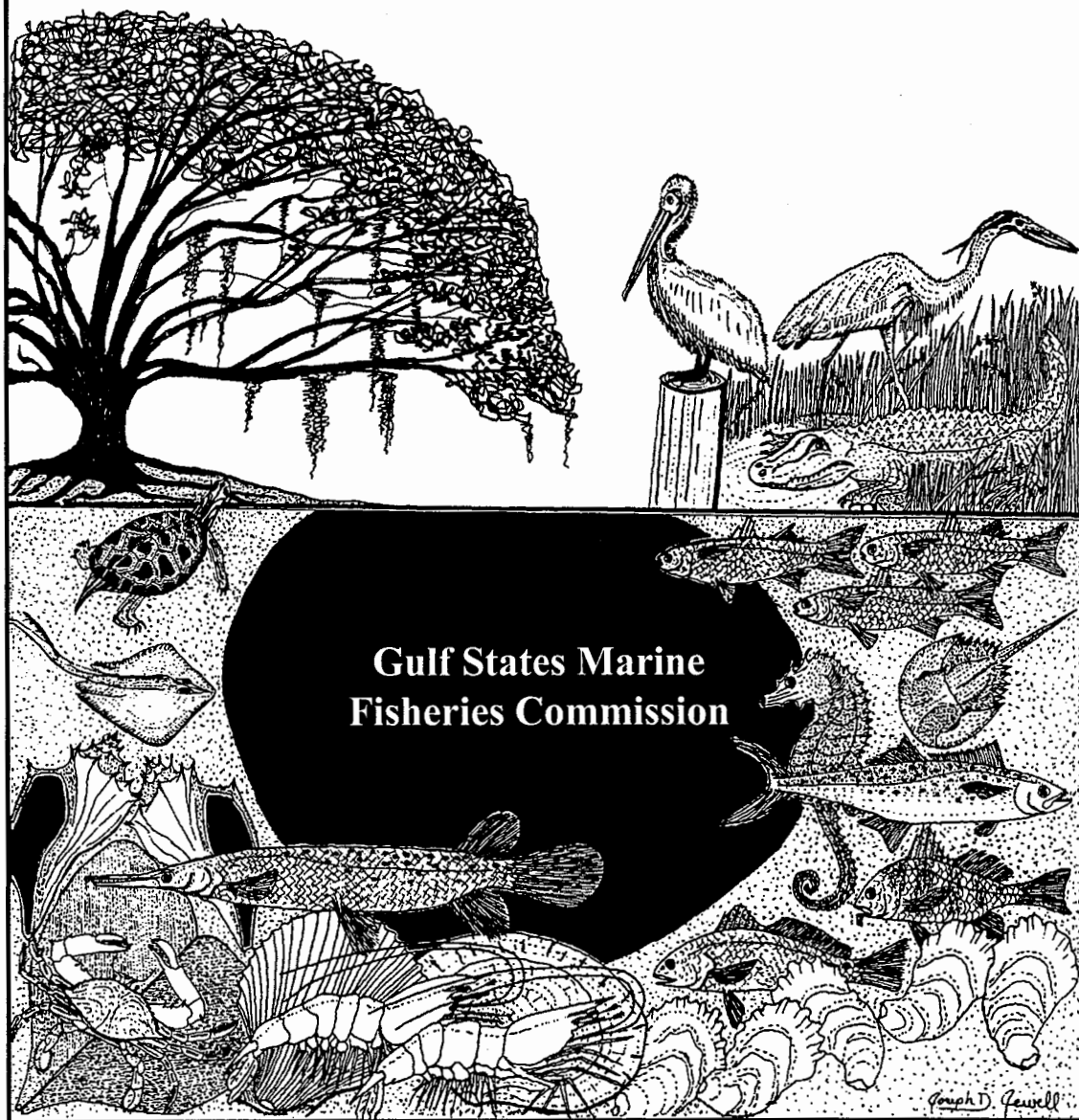


Forty-Seventh Annual Report
of the
GULF STATES MARINE FISHERIES COMMISSION

FOR THE YEAR 1996



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.

*Inside
front
cover*

GULF STATES MARINE FISHERIES COMMISSION

FORTY-SEVENTH ANNUAL REPORT
(1996)

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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Acknowledgment

In submitting this Forty-seventh 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-seven 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,

Chris Nelson, Chairman
Gene McCarty, Vice Chairman
Larry B. Simpson, Executive Director

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Commission Roster

Chairman: Chris Nelson

Vice Chairman: Gene McCarty

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
Allen Boyd
Florida House of Representatives
Monticello, 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
Jan J. Harper
Lake Jackson, TX

Staff

Larry B. Simpson
Executive Director

Ronald R. Lukens
Assistant Director

James J. Duffy
Program Coordinator

David M. Donaldson
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

Commission Officers

Chairman: Chris Nelson
1st Vice Chairman: Gene McCarty
2nd Vice Chairman: vacant

Committee Officers

Executive Committee Chris Nelson
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 David Ruple, Chairman
TCC SEAMAP Subcommittee Richard Waller, Chairman
Jim Hanifen, Vice Chairman

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GULF STATES MARINE FISHERIES COMMISSION

ACTIVITIES

Several Commission initiatives came to the forefront in the year 1996. Most notable were data collection programs. For several years, the Gulf States have taken on the task of trying to improve the data collection activities in the Gulf. The Fisheries Information Network (FIN) for the Gulf of Mexico was developed. This program, patterned after the successful and highly-regarded Pacific States program, was developed through the auspices of the Gulf States Marine Fisheries Commission (GSMFC) and was designed to meet the data collection and management needs for important marine, estuarine, and shellfish resources of the Gulf of Mexico. The need for high quality data with timely availability for fisheries management transcends jurisdictional boundaries, and the interjurisdictional nature of most fish and shellfish stocks in the Gulf of Mexico require the cooperation of both state and federal agencies with the authority to manage those stocks through regulatory programs.

The FIN is a regionally based program which is a component of an overall national, state-federal cooperative program. It is composed of two units, the Commercial Fisheries Information Network (ComFIN) and the Southeast Recreational Fisheries Information Network [RecFIN(SE)]. The ComFIN is a fishery dependent data program for commercial fisheries, and the RecFIN(SE) is a fishery dependent data program for recreational fisheries (shore, private boat, and charter fishing). Each of these units functions through three distinct program activities including data collection, data management, and program management and coordination. Data collection and data management represent the operational aspects of the program; program

management and coordination represent the administrative aspects of the program.

Until now, the ComFIN and RecFIN(SE) programs were planning activities with initial benefits from a joint partnership approach. This approach led to modifications in state and federal programs. Regional state and Commission data collection in the field is now ready to implement. Support for these programs and their implementation comes from a cross section of the fishing community including the states, commercial and recreational fisheries, and the councils.

The organizational structures created under the ComFIN and RecFIN provide a state-federal cooperative oversight function to identify data needs and operational plans to satisfy those needs. Additionally, these organizational structures provide the means to resolve problems and issues regarding the collection and management of data with the ultimate goal of providing data that are of sufficient quantity and quality to meet the needs of fishery management agencies in a timely manner. Full implementation of the FIN for the Gulf of Mexico now only requires money. Following an evaluation of the programmatic costs and an analysis of needs by all partners, it has been determined that the financial requirements to fully implement the FIN in the Gulf of Mexico will be \$5.5 million. The ComFIN program will cost \$4.0 million, and the RecFIN program will cost \$1.5 million. Any new initiative requires some time of phase-in, and a transition plan has been developed for these multi year data programs.

MEETINGS/ACTIVITIES OF THE EXECUTIVE DIRECTOR

GULF STATES MARINE FISHERIES COMMISSION

Joint GSMFC/ASMFC/PSMFC Meeting on RecFIN/ComFIN, Washington, DC — January 1996
SEAMAP Conference Call on Red Drum, Ocean Springs, MS — February 1996
Mississippi Department of Marine Resources Commission Meeting, Biloxi, MS — February 1996
Gulf Programs Meeting with Ralph Rayburn, Ocean Springs, MS — February 1996
Internet Workshop, Biloxi, MS — March 1996
GSMFC Spring Meeting, Brownsville, TX — March 1996
GSMFC/ASMFC/PSMFC Directors' Meeting on Statistics Funding, Washington, DC — April 1996
Interviews for Program Coordinator, Ocean Springs, MS — June 1996
Habitat Poster Meeting with Artist, Ocean Springs, MS — June 1996
Habitat Poster Meeting with Artist, Ocean Springs, MS — July 1996
PSMFC Annual Meeting, Sun River, OR — September 1996
Data Progress Meeting with Bill Fox, Sun River, OR — September 1996
GSMFC 47th Annual Meeting, New Orleans, LA — October 1996
State Directors' Meeting, Gulf Shores, AL — December 1996

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

Brownsville, TX — January 1996
Red Snapper Conference Call, Ocean Springs, MS — February 1996
Duck Key, FL — March 1996
Houston, TX — May 1996
Tampa, FL — July 1996
Ad Hoc Council Habitat Policy, New Orleans, LA — July 1996
New Orleans, LA — September 1996
Point Clear, AL - November 1996

CONGRESSIONAL MEETINGS

Gulf of Mexico Issue Meetings with Senators Breaux and Lott, Representative Livingston, and Representative Taylor's staff, Washington, DC — December 1996

OTHER MEETINGS AND ACTIVITIES

North American Wildlife Conference, Speech on Data Collection, Tulsa, OK — March 1996
NOAA Baker Town Hall Meeting on NOAA Programs, New Orleans, LA — May 1996
NMFS Aquaculture Policy on Pathogens and Exotics, New Orleans, LA — June 1996
NMFS Constituents Meeting, New Orleans, LA — October 1996
Secretary of Commerce's Marine Fisheries Advisory Committee Meeting, Honolulu, HI — November 1996

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 1996, SEAMAP operations continued for the fifteenth consecutive year. SEAMAP resource surveys included the Louisiana seasonal trawl surveys, Spring Plankton Survey, Reef Fish Survey, Summer Shrimp/Groundfish Survey, Fall Plankton Survey, and Fall Shrimp/Groundfish Survey. Other 1996 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.

Sampling was conducted aboard the R/V PELICAN during three segments: July, September, and December 1996. A stratified random station selection design was maintained, varying from the transects previously surveyed.

During each segment, stations were sampled during day and night at depths from 5 to 20 fm. The July sampling was completed as part of the SEAMAP Summer Shrimp/Groundfish Survey.

All seasonal trawls were completed with the standard SEAMAP 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.

Spring Plankton Survey

For the fourteenth year, plankton samples were collected during the spring in the northern Gulf of Mexico. The NOAA ship CHAPMAN 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 May 26, 1996. A total of 189 stations was sampled. The CHAPMAN sampled 171 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, dissolved oxygen from surface, midwater, and near bottom, and Forel-ule color) were collected at all stations.

Right bongo and neuston samples 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 fifth Reef Fish Survey was conducted from June 25 to October 24, 1996. Vessels from the NMFS and the states of Texas and Alabama sampled inshore and offshore waters, in addition to plankton and environmental sampling. A total of 265 stations was sampled throughout the Gulf of Mexico. Randomly selected sites from Brownsville, Texas, to Key West, Florida, are chosen from known hard bottom locations. The objectives of the survey are to assess relative abundance and compute population estimates of reef fish using a video/trap technique; determine habitat using an echo sounder and video camera; determine if bioacoustics assessment methodology can be applied to reef fish communities; collect environmental data at each station; and collect ichthyoplankton samples at selected reef sites.

The primary purpose of this survey is to assess the relative abundance and compute population estimates of reef fish. Stations are randomly-selected 100 m² sites which are designated as "reef areas." There are several aspects of the reef fish survey: 1) locating and compiling known hard bottom reef habitat locations; 2) survey site selection; 3) sampling protocol using a fish trap and video camera; and 4) analysis of video records. Data is collected using the trap/video methodology where a fish trap containing a video camera is deployed onto

the selected reef site. Trap soak time is one hour. After trap deployment, hydrographic data including a STD/light meter, transmissometer drop, secchi disk reading, and surface chlorophyll samples will be collected. Also, after the last trap/camera set, one ichthyoplankton station was completed each day with a surface neuston net and Tucker trawl. Environmental and plankton samples collected used established SEAMAP protocols, and plankton samples will be transshipped 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 are based on whether the reader can identify and count fish entering the camera field of view and record the data.

Summer Shrimp/Groundfish Survey

During the spring 1996, 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. The objectives of the survey were to monitor size and distribution of penaeid shrimp during or prior to migration of brown shrimp from bays to the open Gulf; aid in evaluating the "Texas Closure" management measure of the Gulf Council's Shrimp Fishery Management Plan; and provide information on shrimp and groundfish stocks across the northern Gulf of Mexico from inshore waters to 50 fm.

The overall sampling strategy during the 1996 survey was to work from the eastern Gulf to the Texas/Mexico border, in order to sample during or prior to migration of brown shrimp from bays to the open Gulf area. The survey was conducted from June 1 to July 19, 1996. During the survey, the NOAA ship OREGON II and the

Gulf Coast Research Laboratory's 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 323 trawl samples was taken from coastal and offshore waters out to 50 fm from Mobile Bay, Alabama, to Brownsville, Texas. All vessels took environmental data including temperature, salinity, oxygen, and chlorophyll at each station.

Fall Plankton Survey

The purpose of the Fall Plankton Survey is to assess abundance and distribution of king mackerel eggs and larvae in the Gulf of Mexico. Vessels from Florida, Alabama, Mississippi, Louisiana, and the NMFS surveyed Gulf waters from Florida Bay to Brownsville, Texas, from September 3 to October 4, 1996. Stations were located along a 30-minute latitude/longitude grid from inshore waters to the shelf edge.

The CHAPMAN sampled 122 stations from Tampa Bay, Florida, to Brownsville, Texas, at depths from 5 to 100 fm. The R/V VERRILL sampled nine stations at the mouth and outside Mobile Bay. The R/V TOMMY MUNRO sampled 48 stations south of Mississippi Sound along a 30-minute grid. The R/V PELICAN sampled 31 stations in Louisiana territorial waters. Florida's R/V SUNCOASTER sampled 19 stations off Tampa Bay south to the Florida Straits.

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, and temperature; dissolved oxygen from surface, mid-water, and bottom; and water transparency and water color 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 LDWF according to SEAMAP protocols and specimens and data provided to the SEAMAP Archiving Center.

Fall Shrimp/Groundfish Survey

The Fall Shrimp/Groundfish Survey was conducted from October 8, 1996 to December 5, 1996, from off Mobile, Alabama, to the United States-Mexican border. Vessels sampled waters out to 60 fm, covering a total of 346 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 sample the northern Gulf of Mexico to determine abundance and distribution of demersal organisms from inshore waters to 60 fm; obtain length-frequency measurements for major finfish and shrimp species to determine population size structures; collect environmental data to investigate potential relationships between abundance and distribution of organisms and environmental parameters; and collect ichthyoplankton samples to determine relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.

During the survey, the OREGON II sampled 199 stations in offshore waters and territorial Louisiana and Texas waters. The R/V VERRILL sampled seven stations in Alabama territorial waters. The R/V TOMMY MUNRO sampled 29 stations in Mississippi territorial and offshore waters. The R/V PELICAN sampled 31 stations in Louisiana territorial and offshore waters. Texas vessels sampled 80 stations within their territorial waters.

In addition, ichthyoplankton data were collected by the NMFS and Louisiana vessels at sample sites occurring nearest to half-degree intervals of latitude/longitude. A total of 50 stations was sampled with bongo and/or neuston nets, as encountered along cruise tracks. The NMFS completed 43 ichthyoplankton stations, and Louisiana completed seven stations. 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 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 and are managed in conjunction with the NMFS Southeast Fisheries Science Center (SEFC). 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 1982-1995 have been entered into the system, and data from 1996 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 175 SEAMAP data requests has 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. To date, 173 requests have been completed, and work is being performed on those remaining. Requested SEAMAP data were used for a multitude of purposes in 1996 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 1993 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 or distributed. Thus, the SEAMAP users are able to locally and directly enter and retrieve data. 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.

A major function of the SEAMAP Information System in 1996 was the processing of catch data from the Summer Shrimp/Groundfish Survey as near-real-time data. Data were transmitted three times weekly via a cellular phone to the NMFS Mississippi Laboratories from the NOAA vessel, while the states' data were entered into the system weekly. Plots of station locations and catch rates of shrimp, squid, and dominant finfish species were prepared and edited at the NMFS Mississippi Laboratories and processed by GSMFC for weekly distribution to management agencies, fishermen, processors, and researchers. Management agencies also received comprehensive data listings showing penaeid shrimp length frequencies, sampling parameters, and environmental conditions.

SEAMAP Archiving Center

Larval fish and fish egg samples sorted to the 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 1996, 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. Five such requests have been accommodated in the present fiscal year. The FDEP is in the process of completing renovations on the existing building which houses the SEAMAP Archiving Center. The expansion will allow for expansion of the climate-controlled storage area and upgrade to current fire codes.

SEAMAP Invertebrate Plankton Archiving Center

The SIPAC is in its twelfth 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 1996 but at a reduced level of activity. The SIPAC continues to provide unsorted plankton samples and data or specimens of larval invertebrates to qualified researchers upon request.

During 1996, a total of 411 SEAMAP plankton samples was received and logged into the SIPAC data base. In addition, the entire collection of SEAMAP samples was inventoried, curated, and computer files updated. A total of 5,613 samples is currently catalogued in the SIPAC collections, and there are currently 146 samples on loan to various individuals in 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 more than seven years and duplicate samples have been processed by the Polish Sorting and Identification Center are aliquoted. During 1996, approximately 250 samples from 1985 SEAMAP cruises were aliquoted. Approximately 1,450 samples collected from 1982 through 1985 have been aliquoted and prepared for long-term storage. Due to the recent addition of samples to the collection during 1996, there is currently no space available for additional samples to be deposited into the SIPAC archives.

During the next year, the SIPAC will continue to manage SEAMAP plankton collections and generate specimens and data on selected invertebrate species. Beginning in September 1996, a full-time postgraduate student will be assigned to work with the SIPAC plankton collection. It is anticipated that during 1997,

samples from the 1986 collections will be aliquoted for long-term storage, sorted invertebrate collections will be inventoried, curated, and a summary report prepared on the holdings.

PROGRAM MANAGEMENT

The SEAMAP program is administered by the SEAMAP Subcommittee of the GSMFC's Technical Coordinating Committee (TCC) through the SEAMAP Coordinator, who is under the technical 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 who serves as Program Manager.

Planning

Major SEAMAP-Gulf Subcommittee meetings were held in March and October 1996 in conjunction with the GSMFC Spring and Annual Meetings. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in August 1996 to discuss respective program needs and priorities for FY1997.

SEAMAP-Gulf work groups met this past year to provide recommendations to the subcommittee for survey and data management needs. The Red Drum Work Group met on June 28, 1996 (via conference call) to discuss the potential for being unable to conduct the second year of the red drum tag/recapture project and discuss possible alternatives for collecting the necessary data. Where additional discussion was needed, the subcommittee also deliberated plans and needs via conference calls.

Coordination of program surveys and distribution of quick-report summaries of a Gulf-wide survey to management agencies and industries were major functions of SEAMAP

management in 1996. 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 1996:

- *1996 SEAMAP Marine Directory*. Inventories of marine agency contacts (state, federal and universities) 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.
- *Environmental and Biological Atlas of the Gulf of Mexico, 1993*. Information from the 1993 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, 1996*. 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.
- *SEAMAP Subcommittee Report to the GSMFC Technical Coordinating Committee - October 1, 1995 to September 30, 1996*. 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.

David M. Donaldson
Program Coordinator

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

During the period January 1, 1996 through December 31, 1996, the GSMFC continued to coordinate recreational fisheries' programs throughout the Gulf of Mexico through funding provided by the administrative portion of the Federal Aid in Sport Fish Restoration Program which is administered by the U.S. Fish and Wildlife Service (FWS). 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. Minutes, correspondence, reports, and publications are available from the GSMFC office upon request. 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. 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 extension is to allow completion of several activities originally scheduled for completion during 1996. Due to a number of unforeseen conflicts, these activities could be 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.

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 1996 GSMFC Annual Meeting in New Orleans, Louisiana, the document was approved, and the Commission authorized staff to proceed with publishing.

One of the activities scheduled during 1996, but not completed, is the compilation of a regional data base on artificial reef development for the Gulf of Mexico. Several meetings were held to develop the computer file formats for both the programmatic descriptions and the data for individual artificial reef sites. We expect to begin compiling the appropriate data to enter into the file formats very soon. While maintenance of the data base will be an ongoing activity, we expect the initial establishment of the data base to be completed during 1997. In conjunction with establishment of the data base, we plan 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.

A data base on artificial reef literature (both published and gray literature) is being compiled using ProCite software. While this will be an ongoing activity, we expect the initial data

entry of archived articles to be completed during 1997.

As a result of planning efforts begun in 1995 to review and revise the National Artificial Reef Plan, the Program Coordinator met with the Chairman and Vice-Chairman from the Gulf and Atlantic States Marine Fisheries Commissions' (ASMFC) Artificial Reef Committees and the ASMFC Program Coordinator to discuss details related to the subject activity. That meeting was held in Washington, D.C., at the office of the ASMFC on March 6, 1996, and resulted in preliminary plans to hold a joint meeting between the two committees to lay out a schedule and work plan to accomplish the review and revision of the National Plan.

During April 16-17, 1996, the Program Coordinator attended and participated in a workshop sponsored by the Minerals Management Service in New Orleans, Louisiana. The workshop was designed to discuss and make recommendations regarding the use of oil and gas structures as artificial reef material. A proceedings of the workshop including recommendations will be forthcoming. Those recommendations will provide the potential for funding to address a number of ecological questions regarding the use and impact of artificial reefs on associated fish populations.

On May 8, 1996, the GSMFC Artificial Reef Subcommittee met jointly with the ASMFC Artificial Reef Advisory Committee to discuss several items of mutual interest including the review and revision of the National Artificial Reef Plan, development of coast-wide data bases for artificial reefs, and materials criteria for artificial reef development. Most important was the identification of assignments for both committees to begin review of selected sections of the current National Artificial Reef Plan and the establishment of a tentative time line for comments. A separate source of funding was sought from the NMFS to complete the project; however, due to unforeseen circumstances, funding was not approved. The two committees would

like approval to continue with the project on a slower time line through existing funding.

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 TCC Data Management Subcommittee (DMS) oversaw the development of a strategy for the Gulf States, through the GSMFC, to conduct the National Marine Fisheries Service Marine Recreational Fishery Statistics Survey (MRFSS) in the Gulf of Mexico. During its regular meeting on March 19, 1996, the DMS made plans to develop and submit a cooperative agreement proposal to the NMFS to implement the strategy. That cooperative agreement proposal was completed and submitted during June 1996.

A comparative tow survey between the NOAA ship OREGON II and Mississippi's R/V TOMMY MUNRO was scheduled for 1995; however, due to weather and scheduling problems, the cruise was postponed. The cruise took place in 1996, and the vessels trawled side-by-side at designated sites in Mississippi and federal waters. The following methodology for the survey was used:

- utilize time tows of 15 minutes (bottom time)
- adhere as close as possible to the SEAMAP gear configuration as outlined in *The SEAMAP Onboard Operations Manual*
- conduct trawls using an inshore/offshore transect. The tows will begin in five fathoms (fm) and continue out to 25 fm and then back inshore
- count and weigh all organisms and measurement lengths for red snapper, Atlantic croaker, mackerels and brown shrimp

The OREGON II was the lead vessel during the survey. Start and end time and depth was recorded by the OREGON II for each trawl. The vessels conducted surveying activities on October 2-4 and November 22-23, 1996. During this time, a total of 60 comparative trawls was conducted. Initial analysis of the data is being conducted by the NMFS Pascagoula Laboratories. A final report that analyzes the comparative tow data will be available by March 1997.

Other important issues and activities addressed by the Data Management Subcommittee included a project to profile state recreational and commercial fishing licensing systems, strategies to monitor the charter boat fishery, a survey methodology to quantify recreational angling, and development of a workshop to develop guidelines for aging fish using otoliths.

ANADROMOUS FISH ACTIVITIES

During February 8-9, 1996, the Program Coordinator attended and participated in the annual Morone Workshop held in Chattahoochee, Florida. The purpose of this annual workshop is to 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.

On March 18, 1996, the TCC Anadromous Fish Subcommittee met in Brownsville, Texas, to address a number of issues related to striped bass restoration in the Gulf of Mexico. At that time, Dr. Ike Wirgin of the New York University Medical Center provided the Subcommittee with a presentation on the

mitochondrial and nuclear genetics work for Gulf sturgeon and striped bass that he has conducted as a part of the restoration efforts for both species. That presentation provided data that was the culmination of several years of effort between the Subcommittee and Dr. Wirgin. The Subcommittee also discussed the striped bass genetics project that began in 1996. Dr. Wirgin is analyzing the nuclear DNA of striped bass collected and preserved prior to the introduction of Atlantic fish into Gulf waters. It is anticipated that the results of this three-year project will clarify the degree that Atlantic genetic material has compromised the original Gulf striped bass genotypes. It should make brood stock selection more efficient and could increase the potential for the production of fry.

In 1990, the Subcommittee developed a report entitled "*Anadromous Fish Restoration Programs in the Gulf of Mexico.*" That report was developed to assist in acquiring additional funding to support the states' efforts to restore striped bass in the Gulf of Mexico. In a renewed effort to seek funding to support the Subcommittee's restoration efforts, the Subcommittee began a revision of that report, and the expected completion date for this effort is early 1997.

During the October 14 meeting of the Anadromous Fish Subcommittee, the FWS reported that the Regional Office in Atlanta was planning to sponsor 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. Further planning for the workshop will be conducted during March 1997.

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. Due to unforeseen circumstances, however, the work was not initiated. As described above regarding

the time extension amendment, the work is scheduled to be completed during 1997.

Other issues addressed included an update on the Florida Lake Talquin study to compare the survival and fitness performance of Atlantic and Gulf striped bass, a potential project on the Pascagoula River to identify and quantify thermal refuges for striped bass, and a summary of the production and distribution of Gulf striped bass fry from the 1995 production year.

On April 4, 1996, the Program Coordinator met with representatives of the U.S. Geological Survey in Jackson, Mississippi, to discuss plans to conduct a thermal survey of the Pascagoula River System. That meeting resulted in a study plan and preliminary costs associated with the project. This project will be included in the 1997 Anadromous Fish Subcommittee work plan to be completed in 1997.

On May 17, 1996, the Program Coordinator met with the Directorate of the Region 4 Office of the U.S. Fish and Wildlife Service to discuss the future of striped bass restoration for the Gulf region. That meeting resulted in a renewed enthusiasm to seek new funding and alternative avenues to accomplish restoration tasks that have been identified.

MISCELLANEOUS ACTIVITIES

- March 18-22, 1996. The Program Coordinator attended and participated in the Spring Meeting of the Gulf States Marine Fisheries Commission held in Brownsville, Texas.
- March 23-25, 1996. The Program Coordinator attended and participated in the midyear meeting of the International Association of Fish and Wildlife Agencies held in Tulsa, Oklahoma.
- May 28, 1996. The Program Coordinator attended a meeting of the Atlantic States Marine Fisheries Commission regarding habitat management for fisheries.
- June 19, 1996. The Program Coordinator attended and participated in a meeting of the Marine Resources Committee of the Mississippi Wildlife Federation, a citizen based environmental organization in Mississippi.
- September 4, 1996. The Program Coordinator participated in a meeting of the Marine Resources Committee of the Mississippi Wildlife Federation held in Biloxi, Mississippi.
- September 13-17, 1996. The Program Coordinator attended and participated in the Annual Meeting of the International Association of Fish and Wildlife Agencies held in Omaha, Nebraska.
- October 3-5, 1996. The Program Coordinator attended and participated in the FWS Stakeholders' Meeting held in Hot Springs, Arkansas.
- October 9, 1996. The Program Coordinator attended a meeting of the Marine Resources Committee of the Mississippi Wildlife Federation held in Biloxi, Mississippi.
- October-December 1996. The Program Coordinator began working on coordination of GSMFC Habitat activities through the TCC Habitat Subcommittee. Work included participation in the NMFS Essential Fish Habitat work as mandated by the 1996 Magnuson/Stevens Act amendments. It is expected that this work will become a major component of the GSMFC Sport Fish Restoration Administrative Program.

Ronald R. Lukens

INTERJURISDICTIONAL FISHERIES MANAGEMENT PROGRAM

In 1996, the GSMFC continued its work to coordinate and facilitate the development of Gulf fishery management plans (FMPs) among the five Gulf States. This effort was authorized by the Interjurisdictional Fisheries Management Act of 1986 (P.L. 99-659) and supported by funding from the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

The Interjurisdictional Fisheries Management Program (IJF) provides the Gulf States with the best available scientific information on interjurisdictional fish stocks and appropriate recommendations for management of the fisheries which these stocks support. This information is continually being used by the states in their respective management programs.

PROGRAM ACTIVITIES

IJF programming in 1996 suffered somewhat from personnel turnover within the GSMFC staff. The IJF Program Coordinator position was vacant from late April through the end of July, and this resulted in a concomitant reduction in IJF activities during the period. Progress was realized, however, toward program goals in significant effort on spotted seatrout stock assessment and section development; establishment and subsequent meeting of the Flounder Technical Task Force (TTF); and reconvening of the Blue Crab TTF. The following is a brief account of program activities during 1996.

Spotted Seatrout

Work during 1996 on the GSMFC Spotted Seatrout FMP centered around completion of state stock assessments and drafting of heretofore blank or incomplete FMP sections. State stock assessments for spotted seatrout were

completed late in 1996. Drafts of the sections on spotted seatrout stocks, laws, economics, and management were completed, and a sociologist was recruited to complete the sociology section. The GSMFC TCC Habitat Subcommittee began working to draft a much revised and expanded habitat section for the plan. GSMFC staff is currently working to draft the fishery description section.

Flounders

The membership for the Flounder Technical Task Force was selected by the states and the GSMFC for the drafting of a flounder FMP. The group met twice during 1996 with significant progress being made toward drafting the FMP. Several sections were completed in at least rough form, and commercial market channels were identified through a short survey of dealers and processors of flounders. During 1996, the group was unsuccessful in recruiting a sociological expert for the effort, but GSMFC staff is currently exploring options. Flounder stock assessment was discussed during task force and GSMFC Stock Assessment Team deliberations. It appears that a lack of species-specific landings data may render strict stock assessment in states east of the Mississippi River impossible.

Blue Crab

With minor personnel changes from an earlier effort, the GSMFC Blue Crab Technical Task Force was reconvened in 1996 for FMP revision. Work by the task force during 1996 included updating FMP sections to include current fishery and biological information. It is hoped by the task force members that fishery-dependent and fishery-independent data collected since publishing the Blue Crab FMP (1990) can be used to conduct some form of stock assessment, even if only on a regional basis. Exploratory data work

by the task force in late 1996 indicated that data from the northern Gulf (Alabama, Mississippi, and Louisiana) are quite comparable and may be combined in some ways to increase resolution.

Other Activities

The GSMFC Stock Assessment Team, composed of quantitative specialists from each of the five Gulf states, met twice in 1996. Work accomplishments included the completion of each state's spotted seatrout stock assessment, identification of data sources and approaches to flounder stock assessment, and initiation of development of an ageing handbook which will be drafted by invited authors and published by GSMFC. The ageing handbook will focus on Gulf species and techniques, and will provide detailed, how-to information so that technicians throughout the Gulf can be assured of comparability of technique and results. Authors for the handbook were recruited in 1996, and a draft table of contents was distributed for review and comment.

The advent of changes in federal fisheries prosecutorial philosophies for EEZ fishery management presented an opportunity for the IJF Program to facilitate improved state-federal communication in 1996. With federal enforcement and litigation resources at low tide, states in the Gulf region began to realize opportunities in jurisdictional expansion with respect to fisheries' enforcement. The IJF Program and GSMFC Law Enforcement Committee were used as vehicles to convene legal specialists from the Gulf States and the NOAA for the purpose of improving and streamlining interjurisdictional fisheries' law enforcement through effective state prosecution of violations of fishery regulations in the Gulf of Mexico.

The IJF Program continues to support the menhaden industry in the Gulf region with information exchange and meeting facilitation. In 1996, the GSMFC Menhaden Advisory Committee produced the first draft of an informational brochure to be published by the GSMFC. The brochure is an effort to inform the public of the value of menhaden and the industry's conscientious responsibility to maintain a sustainable, low bycatch fishery.

James J. Duffy
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, the 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 the 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, 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

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

and to support the development of an interregional program. The four goals of the ComFIN include:

- 1) to plan, manage, and evaluate commercial fishery data collection activities;
- 2) to implement a marine commercial fishery data collection program;
- 3) to establish and maintain a commercial fishery data management system; and
- 4) 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:

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

PROGRAM ORGANIZATION

The organizational structure consists of the FIN Committee; the ComFIN and RecFIN(SE) 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 committee 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) are accomplished through the Gulf States Marine Fisheries Commission.

PROGRAM ACTIVITIES

The ComFIN and RecFIN(SE) are comprehensive programs comprising coordinated data collection activities, an integrated data management and retrieval system, and procedures for information dissemination. Activities during 1996 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 various state and federal agencies. The ComFIN and RecFIN(SE) committees reviewed and evaluated progress toward the integration of these surveys into the respective programs.

- 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.

ComFIN and RecFIN(SE) Committees

Primary ComFIN and RecFIN(SE) meetings were held in February and September 1996. The major issues discussed during these meetings included:

- identification and continuation of tasks to be addressed in 1996 as instructed by the committees and administrative subcommittee to the following work groups: data collection, future needs, biological/environmental, social/economic, and ad hoc to either begin or continue work on these tasks;
- development and completion of the 1996 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 1997 ComFIN and RecFIN(SE) Operations Plans;
- review of activities and accomplishments of 1996;
- 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 technical work groups and recommendations received from these groups for activities to be carried out during 1997;

Subcommittee and Work Groups

The 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. A summary of their activities follows:

- The Administrative Subcommittee met in February 1996 (via a conference call) to address several tasks. The first task was to modify the RecFIN(SE) goals and objectives to reflect changes since the program is no longer in its pilot phase. The next task was to examine the existing framework plans for the RecFIN and ComFIN and develop a plan which encompasses both programs. Since both programs will be covered under one MOU, the subcommittee believed that a single FIN framework plan should also be developed. Although the programs will be included in one plan, they will still be two distinct programs. Another task was to compile a list of action items from the program review document and provide recommendations concerning the actions to the subcommittee for their consideration. The last issue concerned filling the vacancy of the vice-chairmanship.
- The ComFIN Data Collection Work Group met in August 1996 (via a conference call) to develop data collection planning and tracking processes. The group created a process which develops a list of priority species and the associated data needs and established a

data tracking process. These processes were presented and approved by the ComFIN Committee at the 1996 fall meeting.

The RecFIN(SE) Social/Economic Work Group met in June 1996 to discuss a variety of issues including the assessment of the status of the work group, determination of what tasks need to be addressed, and development of a process to accomplish identified tasks. It was noted that one of the overall goals of the group is to develop a process for integrating social and economic issues into fisheries management. Since membership of the RecFIN(SE) Social/Economic Work Group was to be discussed at the RecFIN(SE) Committee meeting in September, the work group developed a list of potential participants to be utilized during that meeting. The work group also developed a mission statement. The group discussed an upcoming workshop regarding recreational utility demand models. The workshop addressed a variety of issues concerning the collection of social and economic data and will develop recommendations regarding these issues. It was suggested that it might be helpful if the RecFIN(SE) endorse this workshop, and the appropriate information concerning the workshop was forwarded to the RecFIN(SE) Committee for their action. The group also examined the specific tasks identified in the 1996 RecFIN(SE) Operations Plan regarding social and economic issues including the identification of necessary socioeconomic data elements and the identification and determination of standards for sociological and economic data collection.

The ad hoc RecFIN(SE) Recommendations Work Group met in June 1996 to modify the *Recommendations* document developed from the RecFIN(SE) facilitated session report. The revised document was presented to the RecFIN(SE) Committee at the 1996 fall meeting.

The RecFIN(SE) Biological/ Environmental Work Group met in August 1996 (via conference call) and December 1996 to discuss the RecFIN(SE) Quality Assurance/Quality Control (QA/QC) document. In August, the group was charged with comparing the RecFIN(SE) QA/QC document with other QA/QC documents and, where applicable, integrate the standards. During the call, the group decided there needed to be a face-to-face meeting to address this issue. In addition, the group developed a data collection process similar to the one developed for ComFIN. This process was presented and approved by the RecFIN(SE) Committee at the 1996 fall meeting. In December, the group revised the QA/QC document, and the revised document will be presented to the RecFIN(SE) Committee at the 1997 spring meeting.

COORDINATION AND ADMINISTRATIVE SUPPORT

Working closely with the committee 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 1996 via a variety of different methods such as distribution of program documents, presentation to various groups interested in the ComFIN and RecFIN(SE), and via the Internet:

- FIN Committee. 1996. *Framework Plan. Fisheries Information Network for the Southeastern United States (FIN)*. Gulf States Marine Fisheries Commission, Ocean Springs. 35 pp + appendix.
- Southeast Cooperative Statistics Committee. 1996. *1996 Operations Plan for Cooperative Statistics Program (CSP)*. Gulf States Marine Fisheries Commission, Ocean Springs. 8 pp + appendix.
- ComFIN Committee. 1996. *1997 Operations Plan for Commercial Fisheries Information Network (ComFIN)*. Gulf States Marine Fisheries Commission, Ocean Springs. 8 pp + appendix.
- Southeast Cooperative Statistics Committee. 1996. *Annual Report of the Cooperative Statistics Program (CSP) January 1, 1995-December 31, 1995*. CSP-1 Gulf States Marine Fisheries Commission, Ocean Springs. 7 pp + appendices.
- RecFIN(SE) Committee. 1996. *Annual Report of the Recreational Fisheries Information Network for the Southeastern United States [RecFIN(SE)] January 1, 1995-December 31, 1995*. REC-1 Gulf States Marine Fisheries Commission, Ocean Springs. 10 pp + appendices.
- RecFIN(SE) Committee. 1996. *Southeast Recreational Fisheries Information Network Fact Finding Workshop on Charterboat Effort and Harvest*. REC-2. Gulf States Marine Fisheries Commission, Ocean Springs. 19 pp + attachments.
- RecFIN(SE) Committee. 1996. *1996 Operations Plan for Recreational Fisheries Information Network for the Southeastern United States [RecFIN(SE)]*. Gulf States Marine Fisheries Commission, Ocean Springs. 14 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.
- National Park Service 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 a user-friendly data management system for the MRFSS.
- GSMFC has developed a home page for the world wide web which provides programmatic information regarding ComFIN and RecFIN(SE).

*David M. Donaldson
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 1996.

Significant Accomplishments

Red snapper were raised at the Claude Peteet Mariculture Center for the first time anywhere in the world. They were successfully spawned and reared to a size able to accept commercial feed. This presents opportunities for future mariculture of this animal and learning more about its behavior in the wild.

Three inshore artificial reefs were established within Bon Secour Bay which provided enhanced fishing to inshore fishermen who do not have the equipment to travel to Alabama's offshore artificial reef area. These reefs are already producing outstanding catches of spotted seatrout, white trout, and blackfish.

A significant reduction in user conflict was experienced following implementation and enforcement of Act 95-287 which created limited entry in the gill net fishery.

A survey of spotted seatrout anglers was conducted. Collected information was used in an assessment of the stock which indicated a healthy fish population.

Budget and Expenditures

A total expenditure of \$2,577,650 was made from the approved budget of \$2,830,425. Revenue of \$2,885,159 was made from federal aid (21%), license fees (50%), marine gas tax (13%), and other sources (16%).

The Administrative Section expended \$798,099 of salaries and operational expenses for division activities. Portions were reimbursed under federal aid to fisheries programs.

Expenditures for the Enforcement Section totaled \$770,353. A grant for \$25,000 from the NMFS reimbursed that portion of the total expenditures. Other expenses for shared services and materials such as utilities and gasoline were paid by the Administrative Section.

Fisheries Section expenditures were \$1,009,198 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%. In addition to the normal expenditures, shell planting activities and boating access area upkeep and renovation were included in these expenditures.

Significant Problems and Solutions

User conflict continues to be a significant problem in the blue crab trap fishery. Regulations have been developed to remove traps from the coastal rivers and address other changes such as exemptions from legal harvestable size and handling procedures for soft-shelled and premolt crabs; tagging, marking, or otherwise identifying containers of crabs to identify the catcher; possession limits for commercial and recreational shrimp fishermen; identification requirements for imported crabs; requirements for escape panels in crab traps; marking of crab traps by license number or color; placement of commercial and recreational crab traps in certain areas; marking of recreational crab traps; and removal of unserviceable crab traps from the water.

Accomplishments

Enforcement officers conducted 20,992 hours of boat and shore patrol; 15,113 boat checks; 1,045 seafood shop inspections; 11,800 recreational fishermen checks; and issued 770 citations for illegal activities. The majority (55%) of the citations issued were for violations of recreational fishing laws and regulations. Violations of commercial fishing laws and regulations comprised 28% of the citations issued. Officers also issued citations for violations of boating safety, game and fish, and other state laws and regulations.

Future Plans

- Develop mechanisms to improve public relations and better communicate important information.
- 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. These activities involve cooperative efforts with the NMFS in near shore federal waters in the Gulf of Mexico and are primarily funded through federal aid programs of the U.S. Departments of Commerce (NMFS) and Interior (FWS). Fish kills, oyster management, and pollution investigations are not supported by federal aid; however, these biological activities are funded through commercial and recreational license fees.

Fisheries' facilities consist of the Claude Petet Mariculture Center in Gulf Shores and the Marine Resources Laboratory on Dauphin Island.

Personnel consisted of one biologist V, two biologists IV, one biologist III, one biologist II, five biologist aides III, two biologist aids II, five biologist aids I, one data entry operator II, one biweekly laborer, and one temporary laborer.

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 the areas of Cedar Point Reef and in Portersville Bay in the summer of 1996. The shell had been collected from Alabama oyster processors as part of Alabama's ongoing oyster reef enhancement project.

The Sensitivity of Coastal Environment and Wildlife to Spilled Oil Atlas for Alabama was updated for the first time since 1980. This atlas is the reference guide to what habitat and species would be impacted by any oil or hazardous material spill in Alabama coastal waters.

The Blue Crab Fishery Management Plan was completed. Meetings with participants in the crab fishery and persons impacted by it were held in order to formulate measures to alleviate conflicts between the various user groups. This is a working document that can be changed as additional data and experience are available. Working with the various constituents, the division will ensure that the plan remains viable and provides for the best management for the fishery.

Red snapper, one of Alabama's most valuable reef fish, were raised at the Claude Petet Mariculture Center during a joint project with Auburn University. This is the first time that this fish had been spawned and occurred Gulf-wide.

Freshly killed and dying catfish were sent to a pathologist at Auburn University. Though the results were not conclusive, the most probable cause was a virus which attacked the catfish.

In order to develop sound management measures for sustaining oyster resources, biological and enforcement personnel worked together to collect data at oyster checkpoints. To allow undersized oysters to reach harvestable size, a brief closure of a portion of the public reefs occurred. The Biological Section monitored shell pick-up and planting activities in which 4,000 cubic yards of shop shell were planted on Cedar Point Reefs and on plant areas in Portersville Bay.

King mackerel filets were collected and sent to the Alabama Department of Environmental Management where they were analyzed for mercury content. Results prompted the release of a health advisory by the Alabama Department of Public Health concerning the consumption of king mackerel.

Meetings were held with oil company representatives periodically to discuss options for completion of various projects. Biological personnel checked areas of proposed drilling platform location 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 red snapper, shrimp, tilapia, and oysters. Red snapper were cultured in captivity for the first time anywhere in the world. Shrimp culture concentrated on the production of bait shrimp for live bait. Tilapia culture involved rearing in experimental raceways within ponds and stocking at various densities in multiple ponds to compare production and growth. Oyster research involved off bottom culture and remote setting experiments.

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 mariculture procedure for commercially important marine organisms will continue.
- 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

FLORIDA MARINE RESEARCH INSTITUTE

FINFISH

Gamefish and Directed Life History Studies

During 1996, we provided stock assessments on pompano, permit, tarpon, snook, bonefish, sea catfish, and tripletail to the Florida Marine Fisheries Commission (FMFC).

Progress was made describing the life history of bonefish. We published "Age, growth, and mortality of bonefish, *Albula vulpes*, from the waters of the Florida Keys" (*Fisheries Bulletin* 94:442-451). A second manuscript, "Maturation and reproductive seasonality in bonefish, *Albula vulpes*, from the waters of the Florida Keys," was accepted for publication [*Fisheries Bulletin* 95(3)]. A manuscript entitled "Feeding habits of bonefish, *Albula vulpes*, from the waters of the Florida Keys" is in preparation and will be completed during 1997.

Most of our tarpon data has been published. The manuscript "Reproduction of tarpon, *Megalops atlanticus*, from Florida and Costa Rican waters and notes on their age and growth" was accepted for publication [*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.

We completed a MARFIN study on the age, growth, and reproduction of black grouper in South Florida waters and a MARFIN project to describe the age, growth, and reproduction of

vermilion snapper, gray triggerfish, and red porgy. The first year of a three-year MARFIN project to describe the age structure of offshore populations of mature red drum was completed. More than 300 adult red drum were captured and aged; these collections will continue in 1997. "Reproduction of yellow edge grouper, *Epinephelus flavolimbatus*, from the eastern Gulf of Mexico" was published (*Bulletin of Marine Science* 59:216-224).

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

More than 500 spotted seatrout from Florida's east coast were captured to describe spawning frequency and estimate batch fecundity. Seatrout collections will continue through 1997. Collections of 10-15 permits each month were made in the Florida Keys, and these collections will continue through 1997. Collections of tripletail were completed, and we have sectioned otoliths and processed gonads for histology from more than 800 tripletail. Collections of sea catfish were conducted, and otoliths from more than 400 fish have been sectioned. Catfish collections will be completed in June 1997.

Stock Assessment and Population Modeling of Florida's Inshore Species

An additional analyst was added to the Florida Marine Research Institute's (FMRI) modeling and assessment group in 1996. This allowed us to develop more assessments and to offer more technical support to other researchers conducting work at the institute. It also obligated the group to conduct assessments for several

species included in Atlantic States Marine Fisheries Commission (ASMFC) fishery management plans. Detailed assessments were conducted for tripletail, bluefish, Florida pompano, weakfish, gafftopsail and hard head catfish, and permit. These reports included a synopsis of the biological characteristics of the species in Florida, a description of its fisheries and landings, its population dynamics in Florida, and an assessment of the condition of the stock. The group also provided technical advice for assessments of common snook, bonefish, tarpon, ballyhoo, and kingfishes. A bootstrap Monte Carlo model was developed to evaluate amberjack, *Seriola* spp., management alternatives.

Members of the assessment group serve on several state and federal committees charged with reviewing assessments of marine fishes in the Gulf of Mexico and along the Atlantic coast. Work was conducted in support of the development of the GSMFC's fishery management plan for spotted seatrout; the development of alternatives for the South Atlantic Fishery Management Council's (SAFMC) management of amberjack; the Gulf of Mexico Fishery Management Council's (GMFMC) assessment of the condition of red drum, reef fishes, and mackerels; the ASMFC's assessments of bluefish and weakfish; and GSMFC's Stock Assessment Team reviews. Members of the group continue to supply technical advice to other researchers in and out of the Florida Department of Natural Resources (FDNR).

Besides assessments, reports evaluating management options, and manuscript reviews, the assessment group contributed presentations at professional meetings and Florida Marine Fisheries Commission (FMFC) meetings, wrote peer-reviewed articles, and developed a technical report for the FMFC. Presentations were made at the annual meeting of the American Society of Ichthyologists and Herpetologists and several FMFC meetings. Articles describing the fishery for spotted seatrout and an evaluation of its

management, bias in catch-curve estimates of mortality, and the validation of ages determined for black drum were submitted to scientific journals. Finally a technical report was written on the status and trends for inshore and near shore fishes in Florida. This included a trend analysis of catch rates for each of 138 species or groups caught by fishers in Florida waters, and detailed accounts on important life history characteristics, geographic distribution of landings, annual landings since 1982, catch-rate information for the fishery and for fishery-independent monitoring programs, recent assessment results, and regulatory changes.

Baitfish

In this fiscal year, we began to collect biological data on round scad (*Decapterus punctatus*) and Atlantic bumper (*Chloroscombrus chrysurus*) to provide estimates of population dynamic parameters of these species. These two species are becoming an important part of the bait fish purse seine fishery in the state of Florida. Manuscripts describing life history aspects of Atlantic thread herring and scaled sardine are in preparation. We conducted a third acoustic/trawl survey along the west coast of Florida to determine spatial distribution and abundance of important bait fish 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

An update on mullet fishery assessment was prepared for the FMFC. This report included analysis of catch and effort data for the post net ban period. We continued monthly juvenile and adult monitoring sampling for mullet throughout this period in Tampa Bay and Charlotte Harbor regions. Data on age distribution of adult population, juvenile abundance indices, and fishery dependent data from fisheries trip ticket

statistics will be used to evaluate the effects of management regulations on mullet stocks in Florida.

BIVALVE FISHERIES RESEARCH

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

Bay scallop research continues to be directed toward assessing biological and environmental factors influencing the depletion or loss 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. Andrew 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 1, 1997. Two manuscripts concerning systematic relationships among Florida bay scallop populations have been published, and two manuscripts concerning temporal and spatial variation in recruitment among populations are in preparation.

Techniques based on the geographic information system (GIS) continue to be applied to the management and development of the hard clam fishery in Florida. Funds provided through hard clam license fees are being used to assess the fishery potential of the Banana River lagoon on the east-central coast of Florida (including GIS-based resource mapping) and to assess the

relative value of submerged lands to open-water versus aquaculture clamming operations. A manuscript concerning the potential of the northern Indian River lagoon for hard clam aquaculture was published, and a manuscript concerning growth seasonality is in press.

The calico scallop industry in Florida continues to operate on a minimal and sporadic level. Unpredictable availabilities of the product along the Florida east coast, coupled with competition from bay scallops imported from China, contribute to the limited economic exploitation of this fishery. Monitoring will continue, but research efforts are dormant.

CRUSTACEAN FISHERIES RESEARCH

In the Crustacean Fisheries Research Program, staff conduct fisheries-oriented biological and ecological studies on crustacean species of economic importance to Florida. During 1996, a manuscript describing a combined genetic/statistical method for distinguishing the two species of stone crabs in the Gulf of Mexico from each other and from their hybrids was published. In collaboration with researchers from Auburn University, a manuscript describing the physiological effects of salinity and temperature on adult stone crabs was revised for publication. A manuscript describing the history and trends in the Florida blue crab fishery was submitted for publication. Manuscripts in preparation include one describing the population biology and population structure of stone crabs in northwest Florida waters and one demonstrating species-level difference between two color morphs of the deep-sea lobsterette. Staff continued field studies of the population biology of stone crabs in Tampa Bay and concluded studies of the physiological effects of temperature and salinity stress on juvenile stone crabs. Staff continues to provide the FMFC with information on the degradation time of pressure-treated wooden slats used in building stone crab traps and on bycatch in stone crab traps. Staff also continued to present information concerning the

configuration of blue crab traps to the FMFC. Staff participated in workshops being conducted statewide for the purpose of defining shrimping zones in the near shore waters of Florida. Staff is working with the FMRI coastal and marine resource assessment (CAMRA) group to prepare maps integrating near shore habitat and allowed shrimping zones for management of the shrimp fishery. The results of all work are provided to appropriate fishery management agencies and presented routinely at scientific meetings and other public forums.

FISHERIES GENETICS RESEARCH

The Fisheries Genetics Research Program has two principal directions: 1) genetic stock identification of economically important species of fish and invertebrates and 2) 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. During 1996, manuscripts describing the genetic stock structure of common snook and genotype-specific relationships between habitat and growth rate in hard clams were published. 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 continued to work with scientists at the Field Museum of Chicago to learn state-of-the-art methods of morphological analysis for stock identification to complement the genetic stock identification studies.

A manuscript examining the theoretical effects of releasing hatchery-reared fish into the wild on the effective population size of fish populations was submitted for publication. Staff finalized the genetic characterization of all redfish hatchery broods reared at the SERF hatchery during 1994 and obtained 7-locus genotypes of all hatchery brood stock that are not still being used as brood stock at the hatchery. Staff also completed development of 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. The result of all work is provided to appropriate fishery management agencies and routinely presented at scientific meetings and other public forums.

RESOURCE HEALTH AND ASSESSMENT

Faunal Assessment

The Florida Bay Faunal Assessment Program continued research in two subject areas in 1996: 1) assessing impacts of salinity shifts on benthic faunal assemblages throughout the bay and 2) evaluating the effects of recent environmental changes on resident fishes and decapod crustaceans of seagrass-covered mud banks. A subset (16) of the total sites was resampled in early April 1996, and all 102 of the sites were resampled during the following July and August. Results of seasonal subsampling during 1995 and 1996 were summarized and presented at a conference "Ecological and Hydrological Assessment of the 1994-1995 High Water Conditions in the southern Everglades" in August 1996, and further progress was reported at the Annual Florida Bay Science Conference in December 1996. The final samples for the assessment of resident mud-bank fauna were taken in May 1996. Results were incorporated with those of studies by others agencies in a joint presentation at the Florida Bay Science Conference on bay-wide changes in populations of fishes and crustaceans. Final analyses continued, and manuscripts are in preparation.

Progress was made on several manuscripts resulting from the Little Manatee River Fish Community Survey. A manuscript addressing the relationship of fish communities to seagrass and algal cover has been submitted and is in review. A manuscript on the life history and ecology of common snook is now in press, and another manuscript on those topics is undergoing in-house review.

Illustrated guidebooks for the identification of lysianassoidean amphipods and trochid gastropods of the Gulf of Mexico are in press. A draft field guide to fishes of the family Sparidae in Florida waters is undergoing final revision after being field tested. An illustrated guide for the identification of marine decapod crustaceans of Florida is being updated as time permits to incorporate nomenclatural changes and to add distributional information that has been developed since the original edition was published. Several other guides to identification of Florida fishes and invertebrates are in preparation as time permits.

The East Coast Benthic Faunal Mapping Study, funded by SEAMAP, sampled more than 400 stations with trawls and dredges between 1983 and 1987. All crustaceans, echinoderms, mollusks, and many incidental fishes from the samples have been identified and enumerated. Data for these groups, as well as associated field data, have been computerized and verified. Computer data files for the echinoderms were submitted to the SEAMAP data manager during 1996 completing that task for all of the groups. Analyses of the data are underway.

Florida's Hard-Bottom Mapping Study, funded by SEAMAP, was initiated during February 1995 in cooperation with other southeastern Atlantic states; the study was conducted by South Carolina and Georgia in 1993 and continued by North Carolina in 1994. Goals of the study are 1) to acquire point and line data of various accuracies from a variety of sources; 2) to standardize, store, and manipulate those data in several relational computer files; and 3) to use the data to map known locations of hard bottom, possible hard bottom, and absence of hard bottom throughout the South Atlantic region. Florida's study area is the continental shelf (0-200 m depths) from Jupiter Inlet northward to the Florida-Georgia border. In addition to the point and line files, Florida is incorporating polygon data into the database and adding more relational files to the system. More than 20,000 point and

line records and eight polygon data sets have been acquired and processed, and production of the maps is now underway.

The Gulf of Mexico Ichthyoplankton Survey was initiated in 1982. The institute is the designated specimen repository for the program which is wholly funded by SEAMAP. More than 175,000 lots of larval fishes are now archived. Two sampling cruises were successfully completed in the 1996/1997 grant year. Samples collected during 1993, 1994, and 1995 were received from the sorting center in 1996 and are being recorded in computer files. Backlogged neuston specimens from 1986 and 1987 were also received from the sorting center and have been recorded in computer files. Environmental data from all samples collected to date have been processed and sent to NOAA for inclusion in the database management system.

Environmental Monitoring and Assessment Program - Estuaries (EMAP)

Seventeen estuarine stations were sampled by the FDEP from Jacksonville to Port St. Lucie as part of the EMAP-Estuaries Carolinian Province base monitoring. Seven stations in the small estuary class (S. Amelia River, St. Johns River, Doctors Lake, ICW Northern, Halifax River, Newfound Harbor) and 12 stations within the large tidal river class (Indian River Lagoon) were sampled from July 24 to August 26, 1995. These stations complement those sampled in fall 1994. The 1994 data has been combined with data from other states (NC, SC, GA) into a document, "Environmental quality of estuaries of the Carolinian Province: 1994" available from NOAA. A similar report will be produced by NOAA using 1995 data. The 1995 base monitoring revealed no overt water quality problems and very little exceedance of EPA criteria relative to contaminants in sediments.

An indicator research study designed to assess the feasibility of using parasites of fish as ecological indicators was completed in the

Carolinian Province in 1996. These data indicated that fish parasites are sensitive measures of environmental conditions at several levels. They respond to the immediate effects of environmental perturbation on the physiological condition of the host fish, while also integrating the effects of degradation in the ambient surroundings.

Two indicator research initiatives in the West Indies Province (Biscayne Bay to Tampa Bay) are also sponsored by EMAP-Estuaries. The first examines the potential of seagrass-related ecological indicators. Data were collected on seagrass demographics, abundance, and epiphyte communities during early fall sampling in 1995. The second is assessing the effectiveness of dynamic measures of pelagic productivity as ecological indicators. This study is primarily concerned with Florida Bay and uses continuous dissolved oxygen monitors in conjunction with plankton sampling to look at rates of production.

CORAL REEF AND HARD GROUND MONITORING AND ASSESSMENT

During the past year, the first annual sampling of 40 reef sites including 160 stations from Key Largo to Key West was conducted by Coral/hard bottom Monitoring Project scientists. The project is a cooperative effort between the state of Florida, University of Georgia, and University of Charleston, South Carolina. Researchers are using a combination of video and species count methods to develop baseline data on 1) coral cover and other selected benthos and 2) coral species distribution.

The FMRI continues to provide expertise in surveys and litigation of ship groundings. The SSN MEMPHIS case has been in preparation for hearing.

A total of 12 applicants have requested surveys for live rock aquaculture on state submerged lands since the wild harvest was curtailed in 1989. Closure of both the South

Atlantic and Gulf was accomplished over the past two years. Two leases were let in 1993, one in 1995, and three in 1996. Four were slated for recommendation in January 1997. Two requests were denied due to potential for damage to seagrass habitat in the Florida Keys.

Analyses of recruitment (particularly stony coral recruitment) to artificial substrata has been underway. The database consists of organisms recruited to ceramic and terra cotta tiles recovered from selected sites throughout the Florida Keys and Dry Tortugas. Some of the tiles had been submerged since 1989. All collected tiles are being sorted and retained for further analyses.

An analysis of gonadal development of six common gorgonians from Biscayne National Park was completed during the past year. The data are being prepared for publication.

Aquatic Health

During 1996, we investigated a massive hardhead catfish kill that affected Florida's east and west coasts during the spring and fall. Extensive mortalities of this species were also reported in Texas and Louisiana. Arrays of virus-like particles were found in the nucleus of posterior kidney samples processed by transmission electron microscopy. Cooperative research continues with scientists from other Gulf States [through Gulf-wide Aquatic Mortality Response Network (GMNET)], Mexico, and South America on the etiology of the hardhead catfish disease. Articles about the catfish kill investigation were published in the Artificial Reefs newsletter and the newsletter for the American Fisheries Society - Florida Chapter. A pamphlet describing methods of controlling a common marine fish parasite in aquaculture systems was also published for distribution in outreach events.

The 1-800-FISHKILL hotline calling area was expanded statewide to handle calls both about

fish kills and abnormal or diseased fish. Posters about the fish kill hotline were redesigned to deter vandalism and were installed at Tampa Bay area boat ramps. Our participation continued in the EPA Gulf of Mexico program for the development of a GMNET. Development of a mortality event database format, common to all Gulf States, is in progress.

Research on the incidence and etiology of tumors in grey snapper in South Florida was initiated as a cooperative effort with Florida State University (FSU), University of Miami (UM), and Everglades National Park scientific staff. Work continues on characterization of isolates of *Vibrio harveyi*, an opportunistic bacterial pathogen ubiquitous in culture systems at the FDEP's SERF. We tested the use of low salinity and ultraviolet sterilization as effective control measures for bacterial disease in culture systems holding harvested juvenile red drum.

Studies of the marine slime mold *Labyrinthula*, a potential cause of seagrass die-off in Florida Bay were intensified. Samples from 1,110 sites have been collected during the four sampling periods of our study during 1995-1996. A total of 34,690 leaves from 10,838 short shoots have been evaluated for lesion cover and those leaves with lesions examined microscopically for *Labyrinthula*. Results thus far show that there is a close parallel in all the individual basins studied between leaf lesions and the prevalence of *Labyrinthula* in *Thalassia*. The prevalence of both *Labyrinthula* and leaf lesions is high in basins in the west, west-central, and south. We have documented an apparent spread of the die-off from the northwest and western basins eastward to central Florida Bay. The distribution of *Labyrinthula* and associated leaf lesions closely mirrors the change in *Thalassia* abundance through the two years of spring and fall sampling. Results also show an overall increase in infection and associated lesions in 1996 over 1995. Field data and laboratory studies indicate that salinity plays a major role in determining both the distribution of *Labyrinthula* and the severity of

infection. The prevalence of *Labyrinthula* infections and associated lesions closely parallel increasing salinity; salinities below 15 ppt appear to inhibit infection by *Labyrinthula*.

We are maintaining labyrinthulid isolates from 15 different sites in culture and conducting further experiments to determine pathogenicity and modes of transmission. Studies continue to characterize the *Labyrinthula* species found in Florida Bay using both scanning and transmission electron microscopy. Both an invited oral presentation "Examining the correlation between the presence of the slime mold *Labyrinthula sp.* and the loss of *Thalassia testudinum* in Florida Bay" and a poster "The potential role of the pathogen *Lasbyrinthula* in seagrass *Thalassia testudinum* mortality in Florida Bay" were given at the Florida Bay Science Conference, Key Largo, 1996.

Habitat Assessment and Restoration

Projects in this program are designed to assess, enhance, or restore critical fisheries' habitats such as seagrass beds, salt marsh communities, and mangroves. 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 include development of seagrass propagation and transplanting techniques, salt marsh restoration, and the use of an experimental plant macrocosm facility at the SERF at Port Manatee for testing restoration techniques.

The Florida Bay Fisheries Habitat Assessment Program (FHAP) continues and has produced a series of maps showing both seasonal and annual changes in seagrass distribution and abundance. The multi-tiered seagrass assessment used in FHAP (>300 stations) has been adopted by the Dade Environmental Resource Management Taylor River/C-111 study in the transitional basins in northeast Florida Bay (>70

stations) and is being applied in the Florida Keys Marine Sanctuary (>200 stations). Comparisons of seagrass distribution and abundance between 1995 and 1996 indicate that seagrass loss is continuing in the extreme west and extreme northeast basins, but there is a general increase in seagrasses in the interior basins of Florida Bay. Loss patterns in the western basins show some correspondence to the distribution of *Labyrinthula*; losses in the northeast seem to reflect dramatically reduced salinities. Productivity of *Thalassia* generally increased between the summers of 1995 and 1996. In cooperation with University of Florida, physiological studies on the effects of salinity fluctuation on seagrasses are being conducted at the FMRI. Initial data indicate *Thalassia* may be more tolerant of low salinities than previously thought. Another project in Florida Bay is examining the role of sediment nutrients in initiating and supporting phytoplankton blooms. These blooms occupy large areas of Florida Bay each fall and winter, reducing the light available for seagrass on the bay bottom. As a result, additional seagrass beds are dying; beds which might recover are stressed by inadequate light. To date, we have found that substantial amounts of phosphorus, a nutrient which is potentially limiting to phytoplankton blooms, is present in sediments in forms which might be liberated by episodes of water column anoxia. Three papers on the Florida Bay assessment research were presented at the 1996 Florida Bay Science Conference: "The status and trends of seagrass communities in Florida Bay," "Examining the correlation between the presence of the slime mold *Labyrinthula sp.* and the loss of *Thalassia testudinum* in Florida Bay," and "Benthic flux of nutrients from Florida Bay sediments."

A newly initiated project funded by the Environmental Protection Agency (EPA) will examine spatial-scale dependence (seagrass patch-to-regional) and sample size effects on the variation of a number of well-established indicators of ecological condition for the dominant seagrass in the Gulf of Mexico. The

application of several new, potentially more robust indicators of ecological condition will also be examined. This research will examine scale-based and stress/disturbance-based variability and will apply a statistical evaluation of appropriate sampling designs for ecosystem assessment. This will be accomplished using a hierarchical sampling design based on tessellated hexagons at multiple scales (100s; 10,000s; and 1,000,000s m²) at locations representing relatively pristine conditions and a range of natural and human-related disturbance regimes.

Another EPA-funded project examining the effects of chronic light stress on turtle-grass and shoal-grass is ending this year. The study used field enclosures in St. Joseph's Bay and mesocosm vaults in St. Petersburg to examine survival, growth, and physiological responses of turtle-grass and shoal-grass. These data will be used to evaluate water quality transparency criteria which are used by many Gulf States to protect seagrasses. Several projects are currently assessing the effects of seagrass habitat loss and degradation. Institute scientists and staff of the Southwest Florida Water Management District completed a study in Charlotte Harbor to determine whether seagrasses are more sensitive barometers (eco-indicators) of watershed nutrient loading than more traditional water quality measures. The goal of both projects was to develop integrative measures of stress which can be used to assess water quality and the health of seagrass communities throughout the Gulf of Mexico. Impacts of seagrass losses on animal habitats are being investigated in projects examining the effect of seagrass patch size on animal abundance and effects of habitat alteration by prop scars on juvenile pinfish and spotted seatrout.

Development of cost-effective and ecologically-sound techniques for habitat restoration are continuing. Institute scientists have completed a research project looking at methods to optimize cost-effectiveness of producing planting units from clonally-propagated

Ruppia maritima (Widgeon Grass) produced by *in vitro* micropropagation. Current research is focusing on the development of *in vitro* micropropagation protocols for *Halodule wrightii* (shoal grass). Research on the induction of adventitious shoot production in *Thalassia* seedlings is also continuing. A pilot study of smooth cordgrass (*Spartina alterniflora*) restoration in St. Joseph's Bay ended September 1996. Significant differences in survival and growth were found among the four varieties of transplanted *Spartina* and among test sites. Within sites, plants at lower elevations in the intertidal zone grew very slowly or died over the two-year study. However, even plants located high in the intertidal zone were vulnerable to large wracks of turtle-grass which accumulated in midsummer. When restoration plantings are done, they will require protection from seagrass wrack.

FISHERIES STATISTICS

Fisheries Independent Monitoring Program

Fisheries independent monitoring of fishes continues in the Tampa Bay, Charlotte Harbor, Indian River Lagoon, Florida Bay, and Ft. Walton Beach areas. The Cedar Key area has recently been added and preliminary work is being completed. The program uses a systematic sampling strategy to collect fish free from the biases associated with collecting data from recreational and commercial fisheries. Data has been used for stock assessments for several inshore species including red drum, spotted seatrout, and sheepshead. The program is being restructured in order to place more emphasis on assessing the population of sub adult fishes rather than on young-of-the-year fishes. This program will be used to help monitor the status of Florida's estuarine fish stocks. Additionally, staff in this program have been involved in the Mercury Concentration in Fish, the Recreational Survey, and Angler Interview programs.

Commercial Landings Statistics

Information on the commercial harvest of fish and invertebrates (including marine life and live rock used in the aquarium trade) is reported by wholesale and retail dealers to the Florida Marine Fisheries Information System. Annually, approximately 360,000 or more trip tickets containing information on catch, gear, time and area fished, price, and commercial fishing licenses are reported by more than 1,300 dealers under the mandatory reporting rules. These data are used in stock assessments, quota monitoring, sampling program design, 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 and federal fishery management plans and stock assessments.

Biostatistical Sampling

Presently, this cooperative state/federal program's staff obtains fish and invertebrate species length-frequency measurements and characteristics (gears used, duration, effort, area fished, etc.) directly from commercial fishing trips. Samplers are located in St. Petersburg, Port Charlotte, Marathon, Melbourne, Cedar Key, Jacksonville, and Fort Walton Beach. This program provides otoliths and otolith processing used for age-determination and age-length regression keys for some species (*e.g.*, spotted seatrout, sheepshead) currently undergoing stock assessment at the FMRI.

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 FMRI, the FDEP, and other agencies,

universities, companies, and individuals for survey work and mailing lists. Beginning in February 1997, the Florida Game and Fish Commission will issue Saltwater Fishing Licenses and will be computerizing all license information. For recreational landing estimates and other types of analyses, the NMFS Marine Recreational Fishery Statistics Survey (MRFSS) is utilized. From January to December of 1996, the FMRI conducted a creel survey in the Tampa Bay region to compare results with the MRFSS. The Tampa Bay recreational fishery pilot survey utilized an aerial survey of recreational fishing boats for an instantaneous boat count with global positioning system (GPS)-determined locations, a roving boat survey to intercept fishermen on the water, an access point survey of boat ramps, and a modified bus route roving creel survey for shore fishermen. The results of the pilot survey are still being evaluated.

HARMFUL ALGAL BLOOMS AND PLANKTON DYNAMICS

Studies of the algal blooms in Florida Bay originally begun in 1994 were continued on a monthly basis during 1996. A combination of aerial reconnaissance to map bloom areas, *in situ* water sampling and testing for species composition, chlorophyll a, total particulate solids (organic and inorganic), and dissolved nutrients gave a synoptic characterization of the bloom events through the year. Central bloom areas consisted of mixed assemblages with cyanobacteria often dominating but co-occurring with diatoms and photosynthetic and heterotrophic flagellates. Blooms in the western basins, nearest to the West Florida Shelf were often dominated by diatoms augmented by components of the inner bay blooms. These blooms were observed to be transported from the central bay regions to the west toward the shelf and to the south through passages between keys toward the reef tract and Florida Straits. Process measurements of the phytoplankton community indicated extreme primary production rates which varied directly with biomass. At the most

impacted stations, primary production exceeded 400 g C/m²/yr, while the less-stressed areas had values from <100 to 250 g C/m²/yr. The phytoplankton community showed continued adaptation to low light with consistent high light inhibition to photosynthesis. The nutrients supporting this activity, normally undetectable in water-column studies, were identified by selective bioassay studies and found to vary within the bay. Phytoplankton of the eastern bay region was consistently limited by phosphorus while the central and western bay stations showed limitation alternating between nitrogen, phosphorus, and silica. At the farthest west station, nitrogen and silica were major limiting phytoplankton nutrients. These water-column results contrast the findings for nutrients limiting seagrass which consistently indicated phosphorus limitation throughout the region. Laboratory studies using two dominant diatoms and two dominant blue-greens are being conducted to determine why they have a competitive advantage over other microalgal species. If salinity, turbidity, light, and/or nutrient availability regulates the dominant microalgae and consequently bloom development, then knowing the environmental regulators or modulators will help evaluate restoration options and their potential success. Laboratory studies involve a series of light growth rate experiments, salinity growth rate experiments, growth kinetic (Monad-type) experiments, and nutrient-limited competition experiments involving static and fluctuating salinities. Preliminary results suggest that the blue-greens tolerate a wide salinity range, high turbidity, and low water clarity.

Florida Bay secondary production studies, conducted at the same time and location of the primary production studies, indicated a notable utilization of the bloom species for the production of eggs in key copepod species examined. While the actual amount of eggs formed was modest, the survival and hatching success were excellent, indicating that the second trophic level was feeding and converting the bloom species. An enigma rested in the problem that the major cyanobacteria bloom formers are small (<10 μm)

making it difficult or impossible for some of the copepod predators to capture them as food. Indications in these and other studies confirm that the micro zooplankton component (ciliates and other protozoans) may serve as carbon vectors in this system. Benthic grazing studies including bivalves, ascidians, tunicates, sponges, and other filter/suspension feeders are presently underway to further define the role of animal grazing on the blooms. While the blooms persist, comparison of 1996 data with those of previous years shows a slight improvement with a downward trend in the maximum chlorophyll levels. The remaining blooms, however, are still significant. The central questions involve the role and impact on the ecosystem of the relative size fractions, their production and assimilation by the animal components of the bay, and the origin of the extensive nutrients stocks required to maintain such high biomass and elevated production rates. Studies focusing on these as well as assimilative nutrient rates will be concentrated in the next phase of Florida bay studies of 1997-1998.

In spring 1996, a red tide at high concentrations entered from offshore into the Pine Island Sound and Marco Island areas in southwest Florida. From March 5 until April 27 unprecedented mortalities of the endangered manatee, *Trichechus manatus latirostris*, were documented. This event coincided with the appearance and disappearance of a *Gymnodinium breve* bloom persisting from March 1, 1996, to May 1, 1996. Large numbers of manatees have only been significantly impacted by a red tide under very specific circumstances. A unique combination of environmental, geographical, and biological factors must co-occur to cause mass mortalities of these endangered mammals. In the winter/spring of 1996, a red tide encroached inside the barrier islands of southwest Florida. During this time, following a cold front, large numbers of manatees congregated in the warmer waters of the upstream power plant or in canalized areas. In some areas where the salinity in the inshore areas remained above 27 ppt, *G. breve* maintained persistently high concentrations of

cells (>100,000 per liter), and the likelihood of manatees being exposed to a red tide during their postwinter migrations was fairly high. The critical circumstances contributing to high manatee mortality appear to be determined by temperature, red tide concentration and geographic distribution, and the persistence of the bloom in relation to the distribution of the manatees and their length of exposure to a red tide. In most years, a red tide does not come inshore during the winter/spring period when high numbers of manatees are concentrated and are about to disperse. However, individual manatees can be at risk from red tide exposure at any time. In addition, numerous fish kills and turtle and dolphin strandings were reported during the same time period from the same locations.

Three cases of neurotoxic shellfish poisoning were documented in June 1996 and involved two children and an adult that had eaten cross-barred venus clams and whelks harvested from a prohibited shellfish harvesting area in Sarasota Bay. Cross-barred venus clams from this area remained toxic (>20 Mouse Units) for more than six months due to retention of brevetoxins, while cross-barred venus clams collected from a nonimpacted Florida east coast location was not a public health risk (<20 Mouse Units).

A red tide has been offshore or offshore and inshore along Florida's Gulf Coast at some point during most of 1996. In May-July, October, and November, a red tide was documented in offshore and inshore North Florida waters. Inshore blooms caused shellfish harvesting area closures. There has been an offshore red tide ten to 35 miles off the central west coast since September, and the tide carried over into 1997. The FDEP maintains red tide logs during such events. During future events, these summaries will be posted to the GSMFC home page which carries a current red tide alert.

SOUTH FLORIDA REGIONAL LAB

The spiny lobster research program continues to monitor harvest and other important fishery components for all three user groups currently harvesting spiny lobster. Additional research continues 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 hard bottom shelter loss as a consequence of changes to the Florida Bay ecosystem. New research has commenced on the reproductive potential of adult spiny lobster with respect to fishery impacts and the role of lobster sanctuaries. During the 1995-1996 fishing season, we completed 127 onboard surveys and received 500 mail surveys from commercial fishermen. Total commercial harvest was 7.0 million pounds. Nearly 2,000 recreational surveys were returned that indicate a harvest of 426 thousand pounds during the special two-day season and 1.6 million pounds during the first month of the regular season. Estimates for the 1996-1997 fishing season indicate that commercial landings may approach 7.9 million pounds. The third user group is holders of special recreational crawfish licenses. Landings for the 426 license holders were approximately 75,000 pounds for the entire 1995-1996 season.

The south Florida queen conch spawning stock increased slightly to approximately 12,000 individuals in offshore aggregations. The largest increase was in the lower keys; the middle and upper keys populations remained fairly stable. Histological examinations of gonadal tissue from the near shore, nonspawning adult conch population and offshore spawning conch showed a deficit in gonadal condition in both males and females from the near shore population. We plan on implementing a reciprocal transplant experiment between the two populations to assess transplantation as a method to rehabilitate the spawning stock. Recruitment to offshore nurseries as measured by juvenile abundance

remained relatively constant both regionally and overall. The area encompassed by the conch aggregations increased slightly in the lower keys and remained stable in the upper and middle keys. Research continued on a grant to assess seasonal effects on mortality of hatchery out plants. In order to recapture released juveniles, we instituted a new tagging technique using aluminum tags and underwater metal detectors. Recoveries approximated 97% with this technique compared with 16% using visual location. We also developed a new model to assess mortality in an open population by estimating emigration from a plot based upon movements of individuals within the plot. An enhanced ozone delivery system was implemented at the conch hatchery which increases efficiency and decreases labor. Approximately 1,500 hatchery-raised conches were released into near shore and offshore aggregations.

FISHERIES STOCK ENHANCEMENT

The Fisheries Stock Enhancement Program began its twelfth year July 1, 1996. Efforts to restore red drum (*Sciaenops ocellatus*) in Biscayne Bay continued through 1996. This program completed its sixth year in August 1996. The program is conducted in cooperation with the UM, Florida International University (FIU), and the Dade County Environmental Resources Management (DERM). Contracts with UM and FIU for grow out, tagging, and release of red drum produced at the Port Manatee SERF continued. A contract with UM for a fisheries-dependent assessment of red drum in Biscayne Bay began June 1996. A total of 1,608,032 (1,060,548 phase I; 427,339 phase II; and 120,145 phase III) fingerlings were released in Biscayne Bay through November 1996. A total of 2,213,273 red drum had been released state wide through November 1996.

A cooperative program designed to enhance the bay scallop (*Argopectin irradians*) populations on the west coast of Florida will begin July 1, 1997. This program will be

conducted in cooperation between the University of South Florida (USF) and FDEP. The fisheries stock enhancement component of this program will initially be to function as a nursery to rear animals propagated at the USF hatchery. Development of a hatchery capability at Port Manatee is planned.

The ozone water treatment system constructed during 1996 is nearing operational status. The system consists of two 30,000-gallon settling tanks; a 15,000-gallon gassing silo; a 15,000-gallon degassing silo; oxygen and ozone generators; and associated pumps and other equipment. The system is operated by a computerized process control system. Testing and adjusting system parameters continued through the end of the year.

Hatchery Operations

Fall 1995 Production: Eighteen Indian River red drum brood fish, divided between three environmentally-controlled rooms, were photothermally-conditioned to induce egg production for the fall 1995 season. Seventeen red drum brood fish were maintained in a one-acre pond for ambient conditioning until July 1995 when three pairs were transferred to a fourth conditioning tank. The fall 1995 total red drum egg production was 95,430,000 eggs.

Three pairs of red drum brood stock were lent to the University of Miami (UM) for production of red drum eggs for commercial aquaculture in Florida.

Ten one-acre ponds were stocked with 1,678,792 two-day-old red drum larvae for phase-I fingerling production. Total phase-I fingerling production for the fall 1995 was 617,106 fish. Mean survival rate and rearing cycle length for these ten ponds were 41.2% and 79.5 days, respectively. A total of 475,611 fish were stocked into SERF rearing ponds for both phase-II and phase-III fingerling production. FIU received one shipment of phase-I fish (12,881)

November 28 for phase-III rearing. The University of Miami Experimental Hatchery (UMEH) received four shipments of phase-I fish October 13 (15,814); October 18 (16,354); March 1, 1996 (2,288); and April 4, 1996 (6,487) for phase-II and phase-III rearing.

Two groups of phase-I fish were transported to Biscayne Bay November 28 (36,529) and January 17, 1996 (39,822) for monitored releases by the UM Assessment Team.

Total phase-II red drum production for fall 1995 was 220,518 fish reared from six one-acre ponds (145,200) and 13 quarter-acre ponds (75,318). Mean survival rate for the one-acre and quarter-acre ponds were 48.8% and 42.0%, respectively. Three groups of untagged phase-II fish were transported during 1996 to the UMEH January 31 (8,248); March 27 (4,077); and March 28 (9,232) for advance rearing.

One group of untagged phase-II fish (21,543) was transported and released into Biscayne Bay for a monitored release by the UM Assessment Team. A total of 61,132 binary coded wire tagged fish were released into Biscayne Bay either at the 59th Street Causeway or the Oleta River State Park during 1995-1996.

Total phase-III red drum production from seven ponds for fall 1995 was 15,037 fish with a mean survival rate of 62.5%. A total of 2,768 untagged phase-III fish were shipped to UMEH during 1996 for additional rearing. A total of 5,949 east coast internal anchor tagged (IAT) phase-III fish were transported and released into Biscayne Bay. Two groups of west coast phase-III IAT fish were transported by the USFWS and released into the St. Marks Reservoir on October 1 (205) and October 3, 1996 (203).

Fall 1996 Production: Twenty-four Indian River red drum brood fish, divided between four environmentally-controlled rooms, were photothermally-conditioned to induce egg production for the fall 1996 season. Sixteen red

drum brood fish were maintained in a one-acre pond for ambient conditioning. The fall 1996 total red drum egg production was 30,668,000 eggs.

Three pairs of red drum brood stock were lent to the UM for production of red drum eggs for commercial aquaculture in Florida.

Five one-acre ponds were stocked with 762,594 two day old red drum larvae for phase-I fingerling production. Total phase-I red drum production for 1996 was 238,000 fish with a mean survival rate of 31.1% for these five ponds. Four one-acre ponds, composed of two uncovered and two covered (bird-netted) ponds, were stocked with a total 107,214 phase-I fingerlings for a bird predation study. Two groups of phase-I red drum were transported to FIU November 1 (11,987) and November 6 (12,378) for phase-III rearing. Two groups of phase-I fish were transported to UMEH October 10 (14,560) and October 25 (9,352) for phase-III rearing.

Fall 1996 production of phase II and III fingerlings continued through the end of the year, and no releases of tagged red drum into Biscayne Bay were made from Port Manatee by year's end.

Snook Propagation Research

Three groups of phase-I snook fingerlings were transported from the Harbor Branch Institute to the SERF August 14 (699); October 15 (1,669); and November 25 (607) for pond rearing during 1996. A total of three ponds was stocked with the first two groups of snook and survival averaged 93.7%.

The summer of 1996 was truly an exciting and important one for the Snook Project. Numerous research studies that were begun at either the SERF or the MML during 1995 through 1996 were concluded. Most of the research could have been concluded during the summer 1995, but Hurricane Erin caused the snook to stop

reproducing. Because of the hurricane, snook production and many research goals remained uncompleted until summer 1996.

Totals of five different hormones, four of them brain hormones, have been successfully compared in their ability to induce spawning in female snook. New protocols have been developed for handling snook, for monitoring their progress toward spawning, and for egg quality. These protocols can be applied to other saltwater fish species and can be easily taught. They are more cost effective and production oriented than are the existing research protocols. A listing of more than 30 research papers on snook reproductive biology has been compiled. The first paper is on tag retention and has been accepted in the *Fishery Bulletin*.

Problems persist regarding the rearing of larval snook to juvenile size, but significant progress has been made. In collaboration with SERF and MML scientists, Dr. Blain Kennedy at HBOI has introduced the concept of probiotics. Probiotics involve the introduction of nonpathogenic bacteria into a culture system which out-compete pathogenic bacteria. This new technique may serve as a replacement for the effective antibiotics which have been taken off of the market due to Food and Drug Administration regulations. A paper on probiotics will be submitted for publication as part of the international symposium on marine stock enhancement held at the MML during November 1996.

Numerous juvenile snook have now been raised because of the joint collaboration between the SERF, MML, and HBOI. There have now been three snook releases, and more than 500 hatchery-reared snook are in Florida waters. Approximately 2,000 fingerling snook are currently being reared at SERF. In addition, Mote Aquaculture raised an estimated 10,000 snook during this past summer.

A multi-year snook sex reversal study was concluded. Beginning in the summer 1994, 138 snook raised at SERF were all confirmed to be males. By the summer 1996, four fish had become females. This evidence, plus field collections of wild snook, confirms that snook are protandric (beginning life as males and becoming females at a later time).

The future of culture research with snook at the Port Manatee Hatchery is currently being debated. Funding shortfalls and priority changes as well as the lack of success in propagating large numbers of fingerlings have left the future of this species in question.

The Fish-Health Program

The goal of the Fish Health Program at SERF is to ensure that cultured fish are produced efficiently (*i.e.*, with minimal losses due to disease or adverse environmental conditions) and to ensure that fish are healthy before being released into state waters. This goal is being achieved by minimizing the stress associated with harvest, handling, tagging, transport, and anesthesia, as well as by ongoing refinements in management, husbandry, monitoring, and treatments.

Specific methods for disease monitoring and treatment have been (or are being) developed for all life-history stages of cultured fish including brood stock, eggs, larvae, and various juvenile stages. Diagnostic evaluations are based on clinical signs (including behavior) and necropsy results. A full in-house clinical evaluation may include microphotography, parasitology, bacteriology, electron microscopy, and histopathology.

Consultation, treatment advice, and fish-health training is provided to SERF culture personnel by a staff fish-health specialist. Limited diagnostic support, as well as treatment advice, has been made available to contractors working with SERF. Veterinary support for

health certification of fish prior to release and for some diagnostics is provided by the University of Florida Tropical Aquaculture Laboratory in Ruskin, Florida.

Emphasis has been placed on the prevention of disease through maintenance of the best possible environmental conditions and on superior husbandry, rather than depending on chemical treatments. Chemical treatments are avoided whenever possible in favor of "environmentally friendly" treatments, such as freshwater dips to remove parasites.

Control for all of the most serious parasites of red drum and common snook has been achieved using a variety of experimentally-developed treatments. We now have effective control measures for the protozoans *Amyloodinium* cf. *ocellatum*, *Cryptocaryon irritans*, and *Ambiphyra* sp., as well as the copepod *Caligus elongatus* and the trematodes *Rhabdosynochus rhabdosynochus* and *Neobenedenia* sp.

Significant progress has also been made in the past year in controlling opportunistic bacterial infections. Losses of red drum to bacterial infections, particularly *Vibrio* sp., have been greatly reduced using a low-salinity treatment. This treatment is less expensive, more effective, and environmentally safer than any antibiotic on the market. Laboratory and production-level testing of new bacterial and parasite treatments for safety and efficacy are ongoing and results will be published in peer-reviewed journals at appropriate intervals. To fully support aquaculture development in Florida, research results will also be made available to the industry through pamphlets, fish-health training sessions, and technical manuals.

Assessment

Assessment of hatchery-reared red drum using fishery-dependent means continued through

1996. Three hundred thirty-eight phase III fish have been recovered from Biscayne Bay through fisheries-dependent means. Two 2-day fishing tournaments were held in Biscayne Bay to promote angler awareness of the program and to increase fish recoveries. During the first tournament, held during October 1995, no red drum were captured. In October 1996, 43 red drum ranging in size from 14 to 16½ inches, were caught by participating anglers. A second lottery, funded by the Atlantic Gamefish Foundation, was held during April 1996, and \$1,000 was awarded to an angler who had returned a hatchery-reared fish. The lottery will be repeated in 1997. Fisheries-dependent returns continued from other red drum releases on both the east and west coasts of Florida.

ENDANGERED SPECIES

Marine Mammals

The FDEP Marine Mammals Research Program is headquartered at the FMRI in downtown St. Petersburg. Additional staff is located at the FMRI Marine Mammal Pathobiology Laboratory (MMPL) in St. Petersburg and at field stations in Port Charlotte, Jacksonville, Melbourne, and Tequesta. Manatee research is organized into five projects: mortality and rescue, population monitoring, ecology and migration, life history and biology, and the manatee GIS. Research on the endangered North Atlantic right whale is coordinated by program staff at the Jacksonville field station.

Manatee mortality reached an all time high during 1996. The total number of deaths recorded in Florida was 415. This represents approximately 16% of the total number of manatees counted during the last synoptic count in February 1996. A great deal of national and international attention was focused on a single-mass mortality of manatees that resulted in the loss of at least 151 animals during the months of March and April. The total annual mortality

excluding the mass mortality event was 264 which is over 50 animals higher than any annual mortality ever recorded. Watercraft-related mortality reached an all time high of 60 although this category remained the typical 25%-27% of the total mortality. Mortality of newborn manatees (perinatal) was only slightly greater than the 1995 total (61). Other categories of mortality were slightly higher than during previous years, but the proportion of each category was approximately the same as in other years.

The single mass mortality event this past year represented the largest event of its type on record. Previously, there have been mass mortality events that either resulted from cold weather or suspected red tide exposure. Evidence collected during the 1996 event suggests that manatees most likely succumbed to exposure to red tide toxin (breve toxin). Because of the extensive nature of the investigation into the cause of this event, a great deal was learned about the biomedical nature of manatees. At least five animals were recovered alive after their exposure and survived. They have all been released back into the wild. A great deal of interest about the effect of Harmful Algal Blooms (HAB) has resulted from this event, and a significant amount of research is ongoing and planned to better understand toxic marine algae and their relationship to the environment.

Aerial surveys are an important method 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 are being combined to create a population model that will estimate trends in regional population sizes. Two inter-agency synoptic manatee aerial surveys were flown in 1996: January 9-11 and February 17-18. Record counts were achieved on both surveys: 2,274 manatees in January and 2,639 in February. Counts were much higher than

previous synoptic counts, primarily due to the excellent survey conditions. Twice-monthly aerial surveys were flown for manatee distribution in Wakulla, Tampa Bay, and Lee counties. Partial funding was provided for manatee survey flights of Florida Bay conducted by Everglades National Park staff. Eight multi-plane surveys documented manatee distribution during the mortality event. Flights sampled the area from Sarasota to the Port of the Islands in Collier County. Sightings from these surveys were rapidly entered into the GIS system for immediate analysis. Tests to determine the accuracy of GPS for rapid entry of aerial sighting locations were initiated. GPS is already used to document generalized flight paths for aerial surveys.

The West Coast Telemetry Project staff completed the last of six years of field work tracking manatees tagged with satellite transmitters. A total of 20 manatees was monitored during 1996 from Apalachicola Bay to Miami, including one animal that used Lake Okeechobee. Nine manatees were captured at the TECO power plant in Apollo Beach in January; three were tagged with telemetry equipment. Seven rehabilitated manatees were tracked to monitor readjustment to the wild. One female, Sweet Pea, was the first-tagged manatee to travel around the south end of Florida from the west coast to the east coast. Passive integrated transponder (PIT) tags, used as long-term individual identification markers, were implanted in a total of 35 animals during 1996. The manatees tagged with PIT tags included the nine animals captured during the winter capture at TECO, four manatees captured during a capture at Fernandina Beach, ten animals caught by open water capture in order to take blood samples during the epizootic event in southwest Florida, and eleven rescued/rehabilitated animals. Blood samples were collected on 21 wild and rehabilitated animals in 1996. A team composed of telemetry staff and marine mammal GIS personnel formulated a plan for data analysis, creation and verification of GIS coverages, and completion of telemetry project segments that will

comprise the final report.

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 is essential to a population model and comes from a variety of research projects: the scar catalog, use of PIT tags (briefly described above), and non-invasive body condition indices. The FMRI is responsible for managing the scar catalog data from areas extending from south of Crystal River to the Everglades on the west coast of Florida. The FMRI scar catalog consists of more than 1,250 images representing 320 photo-documented scarred manatees. Over two-thousand sightings have been recorded. PIT tag deployment using the FMRI protocol is now standard procedure at all oceanaria and rescue operations. Tag scanners are available at all field stations to check for the markers in badly decomposed carcasses that are not transported to the MMPL in St. Petersburg. The body-condition study uses ultrasound to measure manatee blubber layer changes and results have proven effective in field operations as one tool to evaluate manatee health. Training of other biologists at the USGS Sirenia project has allowed the methodology to be used in other regions of the state and country not readily reached by the FMRI staff.

Marine Mammals Geographic Information System (MMGIS) staff worked with CAMRA staff at the FMRI to release the first FDEP Atlas of Marine Resources on CD-ROM. Compiling this CD has made considerable data and information from state, federal, and local agencies available to organizations involved with manatee protection. The CDS have been widely distributed through the Manatee GIS Working Group and through scientific forum presentations. Annual updates are planned and will include new data layers and additional background material on the data. Databases used to monitor the spring 1996 manatee mortality event in southwest

Florida were created, including carcass location, aerial survey results, red tide sampling stations, and basic hydrological data. The GIS served as a primary research tool for synthesis, visualization, and analysis of spatial biological and environmental data. A right whale component was established as part of the MMGIS. Results of right whale aerial surveys, measurements of oceanic surface water temperature obtained from NOAA weather satellites, and offshore bathymetry were all created as data layers that can be mapped and analyzed with the GIS system. MMGIS research staff also worked to refine analysis techniques for aerial survey and telemetry data. Meetings of the Manatee GIS Working Group, with participants from a wide variety of organizations, have been held twice-yearly since 1994 and focus on data and analysis issues. Teams were formed to address data acquisition, data sharing, data-use ethics, and analysis issues. Through these teams, the group seeks to create an environment where everyone has access to the same data and knowledge about analytical methods is available to participants.

In addition to manatee recovery efforts, the FDEP has responsibility for the recovery efforts of other endangered marine mammals including the northern right whale, *Eubalaena glacialis*, the most endangered of the world's large whales. Even one mortality annually is a significant blow to this endangered species, whose North Atlantic population numbers fewer than 350 individuals. In June 1994, the NMFS designated three areas as critical habitat, including the Northeast Florida and Georgia coastal waters, the only known calving areas for right whales. The NMFS has lead responsibility for recovery of the right whale, but the FDEP has committed to assist their efforts as set out in the 1991 Northern Right Whale Recovery Plan. The FDEP has been involved as a member of the Southeastern U.S. Implementation Team since its inception in 1993. In addition, staff of the FMRI has conducted winter right whale aerial surveys in Florida since 1987 to monitor the seasonal presence of whales and to determine the number

of calves born during the season.

Aerial surveys by the FMRI, the New England Aquarium, and the Georgia Department of Natural Resources (GDNR) resulted in documentation of 21 mother/calf pairs and 48 other individual right whales for a total of 90 whales during the winter 1995-1996 season. This was an all time high for both mother/calf pairs and for other individual whales documented in the critical habitat. All but one of the documented whales have been matched to the *North Atlantic Right Whale Catalog*. The one unmatched whale is a new female for the catalog; she was one of this year's mothers and adds another member to the small reproductive population. The FMRI and GDNR also conducted a pilot study of right whale use of offshore habitats during February using funds from the NMFS and NOAA Air Corps aircraft. Five whale mortalities (an adult male, a sub-adult female, and three calves) were documented during the 1995-1996 winter. The FMRI staff assisted in confirmation, recovery, and necropsy of four right whale carcasses from northeast coastal Florida and southeast Georgia.

Sea Turtles

The FDEP marine turtle conservation goals, responsibilities, and program direction promote the recovery of the five species of marine turtles that occur in Florida. The overall approach is to develop the scientific information that will guide recovery efforts (FMRI) and to minimize human impacts which result in increased mortality, degrade habitats, and impede recovery of listed turtle species [see Bureau of Protected Species Management (BPSM)]. Sea turtle research is divided into three major components: 1) biological and ecological research and population assessment, 2) assessment of mortality factors, and 3) education.

Research carried out by program staff during 1996 addressed the following topics: 1) the distribution, abundance, life history, ecology, and migrations of marine turtles in

Florida and contiguous Western Atlantic and Caribbean waters; 2) assessment of population status and trends of loggerhead, green and leatherback turtle nesting populations in Florida; 3) identification of genetic stocks of marine turtles utilizing Florida's nesting beaches and foraging habitats; 4) development of reliable sex determination techniques for marine turtles; 5) the nesting ecology of loggerhead turtles; 6) the effects of artificial lights on marine turtles; and 7) the dispersal behavior and lost-year ecology of marine turtles hatching on Florida's east coast. The various research projects greatly enhance the department's ability to carry out effective management on behalf of marine turtles.

The FDEP, through the FMRI, continued to coordinate the Florida portion of the Sea Turtle Stranding and Salvage Network (STSSN), an 18-state program coordinated at the federal level by the NMFS. During 1996, 1,379 stranded turtles were documented by the Florida network. Department staff responds to strandings, coordinates statewide activity of permitted volunteers, and manages the Florida STSSN database. Data analyses contribute significantly to management decisions such as the regulation of fisheries that impact marine turtles. The FMRI also manages two long-term databases that describe nesting activity by marine turtles.

The FMRI and Bureau of Protected Species Management jointly participate in decisions regarding coastal construction activities, land acquisition, and management of nesting beaches and foraging habitats. Staff reviewed and commented on permits for coastal construction activity, dredge and fill permits, renourishment projects, beach lighting ordinances, and beach cleaning practices. Field evaluations of proposed and permitted activities to recommend and evaluate the success of marine turtle protection measures were also conducted.

Educational activities included distribution of brochures and informational booklets, responses to numerous requests for

information from the public and government agencies, attendance at and participation in coastal-related conferences and forums, and providing slide shows and lectures to groups.

SPECIMEN INFORMATION SERVICES

During 1996, 971 invertebrate specimens were lent to 25 investigators at 14 domestic and two foreign institutions, and six other loans of 273 specimens were used for educational purposes. Similarly, 934 fish specimens were lent to 24 investigators at 12 domestic and one foreign institutions. Eight other loans of 120 specimens were used for educational purposes.

COASTAL AND MARINE RESOURCE ASSESSMENT

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

To tailor the maps for policy analysis, additional thematic information is added such as bycatch volumes or shrimp nursery areas. These maps have been used in the complex process of developing shrimp management plans and rules for the Big Bend and Northeast regions and

analyzing bycatch reduction issues. Most recently, this process has been extended to the Panhandle. Since August 1994, staff of the FMRI has been developing portable computers and databases to support taking this technology into meetings of the FMFC rather than traditional paper maps. The computer system was used to provide interactive policy analysis capabilities by

displaying alternative shrimp zone closure alternatives on an overhead projector for open debate by the FMFC, the FDEP, citizens, and industry representatives. The representation of the shoreline conditions relative to the proposed zones reduced confusion and fostered more expedient policy analysis.

BUREAU OF MARINE RESOURCE REGULATION AND DEVELOPMENT

The primary responsibilities of the bureau include the classification and monitoring of shellfish growing waters, the inspection of shellfish and blue crab processing plants, resource assessment, and resource rehabilitation and development. Sections 20.06(4), 20.56(6), 370.021, 370.071 and 370.16, Florida Statutes (F.S.), and Chapters 381 and 386, F.S., set forth the department's responsibilities in management of shellfish resources and the public health protection aspects of the shellfish industry.

Accordingly, under the mandate provided in Section 370.16(12), F.S., to "improve, enlarge, and protect the oyster and clam resources of this state," the department is actively engaged in collecting oyster shell from processing plants and constructing and restoring oyster reefs on public bottoms. During 1996, the Aquaculture and Shellfish Development Section collected 190,344 bushels of processed oyster shells, and deposited 216,000 bushels of shells to restore approximately 45 acres of oyster reefs in Apalachicola Bay.

The Florida Legislature appropriated \$454,400 as part of a statewide commitment to rehabilitate and develop productive shellfish resources for FY 1995/1996. Funding was allocated among seven coastal counties, including Levy, Dixie, Wakulla, Franklin, Bay, Okaloosa, and Santa Rosa. In 1996, about 96,445 bushels of live oysters were relayed and transplanted during oyster resource development projects in Apalachicola Bay. Funding for this project was allocated from monies deposited in the Apalachicola Bay Conservation Trust Fund. Also

in 1996, 4,000 cubic yards of dredged oyster shell were deposited to restore oyster reefs in Santa Rosa and Bay counties. Funding was from special category appropriations from the general revenue fund.

Marine Resources Information System statistics (unedited data) showed statewide oyster landings in 1995 were 1.5 million pounds valued at \$1.8 million. As a result of poor environmental conditions and red tide blooms that limited harvesting for extended periods, Franklin County landings fell to about one million pounds. The department has issued 630 Apalachicola Bay oyster harvesting licenses for the 1996/1997 harvesting season, generating about \$65,000 in user fees for the Marine Resource Conservation Trust Fund.

Reported hard clam landings in 1995 reached 1.35 million pounds which were valued at more than \$11 million. Production trends for 1996 suggest that landings will continue to decline in portions of the Indian River in Brevard County as a result of decreased salinity levels and poor sets over the past three years. The emergence of shellfish aquaculture on Florida's Gulf Coast is increasing substantially, and all aquaculture products may not be reported in the annual landings. Clam farming is Florida's most rapidly growing form of marine aquaculture with reported sales of \$5.4 million in 1995. Trends, based on the amount of seed stocks purchased in 1996, suggest that there will be a substantial increase in landings from aquaculture operations in 1997 on the Gulf Coast.

Hard clams harvested from waters classified as restricted or conditionally restricted must be processed through relaying and depuration activities rigorously controlled by the Florida Division of Marine Resources. The division has promoted depuration as a practical method for cleansing potentially contaminated shellfish, ensuring product quality, and protecting public health. In 1996, the division issued 11 special activity licenses to relay shellfish to private leases, and one license was issued to a depuration facility using on shore wet storage and controlled purification methods.

During 1996, 369 special activity licenses were issued to promote shellfish aquaculture activities, including exemptions for aquaculture products below the minimum size, bag limits, and harvesting seasons. The department has entered into one wet storage agreement for on-lease wet storage of oysters and hard clams.

Provisions of Section 370.16(1)-(11), F.S., allows leasing sovereign submerged bottoms for cultivation of oysters and clams. In 1996 there were 127 shellfish leases in effect totaling 1,720 acres. Additionally, 264 aquaculture leases issued under the provisions of Chapter 253, F.S. are in effect (942 acres), and more than 150 aquaculture leases are in the review process. Cultivation of hard clams and oysters offers a technically feasible and economically practical alternative to increase shellfish production in Florida.

Nearly 50% of Florida's 2.4 million acres of coastal waters have been classified in 58 Shellfish Harvesting Areas (SHA). In 1996, six comprehensive shellfish surveys were completed and six shellfish management areas were reclassified as part of continuing efforts to maintain proper classifications in all SHAs. The Shellfish Laboratory analyzed 85 shellfish meat samples and 18,007 water samples to insure shellfish quality. The division certified 111 shellfish processing plants in 1996 and conducted 552 processing plant inspections.

BUREAU OF PROTECTED SPECIES MANAGEMENT

MANATEES

Rule Making

Prior to 1996, boat speed zone rules addressing county-wide manatee protection needs were approved in 12 of the 13 counties identified by the governor and cabinet in 1989 as needing priority attention. (The 12 counties with comprehensive rules in place are Brevard, Broward, Citrus, Collier, Dade, Duval, Indian River, Martin, Palm Beach, St. Lucie, Sarasota, and Volusia.) During 1996, several rule amendments were begun or completed and development of a rule to address county-wide protection needs continued in Lee County, the last of the 13 priority counties.

In March 1996, the department proposed amendments to the General Provisions of Chapter 62N-22 [Rules 62N-22.001 through 62N-22.003, Florida Administrative Code (FAC)]. The amendments were revised slightly based on comments received by the department and filed for adoption in June. The main purpose of the amendments was to address comments made by staff from the Joint Administrative Procedures Committee, but the department also took the opportunity to make other changes to the affected rules to improve organization and otherwise clarify relevant terms and processes. The processes the department uses to establish zones and issue authorizations to conduct activities otherwise prohibited by Chapter 62N-22 were not changed significantly. The overall permitting process for 62N-22, while not changed significantly, is now more easy to follow.

A proposal to amend the Collier County rule (62N-22.023, FAC) was published in the *Florida Administrative Weekly* (FAW) in August 1996 in association with the county's manatee protection plan approved by the department in 1995. A public hearing was held in Naples in September. Most of the county is designated as a "30 mph in channel/20 mph out of channel" (30/20) zone by the existing rule; however, the proposed rule is more site-specific. Many areas would remain at 30/20 (such as the Ten Thousand Islands area and the back bays) but some areas would be changed to either "slow speed" or "30 mph in channel/slow speed out of channel" to increase protection. Regulations in other areas (such as in the Gulf of Mexico within 500 feet of shore) would be removed. Several changes to the proposal were announced in November, based on the department's review of comments it received. The county took exception to one change (in Rookery Bay) and opted to file an administrative challenge to the rule in early December. At the close of the year, negotiations were in progress with a settlement likely.

Although a formal proposal was not finalized in 1996, the department continued to work on a proposal to amend the existing Lee County rule (62N-22.005, FAC) to address manatee protection needs throughout the county. (A proposal was published in the FAW in April 1995; however, an administrative challenge was filed against the proposed rule and, in December 1995, the rule was declared invalid for several technical reasons. The department elected not to appeal the decision.) Development of a new proposal has been slowed by statutory changes made in 1996 which affect the process the department must follow when performing rule-making. The department expects to have a new proposal published in the FAW by mid-1997.

In May 1996, the department was notified that the challenge to the Broward County rule (62N-22.010, FAC) filed by the Marine Industries Association of South Florida (MIASF) in 1993 had finally been resolved in the department's

favor. A state hearing officer had issued a Final Order in August 1994 declaring that the rule was a valid exercise of delegated legislative authority. The MIASF appealed the ruling to the Fourth District Court of Appeals (4DCA) in September 1994, and oral arguments were eventually heard in November 1995. The May 1996 ruling from the 4DCA affirmed the validity of the rule. The decision was not appealed.

The department continued to issue permits to commercial fishermen and professional guides in accordance with provisions set forth in the specific county rules and Rule 62N-22.003, FAC. The permitting process was revised in June 1996 as part of the amendments to the General Provisions of Chapter 62N-22 discussed above. The department also issued several permits to allow access to several no entry zones: one was issued to allow scientific research while several others were issued to individuals for access to private property located within no entry or motorboats prohibited zones. Two site-specific permits were also issued in Volusia County: one was issued to Boston Whaler as a vessel manufacturer to allow continued testing in a portion of Mosquito Lagoon, and one was issued to allow for a powerboat race on the Halifax River in October 1996, but the race was never held. (A similar permit was later issued for the race if it is held in 1997.)

Sign Posting

As manatee protection zones are established, appropriate regulatory signs must be posted. If such zones are to be enforced, the signs must be properly designed, located, and maintained. In 1990, by act of the legislature, the Florida Inland Navigation District (FIND) and the West Coast Inland Navigation District (WCIND) were assigned responsibility for posting and maintaining manatee regulatory signs for duly approved zones within their counties. The FDEP must still post the other counties, coordinate review, and approve sign plans submitted by the navigation districts. Within the FDEP, the Office

of Waterway Management is primarily responsible for coordinating this effort.

The process of posting protection zones generally requires that a contractor with special equipment and personnel obtain the necessary environmental permits, post the new signs, and replace damaged or missing pilings and signs. These areas must then be inspected on a regular basis (preferably quarterly) to ensure the signs are maintained in place and do not pose a significant hazard to navigation. In conjunction with the permit review process, applicants are often required to post appropriate signs during and/or after construction projects. In areas where boating speed zones have been approved by the governor and cabinet, additional signs may be required to be posted at marinas, docks, and boat ramps located on state leased lands in the boating speed for the area. Some counties have posted, at marinas and boat ramps, an enlarged map of the boating speed zones for that area.

During 1996, no major new zones were posted. The Crystal River in Citrus County was remarked with channel markers and manatee signs in order to improve compliance and enforcement with the existing speed zones. Routine maintenance was performed in many parts of the state.

Manatee Protection Plans

In response to a directive from the governor and cabinet in November 1989, the FDEP has been working with the 13 "key" counties to develop manatee protection plans (MPPs). In counties with adopted plans (Citrus, Dade and Collier counties), staff has focused on implementing the plans. For example, in Citrus County staff attend local coordination meetings by the USFWS, coordinate the aquatic plant management efforts and make recommendations on permits. The county is currently in a five-year review of its local government comprehensive plan under the evaluation and appraisal report (EAR) process, which falls under the Florida

Department of Community Affairs. Staff assisted the county in updating the MPP and has attended a series of meetings and public workshops on issues which will require amendments to the comprehensive plan. The amendment process is scheduled for 1997. The FDEP obtained a grant to produce two boater education guides/maps for Citrus and Brevard counties. The grant also funded production of a video on manatee protection for Dade County which was completed in August 1996. Dade County efforts also involved reviewing developments for compliance with the Dade MPP. Staff attended a county commission hearing in August on a controversial project. The MPP was upheld as a result of the hearing. Staff also worked on the closing of a culvert in the Coral Gables waterway.

Plans have been drafted for Brevard, Duval, Indian River and Volusia counties with partial funding support from FDEP. The Brevard and Volusia plans are currently in the local government hearing process. The Duval plan is still being evaluated by the local government committee responsible for its development. Information collection was the focus for some county MPP efforts. In 1996, a boating study was completed for St. Lucie and Martin Counties. A task force of permit review staff was established for Palm Beach County to refine the department-funded "Boat Facility Siting Plan" for the county. In the summer of 1996, the task force members conducted sea grass site inspections on 52 sites with the potential for boat facility development. A plan to inventory sea grasses of another 100 sites is set for the summer of 1997. MPP staff also provided support to the County Planning Department for the Comprehensive Plan EAR review. In Charlotte County, a non-key county, BPSM staff provided manatee information to aid the county in the development of a coastal resources management plan.

Permitting

A total of 270 requests for manatee impact review comments for permit or lease

applications were received. A total of 320 manatee impact reviews was performed and comments sent to appropriate agencies. A total of 49 projects (deemed "critical" because of their size, location, complexity, or potential to impact manatees or their habitat) was reviewed, and recommendations were provided to appropriate agencies. Bureau recommendations were also sent to the USFWS, Tampa Port Authority, the COE, and the Office of Intergovernmental Programs.

Habitat Characterization Assessment and Protection

The manatee habitat protection section is responsible for coordinating reviews of manatee habitat-related issues for the FDEP, including collecting and assimilating reference information concerning manatee habitat issues, review of pertinent inter- and intra-departmental efforts dealing with manatee habitat protection, coordinating agency working groups in areas of special concern for manatees, and presenting current information regarding manatee habitat research to public and agency groups.

The FDEP staff continued participation in the Crystal River Interagency Working Group which establishes aquatic herbicide work plans for Kings Bay and Homosassa River based on seasonal manatee use. Coordination of the Blue Spring Interagency Working Group was continued to ensure that manatee habitat in this area will be sustained and monitored on an annual basis. Both working groups are comprised of representatives from the USFWS, U.S. Army COE, respective counties, the Florida Game and Freshwater Fish Commission, and the FDEP Division of Recreation and Parks, Bureau of Coastal and Aquatic Managed Areas, Bureau of Aquatic Plant Management and BPSM.

Habitat characterization and identification continue to be a major component of this section's efforts. The habitat section continues to distribute a bureau-published summary report identifying all

known manatee habitat components (in both freshwater and marine systems) in Florida and identified anthropogenic threats to this habitat. The report summarizes available scientific literature concerning forage species and feeding preferences, foraging impacts to feeding habitat, foraging behavior, feeding efficiency and related metabolism, regional habitat characteristics, currently used warm-water refuge sites (both artificial and natural), regional distribution based on seasonal movement patterns, historical ranges, and threats to manatee habitat associated with human activities. The habitat report is entitled, "Manatee Habitat and Human-related Threats to Sea grass in Florida: a Review," and is available upon request from the BPSM.

During this year, the contract with the St. Johns Water Management District, which partially funds a characterization of the submerged aquatic vegetation (SAV) resources of the Lower St. Johns River Basin and provides preliminary information concerning the effect of dock construction on these resources, was completed. This effort allowed the mapping of manatee habitat resources within the system and completed GIS maps have been produced. These maps provided necessary information for ongoing development of boat speed zones and buffers within the St. Johns River.

Habitat staff amended a report concerning the permanent closure of some South Florida water control structures as a means of reducing manatee mortality attributable to the operation of such devices. Staff developed a draft criteria assessment approach that may be used as a component of the process addressing such closures.

Aquaculture leases issued by the department as they pertain to threats to sea grass communities were reviewed. The coordination of Conservation and Recreational Lands (CARL) and Florida Communities Trust (FCT) project review for related manatee habitat value has continued in the habitat section also. In order to

facilitate the CARL project review process, a criteria matrix ranking system based on pertinent manatee habitat value (*i.e.*, feeding areas, accessible water depths, use patterns, etc.) was updated and again used for the 1996 CARL proposed projects. This section also continued to foster cooperative efforts with the NMFS, the USFWS, the department, counties, water management districts, the National Estuary Program, and academic authorities in the fields of aquatic habitat research and management to facilitate a workshop and/or the development of an interagency working group concerning the protection of manatee habitats.

Marine Resources Geographical Information System (Tallahassee)

The Tallahassee GIS statistics and graphics section uses ArcInfo, ArcView, SAS, AutoCAD, several graphics packages, and a 35 mm slide maker to meet the needs of BPSM. Updated GIS data were received from the FMRI for use in rule-making, protection planning, permitting, and public information activities of BPSM. Arc/Info was upgraded to version 7.04. Eight gigabytes of drive space and a larger capacity tape backup were added to the Sun Sparc for GIS storage and manipulation. A new high resolution ink jet plotter was purchased to replace the old electrostatic plotter. The new plotter provides better images while costing substantially less to run. ArcView was updated to version 3.0 and is now used by all sections for BPSM. All staff members now have access to GIS data and ArcView. All GIS data are stored in triplicate on the Sparc Station, GIS PC, and Network server. This provides universal access to the data and insures data cannot be lost. The Tallahassee GIS section distributed 297 GIS maps, 238 AutoCAD maps, 53 SAS prints, and 153 digital data sets, 63 graphic prints, and 137 35 mm slides. Assistance was provided to other GIS or graphic groups in the department's law enforcement, marine resources, recreation, and environmental protection divisions.

Public Information and Education

During 1996, the education and information (E&I) section focused on completing several manatee education projects funded by the Florida Advisory Council on Environmental Education. New posters, boater guides, mini-posters, and activity sheets were developed. Several brochures and the *Miss Her Now* posters were updated and reprinted. The E&I section also sent out 1,180 information packets (or boxes) to various individuals, teachers, or environmental educators. This year, all of the manatee, right whale, and marine turtle information available in the bureau was entered onto the Internet for worldwide access (<http://www.dep.state.fl.us/psm/>).

The outreach movement was implemented this year. Instead of waiting for individuals to contact staff about attending events, the E&I staff targeted areas of the state where additional information needed to be distributed or contacts needed to be made. Two trips were taken to southwest Florida (Charlotte, Sarasota, and Lee counties), one trip to Citrus County (other staff also distributes information to this county), one trip to southeast Florida to visit new manatee facilities and one trip to central Florida in the Blue Springs area. Personal contacts were made at environmental education facilities, libraries, chambers of commerce, visitor centers, and at public marinas. E&I staff participated in four manatee festivals held in the following cities: St. Marks, Blue Springs, Homosassa Springs, and Fort Myers. Staff will continue to target various areas of the state to distribute educational materials.

The manatee decal program continued in 1996. The winning counties for the Voluntary Contribution Campaign in June were Sarasota County at first place, Manatee County at second place, Okaloosa County at third place, and Flagler County at fourth place.

The Manatee Technical Advisory Council (MTAC) held four meetings this year at various places around the state. The *MTAC Update* continues to be a popular publication and has a wider distribution than in previous years. E&I is responsible for coordinating these meetings, taking minutes, and developing the newsletter.

RIGHT WHALES

In addition to the manatee, the FDEP has responsibility for other endangered marine mammals, including the North Atlantic right whale, the most endangered great whale in the world. The NMFS has lead responsibility for recovery of the right whale and in December 1991 published a recovery plan for the right whale. The Georgia and northeast Florida coastal waters are the only known calving area for this whale and were designated as critical habitat by the NMFS on June 3, 1994. Accordingly, aerial surveys were conducted to monitor the seasonal presence of right whales and to determine the number of calves. During the 1995/1996 winter season 21 mother calf pairs and 48 other individuals were documented. Five whale mortalities were documented during the winter season, and the FMRI staff assisted in the confirmation, recovery, and necropsy on four cases. Individual whales were identified, and movements were tracked based on a scar catalogue. Permit applications which may affect the right whale and/or its habitats were reviewed by staff, and specific conditions were recommended to minimize adverse effects. The FMRI staff participates on a southeastern U.S. multi-agency task team to implement recovery plan tasks and to minimize ship collisions with right whales for example, by assisting in educational seminars for harbor pilots and the port community. The FMRI staff also participated in the right whale take reduction team in an effort to develop strategies to reduce right whale commercial fishing interaction.

MARINE TURTLES

Staff continues to work for the protection of threatened and endangered marine turtles and their critical nesting beaches along Florida's coast. The FDEP is the lead or a cooperating agency for the implementation of approximately 91 tasks identified in the USFWS and NMFS recovery plans for the five species of marine turtles that occur in Florida. Staff participates in development of the scientific information necessary to guide recovery efforts (research), in review of ongoing and proposed human activities that could impact marine turtles and their nesting habitat (management), and in public education about marine turtles. Marine turtle program staff is integral to the implementation of the federal recovery plans for marine turtles, including program planning, management, and administration.

Research

Marine turtle program staff coordinate the Florida portion of the STSSN, an 18-state program coordinated at the federal level by the NMFS. The stranding network provides necropsy data collected by trained volunteers to the NMFS and the FMFC. During 1996, approximately 1,257 strandings were reported through this program. More than 37 marine turtles were rehabilitated and released to the wild between January and July 1996. These included an endangered Hawksbill turtle, an endangered Kemps Ridley turtle, and 18 endangered green turtles.

Staff at the FMRI is involved in biological/ecological research and assessment of marine turtle population numbers. These studies include: 1) the distribution, abundance, life histories, ecology, and migrations of marine turtles in Florida and contiguous western Atlantic and Caribbean waters; 2) the population status and trends of loggerhead, green, and leatherback turtle nesting populations in Florida; 3) incidence of marine turtle mortalities and assessment of

mortality factors; 4) identification of genetic stocks of marine turtles that use Florida's nesting beaches and foraging habitats; 5) development of reliable sex-determination techniques for marine turtles; 6) the nesting ecology of loggerhead turtles; 7) the effects of artificial lights on marine turtles; and 8) the dispersal behavior and pelagic ecology of marine turtle hatchlings on Florida's east coast.

In addition, staff reviewed research proposals submitted by marine turtle permit holders. Such studies include the impact of renourished sediments on marine turtle nesting behavior and hatchling development and behavior, orientation patterns in endangered leatherback turtles, and hatchling feeding behavior.

Management

The Marine Turtle Program administers issuance of Florida Administrative Code Chapter 62R-1 permits. This chapter includes specific guidelines for authorization of marine turtle research, conservation, and educational activities. Approximately 176 permits were issued in 1996. Oversight of this program includes numerous meetings with permit holders in the field to provide training and technical advice. Through this program, marine turtle nesting activity was monitored on more than 1,000 kilometers of beaches statewide. During 1995/1996, management program staff instituted amendments to Chapter 62R-1, FAC. A series of workshops was held to discuss the proposed amendments.

Staff participated in the development of the Gulf County Beach Driving Plan. This important public/private partnership included county officials, private property owners, local residents, and FDEP staff from the Bureau of Coastal and Aquatic Managed Systems, the Bureau of Protected Species Management, and the Bureau of Beaches and Coastal Systems. The plan developed should minimize impacts to marine turtle nesting behavior and habitat through

restrictions on driving at night or during high tides during the nesting season while allowing public access to the beach for local residents.

Staff provides technical expertise on marine turtle protection during review of coastal permits handled by the Bureau of Beaches and Coastal Systems to ensure the provisions of Florida Statute 370.12 and Chapter 161 are met. All activities in coastal areas must be conducted such that there is no adverse impact to marine turtles, their nesting habitat, or hatchlings. Staff provides written comments or draft conditions for issuance of coastal permits to ensure no adverse impacts to marine turtles during project implementation, and during compliance inspections. Review of all proposed construction or excavation activity seaward of the Coastal Construction Control Line (CCOL) for potential impacts to marine turtles involves large numbers of permit applications. Field evaluations of proposed activities and inspections of permitted activities are often necessary.

Staff members were active participants in the ongoing department streamlining of permitting for certain activities pursuant to Chapter 161, F.S. and Chapter 62B-33, FAC. Activity-based permit processing procedures were developed to ensure marine turtle protection during implementation of routine beach construction activities, including beach cleaning, sand fencing, dune fill, dune planting, special events, and beach lighting. Development of these procedures and guidelines should minimize the requirement for separate review of CCCL applications by Bureau of Protected Species Management and Bureau of Beaches and Coastal Systems staff. However, any activity with the potential to "take" a marine turtle pursuant to s. 370.12(1)(f), F.S., must be reviewed by marine turtle management program staff.

Staff also participated in all emergency shoreline response activities, such as rebuilding after Hurricane Opal or other severe storms that produced coastal erosion, and provided review

and comment on fisheries management plans, federal documents including Environmental Impact Statements, and other regional plans that could impact marine turtles, their nesting beaches, and hatchlings. Coordination of research and management activities was also accomplished through the continued participation of the FDEP staff on local, state, federal, and international conservation panels, recovery teams, and specialist groups.

Education

Educational activities for marine turtle conservation included distribution of brochures, informational booklets, responses to numerous requests for information from interested parties, attendance and participation in coastal-related conferences and forums, providing slide shows

and lectures to groups, and general promotion of the program and its fund-raising activities. Marine turtle program staff has developed five, colorful marine turtle decals and a poster that depicts the marine turtle species that occur in Florida and their marine habitat. Proceeds from the sale of these marine turtle decals, primarily associated with boat registrations, remain the primary source of dedicated funding for the education program.

The BPSM has an educational opportunity through a "web" page located at <http://www.dep.state.fl.us/psm/index.html>. This excellent educational tool affords interested public from around the world an opportunity to learn about marine turtles in Florida and to order marine turtle decals and posters.

BUREAU OF COASTAL AND AQUATIC MANAGED AREAS

APALACHICOLA NATIONAL ESTUARINE RESEARCH RESERVE

Educational Activities

During 1996, education staff conducted lectures, presentations, field trips, tours, and workshops for 4,978 people. An additional 3,871 walk-in visitors were serviced at the Apalachicola National Estuarine Research Reserve's (ANERR) visitor center. Staff participated in a Boy Scout jamboree, the Carrabelle Waterfront Festival, judging science fairs, the Florida Seafood Festival, the Franklin County Arts Festival, career days, and Archaeology Day at the reserve. A guest lecture series was continued monthly, along with the quarterly coastal management workshops for environmental professionals. A newsletter was distributed to a mailing list of approximately 500. Staff also managed a grant from the Northwest Florida Water Management District that supplied funding for group field trips to the reserve. Additional funding was obtained to conduct teacher training

Program development activities this year included new lesson plans for the educational treasure chests, a new touch box activity series for younger students, and a new outreach program which takes activities into local elementary classrooms. Also, staff created a bird observation window and completed preliminary plans for a boardwalk/interpretive trail. Temporary staff was hired to complete renovations on the Marshall House field station, and a traveling exhibit from the Florida Museum of Natural History was obtained during the month of October.

RESEARCH

The research section at ANERR promotes research within the reserve utilizing a variety of methods. First, the research program provides the setting and basic equipment to attract and assist researchers to the area. Second, the reserve tries to direct outside researchers to priority research topics that need to be addressed to answer important coastal management issues. Third, the program has developed in-house, management

oriented research projects to solve issues of local, state, and national concern. Finally, the reserve coordinates activities and reviews of proposed projects with outside agencies including federal, state, and local. The reserve has also worked with other reserves and the NOAA to develop and implement the Graduate Research Fellowship Program and promoted its implementation with area institutions.

Throughout the past two years, the reserve has assisted numerous outside researchers conducting projects related to Apalachicola Bay. These researchers have represented the following institutions and agencies: FSU, Georgia Southwestern University, USF, University of Florida, Auburn University, State University of New York, Florida Geologic Survey, U. S. EPA, Northwest Florida Water Management District, NMFS, FMRI, U.S. Coast Guard (USCG), USFWS, Florida Health and Rehabilitative Services, and Florida Division of Forestry. The studies associated with researchers represent a wide range of scientific disciplines: nutrient transport; primary production; marsh ecology; flood events; sedimentation; trace metal concentrations; archaeology; fishery biology (spotted seatrout, redfish, mullet, and sturgeon); vegetation surveys; ctenophores; red tide blooms; and avian ecology (common loons).

Research staff is also highly involved in dredge and fill permit review, oil spill planning, local land development regulation review, large-scale development reviews, and any other local, state, or federal program that may have an impact on resources within the Apalachicola River and Bay Drainage Basin. Research staff coordinate many of their reviews and activities with NOAA, EPA, NMFS, USFWS, USCG, and COE on the federal level. Coordination on the state level includes the Northwest Florida Water Management District, the FDEP, the Florida Department of Community Affairs, the Florida Department of Transportation, the Florida Game and Fresh Water Fish Commission, the Apalachee Regional Planning Council, the Florida Division

of Forestry, the Florida Coastal Management Program, the Florida Health and Rehabilitative Services, and Florida Sea Grant. Locally, research staff work with the Franklin County Planning Office, Franklin County Board of County Commissioners, and the City of Apalachicola. Research staff have also been on the local high school's advisory committee as the science representative and as chairman.

Research staff also provide information to local, state, and federal agencies as well as to local citizens, schools, and other organizations. In the last two years, presentations by research staff have been done at the Coastal Zone '95 Conference in Tampa, Annual Symposium on Sea Turtle Biology and Conservation at Hilton Head, and the Gulf of Mexico Symposium in Corpus Christi. Additional presentations have been made regionally to universities, agencies, high schools, and community organizations. Information for science fairs, college courses, public organizations, and local, state, and federal agencies are also provided on a routine basis.

During the last seven years, the Apalachicola Reserve has participated in a state-wide program to protect sea turtle nests, predominantly those of the Atlantic loggerhead (*Caretta caretta*). Reserve staff is currently responsible for monitoring 26 miles of beach. All data are compiled and sent to the FMRI. The reserve is also a member of the STSSN. Predator control activities are also underway on Little St. George Island to reduce predation of nests by raccoons and feral hogs. Staff is currently working with the USFWS to obtain approval to put red wolves (*Canis rufus*) on the island to control raccoons and allow an additional wild storage area for these pups as part of the USFWS's Red Wolf Recovery Project.

Since 1983, the St. George Island Bridge Causeway has been utilized by a large colony of migratory nesting birds consisting of least terns (*Sterna antillarum*), black skimmers (*Rynchops niger*), American oystercatchers (*Haematopus*

*palliatu*s), and gull-billed terns (*Sterna nilotica*) between May and August. This colony, dominated by least terns and black skimmers, represents the largest of its kind in the Florida Panhandle and has shown a significant increase in size each year since 1988. A formal census is taken twice a year by biologists from the reserve and the Florida Game and Fresh Water Fish Commission. Reserve staff along with the Florida Department of Transportation prepare the nesting site by cleaning up trash, putting up signs and fences, and reducing the speed limit through the nesting area. In 1995, the reserve working with the COE designed and constructed a spoil island in the bay. Although the reserve has been successful in attracting the skimmers to this site, attempts to lure the least terns from the causeway site will be strengthened in the future to reduce vehicular mortality. Quarterly surveys on Cape St. George Island have also been conducted to monitor the seasonal abundance of key shorebird species.

Reserve staff has become more involved with marine mammals during the last two years. Since 1990, at least 53 strandings of cetaceans or sirenians have occurred in Apalachicola and its surrounding areas. Reserve staff has responded to 41 of these in cooperation with other FDEP biologists, Florida Marine Patrol, USFWS, Hubbs-Sea World Research Institute, and the NMFS. These strandings were primarily comprising bottlenose dolphins (*Tursiops truncatus*). Morphometric data, stomach, teeth, skin, and toxicology and histology samples are collected whenever possible. Research staff assisted BPSM biologists with the tracking of a radio-tagged West Indian manatee (*Trichechus manatus latirostris*) in the Apalachicola area during 1996. Reserve staff also documented manatee sighting locations in Franklin County, which were called in by other FDEP personnel and the general public. The manatee sighting data gathered in 1995 and 1996 have been extremely useful in providing baseline information pertaining to manatee distribution and abundance within the Apalachicola system.

Research staff are working on a project funded through the Environmental Protection Agency's Near Coastal Waters Program. The project titled "Apalachicola Shoreline Stabilization Demonstration Project" began in October of 1992. This project enables the reserve to demonstrate a better method of stabilizing eroding bay front property without the loss of intertidal habitats. The project demonstrates methods of marsh restoration as well as shoreline protection. Results from this project have been made available to local, state, and federal regulators as well as local developers and citizens.

Research staff have begun monitoring the beaches of Cape St. George Island on a quarterly basis to document the recovery of the sand dunes after Hurricane Opal. The high tide combined with heavy surf destroyed both the primary and secondary dune lines on all of the barrier islands surrounding the bay. Profiling techniques are consistent with the shoreline stabilization project currently being monitored on St. George Island. These stations, along with four bayside profiles, will be utilized by reserve staff in their study of erosion and accretion on the local barrier islands.

Research staff continued monitoring physical parameters on two Apalachicola Bay oyster bars and at a third station in East Bay. Fifty-six months of continuous data have now been collected. One Yellow Springs Instruments (YSI) data logger has now been deployed for 24 months as part of the Research Reserves' National Monitoring Effort. Two more YSI data loggers will be deployed in the near future, one in Nicks Hole and another in a site yet to be determined. This data logger data is presently being utilized by the Northwest Florida Water Management District as they develop a three-dimensional model of Apalachicola Bay, which not only determines the bay's freshwater needs but also the significance of upstream water usage to the system's productivity.

The reserve has begun to track development and potential impacts from local

development on the bay system. Staff has compiled maps and a database of all waterfront development on St. George Island since 1984. This information, which includes septic tanks, seawall, riprap structures, dredge and fill, and house construction will be utilized to help determine causes and effects of water quality changes along the bayside of the island. This database will be expanded to include all of Franklin County in the near future.

East Coast

The estuarine ecosystem comprised of the Guana, Tolomato, and Matanzas Rivers which are actually coastal lagoons rather than rivers were nominated by the governor and cabinet as Florida's third site for a National Estuarine Research Reserve. The reserves previously established are at Apalachicola and Rookery Bay. A contractor was hired to develop the management plan with the input of a twenty-eight-member advisory council comprising representatives of local interest groups and government entities of St. Johns and Flagler counties. The management plan is nearing the first draft stage which is expected in May of 1997. Upon the establishment of the draft, the public input processes of the Florida Administrative Procedures Act and the National Environmental Protection Act will begin. Designation (targeted for late 1997) by the NOAA will follow those processes.

Land acquisition has been active in coastal areas. Areas managed by CAMRA on the east coast now total 3,944 acres at Pumpkin Hill (Duval County); 14,694 acres at St. Sebastian River (Brevard and Duval counties); and 1,713 acres at North Fork of the St. Lucie River (St. Lucie County). These areas are managed as state buffer preserves of which a primary goal is protection of the watershed of significant state waters such as aquatic preserves. CAMRA has focused considerable effort on these sites to develop management plans and establish an on-site management capability.

Aquatic Preserve staff has participated in numerous resource management activities including: seagrass surveys and monitoring in the Indian River Lagoon, evaluation of potential marina siting areas to minimize impact to key habitats, monitoring impacts of mangrove trimming, selection of areas for shellfish culture in the Indian River Lagoon, fishery and avian surveys in the Tomoka Basin, and environment education on coastal resource issues throughout the east coast area.

Florida Keys National Marine Sanctuary

Florida Keys National Marine Sanctuary released its final management plan/environmental impact statement in September after incorporating over 6,500 public comments on the draft plan. An executive summary "Overview" was drafted to make changes and new regulations easy to find and understand. Both Key Largo and Looe Key National Marine Sanctuaries celebrated anniversaries. Key Largo celebrated its 20th with an outdoor party hosted by the Key Largo Chamber of Commerce; Looe Key celebrated 15 years with the "Night at Looe Key" featuring science, history, and keynote speaker Sylvia Earle.

Ongoing education efforts have enjoyed success this year, from the expansion of the volunteer Team OCEAN program into the Looe Key area to a series of education grants awarded to local environmental educators. Outreach continued its public education efforts through *Sounding Line*, the "Waterways" television program, presentations, appearances on radio and TV shows, as well as newspaper columns and press releases. G.P. Schmahl continued in his role as liaison in the Water Quality Protection Program and aided in the oversight and follow-up on eight special studies projects as co-chair of the technical advisory committee. Sanctuary officers issued 569 verbal warnings and 66 written warnings in the Looe Key area. Sanctuary visitation totaled 71,740.

Rookery Bay National Estuarine Research Reserve

The Rookery Bay National Estuarine Research Reserve education staff conducted 170 programs reaching a total of 4,870 people. Programs included workshops on ecotourism, coastal management and marine biology. Staff co-hosted a local television program, "Gulf Coast Eco Update," designed to enhance public awareness of coastal issues. The reserve's water quality monitoring program is now part of a national network of monitored estuarine sites through the National Estuarine Reserve system. Dr. Mike Savarese was hired as the reserve's research staff biologist. Staff completed the third year of research on effects of mosquito control pesticide drift on non-target estuarine species. Land acquisition efforts continued for both Rookery Bay and the Belle Meade watershed, and the reserve was awarded a \$1.3 million USFWS Grant to acquire coastal barrier lands. The reserve completed construction of a new headquarters building with funding from federal, state, and local partners.

Charlotte Harbor/Estero Bay Buffer and Aquatic Preserves

Staff conducted a total of 61 programs reaching 3,974 people and participated in the JASON school project targeting 4,200 students and 35 teachers with information on coastal management and research. Staff initiated a volunteer water quality monitoring project which covered estuarine waters in Lee, Charlotte, and Sarasota counties. Staff has been awarded funds and are conducting exotic plant removal in upland sites and have initiated a \$98,000 hydropattern restoration study.

Tampa Bay

Staff conducted seven technical training programs targeting 146 environmental professionals on topics including aquaculture, artificial reefs, and exotic plant control. Staff prepared the project design and with support from local, state, and federal partners, successfully established a land acquisition project for Terra Ceia encompassing 4,700 acres of hammock, marsh, and mangrove forest.

OFFICE OF FISHERIES MANAGEMENT AND ASSISTANCE SERVICES

The major responsibilities of the Office of Fisheries Management and Assistance Services (OFMAS) are: 1) to serve as the FDEP liaison to the FMFC, 2) the state artificial reef program, 3) to monitor and evaluate the accuracy of the marine fisheries trip ticket 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 recreational and commercial fishing licenses, 6) the administration of lobster trap certificate allocations, 7) the oversight of landings for fisheries managed by quota with closure of the fishing season as quotas are reached, 8) civil penalty assessments for violations of certain

fisheries regulations, 9) aquatic resource education, 10) recreational angler outreach, and 11) to act as technical liaison with local government mosquito control programs.

Staff continued to provide information on fishing license requirements (both commercial and recreational), fishing opportunities and locations, fish identification, and generation and expenditure of revenues generated from the sale of fishing licenses as well as general marine resource issues. Over 30,000 copies of posters aiding in the identification of common snappers, groupers, and jacks were distributed. Staff assisted in the distribution of nearly 400,000 copies of "Fishing Lines, Angler's Guide to Florida's Marine Resources," now in its sixth

printing. The OFMAS printed 425,000 copies of "Fishing Lines Newsletter" during 1996. An additional three volumes are scheduled to be completed during the upcoming year.

Highlights of staff efforts in 1996 include the following:

Angler Outreach: During 1996, the outreach team participated in more than 21 scheduled outreach events including boat shows, *Florida Sportsman* shows, fishing seminars, Earth Day, and the annual tax collectors' conference. An estimated one million people were provided with educational material and marine ecological literature. The outreach staff traveled around the entire state of Florida. Additional activities included participating on several radio shows where audiences were informed of other outreach activities and marine resource issues.

Aquatic Resource Education: During 1996, over 600 Florida teachers completed an EcoVentures workshop. Staff demonstrated and presented the Aquatic Resource Education Program to various fishing clubs and interested parties. Staff continued to expand the marine resources network by interacting with fishing clubs and angling groups from around the state promoting Sportfish Restoration Programs, and maintained close working contacts with the Coastal Conservation Association (CCA), the Florida League of Anglers, and other groups. Staff attended all of the Florida Sportsman Fishing Seminars. A pilot "Kids Fishing Clinic" was held at Fort DeSoto Park on June 8, which provided guidance and direction for development of the new "Kids Fishing Program." Assistance in this endeavor was provided by the CCA, the Atlantic Gamefish Foundation, Florida Fishing & Boating Buddies, and other local marine conservation groups. One additional staff member was added making a total of three full time staff.

Artificial Reefs: During 1996, thirty-two artificial reef construction projects totaling

\$457,000 in saltwater fishing license and Sportfish Restoration funds were completed statewide. These reefs benefited seven Gulf Coast and nine Atlantic Coast counties. Another 24 grants were entered into with cities and counties throughout the state to deploy and monitor artificial reef projects in 1997. The artificial reef assessment dive team completed twenty-nine dive projects during 1996 and were present for eight deployments of new artificial reef materials. The OFMAS has managed three large areas off the Florida Panhandle for the deployment of material by individuals for artificial reefs. Last year, staff supervised the placement of twenty-six loads of materials into these large areas. Staff was also very busy with the production of four new editions of the *Reef Report*, a newsletter intended to get information out to interested parties in Florida involved in artificial reef issues. This newsletter currently is distributed to more than 2,200 individuals. Jon Dodrill was elected chairman of the GSMFC's TCC Artificial Reef Subcommittee. The subcommittee has been busy finalizing a reefs materials guide document as well as initiating the process to revise the National Artificial Reef Plan. The OFMAS is also participating in the Florida Division of Marine Resources Internet web page (located at www.dep.state.fl.us/marine/index.html) with information available on the locations of artificial reefs built with grant funds as well as information on fishing and recreational record catches.

Auditing: The OFMAS Audit Section implemented a civil penalties program for untagged crawfish traps during 1996. Since the inception of the program, 53 assessments have been issued for a total of 1,818 untagged traps resulting in \$12,800 in penalties being collected. The Audit Section also implemented a trap retrieval program as per Florida Statutes. As a result, the department removed over 6,000 crawfish and stone crab traps from state and federal waters during the closed season generating to date approximately \$30,000 in trap retrieval fees to operate the program next year. Audits of wholesale and retail dealers continued with a total

of 10,412,646 pounds of saltwater products being audited. Collection of statistical data is still being enhanced through improved communications with saltwater product dealers, and the fisheries information system trip ticket is being revised. Quota monitoring of managed species continues with closures being issued as required. Communication and enforcement has been greatly improved through regular contact with the Florida Marine Patrol and respective field offices. The audit section currently oversees and supervises the saltwater licensing and permitting sections and assists with administrative oversight of those sections.

Mosquito: Mosquito control liaison staff oversaw the completion of a project that reconnected 1,963 acres of estuarine wetlands in the Merritt Island National Wildlife Refuge.

These impoundments were built in the 1950s and 1960s to allow flooding for the elimination of the moist substrate utilized by salt marsh mosquitoes for laying eggs. This impoundment process of the Indian River Lagoon had an enormous negative impact on the estuarine wetland fish and plant communities. The fish eliminated by this process include the larvae/juveniles of many important fisheries' species such as snook, tarpon, ladyfish, and mullet. Improved seasonal water access to these wetlands had an immediate and significant beneficial impact to a multi-billion dollar recreational and commercial fisheries industry without affecting mosquito control. This brings the total reconnected impounded acres with Marine Resources Grants Program participation to more than 5,600 acres.

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

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

DEPARTMENT OBJECTIVES

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

The agency's regulatory functions, of course, are not to be overlooked. In concert with the ADCNR, the Louisiana Department of Wildlife and Fisheries (LDWF), the GSMFC, and the GMFMC, the MDMR's fisheries management

program is geared toward providing for the continued wise utilization of fisheries resources while at the same time ensuring the health and vitality of the state's valuable renewable marine resources. Working jointly with scientists of the Gulf Coast Research Laboratory (GCRL) in Ocean Springs and the NMFS, department biologists continually monitor shellfish and finfish stocks in state waters and both sport and commercial harvest levels in order to provide the Mississippi Commission on Marine Resources (MCMR) with the best available scientific information on which to base its management decisions. Staff biologists work in cooperation with the U.S. Food and Drug Administration to provide a shellfish management program that is in full compliance with all applicable federal guidelines.

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

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

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

DIRECTORATE

Executive Director's Report

Organization. The department's organizational structure has been based on the legislative mandates assigned to MCMR/MDMR to date as well as findings in a number of PEER and internal department of wildlife and fisheries' reports conducted over the past ten years. Requests for new positions have been made as part of the MDMR FY1996 and FY1997 budget requests. One position was approved in FY1996, and four positions were approved for FY1997 out of the twenty positions requested. The department will continue to have major public image problems due to the nature of its charter. However, additional personnel would permit the department to become more proactive in its operation to address problems before they arise. The basic problem, which is at a critical stage, is an insufficient number of properly trained personnel to operate the MDMR. There are additional organization improvements that can be made only after additional positions are obtained to fill functions that are not staffed and to provide a minimum number of employees for backup or reserve staff.

It is very important that the MCMR/MDMR have marine enforcement added to the organization to be an effective operation. Initial estimates are 30 to 35 enforcement officers with all the required administrative support, equipment, and full funding. The number one complaint received from the public is an insufficient number of marine enforcement officers to counteract illegal activities.

The organization must continue to expand its interaction with the numerous state, federal, and public entities to improve planning and operations. The director will continue to revise the organization as required when new functions are added to the MDMR charter. The organization must be structured to be flexible and responsive to the public, the MCMR, the

legislature and other state and federal agencies. Preliminary reviews of other state's organizations indicate this department has inadequate staffing for the mandates assigned to meet the expanding customer needs of coastal Mississippi.

Personnel and Staffing. In the 1996 legislative session, the MDMR was fortunate in acquiring four new staff positions. Although there were twenty positions originally requested and justified, the four should help bolster the department's capabilities and effectiveness in FY1997. The department is still at a very critical stage in not having adequate numbers of employees to implement the MCMR/MDMR legislative mandates. The new positions are for a personnel officer, data analyst, tidelands program manager, and economist. Recruitment for these new staff vacancies began July 1, and the positions were filled by year's end.

The department succeeded in filling several existing position vacancies. These include two fisheries technician trainees, marine program manager, system analyst III, director of marine fisheries, and two key positions of shellfish program coordinator and legal counsel. In-house staffing changes included the promotion of the director of marine fisheries to the position of deputy director.

Contractual staff is in place to work on several projects. These projects include developing the Non-Point Source Pollution and Derelict Vessel Programs, rewriting the "Guide of Mississippi's Marine Resources," developing the MDMR's Five-Year Strategic Plan and working on a joint state/EPA tax-forfeited wetland evaluation.

A number of staff illnesses have pointed out how deficient the department is in having reserve strength. Some functions stop when key staff members are not present.

Direction and Control. During this period, the Mississippi State Personnel Board

introduced a new personnel performance evaluation system. The department has initiated training and implementation of the new system. Required in all MDMR personnel performance evaluation plans is the following element:

Complies with Department Policies/Procedures. Complies with department policies, plans, procedures and decisions as well as promotes and supports high standards of confidentiality with no incidence or reports of non-support. Examples of behavior that demonstrate non-support include but are not limited to the following; (1) makes intentional non-supportive statements about the Commission or Department's decisions and/or the organization's activities; (2) talks and acts in a manner that is discourteous to the public, public officials, commissioners or department personnel; (3) makes misleading comments or statements or provides misinformation; (4) refuses to assist or is uncooperative with the public and with other department staff members in meeting goals, deadlines or directives; (5) releases department information outside the department without specific authorization.

In addition, a number of department policies have been developed. A listing of the policies includes:

- MDMR aircraft operations
- MDMR safety
- MDMR public interfaces
- Trip reports
- Weekly staff meetings
- Weekly activity reports
- Public request for documents - cost to search/copy
- Access of MDMR files by public
- Open door policy to director
- MDMR program reviews
- Conducting public meetings

- Reception of public calls and visitors
- Parking and building access
- Smoke-free building
- Reporting building security violations
- MDMR identification badges
- Property accountability
- MDMR dress code - office and field
- MDMR contract review
- Request for MDMR information and files policy
- Department protocol on external communications

Quarterly program reviews have been initiated and are very helpful in the department performance evaluation. Coordination of correspondence procedure has been developed but still requires discipline. Performance measures have been selected and placed in the strategic plan.

As part of the MDMR policies, a set of operating principles has been adopted per the list below:

- Promote honesty and integrity
- Strive to serve the public
- Treat all people fairly and justly
- Build strong alliances
- Encourage innovation and creativity
- Develop plans, policies, procedures, and goals
- Define the problem carefully before applying the solution
- Consider all possible sources of data and information
- Consider all options for the solution
- Be good listeners, regardless of our own feelings
- Review, evaluate, and improve all processes
- Be good stewards of our environment and given resources

These principles underpin department policies, procedures, and plans.

Communications. Communications, internal and external, is still one of the most critical functional elements for the department. Internal communications continue to be improved through weekly staff meetings and quarterly program reviews.

Additional equipment has been purchased to improve communications at the MCMR meetings and public hearing events. Audio visual equipment with computer power point software programs has greatly enhanced the staff presentations. There are still more improvements required such as audio (microphone, speakers) and video capabilities.

State-of-the-art computers and software programs have helped general administrative communication within the department. The department has added a scanner and color printing capability but still lacks GIS display capabilities. Plans are underway to develop GIS capability in FY1997/1998.

The MDMR has on its property records several hundred thousand dollars of special video/audio equipment purchased with U.S. NOAA CZM funds. However, the MDMR has no personnel trained to operate the equipment. It is planned to hire public relations employees to operate this equipment as soon as the positions are authorized by the legislature.

Efforts continue to expand news media contacts and use of a home page network system. Recent publication of *The Marine Fisheries Regulation Handbook* has become a very popular item. More of these types of publications are planned, if funding resources become available.

The continuation of weekly staff meetings and quarterly program reviews has done much to bridge the communications gap between departmental divisions. Several key workshops

(blue crab management, oyster summer harvest, limited access, skimmer trawl regulations, boat and water safety ordinances, National Estuarine Research Reserve and others) were held over the past year to enhance communications between the agency and the general public which it serves.

Additionally, a summary of department regulations, *The 1996 Guide to Mississippi's Saltwater Fishing Regulations*, was developed and made available to the public to help foster awareness and compliance of these regulations. A popular fish identification poster was also developed in the past year as well as a brochure describing the artificial fishing reef program.

Numerous visits to the legislature helped to open new channels of communications with key committee members of both the Senate and the House, and a legislative workshop was held at the departmental offices in the fall to familiarize newly elected officials with the department's goals and objectives.

Major communication initiatives for the coming year include the development of a Mississippi Department of Marine Resources world-wide-web home page with the assistance of the EPA Gulf of Mexico Program office at the Stennis Space Flight Center; a monthly or bimonthly departmental newsletter; and the publication of the *1997 Guide to Saltwater Fishing Regulations*.

Mrs. Della McCaughan, original author of *The Mississippi Guide to Marine Resources*, has been contracted to rewrite and publish a new edition of this highly popular work.

Workshops on specific regulatory changes or other resource management issues will continue to be held throughout the year to meet specific needs.

Initiative has been taken to improve the department communications with other state agencies including the GCRL; Mississippi

Department of Environmental Quality; Mississippi Department of Finance and Administration; Mississippi Department of Wildlife, Fisheries and Parks; the Secretary of State; the Attorney General's Office; and the Mississippi Gaming Commission. In addition, efforts have been made to develop joint projects with other federal agencies including the U.S. Navy, NASA, NOAA, U.S. Fish and Wildlife Service, Environmental Protection Agency, and the National Wetlands Program.

Operations. There is a major missing element in the proper operation of the department-management operations. This functional element requires the focus by special skilled operation such as: emergency response; safety; property security; communications; transportation; equipment maintenance; audio/video; computer/software systems; data systems; publications; contracts; equipment operations; building operation; aircraft and boat operations; and new technology applications for the department.

Management operations will free other specialized skills to direct their efforts toward fisheries, coastal management, and seafood plant processing inspections. This operation would be the day-to-day operation of the department. Currently these functions are shared by numerous employees. Operations should address day-to-day activities to keep operation and management functions healthy.

PROGRAMS, PROJECTS, AND STUDIES

There are a number of programs, projects, and studies required to better manage Mississippi's marine resources. Programs on speckled trout, red fish, blue crab, water quality survey, oyster reef evaluation, coastal wetlands remote sensing survey and sensitivity indexing, HAACP application, coastal preserves, boat and water safety, derelict vessel removal, and marine enforcement enhancement techniques are examples of these programs or projects that

require further planning and development.

In the future, the Bonnet Carré Project may become a very large program for the department to manage in cooperation with the state of Louisiana and the U.S. Corps of Engineers. Additional personnel and funding resources will be required to jointly manage this project.

The department continues to work with the GCRL and other state and federal organizations to plan and share resources on joint projects and studies. Programs and projects require much coordination with other state and federal programs and are dependent on new employee positions and funds.

Examples of travel required are as follows:

- Gulf of Mexico Fisheries Management Council - Gulfwide
- Gulf States Marine Fisheries Commission - Gulfwide
- Legislative Liaison - Jackson, Mississippi
- International Shellfish Sanitation Conference - Nationwide
- Minerals Management Service Information Transfer - New Orleans, Louisiana
- GIS Training - Local
- Port of Pascagoula SMA Revisions - Pascagoula, Mississippi
- Coastal States Organization - Galveston, Texas
- East Mississippi Sound - Dauphin Island, Alabama
- U.S. Corps of Engineers Interagency Meeting - Mobile, Alabama
- South Mississippi Environmental and Agricultural Coordination Organization - Local
- Clean Vessel Act Workshop - Atlanta, Georgia
- Boat and Water Safety Course - Local
- Alabama Coastal Zone Management - Escatawpa River Watershed Planning
- Gulf/Caribbean Regional Workshop - Orange Beach, Alabama

- Mississippi Department of Environmental Quality Permit Board - Jackson, Mississippi
- State Wetland Development Workshop - Atlanta, Georgia
- Wetland Conservation Grant Workshop - Americus, Georgia
- Grand Bay Task Force - Mississippi and Alabama
- Mississippi Gaming Commission - Jackson, Mississippi
- Planning Protection Meeting - Jackson, Mississippi
- Tax-Forfeited Wetlands Survey - Local
- The Nature Conservancy - Local and Jackson, Mississippi
- NOAA Environmental Valuation Workshop - New Orleans, Louisiana
- Cobra/FLSA - Jackson, Mississippi
- Mississippi Association of Governmental Purchasing Agents Convention - Greenville, Mississippi
- SPAHRS Meeting - Jackson, Mississippi

PLANNING

The MCMR-approved five-year strategic plan will help further the agency's legislative needs in the coming year by pointing out the magnitude of the work load faced by the staff and the material inadequacy of the agency in several key areas. The MDMR material deficiencies of personnel and funding are a buildup over a number of years. The strategic plan will be the foundation of future programs and resources.

The 15-year tidelands' plan developed in October and November 1995 was most valuable to the presentation made in the 1996 legislature session. All the proposed tidelands' projects approved by the MCMR in December 1995 were approved by the legislature—proof that planning pays. Plans need to begin for FY1998 - FY2003.

A critical development in planning and policy in the coming year will be the proposed special management area plan for Biloxi Bay and other key areas. This effort by the coastal

program will help foster managed economic growth, particularly of the gaming industry, within this critical area while at the same time protect the scenic values and habitat that it has historically provided. Program plans are required for a number of marine fisheries programs for special studies. Special management area plans are under consideration for Biloxi Bay and Bay St. Louis.

A National Estuarine Research Reserve site nomination was coordinated by MDMR. A site nomination packet will be presented to the governor for consideration and submission to the NOAA.

Other plans include the Mississippi Artificial Reef Plan which is funded for FY1996 and FY1997 and is currently in process of development. Another key plan under development is derelict vessel removal. The derelict vessel and artificial reef plans are key planning efforts in process.

New planned initiatives under consideration and development:

- MDMR Internet Homepage
- Casino Policy Development
- Casino Impact Workshop
- East Mississippi Sound Study
- Revision of Marina Siting Guidelines
- Revision/rewrite of the Mississippi Coastal Program
- Dingle-Johnson Water Access Grant
- Low Coast Construction - Coffee Creek - Gulfport
- Revision of Mississippi Coastal Program/Assessment and Strategy
- Revision of the "Guide to Marine Resources of Mississippi"
- Modification of Septic Tank Requirements
- Marine Discovery Series (Book XIII)
- Maritime Seafood and Industry Museum Program
- Scranton Museum Program
- Clean Vessel Act Grant Application

- FY1996 OCRM Grant Application (\$729,000)
- Oyster Reef (Growing Waters Survey)
- MDMR GIS Project
- Five-year MDMR Equipment Plan
- MDMR move to the Bolton Building
- Mitigation Reports

review by department supervisors to be included in future budget plans. These measurement performance elements are included in the strategic planning process.

Again, the most critical element is obtaining adequate personnel and budget for equipment, travel, personnel, and contracts. A copy of the FY1996, FY1997, and FY1998 projections are found below.

BUDGET AND RESOURCES

New performance elements are under

FUNDING SOURCE	FY 94	FY 95	FY 96	FY 97 Proposed	FY 97 Authorized
General	\$ 649,015	\$ 662, 407	\$ 717, 579	\$ 1,822,071	\$ 689,010
Special	\$ 1,526,854	\$ 1, 340, 060	\$ 1,315,534	\$ 2,227,450	\$ 2,299,919
Federal	\$ 1,072,556	\$ 421, 258	\$1,000,198	\$ 1,008,000	\$ 1,008,000
Total w/o Tidelands	\$ 3,248,425	\$ 2,423,725	\$ 3,033,311	\$ 5,057,521	\$ 3,996,929
Tidelands	\$ 433,760	\$ 3,233,943	\$ 3,750,507	\$ 3,200,000	\$ 7,000,000
Total with Tidelands	\$ 3,682,185	\$ 5,657,668	\$ 6,783,818	\$ 8,257,521	\$10,996,929

Human Resources

CATEGORY	FY 94 (BMR)	FY 95 (DMR)	FY 96 (DMR)	FY 97 Proposed	FY 97 Authorized	FY 98 Proposed
Full-Time	59	32	33	53	37	57
Time Limited	0	4	4	4	4	0
Part-Time	2	0	0	0	0	0
Total	61	36	37	57	41	57

*FY1994—includes 28 enforcement positions
 FY1995 - FY1998—without enforcement positions*

At this time, the legislative mandates imposed on the MCMR do not include the resources to perform these jobs, such as no

tidelands manager or coastal preserves manager, boat and water safety manager, an economist, etc. Should marine enforcement be added in FY1998,

added resources will also be required. Staff levels are minimum within the divisions.

New equipment and added contract funds are required to support expanded and new programs. Travel is required by staff for expanded program coordination but no additional travel has been authorized in the recent budgets.

Other budgetary and competitive threats include:

- Increased Marine Enforcement Needs
- Boat and Water Safety Program Implementation
- Potential Coastal Programs Funding Reduction
- Upcoming USFDA/HAACP Implementation
- Potential Loss of Tidelands Funds
- Impending Move to New Office Facility
- Potential Loss of Key Personnel and No Staff Depth
- Potential Loss of Federal Funds
- Potential Litigation

CONCERNS AND CHALLENGES

1. The continual lack of success in obtaining adequate number of personnel and funds to properly operate the department.
2. The continual instability or threat to restructure the MCMR due to political motives.
3. Insufficient numbers of properly trained MDMR personnel to implement the legislative mandates.
4. The poor public image of the MCMR/MDMR depicted by other state organizations, other Gulf States organizations, and the public in general.
5. The low pay scale requirements which make it difficult to attract and hold quality, skilled state employees at the MDMR.

6. The lack of functional employee reserves to conduct proper MDMR operations - no backup for critical functions.
7. Inadequate and poor marine data management systems, *i.e.*, GIS.
8. No cross training of employees to develop future capabilities and employee resources.
9. The potential of losing federal funding support from the U.S. NOAA CZM program.

MAJOR ACCOMPLISHMENTS

Within each functional division of the agency, there were a number of key initiatives and accomplishments made during FY1996. These are as follows:

- MDMR/MCMR Strategic Plan - Draft
- Fifteen-Year Tidelands Program Development and Adoption
- Boat and Water Safety Ordinance Development and Adoption
- Derelict Vessel Identification Survey
- Grand Bay Coastal Preserves Acquisitions (100 acres)
- Hancock County Marsh Coastal Preserves Acquisitions (6,500 acres)
- Completion of EPA Tax-Forfeited Survey
- Continued Coastal Preserve Planning
- Hancock County Mitigation Project
- Secured Land Use Evaluation Grant from EPA
- Continued Wetlands Assistance and Recommendations
- National Estuarine Research Reserve Nomination
- Modified COE/MDMR/MDEQ General Permit
- Photo Interpretation Training
- Tax-Forfeited Parcels Transferred to Coastal Preserves
- Administration of Tidelands Trust Projects
- Completed 672 Coastal Management Permitting and Related Actions
- Spotted Seatrout Regulatory Changes

- Cooperative MDMR/U.S. Navy Oyster Reef Side-Scan Sonar Survey and Mapping
- Continuation of Coast-Wide Creel Survey and Cooperative Fisheries Statistics Programs
- Continuation of Wetlands Permitting and Federal Consistency Program with Undersized Staff
- Participation in Bonnet Carré Spillway Diversion Structure Development
- Development of Fifteen New Low-Profile Nearshore Fishing Reefs
- Publication of 1996 Mississippi Saltwater Fishing Regulations Booklet
- Establishment of World-Wide-Web Access and Staff E-Mail Addresses
- Development of Proposed Gill and Trammel Net Regulations
- Conversion of Seafood Licensing Program from Obsolete Motorola Four-Phase Unix System to PC Platform
- Initiation of Staff Training Program for Personal Computer Skills
- Participation and Attendance at GMFMC and GSMFC Meetings
- Participation and Attendance at the Interstate Shellfish Sanitation Conference
- Participation and Attendance at NOAA's Strategic Assessment Workshop on Shellfish Growing
- Development of Annual Department of Marine Resources Science Fair Award for Excellence in the Marine Sciences
- Determination of Spawning Stock Potential Ratio for Mullet
- Non-Point Source Pollution Program Development
- MDMR Aviation Handbook Developed and Approved
- Seven OCRM Performance Reports Completed
- Eight Marine Pumpout Units Installed
- Prepared \$819,000 OCRM Grant Application
- Prepared \$30,000 Section 308 Grant Application
- Prepared a number of MDMR Program Presentations using higher technology
- Moved to New Facility
- Improved MCMR Meeting Support

RECOMMENDATIONS

1. Place an all out effort on working with the legislature to acquire additional positions and funding.
2. Form additional interagency alliances to share joint marine resource planning and program implementation exercises.
3. Improve the communications mechanism between MCMR members and the MDMR staff members through the MDMR Director.
4. Develop marine program plans.
5. Develop a more robust MDMR Public Relations.
6. Acquire a marine enforcement function for the MCMR/MDMR.
7. Approve higher start step salaries to attract and hold employees.
8. Initiate active management of coastal preserves, including mitigation, restoration and enhancement efforts.

LIAISON OFFICE

During FY1996, the Liaison Office assisted the executive director in formulating resource data needs and research objectives of the department and then facilitated development, conduct, and final reporting of those research projects. In the course of project development, the Office of Liaison identified possible funding sources, oversaw in-house grant proposals, and coordinated with contract grantees. The office also acted as technical monitor to all grants to ensure federal and state terms and conditions were met and work was carried out as contracted. As specified in Mississippi Code Section 49-15-15 (2)(a), all research activities were closely coordinated with the GCRL to utilize their resources to the fullest. In addition, the office

provided scientific liaison between the MDMR and other state and federal agencies including the MDEQ, GSMFC, GMFMC, USFWS, and the NMFS.

Major efforts outside the area of research developments included providing a coastal perspective to the semimonthly meetings of the MDEQ's Permit Board; representing the MDMR in technical negotiations with LDWF and the COE regarding the proposed Bonnet Carré Freshwater Inflow Project; and coordinating with the states of Louisiana, Alabama, and Florida and the GSMFC in an effort to enhance recreational fisheries' data collection.

EMERGENCY RESPONSE OFFICE

During FY1996, the majority of the significant emergencies in the Mississippi Coastal Zone were related to weather events. Six major tropical storms/hurricanes threatened the region during the 1995 hurricane season. Hurricanes Erin (July 30-August 6) and Opal (September 30-October 6) posed direct threats to our coastline. The staff secured the building and equipment as necessary and evacuated the premises on governor-approved administrative leave until the area was declared safe to return. Fortunately, the coast escaped major damage. Most damage was erosional in nature and concentrated on the barrier islands.

Several major algal blooms occurred in the Mississippi Sound and its adjacent waters during the fall. The most persistent bloom occurred between late August and early October. Regular monitoring indicated that *Gonyaulax monilata* (generally a nontoxic algae) was blooming within many areas of the sound and concentrated north of Horn Island. No significant fish kills were associated with this phenomenon nor was it necessary to shut down the oyster industry because of it. The weather associated with Hurricane Opal created conditions that caused the blooms to dissipate.

A major freeze occurred along the coast February 3-5. Temperatures were so low that the near shore waters along front beach and within bays and bayous froze over for a short period of time. Thousands of fish (mainly white mullet) died due to the extremely low temperature. Along coastal canals, local residents were subject to the odor of rotting fish for several days.

In mid-January, a gas pipeline located between the bridges in the Bay of St. Louis was ruptured by an anchor. This caused minimal environmental and navigational problems in the area. The pipeline company readily coordinated with the department to repair the problem.

Over Memorial Day weekend a large number of dead catfish began washing up on our front beaches as well as on the beaches of the other Gulf States. This phenomenon continued for several weeks although it seemed to peak during the holiday weekend. Staff members collected water and fish samples for analysis by the Gulf of Mexico Aquatic Mortality Response Network as well as the GCRL. After many months and through the efforts of researchers from throughout the south, the probable cause of the mysterious fish kill was determined to be a virus attacking the kidneys of the catfish. The exact source of the virus is unknown.

Several barge groundings on or near critical habitats (in particular oysters and seagrass beds) have occurred this past year. The department coordinated with the barge companies to ensure that the least amount of environmental damage would occur during the removal process.

ADMINISTRATIVE DIVISION

The principal objective of this program is to provide the necessary administrative support services for the department. While this program is largely one of providing maintenance services for existing agency activities, there were several developmental activities which will ultimately serve to improve overall agency function.

Support services over the past fiscal year included data-processing and microcomputer support for day-to-day department activities. A new license system was implemented during the fiscal year, along with new computer support for accounts payable activities.

Administrative Services

This project provides general accounting support for the agency to include accounts payable, accounts receivable, revenue support systems, general ledgers, GAAP financial reporting payroll, budget/appropriation assistance, bank reconciliations, cash management, federal grant accounting, SAAS table maintenance, and overall accounting functions.

Our staff is responsible for processing payroll, maintaining time, attendance and leave records, and also coordinating agency support functions of purchasing, property inventory, operational expenses, as well as accounting for licenses and the sales of licenses.

It is the mission of Administrative Services to provide administrative support required by other divisions within the department to meet their goals and objectives.

During the last year we have successfully implemented a new license system, reduced the amount of time taken to process accounts payable paperwork via a new computer system, produced the FY1998 budget request, and maintained inventory control.

MARINE FISHERIES DIVISION

Marine Fisheries Management

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

1. To design and initiate projects for the collection and analysis of data required for

population dynamics estimates, and other fisheries management related projects as may be required.

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

During FY1996 the Saltwater/Marine Fisheries Division drafted changes to ordinances and opening and closing orders; Ordinance 1.007 (regulation of shellfish sold in retail stores operating in conjunction with a processing plant or seafood market.); Ordinance 2.013 (eliminated 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.) Ordinance 4.005 (limited the number of recreational crab traps to six per registered vessel.); Ordinance 5.013 (commercial quota for spotted seatrout and defining degradable gill and trammel nets.); Ordinance 7.021 (updating ordinances to be consistent with federal regulations.)

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

During FY1996 approximately 13,200 cubic yards of concrete rubble were deployed at 11 permitted inshore and offshore reef sites. In addition, more than 4,000 cubic yards of crushed limestone were deployed as reef material on 11 near shore shallow waters sites.

Saltwater fisheries' personnel served on regional management activities of the GSMFC including: the State-Federal Fisheries Management Committee (SFFMC), the Technical Coordinating Committee (TCC), the TCC Data Management Subcommittee, the TCC Artificial Reef Subcommittee, the Mullet Technical Task Force, and the Flounder Technical Task Force. 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 for the Cooperative Fishery Statistics Program, the Sports Fish Resortation Act, and the Interjurisdictional Fisheries Act. Division personnel also responded to various requests from other government agencies and the general public.

Marine Fisheries Statistics

Objectives of this project include:

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

Fisheries landings' 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 landings' data are an important part of the fisheries management process, both as an indicator of potential problem areas and as a gauge of the success of existing fisheries regulations and practices.

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

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

Monitor & Assess Shrimp Populations

Objectives of this program include:

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

Shrimp sampling was conducted throughout the year as required for commercial, recreational, and live bait shrimping. Semi-weekly trawl samples were taken in the

Mississippi Sound in May and June 1996 which indicated legal size would be attained on June 12. Alabama waters opened simultaneously with Mississippi.

Mississippi Sound Creel Survey

The primary objective of this project is to conduct a point access creel survey of sport boat fishermen. Specifically, this project is designed to provide information on relative pressure at public boat launch sites and piers along the Mississippi gulf coast. Data on species composition of the catch, size frequency, distribution of economically and recreationally important finfish, estimates of total fishing pressure, estimates of total catch, and estimates of catch per unit of effort (CPUE) are calculated for high and low use seasons.

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

As sessile filter feeders, oysters 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 are based on the amount of fecal coliform in the water column at the time of sampling. Multiple stations are sampled in each reef area (subarea) 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. This includes reef turn over, oyster relaying, and the planting of culch material.

A total of 326,579 sacks of oysters was harvested during the 1995-1996 season. Mississippi's state oyster harvesting waters are divided geographically into eight areas which are monitored closely and opened and closed accordingly. The following is a listing of the number of days the eight area and subarea reefs were open and closed during the 1995-1996 season:

Area	Number of Days Open	Number of Times Closed
Area I-A	0	Closed
Area I-B	50	2
Area II	186	9
Area II-A	120	10
Area II-B	65	5
Area II-C	141	12
Area III	47	5
Area IV	0	Closed
Area V	0	Closed
Area VI	0	Closed
Area VII	0	Closed
Area VIII	40	5

Interjurisdictional-Monitoring and Assessment of Selected Mississippi Marine Resources

The objective of this program is to monitor and assess adult and large juvenile finfish species comprising fisheries resources in Mississippi's estuarine and marine territorial waters.

In FY1996, the MDMR received federal funds made possible from the Interjurisdictional Fisheries Act of 1986 (P.L. 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 surveys of portunid crabs; continued monitoring of near shore 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 within Mississippi marine water and adjacent Gulf waters.

In FY1996, 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 currently 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 and Pascagoula Rivers of Mississippi

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

The project is funded through monies made available through the MDMR to the GCRL by the Anadromous Fish Act (P.L. 89-304) 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 FY1996 more than 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.

Gulf of Mexico Fishery Management Council

Objectives of this project are:

1. To provide a state representative to serve as a voting member on the Gulf of Mexico Fishery Management Council (GMFMC).
2. To provide technical support to the GMFMC in developing fishery management plans (FMPs), amendments, stock assessments, and technical analyses.

The MDMR provided technical support to the GMFMC in the development of FMPs, amendments, and technical analyses and was represented at meetings and functions relevant to GMFMC matters such as:

- July 1, 1995: Mississippi opened territorial waters to commercial harvest of king mackerel, in accordance with the pelagic fish FMP.
- July 1, 1995: Mississippi opened territorial waters to commercial harvest of large coastal sharks, in accordance with the shark FMP.
- July 18-21, 1995: Mr. E.G. Woods attended the Gulf Council meeting in Key West, Florida.
- September 9, 1995: Mississippi closed territorial waters to commercial harvest of king mackerel, in accordance with the pelagic FMP.
- September 18-21, 1995: Mr. E.G. Woods and Tom VanDevender attended the Gulf Council meeting in Biloxi, Mississippi.
- October 1, 1995: Mississippi closed territorial waters to commercial harvest of large coastal sharks in accordance with the shark FMP.
- October 27-29, 1995: Mr. Tom VanDevender participated in the Fall Shrimp/Groundfish Survey of SEAMAP documenting catches of

juvenile red snappers in shrimp trawls off Mississippi territorial waters.

- November 13-16, 1995: Mr. E.G. Woods attended the Gulf Council meeting in New Orleans, Louisiana.
- December 12, 1995: Mr. Tom VanDevender attended a Gulf Council public hearing in Biloxi, Mississippi, on Amendment 8 to the coastal pelagics FMP.
- January 6, 1996: Mississippi opened territorial waters to commercial harvest of large coastal sharks in accordance with the shark FMP.
- January 22-26, 1996: Mr. E.G. Woods and Mr. Dave Ruple attended the Gulf Council meeting in Brownsville, Texas.
- February 1, 1996: Mississippi opened territorial waters to commercial harvest of red snapper in accordance with the reef fish FMP.
- February 15, 1996: Mr. Tom VanDevender represented Mr. E.G. Woods during a Gulf Council conference call meeting.
- March 11-14, 1996: Mr. E.G. Woods attended the Gulf Council meeting held at Duck Key, Florida.
- April 5, 1996: Mississippi closed territorial waters to commercial harvest of red snapper in accordance with the reef fish FMP.
- May 13-16, 1996: Mr. E.G. Woods attended the Gulf Council meeting in Houston, Texas.
- May 17, 1996: Mississippi closed territorial waters to commercial harvest of large coastal sharks in accordance with the shark FMP.

Routine reviews of Gulf Council correspondence and briefing book materials were conducted during this period. The collection of red snapper otoliths commenced with the

commercial season and will be sent to the NMFS Panama City Laboratory for aging and inclusion in the annual stock assessment.

Assessment of the Red Drum Spawning Population from Estimates of Reproductive Success

Objectives of this project are:

1. To continue monitoring changes in the offshore red drum population that resides in coastal waters between the Mississippi River delta and Mobile Bay (*i.e.*, the spawning stock that produces fish which support the near shore/estuarine Mississippi red drum sport fishery).
2. To continue the time series of spawning biomass estimates which were begun in 1986.
3. To further refine and improve these spawning biomass estimates.
4. To continue tracking the effects of both state and federal management regulations in particular Mississippi's size and bag limits which have been designed to increase escapement of maturing red drum from inshore sportfishing pressure.

The collection of larval red drum samples on offshore spawning grounds provides data on larval abundance and survival which is needed to estimate egg production. Ichthyoplankton samples and various environmental parameters were collected and sorted during two cruises in September 1995 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

Objectives of this project are:

1. To assess and monitor the population of adult/subadult spotted seatrout in Mississippi coastal waters using protocols established in previously completed work.
2. To investigate and delineate the male:female ratio as it occurs in juvenile and subadult spotted seatrout in Mississippi coastal waters.
3. To tag and release spotted seatrout in Mississippi coastal waters in order to acquire information on seasonal movements within coastal Mississippi estuarine systems.
4. To coordinate a series of public workshops to provide for the exchange of information on fishery research and management procedures regarding the spotted seatrout sport fish fishery in Mississippi coastal waters.

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 otoliths were removed for age determination during FY1996. Additional smaller specimens were taken to augment the database for growth estimates and further delineate the male:female ratio at younger ages.

COASTAL ZONE MANAGEMENT/PLANNING AND POLICY

The primary objective of this program is to implement the provisions of the Mississippi Coastal Program (MCP). The MCP is legislatively mandated in Mississippi Code, Section 51-15-6 and was approved by the federal government under provisions of the Coastal Zone Management Act of 1972, as amended. The MCP was adopted as state policy by the Mississippi

Commission on Wildlife Conservation. The MCP, coupled with coastal management responsibilities, carries out the mandates of the amended Marine Litter Act of 1989 as well as mandates of the Clean Vessel Act.

Coastal Zone Management Assistance

Coastal Zone Management Assistance is provided through:

1. Grant development and maintenance of new and existing programs for marine resource management and protection.
2. Advanced and strategic planning
3. Marine projects/programs implementation and evaluation
4. New marine program development
5. Policy development (internal and external) and coordination
6. Technical assistance to other department operations, assistance to other state agencies, cities, and counties or local units of governments such as port authorities, waterfront access studies, etc.
7. Preparation and maintenance of MOU/MOA's with other state and federal agencies.
8. Development of a coastal non point source pollution program in response to national legislation
9. Tracking national legislation pertaining to coastal and marine resources management

The MDMR received federal funds from the Office of Ocean and Coastal Resource Management and the 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 Attorney General's office. Coastal Management staff participated in two coastwide 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 two marine museums to conduct public outreach and public education programs in the coastal area. Public access sites along the coast were constructed and public service announcements were produced.

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.

In addition to both financial and technical support to the local coastal communities, coastal zone management assisted in the "Clean Vessel Act." Funds were passed to local marinas (both coastal and inland) to purchase and install marine pump out facilities that remove sanitary waste from onboard holding tanks on boats and vessels. The Coastal Nonpoint Source Pollution Program was also prepared and received conditional approval from both NOAA and EPA.

TECHNOLOGY APPLICATIONS DIVISION

By statute, the MCMR regulates all shellfish sanitation and processing programs. The MCMR is given the responsibilities to protect, conserve, enhance, and properly develop and utilize coastal/marine resources to the benefit of the citizens of the state. Also, economic impact analyses are required by statute when the MCMR makes certain rule changes.

The Technology Applications Division conducts activities that contribute to meeting the legislatively specified responsibilities described above and that support and complement the mission of the MDMR.

The goals of the division are to assist the processing and distribution activities of the Mississippi seafood industry in providing quality,

wholesome, and safe seafoods to consumers and in creating a high consumer confidence and thus demand for such products; to aid in creating new job opportunities and economic worth in south Mississippi through the application of new technologies, particularly aquaculture technologies; and to conduct economic evaluations of selected coastal/marine resources and activities to aid in making resource management decisions.

Technology Applications/Seafood Quality Program

The objectives of this program are:

1. To provide technical advice to those in the Mississippi shellfish processing industry so

that they can comply with seafood sanitation and health safety regulations.

2. To conduct official inspections of shellfish processing and transporting facilities to determine compliance with state and federal seafood sanitation and health safety regulations.
3. To provide technical advice to the seafood processing industry regarding new technologies and new products that provide added value, economic stability, and new market opportunities for the seafood industry.
4. To provide technical advice to persons interested in aquaculture and active aquaculturists to increase production of aquaculture products and thereby increase job opportunities, to compete against imported seafood, and help fill the shortage of fish supply from the Gulf capture fishery.
5. To collect and analyze economic data, present economic information, and prepare economic impact statements which aid in making coastal/marine resource management decisions.
6. To provide administrative work that supports the activities of the division, commission, and the department.

Seafood processors and transporters were assisted in maintaining a high level of seafood quality and compliances with state and federal seafood sanitation and health safety regulations. Consumers were thus provided maximum opportunities for purchasing safe and wholesome Mississippi seafood which was processed and transported through inspected and certified facilities. The seafood industry was assisted in applying new technologies/procedures to improve the quality of seafood and the economic worth of the industry's seafood products.

Aquaculture and other technical

assistance actions were provided to persons in south Mississippi. Information was provided on specific aquaculture species, the technologies for culturing them (particularly in closed recirculating systems), the economics of their cultured production, and potential market opportunities for cultured aquatic products. Upon request, technical information applicable to several other topics was provided to interested persons. A total of 412 technical assistance actions was provided.

The following are examples of technology applications and assistance actions as provided by the staff of the Technology Applications Division.

- The staff conducted efforts aimed at providing technical assistance each quarter particularly to molluscan shellfish processors to identify noncompliance sanitation problems prior to a later official inspection of the facilities. Therefore, the technical assistance afforded the processor the opportunity to correct noncomplying conditions and have a clean record when the official sanitation inspection occurred and sanitary conditions were recorded for the files for FDA review.
- Several technical information papers were prepared and provided to Mississippi Certified Shellfish Dealers to help them maintain an awareness of new sanitation and seafood safety regulations.
- The staff verbally provided technical advice on numerous occasions to persons in the seafood industry.
- A number of aquaculture technical papers were prepared and provided to persons interested in becoming involved in aquaculture and those already involved in it. Also, a number of persons verbally received aquaculture technical assistance. Some implemented aquaculture business operations. The technical assistance efforts described above included aquaculture information about

tilapia, freshwater red claw lobsters, oysters (including a mobile system for culture and cleansing), saltwater shrimp, bull minnows, red fish, aquaculture parks, and plant and bead biofilter systems to maintain clean water.

- Staff members participated in The Very Special Rodeo.
- Staff served on the Aquaculture Task Force of the Mississippi Department of Agriculture and Commerce regarding regulatory and economic development aspects of aquaculture in Mississippi.
- The Mississippi Department of Agriculture and Commerce was provided advice and assistance on cultivation/marketing permit applications.
- A businessman was provided assistance toward developing the use of irradiation (non-isotope type) for preserving fish in Mississippi.
- Information was reviewed to determine some

quick analytical methods that could be used by seafood processors to determine the quality of a seafood product.

- A table was prepared that shows Mississippi commercial oyster statistics for the 1994-1995 harvest season.
- Staff aided in the development of the MDMR five-year strategic plan.

Shellfish Sanitation and Health Safety Inspections and Certifications.

- Mississippi certified shellfish processing, storage, and distribution facilities were inspected 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 seafood helps to sustain market demand for Mississippi seafood products.
- The seafood facilities permitted and routinely inspected by type were as follows:

Number	Type of Seafood Permitted
30	Shrimp
24	Crab
32	Oyster
1	Scallop
87	Total Number of Permits

These 87 permits represent 123 certified facilities.

that were conducted by the staff of the Technology Applications Division.

The following are examples of seafood sanitation and health safety regulatory activities

- The shellfish sanitation and health safety regulatory activities that were conducted were as follows:
 - 1) Seafood Facility Inspections-167
 - 2) Processing Source Water Samples Collected for testing-56
 - 3) Seafood Sanitation Regulatory Letters-81
 - 4) Total Seafood Sanitation Regulatory Activities-304
- These inspections and associated actions were conducted to determine compliance with the following sanitation and seafood health safety regulations:
 - 1) Mississippi seafood quality regulations
 - 2) Molluscan shellfish sanitation regulations covered under the National Shellfish Sanitation Program
- 3) Seafood species sanitation regulations not covered under the National Shellfish Sanitation Program
 - Conducted quarterly inspections of all certified facilities.
 - Water samples were collected twice and analyzed for sanitary bacteriological quality.
 - Served on the HACCP Committee of the Interstate Shellfish Sanitation Conference.
 - Follow-up letters were mailed to the owners of the certified facilities to remind them of any corrective actions needed to maintain compliance with regulations.
 - Received training in the Seafood Risk Management Workshop sponsored by the National Marine Fisheries Service.
 - Prepared epidemiological information applicable to a food borne illness caused by consumption of Louisiana-harvested oysters.

COASTAL ECOLOGY DIVISION

This program's primary objective is the protection and management of the state's coastal wetlands resources. Secondary objectives include policy development and implementation, habitat enhancement, regulatory guidance, and public education. The following projects and their status reflect the activities of the division.

Wetlands Education and Protection

The MDMR continues efforts to protect coastal wetlands and educate the public about the functions of coastal wetlands. This project's primary objective is the protection and management of the state's coastal wetland resources. Secondary objectives include policy development and implementation, habitat enhancements, regulatory guidance, and public

education.

The Coastal Ecology staff administered the provisions of the Coastal Wetlands Protection Law and the Mississippi Coastal Program, conducted special research projects, and protected 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. Staff participated in a variety of public education efforts, providing specific wetland related information to groups and the general public.

Staff conducted site inspections and environmental assessments, sponsored meetings, and acted on a total of 679 wetland cases in 1996

that included addressing the nearshore impacts brought about by dockside casino gaming and related coastal development. There were several legal challenges to wetland-related MCMR decisions which are still pending.

Tidelands

This project is established to provide new and extra programs of tidelands management. Special funds for this project are disbursed to the department from the Secretary of State's Office for new and extra programs of tidelands management such as conservation, reclamation, preservation, acquisition, education or the enhancement of public access to the public-trust tidelands or public improvement projects as they relate to such lands.

During the year, a 15-year tidelands plan was developed and adopted by the MCMR to help guide future projects. The Mississippi Legislature appropriated funds for this project including approximately 75% to public access type projects and 25% to tideland management related projects.

Coastal Wetlands Restoration

This project serves to acquire critical coastal habitat as part of the coastal preserves program. This program, the "Grand Bay Bioreserve: Planning and Acquisition," is a cooperative effort between the U.S. Fish and Wildlife Service, The Nature Conservancy, and the department. Total funding for the project is \$200,000. The original two-year project has been expanded, and project objectives include the acquisition of approximately 1,000 acres of wetland habitat in eastern Jackson County. These acquisitions will serve to connect state and federal

properties in the area and will allow for coordinated management efforts to be developed. Acquired parcels will be part of the Bangs Lake Coastal Preserve and adjacent to the Grand Bay National Wildlife Refuge. A final parcel was acquired to complete nearly 1,000 acres of acquisition for this project.

Hancock County Marshes

The project will serve to acquire coastal habitat as part of the coastal preserves program in southwest Hancock County. Eventually, the state is to acquire approximately 5,000 acres of habitat in Hancock County. Staff is coordinating efforts to purchase through the Mississippi Nature Conservancy.

This project should be completed by early 1997 and will serve to acquire nearly 6,500 acres of coastal wetland habitat.

EPA Tax Forfeited

The project will help identify critical wetland habitat currently on the state list of tax-forfeited properties. Tax-forfeited parcels were turned over to the state to evaluate their relativity to wetland and habitat functions.

Objectives included hiring staff, sponsoring training workshops, mapping hundreds of parcels, extensive wetland evaluations, transferring certain properties to the state, and removing wetlands parcels from the state tax-forfeited list. The project included extensive coordination with the Secretary of State's office. Recommendations were made on numerous parcels and protected critical coastal wetlands to the Secretary of State.

PUBLIC TIDELANDS TRUST

Mississippi Code Annotated 29-15-9 (Rev.1990) provides for the disbursement of Public Trust Tidelands Funds to the MDMR for

certain activities for new programs for tidelands management. Such programs may include wetlands research, acquisition, conservation, and

the enhancement of public access to the public trust tidelands status report.

A total of over \$3.5 million in tidelands funds was expended for thirteen projects ranging from mapping of submerged grassbeds to pier and

boat ramp repair to low profile reef building. Portions of the tidelands funds were used to match a U.S. Fish and Wildlife service grant for pine savanna acquisition and for a wetlands research project. Projected funding was adopted by the MCMR as follows:

Agency	Authorized Funds
Hancock County Board of Supervisors	\$ 500,000.00
Delisle Boat Launch	\$ 100,000.00
Pass Christian Harbor Repairs	\$ 150,000.00
Long Beach Harbor Repairs	\$ 175,000.00
City of Gulfport Pier Repairs	\$ 500,000.00
City of Biloxi, Port Commission Boat Docking Facility	\$ 500,000.00
City of D'Iberville, Port Commission Boat Docking Facility	\$ 300,000.00
City of Ocean Springs, Port Commission Harbor Repairs	\$ 150,000.00
City of Pascagoula, Port Commission Boat Launch Facility	\$ 150,000.00
City of Moss Point, Boat Docking Facility	\$ 150,000.00
DMR Land Acquisition	\$ 250,000.00
DMR Fishing Reefs	\$ 375,000.00
GCRL Study on All Aquatic Life	\$ 200,000.00
TOTAL	\$ 3,500,000.00

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES

OFFICE OF FISHERIES

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

SHELLFISH PROGRAM

The LDWF Marine Fisheries Division continues 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 closure. Additionally, an extension to the 1995 fall season was granted in all of the inshore waters east of the Mississippi River until the end of January 1996. Breton and Chandeleur Sounds were left open until the end of March 1996 to allow for the harvest of pink shrimp which often occur at that time of the year.

Shrimp Seasons

Offshore. The state's offshore territorial waters remained open throughout 1996.

Inshore. The 1996 spring inshore season opened statewide May 29, 1996. Zone I closed July 22, Zone II closed July 7, and Zone III closed July 15, 1996.

Environmental conditions throughout the coast seemed to indicate the possibility for good brown shrimp production. Department samples, however, revealed that there were very few shrimp in the interior marshes. When the season opened, shrimp production was very poor in both Zones 1 and 3. Good catches were made for the

first few weeks in Zone 2, but quickly fell off and remained low for the remainder of the season. Overall production was poor throughout the state.

Good environmental conditions during the late winter and early spring should have contributed to the good catches. A lack of strong southeast winds during the early spring may have resulted in poor larval transport into the interior marshes. High salinities and warm water temperatures during late April and early May resulted in good survival and rapid growth of those shrimp present, but populations were very low.

Brown shrimp began showing up in samples in the early portion of April about one or two weeks later than 1995. Water temperatures were above 20° centigrade during the latter portion of March. This was about the same time as 1995. The 10 part per thousand line appeared to be pushed well inshore during 1995, primarily due to low Mississippi River discharge. Rainfall was low from January through April and seemed to have little effect on salinities.

The NMFS preliminary landing's data indicated that landings from January through July were about 31.4 million pounds (headless). This was down from the same time in 1995.

The 1996 fall inshore shrimp season opened on August 19 statewide and closed December 16 in all zones. Breton and Chandeleur sounds were extended until April 1, 1996, to hopefully allow for the harvest of pink shrimp which generally show up in those areas sometime between late January through early April.

Department samples showed poor recruitment of white shrimp. Catches at the start of the season were very poor. Catches remained below average into the fall and the passage of cold

fronts provided very few good fishing days throughout the remainder of the season. Overall production of white shrimp was poor throughout most of the state. Sporadic incidences of good seabob catches were reported throughout the fall.

The NMFS preliminary landings' data indicated that shrimp landings during August through November were considerably lower than 1995.

Landings

Preliminary landings' data also indicate total landings of approximately 51 million pounds headless for all shrimp species combined from January-November. This is roughly nine million pounds lower than 1995, which was a slightly above average year.

Task Forces

The LDWF is currently working with the Crab Task Force on the development of legislation for the upcoming 1997 Louisiana Legislative Session. The Shrimp Task Force has not been active during the past year. It is expected that the governor will reactivate the Shrimp Task Force sometime during 1997.

Shrimp Management

Personnel with the Marine Fisheries Division provided technical expertise in a gulf wide review of shrimp mariculture and the shrimp disease outbreak in several south Texas mariculture operations sponsored by the GMFMC. Division personnel also participated in an international shrimp pathogens workshop sponsored by the NMFS. This workshop investigated the potential spread of shrimp pathogens in mariculture operations as well as the potential spread of these diseases from reprocessed shrimp and mariculture operations to the wild populations.

MOLLUSC PROGRAM

Oyster Seasons

The 1995/1996 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 on September 6, 1995. The Bay Junop Oyster Seed Reservation remained closed during the 1995/1996 oyster season.

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 November 1, 1995, and remained open until one-half hour after sunset on April 30, 1996, with the Secretary of the Louisiana Department of Wildlife and Fisheries having the authority to extend the season to compensate for health closure days.

Oyster production for 1995/1996 continued on an above average trend, particularly on the public grounds east of the Mississippi River.

Lease Auction

During the 1995/1996 year, no auction was held. In addition, a moratorium on the taking of oyster lease applications was put into effect in May 1996.

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 1995/1996 with monitoring of production in the restored areas.

Oyster Task Force

The Oyster Task Force was instrumental in establishing an "Oyster Development Fund" to be used for promotion and developmental activities. The funds will be provided for by a \$0.05 charge on each oyster tag. They were also successful in completing a white paper on research needs.

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 coast wide 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 provides 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 6 twine; outer wall - 6" bar, 12" stretched, number 9 twine. Gill net samples are taken semimonthly from April through September and monthly from October through March; trammel net samples are taken monthly from October through March; and seine samples are taken monthly from January through August and semi-monthly from September through December. Hydrological readings (conductivity, salinity, and water temperature) are taken each time a biological sample is taken. Also, estimates of cloud cover, sea state, tide, wind direction and speed are taken each time a biological sample is taken. Samples are taken at specific locations arranged in such a manner so as to cover the beach, mid-marsh, and upper marsh areas of all major bay systems throughout coastal Louisiana. The catch and hydrological information is summarized for each coastal area on a monthly basis to give the resource managers information as to the current condition of the resource. The pertinent life history information for the important species is also used in developing analytical and predictive models.

Spotted Seatrout

Effective September 1, 1995, the Louisiana Wildlife and Fisheries Commission enacted rules following the legislative mandates established by Act 1316, 1995 Regular Legislative Session and the Louisiana Marine Resources Conservation Act of 1995 concerning the commercial harvest of spotted seatrout. These rules established a season to run from sunrise of the third Monday in November of each year until midnight on April 30 of the following year. The rules maintained the commercial quota for spotted seatrout at one million pounds and stated that the season would be closed if the quota was reached before the established ending date.

Harvest with 3½" minimum stretch mesh gill nets (strike nets) is allowed until March 1 or until the quota is filled, whichever comes first. After that time, only commercial rod and reel is allowed for taking spotted seatrout commercially. During the season, no commercial harvest is allowed at night, and strike nets may not be fished on weekends.

The commercial season for the harvest of spotted seatrout in state territorial waters was opened on November 20, 1995 and halted at sunset on April 30, 1996, when the season was statutorily closed. Preliminary estimates indicate that harvest for the 1995-1996 commercial spotted seatrout season was 551,116 pounds.

Recreational harvest of spotted seatrout in 1995, as measured by the Marine Recreational Fishery Statistics Survey, was the maximum for the period since the imposition of the present length and creel limits of 1987. The harvest was estimated as 6,864,535 fish with an average weight of about 1.10 pounds. The average size was near 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 1995, as measured by the Marine Recreational Fishery Statistics Survey, was the maximum 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 4.09 pounds. The mean size was slightly above average for the period since 1988. The magnitude of the recreational harvest was attributed to the large 1990-1993 year classes.

Menhaden

Information from department trawl samples has been used each year to develop a forecast for menhaden production. A comprehensive research project was instituted to

improve department 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 department presented a preliminary 1996 harvest forecast to menhaden industry representatives in November 1995. Anticipated 1996 fishing effort, newly developed juvenile menhaden indices, environmental factors, and other commercial harvest statistics were used as input data.

Projections of 1996 menhaden landings were in the 415,000 to 525,000 metric ton range as both of the 1993 and 1994 year classes were estimated to be above average. Actual 1996 Louisiana landings were 418,600 metric tons.

Two average to below average year classes, 1995 (age one's in 1996) and 1994 (age two's in 1996), were estimated to comprise the 1996 fishery. The projected Louisiana menhaden landings for 1996 were in the range of 450,000 to 540,000 metric tons.

Black Drum

Commercial harvest figures for black drum larger than 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 the fishing year September 1995 through August 1996, preliminary estimates indicated a harvest of 683,509 pounds of 16-27 inch black drum. This compares to an estimated harvest of 2,462,357 pounds in fishing year 1994/1995.

Preliminary estimates of bull drum harvest for fishing year 1995/1996 indicated

41,215 drum larger than 27 inches were harvested. This compares to an estimated harvest of 64,536 in fishing year 1994/1995.

Recreational harvest of black drum in 1995, as measured by the Marine Recreational Fishery Statistics Survey, was above average for the period since the imposition of the present length (16-inch total length) and creel (5/person) limits in 1989. The harvest was estimated as 231,500 fish with an average weight of about 3.38 pounds. The mean size was below average.

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. 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 the NMFS. Landings are self-reported by wholesale/retail dealers licensed to purchase fish in Louisiana. Louisiana also participates in the collection of trip interviews

(TIP). Port samplers obtain interviews in Plaquemines, St. Bernard, Lafourche, Jefferson, and Terrebonne parishes. The information provided by landing statistics and trip interviews have been used by the NMFS, the LDWF, the GSMFC, and the GMFMC to evaluate the status of various species currently under intensive management. The continuing goal of the program is to collect commercial fisheries data necessary to better manage those species of concern.

Sport Fish Restoration Program

In 1995-1996, Louisiana used the marine share of its Sport Fish Restoration Funds in two activities; (1) development of access for fishermen and (2) finfish age and growth research (described under the Research Program).

HABITAT PROGRAM

Department of Energy (DOE)

The department 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 department 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 the 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 department 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. The department, in cooperation with state and federal natural resource trustees, is currently working with the responsible party to formulate assessment plans.

Statewide Hydrographic Monitoring

The department, through interagency agreements with the Louisiana Department of Natural Resources and the U.S. Geological Survey, continued to collect constant records of salinity, water temperature, and tide level from stations located throughout coastal Louisiana. The LDWF provided database management as its contribution to the program. Data were used for managing marine fisheries (shrimp, oysters, and finfish) and for investigating extent and impacts of hypoxia and red tide in Louisiana coastal waters. Data also were provided on request to

other state and federal agencies, as well as university researchers.

Seismic Monitoring

The Seismic Monitoring Program's mission is to protect oysters, fish, shrimp, and wildlife from possible loss or damage due to seismic exploration for oil and gas. Department biologists review all seismic project requests and seismic inspectors monitor seismic activity in the field for the purpose of protecting sensitive or special areas and resources. During fiscal year 1995-1996, a total of approximately 280 projects were evaluated and inspected in the field.

Caernarvon Biological Monitoring

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

The LDWF conducts extensive monitoring activities in the Breton Sound Estuary. It has undertaken a biological monitoring program to accurately measure the success of the diversion project. In 1996, the department began the long-term phase of the post-diversion monitoring program. The overall objective of this program is to assess the long-term effects of diversions on the

fisheries, waterfowl, wildlife and vegetation as well as to determine the success of diversions in meeting project goals while helping to guide future project operations. These studies were designed to gather both fishery dependent and fishery independent data. The long-term program is scheduled to continue for 46 years.

State Coastal Restoration Activities

In 1996, the Marine Fisheries Division continued to work with the state Wetlands and Restoration Task Force and the federal Coastal Wetlands Planning, Protection and Restoration Act Task Force in developing projects and strategies for slowing the rate of coastal wetlands loss in Louisiana.

A biological monitoring plan for the David Pond Freshwater Diversion Project was developed by division personnel and the re-analysis of the Bonnet Carré Freshwater Diversion Project was completed in 1996. Additionally, division personnel assisted in identifying a series of alternatives to the designed Bonnet Carré Project such as using the existing Bonnet Carré Spillway to divert water and supplementing this with other smaller diversions in Bind River and the La Branche wetlands.

Personnel from the Marine Fisheries Division were instrumental in the development of a MOA between the Louisiana Department of Wildlife and Fisheries and Louisiana Department of Natural Resources for mutual cooperation related to coastal restoration activities, particularly in the area of leasing state water bottoms for oyster cultivation. Additionally, Marine Fisheries Division personnel began working on a mitigation procedure for oyster lease holders that may be adversely impacted by coastal restoration projects.

Marine Fisheries Division personnel played an important role in the development of a new mariculture policy for the GMFMC. Division personnel had identified areas where the

Council's existing mariculture policy was inadequate and were successful in convincing the Council that the policy needed to be revised. Division personnel participated in a gulf wide technical panel to rewrite the Council's mariculture policy.

RESEARCH PROGRAM

Lyle S. St. Amant Marine Laboratory

The primary mission of the Lyle S. St. Amant Marine Biological Laboratory is to do the biological investigations needed to manage the marine fisheries. It is the only such facility along the Louisiana coast devoted to the marine fisheries.

There has always been interest by other sections of the department, and by non-department groups, in use of the lab facilities. There are very few facilities along the Louisiana coast which can support the needs of those interested in coastal research or marine educational activities. Most of the biological and hydrological research done in the coastal environment is useful in our management of the marine fisheries. Therefore we have made it a part of our mission to support and provide a base of operations for any research or educational groups wishing to work in the area.

Hook-and-Release Mortality

Phase Two of this study is examining survival in large ("bull") red drum. Since current regulations allow anglers only one red drum larger than 27 inches, many fish of this size are subject to catch-and-release. To date, 64 red drum averaging 41 inches long and 25 pounds have been evaluated for the study. Survival of fish taken with standard hooks was 93%, while 97% of those taken on circle hooks survived. Use of circle hooks prevented 22% of deep "gut" hooking occurrences making this type of hook preferable for catch-and-release fishing for large red drum.

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 the important marine finfish. Otoliths (ear bones) are collected by fishery independent sampling and by sampling from the commercial and recreational fisheries and are examined for

annular rings (indicators of age). Gonads are collected and examined to obtain fecundity indices.

During 1996, otoliths were collected from over 1,000 red drum and 1,500 spotted seatrout. Work began on four new species with the following being collected: 400 black drum, 300 sheepshead, 300 flounder, and 200 mullet.

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: (1) 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; (2) to determine trends in abundance of finfish and shellfish populations affected by environmental conditions and fishing; (3) to determine landings of marine species and associated social and economic characteristics of the fisheries; (4) to restore, manage, and enhance existing fishery populations through stock identification, life history, genetic and reproductive physiology research, establishing appropriate stocking ratios for selected marine organisms in Texas bay, and assessing impacts of stocking on present populations and existing fisheries; and (5) to promote, develop, maintain, monitor, and enhance the artificial reef potential in the marine waters off Texas.

To achieve these objectives, the 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 FY1996 included participation in the development, review, and revision of Gulf of Mexico Fishery Management Council and Gulf States Marine Fisheries Commission 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, a total of 15 technical reports, scientific journal articles, and magazine articles about various aspects of the Texas coastal fishery resources was completed.

Resource and Harvest Monitoring

Monitoring of the relative abundance of adult finfishes in Texas waters is accomplished through using 600 foot 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 1995 and June-July 1996 with the other Gulf States and the NMFS. This effort, the Southeast Area Monitoring and Assessment Program (SEAMAP), was coordinated by the GSMFC. Results of sampling were used to evaluate the closure of gulf waters to shrimping

and determine relative abundance of associated organisms.

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 9,600 fishes was tagged and released. About 6% were returned for rewards. The percent of tags returned was consistent with prior years.

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. In addition to commercial landings, the TPWD collected head boat information and provided it to the NMFS as part of the agreement. 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 were initiated. 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. Studies designed to evaluate stocking of red drum continued with the stocking of "gene-marked" red drum in East Matagorda Bay and chemically marked red drum in lower Laguna Madre and Galveston Bay. To further evaluate stocking, a comparison of red drum populations in the unstocked Cedar Lakes to populations in stocked bays was initiated. Collection of otoliths from red drum and spotted seatrout stocking 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 years old Texas coastal archaeological sites are being 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 appear to be the most favorable at breaking within a reasonable time period.

Bycatch characterization studies for the commercial bay shrimp fishery were conducted during August-December 1995 (Galveston Bay, Matagorda Bay, San Antonio Bay, and Corpus Christi Bay). Information will be used to assess impacts of shrimping on bay marine fish and shellfish populations.

Regulatory Changes

The Texas Legislature did not meet in FY1995. However, the Texas Parks and Wildlife Commission did adopt several recommended rule changes to ensure stability of the resources. Texas marine waters extend offshore for nine nautical miles and are adjacent to the federal waters of the exclusive economic zone (EEZ). Many marine species traverse both state and federal waters and fall under conservation regulations of both the TPWD and the GMFMC. Because of differences between regulatory schedules, there are frequent periods of time when fisheries' rules in state and federal waters are not the same. The recent passage of Texas Senate Bill 733 allows the TPWC to authorize the TPWD Executive Director to accept duties and responsibilities to take action as necessary to modify state coastal fisheries regulations in order to provide consistency with federal regulations in the EEZ. This proposed regulation was published in the Texas Register and adopted by the TPWC in November 1995.

In 1996, TPWD was directed by the TPWC to review all hunting and fishing regulations (sunset process) and delete/consolidate and shorten existing regulations to eliminate duplication and promote user-friendliness of rules. Oyster and shrimp fishery rules were rewritten to restructure and reorganize regulatory provisions in previous proclamations. In addition, the rules, provisions, and criteria for a shrimp license buyback program were established. Within the statewide hunting and fishing regulations, the flounder regulations were changed to provide a 14-inch minimum size limit on all flounder and a bag limit of 10 (possession

20) for the recreational fishery and a bag and possession limit of 60 for the commercial fishery. These proposals were adopted by the TPWC in August 1996.

Fish Stocking

Effort directed toward spawning and rearing marine fish continued. A controlled photoperiod and temperature regime to induce sexual maturity and spawning resulted in over 23.3 million red drum fingerlings, 182 million red drum fry, 1.9 million spotted seatrout fingerlings, 59.3 million spotted seatrout fry, and 1.2 million Atlantic croaker 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. Sea Center Texas is a joint venture between the Texas Parks and Wildlife Department; 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 welcomed its 100,000th visitor in August 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. The hatchery is expected to produce 20 million fingerlings per year 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 accepted the donation of two, four-pile petroleum jackets in High Island A-341 and one, eight-pile partial mechanically cut jacket in High Island A-355. These donations resulted in \$591,850 to the Artificial Reef Fund. The eight-pile jacket in High Island A-355 was cut at 90-ft by abrasive cutters rather than using explosives. This is the second time in the Gulf of Mexico that this new, more environmental friendly removal method has been used. Additionally, eight to ten more concrete anchor sinkers were placed at Basco's Reef off Sabine.

The program continued negotiations with the Texas Department of Transportation on the donation of three, 350-ft sections of the Baytown Tunnel to be placed at the Freeport Liberty Ship

Reef Site off Galveston. Staff also continued planning with the Texas National Guard, the Civil Military Fund Cooperative, and the U.S. Army Tank and Automotive Command to expand the REEF EX (Reef Exercise) into Texas. The National Guard was unable to provide the necessary personnel for this exercise in 1996.

In July 1996, Senator Buster Brown and the Texas Parks and Wildlife Department kicked off the "Discover Texas Artificial Reefs" photo contest. The contest will run until September 1, 1997 and is designed to promote the program and increase public interests in all artificial reefs in Texas.

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 seagrass beds continue to be at risk because of reduced light penetration. About 25% of seagrass 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.

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 comprises 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; 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 the NMFS programs. It provides administrative and technical support to regional fishery management councils 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 Miami and Panama City, Florida; Pascagoula and Stennis Space Center, Mississippi; Beaufort, North Carolina (which includes a laboratory located in Oxford, Maryland); Charleston, South Carolina; 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; environmental assessment and environmental impact statements for management plans and/or international negotiations; and pursues research to answer specific needs in the subject areas of habitat conservation, aquaculture, fishery engineering, marine mammals, endangered species, fishery oceanography, food sciences, and fishery economics.

Significant fisheries' actions in FY1996 include:

FISHERY RESOURCE CONSERVATION AND MANAGEMENT

- Amendment 8 of the Shrimp Fishery FMP of the Gulf of Mexico was implemented. This amendment sets up a regulatory process for

adjusting catch for the royal red shrimp fishery.

- The Gulf of Mexico live rock fishery was closed, effective January 1, 1997, to protect essential fish habitat.
- Amendment 11 of the Reef Fish FMP (Gulf of Mexico) was implemented and proposed various measures to enhance enforcement in and increase economic benefits to the reef fish fishery.
- The prematurely closed red snapper commercial fishery was reopened for a 36-hour period to allow harvest of the remaining 1995 quota.
- Amendment 13 to the Reef Fish FMP was implemented and reestablished commercial red snapper trip limits and endorsement provisions through December 31, 1997.
- Part of a regulatory amendment to the Reef Fish FMP was implemented. The amendment proposed the following red snapper measures: an increase in the total allowable catch (TAC), a 14-inch commercial size limit for red snapper, a split commercial season, and extension of the red snapper resource recovery target date.
- An FMP for the Golden Crab Fishery of the South Atlantic was implemented and proposed a controlled access program and other management measures to conserve and manage that species.
- Amendment 1 to the FMP for the Shrimp Fishery off the South Atlantic States was implemented and proposed to add rock shrimp to the management unit and establish other measures to manage and conserve that species.
- Part of Amendment 12 to the Reef Fish FMP was implemented to propose a 14-inch

commercial size limit for red snapper; a recreational size limit for banded rudderfish and lesser amberjack; a bag limit for banded rudderfish, greater amberjack, and lesser amberjack; and an aggregate bag limit for reef fish species (*i.e.*, in the management unit and fishery) for which there is no other bag limit.

- Secretarial review of Amendment 14 to the Reef Fish FMP was initiated to propose an area prohibition of fish traps, a phase out of fish traps over a ten-year period, a modified procedure for retrieval of fish traps, modified restrictions on transfer of fish trap endorsements and reef fish permits, protection of Nassau grouper, and additional authority to reopen a prematurely closed fishery.
- In 1996, 5,523 multiple species fishing vessel permits and 378 multiple species dealer permits were issued. Total deposits to the U.S. Treasury from permit applications were \$312,525.
- Costs and return survey data of reef fish harvesting activities throughout the Gulf of Mexico and South Atlantic were analyzed. The analyses are being used to address amendments to the Reef Fish and Snapper-Grouper FMPs.
- Results of a cost and return survey for Gulf of Mexico shrimp harvesting were used to analyze the impacts of bycatch reduction devices (BRDs) in the Gulf of Mexico.
- Reviews of RIR/IRFA documents for the Gulf, South Atlantic, and Caribbean Councils were conducted that analyzed economic effects of new rules in coastal migratory pelagic, queen conch, reef fish, snapper-grouper, golden crab, and shrimp FMPs.
- Economic assessments were completed and presented to Council committees for most of the FMPs in force in the Southeast.

- RIR/IRFA were written to assess the economic consequences of a proposed registration system for all Southeast shrimp harvesting firms that are required to utilize turtle excluder devices (TEDs).
- A study of the live market for spiny lobster was completed. Study results indicated that the market is large and that the current size limit of a three-inch carapace is ideal for that market.
- A compilation of data for reef fish/snapper-grouper harvesting activities in south Florida and the Keys was completed. Data will be used to analyze management measures proposed by the Gulf and South Atlantic Councils.
- Planning for a Southeast economic add-on survey to the MRFSS national survey was initiated. Data will be used to determine the value of private boat and head boat recreational fishing in the Southeast.
- In conjunction with the NOAA Sanctuary Program, the Final Regulatory Flexibility Analysis for the Florida Keys Sanctuary was coauthored.
- The Sea Turtle Expert Working Group produced a report which assessed loggerhead and Kemp's Ridley populations and estimated temporary sustainable mortality levels pursuant to the November 1994 Biological Opinion on the shrimp fishery.
- Two emergency rules were implemented following the guidance of the Emergency Response Plan developed pursuant to the November 1994 Biological Opinion on the shrimp fishery.
- Sea turtle and right whale recovery plans were implemented through administration of Section 6 agreements and protected species projects with Georgia and South Carolina. Work continued to develop additional agreements with Florida, U.S. Virgin Islands, and North Carolina.
- An ESA section 10 permit was developed with the state of North Carolina to authorize use of limited tow times in lieu of TEDs in the special "North Carolina algae exemption area."
- Contracts were developed and implemented with state (and private) STSSN coordinators to provide more consistent sea turtle stranding network coverage region-wide to monitor levels of incidental mortalities to sea turtles from shrimp trawling, coastal gill netting, or other causes.

PROTECTED SPECIES MANAGEMENT

- A proposed rule was published to amend the Sea Turtle Conservation Regulations pursuant to the November 1994 Biological Opinion on the shrimp fishery.
- A final rule was drafted which incorporated more than 5,000 comments and results of the 1996 TED testing trials conducted out of Panama City, Florida.
- Economic Assessments and Biological Opinions were produced to support the proposed and draft final rules amending the Sea Turtle Conservation Regulations.
- The NMFS participated on two Take Reduction Teams, the Atlantic Offshore Cetaceans and Atlantic Large Whale Teams, as required by the 1994 amendments to the Marine Mammal Protection Act. Personnel also acted as the NMFS lead on the Large Whale Team, a very high-profile team due to numerous right whale litigation. Assistance was rendered in the development of a third (mid-Atlantic) team.

- Assistance was given in development of national marine mammal stock assessment report guidelines.
- An annual List of Fisheries was developed under MMPA §118 for Southeast Region fisheries based on levels of marine mammal/fishery interactions.
- The 1996 Negligible Impact Determinations was developed with respect to levels of marine mammal/fishery interactions under MMPA §101(a)(5)(E).
- Participation was given on the Southeast Right Whale Recovery Plan Implementation Team to ensure protection of right whales while on their calving grounds in southeastern U.S. waters. Assistance was given to the GDNR in developing a "Partnering Agreement" in lieu of an MOU between states, federal agencies, port authorities, pilots' associations, and other stake holders in furthering protection for the northern right whale on its southeastern calving grounds.
- A MOA was signed with Navy, Coast Guard, and Corps of Engineers to support right whale protection efforts in the Southeast.
- Numerous records were prepared for Discovery Suit (Strahan right whale litigation) and the eventual administrative record.
- The Marine Mammal Authorization Program was administered which provides fishers operating in categories I and II fisheries in the Southeast with authorization to participate in fisheries known to interact with marine mammals.
- The Southeast marine mammal stranding network was administered.
- A Southeast Region Marine Mammal Program Peer Review was conducted.
- Three formal consultations were conducted with the Corps of Engineers on rig removals in state waters of the Gulf of Mexico. Work also continued with the Minerals Management Service on an ongoing formal consultation on offshore rig removals.
- Four formal consultations were conducted with the Corps of Engineers on "emergencies" involving wood debris off of South Carolina and Cape Canaveral dredging.
- A MOU was signed with the Environmental Protection Agency facilitating transfer of discharge permitting authority to the state of Louisiana while retaining protection of endangered and threatened species.
- Formal consultations were conducted on the swordfish drift gill net and longline fisheries.
- TED training activities were conducted in two locations in Brazil. Assistance was provided to the state department in verifying the level of TED use by countries affected by P.L. 101-162, the sea turtle conservation embargo. Venezuela and Trinidad were briefly embargoed, but with assistance from NMFS and additional training efforts, these countries were ultimately certified along with Mexico, Brazil, Guyana, Colombia, Nicaragua, Panama, Costa Rica, Guatemala, Belize, and Honduras.
- A meeting was convened of all state sea turtle stranding coordinators to ensure timely reporting of sea turtle strandings to enable quick response to prevent elevated levels of turtle mortalities.
- Approximately 120 informal Section 7 consultations were conducted.

HABITAT PROTECTION

- The NMFS conducted 239 preapplication consultations for proposed water development

projects. We believe this process to be 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 FY1996, 59 of the 239 preapplication consultations held involved more than 8,516 acres of fishery habitat.

The NMFS reviewed 4,612 individual proposals; *i.e.*, Corps of Engineers and U.S. Coast Guard permit requests to develop in wetlands. Most of these activities (about 65 percent and 6 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 14 percent were of concern because they involved substantial environmental impact. These projects required modification or denial of federal authorization to protect fisheries resources. Over 15 percent of the review opportunities could not be accommodated because of manpower and funding constraints.

Federal water development projects included construction and maintenance of federal navigation channels, beach erosion and hurricane protection, flood control, port expansion and deepening, and other similar actions. The 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, FWS, 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 (FWCA); however, other statutes such as the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and NEPA also apply. These laws encourage our review and input with respect to anticipated impacts and means by which adverse impacts can be avoided and offset. The HCD reviewed 121 federally constructed or sponsored projects during the year.

The NEPA requires preparation of an environmental impact statement (EIS) 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 the views of the NMFS are not adequately considered, NEPA provides for an appeals process that allows the issue to be mediated at higher organizational levels. During FY1996, 88 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. The NMFS conservatively estimates that proposals interacted on this year will preserve, enhance, restore, or create more than 133,000 acres of fisheries habitat.

COOPERATIVE AGREEMENT AND GRANT PROGRAMS

- The NMFS participated in SEAMAP and CSP through cooperative agreements with state and interstate fishery commission constituents.
- The NMFS enhanced the capabilities of managing federal aid programs by providing all applicants formal guidelines and application packages for all non-competitive programs including the Interjurisdictional Fisheries Act, Anadromous Fisheries, SEAMAP, CSP, Fishery Management Councils, Endangered Species, Atlantic Coastal Fisheries Cooperative Management Act, Unallied Management Projects, and Unallied Science Projects.
- The 1995 MARFIN Annual Report was distributed throughout the nation.
- The NMFS initiated the FY1996 Saltonstall-Kennedy competitive grant program solicitation process.
- The NMFS implemented a \$15 million dollar Gulf of Mexico Fisheries Disaster Program with NOAA's Office of Sustainable Development and Intergovernmental Affairs. A \$5 million Gear Compensation Program was completed; a total of 429 applications were received. The remaining \$10 million program was designed to alleviate state-specific, long-term effects of disaster's on the gulf's fishery resources and associated habitat.

- The NMFS conducted the 1995 MARFIN Conference in Tampa, Florida.

TEAMWORK AND COOPERATION

- Appropriate actions were coordinated with the Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils.
- 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.
- Outreach efforts included formal and informal presentations, production of reports and informational materials, and publication of research and management related material for peer and public use. Information requests by private, local, state, and federal entities were answered. The NMFS disseminated habitat information through presentations at scientific and management meetings, journal publications, poster sessions, classroom and organization lectures, and interaction with environmental groups and the media.
- The NMFS continued to maintain and promote good relationships and communications with a broad range of industry groups including, but not limited to: Concerned Fishermen of Florida, Southern Offshore Fisherman's Association, Southeast Fisheries Association, Monroe County Fishermen's Association, Do You Care Coalition, Louisiana Shrimpers Association, Texas Shrimp Association, and Texas Inshore Fisheries Association. These communications are frequent and involve attendance at meetings, telephone calls, small group meetings, and correspondence.

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- The NMFS Southeast Regional homepage (<http://caldera.sero.nmfs.gov/>) was developed and summarizes activities and responsibilities within each division.
 - The NMFS issued numerous news releases, NOAA weather announcements, held workshops, and press conferences to inform the public and fishermen of regulations and requirements for protected species.
 - The National Estuary Program (NEP) 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 Bay and Corpus Christi Bay, 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. The Charlotte Harbor and Mobile Bay NEPs are the newest programs in the Southeast.

- Communicated on a regular basis with southeast fishing industry organizations, the United States trade representative, state fisheries and agriculture agencies, and other entities on the trade issues of importance to the southeast and the United States.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

ANNUAL STATUS REPORT ON FMP RULES¹

First Half

- Final rule for TAC for mackerels and cobia was published.
- Control date for commercial mackerel fishery was published.
- Commercial fisheries for king mackerel were closed.
- Final rule for Coral Amendment 3 was published.
- Final rule for Reef Fish Amendment 8 was published.
- Emergency rule postponing implementation of Reef Fish Amendment 8 was published.
- Final rule for Reef Fish Amendment 11 was published.
- Proposed rule reducing red grouper size limit was published for comment.
- Commercial red snapper fishery reopened in November.
- Final rule for opening the 1996 red snapper fishery was published.

Second Half

- Commercial king mackerel fishery in the western zone was closed.
- Commercial red snapper fishery was closed.
- Emergency rule to postpone implementation of Reef Fish Amendment 8 was extended.
- Final rule for Reef Fish Amendment 13 was published.
- Proposed rule to reduce size limit for commercial red grouper to 18 inches.
- Proposed and final rules for Reef Fish Regulatory Amendment increasing TAC for red snapper and providing for a split season were published.

¹This section no longer includes summaries of rules for FMPs administered by the NMFS.

- Cooperative Texas shrimp closure date was modified.

Fifth Quarter

- Notice of Closure of the wild live rock fishery under the Coral FMP was published.
- Proposed rule for king and Spanish mackerel total allowable catch (TACs), bag limits, and trip limits for 1996/1997 season was published.
- Notice of reduction of king mackerel trip limits to 50 fish was published for eastern zone handline quota.
- Notice of closure of fall commercial red snapper fishery was published.
- Final rule partially implementing Reef Fish Amendment 12 was published.
- Proposed rule for Reef Fish Amendment 14 was published and subsequently corrected.

COUNCIL ACTIONS ON FMPs

Billfish FMP²

During the first, second, third, fourth, and fifth quarter, no action was taken.

Butterfish FMP

The Council has deferred action toward development of a FMP indefinitely with the condition that the NMFS continue to monitor the fishery and periodically advise the Council on changes in harvest and status of stock.

²The Billfish FMP is under the authority of the NMFS. The Council has a consultation role in the development of FMPs, amendments, and rules and may convene SSC, AP, or committees for advice.

Golden Crab FMP

No action was taken during the first and second quarter. During the third quarter, golden crab landings from the gulf were 1.2 million pounds in 1995. The Council reviewed the current status of the fishery in 1996 and determined that most of the major harvesters in 1995 had ceased to participate in the fishery largely because their operations were not fiscally viable. Based on this reduced participation level, the Council deferred any consideration of establishing a FMP and requested that the NMFS continue to monitor the fishery and keep them apprised of landing levels.

In the fourth quarter, the Council deferred any consideration of establishing a FMP and requested that NMFS continue to monitor the fishery and keep them apprised of landing levels. No action was taken during the fifth quarter.

Coral FMP

During the first quarter, Amendment 3 was implemented by the NMFS which established a TAC of live rock for the gulf area. The directed fishery for "wild" live rock was closed as the quota for 1995 was harvested. Some fishermen filed litigation challenging the provisions of Amendment 3. The administrative record for the amendment was prepared and provided to General Counsel.

No action was taken during the second and third quarter. In the fourth quarter, the plaintiff in litigation over provisions of Amendment 3 petitioned the court to include Amendment 2 in the litigation. In the fifth quarter, the plaintiff in litigation over provisions of Amendment 3 withdrew the litigation. The NMFS notified fishermen that harvest of wild "live rock" is permanently prohibited after December 31, 1996.

Mackerel FMP

During the first quarter, the Gulf and South Atlantic Councils reviewed draft Amendment 8 and selected their preferred alternatives. The draft amendment was submitted to the Law Enforcement Advisory Panel (AP), Mackerel AP and SSC for review and comment. Nine public hearings were held in the gulf area on the amendment. The NMFS did not approve the Council's request for an emergency allocation of 200,000 pounds of king mackerel for the western zone. The Council's control date for the commercial and charter vessel fisheries was published effective October 16, 1995.

During the second quarter, the committees and Council, at separate meetings, reviewed AP and SSC recommendations and public hearing comments and took final action on some of the management measures in Draft Amendment 8. Action on other management measures was deferred to an Inter-Council committee meeting with SAFMC in April. The Council will take final action on these issues in May. The Council requested the NMFS change, by emergency rule, the overfishing definition for gulf-group mackerel from 30 percent SPR to 20 percent. The request was based on recommendations of the SPR Strategy Committee and SSC, and the change was needed prior to specifying TAC for these stocks in May.

In the third quarter, the SEFSC completed stock assessments for king and Spanish mackerel and provided assessment information on cobia and dolphin (fish). The Mackerel Stock Assessment Panel (MSAP) met, reviewed this information, and recommended the acceptable biological catch (ABC) range for Spanish mackerel and cobia. They detected data deficiencies in the assessment information and scheduled a subsequent seven-day meeting to correct the data and specify the ABC range for king mackerel. The Socioeconomic Panel (SEP) reviewed stock assessment information and the MSAP report on Spanish mackerel and cobia and

recommended TAC levels based on economic and social criteria. Reviews by the Scientific and Statistical Committee (SSC), Advisory Panel (AP), and Council of the MSAP and SEP reports were deferred to the fourth quarter.

The SAFMC took final action on approval of Mackerel Amendment 8 in April and the Gulf Council in May. Staff revised the document for submission to the NMFS.

During the fourth quarter, the MSAP report for king mackerel was reviewed by the SEP, AP, and SSC, and the Council reviewed their recommendations and set TAC from within the ABC range for the 1996-1997 season. Management measures to constrain recreational and commercial landings of king and Spanish mackerels within the TAC levels were submitted to the NMFS for implementation by regulatory amendment.

Revisions to Mackerel Amendment 8 were completed by staff (including SAFMC) and the amendment was submitted to the NMFS for implementation. Council requested staff begin development of an options paper for Draft Amendment 9 to address some commercial allocation issues. The commercial king mackerel fishery in the western zone was closed when the allocation was reached.

In the fifth quarter, staff began development of an options paper for Draft Amendment 9 to address some commercial allocation issues.

Red Drum FMP

No action was taken during the first quarter. In the second quarter, the committee reviewed the actions that would be necessary to specify a TAC with EEZ allocations, provided the next stock assessment indicated the stock had been restored above the overfishing threshold (20 percent SPR). The committee reviewed the alternatives for completion of the stock

assessment which depended on the data that would be included. The Council requested that assessment be completed by early June for action at the July meeting.

During the third quarter, the SEFSC completed the 1996 stock assessment which was distributed to the Red Drum Stock Assessment Panel (RDSAP), AP, and Council. In the fourth quarter, the Red Drum Stock Assessment Panel (RDSAP) reviewed the stock assessment prepared by SEFSC and results of stock assessments and fishery independent surveys by the states. Because the information indicated that the offshore spawning stock has not been restored to a level above the overfishing threshold (20 percent SPR), the panel set ABC at zero. The SSC reviewed the RDSAP report and accepted the recommendations of the RDSAP. The Council reviewed the NMFS stock assessment, the report of the RDSAP, and recommendations of the SSC, and set TAC for the EEZ at zero. The Council requested the states assist in funding a mark/recapture and age composition study of the offshore spawning stock for use in future stock assessments. They also requested the NMFS provide social, economic, and assessment methodology analyses for the next biennial stock assessment in 1998. No action was taken during the fifth quarter.

Reef Fish FMP

During the first quarter, the NMFS published the final rule implementing Amendment 8 which created an ITQ system for the commercial red snapper fishery. The NMFS and Council scheduled the ITQ Appeals Board. Due to furlough of NMFS personnel for lack of an approved federal budget and Congressional direction on expenditure of funds for implementation of the ITQ system, the NMFS advised the Council to postpone the appeals process. The Council canceled meetings of the Appeals Board.

Amendment 12 which proposes size and bag limits for certain species was submitted to the NMFS for implementation. The Council's request by emergency rule, that the current moratorium and red snapper endorsement system be extended into 1996 with the commercial season to open on February 1, 1996 under the endorsement system with a quota of 1.0 million pounds and the remainder of the commercial quota to be taken under the ITQ system when that opens (about April 1), was approved by the NMFS. The Council's intent was if the ITQ system was not approved or was delayed that the season remain open under the endorsement system until the commercial quota was taken.

Staff prepared an options paper for Draft Amendment 14 which considers alternatives for extending the fish trap endorsement moratorium, prohibition on traps in certain areas, and modification of the framework measure to allow taking of unharvested quota. The NMFS reopened the commercial red snapper fishery on November 1 for unharvested quota of 130,000 pounds. The NMFS SEFSC completed the 1995 stock assessment for red snapper. The Reef Fish Stock Assessment Panel (RFSAP) reviewed the stock assessment and set the ABC range for 1996 at 6.0 to 10.0 million pounds. The Socioeconomic Panel (SEP) reviewed the assessment and RFSAP report and recommended TAC levels of 8.0 million and 10.0 million pounds for 1996 and 1997, respectively. The Red Snapper AP and SSC reviewed the assessment, RFSAP report and SEP report and developed recommendations to the Council. After reviewing all the reports and hearing public testimony, the Council adopted a TAC level of 9.12 million pounds, a bag limit of 5 fish, and size limits of 15 and 14 inches, respectively, for recreational and commercial fishermen. These measures were submitted to the NMFS for implementation by regulatory amendment.

The Council reviewed and approved a draft amendment to resubmit a definition for OY and modification of the framework procedure to

the NMFS, which had been disapproved by the NMFS in Amendment 11. The resubmission document will be revised by the NMFS and Council staff before it is submitted to the NMFS for implementation.

During the second quarter, the Council held five public hearings on Draft Reef Fish Amendment 13, reviewed the public comments and the AP and SSC recommendations, and approved and submitted the amendment to the NMFS for implementation. The amendment extended the red snapper endorsement system through 1997 unless sooner replaced by the red snapper ITQ system (Amendment 8), or if that was prohibited, by an alternative limited access system.

By emergency rule, the NMFS postponed the effectiveness of the final rule for Amendment 8 implementing the red snapper ITQ system for 90 days. This emergency rule also added the remaining amount of the commercial snapper quota (2.06 MP) to the 1.0 MP of the quota granted the industry under the endorsement system effective February 1, 1996.

At the request of the NMFS, the Council withdrew the Regulatory Amendment specifying TAC for the red snapper 1996 season, including the associated commercial quota and size limit and the recreational bag and size limits. The Council prepared an addendum to the regulatory amendment to create a split commercial fishing season with the additional quota to become effective on September 15, 1996. The addendum was submitted to the NMFS for implementation.

At the request of NMFS, the Council held a conference call meeting that included public participation to determine whether an emergency existed that warranted an emergency rule to reduce the commercial red snapper size limit to 14 inches. A declination of an emergency failed by tie vote.

Staff prepared Draft Amendment 14 addressing a license limitation system for reef fish trap endorsement holders and areal prohibitions on use of traps. After holding a public workshop on the trap fishery and after having reviewed the amendment, the Council elected to schedule an additional workshop before approval of the document for public hearings. That workshop will be scheduled in April. Draft Amendment 14 was submitted for review by the Law Enforcement AP, the Reef Fish AP, the Socioeconomic Assessment Panel, and the SSC after revision by staff.

During the third quarter, the Council held a public workshop on fish traps in the Florida "Big Bend" area. The Council approved Draft Reef Fish Amendment 14 and held five public hearings on the amendment which addresses the fish trap fishery. The amendment was reviewed by the Reef Fish AP and SSC.

In the fourth quarter, the Council heard public testimony on Draft Reef Fish Amendment 14 which included alternatives for regulating the fish trap fishery, transfer of reef fish permits, and prohibition of harvests of Nassau grouper. The Council adopted fish trap alternatives that would phase-out the fishery over the next ten years and prevent its geographical expansion beyond Cape San Blas, Florida. Staff completed revisions of the amendment and submitted it to the NMFS for implementation.

Because amendments to the Magnuson Act providing for moratoriums on implementing ITQs had prohibited implementation of the approved rules for Amendment 8, the Council decided to proceed with a license limitation system for the commercial red snapper fishery. Staff was instructed to prepare an options paper for Draft Amendment 15 for such a system. The Council reviewed and revised the alternatives to be included in the options paper. Staff was instructed to submit the revised options paper to the Ad Hoc Red Snapper AP, SEP, and SSC for review and selection of their preferred

alternatives. On completion of those reviews, staff will begin preparing Draft Amendment 15.

In the fifth quarter, staff revised the Options Paper for Reef Fish Amendment 15 which provides alternatives for a license limitation system for the commercial red snapper fishery. The options paper was reviewed by the Scientific and Statistical Committee (SSC), the Socioeconomic Panel (SEP), and by an Ad Hoc Advisory Panel consisting of commercial red snapper fishermen and association representatives. The recommendations of these groups will be presented to the Council for adoption of preferred alternatives in January.

The NMFS Southeast Fishery Science Center (SEFSC) completed stock assessments for red snapper, vermilion snapper, and greater amberjack. The Reef Fish Stock Assessment Panel (RFSAP) was convened to review the assessments and specify allowable biological catch (ABC) ranges. The RFSAP lacked a quorum at their meeting; therefore, Council action on specifying the TACs was deferred from the November 1996 meeting to the January 1997 meeting. The RFSAP was reconvened to review the stock assessments and specify ABC ranges. The SEP reviewed the stock assessment information and the report of the RFSAP. The stock assessment information and the reports of RFSAP and SEP were reviewed by the SSC and Red Snapper Advisory Panel and the Reef Fish Advisory Panel.

Shark FMP³

During the first quarter, the Council representative participated in a limited access workshop. No action was taken during the second quarter. During the third quarter, staff

³The Shark FMP is under the authority of the NMFS. The Council has a consultation role in the development of FMPs, amendments, and rules and may convene SSC, AP, or committees for advice.

participated in developing the stock assessment for large coastal and pelagic sharks. In the fourth quarter, Council representatives participated in the Shark Operations Team meeting to recommend management measures for the fishery. No action was taken during the fifth quarter.

Shrimp FMP

In the first quarter, the NMFS approved and implemented Amendment 8 which redefined overfishing for royal red shrimp and provided a framework measure for reassessing MSY for this stock. Work continued on development of a SEIS for Amendment 9. A social impact assessment (SIA) for the fishery and measures proposed in Draft Amendment 9 were prepared by a contractor.

The Council took action during the second quarter to set the cooperative shrimp closure with the state of Texas at 200-miles for the 1996 season. This action was taken after review of the scientific assessment by the NMFS and recommendations of the Shrimp AP. The AP approved a regulatory amendment for the royal red shrimp fishery which would allow landing levels 30 percent above MSY for two consecutive seasons to collect information for revision of MSY. The amendment will be submitted to the SSC for review before Council action to implement. Council staff continued drafting the SEIS and RIR for Draft Amendment 9 which addresses shrimp trawl bycatch. After completion, the draft document will be submitted to Council, AP, and SSC for review and revision.

In the third quarter, Council representatives met with Mexican, NMFS, and Texas officials to discuss cooperative management of brown shrimp. A preliminary draft of Shrimp Amendment 9/RIR/SEIS/SIA (addressing bycatch) was reviewed by the AP, SSC, SEP, and NMFS to determine the technical changes that should be incorporated into the documents. The SSC reviewed a regulatory amendment that provides a framework procedure

for adjusting MSY for the royal red shrimp fishery. The amendment was approved by the Council and submitted to the NMFS for implementation.

During the fourth quarter, a consultant from LGL Ecological Research Association for the Texas Shrimp Association (TSA) prepared and submitted a report examining the stock assessment methodology and data used by the NMFS in preparing the stock assessment for red snapper. The NMFS assessment indicated the need to reduce shrimp trawl bycatch in order to restore the red snapper stock. This report was reviewed by the Reef Fish Stock Assessment Panel (RFSAP) who concluded the issues raised in the report were unlikely to affect the red snapper assessment outcome; however, the general linear model (GLM) estimates of bycatch warranted further consideration. The SSC reviewed the LGL report, SEFSC comments on the report, and the RFSAP report, and they concluded the NMFS red snapper stock assessment represents the best available scientific information. The Council reviewed all these reports and information and decided to convene a panel of statistical experts to examine the issue related to the GLM model and to simultaneously contract to have the VPA assessment analyses re-run to see what effect, if any, the lower bycatch estimates suggested by the LGL would have.

The Council reviewed Draft Shrimp Amendment 9 and the recommendations by the AP, SSC, SEP, and NMFS for revisions to the amendment at their July meeting. Staff was instructed to revise the document based on those reviews. In September, the Council reviewed the revised amendment/RIR/SEIS, selected their preferred alternatives, and approved the amendment for 14 public hearings scheduled in October.

The Council held 14 public hearings during the fifth quarter on the Draft Shrimp Amendment 9/RIR/SEIS. The amendment was reviewed by the SSC and the Shrimp AP. After

public testimony, the Council approved the amendment for submission to the NMFS for implementation. The amendment will require the installation of bycatch reduction devices (BRDs) in shrimp trawls used in the exclusive economic zone (EEZ) west of Cape San Blas, Florida, to reduce bycatch of juvenile red snapper.

The Council hired a consultant to examine the effect of allegations by LGL Research Associates that general linear model (GLM) estimates by the NMFS of shrimp trawl bycatch of red snapper were overestimated by 14 to 33 percent. The consultant ran the virtual population analysis (VPA) model reducing the annual bycatch estimated for red snapper by 14 and 33 percent for each year class. He concluded that had the allegation of a 33 percent overestimate been correct, the use of BRDs would still be required to restore the red snapper stock. The Council also decided to hire a group of statisticians to assess an allegation by LGL Associates that NMFS was not utilizing the proper transformation of data used in the GLM.

Spiny Lobster FMP

No action was taken during the first quarter. In the second quarter, the Council was notified by the NMFS of its intent to withdraw the Spiny Lobster FMP and let the states regulate the fishery. No action was taken during the third quarter. During the fourth quarter, the Council and SAFMC representatives met by conference call with Mr. Rolland Schmitten, NMFS headquarters, and regional staffs to discuss the issue of the NMFS proposal to withdraw the FMP. During the fifth quarter, Mr. Schmitten repealed the NMFS proposal to withdraw the FMP.

Stone Crab FMP

No action was taken during the first quarter. In the second quarter, the Council objected to the NMFS proposal to withdraw the Stone Crab FMP. The fishery is now predominantly in the EEZ, and there is concern

that the state could not regulate the fishery. No action was taken during the third quarter. Council representatives met with Mr. Rolland Schmitten, NMFS headquarters, and regional staffs by conference call to discuss the issue of the NMFS proposal to withdraw the FMP. The Council instructed staff to convene the Stone Crab AP to determine its position on requesting the state of Florida to proceed with the development of the limited access system for the fishery. In the fifth quarter, Mr. Schmitten repealed the proposal to withdraw the FMP. The Stone Crab AP was convened to determine its position on requesting the state of Florida to proceed with the development of the limited access system for the fishery. The AP concurred that a limited access system was needed but requested data on the fishery to consider the structure of such a system.

Swordfish FMP⁴

During the first quarter, Council representatives participated in the International Committee for the Conservation of Atlantic Tunas (ICCAT) Advisory Panel and a limited access workshop for the fishery. No action was taken during the second and third quarters. In the fourth quarter, a representative of the NMFS Highly Migratory Species (HMS) Division from headquarters advised the Council on actions being taken or proposed for management of this and other HMS fisheries. During the fifth quarter, a representative of the Council participated in the ICCAT Advisory Panel deliberations on management of this stock(s).

⁴The Swordfish FMP is under the regulatory authority of the NMFS. The Council has a consultation role in the development of FMPs, amendments, and rules and may convene SSC, AP, or committees for advice.

Tuna FMP⁵

During the first quarter, a Council representative participated in the ICCAT Advisory Committee. In the second quarter, a Council representative participated in the ICCAT working group on bluefin tuna. No action was taken during the third and fourth quarters. In the fifth quarter, a representative of the Council participated in the ICCAT Advisory Panel deliberations on management of this stock(s).

OTHER ACTIONS

Habitat Protection

During the first quarter, the Council scheduled the joint meeting of the Habitat Protection APs in conjunction with the January 1996 Council meeting to allow Council members to attend this session dealing with environment problems associated with shrimp mariculture. This includes assessment of dangers of infecting native shrimp with pathogens from non-native cultured species.

The Council convened the three Habitat Protection APs during the second quarter to review shrimp mariculture practices and problems in Texas. Based on these recommendations the Council will form an Ad Hoc Committee of experts to develop a mariculture policy for the Council. By letter, the Council will also take the following actions:

- Urge Gulf States not to issue any permit for aquaculture/mariculture operations until the related issues raised by the Habitat APs have been resolved.
- Urge the EPA to expeditiously bring all aquaculture/mariculture operations into

⁵The Tuna FMP is under the authority of the NMFS. The Council has a consultation role in the developing of FMPs, amendments, and rules and may convene SSC, AP, or committees for advice.

compliance with all the Pollution Discharge Elimination System (NPDES) Permit Programs including adequate monitoring and proper enforcement, with primary emphasis on coastal operations.

- Urge the Texas Natural Resource Conservation Commission (TNRCC) to re-evaluate their wastewater discharge standards and surface water quality standards for aquaculture/mariculture operations with special emphasis on TSS, BOD, and nutrient loading and consider the Arroyo Colorado River and the Lower Laguna Madre as one body of receiving water, *i.e.* ecosystem approach.
- Urge the Corps of Engineers to include an analysis of the TSS/BOD/nutrient loading issues from aquaculture/mariculture operations into their Section 216 study process as it relates to the Arroyo Colorado River and Lower Laguna Madre.
- Urge the Texas Department of Health and other agencies involved with regulating landfills (primarily those that receive seafood processing wastes) to evaluate their standards as they relate to viruses and other diseases of marine organisms.
- Urge all state and federal agencies to review, update, and coordinate their siting requirements for aquaculture/mariculture operations, especially those in the coastal areas.
- In keeping with the notions forwarded by the Ad Hoc Communications Committee, provide technical briefings, public comments, recommendations of the Advisory Panel and all resultant Council correspondence on the aquaculture/mariculture issue to the Texas Senate Interim Aquaculture Committee, resource agencies in the Gulf States, the GSMFC, the ASMFC, and all Atlantic Coast Fisheries Management Councils.
- Urge the Texas Parks and Wildlife Department to seek authority for regulation of the culture of aquatic organisms including exotic species, diseases, parasites, viruses, etc.

During the third quarter, the Council appointed an Ad Hoc committee of state and federal officials to review and revise the Council's policy on mariculture facilities that may impact gulf fisheries. In the fourth quarter, the Council adopted and incorporated in its Habitat Protection Policy a policy on addressing mariculture facilities. The Louisiana/Mississippi and Texas Habitat Protection APs were convened to address habitat issues affecting fisheries in these areas. In the fifth quarter, support was given to reauthorization of the Coastal Wetlands Planning, Protection, and Restoration Act by writing to the task force responsible for implementing it with a view of maintaining or improving marine organism productivity and access. Prior to the January 1997 Council meeting, an ad hoc panel will convene to review the NMFS draft habitat guidelines for implementing the new Magnuson-Stevens Act requirements and to develop a definitive assessment and suggested comments for Council's review.⁶ The Florida/Alabama Habitat Protection AP was convened to review issues affecting that region.

Data Collection

No action was taken during the first and second period. During the third and fourth quarters, the Council selected a panel of economic experts to participate with a SAFMC panel in developing an economic questionnaire that will be used in interviewing fishermen intercepted under MRFSS. In the fifth quarter, a panel of economic experts participated with a SAFMC panel in developing an economic questionnaire that will be used in interviewing fishermen intercepted under MRFSS.

OTHER MEETINGS

Council members and/or staff participated in the following meetings:

First Quarter

MARFIN Conference
ICCAT Advisory Committee
Shrimp Effort Workshop
Operations Plans Meeting
Hypoxia Conference
SAFMC Meeting
Shark and Swordfish workshop

Second Quarter

Wreckfish Stock Assessment Panel
Louisiana Shrimp Association
SAFMC Meeting
GSMFC Cooperative Statistics Committee
GSMFC RecFin Committee
ICCAT Working Groups
GSMFC Data Collection Committee

Third Quarter

American Shrimp Processors Meeting
SAFMC (two meetings)
NMFS Internet Users Conference
NOAA Constituency Conference
Shark Stock Assessment
Shrimp Pathogens Workshop

Fourth Quarter

Council Chairmen's Meeting
Administrative Officer's Meeting
SAFMC meeting
Council Chairman Meeting with Mr. Schmitten
ICCAT Advisory Board Public Hearing
RecFin Workshop
NMFS/Council FMP Operations Plans Meeting
Council Member Orientation Meeting

Fifth Quarter

MRFSS Economic Workshop
ICCAT Advisory Committee (2 meetings)
SAFMC meeting
MARFIN Board
GSA Recycling Training Workshop
Exotic Species Task Force

⁶ Meeting subsequently canceled.

STATUS OF PLAN DEVELOPMENT
October 1, 1996 through December 31, 1996

Fishery Management Unit	Completed Implementation as of December 31, 1996	Target Date	Remarks
*Billfish Plan ^{2,4}		1988	
Coastal Herring	Final profile completed.	None	No further action.
Coral ³	Amendments 1, 2 and 3 implemented.	1984	
Groundfish	Draft completed, FMP development suspended.	None	
Mackerel ^{1,2,3}	Amendments 1 through 7 implemented.	1983	Amendment 8 submitted for implementation. Amendment 9 being developed.
Reef Fish ^{2,3}	Amendments 1 through 13 implemented. Amendments 8 and 10 withdrawn.	1984	Amendment 14 submitted for implementation. Amendment 15 under development.
Red Drum ^{1,2,3}	Amendments 1, 2, and 3 implemented.	1986	
*Shark		1993	
Shrimp	Amendments 1 through 8 implemented.	1981	Amendment 9 being completed.
Spiny Lobster ^{1,2,3}	Amendments 1 through 4 implemented.	1982	
Stone Crab ^{1,2,3}	Amendments 1 through 5 implemented.	1979	
*Swordfish ^{2,3}		1986	
*Tuna		?	

¹Monitoring report completed.

²Operations plan completed or under development.

³Overfishing procedure approved.

*Secretarial FMP affecting gulf. The Council has a consultation role and may convene SSC, AP, or committees for advice on regulatory measures.

U.S. FISH AND WILDLIFE SERVICE

ANADROMOUS FISHERIES

Gulf Coast Fisheries Coordinator Doug Frugé served as chairman of the GSMFC Anadromous Fisheries Subcommittee during 1996 and participated in the GSMFC spring and fall meetings.

Apalachicola-Chattahoochee-Flint River Striped Bass Restoration

The Panama City Fisheries Resource office (FRO) continued serving as the FWS lead office in efforts to restore striped bass to the Apalachicola-Chattahoochee-Flint (ACF) rivers system. This included coordination of the ACF Striped Bass Restoration Committee. The annual *Morone* Workshop was held February 8-9 in Chattahoochee, Florida, and a committee meeting was held on August 27.

Striped Bass Fry/Fingerling Production and Stocking

The FWS contracted with Dr. Isaac Wirgin of New York University Medical Center for genetic screening of striped bass broodfish used in producing gulf race striped bass fry in spring 1996.

Personnel of the FWS assisted state agencies in Florida, Georgia, and Louisiana with broodstock collection and transportation for striped bass fry production. Mammoth Springs and Welaka National Fish Hatcheries (NFH) produced and stocked or shipped over 6,000,000 gulf race striped bass fry for fingerling production. Approximately 546,800 Phase I and 59,400 Phase II gulf race striped bass fingerlings were produced by Edenton (North Carolina), Inks Dam (Texas), Natchitoches (Louisiana), Private John Allen (Mississippi), Warm Springs (Georgia), and Welaka (Florida) NFHs and stocked in various Gulf of Mexico streams and reservoirs as part of the gulf-wide restoration

effort. The Panama city FRO conducted studies to evaluate survival of stocked fish.

Other Striped Bass Activities

The final report for the Sabine River (Louisiana-Texas) striped bass radiotelemetry study conducted by the Baton Rouge FRO during April 1992-April 1994 was completed on September 5 and distributed in October.

A new memorandum of understanding with the LDWF was signed during 1996 regarding restoration of striped bass, paddlefish, sturgeon, and other federal trust fish species in which the FWS may have an interest.

On April 9, Doug Frugé and GSMFC Assistant Director Ron Lukens met with U.S. Geological Survey personnel in Pearl, Mississippi, regarding a proposal to conduct a temperature survey of the Pascagoula River system in Mississippi. The study would help locate potential anadromous fish thermal refuge habitat in the river. Such habitat is important in restoration efforts for both striped bass and gulf sturgeon. A proposal to conduct the study was developed and submitted on April 10 to the FWS as an ecosystem proposal.

Doug Frugé met on May 17 in Atlanta, Georgia, with the FWS Regional Director, other regional personnel, and Ron Lukens regarding restoration of striped bass in Gulf of Mexico rivers.

During the last week of May, a proposal for a project addressing gulf striped bass restoration in several Gulf of Mexico rivers was jointly prepared by the Gulf Coast FCO and the Panama City FRO and submitted under the FWS' Fisheries Stewardship Program.

Doug Frugé attended meetings on June 1-3 and November 19 of the Lower

Mississippi River Conservation Committee's (LMRCC) Lower Mississippi River FMP Task Force at the Tara Wildlife Management and Services facility at Eagle Lake, Mississippi, and at Holmes County State Park near Durant, Mississippi. Striped bass are expected to be a major consideration in the FMP. An FMP narrative section on striped bass in the Mississippi River was drafted on November 25 and sent to Dr. Allen Rutherford at Louisiana State University. Dr. Rutherford is developing the section on fish species of concern.

Early planning for a proposed workshop on restoration of anadromous striped bass in Gulf of Mexico rivers, to be funded through the FWS Region 4 Federal Aid Office, was initiated by the FWS and the GSMFC in August.

In August and September, the Gulf Coast FCO consulted with Dr. Jim Williams of the National Biological Service, Southeastern Science Center in Gainesville, Florida, and Dr. George Burgess of the Florida Museum of Natural History at the University of Florida on the question of whether the gulf race of striped bass warrants descriptions as a subspecies.

Gulf Sturgeon Recovery Activities

The final Recovery/Management Plan for the gulf sturgeon was mailed by the Panama City FRO to over 300 agencies, organizations, and other interested parties in January. A meeting among FWS personnel occurred on February 7 in Grand Ridge, Florida, to discuss implementation of the plan.

Dewayne Fox, Ph.D. candidate from North Carolina State University, returned to the Panama City Field Office in February to continue gulf sturgeon investigations in the Choctawhatchee River, Florida. Study objectives were to document habitat preference and identify potential spawning locations. Egg catching

devices were also strategically placed in the river to document spawning locations and habitat requirements.

On March 13, the Gulf Coast FCO was contacted by an interested citizen in Jackson County, Mississippi, regarding the potential illegal take of gulf sturgeon in the lower Pascagoula River. The FWS Law Enforcement Office in Jackson, Mississippi, was notified.

The Baton Rouge FRO provided assistance to the LDWF on March 28-29 and August 22-23 with sampling gulf sturgeon in the Pearl River and Lake Pontchartrain, Louisiana.

Frank Parauka and Lorna Patrick of the Panama City FRO presented papers on gulf sturgeon at the COE's Endangered Species Workshop in Atlanta, Georgia, in April. The purpose of the meeting was to exchange information and develop priorities for the Corps.

The Panama City FRO reviewed and commented on a draft monitoring plan by the Corps of Engineers for gulf sturgeon in association with the West Pearl River Navigation Project in Louisiana in June. A revised biological opinion for the project was developed by the FWS during July 1996. The opinion deals with project effects on the gulf sturgeon, among other species.

Comments from the Panama City FRO, the Warm Springs Regional Fisheries Center, and the Gulf Coast FCO were submitted to the NMFS on July 11 regarding a Saltonstall-Kennedy grant proposal by the University of Florida for a study of the gulf and shortnose sturgeon dietary requirements. On November 2-8, Welaka NFH personnel assisted the Biological Resource Division of the U.S. Geological Survey with gulf sturgeon studies in the Suwannee River.

OTHER COASTAL FISHERIES

The Corpus Christi FRO sampled coastal fish populations on Brazoria, Laguna Atascosa,

and Matagorda Island National Wildlife Refuges (NWRs) and continued a special study of effects on fish of the Salt Lake Weir on Brazoria NWR in Texas.

The Corpus Christi FRO continued range expansion studies on the edible brown mussel (*Perna perna*), a non-indigenous species, in coastal waters of Texas. During 1996, the mussel colonization had extended up the Texas coast as far as the Brazosport area.

Corpus Christi FRO personnel assisted TPWD personnel with fisheries sampling work in Baffin Bay during April.

In October, the Corpus Christi FRO received funding to conduct a study on the interactions of diamondback terrapins and the blue crab fishery in coastal Texas.

HABITAT PROTECTION/ENHANCEMENT

Ecosystem Approach

Doug Frugé presented information on the FWS Ecosystem Approach to the GSMFC TCC at their meeting held on October 16.

Gulf of Mexico Program

Participation by the FWS in the Gulf of Mexico Program (GMP) continued at various levels including the continued stationing of a FWS staff person, Dr. David Smith, at the GMP office at Stennis Space Center, Mississippi.

Doug Frugé participated in workshops of the GMP Data and Information Transfer Committee (DITC) on February 26-28 and October 21-22 in St. Petersburg, Florida, and Corpus Christi, Texas. A letter was sent August 16 to the co-chairs of the GMP issue committees requesting input on what the most important data needs are with respect to their committee's issues. This was an action item

assigned to Doug at the February 26-28 DITC workshop.

Doug Frugé attended a workshop at the GCRL in Ocean Springs, Mississippi, on April 24-25. The workshop was part of a project funded by the GMP to identify species of special concern in the Gulf of Mexico.

Estuarine Conservation Programs

The Lafayette Field Office and Lacassine NWR had discussions with the LDWF during spring regarding establishment of estuarine fish sanctuaries in coastal Louisiana via voluntary agreements with private landowners. The LDWF had requested FWS input because of the experience gained through the FWS' "mini-refuge" program.

Other Habitat Protection Activities

Several FWS personnel attended the Sabine Lake Conference on September 13-14 in Beaumont, Texas. This conference was sponsored by the Texas Water Development Board (TWDB) to discuss resources that may be affected by the TWDB's proposed Trans-Texas Water Project which potentially could involve an inter-basin water transfer from the Sabine River to other rivers farther west with potentially serious impacts to the Sabine Lake ecosystem.

Panama City FRO personnel attended a meeting in August to formulate action groups and discuss strategies for managing the natural resources in the Choctawhatchee Bay and river system in Florida.

Significant involvement by the FWS continued on the Louisiana Coastal Wetlands Task Force charged with implementing provisions of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). Major issues included funding and focus of Mississippi river diversion and barrier island shoreline restoration feasibility studies.

The Panama City ESFO continued work on the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins Comprehensive (Tri-State) Study for water management in those basins. The Panama City FRO manages the Environmental Scope of Work under the study. That office also continued active involvement on the Bay Environmental Study Team for St. Andrew Bay, Florida.

The FWS' ESFO, FRO, FCO and Refuges and Wildlife personnel were involved in various coastal fisheries habitat issues and activities during the year. These included:

- planning and evaluation for a hydrologic restoration project at Bayou Sauvage NWR, Louisiana, Phase I of which was completed during 1996;
- planning and evaluation of the Cameron-Creole Watershed Hydrologic Restoration Project which was initiated in June in Southwest Louisiana;
- work on a coastal landscape modeling effort for the Barataria-Terrebonne National Estuary Program (BTNEP);
- wetlands and navigable water permit application review and comment to regulatory agencies, and associated planning and evaluation with respect to wetland impacts, mitigation, and restoration;
- consultations involving Outer Continental Shelf mineral leasing, Coastal Barrier Resources Act, and the National Pollutant Discharge Elimination System;
- comments to the Cameron Parish Police Jury, Louisiana, expressing opposition to a preliminary proposal for a nine-mile long highway across marshes within and adjacent to the East Cove Unit of Sabine NWR; and
- review and comment to regulatory agencies on proposed marsh management projects.

PUBLIC OUTREACH/EDUCATION

The Panama City Field Office (FO) agreed in January to be a supporting partner with Gulf Coast Community College in Panama City, Florida, for a project entitled, *A Marine Science Seminar—The Ecology of St. Andrew Bay*. Information about hydrographic, chemical, sediment, and biological data, as well as access to maps and aerial photography was provided.

In February, the Panama City FRO made a presentation on striped bass to the Panama City Fly Fishermen and set up an exhibit at the Bay County Science Mini Conference in Panama City, Florida.

The Panama City FRO initiated a new Watchable Wildlife project involving gulf sturgeon in April. Signs describing gulf sturgeon were to be placed at boat ramps and other appropriate locations throughout the gulf sturgeon's range.

Panama City FRO personnel participated in the first "Good Earth Festival" in Panama City, Florida, in celebration of International Earth Day in April. Static displays describing the work of the FWS and the Panama City FO were set up. Also in April, Jennifer Lundin (Panama City FRO) presented a program about anadromous fish to two marine biology classes at Bay High in Panama City, Florida.

On April 20, the Gulf Coast FCO assisted the National Park Service with an Earth Day festival at the Gulf Islands National Seashore Davis Bayou Visitor Center in Ocean Springs, Mississippi.

In May, the Panama City FRO presented information about gulf sturgeon, striped bass, and

other FWS activities to over 200 scouts and their leaders at a Boy Scout event at Apalachicola National Forest, Florida. Also during May, Panama City FRO personnel conducted beach seine demonstrations for approximately 200 Florida elementary and junior high school students. Students were briefed before the events about species they would see and the importance of estuaries and seagrass habitats for the early life stages of these species.

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.

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, 1996

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

GULF STATES MARINE FISHERIES COMMISSION
DECEMBER 31, 1996

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Gerald W. Rigby, C.P.A.

Professional Accounting and Tax Services

Member of

American Institute of Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT

To the Board of Commissioners of
Gulf States Marine Fisheries Commission

I have audited the accompanying statement of financial position of **Gulf States Marine Fisheries Commission** (a not-for-profit organization) as of December 31, 1996, and the related statement of activities and cash flows for the year then ended. These financial statements are the responsibility of **Gulf States Marine Fisheries Commission's** management. My responsibility is to express an opinion on these financial statements based on my audit.

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

In my 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, 1996, and the results of its operations and cash flows for the year then ended in conformity with generally accepted accounting principles.

Gerald W. Rigby, C.P.A.

Waveland, Mississippi
May 19, 1997

GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF FINANCIAL POSITION
DECEMBER 31, 1996

ASSETS

CURRENT ASSETS:

Cash	\$ 263,770
Investments	25,405
Grants Receivable	<u>17,709</u>
	306,884

PROPERTY AND EQUIPMENT

Fixed Assets	148,719
Less Accumulated Depreciation	(72,401)
Less Contra Account	<u>(58,689)</u>
	<u>17,629</u>

TOTAL ASSETS 324,513

LIABILITIES AND NET ASSETS

CURRENT LIABILITIES:

Note Payable	9,133
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TOTAL CURRENT LIABILITIES 9,133

NET ASSETS

Unrestricted	236,973
Temporarily Restricted	<u>78,407</u>

TOTAL NET ASSETS 315,380

TOTAL LIABILITIES AND NET ASSETS \$ 324,513

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

GULF STATES MARINE FISHERIES COMMISSION
 STATEMENT OF ACTIVITIES
 For The Year Ended December 31, 1996

	Un- Restricted	Temporarily Restricted	Permanantly Restricted	Total
<u>REVENUES AND RECLASSIFICATIONS</u>				
Member State Appropriations	\$ 112,500	\$	\$	\$ 112,500
Fees	4,065			4,065
Interest	5,111			5,111
Grants:				
Fishery Management Council		25,000		25,000
Port Samplers		33,184		33,184
DNA		15,000		15,000
Fish & Wildlife		13,050		13,050
Interjurisdictional Fisheries		193,705		193,705
SEAMAP		90,504		90,504
RECFIN		128,605		128,605
Chevron		-0-		-0-
Sportfish Restoration		169,433		169,433
Net Assets released from restrictions:				
Satisfaction of program restrictions	<u>599,782</u>	<u>(599,782)</u>	<u>-0-</u>	<u>790,157</u>
Total Revenues & Reclassifications	721,458	68,699	-0-	790,157
<u>EXPENSES AND LOSSES</u>				
Grant Programs:				
Fishery Management Council	24,233			24,233
Port Samplers	34,512			34,512
DNA	13,320			13,320
Fish & Wildlife	15,857			15,857

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

GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF ACTIVITIES
For The Year Ended December 31, 1996

	Un- Restricted	Temporarily Restricted	Permanantly Restricted	Total
Interjurisdictional Fisheries	\$ 158,511	\$	\$	\$ 158,511
SEAMAP	77,782			77,782
RECFIN	112,513			112,513
Chevron	1,557			1,557
Sportfish Restoration	<u>161,497</u>	<u> </u>	<u> </u>	<u>161,497</u>
Total Grant Programs	599,782			599,782
General & Administrative	101,511			101,511
Loss on Disposal of Assets	<u>3,828</u>	<u> </u>	<u> </u>	<u>3,828</u>
Total Expenses and Losses	\$ 705,121	\$	\$	\$ 705,121
Change in Net Assets	16,334	68,699		85,033
Net Assets as of Beginning Year	201,975	28,372		230,347
Prior Period Adjustment	<u>18,664</u>	<u>(18,664)</u>	<u> </u>	<u> </u>
Net Assets as of End of Year	<u>\$ 236,973</u>	<u>\$ 78,407</u>	<u>\$</u>	<u>\$ 315,380</u>

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

**GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF CASH FLOWS
For The Year Ended December 31, 1996**

CASH FLOWS FROM OPERATING ACTIVITIES:	
Net Increase in Net Assets	\$ 85,033
Adjustments to Reconcile Net Decrease in Net Assets to Net Cash Used By Operating Activities -	
Depreciation	9,618
Loss on Sale	3,828
Changes in Operating Assets and Liabilities -	
Decrease in Grant Receivable	<u>10,015</u>
Net Cash Provided by Operating Activities	108,494
 CASH FLOWS FROM FINANCING ACTIVITIES:	
Principal payments on loan	<u>(8,479)</u>
Net Cash Used by Financing Activities	<u>(8,479)</u>
 Net Increase in Cash	 100,015
Cash at Beginning of Year	<u>189,160</u>
Cash at End of Year	<u>\$ 289,175</u>

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

GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF FUNCTIONAL EXPENSES
For The Year Ended December 31, 1996

	Council Funds	Port Samplers	DNA	Fish and Wildlife	Inter Juris- Dictional	SEAMAP Funds	RECFIN	Chevron	Sportfish Restoration	General and Admin- istrative	Total All Funds
EXPENDITURES											
Salaries	17,328	0	0	8,209	65,091	34,180	42,968	0	60,431	43,289	228,207
Payroll Taxes	1,427	0	0	628	4,878	2,615	3,287	0	4,623	3,312	17,458
Health Insurance	2,726	0	0	1,457	11,715	6,084	7,637	0	10,786	7,649	40,405
Retirement	1,095	0	0	544	4,481	2,274	2,821	0	4,116	2,963	15,331
Office Rent	845	0	0	3,398	3,836	2,016	2,533	0	3,559	2,568	16,187
Equipment Rental	1	0	0	14	190	83	85	0	198	120	571
Office Supplies	29	0	0	137	6,616	1,364	1,176	0	2,378	2,560	11,700
Postage	42	0	0	4	3,418	2,351	1,779	0	611	782	8,205
Travel - Committee	0	0	0	0	37,397	15,207	43,004	0	41,064	7,408	136,672
Telephone	339	0	0	414	2,841	1,847	2,338	0	2,848	2,616	10,627
Copy Expense	39	0	0	620	1,587	1,215	1,630	0	1,376	853	6,467
Printing	4	0	0	9	4,518	4,928	195	1,557	714	561	11,925
Meeting Costs	0	0	0	0	4,694	1,604	896	0	2,060	8,720	9,254
Subscriptions & Dues	0	0	0	0	198	61	61	0	438	910	758
Auto Expense	0	0	0	0	813	91	27	0	30	2,719	961
Maintenance	0	0	0	39	923	232	209	0	591	609	1,994
Professional Services	261	0	0	207	1,300	860	1,076	0	1,532	1,114	5,236
Other Taxes	97	0	0	75	314	172	250	5	302	227	1,210
Contractual	0	34,512	13,320	0	800	0	0	0	22,354	0	70,986
Insurance	0	0	0	102	1,486	598	541	0	1,486	899	4,213
Capital Expenditures	0	0	0	0	1,415	0	0	0	0	0	1,415
Courtesies	0	0	0	0	0	0	0	0	0	981	0
Depreciation	0	0	0	0	0	0	0	0	0	9,618	0
Interest	0	0	0	0	0	0	0	0	0	1,033	0
Loss on Disposal	0	0	0	0	0	0	0	0	0	3,828	0
TOTAL EXPENDITURES	\$ 24,233	\$ 34,512	\$ 13,320	\$ 15,857	\$158,511	\$ 77,782	\$112,513	\$ 1,557	\$161,497	\$105,339	\$599,782

See accompanying Independent Auditor's Report on Additional Statements

SUPPLEMENTARY INFORMATION

GULF STATES MARINE FISHERIES COMMISSION
NOTES TO FINANCIAL STATEMENTS
December 31, 1996

NOTE 1 - ORGANIZATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

(a) **Organization** - 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 appropriate Federal Programs. The Commission may also receive and expend funds from any other sources not "prohibited by law".

(b) **Basis of Accounting** - The financial statements have been prepared on the accrual basis of accounting. Revenues and expenses are recognized when incurred.

(c) **Financial Statement Presentation** - The Commission adopted Statement of Financial Accounting Standards (SFAS) No. 117, "Financial Statements of Not-for-Profit Organizations," Under SFAS No. 117, the Commission 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. The Commission has discontinued its use of fund accounting and, accordingly, has reclassified its financial statements to present the three classes of net assets.

(d) **Grants Receivable** - In accordance with the accrual basis of accounting, revenues are recognized when earned. In the case of grant revenue, amounts are earned when the related expenditures are incurred or when grant funds are received.

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

<u>TYPE OF ASSET</u>	<u>LIFE (years)</u>
Office Equipment and Furniture	5 & 10
Vehicles	5

Depreciation expense recorded for the year ended December 31, 1996, was \$ 9,618.

NOTE 2 - LEASE COMMITMENTS

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

The approximate minimum future annual rental commitments under such lease as of December 31, 1996 are as follows:

1997	\$ 15,720
1998	15,720
1999	15,720
2000	15,720
2001-2002	<u>31,440</u>
TOTAL	\$ 94,320

NOTE 3 - RETIREMENT PLAN

The Commission has a tax sheltered annuity plan for all employees that have been employed for at least six (6) months. The Commission contributes seven (7) percent of each eligible employee's base pay with the amounts being fully vested upon

payment by the Commission. The total expense for the year ended December 31, 1996 was \$18,294.

NOTE 4 - FUNCTIONAL ALLOCATION OF EXPENSES

The cost of providing the various programs and supporting services have been summarized on a functional basis in the statement of activities. Accordingly, certain costs have been allocated among the programs and supporting services benefited.

NOTE 5 - INCOME TAXES

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

NOTE 6 - NOTE PAYABLE

Note Payable, secured, monthly installments of \$792.58, at 5.5%, maturity date December 6, 1997.

NOTE 7 - TEMPORARILY RESTRICTED NET ASSETS

Temporarily restricted net assets are available for the following programs of December 31, 1996:

Fishery Management Council	\$	206
Port Samplers		5,552
DNA		1,680
Interjurisdictional		40,790
SEAMAP		15,276
RECFIN		16,092
Chevron		1,617
Fish & Wildlife		<u>(2,807)</u>
	\$	78,407

Gerald W. Rigby, C.P.A.

Professional Accounting and Tax Services

Member of

American Institute of Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT ON SCHEDULE OF FEDERAL AWARDS

To the Board of Commissioners
Gulf States Marine Fisheries Commission

I have audited the financial statements of **Gulf States Marine Fisheries Commission** (a not-for-profit organization) for the year ended December 31, 1996, and have issued my report thereon dated May 19, 1997. These financial statements are the responsibility of **Gulf States Marine Fisheries Commission's** management. My responsibility is to express an opinion on these financial statements based on my audit.

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

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

Ronald W. Rhyly, C.P.A.

Waveland, Mississippi
May 19, 1997

GULF STATES MARINE FISHERIES COMMISSION
 SCHEDULE OF FEDERAL AWARDS
 For The Year Ended December 31, 1996

<u>Federal Grantor/Program Title</u>	<u>Award #</u>	<u>Federal CFDA Number</u>	<u>Award Amount</u>	<u>Accrued/Deferred Revenue at Jan. 1, 1996</u>	<u>Revenue Recognized</u>	<u>Disbursements/ Expenditures</u>	<u>Accrued Revenue at Dec. 31, 1996</u>
<u>Department of Commerce</u>							
Southeast Area Monitoring and Assessment Program	NA47FS0038	11.300	\$ 189,562	\$ 2,554	\$ 90,504	\$ 77,782	\$ 15,276
Inter Jurisdictional Fisheries Management Plans	NA26FI0026-03	11.300	366,666	5,596	193,705	158,511	40,790
Recreational Fisheries Information Network	NA57FT0457	11.434	192,613	0	128,605	112,513	16,092
Gulf of Mexico Fishery Management Council	95-GS-70600	11.300	25,000	(561)	25,000	24,233	206
<u>Department of Interior</u>							
Sports Fish Restoration Program	14-48-0009-94-1223	15.605	200,000	(7,936)	169,433	161,497	0
DNA	14-16-0004-91-920	15.605	<u>90,504</u>	<u>0</u>	<u>15,000</u>	<u>13,320</u>	<u>1,680</u>
TOTAL			\$1,064,345	\$ (347)	\$ 622,247	\$547,856	\$ 74,044

See accompanying Independent Auditor's Report on Schedule of Federal Awards.

AUDITOR'S REPORTS ON INTERNAL CONTROLS

Gerald W. Rigby, C.P.A.

Professional Accounting and Tax Services

Member of

American Institute of Certified Public Accountants

INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL STRUCTURE USED IN ADMINISTERING FEDERAL AWARDS

To the Board of Commissioners
Gulf States Marine Fisheries Commission

I have audited the financial statements of **Gulf States Marine Fisheries Commission** (a not-for-profit organization) for the year ended December 31, 1996, and have issued my report thereon dated May 19, 1997.

I conducted our audit in accordance with generally accepted auditing standards, Government Auditing Standards, issued by the Comptroller General of the United States, and Office of Management and Budget (OMB) Circular A-133, "Audits of Institutions of Higher Education and Other Non-Profit Institutions." Those standards and OMB Circular A-133 require that I plan and perform the audit to obtain reasonable assurance about whether the misstatement.

In planning and performing my audit of the financial statements of **Gulf States Marine Fisheries Commission** for the year ended December 31, 1996, I considered its internal control structure in order to determine our auditing procedures for the purpose of expressing my opinion on the financial statements of **Gulf States Marine Fisheries Commission** and to report on the internal control structure in accordance with OMB Circular A-133. This report addresses my consideration of internal control structure policies and procedures relevant to compliance with requirements applicable to federal award programs. I have addressed internal control structure policies and procedures relevant to my audit of the financial statements in a separate report dated May 19, 1997,

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

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

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

Cycles of Activity

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

General Requirements

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

Specific Requirements

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

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

During the year ended December 31, 1996, **Gulf States Marine Fisheries Commission** had no major federal award programs and expended 100 percent of its total federal awards under nonmajor federal financial assistance programs. I performed tests of controls, as required by OMB Circular A-133, to evaluate the effectiveness of the design and operation of internal control structure policies and procedures that I considered relevant to preventing or detecting material noncompliance with specific requirements, general requirements, and requirements governing claims for advances and reimbursements and amounts claimed for advances and reimbursements and amounts claimed or used for matching that are applicable to the nonmajor programs. Our procedures were less in scope than would be necessary to render an opinion on these internal control structure policies and procedures. Accordingly, I do not express such as opinion.

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

Ronald W. Rely, C.P.A.

Waveland, Mississippi
May 19, 1997

Gerald W. Rigby, C.P.A.

Professional Accounting and Tax Services

Member of

American Institute of Certified Public Accountants

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

To the Board of Commissioners
Gulf States Marine Fisheries Commission

I have audited the financial statements of **Gulf States Marine Fisheries Commission** (a not-for-profit organization) for the year ended December 31, 1996, and have issued my report thereon dated May 19, 1997.

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

In planning and performing my audit of the financial statements of **Gulf States Marine Fisheries Commission** for the year ended December 31, 1996 I considered its internal control structure in order to determine our auditing procedures for the purpose of expressing an opinion on the financial statements and not to provide assurance on the internal control structure.

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

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

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

Cycles of Activity

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

General Requirement

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

Specific Requirements

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

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

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

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

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

Arnold W. Ryle, C.P.A.

Waveland, Mississippi
May 19, 1997

AUDITOR'S REPORTS ON COMPLIANCE

Gerald W. Rigby, C.P.A.

Professional Accounting and Tax Services

Member of

American Institute of Certified Public Accountants

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

To the Board of Commissioners
Gulf States Marine Fisheries Commission

I have audited the financial statements of **Gulf States Marine Fisheries Commission**, a not-for-profit organization, as of and for the year ended December 31, 1996, and have issued my report thereon dated May 19, 1997.

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

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

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

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

Arnold W. Rely, CPA.

Waveland, Mississippi
May 19, 1997

Gerald W. Rigby, C.P.A.

Professional Accounting and Tax Services

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INDEPENDENT AUDITOR'S REPORT ON COMPLIANCE WITH SPECIFIC REQUIREMENTS APPLICABLE TO NONMAJOR FEDERAL FINANCIAL ASSISTANCE PROGRAM TRANSACTIONS

To the Board of Commissioners
Gulf States Marine Fisheries Commission

I have audited financial statements of Gulf States Marine Fisheries Commission's (a not-for-profit organization), as of and for the year ended December 31, 1996, and have issued my report thereon dated May 19, 1997.

In connection with my audit of the financial statements of Gulf States Marine Fisheries Commission, and with my consideration of Gulf States Marine Fisheries Commission control structure used to administer federal financial assistance programs, as required by Office of Management and Budget Circular A-128, Audits of State and Local Governments, I selected certain transactions applicable to certain nonmajor federal financial assistance programs for the year ended December 31, 1996. As required by OMB Circular A-128, I have performed auditing procedures to test compliance with the requirements governing types of services allowed or unallowed and eligibility that are applicable to those transactions. My procedures were substantially less in scope than an audit, the objective of which is the expression of an opinion on compliance with these requirements. Accordingly, I do not express such an opinion.

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

This report is intended for the information of management. However, this report is a matter of public record and its distribution is not limited.

Donald W. Rely, C.P.A.

Waveland, Mississippi
May 19, 1997