500 children, 1,700 parents, and 500 community volunteers participated.

Auditing. In 1996, a civil penalty assessment program for untagged crawfish traps was implemented. Sixty-five assessments have been issued for a total of 2,168 untagged traps resulting in \$18,975 in collected penalties. Another \$8,000 in penalties' assessments are still outstanding. A trap retrieval system was also implemented. Over 10,000 crawfish and stone crab traps were removed from federal waters during the closed season. The retrieval program has collected approximately \$43,000 in fees that will be used to operate future retrieval programs. Audits of wholesale and retail seafood product dealers continued with a total of 55,379,968 pounds of saltwater products being audited. The Audit Section supervised the Saltwater Licenses and Permits Section and assisted in the administration of the section. Processing time for license applications and spiny lobster trap tags has been reduced through implementation of new management practices.

Artificial Reefs. Twelve artificial reef construction projects involving deployment of steel vessels, concrete rubble, limestone rock, and concrete reef modules off four Atlantic coastal counties and eight Gulf Coast counties were completed in 1997. This was accomplished through a Federal Aid in Sport Fish Restoration grant. Another three East Coast counties completed reef construction projects using saltwater fishing license funds. Contract agreements for eight artificial reef projects using state saltwater fishing funds were executed. A total project amount encumbered was \$175,000 for six artificial reef construction projects using concrete, limestone, or engineered modules. Grant agreements for a side scan sonar project, and one reef complexity study were also executed. State saltwater fishing license funds and Federal Aid in Sport Fish Restoration funding was conceptually approved for sixteen artificial reef projects in 1997. One project was completed, and the remainder are scheduled for completion in 1998. A project to examine the socioeconomic impacts and user benefits of artificial reefs in the western Florida Panhandle was initiated in 1997 and is scheduled for completion in 1998.

A FDEP saltwater fishing license funded artificial reef research project, underway since 1990 off Cedar Key, completed the third year of a grouper (gag) residency and directed fishing impacts study on an

artificial reef in federal waters off the mouth of the Suwannee River.

In the western Florida Panhandle, the first private multi-square mile artificial reef permit application request (two areas, 160 square miles in federal waters, thirty square miles in state waters) was received by the Environmental Resources Permitting Section and the COE in fall 1997. The application request is currently under review.

Two large area pilot artificial reef sites in federal waters (under FDEP permit) continue to receive limited private use. In 1997, only six inspected private deployments were made bringing to twenty-three the number of inspected private reef deployments made in the sites since 1994. A 56.7 square nautical mile area off Okaloosa County was transferred to that county in

July 1994. Since 1994, an estimated 25 inspected private reef deployments have taken place in that site.

Florida participated in both the GSMFC and ASMFC artificial reef subcommittees during 1997 and assisted in the formalization of recommendations for revision to the Artificial Reef Plan for presentation to the commissions in March and April 1998, respectively.

Mosquito. Mosquito control liaison staff continue to closely communicate and coordinate with local mosquito control districts and other state and federal government entities to promote the safe and wise use of pesticides in and around the marine environment. Staff are also involved in evaluating the comparative merits of mosquito control efforts, including the use of adulticide chemicals versus use of larvicides in terms of impact on important fishery species, marine resources in general, and public benefit.

FLORIDA MARINE RESEARCH INSTITUTE (FMRI)

FINFISH

Gamefish and Directed Life History Studies

During 1997, the FMRI provided stock assessments on tarpon and snook to the FMFC. Progress was made describing the life history of bonefish. "Maturation and reproductive seasonality in bonefish, *Albula vulpes*, from the waters of the Florida Keys" was published in *Fisheries Bulletin* 95(3), and a manuscript entitled "Feeding habits on bonefish, *Albula vulpes*, from the waters of the Florida Keys," was accepted for publication in *Fisheries Bulletin*.

The manuscript "Reproduction of tarpon, *Megalops atlanticus*, from Florida and Costa Rican waters and notes on their age and growth" was accepted for publication in *Bulletin of Marine Science* 60(1). A manuscript entitled "Respiratory physiology of juvenile tarpon, *Megalops atlanticus*" was submitted to *Biological Bulletin*. Work on radiometric aging of tarpon was conducted but has not been completed. Scanning electron microscopy studies were conducted to estimate the duration of the tarpon larval phase.

A marine fisheries initiative (MARFIN) program study on the age, growth, and reproduction of black grouper was completed and accepted for publication in *Fisheries Bulletin*. The second year of a three-year MARFIN project to describe the age structure of offshore populations of mature red drum

was completed. Over 300 adult red drum were captured and aged; these collections will continue in 1998.

Snook were captured and tagged on both Florida's east and west coasts during the summer to estimate snook abundance. A manuscript is in preparation.

Over 1,500 spotted seatrout from Florida's east coast were captured to describe spawning frequency and estimate batch fecundity. Seatrout collections will continue through 1998. Collections of 10-15 permit each month were made in the Florida Keys, and these collections will continue through 1998. A paper describing Florida's river herring fishery was submitted.

Baitfish

In 1997, analyses of biological data on round scad (*Decapterus punctatus*) continued. An Salstonstall Kennedy (SK) grant provided funding to assess the status and trends of Florida's halfbeak fishery. Manuscripts describing the life history aspects of scaled sardine from the east and west coasts of Florida were completed and are in review. Two other manuscripts, "Association of baitfish species in relation to fish assemblages along the west central coast of Florida" and "Characteristics of the baitfish purse-seine fishery in Florida: past, present, and future" are in preparation.

A fourth acoustic/trawl survey was conducted along the Florida west coast to determine spatial distribution and abundance of important baitfish species such as Spanish sardine, Atlantic thread herring, round scad, and scaled sardine. The results of this survey have been used by the FMFC in the development of catch quotas for Spanish sardine in Florida.

Mullet

A study is being conducted to better understand the population dynamics and stock structures of mullet throughout the Gulf of Mexico and southeast United States. Monthly juvenile and adult monitoring sampling for mullet continued throughout this period in Tampa Bay and Charlotte Harbor regions. An update on the mullet fishery assessment included analyses of size/age distributions of adult populations, juvenile abundances indices, and catch and effort statistics for the post net ban period.

BIVALVE FISHERIES RESEARCH

Bivalve fisheries research encompasses bay scallops (*Argopecten irradians*), calico scallops (*Argopecten gibbus*), and hard clams (*Mercenaria* spp.) with consideration to other genera (e.g., *Chione*, *Macrocallista*) as needed. Assessment and monitoring of oysters (*Crassostrea*) are conducted by a separate branch of the FDEP.

Bay scallop research is directed toward assessing biological and environmental factors influencing the depletion of scallop populations in peninsular Florida. Adult abundance monitoring continues in Pine Island Sound, Anclote Estuary, Homosassa, and Steinhatchee in peninsular Florida and St. Joseph Bay and St. Andrews Bay/Sound in panhandle Florida. Recruitment monitoring suggests that recruitment limitation is preventing the recovery of depleted populations. Federal disaster relief funds have been requested to initiate a restoration program in the area between Anclote Estuary and Homosassa with the intent of enhancing larval availability and rates of recruitment. Restoration efforts are tentatively scheduled to begin July 1997. Two manuscripts concerning Florida bay scallop populations have been submitted, "Recruitment of bay scallops (*Argopecten irradians*) in Florida Gulf of Mexico waters: scales of coherence" and on seasonal dating of hard clam shells.

Geographic Information System (GIS) based techniques are applied to the management and development of the hard clam fishery in Florida.

Manuscripts concerning hard clam aquaculture were submitted including "Integrated resource management using geographic information system technology: shellfish aquaculture in Florida, USA," "Hard clam aquaculture in Florida: application of geographic information system technology to lease siting," "GIS modeling: coupling habitats to Florida fisheries," and "A history of quahoging."

The calico scallop industry continues to operate on a minimal and sporadic level. Unpredictable availability, coupled with competition from imported bay scallops, contribute to the limited economic exploitation of this fishery. Monitoring will continue; research efforts are dormant.

CRUSTACEAN FISHERIES RESEARCH

Staff conducted fisheries-oriented biological and ecological studies on crustacean species of economic importance to Florida. In collaboration with researchers from Auburn University, a manuscript describing the physiological effects of salinity and temperature of adult stone crabs was revised. A manuscript describing the history and trends in the Florida blue crab fishery was submitted for publication. Other manuscripts in preparation include one on the population biology and structure of stone crabs in northwest Florida waters and one demonstrating species-level differences between two color morphs of the deep-sea lobsterette. Field studies continued on the population biology of stone crabs in Tampa Bay. Studies were concluded on the physiological effects of temperature and salinity stress on juvenile stone crabs. Information on the degradation time of pressure-treated wooden slats used in building stone crab traps, bycatch in stone crab traps, and configuration of blue crab traps was provided to the FMFC. In cooperation with the Coastal and Marine Research Assessment group, maps are being prepared which integrate nearshore habitat and allowable shrimp zones for management of the shrimp fishery. Staff participated in workshops being conducted statewide for the purpose of defining shrimping zones in the nearshore waters of Florida.

FISHERIES GENETIC RESEARCH

The two principle directions of this research program are: genetic stock identification of economically important species of fish and invertebrates and monitoring the effects of FMRI Stock Enhancement Research Facility (SERF) hatchery operations on the genetic variability of wild redfish populations and monitoring the success of SERF stock restoration efforts. A manuscript describing the genetic

stock structure of Atlantic tarpon is in preparation. Studies of the genetic stock structure of blue crabs, stone crabs, seatrout, sheepshead, redfish, and shrimp continued. Staff finalized the genetic characterization of all redfish hatchery broods reared at the SERF hatchery during 1994 and obtained seven-locus genotypes of all hatchery broodstock that are not still being used as broodstock at the hatchery. Development was completed on a genetic tag that can be used to assess the percentage of hatchery-reared fish in samples obtained from areas where stock enhancement or restoration is ongoing.

FISHERIES STATISTICS

Fisheries Independent Monitoring Program

Fisheries independent monitoring (FIM) of fishes continues in the Tampa Bay, Charlotte Harbor, Indian River Lagoon, and Cedar Keys areas. Sampling effort in Florida Bay has been reduced. The program has been restructured to place more emphasis on assessing the population of subadult/adult fishes rather than young-of-the-year fishes. The subadult/adult program is used to help monitor the current status of Florida's estuarine fish stocks. Additionally, staff in this program have been involved in the mercury concentration in fish program and the recreational survey and angler interview programs.

Commercial Landings Statistics

Information on the commercial harvest of fish, invertebrates, and other marine resources is reported by more than 1,300 wholesale and retail dealers to the Florida Marine Fisheries Information System. More than 360,000 marine fisheries trip tickets are reported annually under the mandatory reporting rules. These data are used in stock assessments, for quota monitoring, design of sampling programs, and summaries of landings and trips by species, qualification of fishermen for state and federal license endorsements and permits, and determination of participation in fisheries. Many of these data are incorporated into state, regional, and federal fishery management plans and stock assessments. Incorporation of the new standards proposed by the Atlantic Coastal Cooperative Statistics Program will be carried out after the standards are adopted. Florida has been selected by the ACCSP to be one of the sites for the development of the prototype of the ACCSP commercial fisheries data base during 1998.

Biostatistical Sampling

This project is designed to obtain fish and invertebrate species length-frequency measurements and fishing trip characteristics directly through dockside interviews with commercial fishermen. During 1997, samplers measured approximately 76,000 fish from 2,000 trip interviews. Samplers may also collect otoliths and other hard parts (used for age determinations), gonads (used for reproductive studies), and other biological tissues for analyses. During the last three months of 1997, samplers performed commercial fishing trip interviews which provided information and length data from weekly striped mullet harvests during the roe season. This provided additional data for an upcoming stock assessment.

Recreational Surveys, License Monitoring, and Statistics

Until February 1997, the FMRI received a 10% sample of all individual Saltwater Fishing Licenses and Stamps (spiny lobster and snook) and all ("for hire") vessel Saltwater Fishing Licenses and tarpon tags. These data are used for mail surveys of recreational anglers and have been utilized by the FMRI, the FDEP, and other agencies, universities, companies, and individuals for survey work and mailing lists. In February 1997, the FGF issued Saltwater Fishing Licenses and computerized all license information. For recreational landings estimates and other types of analyses, the NMFS MRFSS is utilized. In September 1997, the FDEP Fishery Dependent Monitoring Group participated in the Enhanced Pilot Charter Boat Survey. Florida conducted its portion of the survey with seven field samplers coordinated by two researchers. Dockside sampling achieved four to five times the base level of sampling normally conducted by the MRFSS. Fishing effort was obtained through telephone interviews of a randomly selected 10% sample. The FDEP also participated in the NMFS Beaufort Laboratory Head Boat Survey and has two samplers dedicated to the project.

STOCK ASSESSMENT AND POPULATION MODELING OF FLORIDA'S INSHORE SPECIES

In 1997, detailed assessments were developed for common snook, sheepshead, spotted seatrout, striped mullet, weakfish, spot, Atlantic croaker, and stone crabs. The finfish species were evaluated with age-structured models, and stone crabs were evaluated with a non-equilibrium De Lury Depletion model. The

sequential population assessment for spiny lobster was updated with information through the 1996-1997 season. The group also provided technical advice for revising the sampling project for common snook. A boot-strap Monte Carlo model was developed to evaluate the harvest levels, sex ratios, and average weight of common snook, *Centropomus undecimalis*, with various size slot limits and closed seasons. A manuscript entitled "An evaluation of effort reduction in the Florida Keys spiny lobster, *Panulirus argus*, fishery using an age-structured population analysis" was accepted for publication in *Marine Freshwater Resources* (48).

Members of the group served on several state, regional, and federal committees charged with reviewing assessments of marine fishes in the Gulf of Mexico. Work was conducted in support of the development of the GSMFC fishery management plans for spotted seatrout, flounder, and blue crab and the GMFMC assessment of the condition of red drum, reef fishes, and mackerels. Other papers published in 1997 include "Bias in Chapman-Robson and least-squares estimators of mortality rates for steady-state populations" in *Fisheries Bulletin* 95:863-868 and "Spotted seatrout: a case study in fishery management" in *Fisheries* 22:10-11.

RESOURCE HEALTH AND ASSESSMENT

Environmental Monitoring and Assessment Program - Estuaries (EMAP)

The completion of the field component was the concluding phase of the EMAP program. The Florida Bay region was the center of studies where the radioisotopes method (C^{14} bicarbonate) was compared with *in situ* oxygen loggers to determine the primary production for the various regions of the estuary. This measure is critical in determining how the trophic structure of an altered region like Florida Bay may influence other consumer levels of that region. All components of the EMAP were completed in 1997 except recommendations. Recommendations as to the use of these methods as a routine measurement for evaluating different estuaries, comparing their carrying capacity and utility in estimating environmental status will be made in 1998.

CORAL REEF AND HARD GROUND MONITORING AND ASSESSMENT

During 1997, the second annual sampling of 40 reef sites including 160 stations from Key Largo to Key West was conducted by coral/hardbottom

monitoring project scientists. Point count analysis of the 1996 data neared completion in late 1997. Researchers used a combination of video and species count methods to develop baseline data on coral cover and other selected benthos and coral species distribution. The project was a cooperative effort between the FDEP FMRI, University of Georgia, and University of South Carolina. The project was managed by the FMRI and involved the teamwork of 15 scientists.

The FMRI continued to provide expertise in surveys and litigation of ship groundings. The SSN MEMPHIS case was settled and a restoration process was in process. Groundings continued to require survey by staff. In 1997, restoration was accomplished and monitoring is in progress at the FIRAT grounding site in Broward County. The HOUSTON grounding was settled out of court, restoration was accomplished, and monitoring is being negotiated. The JACQUELYN L case was settled, but restoration has not been finalized.

Since the wild harvest was curtailed in 1989, twelve applicants requested surveys for live rock aquaculture on state submerged lands. Four leases slated for recommendation in 1997 were approved in January. One Keys application had no action as the applicant was encouraged to relocate away from sensitive seagrass and hardbottom habitat.

Analyses of recruitment (particularly stony coral recruitment) to artificial substrata was completed, and a final report was submitted. A draft manuscript was prepared during 1997 for analyses of gonadal development of six common gorgonians from Biscayne National Park.

Aquatic Health

Research in south Florida on gray (mangrove) snapper continued in 1997. In conjunction with researchers at Florida State University, additional samples of tumors were examined and tentatively diagnosed as neurofibromas. The black spots affecting some gray snappers in south Florida were identified as a trematode (*Scaphanocephalus* sp.).

Research efforts continued on the ulcerated fish occasionally caught in the St. Johns River. A new species of dinoflagellate (*Cryptoperidiniopsis* sp.) was discovered in the Tallyrand area near Jacksonville. The FMRI Harmful Algal Bloom Group studied this organism to determine its toxicity and effect on fish, if any. Although this species has been found in areas of

extensive fish kills in Chesapeake Bay and North Carolina systems, it has not been associated with fish kills or fish lesions in Florida. Angler surveys were conducted and staff presented informational displays to help locate potential "hot spots" of ulcerated fish. Cooperative research with the St. Johns River Water Management District continued. Posters and stickers were used to encourage anglers to report information. Similar work is ongoing on the Indian and St. Lucie rivers.

In fall 1997, an extensive fish kill occurred in southeast Florida and the Florida Keys. Samples of water, sediment, algae, and fish tissues were examined to determine the cause of the mortalities.

The Aquatic Health Group coordinated the Florida Aquatic Health Network. More than 180 staffs from federal, state, county, and city agencies and universities are members of the network that will assist documentation and investigation of fish kills and aquatic disease events.

Bacteriological samples from 21 species of fish exhibiting lesions or abnormal yellow pigmentation were obtained in 1997. Examination using light microscopy were inconclusive. Yellow pigmentation on some spottail pinfish were caused by chromatophore aggregations. The incidence of these abnormalities continues to be studied in conjunction with researchers from NOAA. Bacteriological experiments to determine the pathogenicity of *Vibrio harveyi* from cultured red drum continue.

More than 500 slides consisting primarily of gonadal tissue from the collection of archived wild scallop tissues have been reviewed. Most of the slides also contain digestive, kidney, and mantle areas, therefore a comprehensive survey for parasites and pathologies was not possible. The parasite *Nematopsis* was consistently present in most of the organs of the animals screened and digenean parasites were noted. Neither of these parasites appear to elicit a substantial pathological response.

Cultured scallops were also evaluated. Up to 80% of the batches were infected with a protistan parasite in the testes only. It was of interest that this parasite was not detected in wild stocks.

A literature review of diseases in scallops was performed. Bacterial isolates were collected and stored from 22 water and 34 larval scallop samples. One isolate from water has been identified as *Vibrio splendidus* II. Eighteen samples were screened for

potential isolates; all were negative. Early developing larval stages were monitored during the hatchery phase. Development of appropriate health profiles was begun. Wild scallops were evaluated in fresh squash preparations, and preliminary bacterial cultures were taken. No major parasite infestations or pathologies were noted.

Habitat Assessment and Restoration

Current assessment projects focus on Florida Bay seagrass communities, seagrass habitat loss and degradation, the development of ecoindicators for assessing ecosystem condition, and techniques to measure stress in seagrasses. Restoration activities included development of seagrass propagation and transplanting techniques and the use of an experimental plant macrocosm facility at the Stock Enhancement Research Facility at Port Manatee for testing restoration techniques.

Four assessment projects in Florida Bay were underway in 1997: seagrass monitoring, seagrass disease, mortality of mudbank seagrass, and sediment nutrient fluxes.

Spatially extensive qualitative and quantitative data is being provided to assess variability in macrophyte species distribution and abundance, community structure, and population dynamics in response to multiple stressors affecting the bay. A series of maps have been produced showing both seasonal and annual changes in seagrass distribution and abundance. There have been significant bay-wide reductions of *Thalassia* short-shoot densities and densities of apical meristems. In contrast, *Halodule wrightii* short-shoot densities have exhibited a significant bay-scale increase.

Studies of marine slime mold *Labyrinthula*, a potential pathogen of Florida Bay seagrasses, continued. Results from field and laboratory studies suggest that slime mold plays a critical role in *Thalassia* die-off. Samples from 1,923 sites were collected during the six sampling periods of the study from 1995-1997. A total of 54,804 leaves from 17,098 short shoots were evaluated for lesion cover, and 7,523 leaves were examined for *Labyrinthula*. Surfer maps of lesion and *Labyrinthula* prevalence in Florida Bay were created for all six seasons of data, and change maps are complete through spring 1997. Results show that there is a close parallel between the distribution of leaf lesions and the occurrence of *Labyrinthula* on *Thalassia* in Florida Bay. Results show an overall increase in infection and associated lesions in 1997

over previous sampling years. Field data and laboratory studies indicate that salinity plays a major role in determining both the distribution of *Labyrinthula* and the severity of the infection. The prevalence of infection is highest in basins with persistently higher salinities; infection appears to be inhibited in basins where salinities are frequently below 15 ppt.

Labyrinthulid isolates from 15 different sites are being maintained in culture. Further experiments are being conducted to determine pathogenicity and modes of transmission. A large scale infection experiment was carried out in 1997, testing three of the isolates previously determined to be pathogenic to *Thalassia*. All three isolates appear to infect *Thalassia* at mid-range salinities (24-45 ppt). Infection was never found in Florida Bay at salinities below 15 ppt, and none of the isolates were infective in the laboratory at 10 ppt or lower. The role of other environmental factors that may trigger proliferation, maintenance, and pathogenicity of *Labyrinthula* are being investigated, and using scanning and transmission electron microscopy, studies are being done to characterize the *Labyrinthula* species found in Florida Bay.

Mortality of turtlegrass on Florida Bay mudbanks is being investigated. Mudbank seagrass appeared to be unaffected by the widespread die-off of basin seagrass between 1988 and 1991. However, recent analyses of satellite images and aerial photographs indicate significant declines of seagrass cover on mudbanks since 1991. Change analysis of aerial and satellite photos from previous years were mapped and quantified using ArcInfo(c) in order to determine the historical and present status of bank die-off. Seagrass morphometrics, disease prevalence, seagrass stress metabolites, and sediment chemistry were sampled at three sites.

The role of sediment nutrients in initiating and supporting phytoplankton blooms was examined. These blooms occupy large areas of Florida Bay each fall and winter and reduce the light available for seagrass on the bay bottom. As a result, seagrass beds are dying and other beds are stressed. Sediment nitrogen and phosphorus concentrations and benthic nutrient fluxes were measured quarterly at five sites. Substantial amounts of phosphorus have been found. Phosphorus is potentially limiting to phytoplankton blooms and was present in sediments in forms which might be liberated by episodes of water column anoxia.

The effectiveness of biological monitoring of turtle-grass health was being tested at eleven sites in the

eastern Gulf of Mexico. Several demographic, morphological, and physiological characteristics of turtle-grass health were measured along natural and anthropogenic stress gradients using a hierarchical sampling design based on tessellated hexagons at multiple spatial scales (e.g., 2,500; 25,000; and 250,000m²). This research will produce a suite of cost-effective techniques which can be sampled to seagrass and ecosystem monitoring programs throughout the Gulf of Mexico. The effects of sampling scale on impact assessment also will be determined.

Development of cost-effective and ecologically-sound techniques for habitat restoration continue. FMRI scientists have completed a research project looking at methods to optimize cost-effectiveness of producing planting units from clonally-propagated *Ruppia maritima* produced by *in vitro* micropropagation. Current research focused on the development of *in vitro* micropropagation protocols for *Halodule wrightii*. We examined sterilization protocols, geographic and seasonal variation, media types, and methods for transferring plants to the field. In addition, new techniques for transplanting *Spartina alterniflora* were tested at an experimental saltmarsh at the Stock Enhancement Research Facility at Port Manatee.

HARMFUL ALGAL BLOOMS

Red tide, *Gymnodinium breve*, continued in 1997. Much of the summer-winter activity was offshore in Apalachee Bay or offshore the west central coast near Tampa Bay-Sarasota between 5 and 35 miles offshore. Fish kills offshore were noted. Sarasota Bay was closed from June 1996 through July 1997 due to the small cross-banded venus clam retaining toxicity beyond the typical two to six weeks of shellfish depuration in natural waters. This is the longest water closure due to red tide in the history of documenting such events in Florida.

In October 1997, red tide was detected inshore and offshore in southwest Florida. Shellfish closures occurred and 16 manatee mortalities were associated with this toxic event. By March, most inshore shellfish areas closed to red tide were reopened; however, blooms of *G. breve* were consistently recorded offshore up to 35 miles. In one February water sample, the abundance of *G. breve* was in the tens of millions of cells per liter of seawater.

The FMRI participated in a multidisciplinary cruise in conjunction with the University of South

Florida, Mote Marine Laboratory, and Rutgers University to study *G. breve*. The region from Charlotte Harbor to north of Tampa Bay was surveyed in a series of transects on the shelf to determine those oceanographic conditions which accompanied the blooms. In addition, a large bloom just south of Apalachicola Bay was mapped and studied. Other studies included detailed high performance liquid chromatography studies for pigments in the bloom population, light harvesting characteristics as well as nutrient absorption, and utilization of the natural *G. breve* populations.

Clonal cultures made from bloom samples taken at different regions of Florida were placed in mass culture. The large cultures of the 12 clonal isolates were grown and harvested using a continuous centrifuge and frozen for future pigment and genetic analysis.

In response to *G. breve* and the potential for *Pfiesteria*-like species causing fish kills and fish lesion events, the state established a Harmful Algal Bloom Task Force chaired by the Secretary of the FDEP. The task force was created to advise the Secretary on monitoring, research, and mitigation plans for harmful algal blooms. There are about 37 toxic species of harmful microalgae in Florida waters. The task force concentrated on the more problematic species and their natural resource and human health impacts.

Several emerging harmful algal bloom issues emerged in Florida during 1997. One of them being *Pfiesteria*-like species that have been identified for historical fish kill or fish lesion geographic sites. These are not *Pfiesteria piscicida* nor another *Pfiesteria* species, but they are toxic in that they caused fish kills experimentally in tanks. Florida has three such species and established a monitoring program to look at distribution and abundance. In summer and fall 1997, FDEP assisted Maryland in identifying what species were at fish kills and other events. Scientists at FDEP were able to properly classify and describe these very small, cryptic dinoflagellates that live on the bottom of estuaries.

Water and sediment samples from areas of recent fish mortalities were incubated for the purpose of stimulating the growth of unidentified dinoflagellates that may be responsible for the fish kill. These flagellates were identified and studied as to their role in the fish kills.

Florida Bay

The study of phytoplankton blooms in Florida Bay continued both in the field and laboratory. Studies looked at the trophic linkages between primary and secondary production at identical stations. Biomonthly measurements of primary production are made to give the range of annual variability for the selected regions which represent the bay. Concomitant studies on secondary production allowed the detection of trophic linkages which occur and give an indication of the efficiency of these linkages.

The study of the influence of salinity on the nutrient kinetics of phosphorus ($\text{PO}_4\text{-P}$) dependent growth of several dominant micro algal taxa of Florida Bay continued. The kinetics of phosphorus dependent growth (U_{max} and K_u) at 501 were determined for four selected dominant study species. Although U_{max} was found to differ as expected for most of the species, K_u values did not differ significantly from the values previously determined at 251 salinity indicating that at salinities of 25 and 501, differences in competitive outcome under P-limitation cannot be attributed to differences in K_u values. Resource competition experiments were carried out at 251 to test the predictions of the equilibrium theory of resource competition which were derived from the nutrient kinetic parameters of each species. The results of interspecific competition under phosphorous limitation were found to be in agreement with the predictions made by the equilibrium theory. Competition under P-limitation, N-limitation, nutrient ratio N:P 16:1 as well as the influence of fluctuating salinities under P-limitation, N-limitation, and N:P 16:1 were also examined at 251. To complete the proposed study investigating the potential role of salinity and nutrient competition in the structuring of the community composition of Florida Bay as well as the initiation and persistence of the blue-green algal bloom, further nutrient kinetic studies, competition studies, nutrient cell quotas and ratios will be examined as described at 15 and 501.

STOCK ENHANCEMENT AND AQUACULTURE DEVELOPMENT

The Stock Enhancement and Development Program began its thirteenth year in 1997. Efforts to restore red drum (*Sciaenops ocellatus*) in Biscayne Bay continued. Contracts with the University of Miami and Florida International University for grow out, tagging, and release of red drum produced at the Port Manatee Stock Enhancement Research Facility (SERF) continued. A contract with Mote Marine Laboratory to

provide a critical evaluation of red drum stock enhancement releases in Biscayne Bay began in 1997. A total of 1,636,344 fingerlings was released in Biscayne Bay 1997. A total of 2,241,585 red drum had been released state wide through 1997.

Efforts were underway in 1997 to adopt the Port Manatee hatchery to intensive culture rather than extensive pond culture. In recent years, it has become evident that all marine species are not well suited to pond culture. Some, such as snook, require "head-starting" in intensive or semi-intensive systems. An intensive phytoplankton culture laboratory is under construction. It will provide both a food source for scallops as well as for zooplankton culture for intensive finfish larviculture.

On July 1, 1997, a program was begun to enhance bay scallop (*Argopectin irradians*) populations along the west coast of Florida. The Stock Enhancement & Aquaculture Development component of this program is to function as a nursery to rear animals propagated at the University of South Florida hatchery. Development of a full-scale bay scallop hatchery capability at Port Manatee is underway.

Hatchery Operations

Production. Twenty-five Indian River red drum brood fish, divided between six environmentally-controlled rooms, were photothermally conditioned for egg production during fall 1997. Total egg production was 202,290,000.

Total phase-I production was 182,977 and survival averaged 25.3% for 4 of the 5 ponds harvested. Phase-I fish were transported to the University of Miami (35,366) and the Florida International University (22,802) for advance rearing.

Health Management and Disease Control. An integrated and effective health management program has been developed to minimize mortality caused by parasites, bacterial infections, and environmental stressors. Superior husbandry was practiced to correct conditions that lead to disease. Constant and comprehensive disease surveillance was used to detect any developing conditions which might lead to disease. Advanced diagnostic methods and tools were used as necessary to characterize a disease or pathological condition. Early disease detection resulted in reduced mortality and improved production efficiency. Aquaculturists throughout the state were provided with information on disease surveillance methods. Culture methods were continuously refined

to minimize stress and disease. Reduction in major culture stressors resulted in an overall improvement in the health and vigor of released stocks. This facilitated the survival and adaptation of cultured fish in the wild and improved the cost effectiveness of stock enhancement. New treatment methods have been developed and tested using rigorous experimental methods. Parasitic problems are largely under control after application of experimentally-derived treatments and parasite-prevention strategies developed over the past eight years. Experimental work with bacterial pathogens became a high priority in the last year. Losses due to *Vibrio* and *Aeromonas* infections were significant for all stages of development except broodstock. Intensive bacterial monitoring of both red drum and bay scallop larval culture systems was in progress because larvae seem to be extremely susceptible to bacterial infection. Survival of larval scallops in culture was about 0.5%. Samples indicated that bacterial pathogens contributed to or were the primary cause of this poor survival.

Development of probiotic and environmental methods of bacterial control were begun as an alternative to antibiotic treatments. As bacterial control methods are developed for red drum and scallops, they will be applied to other species of aquacultural interest.

Assessment. Assessment of hatchery-reared red drum using fishery-dependent means continued through 1997. The state-wide total of angler captures passed the 1,000 mark in 1997. In Biscayne Bay, more than 500 phase III fish were captured through fisheries-dependent means. A third two-day fishing tournament was held in Biscayne Bay to promote angler awareness of the program and to increase fish recoveries. In October 1997, 65 hatchery-reared red drum were caught by participants. Fisheries-dependent returns continued from other red drum releases on both the east and west coast of Florida.

ENDANGERED SPECIES

Marine Mammals

During 1997, 242 manatee deaths were documented throughout the state. This brought the total number of manatee deaths documented since 1974 to 3,269.

During 1997, 55 manatees died as a result of collisions with watercraft. No indication is available of how many manatees sustained sub-lethal strikes and survived. The majority of deaths resulted from impact with a blunt portion of the watercraft. These carcasses

had no fresh boat propeller cuts and seldom displayed any external marks. The greatest number of deaths attributed to watercraft occurred in Brevard County. Lee County ranked second. Duval and Collier counties closely tied for the third rank, but the number of watercraft-related deaths in these counties recently declined.

Eight deaths occurred in 1997 that resulting from entrapment in water-control structures. A number of these deaths resulted from an unspecified trauma. There was clear evidence that the animal had encountered a tremendous external force that caused damage, but the identity of the force was not clear. In other cases, manatees had ingested monofilament line that resulted in intestinal damage. Deaths of perinatal manatees comprised 25% of the deaths during 1997. The majority of carcasses recovered during 1997 were in bad condition; however, none of these animals died from trauma. During all 1997, a red tide bloom resulted in 16 manatee deaths. Tissues tested positive for breve toxin.

A milestone in manatee biology was the first description of a virus isolated from manatees. This papilloma-like virus presented as vacuolated skin lesions most frequently found on the lips and face. At present, there is no evidence that the virus poses any serious harm to manatees.

During the past two years, the number of deaths attributed to natural causes centered in the southwest region of the state. Otherwise, carcasses were recovered from 11 counties during 1997. The leading cause of natural deaths was bacterial infection most often present in the intestines or lungs.

The majority of carcasses from undetermined deaths numbered 62 in 1997. The frequency of undetermined cases decreased during 1997. Badly decomposed carcasses were found in 18 counties. These carcasses were so badly decomposed that little information about the cause of death was available.

Aerial surveys were important for acquiring information on manatee distribution, relative abundance, and use of habitat types. Synoptic aerial surveys of all manatee wintering habitats in Florida and southeast Georgia are useful in determining a minimum manatee population estimate. Data from aerial surveys, mortality, life history and ecology studies were combined to create a population model to estimate trends in regional population sizes.

A pilot study was initiated in February 1997 in response to the death of 149 manatees from red tide in spring 1996. Manatees in the Caloosahatchee River were tagged with satellite/radio transmitters to document spring dispersal from the Ft. Myers power plant; movement patterns and habitat use; collect serial blood samples and multiple morphometric measures, such as blubber thickness and weight on known individuals; and document the scar patterns of tagged animals and other animals associated with them. Twenty manatees were captured by open water capture over a three-day period. Eight animals were tagged; all animals caught had blood samples and morphometric measurements taken. Passive integrated transponder (PIT) tags were implanted in each animal, and photos were taken. The tagged manatees ranged from Tampa Bay to the Everglades. Recaptures of tagged manatees occurred in April, June, and October. Not all the animals were recaptured each time. Several of the tags sank due to possible boat strikes, tag malfunction, or barnacle growth. One tagged male was taken into captivity in poor health after being recaptured and subsequently died. Following an outbreak of red tide in the Marco Island area, one tagged female and her calf were caught to collect blood samples. The blood will be used in the development of a test for the presence of red tide toxin.

Information on aspects of manatee life history is essential in formulating an assessment of manatee population dynamics and recovery. Data on long-term growth and survival of individuals, reproductive capability of mature females, and health of wild manatees are essential to a population model and comes from a variety of research projects including the photo-identification catalog, use of PIT tags, and noninvasive body condition indices. The FMRI managed the photo-identification catalog data from areas extending from the south of Crystal River to the Everglades on the west coast of Florida. The catalog consists of more than 2,175 images representing 440 photo-documented scarred manatees. About 4,000 sightings have been recorded. PIT tag deployment using the FMRI protocol is standard procedure at all oceanaria and rescue missions.

Marine Mammal Geographic Information System staff worked with the FMRI to produce the second version of the Atlas of Marine Resources on CD-ROM. This release contains new data layers, a data directory, products of the Manatee GIS Working Group, and annual mortality statistics. Distribution of the CD made considerable data and information from state, federal, and local agencies available to

organizations involved with manatee and marine resources protection.

Right Whales

In addition to the manatee, the FDEP has responsibility for other endangered marine mammals, including the North Atlantic right whale, *Eubalaena glacialis*, the most endangered large whale in the world. 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 in 1994. During the 1996/1997 calving season, 18 mother/calf pairs and 15 other individuals were documented. One mortality was documented during the winter season, and FMRI staff assisted in the confirmation, recovery, and necropsy of that animal.

SPECIMEN INFORMATION SERVICES

Invertebrate and fish collections maintained by the Specimen Information Services group are important repositories of reference specimens and ecological data dealing with Florida's unique ecosystem. During 1997, 2,872 invertebrate specimens were lent to 18 investigators at 17 domestic and one foreign institutions. Six other loans of 250 specimens were used for educational purposes. Similarly, 403 fish specimens were lent to 14 investigators at 9 domestic and one foreign institutions. Six other loans of 214 specimens were used for educational purposes. In addition to specimen loans, 37 requests for information were processed in 1997, and six requests for educational material resulted in the distribution of 250 Specimen Information Service packets. In 1997, 300 lots of invertebrates containing 804 specimens and 218 lots of fishes containing 332 specimens were accessioned into the collections.

Two sampling cruises for the Gulf of Mexico Ichthyoplankton Survey were completed during spring and fall 1997. All associated hydrographic data was processed and sent to the SEAMAP data manager for inclusion; the biological samples were processed and delivered to NMFS, Pascagoula Laboratory, for shipment to the Polish Sorting Center. A total of seven loan and 28 information requests were processed during the year.

Illustrated guidebooks for the identification of Florida fishes are in preparation as time permits.

COASTAL AND MARINE RESOURCE ASSESSMENT

The FMRI's Coastal and Marine Resource Assessment group, the Invertebrate Section, and FMFC staff continued to develop the Resource Impact Map series of eight chart-sized 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. In the last year, offshore bathymetry with contours ranging from 60 feet to 6,000 feet for the southeast Atlantic, western Caribbean, and Gulf of Mexico were incorporated into the data base. Channels and navigation aids such as buoys were displayed to help users orient themselves. Currently, 57 shellfish harvesting zones are depicted.

For policy analysis, thematic information was added such as bycatch volumes or shrimp nursery areas. These maps were used for the complex process of developing shrimp management plans and rules for the Big Bend and Northeast regions and analyzing bycatch reduction issues.

SOUTH FLORIDA REGIONAL LABORATORY

The spiny lobster research program continued to monitor harvest and other important fishery components for all three user groups currently harvesting spiny lobster. Additional research continued on numerous aspects of juvenile lobster ecology with the goal of relating recruitment and environmental fluctuations to future harvest levels. Investigations continue on the role of seagrass as an alternative juvenile lobster habitat and the impact of hardbottom shelter loss as a consequence of changes to the Florida Bay ecosystem. Continued in the second of a three-year project, the reproductive potential of adult spiny lobster with respect to fishery impacts and the role of lobster sanctuaries began new monitoring in the Florida Keys National Marine Sanctuary in 1997. During the fishing season, 96 onboard surveys were completed, and over 400 mail surveys were received from commercial fishermen. Total commercial harvest was 7.7 million pounds. One highlight of 1997s research was the completion of the individual catch age model. This model indicated that the population of lobsters increased even as fishers harvested more pounds. Nearly 2,000 recreational surveys were returned which indicate a harvest of 356 thousand pounds during the two-day season and 1.4 million pounds during the first month of the regular season.

Commercial landings for 1997 may approach 7.0 million pounds. The third user group consists of holders of special recreational crawfish licenses. The 392 license holders landed approximately 60,000 pounds in the 1997 season.

The south Florida queen conch spawning stock located in offshore aggregations increased from approximately 12,000 in 1996 to approximately 16,700 individuals in 1997. The largest increase was in the lower keys where approximately 11,000 of the total were found; the middle and upper keys populations remained stable. Recruitment to offshore nurseries as measured by juvenile abundance decreased by 50% from 1996. The area encompassed by the conch

aggregations remained relatively constant. Research was completed on a grant to assess temporal (i.e., seasonal and lunar) effects on mortality of hatchery outplants. Survival analysis indicated statistically significant enhanced survival for individuals released in the fall and on full moon cycles. Site selection was critical for survival. Size at release was less significant than the other parameters. Research was begun on movements, migrations, and habitation utilization for conch tagged with sonic tags; 48 individuals were tagged at two reef locations, and their movement was tracked semiweekly, weather permitting. Refinements were made to the ozone delivery system for larviculture and the nursery system. Approximately 250 hatchery-raised conch were released into offshore aggregations.

BUREAU OF MARINE RESOURCE REGULATION AND DEVELOPMENT

Sections 370.021, 370.071, and 370.16, Florida Statutes (FS) set forth the FDEP's responsibilities in management of shellfish resources and the public health protection aspects of the shellfish industry. Additionally, the bureau has been mandated broader responsibilities related to aquaculture pursuant to Chapter 370.26, FS.

SHELLFISH RESOURCE MANAGEMENT

The FDEP is actively engaged in collecting oyster shell from processing plants and constructing and restoring oyster reefs on public bottoms. During 1997, the Aquaculture and Shellfish Development Section collected 113,744 bushels of processed oyster shells and deposited 232,920 bushels of shells to restore approximately 90 acres of oyster reefs in Apalachicola Bay.

The Florida Legislature appropriated \$454,000 to rehabilitate and develop productive shellfish resources for 1997/1998. Funding was allocated among seven coastal counties. In 1997, 156,200 bushels of live oysters were relayed and transplanted during oyster resource development projects in Levy, Dixie, Wakulla, and Franklin counties.

The FDEP issued 730 Apalachicola Bay oyster harvesting licenses for the 1996/1997 harvesting season which generated \$78,000 in user fees. Landings in 1996 were 1.5 million pounds valued at \$2 million. Reported hard clam landings in 1996 reached 1.35 million pounds, valued at more than \$11 million. Production trends suggested that landings will continue to decline in portions of Indian River in Brevard County as a result of decreased salinity levels and poor

sets over the past three years. Shellfish aquaculture on Florida's Gulf Coast increased substantially, and all aquaculture products may not be reported. Clam farming is the most rapidly growing form of marine aquaculture with reported sales of \$5.4 million dollars in 1995. Trends suggested that there will be a substantial increase in landings from aquaculture operations in 1997.

Shellfish Public Health Protection

More than 1.3 million acres of Florida's coastal waters were classified in 37 shellfish management areas. In 1997, six comprehensive shellfish surveys were completed, and reclassification was initiated for six shellfish management areas. Four shellfish management areas were reclassified as part of continuing efforts to maintain proper classifications in all shellfish growing waters. The shellfish laboratory analyzed 53 shellfish meat samples and 18,959 water samples to ensure shellfish quality.

Aquaculture

In 1996, the Florida Legislature passed a comprehensive bill relating to aquaculture. The FDEP implemented numerous program elements to accomplish new legislative mandates to be more responsive to the needs of the aquaculture industry.

The FDEP established the Aquaculture and Shellfish Development Section. This section includes four program components: aquaculture leasing, aquaculture permitting, aquacultural site development and compliance, and oyster culture and shellfish resource development.

There are 126 shellfish and 434 aquaculture leases administered by the bureau. To encourage the development of aquaculture on sovereign lands, specific tracts of submerged lands in seven coastal counties were identified that are suitable for growing hard clams. Special aquaculture use areas were established in Volusia, Brevard, Indian River, Lee, Charlotte, Levy, and Dixie counties. The FDEP entered into a management agreement with Citrus County to locate an experimental bay scallop aquaculture project in the coastal waters off Crystal River.

The FDEP was actively involved in streamlining the permitting process for all aquaculture facilities. The department has consolidated the permit application process and eliminated several permits and activity licenses previously required for aquacultural activities. The aquaculture section acted as a consulting service to applicants throughout the permitting process so that applicants do not have to go back and forth between agencies. During 1997, 52 special activity licenses were issued to promote

shellfish aquaculture activities, including hard clam hatchery and nursery operations. The department entered into one wet storage agreement to promote alternative production methods and protect public health. The FDEP has issued four special activity licenses for the aquaculture of non-indigenous sturgeon.

An aquaculture grant program was established within the department by a legislative appropriation of \$250,000 for 1996/1997. Applicants responded through a request for proposal process, and recipients were selected by industry and agency representative committees. Eight aquaculture grants totaling \$224,972 were awarded in three grant categories, including one grant in the research and development category, three grants in the marketing category, and four grants in the economic development category. Unfortunately, two grants equaling \$60,542 in the economic development category were not completed because matching funds or services could not be obtained.

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES (LDWF)

OFFICE OF FISHERIES

It is the mission of the Office of Fisheries to conserve and protect Louisiana's renewable aquatic resources for present and future generations of Louisiana citizens by controlling harvest and by replenishing and enhancing stocks and habitat. Program activities in support of these goals are described as follows:

SHELLFISH PROGRAM

The Marine Fisheries Division continued its long-term 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. Additionally, these same data were used to recommend season extensions and special shrimp seasons.

Shrimp

Offshore Shrimp Season. The state's offshore territorial waters remained open throughout 1997.

Inshore Shrimp Season. The 1997 spring inshore shrimp season opened in Zones 1 and 2 on May 19, 1997 and May 26 in Zone 3. Inshore brown shrimp production was down as compared to the last three years and below the long-term average.

The 1997 fall shrimp season opened in Louisiana's inshore waters on August 18, 1997 and remained open until December 14, 1997. The portion of Zone 1 north of the Mississippi River Gulf Outlet remained open until December 21, 1997. The Secretary extended the season in Breton and Chandeleur sounds until April 1, 1998 in an effort to harvest pink shrimp which are usually present in that area during late winter and early spring. A few pink shrimp were harvested during this extension, but catches were generally poor. The fall and early winter seabob production was very good.

The 1997 fall inshore shrimp season opened statewide on August 18, 1997. Production was up compared to the last three years and above the long-term average.

Preliminary NMFS total state landings figures (all species) show overall production at 59.4 million pounds (headless), slightly above the five-year average.

A Select Council on Shrimp Management convened in fall 1997 to study the current and future management of Louisiana's shrimp resources and to make recommendations for future management objectives per Senate Concurrent Resolution 11 of the 1997 Legislative Session. The Council will report its findings to the Senate and House Natural Resource committees and a Industry Task Force to begin in the fall of 1998.

Crabs

Preliminary Louisiana crab landings were approximately 44 million pounds which is consistent with the ten-year average. The moratorium on new crab licenses initiated in 1995 remains in effect through 1998.

The Crab Task Force continued to meet and addressed several issues, included limited entry, ghost traps, and crabber/shrimper user group conflicts. Crab bills (2 5/16" escape rings and increased penalties for possession of excessive numbers of undersize crabs) were passed during the spring 1997 legislative session; in addition, several other crab bills, including limited entry for the crab fishery, biodegradable panels, and dual penalties for possession of undersize crabs, were introduced but not passed. The GSMFC TCC Crab Subcommittee began revising the regional blue crab management plan. The LDWF and LSU Sea Grant cooperated and held a series of workshops across coastal Louisiana on the blue crab resource.

MOLLUSC PROGRAM

Oyster Seasons

The 1996/1997 oyster season on Louisiana's public oyster seed grounds and at the Hackberry Bay, Bay Gardene, and Sister Lake Oyster Seed Reservations opened one-half hour before sunrise September 4, 1996.

There was an area on the public grounds east of the Mississippi River in the lower Black Bay area set aside for sacking as prescribed by Act 46 of the 1992 Legislative Session.

Public Grounds in Calcasieu and Sabine lakes opened one-half hour before sunrise on October 15, 1996 and remained open until one-half hour after sunset on April 30, 1997, with the Secretary of the LDWF having the authority to extend the season to compensate for health closure days.

Oyster production for 1997 continued on an above average trend, particularly on the public grounds east of the Mississippi River. Production was somewhat hampered by health concerns, particularly on the public grounds east of the Mississippi River. There were two significant health closures on the grounds that seriously interrupted the 1997 season. One was the *Gymnodinium breve* (red tide) closure in the Lake Borgne area from the Mississippi River Gulf Outlet eastward to the Mississippi/Louisiana state line from November 13, 1996 through February 28, 1997 when a portion of the area was reopened, with a total reopening in April. There was also a health closure of oyster seed ground areas in Plaquemine Parish from January 4 through January 23, 1997 because of an oyster-related illness outbreak.

Oyster Leasing

During the 1997 year, no auction was held. In addition, a moratorium on the taking of oyster lease applications was put into effect in May 1996 and remained in effect through 1997.

The Oyster Lease Survey Section completed surveying all leases not referenced to the Louisiana State Plane Coordinate System and converted all lease coordinates from NAD27 to NAD83.

Disaster Oyster Restoration Program

A \$5.1 million federal grant was obtained through the Dire Emergency Supplemental Appropriations Act (P.L. 102-368) to restore oyster resources damaged by Hurricane Andrew. The Louisiana Shellfish Restoration and Enhancement Project continued during 1997 with monitoring of production in the restored areas. There was continued commercial and seed harvest from the reefs restored with federal funds received as the result of Hurricane Andrew damages in 1992.

Oyster Task Force

The Oyster Task Force was instrumental in getting legislation enacted regarding damages to oyster resources on leases, particularly the relocation

legislation to compensate for coastal restoration projects.

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 rational 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 ¼" bar, ½" 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 five panels, each of the following mesh sizes: (1) 150'x10', 1" bar, 2" stretched mesh, 0.4 mm diameter filament; (2) 150'x10', 1¼" bar, 2½" stretched mesh, 0.52 mm diameter filament; (3) 150'x10', 1½" bar, 3" stretched mesh, 0.52 mm diameter filament; (4) 150'x10', 1¾" bar, 3½" 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 entire net has a 2:1 sag, and the mesh sizes are as follows: inner wall - 1⅝" bar, 3⅝" stretched, number six twine; outer wall - 6" bar, 12" stretched, number nine 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

The commercial season for the harvest of spotted seatrout in state territorial waters was opened on November 18, 1996 and ended at midnight April 30, 1997 when the season was statutorily closed. Harvest with strike nets was statutorily closed on March 1. After that time, only commercial rod and reel was allowed for taking spotted seatrout commercially. During the season, no commercial harvest was allowed at night and strike nets could not be fished on weekends. Preliminary estimates indicate that harvest for the 1996-1997 commercial spotted seatrout season was 938,468 pounds.

Recreational harvest of spotted seatrout in 1996, as measured by the Marine Recreational Fishery Statistics Survey, was above average for the period since the imposition of the present length and creel limits of 1987. The harvest was estimated as 6,013,222 fish, with an average weight of about 1.25 pounds. The average size was slightly above the mean of other years since 1987.

Red Drum

Red drum has had official game fish status in Louisiana since 1988. Recreational harvest of red drum in 1996, as measured by the Marine Recreational Fishery Statistics Survey, was the second highest recorded for the period since the imposition of the present length (16-inch) and creel (5/person) limits in 1988. The harvest was estimated as 2,435,351 fish, with an average weight of about 4.55 pounds. The mean size was above average for the period since 1988. The magnitude of the recreational harvest was attributed to the large 1993 year-class.

Menhaden

Information from LDWF trawl samples has been used each year to develop a forecast for menhaden production. A comprehensive research project was instituted to improve LDWF forecasts. Objectives of

this research are to: develop new juvenile menhaden indices that allow for earlier, more accurate forecasts; investigate the influence of environmental factors on average weight of menhaden; and provide estimates of resource abundance rather than harvest.

Using multiple regression predictive models based on results from this study, the LDWF presented a preliminary 1997 harvest forecast at the October 1996 GSMFC meeting. Anticipated 1997 fishing effort, newly developed juvenile menhaden indices, environmental data, and other commercial harvest statistics were used as input data.

Hydrological/climatological conditions during the winter of 1995-1996 were favorable for menhaden recruitment while juvenile menhaden abundance indices were above average. Above average age-1 and below average age-2 year classes were projected to enter the fishery in 1997. The projected 1997 landings were in the range of 400,000 to 460,000 metric tons; however, it was cautioned that the forecast was probably underestimated.

Projections of 1996 menhaden landings were in the 450,000 to 540,000 MT range, as two average to below average year classes, 1995 (age-1 in 1996) and 1994 (age-2 in 1996), were estimated to comprise the 1996 fishery. Actual 1996 Louisiana landings were 419,000 MT.

Black Drum

Commercial harvest figures for black drum over 27 inches were obtained from black drum permit reports by commercial fishermen. Harvest of 16 to 27 inch black drum was obtained from wholesale-retail dealer landing reports, after adjusting for their bull drum landings. For fishing year September 1996 through August 1997, preliminary estimates indicated a harvest of 1,532,455 pounds of 16-27 inch black drum. This compares to an estimated harvest of 683,509 pounds in fishing year 1995-1996.

Preliminary estimates of bull drum harvest for fishing year 1996-1997 indicated 18,986 drum over 27 inches were harvested. This compares to an estimated harvest of 41,215 in fishing year 1995-1996.

Recreational harvest of black drum in 1996, as measured by the Marine Recreational Fishery Statistics Survey, was slightly above average for the period since the imposition of the present length (16-inch total length) and creel (five/person) limits in 1989. The harvest was estimated as 300,189 fish, with an average

weight of about 3.01 pounds. The mean size was near the minimum recorded for years under present regulations.

ARTIFICIAL REEFS

The Louisiana Artificial Reef Program was established in 1986 to take advantage of obsolete oil and gas platforms which were recognized as providing habitat important to many of Louisiana's coastal fishes. Federal law and international treaty require these platforms to be removed one year after production ceases, at great expense to the industry. The removal of these platforms results in a loss of reef habitat.

Since the program's inception in 1986, 24 different petroleum companies have participated in the program and donated the jackets of 63 structures. In addition to the material, the participating companies also contributed \$7.7 million into Louisiana's Artificial Reef Trust Fund, which also represents a similar savings on platform abandonment to the industry. In 1997, eight projects across the coast were completed. The reef program also developed reefs in Louisiana's inshore waters, primarily low profile reefs composed of shell.

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 NMFS. Landings are self-reported by wholesale/retail dealers licensed to purchase fish in Louisiana. Louisiana also participates in the collection of trip interviews. Port samplers obtain interviews in Plaquemines, St. Bernard, Lafourche, Jefferson, and Terrebonne parishes. The information provided by landing statistics and trip interviews has been used by the NMFS, the LDWF, the GSMFC, and the Gulf of Mexico Fishery Management Council (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 1997, Louisiana used the marine share of its Sport Fish Restoration Funds in two activities, development of access for fishermen and finfish age and growth research (described under the Research Program).

HABITAT PROGRAM

Department of Energy (DOE)

The LDWF is assembling environmental monitoring databases associated with the West Hackberry Strategic Petroleum Reserve and other DOE-related projects in the Calcasieu estuarine system. These are being integrated into a standardized data management system that will include other biological and environmental databases from Louisiana and Gulf of Mexico waters.

Southeast Area Monitoring and Assessment Program (SEAMAP)

Louisiana participated in planning and resource survey activities during the sixteenth year of this NMFS-funded project. Planning activities included identifying priorities for fisheries-independent data acquisition and coordinating Gulf-wide resource survey activities by SEAMAP participants. The LDWF conducted summer, fall, and winter sample surveys in the Louisiana territorial sea and nearshore EEZ from the Mississippi River to Atchafalaya Bay. Summer and fall surveys coincided with NMFS resource survey activity off the Louisiana coast.

Oil Spill Contingency Planning and Response

The LDWF continued to participate in oil spill contingency planning, response, and Natural Resource Damage Assessment during 1996. Notifications of more than 1,000 spills and other environmental incidents were received, and the LDWF mounted a response when fish, wildlife, and habitat resources were endangered. During 1996, LDWF, in cooperation with other state and federal trustees and Chevron, completed a marsh restoration project on Delta National Wildlife Refuge to complete the NRDA process for a 1995 spill. The LDWF also responded to a spill of nearly 500,000 gallons of regular unleaded gasoline in cypress swamp habitat between Baton Rouge and New Orleans. State and federal trustees currently are working with Marathon Pipeline Company to identify and restore natural resources injured as a result of that spill. A blowout in November and early December 1996 on the Attakapas Wildlife Management Area resulted in 20 acres of heavily oiled intermittently flooded forest. LDWF, in cooperation with state and federal natural resource trustees, is currently working with the responsible party to formulate assessment plans.

It has been predicted that over the next 50 years, Davis Pond will preserve about 33,000 acres of marshland and benefit about 777,000 acres of marshes and bays, providing important habitat for fish and wildlife. The project is expected to provide annual average benefits of \$15 million for fish and wildlife plus \$300,000 for recreation.

RESEARCH PROGRAM

Lyle S. St. Amant Marine Laboratory

The primary mission of the Lyle S. St. Amant Marine Biological Laboratory is to conduct research needed to manage the state's marine fisheries. It is the only laboratory facility on the Louisiana coast devoted to marine fisheries. However, as most of the biological and hydrographical research done in the coastal environment is useful in management of marine fisheries, another mission of the laboratory is to support and provide a base of operations for any research and

educational groups wishing to work in the area.

Age, Growth, and Fecundity

To increase accuracy of stock assessments, the Laboratory has undertaken a long-term project to obtain age, growth, and fecundity data for important commercial and recreational marine finfishes. Otoliths are collected by fishery independent sampling and by sampling from the commercial and recreational fisheries. These otoliths are sectioned and annular rings (indicators of age) counted. Gonads are also collected and examined histologically to obtain data for fecundity indices.

During 1997, otoliths were collected and processed from 499 red drum and 1,612 spotted seatrout. Work also continued in 1997 on four other species: otoliths were collected and processed from 470 black drum, 645 sheepshead, 264 southern flounder, and 496 striped mullet.

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

The Mississippi Department of Marine Resources (MDMR) is a technically and functionally diverse state regulatory agency with responsibilities ranging from marine fisheries and coastal wetlands management to seafood plant inspection and certification, boat and water safety administration, derelict vessel identification and removal, shellfish growing-waters management, and tidelands grants program administration to name a few.

While the agency's public image is typically linked to its regulatory functions, much of the organization's activity focuses on assistance, development, and public education regarding the wise use and conservation of coastal resources.

During fiscal year 1997, the MDMR made great strides in developing its capabilities to carry out its mandates and mission to enhance, protect, and conserve marine interests of this state by managing all marine life, public trust wetlands, adjacent uplands, and waterfront areas to provide for the optimal commercial, recreational, educational, and economic uses of these resources consistent with environmental concerns and social changes. It is the intent of this report to provide a summary of those developments and activities.

Significant actions or events that occurred in the past fiscal year included:

- Authorization of \$1 million in Federal Disaster Relief Funding for fishermen through the NMFS to be used for the revitalization of oyster reefs which were damaged in coastal hurricanes.
- Nomination by Governor Fordice and approval by National Oceanic and Atmospheric Administration of the Grand Bay Savannah National Estuarine Research Reserve in east Jackson County, Mississippi: The Grand Bay Savannah is a 15,500 acre tract of representative Gulf Coastal marsh in southeastern Jackson County that has been set aside for preservation and research purposes.
- Move into the new Eldon Bolton State Office Building in December 1997. The MDMR is one of several state agencies that will move into the new state office building at 1141 Bayview Avenue in Biloxi. The new building will offer the agency both new challenges and opportunities in FY1998.
- Disbursal of \$7 million in Tidelands Trust Funds in fiscal year 1997 for Tidelands public access and management projects in the three coastal counties.

- Closure of state oyster reefs in November 1996 due to toxic marine algae – red tide, adversely impacted the oyster industry. While this event could have posed a public health threat, quick action on the part of agency management personnel to recall oysters ensured that none of the adulterated product reached the market while minimizing economic losses to the shellfish industry.
- Harvest of a total of 358,102 sacks of oysters from state reefs during the 1996-1997 oyster season which closed June 14, 1997, despite the closure resulting from the red tide event. The 1997 shrimping season opened on Tuesday, June 17; and landings to date indicate an average season.
- Establishment of a computer-based, remote-sensing rainfall gauging system for shellfish growing waters management in cooperation with the Harrison County Office of Civil Defense. This system will provide for the preemptive closure of shellfish growing waters in response to significant rainfall events that cause degradation in coastal water quality. Effective management of shellfish growing waters is key to protecting public health and ensuring that only safe shellfish products reach the market place. Mississippi's shellfish program has an enviable record of no shellfish-borne illnesses attributable to Mississippi oysters, and that is an unblemished record that this Department will strive to maintain.

The following narratives provide a brief description of each of the agency's major programs and projects, highlighting the principal objectives and accomplishments of each during the past fiscal year and underscoring what the Department hopes to accomplish in the coming year.

MARINE FISHERIES MANAGEMENT

The Saltwater Fisheries projects and activities coordinated through this program include: -

- 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.
- To develop management recommendations based on specific criteria.
- To monitor the existing condition of the stocks and the fisheries that depend on them.

- To provide information transfer and liaison activities with regional fisheries management entities and others.
- To provide technical support to the Mississippi Commission on Marine Resources in developing fishery management plans, amendments, stock assessments, and technical analysis.
- To provide a state representative to serve on fisheries related boards, committees, panels, etc. as may be required.
- To provide for administrative services, general maintenance, the locating of suitable funding sources, and other fisheries management support services as may be required.

During FY1997, the Marine Fisheries Division drafted changes to Ordinances and opening and closing orders: 1/1/97 Ordinance 5.013 (Requires all gill and trammel nets be constructed of an approved degradable material); 1/1/97 Ordinance 1.008 (Regulate shellfish sold in retail stores operating in conjunction with a processing plant or seafood market.); 11/1/96 Ordinance 2.013 (Eliminate the size restriction for the frame of skimmer trawls and exempted the Siamese trawl from the bib trawl restriction from January 1 through the third Monday in August.); 8/19/96 Ordinance 7.021 (Charter boats must be less than 100 gross tons and meet Coast Guard requirements to carry six or fewer passengers. Headboats must hold a valid certificate of inspection issued by the Coast Guard. The charter boat or headboat must possess a reef fish permit if fishing for reef fish or in possession of reef fish in the exclusive economic zone.)

Public notices published for opening and closing of the commercial seasons for shrimp, oysters, king mackerel, red snapper, red drum, and large coastal sharks.

During FY1997 approximately 8,500 cubic yards of concrete rubble was deployed at 12 permitted inshore and offshore reef sites.

Marine Fisheries personnel served on regional management activities of the GSMFC including the: State-Federal Fisheries Management Committee, Technical Coordinating Committee, Menhaden Advisory Committee; TCC Artificial Reef, Data Management, Anadromous, and Crab Subcommittees; Stock Assessment Team, Spotted Seatrout, Blue Crab, and Flounder Technical Task Forces; and RecFIN and ComFIN Committees. Marine 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 Sport Fish Restoration Act, Cooperative Fishery Statistics Program, and the Interjurisdictional Fisheries Act. Division personnel also responded to various requests from other government agencies and the general public.

MARINE FISHERIES STATISTICS

Fisheries landing's data have been collected weekly and monthly according to schedule. The data were processed, edited, and submitted to the NMFS in accordance with established data handling procedures. Fisheries landing's 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 were collected from the major fish houses along the Mississippi Gulf Coast. The information collected will be utilized in the development of various fishery management plans, both on a state and regional level.

Information for selected reef fishes was collected from the major landing sites for these species on an as available basis. This information was submitted to the NMFS for inclusion in their Trip Information System. These data are utilized by both state and federal fisheries managers to properly manage these valuable resources.

MONITOR & ASSESS SHRIMP POPULATIONS

Shrimp sampling was conducted as required by Mississippi Code Annotated of 1972 §49-15-64.1 to determine the count per pound for the commercial and recreational shrimp season.

Sampling of the nine stations was scheduled every four days, subject to weather conditions, from late April through June of each year. Trawling at each station involved towing a sixteen-foot unlined otter trawl for 15 minutes. Surface and bottom water samples were collected at each station measuring the salinity, temperature, and dissolved oxygen to record the variations of environmental conditions that may influence the growth rate of the shrimp. The shrimp were sorted by species (brown, white, or pink). Length and weight of fifty brown shrimp (an aliquot) were recorded as well as the total number and weight of each species. These data are used to calculate the count per

pound of shrimp by species. Shrimp from all nine of the sampling stations must average out to be 68 count per pound or greater in order to open the shrimp season in Mississippi territorial waters.

One area where the shrimp size remained small was kept closed as sampling of the area continued and this area was eventually opened as the average size increased to meet or exceed the legal 68 count per pound size limit.

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 sites and piers along the Mississippi Gulf coast. Data were collected on species, size frequency distribution of economically and recreationally important finfish, estimates of total fishing pressure, estimates of total catch, and estimates of catch per unit of effort.

A total of 48 aerial counts was conducted at the 42 boat launch sites and 39 pier and jetty sites. They were used to determine relative pressure at each site for development of random weighted probabilities. The probabilities were used to schedule creel surveyors at the sites that received the most boat pressure. Interviews were conducted on 144 days throughout the year from sport boat trips and pier fishermen along the Mississippi Gulf coast.

SHELLFISH SANITATION

Oysters, as sessile filter feeders, are subject to the influence of environmental conditions to a greater extent than mobile fisheries. Consequently, oyster landings can change dramatically from year to year according to the quality of the water. In addition to fluctuations in the amount of rainfall, problems with upland pollution can render abundant supplies of oysters unavailable for harvest. During the oyster season, field sampling trips are made to stations located over the oyster reefs to collect water samples which are analyzed for fecal coliform content. Opening and closing of the reef areas is based on the amount of fecal coliform in the water column at the time of sampling. Multiple stations are sampled in each reef area (sub-area) and two consecutive clean samples separated by at least forty-eight hours must be obtained from each area in order to be opened. Oyster harvesting is closed after significant rain events until it is determined that

the water quality has improved to allow harvesting to resume. Water quality samples are obtained throughout the year to classify shellfish growing waters.

Along with monitoring the water quality of the oyster reefs, other work performed on the reefs involves revitalization of the reef. This includes reef turn over, oyster relaying and the planting of culch material.

A total of 358,102 sacks of oysters were harvested during the 1996-1997 season. Mississippi oyster harvesting waters are divided geographically into eight areas that are monitored closely and opened and closed accordingly.

INTERJURISDICTIONAL MONITORING AND ASSESSMENT OF SELECTED MISSISSIPPI MARINE RESOURCES

In FY1997 the MDMR received federal funds made possible from the Interjurisdictional Fisheries Act of 1986 (PL 99-659) and subcontracted with the GCRL for the work conducted for this project. This is an ongoing project that samples the estuarine and marine biota with gillnets, dredges, trawls, beam plankton nets, 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 of 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; continued monitoring of nearshore red drum populations; and commercial shrimp monitoring.

INVESTIGATIONS OF THE COBIA (*Rachycentron canadum*) IN MISSISSIPPI MARINE WATERS AND ADJACENT GULF WATERS

The project objectives are to determine seasonal movement patterns and growth by utilizing an extensive tag and release program while in Mississippi marine waters and adjacent Gulf waters.

In FY1997 the MDMR received federal funds made possible by the federal aid in Sport Fish Restoration Act (16 U.S.C. 669-669:) 50 CFR Part 80,

from the U.S. Fish and Wildlife Service. Part of these funds were passed on to the GCRL for the study of cobia.

Tagging fish to study movement patterns is being accomplished by GCRL staff, private fishermen, and charter boat fishermen along the Gulf Coast.

The GCRL staff is collecting, slicing, and reading otoliths for age determination and back calculating lengths at annular formation for growth estimates. Aspects of reproductive biology, which have been done and are ongoing, are (1) time of peak spawning; (2) ovarian maturation phases; and (3) egg counts for fecundity estimates.

STRIPED BASS RESTORATION PROGRAM FOR THE PEARL & PASCAGOULA RIVERS

This project is funded through monies made available through the MDMR to the GCRL by the Anadromous Fish Act (PL89-304) and the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 669-669i) 50 CFR Part 80. The project is ongoing, and in FY1997, over 12 million striped bass fingerlings were 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.

ASSESSMENT OF THE RED DRUM SPAWNING POPULATION FROM ESTIMATES OF REPRODUCTIVE SUCCESS

The collection of larval red drum samples on offshore spawning grounds provides data on larval abundance and survival that is needed to estimate egg production. Ichthyoplankton samples and various environmental parameters were collected and sorted during two cruises in September 1996 in the coastal and inner shelf waters between Chandeleur Sound and Mobile Bay from the R/V TOMMY MUNRO. Indices of larval abundance of red drum indicate that the stock sizes are increasing.

SPOTTED SEATROUT SPORT FISH STUDIES IN MISSISSIPPI

Field sampling utilized a multi-mesh gill net and hook and line equipment sampling at various stations along the Mississippi coastline. All the fish collected were returned to the laboratory for processing which included measuring length, total weight, sex, maturity, and removal of otoliths for age determination. Additional smaller specimens were taken to augment the database for growth estimates and further delineate the male to female ratio at younger ages.

TECHNOLOGY APPLICATIONS/ SEAFOOD QUALITY PROGRAM

Technology Applications and Assistance

The total number of technical assistance actions provided was 1,478. Some examples of the technical assistance actions are as follows:

- Assisted seafood processors and transporters maintaining a high level of seafood safety and compliance with state and federal seafood sanitation and health safety regulations. Thus, consumers of Mississippi seafood were provided maximum opportunities for purchasing safe/wholesome Mississippi seafood processed and transported in inspected and certified facilities.
- Developed an industry guidance paper for implementing Hazard Analysis Critical Control Point (HACCP) Sanitation Standard Operating Procedures.
- Mailed follow-up letters to owners of certified seafood facilities to remind them of any corrective actions needed to maintain compliance with seafood safety regulations.
- Provided aquaculture and other technical assistance actions to persons in south Mississippi. Information was provided on specific aquaculture species, the technologies for culturing them, particularly in closed recirculating systems, and some of the potential market opportunities for the cultured aquatic products.
- Served on the state Aquaculture Task Force.
- Peer-reviewed the National Aquaculture Plan.
- Helped an aquaculturist design and activate a closed recirculating system for culturing saltwater shrimp.

**Shellfish Sanitation and Health Safety
Inspections and Certifications**

- Inspected Mississippi certified shellfish processing, storage, and distribution facilities to determine compliance with state and federal

sanitation and seafood safety regulations and to provide the public confidence in Mississippi inspected seafood products. A strong public confidence in these products helps sustain a high market demand for Mississippi seafood products.

Permitted and Routinely Inspected Seafood Facilities by Type	
Shrimp	28
Crab	22
Oyster	38
Scallop	1
Total Number of Permits	89 ¹

The following are examples of seafood sanitation and health safety regulatory activities that were conducted by the staff of the Technology Applications/Seafood Quality Program:

- Conducted the following shellfish sanitation and health safety regulatory activities: 452 Seafood Facility Inspections and 111 Source Water Samples Processed for Testing. Also, 315 seafood sanitation inspection follow-up letters were included under technology applications and assistance.
- Conducted inspections and associated actions to determine compliance with the following sanitation and seafood health safety regulations:
 - ◀ Mississippi seafood sanitation/processing.
 - ◀ Molluscan shellfish sanitation specifications covered under the National Shellfish Sanitation Program.
 - ◀ Seafood species sanitation regulations other than Molluscan shellfish sanitation regulations.
- Conducted quarterly inspections of all certified facilities and conducted follow-up inspections as needed.
- Served on the HACCP Committee of the Interstate Shellfish Sanitation Conference.
- Attended Federal Drug Administration Seafood safety training courses.
- Attended the ISSC 16th Annual Meeting.

- Activated two recall actions pertaining to potentially contaminated seafood products.
- Prepared proposed changes to Ordinance 1 to incorporate NSSP consistency specifications applicable to molluscan shellfish processing plants.

COASTAL ZONE MANAGEMENT/PLANNING & POLICY

Coastal Zone Management Assistance

The MDMR received federal funds from NOAA's Office of Ocean and Coastal Resource Management and the U.S. Fish and Wildlife Service to meet coastal management objectives. Funds were used to provide administration support, purchase equipment, and cover the cost of various office expenses and travel. Funds were used for legal assistance through the State Attorney General's office. Coastal Management staff participated in two coast wide 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. The Port of Pascagoula SMA Plan was revisited to address additional dredge spoil disposal requirements in the Bayou Casotte area for both maintenance and new dredging needs in the bayou area.

A grant was given to the Scranton Museum to

¹These 89 permits represent 126 certified facilities.

conduct public outreach and public education programs in the coastal area.

Oil and gas technical objectives included 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 impact associated with oil and gas development, and the preparation of a comprehensive oil spill response plan for Mississippi's coastal waters.

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.

During FY1997 the implementation status of the MCP was evaluated by the Department of Commerce, NOAA. The evaluation concluded that the management plan was adequate; however, the federal review noted staff shortages in the coastal wetlands permitting efforts and federal consistency reviews. The overall conclusion was that the Department was not fully adhering to the terms and conditions of the grant, as well as the Mississippi Coastal Program.

COASTAL ECOLOGY

Wetlands Education and Protection

The Coastal Ecology staff achieved FY1997 objectives by administering the provisions of the

Coastal Wetlands Protection Law and the Mississippi Coastal Program, conducting special research projects, and protect habitat through a coastal preserves program. 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 FY1997. The staff has participated in a variety of public education efforts, providing specific wetland-related information to groups and the general public. Staff for the period number five full-time and one contract.

The staff conducted site inspections and environmental assessments, sponsored meetings, and acted on a total of 687 wetland cases including federal consistency reviews in FY1997 that included addressing the nearshore impacts brought about by dockside casino gaming and related coastal development. There were several legal challenges to wetland-related Commission decisions which are still pending.

Coastal Wetlands Acquisition

This program "Coastal Preserves and Grand Bay Bioreserve: Planning and Acquisition" is a cooperative effort with the Mississippi Office of Secretary of State.

Project objectives are to increase land acquisition in the state by twenty coastal preserve areas, including the Grand Bay Bioreserve area in Jackson County. In addition, the MDMR is seeking federal designation under the National Estuarine Research Reserve program under the Department of Commerce, NOAA.

TEXAS PARKS AND WILDLIFE DEPARTMENT

The Texas Parks and Wildlife Department (TPWD) Coastal Fisheries Division is responsible for making management recommendations regarding the state's fishery resources within the bays and estuaries and out to nine nautical miles in the Gulf of Mexico. Estimated value of the fisheries within the four million acres of marine habitat is in excess of \$2 billion.

COASTAL DIVISION OBJECTIVES

The goal of the Coastal Fisheries Program is to develop management plans for selected fisheries using the concept of optimum yield. These plans include recommended harvest regulations, resource stock enhancements or habitat enhancements based on fisheries independent and dependent monitoring program data utilizing the best scientific information available. The objectives of the division are:

- to recommend management strategies for aquatic marine resources to the executive director, the Texas Parks and Wildlife Commission (TPWC), and the legislature based on sound scientific data;
- to determine trends in abundance of finfish and shellfish populations affected by environmental conditions and fishing;
- to determine landings of marine species and associated social and economic characteristics of the fisheries;
- 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 bay, and assessing impacts of stocking on present populations and existing fisheries; and
- to promote, develop, maintain, monitor, and enhance the artificial reef potential in the marine waters off Texas.

To achieve these objectives, the division is organized into four major functions: administration, ecosystem monitoring, science, and enhancement. Effective management of finfish and shellfish populations must be based on a thorough knowledge of the population dynamics of the resources. Long-term trend data based on routine monitoring are necessary to assess trends in abundance. Commercial and recreational landings' information is necessary to assess impacts of user groups on the fisheries and to determine economic importance of these fisheries to the state.

Activities in FY1997 included participation in the development, review, and revision of GMFMC and GSMFC fishery management plans. Personnel participated in workshops and advisory meetings as state representatives on both the council and commission as well as other management authorities. In addition, numerous technical reports, scientific journal articles, and magazine articles about various aspects of the Texas coastal fishery resources were completed.

RESOURCE & HARVEST MONITORING

Monitoring of the relative abundance of adult finfishes in Texas waters is accomplished through using 600 feet long gill nets with individual 150 foot sections of three, four, five, and six-inch stretched mesh. Bag seines (60 feet long) and trawls (20 feet long) are used to determine abundance of juvenile finfish, shrimp, blue crabs, and associated organisms. Oyster dredges (19.5 inches wide) are used to collect oyster abundance data.

Gulf of Mexico water from Alabama to the Rio Grande was sampled to a depth of 300 feet during November 1996 and June-July 1997 with the other Gulf States and the NMFS. This effort, 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.

Sport landings (private and party boats) and associated fishermen activities are derived from on site creel interviews of recreational fishermen at the completion of their trips. Roving trailer and wet slip counts are used to assess relative pressure at sampling sites. Relative pressure is used to determine how often a site should be selected for a survey; higher use sites are surveyed more often than low use sites.

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; 2,040 bag seine samples; 2,640 bay and Gulf trawl samples; and 1,080 oyster dredge samples collected. A total of 11,354 fishes was tagged and released. About 6% were returned for rewards. The percent of tags returned was consistent with prior years.

Landings of headboat fishermen are collected by TPWD for the NMFS and coordinated by the GSMFC. Headboat catch, effort, and bioprofile data

are collected on the upper and middle Texas coast. Lower coast data are collected by NMFS port agents. Landings and effort estimates of the headboat fishery in the Gulf of Mexico are also provided to the NMFS.

Routine collection, editing, summarization, and publication of self-reported 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. Commercial landings are obtained from commercial seafood dealers through submission of monthly aquatic products reports (MAPR).

RESEARCH

The Perry R. Bass Marine Fisheries Research Station at Palacios provides information and techniques necessary for improvement of Texas fisheries management strategies. Effort is directed toward methods for improving fisheries management techniques which include spawning and rearing of marine organisms. Division personnel cooperate with other coastal states in marine fisheries enhancement efforts through transmittal of information and supply of available fisheries.

Electrophoretic studies of the population structure of sand seatrout and Atlantic croaker continued. Electrophoretic studies of the population structure of black drum and southern flounder continued as did DNA analysis of the southern flounder population. Development of a library of protein profiles of Texas fishes and shellfishes to be used for species identification and forensics continued. Red drum were collected from Galveston Bay, East Matagorda Bay, and lower Laguna Madre to assess stocking success from "gene marked" and "OTC" marked fingerlings. To further evaluate stocking, a comparison of red drum populations in the unstocked Cedar Lakes to populations in stocked bays continued. Collection of otoliths from red drum and spotted seatrout were continued to estimate age structure of these populations in Texas waters and to develop age-length keys for these fishes. Otoliths of spotted seatrout, red drum, Atlantic croaker, black drum, and sea catfish recovered from 800-5,000 year old Texas coastal archaeological sites were examined. Resulting data will be used to estimate mortality rates of the populations prior to heavy exploitation and to compare age structure of prehistoric populations to that of modern populations.

Two studies addressing information needs for management of shrimp and blue crabs continued. One study addressed the commercial shrimp catch rate (lbs/trip), size and species composition of shrimp landed, and characterized gear and methods used. The second study investigated effectiveness of various natural materials used in attaching degradable panels on crab traps to reduce the effects of ghost fishing from lost traps. At present, sisal and jute twines have the most favorable breaking times. A regulation making biodegradable panels mandatory on crab traps was passed by the Texas Parks and Wildlife Commission and went into effect on September 1, 1997.

A study was conducted during May-June in Aransas Bay testing three bycatch reduction devices (BRDs) (fish-eye, large mesh extended funnel, two-inch space bar turtle excluder device/bycatch reduction device) evaluating effectiveness to reduce bycatch in the spring bay-food industry. Reduction rates reveal BRDs hold promise for reducing bycatch, but further testing is required. This study will be duplicated during the fall 1997 bay-food shrimp season.

REGULATORY CHANGES

The Texas Legislature met in January 1997. Two House bills concerning the harvest of marine species were passed. House Bill 520 created a menhaden seine boat license to be applied to each boat operated in the harvest of menhaden. House Bill 2542 simplified and clarified Parks and Wildlife Code statutes. Chapter 76 was amended to provide statutory authority for the transfer of a commercial oyster boat license. The main points of amendments in Chapter 77 were providing statutory authority to allow for the transfer of a bait shrimp dealer's license and a Gulf boat license, and to provide that a bait shrimp dealer's license may not be held by a person holding a wholesale dealer's license. Amendments in Chapter 78 allowed for the establishment of a crab license management program and review board (i.e., limited entry program) to be implemented in FY1998.

The Texas Parks and Wildlife Commission adopted several rule changes to ensure stability of the resources. In the recreational fishery, flounder bag and possession limits were reduced from 20 and 40, respectively, to a bag and possession limit of 10. Also, the minimum size was increased from 12 to 14 inches. The minimum size on Florida pompano was changed from nine inches to no limit. In addition, a bag limit of 20 was placed on the harvest of ghost shrimp and their means of harvest by sand pumps was defined. In the

commercial fishery, flounder and bag and possession limits were changed from no limit to 60.

FISH STOCKING

Effort directed toward spawning and rearing marine fish continued. Controlled photoperiod and temperature regime to induce sexual maturity and spawning resulted in over 36.7 million red drum fingerlings, 210 million red drum fry, 5.4 million spotted seatrout fingerlings, and 92.1 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.

A new state-of-the-art marine fish hatchery and visitors' center opened in Lake Jackson in March 1996 and was operated very successfully during 1997. Sea Center Texas is a joint venture between the TPWD; The Dow Chemical Company, Texas Operations; and the Coastal Conservation Association and was constructed using \$13 million in sportfish restoration funds. The facility represents a unique merging of fisheries science and visitor education. Touted as the world's largest red drum (redfish) hatchery, Sea Center Texas has become a major attraction both locally and for visitors to the area and has welcomed 200,000 visitors since March 1996.

Sea Center's visitor appeal centers around its interpretive displays, a touch tank, and 25,000-52,000-gallon aquaria. The center's facilities include the largest red drum hatchery in the world, and during 1997 over 20 million fingerlings were produced for stocking in Texas coastal waters. Brood fish are spawned in the facility's 22,000-square-foot hatchery which houses 24, 12-foot diameter spawning tanks. During peak spawning periods, hatchery personnel collect between 1.5 and two million eggs each night from the brood stock tanks. After hatching, the larvae are then transferred to the 35 one-acre rearing ponds. Although established primarily as a red drum and spotted seatrout production hatchery, Sea Center will also serve as a testing ground for production of other marine species such as flounder, Atlantic croaker, snook, and tarpon.

ARTIFICIAL REEF PROGRAM

The Artificial Reef Program enhanced three deep water and two near shore reef sites in 1997. The program received the donation of three obsolete oil and gas structures in Outer Continental Shelf leasing blocks HI-A315, HI-A532, and PN-967. One structure was

mechanically cut in WC-480 and towed 27 miles from Louisiana waters to be placed in the HI-A315 reef site. A second structure was left attached to the bottom at the HI-A532 where the upper portion of the jacket was mechanically cut at 85-ft water depth and placed next to the standing structure. The third structure was mechanically cut in 125-ft of water at the PN-967 reef site. The cost savings to these oil companies resulted in the donation of \$432,239 to the Texas Artificial Reef Fund. The program is now responsible for maintaining 30 permitted reef sites and six unlighted buoys (Port Mansfield Liberty Ship Reef, Basco's Reef, George Vancouver Liberty Ship Reef, Port Isabel/South Padre Island Reef, HI-A-532 Reef, and the PN-967 Reef).

Reef Ball Development Corporation granted \$22,000 to the program for the lease of molds to build concrete reef balls in June-July 1997. Staff, along with an intern and eight Seaborne Conservation Corps youths, constructed 132 reef balls at the Texas A&M University Pelican Island boat basin in Galveston. The R/V GYRE (Texas A&M University-Galveston), transported 100 reef balls 11 miles offshore of Galveston to Barr's Reef at a cost of \$14,400.

Fifty quarry rocks were donated by Reed Tool Company in April 1997 and transported 23 miles offshore to Sabine Pass by Offshore Marine Services to Basco's Reef in September 1997. This donation resulted in a \$14,000 in kind donation to the program. The program was provided national attention when the Discovery News filmed and rebroadcast the deployment of the rocks at the reef site.

Preliminary biological monitoring was done in July 1997 by staff and Texas A&M University at Corpus Christi at a potential structure in PN-A72. This structure is located near Blackfish Ridge, a natural rock outcrop 32 miles north of Port Mansfield.

In July 1996, Senator J.T. "Buster" Brown and the TPWD kicked off the "Discover Texas Artificial Reefs" photo contest. The contest deadline was extended until September 1, 1997. Winners in each category will be presented certificates and ribbons and all winning photos will be displayed at the upcoming 1997 Texas Parks and Wildlife Expo. The grand prize winner will be honored by a brief ceremony conducted by Senator Brown.

Numerous presentations on the Artificial Reef Program were made at various conferences by staff including: the Sixteenth Annual Gulf of Mexico Information Transfer Meetings (New Orleans, Louisiana); Cost Effective Strategies for Offshore

Abandonment Conference (Houston, Texas); the International Workshop on Offshore Lease Abandonment and Platform Disposal Conference (New Orleans, Louisiana); and the annual American Fisheries Society Meeting (Monterey, California).

BROWN TIDE

A persistent algal (brown tide) bloom continues in the upper Laguna Madre area. This algal bloom began in 1990 and continues unabated. The extensive sea grass beds continue to be at risk because of reduced light penetration. About 25% of sea grass beds in water over three feet deep have disappeared and the long-term impacts of this event are unknown. Research continues on the effects of this record setting bloom.

RED TIDE

A red tide bloom *Gymnodinium breve*

occurred during September 1 through November 1, 1996 along the middle to lower Texas coast. The event was first noticed in the Gulf of Mexico off Mustang Island and would eventually be found in patchy distribution in all bays and Gulf waters south of Matagorda Bay and Pass Cavallo. About three million fish were killed, but only 2% were species of commercial or recreational importance; most (2.1 million) were killed offshore in the Gulf. Atlantic thread herring, gulf menhaden, and striped mullet comprised 23%, 23%, and 19% of the total, respectively. Around 12,000 mature spawning red drum were killed in the Gulf just north of the Port Aransas pass area. Subsequently, red drum recruitment in both Corpus Christi and Aransas Bays was adversely affected. Recruitment indices were 65% below the long term mean, whereas, in other bays recruitment was normal or above normal. Additionally, oyster harvest in several mid-coast bays was closed for up to 120 days.

NATIONAL MARINE FISHERIES SERVICE, SOUTHEAST REGION

The National Marine Fisheries Service (NMFS) is an agency of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (DOC/NOAA). The mission of the NMFS is stewardship of the nation's living marine resources. Through conservation and wise utilization, these marine resources and their habitats can be managed effectively and efficiently to maximize the benefit to 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. These programs include 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.

The NMFS is comprised of five regional offices and five centers located along the coastal United States. The Southeast Region covers the coastal states from North Carolina to Texas (including Alabama, Florida, Georgia, Louisiana, Mississippi, 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 NMFS Southeast Regional Office (SERO) is located in St. Petersburg, Florida. The regional administrator 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 through the range of NMFS programs. It provides environmental assessment and environmental impact statements for management plans and/or international negotiations; administrative and technical support to regional fishery management councils; economic and fishery trade analysis support for all regional programs; and is responsible for programs 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 NMFS Southeast Fisheries Science Center (SEFC) is located in Miami, Florida, with laboratories located in: Pascagoula and Stennis Space Center, Mississippi; Beaufort, North Carolina (which includes a laboratory located in Oxford, Maryland); and Galveston, Texas. The SEFC conducts multidisciplinary research programs to provide management information to support national and regional programs of the 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 and pursues research to answer specific needs in the subject areas of habitat conservation, aquaculture, fishery engineering, marine mammals, endangered species, and fishery oceanography.

The following highlights 1997 accomplishments of NMFS Strategic Goals:

SUSTAINABLE FISHERIES

- Closed and opened the EEZ off Texas to shrimp trawling to allow brown shrimp to grow to a larger, more valuable size according to the cooperative agreement with Texas.
- Approved Amendment 9 to the FMP for the Shrimp Fishery of the Gulf of Mexico. Amendment 9 required the use of certified BRDs in shrimp trawls in the EEZ of the Gulf of Mexico, set the red snapper bycatch mortality reduction criterion for NMFS' certification of BRDs at 44 percent, and established an FMP framework rulemaking procedure for modifying the bycatch reduction criterion, establishing and modifying the BRD testing protocol, and certifying BRDs and their specifications. The purpose of Amendment 9 is to reduce the bycatch of juvenile red snapper in the Gulf of Mexico shrimp trawl fishery and, to the extent practicable, not adversely affect the shrimp fishery.
- Initiated Secretarial review and approved Amendment 8 to the FMP for Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. Key changes include a permit moratorium, changes to the authorized gear and other regulations, overfishing definitions, and changes to framework procedures.
- Opened and closed the commercial king mackerel fishery twice for vessels using run-around gillnets

in the Florida west coast subzone to prevent this sector from exceeding its quota.

- Opened and closed the commercial king mackerel fishery twice for vessels using hook-and-line gear in the Florida west coast subzone to prevent this sector from exceeding its quota.
- Implemented 1997 catch limits for king and Spanish mackerel migratory groups and the fisheries in the waters off the Gulf of Mexico.
- Implemented Amendment 14 to the FMP for the Reef Fish Resources of the Gulf of Mexico. Amendment 14 prohibited fish traps west of Cape San Blas, FL; established a ten-year phase-out of fish traps ending February 8, 2007; implemented other fish trap and reef fish permit related measures; and prohibited the harvest or possession of Nassau grouper.
- Approved and implemented Amendment 15 to the FMP for the Reef Fish Resources of the Gulf of Mexico. Key provisions established a two-class transferrable red snapper license and trip limit system, split the red snapper commercial fishing season into two time periods, opened the red snapper commercial fishery at noon on the first of each month and closed it at noon on the 15th of each month during the commercial season; limited the harvest of greater amberjack to the bag limit each year during March through May; removed sea basses, grunts, and porgies from the management unit; and removed certain species from the aggregate bag limit for reef fish.
- Implemented final regulations that established a recreational quota and changes to timing of the commercial season for red snapper in federal waters of the Gulf of Mexico.
- Closed the recreational fishery for red snapper to prevent this sector from exceeding its allocation.
- Approved and implemented a regulation increasing the minimum size limit for vermillion snapper from 8 inches to 10 inches to reduce the potential for overfishing.
- Opened and closed the commercial red snapper fishery twice to allow harvest of the quota during the two seasons.
- Advised fishermen on control dates involving potential limited entry considerations in fisheries in the southeast region.
- For 1997, issued 5,095 multiple species fishing vessel permits and 379 multiple species dealer permits. Deposited \$278,695 into the U.S. Treasury from permit application fees.

RECOVERED PROTECTED SPECIES

- Modified 1994 TED regulations to establish

special sea turtle management areas and institute TED measures in these areas that are more efficient at releasing sea turtles from shrimp trawls. This action will help recover and maintain populations of Kemp's ridley and loggerhead turtles.

- Established a Sea Turtle Expert Working Group to analyze and evaluate the status of Kemp's ridley and loggerhead turtles and establish allowable levels of take in the commercial shrimp trawl fishery. This will contribute to recovery and maintenance of stocks because increases/decreases will be more measurable. Initial findings of the working group are that the Kemp's ridley is recovering substantially and the loggerhead is stable and some stocks are recovering.
- Trained 15 foreign nations in the use of TEDs so that incidental sea turtle mortality will be reduced. Provided technical support and information to the State Department which supported the certification of 42 nations in 1997 that have adopted TED programs or proven their fisheries do not adversely impact turtles.
- Participated as a member of a State Department delegation to negotiate a hemispheric sea turtle conservation convention. This convention, called the Inter American Sea Turtle Conservation Convention, was signed by 26 western hemisphere countries. The primary purpose of the Convention is the recovery and maintenance of sea turtle populations.
- Established an industry/NMFS panel of gear specialists to resolve turtle release problems with soft TEDs. This effort thus far has identified one modification of the Morrison TED that passed a turtle release test. Several modifications of the Andrews TED are being evaluated under commercial fishing conditions. Many Gulf fisherman are experimenting with the upward shooting Morrison soft TED modification as a potential device for Gulf use. Permits were issued to commercial fisherman to test this device eliminating the need for an interim rule to certify this device.
- Conducted 10 formal ESA section seven consultations on dredging activities, military explosive operations, fishery management plans, rig removals, and EPA permitting. These consultations are designed to allow the activity to proceed while minimizing adverse impacts to protected species of marine mammals, sea turtles, and several sturgeon species.
- Monitored a contract by a commercial fisheries organization to identify alternatives to TEDs. This is a major, two-year contract to identify possible

areas where turtles are not present and shrimping occurs. It will also provide data on the distribution and abundance of sea turtles for stock assessment purposes. The study is slated for completion in April 1998.

Issued a short term notice action to suspend the use of TEDs in lieu of limited tow times in Mobile Bay, Alabama, because of debris from Hurricane Danny which made the use of TEDs impossible. This allowed shrimp fisherman to continue to fish while turtles were still being protected.

HEALTHY LIVING MARINE RESOURCE HABITAT

Activities during 1997 focused on individual consultations involving federal regulatory programs, pre- and post-application planning, federal projects affecting habitat, National Environmental Policy Act (NEPA) consultations, watershed planning, partnerships and coordination with others (e.g., Fishery Management Councils), coordination between science and management, outreach efforts as possible, and a heightened involvement in habitat restoration, enhancement, creation, and preservation activities. Through consultative services involving field inspections, meetings, public hearings, and document review, biologists provide recommendations for sequentially avoiding, minimizing, and offsetting adverse impacts to habitat. During the year the following were accomplished:

The NMFS conducted 291 preapplication consultations for proposed water development projects. This process is especially useful in protecting fisheries habitat because potential permit applicants usually have not invested heavily in project plans. They are therefore often more amenable to accepting recommendations from resource agencies aimed at reducing environmental impact. The process also allows the NMFS to deal with the regulated public in a forum that is less adversarial than when project plans have been developed and advertised for public review. The amount of habitat that can be involved in this process is substantial. During 1997, 63 of the 291 preapplication consultations held involved more than 5,784 acres of fishery habitat.

The NMFS reviewed 5,914 individual proposals to develop in wetlands. Most of these activities (about 64 percent and 2 percent, respectively) were found to either pose no significant threat to fishery resources or were deferred to other agencies. Many of the projects with minimal environmental

impact resulted as a consequence of preapplication planning. About 12 percent were of concern because they involved substantial environmental impact. These projects required modification or denial of federal authorization to protect fisheries resources. Over 22 percent of the review opportunities could not be accommodated because of manpower and funding constraints.

Federal water development projects include construction and maintenance of federal navigation channels, beach erosion and hurricane protection, flood control, port expansion and deepening, and other similar actions. The Corps of Engineers (COE) is the principal federal agency in the coastal zone for the planning, design, and implementation of such projects. Environmental review is conducted by the COE, Fish and Wildlife Service, Environmental Protection Agency (EPA), NMFS, and state natural resource agencies. The NMFS's review of federal projects is conducted largely in connection with provisions of the Fish and Wildlife Coordination Act; however, other statutes such as the MSFCMA and NEPA also apply. These laws encourage NMFS review and input with respect to anticipated impacts and means by which adverse impacts can be avoided and offset. The HCD reviewed 104 federally constructed or sponsored projects during the year. The NEPA requires preparation of an Environmental Impact Statement for major federal actions having significant effects on the human environment. The NMFS reviews these documents to ensure that they adequately address impacts to fishery resources and to provide recommendations on least damaging alternatives. The review process can be a powerful tool for the NMFS in its advocacy role on behalf of fishery resources and their habitat. The NMFS comments must be considered and addressed by the lead federal agency. If NMFS views are not adequately considered, NEPA provides for an appeals process that allows the issue to be mediated at higher organizational levels. During 1997, 73 such consultations occurred.

The NMFS participated in numerous activities associated with mitigation planning and habitat restoration that are unrelated to other habitat restoration programs and activities addressed in this report. The majority of these opportunities are related to federal regulatory programs. The NMFS devoted considerable effort in planning for mitigation bank development, mitigation guideline development, and general mitigation planning. Activities related to the Coastal Wetland Planning Protection and Restoration Act (CWPPRA)

continue to be a major habitat restoration activity in the Southeast. This year was extremely active in this arena of the habitat program and substantial accomplishments are evident in all parts of the habitat program. The NMFS conservatively estimates that it interacted on proposals this year that will preserve, enhance, restore, or create more than 157,796 acres of fisheries habitat. This includes 23,610 acres associated with mitigation banks and 65,000 acres of NMFS-sponsored restoration projects under the CWPPRA program. The National Estuary Program is a comprehensive, multi-agency evaluation, planning, and action oriented initiative for preserving, protecting, and restoring the aquatic resources within entire estuarine ecosystems. The EPA is the lead federal agency. The NMFS represented NOAA and

provided technical assistance. Estuary programs in effect and requiring effort include: Galveston and Corpus Christi bays, Texas; Barataria-Terrebonne Bays Complex, Louisiana; Tampa Bay, Sarasota Bay, Indian River, and Charlotte Harbor, Florida; Mobile Bay, Alabama; and Albemarle-Pamlico Sound, North Carolina.

Both the NOAA and NMFS have responsibilities related to habitat protection in the Southeast, and these responsibilities are often intertwined. The NMFS Southeast Region also performs actions directly for NOAA and NMFS Headquarters. Consequently, coordination and cooperation among these entities is essential and forms a large share of the habitat protection activities undertaken during the year.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

ADMINISTRATION

The Administrative Policy Committee reviewed proposed modifications to the Standard Operating Policies and Procedures based on changes to the Magnuson-Stevens Act and general housekeeping changes. A majority of the recommendations were approved. Council staff and the Personnel Committee also provided revisions to the policies and procedures. The revised Standard Operating Policies and Procedures were sent to the NMFS for review and approval.

BUDGET

The Council approved a budget for CY1998 and forwarded the document to the NMFS. A revised budget was subsequently submitted for a lower amount and represented an interim budget pending possible Congressional approval of an increase in funding.

STATUS OF PLAN DEVELOPMENT

The following table provides the status of fishery management plan development from January 1, 1997 through December 31, 1997:

Fishery Management Unit	Completed Implementation as of December 31, 1997	Target Date	Remarks
Billfish Plan* ²		1988	Amendment 1 being developed.
Coastal Herring	Final profile completed	None	No further action.
Coral	Amendments 1, 2, and 3 implemented.	1984	
Groundfish	Draft completed, FMP development suspended.	None	
Mackerel ^{1,2}	Amendments 1 through 8 implemented.	1983	Amendment 9 submitted for public hearings. Amendment 10 being developed.
Reef Fish ^{1,2}	Amendments 1 through 15 implemented. Amendments 8 through 10 withdrawn.	1984	Amendment 16 completed for public hearings. Amendment 17 being developed.
Red Drum ^{1,2}	Amendments 1, 2, and 3 implemented.	1986	
Shark*		1993	Amendment 1 under development.
Shrimp ^{1,2}	Amendments 1 through 8 implemented.	1981	Amendment 9 pending implementation.
Spiny Lobster ^{1,2}	Amendments 1 through 8 implemented.	1982	
Stone Crab ^{1,2}	Amendments 1 through 5 implemented.	1979	Amendment 6 being developed.
Swordfish*		1986	Amendment 1 under development.
Tuna*		1998	

*Secretarial FMP affecting Gulf. The Council has a consultation role and may convene panels and committees for advice on regulatory measures.

¹Monitoring report completed.

²Operations plan completed or under development.

U.S. FISH AND WILDLIFE SERVICE

ANADROMOUS FISHERIES

Gulf Coast Fisheries Coordinator Doug Frugé served as chairman of the GSMFC Anadromous Fisheries Subcommittee during 1997 and participated in the GSMFC spring (Biloxi, Mississippi) and fall (Gulf Shores, Alabama) meetings including the Anadromous Fish Subcommittee meeting that was held at the Tara Wildlife Management and Services facility at Eagle Lake, Mississippi, on September 29-October 1.

Fisheries Stewardship Initiative Project

During December 1996 the Gulf Coast Fisheries Coordination office (FCO) was notified that a Fish and Wildlife Service (FWS) Fisheries Stewardship Initiative proposal that had been jointly prepared with the Panama City Fisheries Resource Office (FRO) had been funded. This proposal, titled *Restoration of striped bass in three Gulf of Mexico river systems*, addressed striped bass restoration in the Apalachicola-Chattahoochee-Flint rivers system of Alabama, Florida, and Georgia; the Pascagoula River, Mississippi; and the Lake Pontchartrain rivers of Louisiana and Mississippi. The project was funded at \$296,000 per year for federal fiscal years 1997-1999.

The FWS, in consultation with the GSMFC, began initial planning in January 1997 on a strategy to implement the project. An overall strategy of implementing the project in partnership with state agencies through the GSMFC was developed. A memorandum was sent on January 27 by the GSMFC to Gulf coastal state resource agencies including the Georgia Department of Natural Resources and Alabama Division of Freshwater Fisheries inviting proposals for implementing aspects of the project in each basin.

Proposals were received from the Florida Game and Fresh Water Fish Commission (FGF), the Georgia Department of Natural Resources (GDNR), the Gulf Coast Research Laboratory (GCRL), Louisiana Department of Wildlife and Fisheries (LDWF), and Mississippi State University (MSU). The GSMFC Anadromous Fisheries Subcommittee meeting held on March 17 in Biloxi, Mississippi, was almost exclusively devoted to discussing proposals received, as well as administrative aspects of implementing the project through the GSMFC. Following refinement and adjustments to a number of the proposals, a cooperative agreement with the GSMFC was developed and signed in June to formalize joint efforts to carry out the project

and effect funding transfer. The GSMFC negotiated subcontracts with state and university participants in the project effective July 1.

On June 24 Doug Frugé accompanied Dr. Don Jackson and Graduate Student John Mareska of Mississippi State University on a reconnaissance trip of the Pascagoula River in preparation for carrying out aspects of the project in the Pascagoula River.

An intra-agency agreement between the FWS and the Louisiana Cooperative Fish and Wildlife Research Unit was developed in August to implement aspects of the project in the Lake Pontchartrain rivers.

The Gulf Coast FCO negotiated a contract with Dr. Isaac Wirgin of New York University Medical Center to perform genetics analyses of striped bass tissue samples that will be collected as part of the Fisheries Stewardship Initiative project. This contract was awarded by the FWS in September. Following this, the FWS provided guidance to project participants regarding sample preparation, preservation, and allied data collection associated with striped bass genetics analyses.

A progress report on the Fisheries Stewardship Initiative Project was drafted by the Gulf Coast FCO and submitted to the FWS Southeast Regional Office on October 15. This report was transmitted to the Washington office of the FWS, as required by the Fisheries Stewardship Initiative grant.

Apalachicola-Chattahoochee-Flint Rivers Striped Bass Restoration

The Panama City FRO again helped the FGF with holding the annual *Morone* workshop for Gulf striped bass restoration in the Apalachicola-Chattahoochee-Flint River system. The meeting was held at Chattahoochee, Florida, on February 5-6 and was attended by FWS personnel from a number of national fish hatcheries (NFHs), the Gulf Coast FCO, the Panama City FRO, and Southeast Regional Office.

Striped Bass Fry/Fingerling Production and Stocking

During January 1997, stocking of Phase II Gulf race striped bass fingerlings from the 1996 hatchery production season continued in the lower Apalachicola River and the Intracoastal Waterway at White City, Florida. Fish were provided by Carbon Hill State Fish Hatchery, Alabama, and National Fish

Hatcheries at Edenton, North Carolina, Warm Springs, Georgia and Welaka, Florida. Post-stocking holding cage evaluations showed survival rates in excess of 90%.

The Gulf Coast FCO coordinated with several state and federal fish hatcheries early in 1997 regarding production and stocking of Phase I and II Gulf race striped bass fingerlings resulting from 1996 hatchery production in preparation for the annual *Morone* workshop at Chattahoochee, Florida, in February. This included preparation of a stocking summary, a summary of FWS hatchery production capabilities for 1997, and a draft protocol to guide Gulf striped bass production and stocking by a number of state and federal field stations across the Gulf Coast.

During Spring 1997 Laura Jenkins of the Panama City FRO began handling day-to-day coordination of Gulf race fry and fingerling distribution which had formerly been done by the Gulf Coast FCO. A memorandum providing guidance on Gulf race striped bass fry and fingerling production and distribution for 1997 was sent to participating fish hatcheries and other offices on March 18.

A contract with Dr. Isaac Wirgin for genetic screening of Gulf race striped bass broodfish during Spring 1997 was developed by the Gulf Coast FCO and issued by the regional contracting office in April. A separate contract for these analyses on broodfish to be collected in Spring 1998 was issued on September 23.

The Panama City FRO transported Gulf striped bass broodfish collected in the Apalachicola River and Lake Talquin by the FGF and in the Flint and Chattahoochee rivers by the GDNR. Fish were transported to either Welaka NFH, Florida, or the FGF's Blackwater Fisheries Research and Development Center (FRDC), Florida for induced spawning.

Welaka NFH produced almost 7 million Gulf striped bass fry, which were sent to state and federal hatcheries for Phase I or Phase II production. A total of 201,800 Phase I Gulf striped bass fingerlings were stocked by Natchitoches, Private John Allen, and Welaka NFHs in Gulf rivers in support of restoration efforts. Also, a total of 114,900 Phase II striped bass produced in 1997 were stocked in the lower Apalachicola River, Florida. The Phase II fish were produced at Welaka NFH, Warm Springs NFH, and Private John Allen NFH. Panama City FRO and FGF personnel tagged some of these Phase II striped bass for future analysis of survival and growth. Private John

Allen NFH and Welaka NFH also provided Phase II Gulf striped bass in January to Mammoth Springs NFH to be used for future brood stock.

Other Striped Bass Activities

A meeting among FWS and GSMFC personnel was held at the Region 4 office in Atlanta, Georgia, on February 9 to discuss planning for a workshop on Gulf striped bass restoration. The GSMFC and FWS will be jointly holding the workshop. The workshop was initially planned for fall 1997 but was postponed approximately one year at the request of the GSMFC.

On June 19 Gulf Coast FCO and GSMFC personnel met in Jackson, Mississippi, with personnel of the U.S. Geological Survey (USGS), Water Resources Division, regarding specifics of a project the GSMFC funded to gather water temperature data during summer 1997 in the Pascagoula River. The objective of the study, which the USGS carried out in August and September, was to identify areas of cool water in the river that might provide thermal refuge habitat for striped bass. Data collected in August were preliminarily analyzed by the Gulf Coast FCO in September. This preliminary analysis did not reveal any areas that appeared to provide suitable cool water refuge areas for striped bass. Another meeting with the USGS was held in December, at which time the complete set of data resulting from the study in geographic information system (GIS) format was provided by the USGS. The Gulf Coast FCO will analyze these data for presentation at the spring 1998 meeting of the GSMFC Anadromous Fisheries Subcommittee.

The Gulf Coast FCO discussed aspects of striped bass management in the lower Mississippi River with a representative of the Delta Wildlife Foundation (DWF) on July 28. The DWF may be interested in helping to facilitate future efforts in this area.

In September the Gulf Coast FCO reviewed the draft Mobile River Basin Recovery Plan (Alabama), prepared by the FWS Ecological Services Field Office (FO) in Jackson, Mississippi. This recovery plan was developed by a coalition of conservation, citizen, and economic development interests in the Mobile River basin and will serve as a recovery plan for a number of species listed as threatened or endangered under the Endangered Species Act in the basin. A narrative for addition to the plan regarding striped bass restoration was drafted and sent to the Jackson FO.

Personnel of the Gulf Coast FCO and GSMFC met in December with representatives of Brown and Mitchell, an engineering firm in Gulfport, Mississippi, regarding a GIS database being developed regarding potential sources of pollution and contaminants in the Pascagoula River watershed. This project is being funded by the GSMFC as part of an effort to better understand environmental factors affecting striped bass restoration in the basin.

Gulf Sturgeon Recovery Activities

Panama City FRO employees assisted the USGS, Southeastern and Caribbean Science Center, Gainesville, Florida, with capturing, tagging, and tracking Gulf sturgeon in the Suwannee River. Welaka NFH personnel also assisted with checking egg collection sites in the river to try to identify Gulf sturgeon spawning sites.

The FWS participated in numerous meetings of the state of Florida's Sturgeon Production Working Group. The Working Group was directed by the Florida legislature to develop a strategy for promoting the aquaculture of sturgeon in the state. Lorna Patrick, Panama City Ecological Services FO, gave a presentation on the Gulf Sturgeon Recovery Plan to the working group. The FWS has concerns, including the take of listed species for commercial production, possible introduction of non-native sturgeon into the wild, and public perception of commercial production and sale of a listed species.

The Panama City FRO continued a Gulf sturgeon movement and habitat use study on the Choctawhatchee River and Bay. This study is being carried out by Dwayne Fox, Ph.D. candidate at North Carolina State University, and Michelle LaRue, student assistant from the University of Michigan. Twenty fish ranging from 50 to 171 pounds were collected from Choctawhatchee Bay, radio tagged, and movements monitored while in freshwater. The fish are being tracked as they migrate upstream to spawn, and egg catching devices are being strategically placed to document spawning locations. To date, six different spawning sites have been documented in the upper Choctawhatchee and the lower Pea River, Alabama. In addition, six sturgeon were fitted with sonic tags to monitor their movements in Choctawhatchee Bay and adjacent Gulf of Mexico waters to determine estuarine and marine habitat use.

Ten Gulf sturgeon from the Yellow River were also fitted with external sonic tags and will be monitored to determine their movement and marine

habitat utilization in Pensacola Bay and adjacent Gulf of Mexico. Assistance with this project was provided by the state of Florida's Northwest Florida Aquatic Preserves in Milton, Florida. The Panama City FRO also conducted Gulf sturgeon investigations in the Mobile Delta during 1997; however, no sturgeon were collected.

Frank Parauka, Panama City FRO, made a presentation on the office's Gulf sturgeon work to the Choctawhatchee Bay Technical Symposium.

OTHER COASTAL FISHERIES

The Corpus Christi FRO (Texas) made presentations on coastal Texas distribution and biology of the edible brown mussel (*Perna perna*), a nonindigenous species, at workshops held in Houston, Texas, in April and New Orleans, Louisiana, in June. The New Orleans workshop was sponsored by the Gulf of Mexico Program's Nonindigenous Species Focus Team. Working with Corpus Christi State University, that office also began developing the final report on edible brown mussel monitoring in Texas coastal waters.

The Corpus Christi FRO conducted fish population surveys at Brazoria, Laguna Atascosa, McFaddin, and Texas Point NWRs on the Texas coast in June and July. That office also provided assistance to the Texas Parks and Wildlife Department with a bycatch reduction study during June.

Dr. Peter Rubec, FDEP/FMRI, St. Petersburg, Florida, sought assistance during November from the Gulf Coast FCO regarding a proposal he was developing for submission to the National Fish and Wildlife Foundation (NFWF) for further development of a coastal habitat GIS database and analysis system.

The Panama City Ecological Services FO assisted a volunteer sea turtle watch group in acquiring a state of Florida permit to conduct sea turtle nesting surveys in Walton County, Florida. The office also continued to provide training and technical assistance in sea turtle conservation and coordinated with FDEP and federal agencies regarding conservation measures to protect sea turtles in conjunction with Hurricane Opal damage repair efforts. These efforts included dune restoration, dune walkover construction, residential and commercial reconstruction, and beach "berm" construction.

HABITAT PROTECTION/ENHANCEMENT

Gulf of Mexico Program

Ron Nassar, FWS Lower Mississippi River Fisheries Coordinator, met with Tom Pullen of the Mississippi Valley Division, Corps of Engineers, and Dave Smith, FWS Liaison with the Gulf of Mexico Program, to discuss potential conservation initiatives to address the northern Gulf of Mexico hypoxic zone at the National Association of Conservation Districts annual meeting.

The Gulf Coast FCO provided comments in June on a proposal by the U.S. Army, Corps of Engineers, for dealing with the Gulf of Mexico hypoxic zone problem. The Gulf Coast FCO also participated in a meeting of the Gulf of Mexico Program's Data and Information Transfer Committee at Stennis Space Center, Mississippi, on June 17.

Essential Fish Habitat

Gulf Coast Fisheries Coordinator Doug Frugé attended a workshop on January 15 in Corpus Christi, Texas, and a public hearing on May 13 in New Orleans, Louisiana, held by the NMFS regarding the new EFH requirements of the 1996 Magnuson-Stevens Sustainable Fisheries Act. Comments on the proposed rule by the NMFS to establish procedures for carrying out the EFH requirements were submitted by the Gulf Coast FCO through the FWS Region 4 Office in June.

In September Doug Frugé was appointed to the GMFMC's *ad hoc* Technical Review Panel (TRP) that was set up to review the draft fishery management plan (FMP) amendment to designate EFH. The activities of the review panel are being coordinated by the GSMFC's Habitat Program under memorandum of understanding with the GMFMC. Doug Frugé attended the first meeting of the TRP in New Orleans, Louisiana, to review draft sections of the FMP amendment.

Estuarine Conservation Programs

The Gulf Coast FCO participated in a meeting at the Mississippi Department of Marine Resources headquarters in Biloxi, Mississippi, on January 6 regarding plans for drafting a management plan and environmental impact statement for the proposed Grand Bay National Estuarine Research Reserve.

Other Habitat Protection Activities

The Panama City Ecological Services Field

Office continued work on biological studies in support of draft interstate water compacts for the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint river basins. Drafts of the compacts were developed and released for review in January. Water extraction from these river basins could impact estuarine resources of Mobile and Apalachicola bays.

In August the Gulf Coast FCO sent out letters to various partner agency representatives across the Gulf of Mexico regarding the *Fisheries Across America* and *Restore our Southern Rivers* initiatives of the NFWF. The letters invited collaboration on developing proposals for matching funds available from the NFWF for fisheries habitat restoration projects.

The FWS's Ecological Services FOs were active in reviewing and commenting on various federal construction and/or permit-related actions involving habitat alteration activities throughout the year. These mostly encompassed Corps of Engineers permitted activities through the Fish and Wildlife Coordination Act and Section 7 consultations under the Endangered Species Act. Mitigation for coastal habitat damages were recommended in FWS comments on these projects.

PUBLIC OUTREACH/EDUCATION

Information on Gulf sturgeon including photographs were sent by the Gulf Coast FCO to a student in Washington State in April in response to a request received by the FWS Washington, D.C. office over the Internet. The information will be used to develop an Internet World Wide Web page as a science class project.

Doug Frugé worked with staff of Southeast Louisiana and Mississippi Sandhill Crane National Wildlife Refuges at an Earth Day festival held at the Gulf Islands National Seashore in Ocean Springs, Mississippi on April 19.

The Panama City FRO developed a draft Gulf striped bass restoration brochure to be produced by the GSMFC Anadromous Fisheries Subcommittee. The draft brochure was discussed at the September meeting of the subcommittee. The Gulf Coast FCO provided comments on the draft brochure following the meeting.

Gulf sturgeon Watchable Wildlife signs developed by the Panama City FRO were sent to all coastal marine fisheries agencies and other

organizations for placement at high use areas along the Gulf coast.

Frank Parauka, Panama City FRO, presented information on Gulf sturgeon to the Geneva (Alabama) Rotary Club. Sturgeon spawning sites have been located on the Choctawhatchee River near the town of Geneva, and local citizens are very interested.

Numerous coastal FWS offices participated in a variety of public events by staffing information tables, participating in special youth fishing events, and presenting programs to civic groups, school classes, and other organizations.

FEDERAL AID FUNDING

The FWS continued providing funds to Gulf of Mexico states for a number of estuarine or marine sport fish restoration projects under the Federal Aid in Sport Fish Restoration Act. This also included provision of funds to the GSMFC through an Administrative Grant under that act.

Doug Frugé met on October 2 with Dr. Wendell Lorio, Mississippi State University, regarding a project he is initiating. The project, an inventory and classification of Mississippi coastal wetlands, is being funded through the FWS Wetlands Grant program.

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, 1997



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

R E P O R T

GULF STATES MARINE FISHERIES COMMISSION
Ocean Springs, Mississippi

DECEMBER 31, 1997

INDEX TO REPORT
of
GULF STATES MARINE FISHERIES COMMISSION

DECEMBER 31, 1997

	<u>PAGE</u>
Independent Auditors' Report	1
<u>Section I - Financial Statements:</u>	
Statement of Assets, Liabilities, and Net Assets-Modified Cash Basis	2
Statement of Revenues and Expenses- Modified Cash Basis	3
Statement of Cash Flows-Modified Cash Basis	4
Notes to Financial Statements	5-8
<u>Section II - Supplemental Information:</u>	
Schedule of Functional Expenses- Modified Cash Basis	9
Schedule of Federal Awards-Modified Cash Basis	10
<u>Section III - Reports on Compliance and Internal Control:</u>	
Independent Auditors' Report on the Compliance and Internal Control over Financial Reporting Based on an Audit of General Purpose Financial Statements Performed in Accordance with <u>Government Auditing Standards</u>	11-12
Independent Auditors' Report on Compliance with the Requirements Applicable to each Major Federal Program and Internal Control over Compliance in Accordance with OMB Circular A-133	13-14
<u>Section IV - Other Items:</u>	
Schedule of Findings and Questioned Costs	15
Auditee's Corrective Action Plan	16
Auditee's Summary Schedule of Prior Audit Findings	17



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Michael D. O'Neill, CPA

Independent Auditors' Report

Gerald Piltz, CPA
Stanford A. Williams, Jr. CPA

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

We have audited the accompanying statement of assets, liabilities and net assets-modified cash basis as of December 31, 1997, and the related statements of revenues, expenses and net assets-modified cash basis and cash flows-modified cash basis 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 and the standards applicable to financial audits contained in 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. An audit 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.

As described in Note A, these financial statements were prepared on the modified cash basis of accounting, which is a comprehensive basis of accounting other than generally accepted accounting principles.

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, 1997, and the changes in its net assets-modified cash basis and its cash flows-modified cash basis for the year then ended in conformity with generally accepted accounting principles.

In accordance with Government Auditing Standards, we have also issued our report dated March 7, 1998 on our consideration of Gulf States Marine Fisheries Commission's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts and grants.

Our audit was performed for the purpose of forming an opinion on the basic financial statements of Gulf States Marine Fisheries Commission taken as a whole. The accompanying financial information listed as supplemental information in the Index to Report, including Schedule of Expenditures of Federal Awards which is required by U.S. Office of Management and Budget Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations, is presented for 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.

Piltz, Williams, LaRosa & Co.
Certified Public Accountants



SECTION I

FINANCIAL STATEMENTS

GULF STATES MARINE FISHERIES COMMISSION
 STATEMENT OF ASSETS, LIABILITIES AND NET ASSETS-MODIFIED CASH BASIS
 December 31, 1997

ASSETS

Current assets:

Cash	\$ <u>288,174</u>
------	-------------------

Property and equipment:

Land	20,000
Building	182,817
Vehicles	61,746
Equipment	<u>142,543</u>
Total	407,106
<u>Less:</u> Accumulated depreciation	<u>(104,551)</u>
Total property and equipment	<u>302,555</u>

Total	\$ <u>590,729</u>
-------	-------------------

LIABILITIES & NET ASSETS

Current liabilities:

Note payments, due within one year	\$ <u>11,837</u>
------------------------------------	------------------

Long-term liabilities:

Note payments, due within one year	<u>141,372</u>
------------------------------------	----------------

Net assets:

<u>Unrestricted:</u>	
Operating	163,551
Temporarily restricted	194,263
Property and equipment - restricted	<u>79,706</u>
Total net assets	<u>437,520</u>

Total	\$ <u>590,729</u>
-------	-------------------

See the Notes to Financial Statements.

GULF STATES MARINE FISHERIES COMMISSION
 STATEMENT OF REVENUES AND EXPENSES-MODIFIED CASH BASIS
 For the Year Ended December 31, 1997

	Un- <u>restricted</u>	Temporarily <u>restricted</u>	<u>Total</u>
<u>Revenues and reclassifications:</u>			
Member state appropriations	\$ 90,000	\$	\$ 90,000
Grant/contract support		1,062,087	1,062,087
Rental income	11,275		11,275
Fees	4,483		4,483
Interest income	7,070		7,070
Net assets released from restrictions	<u>946,231</u>	(946,231)	
Total revenues and reclassifications	<u>1,059,059</u>	<u>115,856</u>	<u>1,174,915</u>
<u>Expenses:</u>			
Programs:			
Fishery Management Council	25,409		25,409
Port Samplers	28,103		28,103
Fish and Wildlife	16,727		16,727
Interjurisdictional Fisheries	231,749		231,749
SEAMAP	85,590		85,590
RECFIN/COMFIN	170,072		170,072
Sportfish Restoration	235,954		235,954
Striped Bass	203,966		203,966
Habitat	<u>14,696</u>		<u>14,696</u>
Totals	1,012,266		1,012,266
General and administrative	<u>120,215</u>		<u>120,215</u>
Total expenses	<u>1,132,481</u>		<u>1,132,481</u>
Change in net assets	(73,422)	115,856	42,434
Net assets, beginning of year	<u>236,973</u>	<u>78,407</u>	<u>315,380</u>
Net assets, end of year	<u>\$ 163,551</u>	<u>\$ 194,263</u>	<u>\$ 357,814</u>

See the Notes to Financial Statements.

GULF STATES MARINE FISHERIES COMMISSION
 STATEMENT OF CASH FLOWS-MODIFIED CASH BASIS
 For the Year Ended December 31, 1997

<u>Cash flows from operating activities:</u>	
Changes in net assets	\$ 42,434
Adjustments to reconcile change in net assets to net cash provided by operating activities:	
Depreciation	7,639
Collection of prior year grants receivable	17,709
Acquisition cost of vehicles and equipment included in operating activities	<u>67,579</u>
Net cash provided by operating activities	<u>135,361</u>
<u>Cash flows from investing activities:</u>	
Purchase of building	(202,817)
Purchase of vehicles and equipment	<u>(77,621)</u>
Net cash provided (used) by investing activities	<u>(280,438)</u>
<u>Cash flows from financing activities:</u>	
Note proceeds, building	150,008
Note proceeds, equipment	33,696
Note payments	<u>(39,628)</u>
Net cash provided by financing activities	<u>144,076</u>
Net increase (decrease) in cash	(1,001)
Cash, beginning of year	<u>289,175</u>
Cash, end of year	<u>\$ 288,174</u>
Interest paid	<u>\$ 7,735</u>

See the Notes to Financial Statements.

GULF STATES MARINE FISHERIES COMMISSION
NOTES TO FINANCIAL STATEMENTS
Year Ended December 31, 1997

Note A - Summary of Significant Accounting Policies:

Operations: The Gulf States Marine Fisheries Commission, a not-for-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 appropriated Federal Programs. The Commission may also receive and expend funds from any other sources not "prohibited by law".

Basis of accounting: The accompanying financial statements have been prepared on the modified cash basis of accounting. That basis differs from generally accepted accounting principles because the Commission has not recognized balances, and the related effects on earnings, of grant receivables from third party agencies and of accounts payable to vendors.

Financial statement presentation: The Commission adopted the Statement of Financial Accounting Standards (SFAS) No. 117, "Financial Statements of Not-for-Profit Organizations" for the year ended December 31, 1996. Under SFAS No. 117, the Organization is required to report information regarding its financial position and activities according to three classes of net assets: unrestricted, temporarily restricted, and permanently restricted. In addition, the Commission is required to present a Statement of Cash Flows.

Revenues: Revenues consist principally of the member state appropriations, which represents the estimated cost of operating the Commission, grants and procurement/service contracts. The member state appropriations are considered to be available for unrestricted use and are reported as unrestricted net assets. Grants and procurement/service contracts are considered to be restricted in their use and are therefore reported as temporarily restricted net assets.

Fixed assets: Fixed assets purchased from unrestricted funds are recorded at cost. Fixed assets purchased from restricted funds are expensed in the fund making the expenditures. They are then recorded as a capital addition at cost, with an offsetting entry to an equity account. Depreciation is computed on the straight-line method over the estimated useful lives of the assets.

Cash and cash equivalents: Cash and cash equivalents for purposes of the Statement of Cash Flows exclude permanently restricted cash and cash equivalents.

Income taxes: The Commission is exempt from income taxes under Internal Revenue Code Section 501(c)(5) and is classified by the Internal Revenue Service as an agricultural organization.

Estimates: The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from these estimates.

GULF STATES MARINE FISHERIES COMMISSION
 NOTES TO FINANCIAL STATEMENTS
 Year Ended December 31, 1997
 (Continued)

Note B - Concentration of Credit Risk:

The Commission maintains two bank accounts at one financial institution. The carrying amount of the Commission's deposits with the financial institution was \$288,149 and the bank balance was \$402,531. Accounts at the financial institution are insured by the Federal Deposit Insurance Corporation (FDIC) up to \$100,000. Cash in these accounts exceeded the federally insured limit. The uninsured bank balance at December 31, 1997, was \$302,531. The uninsured bank balance was collateralized in the amount of \$200,000 with securities held by the pledging financial institution's trust department or agent in the Commission's name. The remaining balance of \$102,531 was uninsured and uncollateralized.

Note C - Property, Plan, and Equipment:

At December 31, 1997, the Organization's land and depreciable property and equipment totaled

Land, pledged	\$ 20,000
Building, pledged	182,817
Vehicles	61,746
Office equipment	<u>142,543</u>
Total	407,106
<u>Less:</u> Accumulated depreciation	<u>104,551</u>
Total property and equipment	<u>\$ 302,555</u>

Depreciation expense for 1997 was \$21,575

Note D - Temporarily Restricted Net Assets:

Temporarily restricted net assets are available for the following purposes or periods:

Striped Bass	\$ 12,852
Port Samplers	178,114
DNA	1,680
Chevron	<u>1,617</u>
Total temporarily restricted net assets	<u>\$ 194,263</u>

Note E - Property & Equipment - Restricted:

This account represents the federal funds equity in property and equipment acquired with federal funds. Following is the current year activity in this account:

Balance, beginning of year	\$ 58,689
<u>Add:</u>	
Federal funds expended for capital additions	<u>73,836</u>
Total	<u>132,525</u>
<u>Deduct:</u>	
Balance due on copier purchased	6,258
Assets disposed of during year	6,916
Adjustment to record beginning of year accumulated depreciation	25,710
Current year depreciation	<u>13,935</u>
Total deductions	<u>52,819</u>
Balance, end of year	<u>\$ 79,706</u>

GULF STATES MARINE FISHERIES COMMISSION
 NOTES TO FINANCIAL STATEMENTS
 Year Ended December 31, 1997
 (Continued)

Note F - Release of Net Assets:

Net assets were released from donor restrictions by incurring expenses satisfying the restricted purposes or by the occurrence of other events specified by donors.

Purpose restriction accomplished:	
Fishery Management Council	\$ 25,206
Port Samplers	28,103
Fish and Wildlife	9,394
Interjurisdictional Fisheries	216,572
SEAMAP	80,524
RECFIN/COMFIN	157,884
Sportfish Restoration	224,582
Striped Bass	<u>203,966</u>
 Total restrictions released	 <u>\$ 946,231</u>

Note G - Notes Payable:

During the current year the Commission acquired the building that it had previously been renting. This acquisition was financed in part with a loan from Hancock Bank. Details of the financing are as follows:

Original loan amount	\$ 150,008
Interest rate	8.5%
Payment terms	60 monthly payments of \$1,488, plus 1 of remaining balance
Collateral	Land and building at 204 Government Street Ocean Springs, MS
 Loan balance 12/31/1997	 \$ 146,951

During the current year the Commission acquired a new copy machine. The financing details are as follows:

Cost of copier	\$ 25,032
Payment terms	Initial payment of \$4,172 plus 10 payments of \$2,086
Collateral	Ricoh 8980 copier
Loan balance 12/31/97	\$ 6,258

Maturities by years are as follows:

Year ending 12/31/1998	\$ 11,837
12/31/1999	6,072
12/31/2000	6,609
12/31/2001	7,193
12/31/2002	<u>121,498</u>
Total	153,209
<u>Less:</u> due within one year	<u>11,837</u>
Due beyond one year	<u>\$ 141,372</u>

GULF STATES MARINE FISHERIES COMMISSION
NOTES TO FINANCIAL STATEMENTS
Year Ended December 31, 1997
(Continued)

Note H - Functional Allocation of Expenses:

The costs of providing the various programs and activities have been summarized on a functional basis in the Statement of Revenues, Expenses and Changes in Net Assets-Modified Cash Basis. Accordingly, certain costs have been allocated among the programs and supporting services benefited.

Note I - 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 expenses for the year ended December 31, 1997 was \$19,374.

SECTION II

SUPPLEMENTAL INFORMATION

GULF STATES MARINE FISHERIES COMMISSION
SCHEDULE OF FUNCTIONAL EXPENSES-MODIFIED CASH BASIS
For the Year Ended December 31, 1997

	Unre-	Restricted								Total	
	stricted	Council	Port	Fish and	Inter-	SEAMAP	RECFIN	Sportfish	Striped		Habitat
	General	Funds	Samplers	Wildlife	jurisdic- tional	Funds	COMFIN	Restor- ation	Bass		
Expenses:											
Salaries	\$ 53,665	\$ 18,853	\$	\$ 8,198	\$ 72,579	\$ 36,301	\$ 54,249	\$ 53,955	\$ 6,400	\$ 8,551	\$ 259,086
Payroll taxes	4,224	1,442		627	5,551	2,772	4,148	3,803	490	654	19,487
Health insurance	7,300	2,680		1,216	10,864	5,333	8,232	7,561			35,886
Retirement	4,087	1,365		633	5,001	2,410	3,801	2,078			15,288
Office rent	1,417	354		3,042	1,794	843	1,116	1,469			8,618
Equipment rental	180			15	340	140	207	268			970
Office supplies	4,606	339		174	7,352	1,371	2,717	2,700		1,217	15,870
Postage	100			68	4,154	4,691	5,633	4,210	53		18,809
Travel	5,607				58,569	10,886	65,881	42,821		1,051	179,208
Telephone	2,723	242		685	3,158	1,836	5,314	3,232	114	816	15,397
Copy expense	873			1,703	6,480	4,990	4,979	4,504	90	62	22,808
Printing	366			49	2,449	9,833	1,897	10,092			24,320
Meeting costs	8,358				3,006	591	3,580	1,521			8,698
Subscriptions and dues	914			10	1,935	178	1,582	544			4,249
Auto expense	3,235			24	1,164	199	304	1,068			2,759
Maintenance	3,364	15		104	2,595	1,292	1,833	1,882			7,721
Professional services	2,222			130	1,919	830	1,241	1,881			6,001
Other taxes	(1,084)	107		44	371	198	266	327			1,313
Contractual			28,103					89,483	196,819		314,405
Insurance	1,701	12		5	2,703	896	1,442	2,555			7,613
Courtesies	983										
Capital expenditures					39,765		1,650			2,345	43,760
Depreciation	7,639										
Interest expense	7,735										
Totals	\$ 120,215	\$ 25,409	\$ 28,103	\$ 16,727	\$ 231,749	\$ 85,590	\$ 170,072	\$ 235,954	\$ 203,966	\$ 14,696	\$ 1,012,266

See the Notes to Financial Statements.

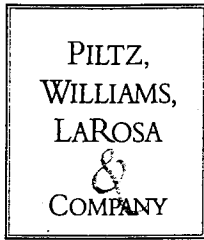
GULF STATES MARINE FISHERIES COMMISSION
 SCHEDULE OF FEDERAL AWARDS-MODIFIED CASH BASIS
 For the Year Ended December 31, 1997

<u>Federal Grantor/Program Title</u>	<u>Catalog of federal domestic assistance</u>	<u>Award amount</u>	<u>Federal revenues received</u>	<u>Federal amount expended</u>
<u>U.S. Department of Interior</u>				
Striped Bass Stewardship Project	15.600	\$ 252,615	\$ 216,819	\$ 203,966
Sports Fish Restoration Program	15.605	400,000	<u>224,582</u>	<u>235,954</u>
Total U.S. Department of Interior			<u>441,401</u>	<u>439,920</u>
<u>U.S. Department of Commerce</u>				
Interjurisdictional Fisheries Management Plan	11.407	599,999	175,782	231,749
Recreational Fisheries Information Network (RECFIN), and Commercial Fisheries Information Network (COMFIN)	11.434	677,720	141,792	170,072
Southeast Area Monitoring and Assess- ment Program (SEAMAP)	11.435	270,564	<u>65,248</u>	<u>85,590</u>
Totals U.S. Department of Commerce			<u>382,822</u>	<u>487,411</u>
Totals for all federal awards			<u>\$ 824,223</u>	<u>\$ 927,331</u>

Note: This schedule was prepared using the same basis of accounting and the same significant accounting policies, as applicable, used for the financial statements.

SECTION III

REPORTS ON COMPLIANCE AND INTERNAL CONTROL



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11

Gerald Piltz, CPA
Stanford A. Williams, Jr. CPA

Independent Auditors' Report
On the Compliance and Internal Control over Financial Reporting
Based on an Audit of the Financial Statements
Performed in Accordance with Government Auditing Standards

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

We have audited the general purpose financial statements of Gulf States Marine Fisheries Commission as of and for the year ended December 31, 1997, and have issued our report thereon dated March 7, 1998. We conducted our audit in accordance with generally accepted auditing standards and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States.

Compliance:

As part of attaining reasonable assurance about whether Gulf States Marine Fisheries Commission's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts and grants, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests did not disclose any instances of noncompliance that are required under Government Auditing Standards.

Internal Control Over Financial Reporting:

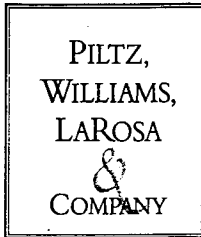
In planning and performing our audit, we considered Gulf States Marine Fisheries Commission's internal control over financial reporting in order to determine our auditing procedures for the purpose of expressing our opinion on the financial statements and not to provide assurance on the internal control over financial reporting. However, we noted certain matters involving the internal control over financial reporting and its operation that we consider to be reportable conditions. Reportable conditions involve matters coming to our attention relating to significant deficiencies in the design or operation of the internal control over financial reporting that, in our judgment, could adversely affect Gulf States Marine Fisheries Commission's ability to record, process, summarize and report financial data consistent with the assertions of management in the financial statements. Reportable conditions are described in the accompanying Schedule of Findings and Questioned Costs as Item 97-1.

A material weakness is a condition in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements in amounts 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. Our consideration of the internal control over financial reporting would not necessarily disclose all matters in the internal control that might be reportable conditions and, accordingly, would not necessarily disclose all reportable conditions that are also considered to be material weaknesses. However, we believe none of the reportable conditions described above is a material weakness.

This report is intended for the information of the Commission, management and federal awarding agencies and pass-through entities. However, this report is a matter of public record and its distribution is not limited.

Petty, Williams, Lubowicz & Co.
Certified Public Accountants

Biloxi, Mississippi
March 7, 1998



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13

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Independent Auditors' Report on Compliance with Requirements
Applicable to Each Major Federal Program and Internal Control
Over Compliance in Accordance with OMB Circular A-133

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

Compliance:

We have audited the compliance of Gulf States Marine Fisheries Commission with the types of compliance requirements described in the U.S. Office of Management and Budget (OMB) Circular A-133 Compliance Supplement that are applicable to each of its major federal programs for the year ended December 31, 1997. Gulf States Marine Fisheries Commission's major federal programs are identified in the summary of auditors' results section of the accompanying Schedule of Findings and Questioned Costs. Compliance with the requirements of laws, regulations, contracts and grants applicable to each of its major federal programs is the responsibility of Gulf States Marine Fisheries Commission's management. Our responsibility is to express an opinion on Gulf States Marine Fisheries Commission's compliance based on our audit.

We conducted our audit of compliance in accordance with generally accepted auditing standards; the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States; and OMB Circular A-133, "Audits of State, Local Governments, and Non-Profit Organizations". Those standards and OMB Circular A-133 require that we plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about Gulf States Marine Fisheries Commission's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion. Our audit does not provide a legal determination on Gulf States Marine Fisheries Commission's compliance with those requirements.

In our opinion, Gulf States Marine Fisheries Commission complied, in all material respects, with the requirements referred to above that are applicable to each of its major federal programs for the year ended December 31, 1997.

Internal Control Over Compliance:

The management of Gulf States Marine Fisheries Commission is responsible for establishing and maintaining effective internal control over compliance with requirements of laws, regulations, contracts and grants applicable to federal programs. In planning and performing our audit, we considered Gulf States Marine Fisheries Commission's internal control over compliance with requirements that could have a direct and material effect on a major federal program in order to determine our auditing procedures for the purpose of expressing our opinion on compliance and to test and report on internal control over compliance in accordance with OMB Circular A-133.

We noted certain matters involving the internal control over compliance and its operation that we consider to be reportable conditions. Reportable conditions involve matters coming to our attention relating to significant deficiencies in the design or operation of the internal control over compliance that, in our judgment, could adversely affect Gulf States Marine Fisheries Commission's ability to administer a major federal program in accordance with applicable requirements of laws, regulations, contracts and grants. Reportable conditions are described in the accompanying Schedule of Findings and Questioned Costs as Item 97-1.

A material weakness is a condition in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that noncompliance with applicable requirements of laws, regulations, contracts and grants that would be material in relation to a major federal program being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. Our consideration of the internal control over compliance would not necessarily disclose all matters in the internal control that might be reportable conditions and, accordingly, would not necessarily disclose all reportable conditions that are also considered to be material weaknesses. However, we believe none of the reportable conditions described above is a material weakness.

This report is intended for the information of the Commission, management and federal awarding agencies and pass-through entities. However, this report is a matter of public record and its distribution is not limited.

Peltz, Williams, Johnson & Co.
Certified Public Accountants

Biloxi, Mississippi
March 7, 1998

SECTION IV

OTHER ITEMS

GULF STATES MARINE FISHERIES COMMISSION
SCHEDULE OF FINDINGS AND QUESTIONED COSTS
For the Year Ended December 31, 1997

Section 1 - Summary of Auditors' Results:

1. An unqualified opinion was issued on the general purpose financial statements.
2. The audit of the general purpose financial statements did not disclose any material weaknesses in internal control.
3. The audit did not disclose any noncompliance which is material to the general purpose financial statements.
4. The audit did not disclose any material weaknesses in internal control over major programs.
5. An unqualified opinion was issued on compliance for major programs.
6. The audit disclosed one audit finding which was required to be reported under Section ____ .510(a) of OMB Circular A-133.
7. The major programs were: Sport Fish Restoration - 15.605; Striped Bass Stewardship Project - 15.600; Interjurisdictional Fisheries Management Plan - 11.407.
8. The dollar threshold used to distinguish between Type A and Type B Programs was \$300,000.
9. The auditee does qualify as a low-risk auditee.

Section 2 - Findings Related to the Financial Statements:

Finding 97-1

Procurement -

During the course of our examination, we were informed that there were no written procurement procedures. It was noted that there are written procedures relative to travel and compensation matters. Our procedures indicate that the Commission is exercising a system of approvals based upon a knowledge of federal regulations and management's experience.

Recommendation -

We recommend that management reduce its procurement procedures to writing. The procedures should provide for a written system of requisitions, authorizations, receipt and compliance so as to document all aspects of procurement.

Section 3 - Findings and Questioned Costs for Federal Awards:

Finding 97-1

Program -

Inasmuch as the Commission operates a centralized accounting system which includes procurement, Finding 97-1 as previously outlined would affect all federal funds.

Requirement -

OMB Circular A-110 provides that recipients shall establish written procurement procedures.

Effect -

The above finding had no impact on any of the Commission's programs.

Questioned costs -

This finding did not result in any questioned cost.



Larry B. Simpson
Executive Director

GULF STATES MARINE FISHERIES COMMISSION

P.O. Box 726, Ocean Springs, MS 39566-0726

(601) 875-5912 (FAX) 875-6604

AUDITEE'S CORRECTIVE ACTION PLAN

As required by Section ____ .315(b) of OMB Circular A-133, Gulf States Marine Fisheries Commission has prepared and hereby submits the following corrective action plan for the finding included in the Schedule of Findings and Questioned Costs for the year ended December 31, 1997.

Finding 97-1 - Corrective Action Plan Details:

Contact person:

Mrs. Virginia K. Herring
Executive Assistant
P.O. Box 726
Ocean Springs, MS 39564

Corrective Action Planned:

Gulf States Marine Fisheries Commission has complied with federal procurement requirements in its purchasing practices. Management will review its procurement practices in connection with its other written policies and take appropriate action. It is anticipated that this will be undertaken during the upcoming year and be resolved by the fall.



Larry B. Simpson
Executive Director

GULF STATES MARINE FISHERIES COMMISSION

P.O. Box 726, Ocean Springs, MS 39566-0726

(601) 875-5912 (FAX) 875-6604

AUDITEE'S SUMMARY SCHEDULE OF PRIOR AUDIT FINDINGS

As required by Section ____ .315(b) of OMB Circular A-133, Gulf States Marine Fisheries Commission has prepared and hereby submits the following summary schedule of prior audit findings as of December 31, 1997:

<u>Findings</u>	<u>Status</u>
There were no prior findings.	