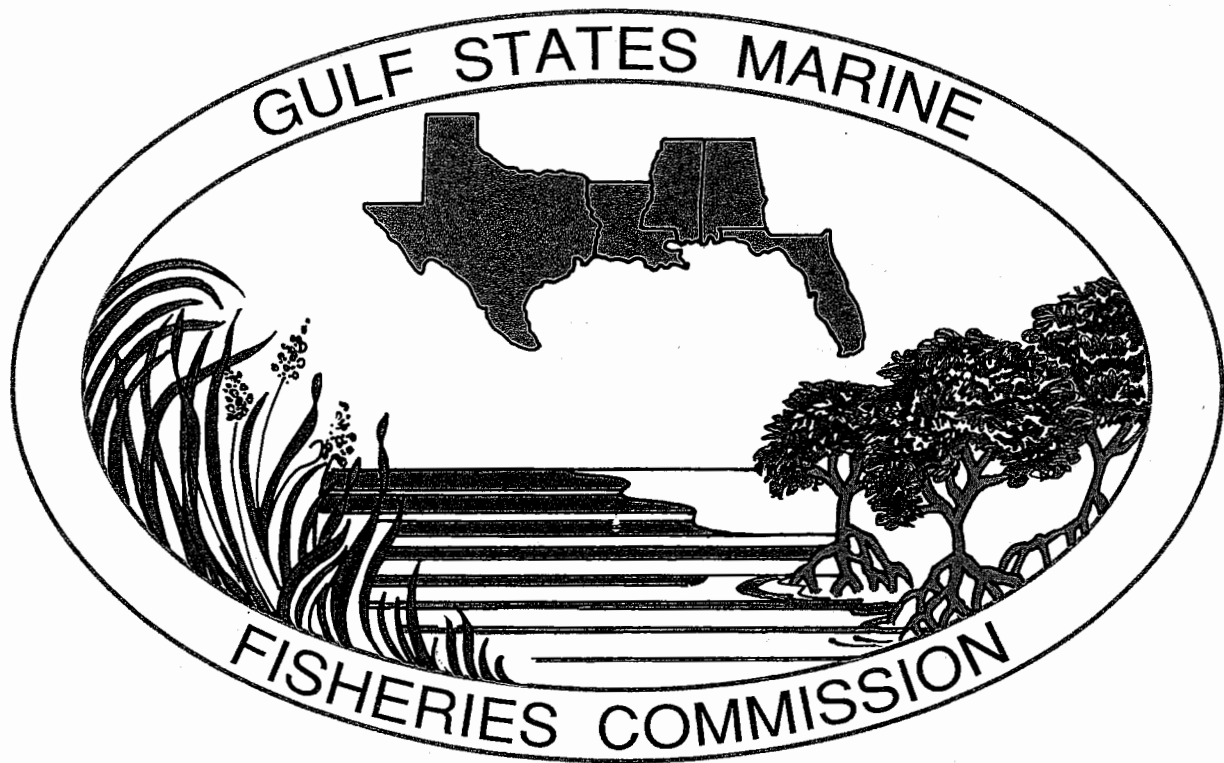


OFFICE COPY ONLY

FORTY-SECOND ANNUAL REPORT
OF THE



P.O. Box 726
Ocean Springs, MS 39564
(601) 875-5912

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. It has as its principal objective the conservation, development and full utilization of the fishery resources of the Gulf of Mexico, to provide food, employment, income and recreation to the people of these United States.

GULF STATES MARINE FISHERIES COMMISSION
FORTY-SECOND ANNUAL REPORT (1991)

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
the State enabling Acts creating such Commission and
Public Law 66 - 81st Congress assenting thereto

GULF STATES MARINE FISHERIES COMMISSION
P.O. Box 726
Ocean Springs, Mississippi 39564
(601) 875-5912

ACKNOWLEDGMENT

In submitting this Forty-second 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-two years could not have been possible without such valued assistance. This acknowledgment is also extended to the directorates and staffs of federal, state and interstate agencies, and to representatives of all organizations and individuals who have contributed toward the realization of the objectives of the GULF STATES MARINE FISHERIES COMMISSION.

Respectfully submitted,

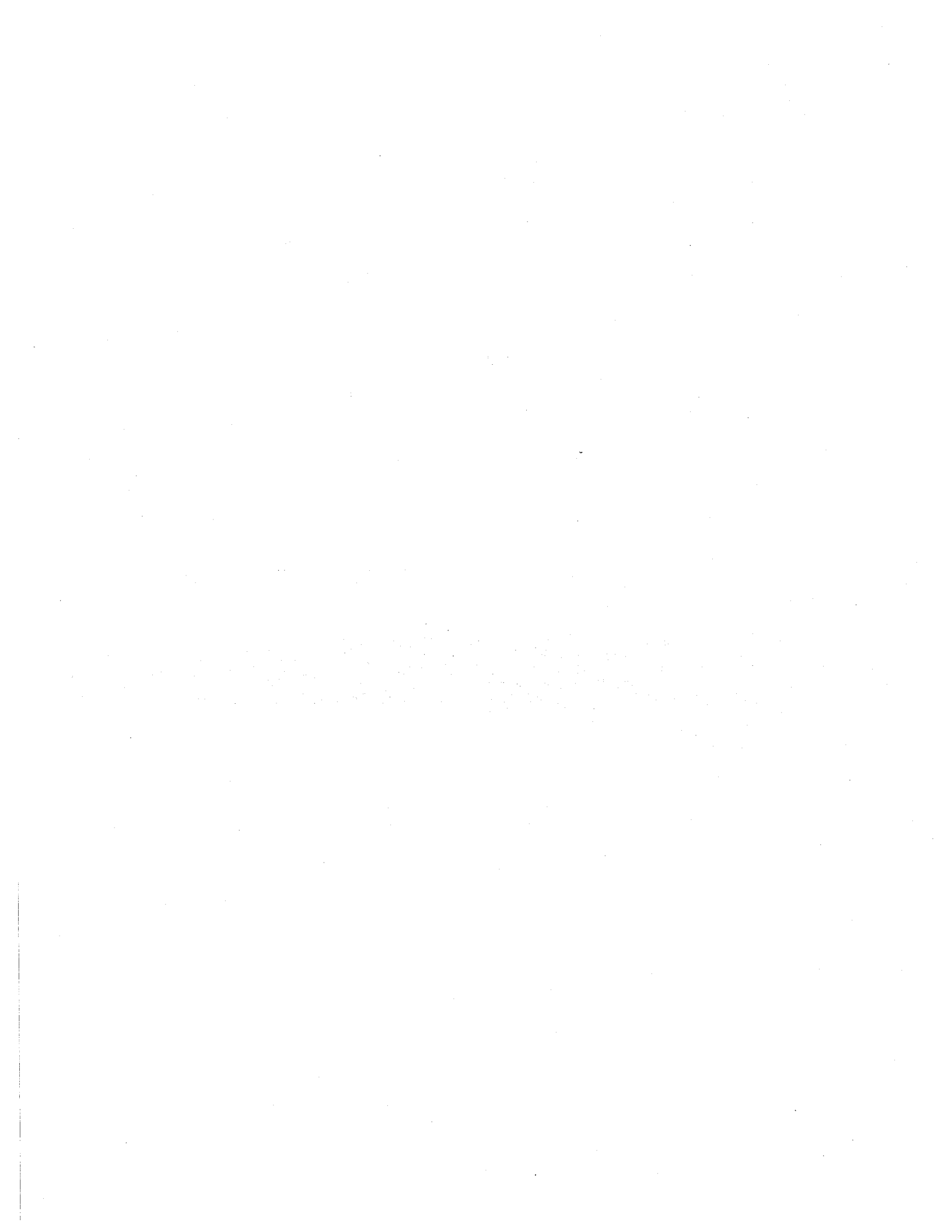
Don Duden, Chairman FY91
Leroy Kiffe, Vice Chairman FY91
Larry B. Simpson, Executive Director

GULF STATES MARINE FISHERIES COMMISSION

Forty-second Annual Report (1991)

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Roster of the
GULF STATES MARINE FISHERIES COMMISSION
January 1, 1991 - December 31, 1991

Chairman: Don Duden

Vice Chairman: Leroy Kiffe

COMMISSIONERS

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

ALABAMA

James D. Martin, Commissioner
AL Department of Conservation
and Natural Resources
Montgomery, AL
Taylor F. Harper, Representative
State of Alabama
Grand Bay, AL
Chris Nelson
Bon Secour Fisheries, Inc.
Bon Secour, AL

Frank J. Patti, Representative
State of Louisiana
Belle Chasse, LA
Leroy Kiffe
Tom Kiffe & Sons Boats
Lockport, LA

FLORIDA

Don Duden
Acting Executive Director
FL Department of Natural Resources
Tallahassee, FL
Sam Mitchell, Representative
State of Florida
Chipley, FL
Hans G. Tanzler, III
Jacksonville, FL

MISSISSIPPI

Jack Herring
Executive Director
MS Department of
Wildlife, Fisheries & Parks
Jackson, MS
Tommy Gollott, Senator
State of Mississippi
Biloxi, MS

LOUISIANA

A. Kell McInnis
Acting Executive Secretary
LA Department of
Wildlife and Fisheries
Baton Rouge, LA

TEXAS

Andrew Sansom
Executive Director
TX Parks and Wildlife Dept.
Austin, TX
Robert Saunders, Representative
State of Texas
Austin, Texas
Charles E. Belaire
Fulton, TX

STAFF

Larry B. Simpson
Executive Director

Ronald R. Lukens
Assistant Director

David M. Donaldson
SEAMAP Coordinator

Richard L. Leard
IF Program Coordinator

V.K. "Ginny" Herring
Executive Assistant

Lucia B. Hourihan
Publication Specialist

Nancy K. Marcellus
Administrative Assistant

Cynthia D. Bosworth
IF Staff Assistant

Cheryl R. Noble
SEAMAP/MARFIN Staff Assistant

**COMMISSION OFFICERS ELECTED FOR
FISCAL YEAR 1991**

Chairman: Don Duden succeeding Tommy Gollott
Vice Chairman: Leroy Kiffe succeeding Don Duden
1st Vice Chairman: Taylor Harper
2nd Vice Chairman: Rudy Rosen

COMMITTEES

Executive Committee Don Duden, Chairman
Technical Coordinating Committee Ed Joyce, Chairman
SEAMAP Subcommittee Walter Tatum, Chairman
 Crab Subcommittee Harriet Perry, Chairman
 Data Management Subcommittee Henry "Skip" Lazauski, Chairman
 Anadromous Fish Subcommittee Vernon Minton, Chairman
 Habitat Subcommittee Larry Lewis, Chairman
Commercial Fisheries Advisory Committee Gene Raffield, Chairman
Recreational Fisheries Management Committee Virginia Vail, Chairman
Law Enforcement Committee Jerald Waller, Chairman
State-Federal Fisheries
 Management Committee Larry Simpson, Moderator
 Menhaden Advisory Committee Wilmer LaPointe, Chairman

GULF STATES MARINE FISHERIES COMMISSION ACTIVITIES

Two annual meetings were held during the time period covered by this report. The meetings are rotated among each of the five Gulf States. The 41st Annual Spring Meeting was held April 15-18, 1992 in Galveston, Texas. The Annual Fall Meeting of the Commission was held October 14-18, 1991 in New Orleans, Louisiana. The National Fish Meal and Oil Association met jointly with the Commission in New Orleans.

The Commission annually presents the "*Charles H. Lyles*" Award, its highest expression of appreciation for contributions to the betterment of the fisheries of the Gulf of Mexico. The recipient for 1991 was Mr. John A. Mehos. Mr. Mehos' talents and wisdom were in evidence as chairman of the Gulf States Marine Fisheries Commission, chairman of the Gulf of Mexico Fishery Management Council for the first three years of its existence, president and one of the founders of both the Texas Shrimp Association and the Shrimp Association of the Americas, member of the Marine Fisheries Advisory Committee and member of the National Sea Grant Advisory Committee.

In conjunction with the Interjurisdictional Fisheries Program, the State-Federal Fisheries Management Committee, at its October 1991 meeting, addressed a recent court case regarding the commercial landing of Spanish mackerel in the State of Florida. The federal judge's decision in that case ruled that when state and federal regulations for the same species are not identical, federal regulations supersede state regulations, even in cases where the regulations were jointly agreed to by state and federal agencies. If this ruling is applied to other species for which there is a federal fishery management plan (FMP) under one of the regional fishery management councils, states will have lost a significant degree of management authority. If the ruling is held as valid under appeal, state authority for fisheries management would only apply to those resources for which state and federal regulations are identical, or for species for which no federal regulations exist. For interstate FMPs which address menhaden, blue crab, oyster, black drum, mullet, and others where the predominance of harvest is from state territorial waters, state jurisdiction will prevail. For those species for which there is a shared state/federal waters harvest, such as Spanish mackerel, spiny lobster, stone crab, red drum, and possibly shrimp, state and federal regulations must be identical or federal regulations will supersede. This issue once again stresses the importance that states must aggressively address and manage those resources which are harvested predominantly in state jurisdictions, through state or interstate FMPs as appropriate. Otherwise, the potential exists to lose jurisdiction over such species through federal action.

The Commission, working through its member states on the various committees and subcommittees, has laid the ground work for a variety of significant issues and programs for the next year and beyond. Federal funding to support many of the activities expected is better than in recent years, therefore we must do our part to cooperatively address marine fisheries management issues and work toward positive actions to improve the status of all marine resources in our Gulf of Mexico.

A resolution passed during the 41st Annual Spring Meeting follows as a part of this report.

Larry B. Simpson
Executive Director

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**Gulf States Marine
Fisheries Commission**

Larry B. Simpson
Executive Director

RESOLUTION

State-Federal Programs

WHEREAS, partnerships between the states and the federal government have historically been necessary for the effective management of the nation's fishery resources throughout their range, and

WHEREAS, there is a need for continuing a strong state-federal partnership regarding management of our shared fishery resources, and

WHEREAS, fishery dependent and independent data collection, management and dissemination require substantial involvement of both the state and federal fishery resource management agencies, and

WHEREAS, such substantial involvement and interaction strongly justify the continued use of a noncompetitive cooperative agreement process, as stated in Open Channel, Volume 1, Number 3, a newsletter of the NOAA Grants Management Division, to support the continuing relationships among the states, interstate commissions, and regional management councils, and

WHEREAS, the states have exclusive legislative mandates for activities related to fishery resources management, including data collection, management, and dissemination in the territorial seas, and

WHEREAS, substantial cost savings can also be realized due to state contributions and the lack of profit motivation, and

WHEREAS, long-term consistent databases are critical for effective management of fisheries resources, and highly successful infrastructures and mechanisms to develop and maintain such databases are in place and working through cooperation between the National Marine Fisheries Service Southeast Region and the states, interstate commissions, and regional councils to conduct noncompetitive cooperative fishery resource data collection and management activities, and

- Member States -

Texas

Louisiana

Mississippi

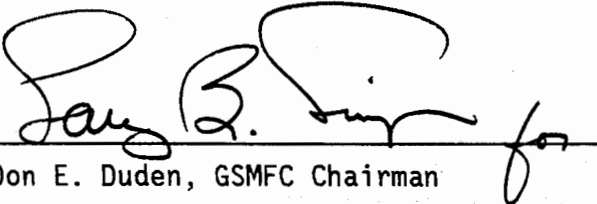
Alabama

Florida

WHEREAS, currently noncompetitive cooperative programs, such as but not limited to the Southeast Area Monitoring and Assessment Program (SEAMAP) and State-Federal Cooperative Statistics, are working to the benefit of the states, federal agencies, the fishery management councils, the fishery resources, and the citizens of the Nation,

THEREFORE BE IT RESOLVED, that the Gulf States Marine Fisheries Commission through its member states of Texas, Louisiana, Mississippi, Alabama, and Florida strongly recommend that the National Marine Fisheries Service through the National Oceanic and Atmospheric Administration continue to approve the use of noncompetitive cooperative agreements for appropriate programs related to marine fisheries management, such as but not limited to SEAMAP, the State-Federal Cooperative Statistics Program, and the proposed Recreational Fisheries Information Network (RecFIN).

Given this the 18th day of April in the year of Our Lord, One Thousand, Nine Hundred, Ninety-one.


Don E. Duden, GSMFC Chairman

SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

INTRODUCTION

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a State/Federal/university program for collection, management and dissemination of fishery-independent data and information in the southeastern United States. The program presently consists of three operational components, SEAMAP-Gulf of Mexico, which began in 1981, SEAMAP-South Atlantic, implemented in 1983 and SEAMAP-Caribbean, formed in 1988.

Each SEAMAP component operates independently, planning and conducting surveys and information dissemination in accordance with administrative policies and guidelines of the National Marine Fisheries Service's Southeast Regional Office (SERO).

Federal programmatic funding for SEAMAP activities and administration was appropriated in Federal Fiscal Years 1985-1992 (October 1 through September 31). State and Gulf States Marine Fisheries Commission (GSMFC) funding allocations for FY1985-FY1992 were handled through State-Federal cooperative agreements, administered by SERO and the Southeast Fisheries Center (SEFC), National Marine Fisheries Service (NMFS).

In FY1992, SEAMAP operations continued for the eleventh consecutive year. SEAMAP resource surveys included the Fall Shrimp/Groundfish Survey, Spring Plankton Survey, Spring Reef Fish Survey, Summer Shrimp/Groundfish Survey, Fall Plankton Survey and plankton and environmental data surveys. Other projects and activities for FY1992 consisted of the Status and Trends Benthic Surveillance Project, SEAMAP data management, information services and program management.

RESOURCE SURVEYS

Fall Shrimp/Groundfish Survey

The Fall Shrimp/Groundfish Survey was conducted from September 30 to November 22, 1991, from off Mobile, Alabama to the U.S.-Mexican border. Vessels waters to 60 fm, covering a total of 353 trawl stations, in addition to plankton and environmental sampling.

Sampling design was similar to the summer shrimp/groundfish cruise; objectives of the survey were:

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

During the survey the NOAA Ship OREGON II sampled 208 stations in offshore waters and territorial Louisiana and Texas waters. The R/V VERRILL sampled 7 stations in Alabama territorial waters. The R/V TOMMY MUNRO sampled 27 stations in Mississippi territorial and offshore waters. The R/V PELICAN sampled 31 stations in Louisiana territorial and offshore waters. And Texas vessels sampled 80 stations within their territorial waters.

Ichthyoplankton data were collected by NMFS and Louisiana vessels, at sample sites occurring nearest to half-degree intervals of latitude/longitude. A total of 46 stations was sampled with bongo and/or neuston nets, as encountered along cruise tracks. NMFS completed 40 ichthyoplankton stations and Louisiana completed 6 stations. The samples, except those taken by Louisiana, will be sorted by the Polish Sorting Center. Once sorted, the specimens and data will be archived at the SEAMAP Archiving Center.

Spring Plankton Survey

For the tenth year, plankton samples were collected during the spring in the northern Gulf of Mexico. The NOAA Ship OREGON II and Florida's R/V HERNAN CORTEZ II sampled offshore waters from the western edge of the West Florida Shelf to the Texas-Louisiana border from April 15 to May 25, 1992. A total of 194 stations was sampled. The OREGON II sampled 173 stations and the R/V HERNAN CORTEZ II sampled 21 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°. 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. Hydrographic data which included surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom and fore-ule color were collected at all stations.

Right bongo and neuston samples collected by NMFS and Florida from SEAMAP stations will be transshipped to the Polish Sorting Center (PSC). Left bongo samples will be archived at the Gulf Coast Research Laboratory in Ocean Springs, Mississippi. Salinity data from the Florida vessels were sent to the NMFS Mississippi Laboratories for interpretation.

Spring Reef Fish Survey

The first Spring Reef Fish Survey was conducted from May 14 to September 11, 1992. Vessels from NMFS, Mississippi and Alabama sampled inshore and offshore waters, covering a total of 169 stations, in addition to plankton and environmental sampling. Randomly selected sites from Brownsville, Texas to Key West, Florida are chosen from known hard bottom locations. The objectives of the survey are:

- (1) assess relative abundance and compute population estimates of reef fish using a video/trap technique;
- (2) determine habitat using an echo sounder and video camera;
- (3) determine if bioacoustics assessment methodology can be applied to reef fish communities;

- (4) collect environmental data at each station;
- (5) 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) analyses of video records. Data is collected using the trap/video methodology where a fish trap containing a video camera is deployed onto the selected reef site. Trap soak time is one hour. After trap deployment, hydrographic data including a STD/light meter, transmissometer drop, secchi disk reading and surface chlorophyll samples will be collected. Also, after the last trap/camera set, one ichthyoplankton station will be completed each day with a surface neuston net and Tucker trawl. Environmental and plankton samples collected will use established SEAMAP protocols and plankton samples will be transshipped to the Polish Sorting Center (PSC).

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

Summer Shrimp/Groundfish Survey

A planning meeting of the Shrimp/Groundfish Work Group was held in March 1992 to examine the design for the Summer Shrimp/Groundfish Survey and determine the random station locations for each participant. Objectives of the survey were to:

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

The overall sampling strategy during the SEAMAP survey was to work from the eastern Gulf to the Texas/Mexico border, in order to sample during or prior to migration of brown shrimp from bays to the open Gulf area. The survey occurred from June 3 to July 13, 1992.

During the survey, the NOAA Ship OREGON II and R/V TOMMY MUNRO sampled offshore and inshore Gulf waters with 40-ft trawls. Alabama's R/V VERRILL sampled offshore Alabama waters with 40-ft trawls. The R/V PELICAN sampled both Louisiana state waters and offshore waters with 40-ft trawls, and Texas vessels sampled Texas state waters and offshore waters with 20-ft trawls.

A total of 326 trawl samples was taken from coastal and offshore waters out to 50 fm from Mobile Bay, Alabama, to Brownsville, Texas. All vessels took environmental data, including temperature, salinity, oxygen, and chlorophyll at each station.

In June, catch rates of brown shrimp east of the River were very low, with a maximum catch of 5.0 lb/hr of 25-count shrimp. White shrimp catches east of the River were all less than 2 lb/hr. The largest pink shrimp catch rate east of the River was 15.3 lb/hr of 33-count shrimp taken in 18 fm of water

off Mississippi. Finfish catch rates east of the River were moderate, with the largest catch of 3,517 lb/hr with Atlantic croaker predominating.

Moderate catches of brown shrimp were made off Texas from June 3 to July 1. The largest catch rate occurred June 24 in waters off Corpus Christi in 10 fm (109.6 lb/hr of 88-count shrimp). White shrimp catches off Texas were low with the largest catch, 59.5 lb/hr of 14-count shrimp, taken off of Brownsville in 9 fm. Catch rates for pink shrimp were low off Texas, with the largest catch, 18.0 lb/hr of 47-count shrimp, taken off Laguna Madre in 8 fm. Finfish catch rates were low in Texas inshore and offshore waters. The largest catch of finfish was 1,737 lb/hr in 7 fm off Matagorda Island with Atlantic croaker predominating.

In July's samples west of the river (Louisiana) brown shrimp catches were low with the largest catch rate of 21.7 lb/hr of 32-count shrimp occurring southwest of Vermilion Bay in 16 fm. White shrimp catches were extremely low, with a maximum catch rate of 3.1 lb/hr of 19-count shrimp taken in 15 fm southeast of Barataria Bay. Catches of pink shrimp were all less than 1 lb/hr off the Louisiana coast. Finfish catch rates were also low with the largest catch rate of 1,526 lb/hr taken on July 5 with Atlantic croaker predominating.

Several areas of low bottom dissolved oxygen (less than 2 ppt) occurred off Louisiana between Cameron, Louisiana and the Mississippi River in depths of 6 to 22 fms.

Fall Plankton Survey

The first fall ichthyoplankton survey to assess abundance and distribution of king mackerel eggs and larvae occurred in August 1984. No sampling survey was conducted in 1985, however expanded surveys in 1986-1991 and in the current year covered Gulf waters from Florida Bay to Brownsville, Texas. Vessels from Florida, Alabama, Mississippi, Louisiana and NMFS conducted the survey from September 8 to October 2, 1992.

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

Stations were sampled with standard SEAMAP bongo nets with 333-micron mesh and/or 1 x 2-meter neuston nets fitted with 947-micron mesh. Hydrographic sampling included chlorophylls, salinity, temperature and dissolved oxygen from surface, mid-water, and bottom, water transparency and water color. Right bongo samples collected by NMFS and the Gulf States will be transhipped to the Polish Sorting Center. Left bongo and neuston samples will be stored at the SEAMAP Invertebrate Archiving Center 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.

Plankton and Environmental Data Surveys

As in previous years, plankton samples and environmental data were collected routinely during most SEAMAP trawling surveys. During the Summer Shrimp/Groundfish Survey, plankton tows were piggybacked on the NMFS and state vessels, sampling randomly generated trawl stations within the

standard 30-minute SEAMAP grids. Plankton and environmental data were also taken by Louisiana at all of its seasonal day/night survey stations. Samples were taken by participants with a 60-cm bongo net and a standard NMFS neuston net.

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

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

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

In addition to these piggybacked surveys, two major SEAMAP plankton surveys were conducted in FY1992, as detailed earlier.

Status and Trends Benthic Surveillance Project

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

Sampling methodologies in the 1992 Benthic Surveillance Project were identical to those of the previous surveys. Gulf sites included: Tampa Bay (FL), Lake Pontchartrain (LA), Barataria Bay (LA), Calcasieu Lake (LA), Galveston Bay (TX), Lavaca Bay (TX) and Arroyo Colorado (TX). South Atlantic sites sampled in 1992 included: Savannah River (GA) and Biscayne Bay (FL).

Sampling was conducted from August 11 to October 8, 1992, with the NOAA Ship FERREL serving as the primary platform. Analyses of trace metals, aromatic and chlorinated hydrocarbons, and other contaminants in fish tissues and sediments are coordinated by the NMFS Beaufort (NC) Laboratory.

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

DATA MANAGEMENT

The requirements report for an integrated data system, Data Management System Design Study for Gulf and South Atlantic, 1987, was completed in March 1987. The document identifies the high-level design specifications and recommended implementation plan for a module-based SEAMAP Data Management System (DMS). The design is based on information contained in the SEAMAP Gulf and South Atlantic DMS Requirements Document developed through a cooperative effort between NMFS and

other SEAMAP participants. The document has five sections: (1) background and brief descriptions of current centralized and proposed distributed systems; (2) summary of the Requirements Survey; (3) overview of the system's architecture; (4) description of developmental modules constituting the DMS design; and (5) modular implementation plan which includes costs and schedule.

Work was completed during FY1990 on the new distributed SEAMAP Data Management System. New modules completed include those for data entry, edit, upload, data query and download. Delivery of the remaining PS/2's has been completed and all of the Gulf States are now equipped with the necessary computer hardware and software.

The new system is decentralized, i.e., distributed. Thus, the SEAMAP users are able to locally, and directly, enter and retrieve data. Software for the system has been distributed to participants for trial runs of data input.

This new system overcomes the deficiencies of the old system (i.e., the time necessary to enter and retrieve data) and provides powerful and flexible local data analysis and display capabilities. Under the new system, each SEAMAP site enters, verifies and edits their data, eliminating the mail-oriented loop necessary to enter/edit/verify data under the old system. Secondly, each site has the capability of locally accessing SEAMAP data, utilizing a user-friendly system. Local data retrieval allows the data to be accessed in a timely manner with a minimum amount of effort and programming skills.

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

Requested SEAMAP data were used for a multitude of purposes in FY1992:

- 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 1989 SEAMAP Biological and Environmental atlas.
- Comparing catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets.

INFORMATION SERVICES

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

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, managed in conjunction with NMFS-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 1982-1990 have been entered into the system and data from 1991 and 1992 surveys are in the process of being verified, edited, and entered for storage and retrieval. Verified, non-confidential SEAMAP data are available conditionally to all requestors, although the highest priority is assigned to SEAMAP participants.

A major function of the SEAMAP Information System in 1992 was the processing of catch data from the Summer Shrimp/Groundfish Survey as near-real-time data. Data were transmitted three times weekly via cellular phone to the NMFS Mississippi Laboratories from the NOAA vessel, while the states' data were entered into the system weekly. Plots of station locations and catch rates of shrimp, squid and dominant finfish species were prepared and edited at the NMFS Mississippi Laboratories, and processed by GSMFC for weekly distribution to management agencies, fishermen, processors and researchers. Management agencies also received comprehensive data listings showing penaeid shrimp length frequencies, sampling parameters and environmental conditions.

SEAMAP Archiving Center

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

The SAC is managed in conjunction with Florida Department of Natural Resources in St. Petersburg, and processes both specimen loans and requests for associated plankton survey environmental data. Merging of these files within the SEAMAP Information System will greatly facilitate managing the environmental data, presently a cumbersome manual procedure. Currently, the SAC is without a collection manager or assistant. The curator has shifted job responsibilities within his section at the Department of Natural Resources, although he will continue to be involved with the SAC in supervisory, training and administrative capacities. This has created a large backlog of uncatalogued samples from 1987 and later years. The Department is in the process of advertising and attempting to hire replacement personnel. When new staff are hired, accessioning of backlogged material will be the main priority until the SAC is caught up on cataloging the collection.

The SAC curator and four staff members from FDNR completed the Florida spring ichthyoplankton cruise in May. Additionally, the curator has sent the final data sets for SEAMAP ichthyoplankton collections from 1984 to 1985 to the National Marine Fisheries Service personnel in Miami preparatory to publication of SEAMAP Ichthyoplankton Atlases for those years.

SEAMAP Invertebrate Plankton Archiving Center

With the determination in 1985 by SEAMAP-Gulf that the retained "back-up" bongo collections also contain valuable research materials, the SEAMAP Invertebrate Plankton Archiving Center (SIPAC) was established and is managed in conjunction with Gulf Coast Research Laboratory in Biloxi, Mississippi.

The entire collection of SEAMAP plankton samples catalogued at SIPAC has been moved from its old location at Point Cadet, Biloxi to new facilities on the main campus of Gulf Coast Research Laboratory in Ocean Springs. All SIPAC activities including sample management, curation and sorting

will be conducted from this new location.

During the FY1992, 250 unsorted SEAMAP samples were received and catalogued at SIPAC. As of September 4, 1991, a total of 4,867 unsorted fish larvae samples are held at SIPAC. In an effort to limit the space and costs of curating the growing SIPAC collection of unsorted samples, a protocol was adopted to retain only a 1/4 aliquot of samples that are more than 7 years old. To date, 1,022 samples were aliquoted and retained in the collection. A request from Joanne Shultz (NMFS) for a printed list of all SEAMAP plankton samples held at SIPAC and those samples shipped from SIPAC to NMFS or PSC was received and the information provided.

A total of 1,118 SEAMAP samples have been sorted for selected invertebrate taxa by the SIPAC and the PSC following established protocol. A total of 4,765 lots were obtained from these samples. Portunid megalopae from the sorted samples have been further identified to the lowest possible taxonomic level. Data from these samples have been provided to the GSMFC Crab Subcommittee to develop an atlas of portunid megalopal distribution in the northern Gulf of Mexico.

During the next fiscal year, the SIPAC collection will continue to be maintained and additional samples will be sorted for invertebrates. Particular emphasis will be placed on providing data on the megalopae of Callinectes sapidus and postlarval Penaeus spp. as requested by several researchers. A substantial data base has been generated on the distribution of blue crab megalopae and postlarval shrimp and is available to researchers upon request.

PROGRAM MANAGEMENT

The SEAMAP program is administered by the SEAMAP Subcommittee of the Technical Coordinating Committee through the SEAMAP Coordinator, who is under the technical direction of the Subcommittee Chairman and administrative supervision of the Gulf States Marine Fisheries Commission's Executive Director. Personnel associated with SEAMAP program management included the Coordinator, Data Manager, SAC Curator, SIPAC Curator and the NMFS-Mississippi Laboratories Director, serving as Program Manager.

Major SEAMAP-Gulf Subcommittee meetings were held in October 1991 and April 1992, in conjunction with the Annual Fall and Spring Meetings of the GSMFC. Also, a planning meeting to discuss the upcoming year was held in January 1992. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in August 1992 to discuss respective program needs and priorities for FY1993.

SEAMAP-Gulf work groups met this past year to provide recommendations to the Subcommittee for survey and data management needs. The Plankton Work Group met in November 1991. And the Shrimp/Groundfish Work Group met in March 1992. Where additional discussion was needed, the Subcommittee and work groups also deliberated plans and needs via telephone conference calls.

Coordination of program surveys and distribution of quick-report summaries of a Gulf-wide survey to management agencies and industry were major functions of SEAMAP management in FY1992. 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.

PUBLICATIONS

The following reports were published and distributed in FY1992:

- 1992 SEAMAP Marine Directory: inventories of marine agency contacts (State, Federal and university) concerned with fishery research in the Gulf, and summaries of information provided by these organizations: target species, types of fishery-independent sampling gear and platforms, annual sampling effort, and other materials.
- SEAMAP Subcommittee Report to the GSMFC Technical Coordinating Committee -October 1, 1991 to September 30, 1992 : 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, 1990 to September 30, 1991: a summary of 1991 activities and proposed 1992 events for the SEAMAP-Gulf, South Atlantic, and Caribbean Programs.
- 1989 Environmental and Biological Atlas: a compilation of information obtained from the 1989 SEAMAP surveys including catch rates of shrimp and finfish, abundance and distribution of plankton in the Gulf of Mexico and environmental data from all surveys.

David M. Donaldson
SEAMAP Coordinator

SPORT FISH RESTORATION PROGRAM

The Gulf States Marine Fisheries Commission (GSMFC) provided administrative support for "Cooperative Interstate Fishery Management in the Territorial Sea of the Gulf of Mexico," FWS Grant Agreement No. 14-16-0009-90-1211. GSMFC furnished services, qualified personnel and material, equipment, and facilities as needed to perform required duties.

During the period covered by this report (January 1, 1991 - December 31, 1991) the GSMFC sponsored and/or attended/participated in appropriate meetings/workshops to accomplish required duties. Meeting minutes, general correspondence, meeting notices, agendas, and other required materials were prepared and distributed to the appropriate persons. Persons authorized to travel have been reimbursed. Documentation of all activities and minutes of all meetings conducted by the GSMFC are available upon request. A brief report on all activities pertinent to this project follows:

Anadromous Fish Activities

Amendment 1, Striped Bass Interstate Fishery Management Plan - In 1986 the GSMFC developed and adopted an interstate fishery management plan (FMP) for striped bass in the Gulf of Mexico region. As a normal course of monitoring the progress of management activities under the auspices of an FMP, periodic amendments are developed to supplement FMPs. Following several meetings to discuss the original FMP and needed changes, it was determined that there were three areas within the FMP that needed to be addressed in the amendment, including the administrative structure, approval, and monitoring process; the regulatory recommendations; and an operational plan for research and data collection activities.

Following established procedures for development and approval of interstate FMPs through the GSMFC, Amendment 1 to the GSMFC Striped Bass Interstate Fishery Management Plan has been completed in final draft form. A broad distribution, public review process has been completed with no comments received. Following final approval of the draft by the GSMFC State-Federal Fisheries Management Committee, the draft amendment will be considered for final approval and adoption by the Commissioners by early 1992. Copies of the draft amendment are available for your information upon your request.

Strategic Plan for Restoration and Management of Gulf of Mexico Anadromous Fisheries - During FY90, the GSMFC produced a white paper entitled "Anadromous Fish Restoration Programs in the Gulf of Mexico." The document summarized state and federal activities to restore populations of striped bass in coastal waters of the Gulf of Mexico since the mid 1960s. As evidenced by the white paper, a great deal of effort has been put into restoration attempts, and recently it appears that some tangible benefits toward that goal have resulted. Also noted in the white paper is the fact that over the twenty-plus years of the Anadromous Fish Conservation Act (P.L. 89-304), the states of the Gulf of Mexico region have received only three percent of the funds distributed. That amounts to approximately \$3.3 million spread over five states over 26 years. That amount of funding is obviously and significantly less than the amount that is needed to properly pursue the goal of restoration.

As a result of this finding, the GSMFC coordinated a state-federal cooperative effort to develop a strategic plan for restoration of anadromous fish populations in the Gulf of Mexico (primarily striped bass), including problem identification, suggested activities to solve the problems, time schedules, and funding requirements. The plan was completed during 1991, and will serve as the basis for justification for additional funding to assist the states in achieving the goal of restoration of striped bass. Copies of

the "Strategic Plan for Restoration and Management of Gulf of Mexico Anadromous Fisheries" are available upon request.

Gulf of Mexico Sturgeon Fishery Management Plan - The states in the Gulf of Mexico have long recognized that the stocks of Gulf of Mexico sturgeon (*Acipenser oxyrinchus desotoi*) are in a severe state of depression, evidenced by the fact that the species has been protected by state regulations for a number of years. In an effort to update information and coordinate state-federal activities regarding the sturgeon, the GSMFC began an activity to develop an interstate FMP for the Gulf of Mexico sturgeon. That activity was begun in late 1990. Since that time the Gulf of Mexico sturgeon has been listed as a threatened species under the provisions of the Endangered Species Act. That Act calls for the development of a recovery plan for all species listed as threatened or endangered. Since the GSMFC activity was already underway, the U.S. Fish and Wildlife Service suggested that interstate FMP be reformatted so that it could serve both FMP and recovery plan needs. Since the primary stated goal of the FMP is restoration, there was no perceived conflict in agreeing with the Service's suggestion; consequently, the GSMFC FMP activity is being conducted so that it will serve the recovery plan function.

To date, several planning and drafting meetings have been conducted, and the text of the FMP/Recovery Plan is approximately 60% complete. That activity is slated for completion by December 31, 1992. Copies of the draft as it currently stands are available upon request.

Fisheries Data Activities

In 1990 the GSMFC, through its TCC Data Management Subcommittee, began investigations into data collection and management programs addressing recreational fisheries activities. The initiative was begun by holding a major workshop during which all past and current programs in the Gulf of Mexico region were analyzed. Also included were discussions of efforts on both the Atlantic and Pacific coasts. A proceedings of that workshop was produced which contained a number of important recommendations for improving both programmatic and technical approaches to recreational fishery data collection and management.

One of the recommendations requiring some rather intense attention was the need to look more closely at the for-hire segment of the recreational fishery, and how best to collect needed data. Efforts during FY91 have been aimed primarily at addressing that recommendation. Currently, a draft document has been produced which deals with a review of existing programs to collect data from the for-hire fishery, problems associated with collecting reliable data, and data elements which are necessary for a comprehensive program. It is anticipated that the final document will be available during early 1992; however, copies of the existing draft are available to the USFWS Federal Aid Office upon request. During 1992, the GSMFC will be compiling a full completion report on all activities which have been conducted in response to the findings of the initial recreational data workshop, including technical, programmatic, and policy recommendations.

Another important recommendation resulting from the initial workshop was that the states should become more directly involved in the collection and management of recreational fishery data. As a result of that recommendation, the GSMFC, in conjunction with its Atlantic and Pacific counterparts, has formulated and presented to the NMFS a proposal for a state-federal cooperative program for the collection and management of recreational fishery data. That proposed program is called the Recreational Fishery Information Network (RecFIN), and is currently in the process of being implemented on the Pacific coast. It is anticipated that the Gulf of Mexico component of RecFIN will be implemented in early 1993.

Recreational Fishery Activities

Artificial Reefs - Artificial reefs constitute a major component of recreational fisheries activities, whether

being conducted by private, local, state, or federal governments. Permitted activities for artificial reef construction have increased in the past several years, and the GSMFC determined that it would be important to produce a data base which would assist in managing those activities. That activity was begun in 1990 and is now complete, with a current data base on line at the Artificial Reef Development Center, which is a national archive and clearing house for information on artificial reefs at the Sport Fishing Institute in Washington, D.C. Activities in 1992 will include a publication on the data base which will include individual program narratives from the states and NMFS.

During the project year the GSMFC developed and adopted a resolution regarding the use of ash residue from coal, oil, and municipal waste incineration as a component in artificial reef materials. The resolution calls for allowing permits for its use in experimental applications only until such a time as the Environmental Protection Agency and/or the U.S. Army Corps of Engineers has developed standards and guidelines for its use. It is anticipated that the GSMFC will continue to pursue aspects of this issue in future activities.

Fishery Management Plans - During the period covered in this report, the Program Coordinator and/or representatives of the GSMFC Recreational Fisheries Advisory Committee have participated in the development of FMPs for both black drum and striped mullet. Also accomplished through the FMP process was a stock assessment for black drum, an effort to which the GSMFC Sport Fish Restoration Administrative Program contributed. It is anticipated that the black drum FMP will be completed by mid 1992 and the mullet FMP during 1993.

Regional Report on the Sport Fish Restoration Program - Late in 1990, the GSMFC was asked during a telephone conversation to substitute a proposed FY91 activity with a report which would summarize activities in the five Gulf States associated with funding received through the Sport Fish Restoration Program (Wallop-Breaux). A letter confirming the telephone conversation and identifying the activity to be deleted is appended to this report. The original intent of producing the report was to provide the U.S. Congress with information on the benefits and successes of the Program as a part of the reauthorization process. Early in FY91 we learned that there would be no reauthorization of the Act until perhaps 1994; consequently, there was no urgency for completion of the report. As a result of postponing work on that report, it has not been completed during the 1991 time frame. Currently the report is about 50% complete, and completion is expected by March or April of 1992. Copies of the incomplete draft are available to the USFWS Federal Aid Office upon request.

Miscellaneous Meetings and Activities

During the course of this project year the Program Coordinator has attended and/or participated in a number of meetings and activities related to the project. A listing of those follows:

- * Meeting with a representative of the Mississippi Power Company regarding the use of coal ash waste in artificial reefs. Other pertinent recreational fisheries issues were also discussed, since the individual in question is also a representative of the Mississippi Chapter of the Gulf Coast Conservation Association.

- * Attended the Fifth International Conference on Artificial Habitats for Fisheries in Long Beach, CA. The Program Coordinator presented information on state artificial reef work in the Gulf of Mexico.

- * Meeting with Dr. Bill Fox, NOAA Assistant Administrator for fisheries. The meeting was regarding implementation of RecFIN.

* Two meetings regarding finfish bycatch in the shrimp fishery in the Gulf of Mexico.

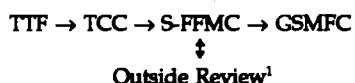
Ronald R. Lukens
Assistant Director

INTERJURISDICTIONAL FISHERIES PROGRAM

During 1991, the Gulf States Marine Fisheries Commission (GSMFC) continued its role of coordinating and facilitating the development of interjurisdictional fisheries management plans (FMPs) among the five Gulf States under P.L. 99-659, the Interjurisdictional Fisheries Act of 1986 (IJF). This function was supported by funding from the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

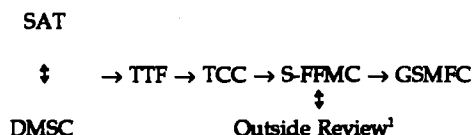
In 1991, the GSMFC made additional changes to the procedure by which IJF management plans are reviewed and approved. These changes were made as the result of our efforts to more adequately address stock assessment needs of IJF FMPs and to gain greater knowledge and input of data and data sources at the onset of FMP development.

At the beginning of 1991, IJF plans were developed and approved by the following process (see GSMFC Annual Report 1990 for details):



At their meetings in October 1991, the GSMFC approved modifications to the approval process for IJF FMPs by adding a Stock Assessment Team (SAT) and the TCC Data Management Subcommittee (DMSC) to the process. The SAT was formed to assist the TTFs in the development of stock assessments, because it was felt that the TTFs would usually not have adequate expertise to provide this vital component of FMPs with only one technical representative from each state. Rather than increase the size of TTFs, the GSMFC opted to have state directors appoint a stock assessment expert, where available, to the SAT in order to accomplish this task for FMPs. Additionally, the DMSC was added to the process to advise the TTFs and the SAT of data sources, availability and other uses in the course of FMP and stock assessment development.

The new approval process is as follows:



The IJF Program of the GSMFC continued its involvement with a number of gulf fisheries in 1991. In addition to FMP development, IJF personnel were involved with two additional IJF initiatives. The first was the review of state efforts to implement management recommendations from previously developed FMPs. This was accomplished by the development of simple matrices for menhaden, Spanish mackerel, blue crab and oyster. These were reviewed by the S-FFMC in October 1991, and the S-FFMC decided to annually review their implementation efforts.

¹(Standing committees, trade associations, general public)

A second project was a review of regulations regarding size limits, bag/possession limits and quotas for a number of species. Again a matrix format was used to compare and contrast regulations among the five Gulf States. States have used this and will continue to use updated versions in an effort to bring about greater uniformity of regulations where applicable and advisable.

The following is a discussion of IJF planning activities and accomplishments for individual FMPs during 1991:

Blue Crab

Although this plan is complete and no formal planning activities are ongoing, the TCC Crab Subcommittee continued to address data needs in the fishery and to review scientific activities that might eventually effectuate changes to the FMP. At their meeting in March 1991, the subcommittee informally appointed members to, in an ongoing manner, review and determine needs for redrafting individual sections of the Blue Crab FMP. The subcommittee also continued to provide publications, reports and other documents for inclusion into the blue crab repository. The repository will be used to expedite efforts to amend the FMP once it is determined that a change is needed.

Oyster

The Oyster FMP was completed in late 1990, but the actual publication was not received from the printer until March 1991. Since March, numerous copies have been distributed to government agencies, organizations and individuals. Because of the historical importance of this fishery, the FMP has been in very high demand. It is also the first comprehensive regional plan for oysters. As a result of information collected during the FMP development process, several additional publications have been prepared or are being prepared by various task force members and the IJF Program Coordinator.

Black Drum

Most of the work under the IJF Program in 1991 focused on the Black Drum FMP. As TTF members collected data and worked on draft sections of the plan, it became obvious that data on the status of the stocks and population dynamics of the fishery were lacking. Furthermore, the TTF realized that they did not have the expertise to analyze this data and formulate a stock assessment. This type of analysis was not needed in previous IJF FMPs that either "piggy-backed" Gulf Council plans or included only invertebrate species for which such analyses were not deemed necessary.

To address the problem, the TTF sought assistance from the DMSC and the S-FFMC. Afterwards, the S-FFMC appointed the SAT to consider appropriate ways and persons to do the assessment. Later, Dr. James Geaghan, Louisiana State University, Department of Experimental Statistics, was selected to develop the stock assessment.

The stock assessment was completed in late 1991 and was reviewed prior to its incorporation into the FMP. The black drum FMP plan should be completed by mid 1992.

Mullet

At their meeting on March 7, 1991, the S-FFMC selected striped mullet as the next species in need of IJF planning. Afterwards appointments to the Mullet TTF were finalized, and the TTF held its organizational meeting on June 27, 1991. At the meeting, TTF members reviewed the IJF FMP process and a tentative table of contents. Assignments were also made to various TTF members to draft sections of the plan.

Due to the commitment of all available IJF funds to the black drum FMP, no additional meetings

of the TTF were held.

Work in 1992 will escalate, and it is projected that the plan will be completed by the end of 1992.

Summary

In summary, the IJF Program continues to evolve and a great deal of progress has been made toward regional management of important fish species in state territorial waters.

Richard L. Leard
Interjurisdictional Fisheries 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 40.68 employees of the Administrative, Enforcement and Fisheries sections during FY1992. A total expenditure of \$2,055,936 was made from the approved budget of \$2,237,000. Revenue of \$2,044,185 was made up from federal aid (37%), license fees (47%), marine gas tax (12%) and other sources (4%).

ADMINISTRATIVE SECTION

Responsibilities and Functions

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

Facilities and Personnel

The Administrative Section consisted of the division director, six clerical, one custodial and one mechanical employee. Offices are maintained at Dauphin Island, Gulf Shores, Bayou La Batre and Montgomery.

Budget and Expenditures

The Administrative Section expended \$465,940 on salaries and operational expenses for division activities, part of which was reimbursed under federal aid to fisheries programs.

Accomplishments

Legislation was introduced and passed that created a saltwater fishing license. The saltwater license is required for residents between the ages of 16 and 65 who fish below a geographic line. All of the revenue from the sale of the license will be utilized solely for research, management and development of saltwater fisheries. Prior to the passage of this legislation the Marine Resources Division received 10% of the revenue from the sale of freshwater fishing licenses. That revenue will now be retained by the Game and Fish Division for use in the management of freshwater fisheries. Regulations were drafted and approved by the commissioner on the commercial harvest of red snapper, king mackerel and mullet. These regulations brought the state into compliance with the federally approved fishery management plans for red snapper and king mackerel. Regulations on the harvest of mullet, initially drafted in 1991, were modified after meetings with fishermen, seafood dealers and the division's Biological Section.

Future Plans

Legislation will be introduced to create a resident trip fishing license for saltwater and a resident trip fishing license for freshwater. Presently, trip fishing licenses are available only for nonresidents. The

trip license will allow the angler who fishes only occasionally in saltwater or freshwater to purchase a less expensive license. Legislation will be introduced to increase the fee for nonresident fishing licenses for both fresh and saltwater. This will solve the present inequity where residents are, in some cases, charged more than nonresidents for their fishing licenses. Legislation will also be introduced to eliminate the loophole where nonresidents are allowed to purchase a resident gill net license.

ENFORCEMENT SECTION

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

Facilities and Personnel

Facilities and personnel included headquarters at Dauphin Island and district offices in Bayou La Batre and Gulf Shores. At the beginning of FY1992 the section consisted of 14 enforcement officers, 8 stationed in Mobile County, 5 stationed in Baldwin County and the Chief Enforcement Officer stationed at division headquarters at Dauphin Island.

Budget and Expenditures

Expenditures during the year totalled \$704,553 of which \$25,000 was reimbursed by a grant from the National Marine Fisheries Service. Other expenses for shared services and material such as utilities and gasoline were paid by the Administrative Section.

Accomplishments

Enforcement officers conducted 23,857 hours of boat and shore patrol, made 24,808 boat checks, 717 seafood shop inspections and issued 580 citations for illegal activities. Violations of rules concerning finfish made up the majority of the citations, followed by shrimp, oyster and other (which included boating, hunting and other state law violations). An officer was elected chairman of the Gulf States Marine Fisheries Commission's Law Enforcement Committee. Two new vehicles were purchased to replace worn-out models. Officers attended schools and courses on fish identification, firearms instruction, boating safety and other state and federal agency law enforcement programs. An officer also attended meetings of the Gulf States Marine Fisheries Commission and the Interstate Shellfish Sanitation Conference.

Significant Problems/Solutions

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

Future Plans

Future plans include formulation of programs to upgrade performance, maintain adequate equipment and personnel and effectively conduct operations.

FISHERIES SECTION

Responsibilities and Functions

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

Facilities and Personnel

Facilities consist of the Claude Petet Mariculture Center at Gulf Shores and the Marine Resources Laboratory at Dauphin Island. Personnel included one Biologist V, two Biologists IV, one Biologist III, two Biologists II, four Biologist Aides III, two Biologist Aides II, four Biologist Aides I, one data entry Clerk Typist II, one biweekly laborer and four temporary laborers.

Budget and Expenditures

Expenditures totalled \$885,443 consisting almost entirely of funds from six federal aid programs. State funds for required match varied from 0% to 50% of program costs.

Accomplishments

The recovery of oyster resources and subsequently the oyster industry has to be considered a major accomplishment during the past year. The industry was devastated in 1987/1988 and reached a record low production of less than 20,000 pounds in 1989 with only slight improvement in 1990/1991. Production in 1992 has recovered substantially and will easily exceed the 30-year average by year's end. The recovery process has certainly been aided by favorable environmental conditions for oyster production in the coastal area, but equally important have been the management measures implemented that have sustained the harvest while not endangering future harvests. Both fishery independent and fishery dependent data have been collected from the resource and resource users, respectively, and this data has dictated the desirable management measures required and adapted to sustain the resource.

Federal Aid

Wallop-Breaux - Wallop-Breaux funds were used to rear, tag and release striped bass and red drum; to evaluate effectiveness of fish excluder devices in reducing bycatch in shrimp trawls; to evaluate reef fish catch from Alabama charter boats; to spawn and rear red snapper; to develop juvenile abundance indices for important finfish species and to maintain equipment and facilities in Baldwin and Mobile counties necessary to carry out project objectives. Fourteen offshore artificial reefs were also constructed in the general permit area off Baldwin County with surplus property obtained from the Navy. Wallop-Breaux funds were utilized during 1991 and 1992 for habitat evaluations of construction permit requests from the U.S. Army Corps of Engineers for either placement of structures in the U.S. navigable waters (Section 10) or for dredge and fill activities (Section 404).

Anadromous Fish - Anadromous fish funds were used for field work to document occurrence of natural striped bass reproduction and characterize genetic makeup of the adult population. Natural reproduction was found in the Alabama River during spring 1989, 1990, 1991 and 1992. The work was expanded in 1990 and 1991 to include the Tombigbee River and to develop an estimate of the number of eggs and larvae in each system. Initial analysis of genetic work indicated striped bass stocks in Alabama are closely related, but subtle differences were detected.

Marine Fisheries Initiative (MARFIN) - On October 1, 1992, the Marine Resources Division began collection of daily catch records from the logbooks of Alabama charter boat fishermen as part of a MARFIN project. The purpose of this project is to validate or invalidate the use of log books information from the Alabama charter boat fleet. Randomly selected trips were intercepted by the Marine Resources Division personnel from which catch data (all species), angler hours fished, fishing method, number of hooks, lengths on individual fish and number of fish thrown back were recorded. Comparisons of the logbooks and ground truth information indicated that Marine Resources Division intercepts were the same as the logbook information. Thus, the data for the logbooks could safely be included in the Gulf of Mexico fishery databases and used in management plans.

Interjurisdictional Fisheries - This project collected additional data from fishermen about the length and catch of recreational finfish. Beginning in May these funds provided for the development of a large range management plan for striped mullet in Alabama. A rough draft of this plan is nearing completion. The rough draft will be reviewed by industry representatives and other interested parties before the final plan is completed.

Statistics - The State-Federal Cooperative Statistics Project, in cooperation with the National Marine Fisheries Service, collects commercial shrimp, oysters, crab and finfish landings information. Information on processed seafood (e.g., picked crab meat) are collected. Additionally, data on fishing trips for a particular species are gathered. Two Alabama port agents, a clerk/typist and a fisheries statistician are involved with this project. The National Marine Fisheries Service has a port agent involved with the project in Mobile County. All landings are processed on a monthly basis for inclusion in Alabama's database and forwarded to the National Marine Fisheries Service for their fisheries work.

Southeast Area Monitoring and Assessment (SEAMAP) - This cooperative state-federal program provided funding for our monitoring and assessment program. Data generated from this project provided information to manage the shrimp fishery and evaluate spawning success and juvenile survival for important recreational and commercial species. The shrimp fishery opened June 9, 1992, in portions of the estuarine system with periodic openings of additional areas thereafter. The shrimp harvest during the summer months was the best since 1989 and 10% higher than the average since 1986.

Non-Federal Aid

Considerable time and effort was expended by the Biological Section in preparing brochures, constructing and manning booths and speaking to organizations on the "Forever Wild" amendment. Time and effort were utilized to illustrate the positive impact of the program's passage to the well-being of Alabama coastal resources. There were only five fish kills reported to the Marine Resources Division during FY1991/1992, all of which were associated with either isolated low pockets of dissolved oxygen or discards from trawls or gill nets. Only one of the five kills involved over 1,000 (1,320 specifically).

Enforcement and Biological Section personnel worked together in collecting data at oyster check points. Data derived from the ad hoc check-points has aided considerably in evaluating the general health of the Alabama oyster reefs, thereby enabling the development of sound management measures for sustaining the resource. Marine Resources Division's Biological Section initiated and monitored a voluntary oyster shell pick-up and planting activity during the spring; the effort yielded a planting of just over 1,200 yards in Portersville Bay and Cedar Point.

Significant Problems/Solutions

The oyster resources and its management remains one of the foremost problems in the coastal area. Even though the recovery of the fishery during 1992 is remarkable, the future of the industry remains uncertain. A stable supply of cultch material is of primary concern as is the adverse impact on the industry from public health concerns. The solution to the former problem is being addressed by a

research project funded by the "Gulf America" program aimed at evaluating alternative cultch material to the historically used (but now scarce) clam and oyster shell. This material being tested is archaeological coral and is readily available. Another problem facing the oyster resources is the physical damage to the reefs imposed by shrimp trawls and barge and tug grounding. This problem is also being addressed by a grant from the "Gulf America" program which will partially defray the cost of marking all oyster reefs with permanent perimeter signs warning the boaters of submerged oyster reefs. While the public health concerns are more of a problem for the Department of Public Health, the Marine Resources Division represents the enforcement arm of the Public Health Department in regard to shellfish and therefore must assume considerable responsibility for ensuring that oyster catchers and openers comply with rules and regulations enacted by the Department of Public Health.

Future Plans

A fishery management plan for mullet is now being developed by the Biological Section and should be completed and published during FY1993. User conflicts between crab fishermen and others who utilize waterways where crab fishing occurs have become volatile in recent months, necessitating serious consideration to the development of a blue crab management plan as soon as the mullet plan is complete.

FLORIDA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MARINE RESOURCES

FLORIDA MARINE RESEARCH INSTITUTE

FINFISH

Studies on tarpon to determine age, growth, reproduction and stock structure continue. Data from nearly 450 adult tarpon and 700 juvenile tarpon have been collected. Tarpon larvae collected from the Gulf of Mexico were aged by counting daily growth increments on otoliths. Larval growth rate estimates were 0.92 mm per day. Age validation through marginal increment analysis has been accomplished for tarpon ages 0-2. Five tarpon that had been injected with tetracycline during March 1991 were sacrificed. Otoliths were removed and are being analyzed for age validation. Adult tarpon appear to undergo a substantial spawning migration from inshore areas frequented during spring and summer to offshore spawning grounds.

To date, 150 bonefish have been collected from the Florida Keys for age, growth and reproduction studies.

The annual report on population abundance of common snook was reviewed and completed. The index for the Port Manatee was significantly greater (250%) than the index of abundance for the previous two years. The MacDill index was 50% greater than last year's but was not statistically significant. Populations on the east coast continue to vary around 25,000, which indicates stability. A snook life history manuscript was reviewed and is near completion. A catch-and-release mortality experiment was conducted to determine lethal and sub-lethal effects of hooking on snook. Preliminary results from 250 fish show that approximately 3% of the fish caught on live bait died after release; no fish caught using lures died. A tag retention study of snook showed that approximately 3.5% of tagged snook shed or lose HallPrint dart tags in 120 days.

Investigations into the early life history of snook found that small, shallow water lagoons fringed with old-growth red mangroves provide important nursery habitat for juvenile snook in moderate to high salinity areas. Similarly structured habitat with alternate vegetation is thought to provide important nursery habitat in riverine systems. One hundred fourteen snook larvae were collected in Tampa Bay during 1992. Larvae were more abundant in nearshore waters than in the middle of the bay and more abundant in the upper three meters of the water column than in depths greater than three meters. Results of channel net sampling in Dollar Bay (a small bay south of Naples Bay) show that larval snook near small bay systems probably develop in nearshore waters outside of the bay systems rather than in the bays.

A "Memoirs of the Hourglass" manuscript on sea bass (family Serranidae) was published. It includes keys, color plates and life history information for all serranids known to occur in the eastern Gulf of Mexico.

Florida's continuing participation in the Southeast Area Monitoring and Assessment Program (SEAMAP) in 1992 included completion of two plankton cruises during May and August over the West Florida Shelf. Sampling included measurements of chlorophyll concentration, larval fish abundance as sampled by neuston and bongo nets and hydrographic information. Approximately 10,000 sample lots

from 1987 to 1990 have been received, accessioned and stored. The SEAMAP reef fish project comparing visual counts of reef fish to video counts has begun. One ten-day trip to the Florida Keys has been completed, and data analysis is underway.

Improved methods for the identification of juvenile fishes from Florida are being developed by staff of the Fish Biology Section and the Fisheries Statistics Section's Juvenile Fish Program. This effort includes literature review, original research and production of illustrations of juvenile stages.

Work continues on a wide variety of other species including, but not limited to, black drum, red drum and spotted seatrout. Nearly 150 black drum ranging from 20-80 lbs were caught, tagged, injected with tetracycline and released as part of a MARFIN supported age validation study. One black drum tag return indicated movement of black drum to as far north as Chesapeake Bay. Staff with the Fish Biology Section participated in the preparation of the management plan for black drum in the Gulf of Mexico. A mark/recapture program for estimating the abundance of red drum >27" total length in lower Tampa Bay was conducted. A total of 250 redfish >27" total length were tagged and released; nineteen tagged fish were recaptured out of a total of 112 fish captured during the recapture phase of the study. Otoliths were sampled from spotted seatrout, red drum, blue fish, gulf flounder, vermilion snapper and silk snapper and sectioned as part of the biostatistical sampling program.

Spanish sardine life history studies were completed during this period; monthly sampling for the life history studies of thread herring and scaled sardine were continued. Monthly hydroacoustic sampling of baitfish schools off Tampa Bay continued. Samples from the October bait-fish ichthyoplankton cruise are being sorted. Data from the previous cruises are being processed. Analysis of spawning stock biomass data are being conducted.

A fishery independent sampling program of size/age composition of black mullet in Charlotte Harbor and Tampa Bay began in March 1992. Quarterly sampling using trammel nets has been conducted based on a stratified random sampling design. Schools of mullet and redfish were captured, marked and released in these regions. Approximately 7,000 mullet have been tagged to date. This study will be expanded to include other commercially and recreationally important species in six regions of the east and west coasts of Florida.

INVERTEBRATES

In our studies of coral reefs, we established additional long-term ecological monitoring stations at Looe Key National Marine Sanctuary and John Pennekamp Coral Reef State Park. We also initiated an experiment to test transplanting of coral reef biota to enhance coral reef recruitment at Pulaski Shoal, Dry Tortugas. We continued to work with the Florida Marine Fisheries Commission (FMFC) on marine life and live rock collection. As a result, the FMFC completed a major revision of the Marine Life Rule in which they voted to prohibit the collection of the Bahama starfish, set a limit of 200 per day for the giant Caribbean anemone and phase-out landing of live rock in Florida by 1995. Our staff continued to work with the FMFC and Florida Department of Natural Resources (FDNR) on regulations to allow aquaculture of live rock, and we conducted surveys at two live rock aquaculture lease sites off Tarpon Springs.

In our invertebrate collection, we received a large collection of invertebrates from various Florida localities courtesy of Applied Biology, Inc. and a small collection from Ft. DeSoto Park, Tampa Bay, courtesy of Pinellas County. Manuscripts published, based on our collection and other collections, included a paper describing a new genus, *Lamellitrochus*, and six new species of gastropods (in Nautilus); a paper describing a new species of *Solarrella*: Gastropoda (in Nautilus); a paper describing a new species of sabellid polychaete (in Bulletin of Marine Science) and an abstract on systematics of *Sabella* and *Bispira*:

Sabellidae (in Ophelia). Our biologists also completed an update of the chiton and the marine gastropod sections of the American Fisheries Society List of North American Mollusks.

Field research on sponges being done cooperatively with John Stevely and Don Sweat, Florida Sea Grant, was completed, and preliminary results were reported to the FMFC. As a result, the FMFC increased the minimum size for commercial sponges to a five inch minimum dimension. Results of these studies are being prepared for publication.

For stone crab, field research in Tampa Bay, laboratory research on physiology and analysis of data from the northeast Florida hybrid zone continued. We also initiated studies of stone crab reproductive biology in Tampa Bay. A manuscript on effects of temperature and salinity on survival and growth of early stage *Menippe mercenaria* was published (Journal of Experimental Marine Biology and Ecology), and a manuscript on growth of early *M. mercenaria* in the laboratory was accepted for publication (Bulletin of Marine Science). We also initiated genotype classification of stone crabs collected during 1986-1989 in the northwest Florida hybrid zone, and we reported the preliminary results of this study at the annual meeting of the Gulf and Caribbean Fisheries Institute.

Collection and genetic analysis of blue crab genetic samples from throughout the species range were completed, and data analysis of these samples is underway. A manuscript on the fisheries biology of blue crabs in Tampa Bay was revised, a manuscript on parasitization of the blue crab by the barnacle *Loxothylacus texanus* was published (Bulletin of Marine Science) and a report of the status of the blue crab fishery in Florida with recommendations for management changes was presented to the FMFC. We also initiated preparation of species profiles on the blue crab and on brown, white and pink shrimp as a part of multi-species stock assessment of important estuarine and nearshore species.

A report on our research on distribution and abundance of hard clams in the Cedar Key region was published (Florida Department of Agriculture and Consumer Services' Aquaculture Research Series), and a manuscript on the increased susceptibility of hybrid clams to gonadal neoplasma was prepared. We also initiated our planned long-term study on the ecology and fisheries biology of bay scallops along the Florida west coast.

In the biochemical systematics laboratory, we completed a report on genetics and morphometrics of the Spanish sardine in the southeastern United States and completed a draft of a manuscript on population genetics of this important bait fish species.

PLANKTON BLOOMS

Studies continued on identifying and culturing potentially toxic dinoflagellates. Maintenance of existing cultures and isolation of additional potentially toxic phytoplankton continued. *Gymnodium breve* bloomed along the gulf coast in late 1991. Bivalve harvesting closures and information advisories to the public were accomplished as required.

A large algal bloom (most likely the blue-green algae, *Synechococcus* sp.) developed in southwestern Florida Bay during October 1991 and persisted until February 1992. The bloom formed following an expansion of the persistent seagrass dieoffs into Johnson Key Basin. Apparently, nutrients pulsing into the water column from exposed sediments in dieoff areas contribute to the conditions that permitted the bloom to form and persist. This bloom extended to Long Key and was associated with the mass mortality of most species of sponges including the loggerhead sponge, *Speciospongia vesparium*. Loggerhead sponges are critical juvenile lobster bait. At a Florida Marine Research Institute (FMRI) research site, juvenile lobster abundance declined in association with sponge loss.

ENDANGERED SPECIES

Sea Turtles

The FDNR's marine turtle conservation goals, responsibilities and program direction promote the recovery of the five species of marine turtles occurring in Florida. The overall approach is twofold: (1) to develop the scientific information (research) that will guide recovery efforts and (2) to minimize human impacts (management) which result in increased mortality, degrade habitat and impede recovery of listed turtle species.

The current FDNR program is divided into six major components: (1) recovery program planning, management and administration; (2) biological/ecological research and population assessment; (3) coordination of research and management activities; (4) assessment of mortality factors; (5) habitat protection and (6) education.

Recently approved recovery plans of the United States Fish and Wildlife Service (USFWS) for the loggerhead turtle (*Caretta caretta*) and green turtle (*Chelonia mydas*) identify approximately 64 tasks, most of them overlapping, to promote the recovery of each of these species. The FDNR is listed as the lead agency or a cooperating agency for implementation of 27 of these recovery actions. Ongoing research topics include:

- Determination of distribution, abundance, life history and ecology of marine turtles in Florida and contiguous South Atlantic and Caribbean waters;
- Assessment of population status and trends of loggerhead, green and leatherback turtle nesting populations in Florida;
- Identifying genetic stocks of marine turtles utilizing Florida's nesting beaches and foraging habitats;
- Developing reliable sex determination techniques for marine turtles;
- Evaluating the impacts of artificial lighting on marine turtle hatchlings and nesting adults;
- Evaluating the extent, quality and long-range future of nesting habitat;
- Evaluating mortality factors affecting marine turtles in Florida waters, focusing on data requests for east coast standings to provide the FMFC information required for fishing regulations and rule development.

Manatees

The FMRI staff performs manatee research related to manatee biology and health, habitat requirements, movement, behavior and population size. The FDNR management staff provides reviews of state land leases, large development projects, coordination with 33 counties on the development and implementation of area-specific manatee protection and comprehensive plans and development of habitat protection strategies. The FDNR research and management strategies reflect and are driven by the Florida Manatee Recovery Plan. Ongoing research topics include:

- **Telemetry** - Satellite tags were placed on 19 manatees on Florida's west coast. Two of the 19 were tagged and released following rehabilitation at Sea World and the Miami Seaquarium for injuries inflicted by crab trap lines. Both manatees appear to be adequately readjusting by

exhibiting normal movement and behavior patterns. At the end of 1992, seven manatees still had tags: four tagged in Tampa Bay, two in Charlotte Harbor and one in the Everglades.

- **PIT Tags** - Passive integrated transponder (PIT) tags were implanted in five captive male manatees in February, June and August 1991. Two tags were implanted in each animal, one on either side of the upper head region, behind the ear opening. The animals were also marked with freeze brands around the implantation site to monitor tag migration. These manatees have been monitored from 17-23 months, every two weeks for the first two months, once a month for an additional year and then quarterly. No health complications have been observed. All the tags function properly and no apparent migration of the tags has been noted. Testing of PIT tags on captive manatees has shown that these tags are a safe and accurate permanent identification marker for manatees and that this marking technology can be applied to the wild manatee population. Manatees will be implanted with PIT tags under a permit from the USFWS. The tags will be implanted in captive manatees, free-ranging manatees during captures for ongoing telemetry studies and in rescued and rehabilitated manatees prior to release.
- **Aerial Surveys** - Twice-monthly aerial surveys for manatee distribution are currently being conducted in four areas: St. Johns, Flagler and Volusia counties; St. Lucie and Martin counties; Collier County and Tampa Bay. The FMRI is jointly sponsoring aerial surveys with Palm Beach County and Everglades National Park. All aerial survey data are mapped into the Marine Resources GIS system and used as a primary source of data for management planning.

The global position system (GPS) data unit is now being used to accurately record the aircraft's flight path and locations of animals sighted during selected aerial surveys. Locations are then downloaded to a microcomputer and used to create GIS maps of the sightings and the flight path displayed against a GIS background map.

Last year's statewide two-day synoptic survey in January 1992 counted 1,856 manatees, more than had ever been counted at one time before.

- **Carcass Salvage and Necropsies** - The yearly total manatee mortality in Florida was 161 (38 watercraft-related). An additional three animals were recorded from outside the state (one in Alabama, two in Georgia) during 1992. The total mortality for 1992 was below that of the previous year (175 in 1991).

The new FDNR Marine Mammal Pathobiology Lab was dedicated November 20, 1992, on the Eckerd College in St. Petersburg. This will serve as a state-of-the-art facility for marine mammal necropsies.

COASTAL VEGETATIVE HABITAT RESTORATION

This program implements projects designed to evaluate and functionally restore, enhance and/or create vegetative marine fisheries habitats, seagrasses, saltmarsh and mangroves. Staff investigate enhancement strategies by designing projects to improve existing or create new critical habitat area, quality and biological diversity. Projects often involve redesign and engineering of existing landscapes to support the desired habitats and to improve access of fisheries organisms to these habitats. Staff conducted independent research to address scientific issues related to environmental requirements of different coastal plants as well as management questions relating to restoration, creation and enhancement of emergent and submergent habitats. Staff developed requests for proposals, supplemental contracts and cooperative agreements to monitor and assess both natural and manipulated habitats.

The FMRI currently utilizes annual revenues from gill-net licenses issued to commercial fishermen in Pasco, Pinellas, Hillsborough, Manatee and Sarasota counties to provide the salary base for the program and to implement restoration projects and associated research. Staff supervise and work directly with contractors and frequently citizen volunteer groups to implement projects; implementation frequently involves coordination with the Southwest Florida Water Management District (Tampa Bay SWIM Program), the Department of Environmental Regulation (Pollution Recovery Program), the National Marine Fisheries Service, the Tampa and Sarasota Bay National Estuarine Programs, the Tampa Bay Regional Planning Council, the Tampa Bay Environmental Action Team, the FDNR Aquatic Preserves, the Tampa Bay National Audubon Preserves and county and municipal governments.

FISHERIES STATISTICS

The Commercial Fisheries Statistics Cooperative effort with the National Marine Fisheries Service continues. The state Marine Fisheries Trip Ticket Program has approximately 690 dealers who report 30,000 to 40,000 fishing trips monthly. This program provides catch and effort data on all state fisheries and real time effects of management decision. The trip ticket was revised last year to collect data on gear employed on each individual trip and to allow specifying a size code. Other changes from last year included expanding the program to include marine life (tropical) species. Those data are now in sufficient quantity for us to examine year specific trends in catch and the marine life fishery. Fisheries independent monitoring of juvenile fishes continues in the Tampa Bay, Charlotte Harbor and Indian River lagoon/bay systems. The program has expanded to include the Florida panhandle (Ft. Walton Beach) and the West Central Coast (Cedar Key). The Florida Keys/Florida Bay area will be the next estuarine area to be evaluated as a future monitoring location. Testing continues for quantitative and efficient sampling methods. Recreational fishing sites continue to be visited on a random basis to update fishing activity levels and facilities. The data acquired are the basis for future surveys on recreational fishing and boat traffic and their effects on endangered marine species, as well as planning of state surveys of recreational fishermen and their catch.

STOCK ENHANCEMENT RESEARCH

Since 1985 the FMRI has engaged in a large research program referenced as the Stock Enhancement Research Program. The goals of the program were: (a) develop facilities and methods to produce thousands of fish fingerlings, (b) develop methods to mark/identify/recapture fish released to the wild, (c) assess the efficacy and advisability of stocking fish at selected estuarine sites and (d) determine cost effectiveness of marine fish stock enhancement. These activities have largely fallen into two categories. Those during the exploratory research are termed "Pilot Studies"; those during the systematic research phase are termed "Interpretative Studies." Initial facilities construction is included in the pilot phase. Some facilities construction has been ongoing. Pilot studies were chronologically addressed from 1985/1986 through 1991/1992. The state of Florida fiscal period is from July 1 through June 30.

The program accomplished the following elements:

1. Sited and constructed a 54-acre hatchery/research complex.
2. Reassigned FMRI staff and hired staff to accomplish research goals.
3. Developed spawning techniques for red drum that consistently produced viable eggs after minimal conditioning. Successfully produced fingerlings in ponds by standardizing pond management techniques.

4. Developed reliable high survival methods to mark and recapture marine fish fingerlings using coded wire tags, internal anchor tags and contracted research to develop other marking methods.
5. Initiated pilot and interpretive non-fishery monitoring programs in two field sites and coordinated protocols for other similar programs in Sarasota and Biscayne bays.
6. Developed methods to control disease and improve production in the hatchery and now carry out routine health screening of fish prior to release.
7. Reared 1.9 million red drum fingerlings and released almost 1,000,000 fingerlings into 5 study areas; most of these were tagged.
8. Recovered almost 1,600 coded wire tagged fish in non-fishery monitoring efforts.
9. Recovered about 400 internal anchor tagged fish with assistance of Florida anglers. The longest day free has been 982 days and this fish travelled 0 miles.
10. Development of a draft stocking rule addressing genetic and fish health factors related to enhancement.

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, 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 1992 the Oyster Culture Section collected 83,200 bushels of shucked oyster shells and planted 50,400 bushels to restore approximately 20 acres of oyster reefs in Apalachicola Bay.

In 1992, \$479,400 were appropriated by the legislature as part of a statewide commitment to rehabilitate and develop productive shellfish resources. Funding was allocated among seven coastal counties, including Levy, Dixie, Wakulla, Franklin, Bay, Walton and Santa Rosa. Currently, 156,538 bushels of live oysters and 94,800 bushels of shell have been planted during FY1992-1993 resource development projects.

Marine Fisheries Information System statistics showed statewide oyster landings exceeded 3.5 million pounds valued at more than \$8 million in 1992. Monitoring station reports from July 1991 to July 1992 accounted for 306,000 bags landed in Franklin County. Increased landings reported to monitoring stations in Apalachicola Bay reflected an upward trend in statewide production. The department issued 872 Apalachicola Bay oyster harvesting licenses generating \$87,200 in user fees for the Apalachicola Bay Conservation Trust Fund.

Preliminary reports indicated that clam landings in 1992 increased to 664,000 pounds with an approximate value of \$5 million. Modest production increases resulted from successful recruitment in natural stocks in Body C (Indian River), Brevard County which is the state's largest clam producing

county. During 1992 aquaculture contributed substantially to hard clam production, but landings have not been calculated.

Hard clams harvested from waters classified as restricted or conditionally restricted must be processed through relaying and depuration activities rigorously controlled by the Division of Marine Resources. The division has promoted depuration as a practical method for cleansing potentially contaminated shellfish, ensuring product reliability and protecting public health. In 1992 the division issued 40 relay permits to leaseholders and depuration facilities; 1 permit was issued to a facility using controlled purification techniques, and 78 Special Activity Licenses were issued to promote shellfish resource development through alternative production operations, principally exemptions for aquaculture on private leases.

Provisions of Section 370.16(1)-(11), F.S., allows leasing sovereign submerged bottoms for cultivation of oysters and clams. In 1992 there were 154 shellfish leases in effect totalling 2,000 acres. Additionally, 25 aquaculture leases (Chapter 253, F.S.) were in effect, and 105 lease applications were in the review process. Cultivation of hard clams and oysters offers a technically feasible and economically practical alternative to increase shellfish production.

The division certified 159 shellfish processing plants. Five comprehensive shellfish surveys to determine proper classification of coastal waters for shellfish harvesting were completed in 1992. Nearly 50% of Florida's 2.4 million acres of coastal waters have been classified in 58 shellfish harvesting areas. The Shellfish Laboratory analyzed 167 shellfish meat samples and 14,635 water samples to insure shellfish quality.

BUREAU OF SANCTUARIES AND RESEARCH RESERVES

The bureau administers the National Estuarine Research Reserve (NERR) and National Marine Sanctuary (NMS) programs in Florida through cooperative agreements with the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). These programs are designed to provide resource protection in estuarine and marine ecosystems through environmental education, scientific research and on-site management which includes enforcement.

The NERR Program originated with the passage of the Coastal Zone Management Act of 1972 and operates under the regulations of 15 CFR Part 921 of the Federal Register. There are two designated reserves in Florida at Apalachicola and Rookery Bay. The reserves allow compatible uses including commercial and recreational fishing. Reserve designation does not provide any additional federal regulating authority. The reserves are managed under existing state authority. Fishing regulations in these areas are established by the FMFC and are enforced by the Florida Marine Patrol and two reserve officers at Rookery Bay. The environmental education programs at the reserves provide programs for schools from elementary to college levels. The focus of the research programs is to synthesize existing research information, determine future research priorities, provide incentives for researchers to conduct the necessary studies, establish an effective baseline ecological monitoring program and to conduct scientific studies with reserve.

The NMS Program was established upon enactment of the Marine Protection, Research and Sanctuaries Act of 1972. Until recently, there were two existing sanctuaries in Florida at Key Largo and Looe Key. However, on November 16, 1990, President Bush signed into law the Florida Keys National Marine Sanctuary Act (H.R. 5909) which designated a 2,800 square nautical mile area of the Florida Keys as a National Marine Sanctuary. The legislation provided for the immediate prohibition of leasing, exploration, development or production of minerals or hydrocarbons within the sanctuary. The restriction of vessels greater than 60 meters in length from the previously determined "Area To Be Avoided" which coincides closely with the sanctuary boundary is now in effect. The act requires the administrator of the

Environmental Protection Agency and the Governor of Florida, in consultation with the Secretary of Commerce, to develop a water quality protection program within 18 months of enactment. The draft plan has been written. Also, the act specifies that a comprehensive management plan for the sanctuary is to be developed within 30 months which must: (a) facilitate all public and private uses consistent with the primary objective of resource protection, (b) consider temporal and geographic zoning, (c) incorporate regulations to enforce the comprehensive water quality protection program, (d) identify research needs and establish a long-term ecological monitoring program, (e) identify funding sources to supplement federal appropriations and fully implement the plan, (f) ensure coordination and cooperation between sanctuary managers and other federal, state and local authorities, (g) promote education on coral reef conservation and navigation safety and (h) incorporate the existing Looe Key and Key Largo National Marine Sanctuaries.

OFFICE OF FISHERIES MANAGEMENT AND ASSISTANCE SERVICES

The major objectives of the Office of Fisheries Management and Assistance Services (OFMAS) are to: (1) act as the FDNR liaison to the FMFC, (2) continue the operations of the state Artificial Reef Program, (3) establish a fisheries independent data collection program for the recreational fishery, (4) establish an in-house trip ticket auditing section to monitor and evaluate the accuracy of the reporting process using the Marine Fisheries Trip Ticket Program, (5) improve and expand an informational outreach program for distributing FDNR and FMFC rules and regulations and information regarding marine resources to sport and commercial fishermen, (6) act as FDNR liaison to Florida's aquaculture industry and (7) act as technical liaison for FDNR to Florida's local mosquito control program.

The OFMAS has produced three editions of the Saltwater Sportfishing Report Newsletter, and the fourth edition is near completion. The purpose of this newsletter is to provide the fishing public with an explanation of the saltwater fishing license, sales, expenditures and research issues. The newsletter also provides information such as fish identification and other topics of interest to anglers. The OFMAS receives and answers a large number of calls from the fishing public. Questions such as "where is the best place to fish," "what can I catch," "which is the best season for 'x' species of fish," etc. are answered from various sources of information the OFMAS has access to. The OFMAS has also distributed approximately 25,000 "Know Your Fish" and "Angling Smart" posters to all county tax collector's offices and interested general public.

Artificial Reef Summit '93, hosted by OFMAS and Organization of Artificial Reefs (OAR) will be held May 4-6, 1993, in Tallahassee, Florida. Discussions will include two reef reference documents developed by OFMAS. These plans are intended to assist people throughout Florida with the development and monitoring of their artificial reefs. The Florida Artificial Reef Development Plan outlines parameters to consider and the procedures necessary to create a responsible and successful artificial reef program. The Florida Artificial Reef Monitoring Plan gives reef managers information on monitoring and evaluation in order to have a successful reef program.

Due to the passage by the Florida Legislature of the "New Limited Entry Lobster Fishery Law," the Spiny Lobster Trap Certificate Program has been established. Appeals Board applicants were interviewed and appointed and the first board meeting was held in Marathon, Florida, in late April 1992. The organizational meeting resulted in the selection of officers and a set of basic operational procedures. The Appeals Board has met eight times to date.

The OFMAS chief serves as the FDNR representative on the Aquaculture Interagency Coordinating Council (AICC). The AICC is mandated by the legislature to improve government cooperation and communication with the aquaculture industry. The AICC is charged with the compilation of an annual report and agency aquaculture activities to be submitted on December 1 of each year to the governor, the

legislature and the heads of each agency represented on the council. The OFMAS assists in the coordination of aquaculture activities within the FDNR and responds to general informational and multidivisional requests and Aquaculture Review Council (ARC) issues. Sections 597.005 and 597.006, F.S., creating the ARC and AICC is scheduled for repeal on October 1, 1993. The House Committee on Regulatory Reform engaged in a mandatory legislative review of those statutes as prescribed by the Regulatory Sundown Act, Section 11.611, F.S. The FDNR strongly recommended reenactment of these sections.

The OFMAS worked with the U.S. Fish and Wildlife Service at the Fort Lauderdale International Boat Show and American Fishing Tackle Manufacturers' Association (AFTMA) Fishing Expo to promote awareness of the Federal Aid in Sport Fishing Restoration Program.

OFMAS has also been working in cooperation with FDNR's Office of Communications to develop a magazine for Florida anglers which will provide information on habitat, fishing ethics, fisheries management and illustrations of regulated species.

The OFMAS coordinates FDNR mosquito policy between divisions. The OFMAS also serves on the Technical Subcommittee on Managed Marshes.

OFFICE OF PROTECTED SPECIES MANAGEMENT

The major objectives of this office are to: (1) coordinate the department's efforts of undertaking the tasks and realizing the objectives of the U.S. Fish and Wildlife Service's Florida Manatee Recovery Plan, (2) enhance coordination of the department's marine turtle management programs and develop additional funding sources for expansion of those programs, (3) provide coordination of on-going habitat protection efforts with emphasis on preservation of essential manatee and marine turtle habitat. The office also monitors the status of other marine mammal populations.

Staff continues to work closely with Collier, Broward, Dade and Brevard counties in review and development of comprehensive manatee protection plans (MPP) and continued coordination with other key counties. Contracts for boating activity studies are under negotiation in the following counties: Indian River Volusia, Palm Beach and Collier. A contract is being developed to assist Brevard County in undertaking/coordinating their MPP. Interim Duval County manatee protection zones were approved by the governor and cabinet in December with the county to submit its full manatee protection plan (including stronger speed zone measures) within one year. Sign plan reviews were coordinated between staff, the Florida Marine Patrol, the Florida Inland Navigation District and the individual counties. Hundreds of general information requests have been answered as well as specific requests for computer generated maps of speed zones, mortality data and telemetry data.

Permit review requests for projects that may impact marine turtles continue to be processed by staff. Meetings have been conducted with federal, local and private groups to coordinate marine turtle protection efforts and coordinate efforts of marine turtle permit holders. The Proposed Rule 16B-55 regarding model lighting ordinance was published in the Florida Administrative Weekly and a public comment period was opened. Draft guidelines to reduce impacts to marine turtles and their habitat from installation and maintenance of sand fences were prepared for internal review.

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES

OFFICE OF FISHERIES

During 1991 the Department participated in five task forces made up of fishing industry representatives, legislators and scientists, which have begun to review the way Louisiana manages its fisheries resources and prepare plans for the future. The Shrimp Task Force was established by Governor Roemer with an Executive Order while the Oyster Task Force and the Limited Entry Task Force were established by the Louisiana Legislature and the Crab Task Force and Finfish Panel were set up by the Department.

SHELLFISH SUBPROGRAM

Shrimp Seasons

During FY 90/91 the Marine Fisheries Division completed 2685 fishery independent trawl samples throughout coastal Louisiana. Data from these samples were used to set season frameworks for both the fall and spring inshore shrimp seasons and the winter offshore shrimp season closure. Additionally, a special spring pink shrimp season was set for a portion of Chandeleur Sound.

The spring inshore shrimp season in Zone 2 of Louisiana's inside waters ended at 12:01 p.m. Thursday, June 28, 1990, because of significant numbers of juvenile white shrimp being collected in samples taken on the shrimping grounds. The inshore waters of Zones 1 and 3 closed at noon on Wednesday, July 11, 1990.

The 1990 Fall inshore shrimp season was set to open at 6:00 a.m. on August 20, 1990, after the Wildlife and Fisheries Commission reviewed data submitted from samples on shrimp populations and associated conditions in the Louisiana marshes.

The Fall shrimp season in the inshore waters of Zone 2 closed at 12:01 a.m. on December 1, 1990. The offshore waters of Zone 2 closed at 12:01 a.m. on December 31, 1990. Both inshore and offshore waters in Zone 3 closed at 12:01 a.m. on December 21, 1990; in Zone 1 both inshore and offshore waters closed at 12:01 a.m. on December 31, 1990.

A special pink shrimp season for a portion of Chandeleur Sound was set for March 18 through April 13, 1991. During this season fishing was restricted to the hours from official sunset to official sunrise each night.

The annual meeting to set the spring inshore brown shrimp season was held at the University of New Orleans on May 2, 1991. Technical data presented to the Wildlife and Fisheries Commission at that time indicated that 50% of the brown shrimp in Zone 2 would reach harvestable size on about May 16, 1991. Data presented at that time also estimated that 50% would be reached in Zone 1 on about May 20, 1991 and in Zone 3 on around May 30, 1991. April environmental conditions indicated that water temperature and the number of hours water temperature was above 20°C generally followed that observed in good shrimp production years. Two other environmental parameters, rainfall and river discharge were well above normal and ranged in the same area as those figures calculated for poor production years.

Salinity readings for Barataria Bay were about the same level as found during poor years and number of acres of nursery above 10 ppt coastwide fell within the range of those calculated for poor production years. Brown shrimp catch per unit effort (CPUE) in 6 foot trawls across the coast in each study area and by Zone was generally lower prior to the Spring Shrimp meeting in 1991 than it was in 1990. Catch per unit effort in Zone 1 was relatively low as compared to Zones 2 and 3; CPUE in Zone 2 was higher than Zone 3.

During the last week of April, shrimp sizes across the coast were smaller prior to the Spring shrimp season in 1991 than in 1990. Sizes were largest in Terrebonne, Caillou and Barataria Bays where they averaged approximately 60 mm. Sizes along the rest of the coast ranged from a low of 32 mm in Zone 3 to about 50 mm in Zone 1.

Environmental conditions associated with shrimp production throughout coastal Louisiana continued to deteriorate during the time between the May 2 Commission meeting and the opening of the inshore shrimp season. Near constant rainfall and persistent southerly winds caused extensive flooding throughout much of coastal Louisiana. In Zone 2 when the season opened tides were 2-4 feet above normal. While the near constant rainfall lowered salinity levels to near zero in the upper bay systems, the persistent southerly winds and above normal tides slowed the normal drainage pattern and tended to mitigate the effects of the excessive amounts of rainfall on lower bay salinities.

A special two day shrimp season was held in Calcasieu Lake on May 7 and 8 to allow fishermen the opportunity to harvest overwintering white shrimp.

On May 5 just prior to the opening of the special season a frontal passage moved through the Calcasieu Lake area causing white shrimp in the lake to begin emigrating from Calcasieu Lake. Wingnet fishermen in the Calcasieu Ship Channel jetty on May 5 and 6 were catching 6,000 - 7,000 lbs. of 21-25 through 36-40 count (whole shrimp per pound) shrimp each night.

When special season opened approximately 250 boats (commercial and recreational) were noted fishing in Calcasieu Lake. Based on the observed effort and catch rates it is estimated that 75,000 pounds of 21-25 through 40-50 count white shrimp were harvested during the 2 day special season.

The spring inshore shrimp season opened in Zone 2 at 6:00 a.m. on May 16th with fishing conditions less than desirable. South and southeast winds had the bays rough and tides were 2-4 feet above normal with coastal flooding prevalent. Salinities in the upper bays were below 5 ppt and continuing to drop. With the exception of Vermilion Bay which produced very few shrimp, overall catches in Zone 2 on opening day were fair, although the brown shrimp were smaller than in past years.

Recreational fishermen in the eastern portion of Zone 2 averaged 50 pounds (one ice chest) of 80-100 count brown shrimp with a few large (21-25 or 31-35 count) white shrimp mixed in. Inshore commercial trawl catches averaged 200 pounds of 80-100 count brown shrimp. Inshore the wingnet fishermen caught significantly more shrimp per fishermen averaging 2,000 pounds of 70-80 and 80-100 count shrimp along the coast and 700 pounds of 80-100 count shrimp in the mid and upper marsh areas. Offshore catches were good with trawlers catching between 4000-5000 pounds of 70-80 and 80-100 count shrimp during a 3-5 day trip. Commercial fishermen also reported catching overwintering (21-25 to 31-35 count) white shrimp. Catches of white shrimp increased as you moved closer to the Atchafalaya River.

Two observations relative to the opening in Zone 2 as compared to the past 5 years were:

1. The absence of medium size (40-50 and 50-60 count) brown shrimp which are usually found in the lower bays and near offshore waters when the season opens.

2. The over all lack of effort this year as compared to past years. A check of license sales indicates through May 10 the Department sold 12,563 resident trawl licenses and 5,747 resident wingnet licenses as compared to 16,735 trawl and 8,142 wingnet licenses for the same time period of 1990. This coupled with flooded launches and anticipation of only small shrimp being available probably contributed to the low turnout on opening day.

The spring inshore shrimp season in both Zone 1 and Zone 3 opened at 6:00 am on May 30. Zone 1 was originally scheduled to open on May 23, however, continued biological monitoring by the department demonstrated the shrimp size in Zone 1 was not increasing as projected. On May 23 the original opening date for Zone 1 only 30% of the brown shrimp would have been 100 count or larger. By delaying the season one week to May 30 this percentage was increased to approximately 50% which is the department's management criteria for opening the season. Based on this information it was recommended the season be delayed until May 30.

When the season opened in Zone 1 and 3, fishermen found an environmental situation similar to that observed in Zone 2 (low salinities and above normal tides, although tides had receded some during the previous week). Overall catches in these areas were low with brown shrimp being small (80-100 count). Some overwintering white shrimp did show up in the catches.

Relative to opening day effort, in general it was well below what we had observed during the past years and in some areas it was as much as 75% below what we observed during 1990.

Task Forces

During FY 90/91 the Marine Fisheries Division provided technical support to two industry task forces. The Shrimp Task Force was established by Governor Roemer's Executive Order BR 89-11. The Shrimp Task Force is made of shrimp industry members from across coastal Louisiana and has been reviewing management of shrimp resources in Louisiana. The Shrimp Task Force also began developing a Shrimp Management Plan for Louisiana.

Additionally as a result of concerns from crab fishermen, the Department assisted in the formation of a Crab Task Force. Similar to the Shrimp Task Force, the Crab Task Force is made up of crab industry members from across coastal Louisiana. The Crab Task Force has been reviewing management of Louisiana's crab resources and working on a system to mark crab traps.

MOLLUSC SUBPROGRAM

Oyster Seasons

The 1991-92 oyster season on Louisiana's public oyster seed grounds except for "Sister Lake Oyster Seed Reservation" began 1/2 hour before sunrise on October 15. The Calcasieu and Sabine Lake public tonging reefs were also opened at that time.

The public grounds in Calcasieu and Sabine Lakes opened 1/2 hour before sunrise October 15 and remained open through April 1992. Gear was restricted to tongs only as prescribed by law. Provisions were made to prohibit the harvest if the State Department of Health and Hospitals declared those waters closed to shellfish harvesting.

Lease Auction

The Department during the period has lifted the moratorium on the taking of new oyster lease applications. From the beginning of 1992 through the end of June, 584 applications were filed and 357 new leases issued and the process is still continuing. An auction of all delinquent oyster leases was held on March 24, 1992. The auction included oyster leases on which rent was delinquent. Opening minimum bid for each lease was rental and penalty due.

FINFISH SUBPROGRAM

Administratively, the operation of the finfish subprograms changed, as the Finfish Section was merged into the remainder of the Marine Fisheries Division.

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. Preliminary "Biological and Fisheries Profile" documents have been developed for the following species: spotted seatrout, red drum, black drum, striped mullet, southern flounder, Atlantic croaker, spot, cobia, king and Spanish mackerel, red snapper, and several grouper species. These profiles include information on nomenclature, taxonomy, morphology, distribution, reproduction, nutrition and growth, behavior, environmental tolerances, habitat, and directed fishing activities. Some of these profiles are currently being updated and expanded and will be used as source documents for the development of individual Fishery Management Plans (FMPs). The FMP for the black drum has been completed, and is now being used as a basis for the management of the black drum resource of the state. Final drafts of the spotted seatrout and red drum FMPs have been produced, reviewed by external referees, and presented to the Louisiana Legislature and the Wildlife and Fisheries Commission. The spotted seatrout FMP has also been reviewed by the Marine Fisheries Panel. Drafts of the biological and fishery profile sections of the FMPs have been produced for mullet, sand seatrout and sheepshead, and these are in the process of inhouse review. The stock assessment and recommended management measures for these species are in preparation.

Monitoring

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

summarized for each coastal area on a monthly basis to give the resource managers information as to the current condition of the resource. The pertinent life history information for the important species is also used in developing analytical and predictive models.

Spotted Seatrout

The commercial harvest of spotted seatrout in state territorial waters was halted at midnight, August 2, 1991. The closure prohibited the commercial harvest, purchase, barter, trade and sale of spotted seatrout taken from Louisiana waters but did not prohibit dealers from possessing spotted seatrout legally taken prior to the date of the closure if appropriate records were maintained. Commercial harvest was suspended because technical projections indicated that the 1.25 million pound annual quota mandated by the legislature had been reached. Commercial mesh sizes for gill nets, trammel nets and seine nets other than strike nets increased to a minimum of 4 1/2 inches once the commercial speckled trout quota was reached.

Legislature enacted in 1988 set the commercial quota at 1,250,000 pounds per year with the commercial speckled trout season beginning September 1 each year. Once the quota is reached no vessel possessing or fishing any seine net, gill net, trammel net, or hoop net is allowed to have a speckled trout aboard. The commercial fishery operated under a 14 inch minimum size limit and the recreational fishery under a 12 inch minimum size limit. Recreational fishermen were also governed by a 25 fish per day bag and possession limit. All fish are required to have head and caudal fin (tail) intact when put ashore from a vessel or when sold.

Legislation passed in 1991 gave the Wildlife and Fisheries Commission authority to set sizes, possession limits, seasons, times, places and quotas for all marine fish species, including spotted seatrout. These rules are to be based on biological and technical data with the objective of conservation and management of the species for maximum benefit to the state without overfishing that leads to biological damage to the species.

Menhaden

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

The predictive models for earlier menhaden forecasts were based on 1964-1977 temperature (Guillory et al., 1983) and juvenile menhaden (Guillory and Bejarano, 1980) data. The availability of nine additional years (1979-1987) of commercial harvest data mandated that the earlier predictive models be updated and refined. A study was undertaken, utilizing the 1964-1987 data: (a) to investigate the relationship between Gulf menhaden year class strength (measured by catch-per-effort or harvest of age-1 fish) and juvenile menhaden indexes or environmental factors; and (b) to develop predictive models for Louisiana menhaden landings by number and weight. A major advantage of these new and updated predictive models is that total harvest, not just catch-per-effort, can be estimated. Effort was used in conjunction with juvenile indexes, environmental factors, or commercial harvest statistics in multiple regression equations. A forecast was made for an average 1990 year class (age-1's in 1991) and 1989 year class (age-2's in 1991) to enter the fishery in 1991. The projected Louisiana menhaden landings was in the 400,000 - 450,000 MT range. The 1990 forecast was for the fishery to be composed of two weak year-classes, and for Louisiana landings to be in the range of 500,000 to 550,000 metric tons. The 1990 menhaden landings for Louisiana were actually 509,000 metric tons.

Black Drum

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

In Fishing Year 90-91 (Sept. 90 - Aug. 91) preliminary figures from bull drum permit reports indicate a harvest of about 104,506 drum over 27". At an average of 15 pounds each, this translates to 1,567,590 lbs. of bull drum. No figures for harvest of drum less than 27" are available from this source. Data from landings reports of black drum are not reliably separable by size. Preliminary landings data indicate total landings of about 1,708,899 lbs. of black drum for the Sept. 90 - Aug. 91 period. Final quota figures are not available for fishing year 89-90 since part of that time period was not covered by these regulations, and the breakdown of landings by size were not reported.

Artificial Reefs

Louisiana's Artificial Reef Program began in 1987 with the legislature's acceptance of a comprehensive plan for siting artificial reefs in both state and federal waters. The first reef was created in October of 1987 when Oxy Corporation donated the jacket of a large eight-pile structure. The structure, located in South Marsh Island-146, was toppled in place in one of the eight planning areas selected by the Artificial Reef Council. Two more artificial reefs were created in 1988. Chevron contributed its South Timbalier-128 platform which is located in 102 feet of water approximately 20 miles southwest of Grand Isle. A cooperative effort between Exxon Corporation and Mobil Exploration and Producing, resulted in the transportation of a structure from offshore Texas to one of Louisiana's planning areas. In addition to the structures, the participating companies donate half of their savings realized through participation in the program. These monies are placed into a trust fund for administration of the program and maintenance of the reefs.

Several other oil and gas companies have come forward and participated in the program. These companies, which include CNG, Kerr McGee, Odeco, and Chevron, abandoned several structures in the summer of 1990. The jackets from these structures have been converted into artificial reefs.

The Program is also working on a project to create inshore artificial reefs from clam shell. Each reef will be approximately one acre in size and have two feet of relief.

State/Federal Cooperative Fishery Statistics

Since 1983, the Coastal Fisheries Institute (CFI) at Louisiana State University has worked cooperatively with the Louisiana Department of Wildlife and Fisheries and the NMFS in collecting urgently needed biological and catch/effort data on king mackerel in the western gulf. This program was so successful that it has since been expanded to include other recreationally and commercially important fishes managed by the federal government such as reef fish and shrimp. The information supplied by CFI to the NMFS over the last six years has been the only commercial data on king mackerel and red snapper available from the western gulf for use by NMFS and Gulf of Mexico Fishery Management Council statisticians. The continuing goal of this project is to obtain catch/effort data, sex ratios, ages, and length frequencies of king mackerel, other coastal pelagics like Spanish mackerel and tunas, sharks and reef fish landed by both commercial and recreational boats in Louisiana. In 1990, LDWF took over the role as

primary collector of Louisiana finfish landings data from NMFS. Monthly reports from wholesale/retail dealers were collected, checked for accuracy, and forwarded to NMFS for entry.

Sport Fish Restoration Program

In 1990, Louisiana used the marine share of its Sport Fish Restoration Funds in three activities: development of boat ramps to create access for fishermen, support of the Artificial Reef Program, and a project to develop fluorochrome markers.

Funds are provided to Louisiana State University through an interagency agreement for development and revision of the Louisiana Artificial Reef Plan.

The Department's interagency agreement with Louisiana State University to develop fluorochrome markers for tagging red drum and striped bass fingerlings is at the end of the project's second year. The objective of the first two years was to validate marking retention and performance of three classes of fluorescent compounds (tetracycline, calcein, and alizarin) in calcified tissue under controlled conditions. Based on the results of years 1 and 2, the alizarin compounds produce excellent marks for at least 16 months and have had no observed negative effects on the fish. Other fluorochromes have also been successful in marking calcified tissue. This project is funded through the Sport Fish Restoration Program.

STOCK ASSESSMENT SUBPROGRAM

Stock assessments were completed for spotted seatrout and red drum. Work began on a Unified Fisheries Database (UFD). By the end of the report period, field sampling crews were entering both fisheries dependent and fisheries independent data directly into a centralized database from their field stations. Work was underway to convert historical data into the UFD format.

HABITAT SUBPROGRAM

Louisiana Oil Port (LOOP)

The Louisiana Department of Wildlife and Fisheries' monthly environmental monitoring of LOOP operations continued during the program's fourteenth year. Sampling of demersal nekton, zooplankton, sediment, benthos, water chemistry and hydrographic parameters is conducted along a transect from the Gulf Intracoastal Waterway to the superport site located 20 miles offshore from Grand Isle. Other project activities included incident monitoring of supersaturated brine discharges and planning/preparation for marine oil spills. A data analysis project for long-term impact assessment was initiated.

Department of Energy (DOE)

Field sampling for this DOE-funded project, which is intended to monitor the environmental impacts of supersaturated brine discharges into the Gulf of Mexico from the West Hackberry Strategic Petroleum Reserves site, continued through 1990. Benthic sample analyses were completed in 1991 and work was begun on the final report.

Southeast Area Monitoring and Assessment Program (SEAMAP)

Louisiana sampled biological and environmental fishery independent data from a series of seven coastwide transects in the Territorial Sea for the tenth year. These sampling cruises are scheduled to coincide with the summer and fall shrimp/groundfish cruises conducted by the National Marine Fisheries Service in the northern Gulf of Mexico. The Department also continued its seventh year of fishery

independent data acquisition from the federal Exclusive Economic Zone with seasonal cruises sampling from the mouth of the Mississippi River to Atchafalaya Bay.

Caernarvon Biological Monitoring

The U. S. Army Corp of Engineers, with support from the Louisiana Department of Natural Resources and the 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 dependencies 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 resources.

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

The structure became operational in the spring of 1991, however, no water was diverted because salinities in the basin were very low due to high levels of the Mississippi River and excessive rainfall. In August a flow study was implemented by federal, state and local agencies and the avenues of freshwater dispersal were identified. Planned diversions began in September and continued through the remainder of the year. The structure was open for a total of 83 days during which time approximately 87.9 billion gallons of water were diverted into the basin.

MISSISSIPPI DEPARTMENT OF WILDLIFE, FISHERIES & PARKS, COASTAL OPERATIONS

BUREAU OF MARINE RESOURCES

The Bureau of Marine Resources (BMR) is a technically and functionally diverse division of the Mississippi Department of Wildlife, Fisheries and Parks with responsibilities that include saltwater fisheries and coastal wetlands' management and the promulgation and enforcement of state and Federal laws that pertain to the regulation of the use and harvest of coastal, estuarine and marine resources.

Division Objectives

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

The agency's regulatory functions, of course, are not to be overlooked. In concert with the Alabama Department of Natural Resources and the Louisiana Department of Wildlife and Fisheries and through its active roll as a participant in the Gulf States Marine Fisheries Commission and the Gulf of Mexico Fisheries Management Council, the Bureau's fisheries management program is geared towards providing for the continued wise utilization of fisheries resources while at the same time ensuring the health and vitality of the state's valuable renewable marine resources. Working jointly with scientists of the Gulf Coast Research Laboratory in Ocean Springs and the National Marine Fisheries Service, Bureau biologists continually monitor shellfish and finfish stocks in state waters and both sports and commercial harvest levels in order to provide the Mississippi Commission on Wildlife, Fisheries and Parks 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 Bureau 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 Bureau's strong enforcement arm 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 Bureau of Marine Resources highlighting the principal objectives and accomplishments of each during the past Fiscal Year.

Marine Division Administration

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

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

Routine staff meetings and briefings were also conducted throughout the Fiscal Year to provide staff with updates on legislative developments and other information relevant to the overall mission of the Mississippi Department of Wildlife, Fisheries and Parks.

Marine Fisheries

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

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

During FY92 the Marine Fisheries Division recommended some nine management regulations for adoption either through ordinance amendment or public notice. Changes were initiated through statutory requirements, participation in regional fishery management plans or through findings from research projects conducted on local marine populations. Effects from previous regulations, most notably on red drum stocks, have been monitored. Planning and project development, as well as actual work, continue on seventeen fisheries projects, ranging from red drum larvae to shrimp to oysters to cobia. Funding for research projects is sought through the Sports Fish restoration Act (Wallop-Breaux funds), the Interjurisdictional Fisheries Act, the Anadromous Fisheries Act, the Marine Fisheries Initiative and the Coastal Zone Management Act. Efforts from these funding sources provided data used to open, close and regulate the state's multimillion menhaden, shrimp, oyster, crab and finfish seafood industry - and the valuable marine recreational fishing industry. Division personnel not only gathered and analyzed fisheries data, but also served on regional committees and task forces dedicated to improve marine management, judged science fairs, helped at fishing rodeos, spoke to various civic and professional groups, investigated environmental perturbations and generally responded to the fishing public.

Marine Fisheries Management

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

1. To design and initiate projects for the collection and analysis of data required for population dynamics estimates, and other fisheries management related projects as may be required.
2. To develop management recommendations based on specific criteria.
3. To monitor the existing condition of the 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 Mississippi Commission on Wildlife, Fisheries and Parks in developing fishery management plans, amendments, stock assessments and technical analysis.
6. To provide a state representative to serve on fisheries related boards, committees, panels, etc. as may be required.
7. To provide for administrative services, general maintenance, the locating of suitable funding sources, and other fisheries management support services as may be required.

During FY 92 the Saltwater Fisheries Division drafted Ordinances 1.006 (Establishing regulations for harvesting, processing and sale of oysters); Ordinance 2.008 (Rules and regulations for commercial shrimping and re-defining saltboxes); Ordinance 5.007 (Banning gill and trammel nets within 1500 feet of the shoreline between the U.S. Highway 90 bridge and Bayou Cadet in Hancock County); Ordinance 7.009 (Making allowances for transporting filleted fish, possession of undersized fish lawfully caught in the waters of other states, allowance of spotted seatrout between 12" and 14"); Ordinance 9.002 (Data collection requirements); Ordinance 12.001 (Seafood transport permit regulations); Public Notice 3187 (Closing the commercial season for king mackerel); Public Notice 3194 (Reducing the recreational bag limit for king mackerel to one fish per person) and; Public Notice 3198 (Closing the commercial season for red snapper). Public hearings were held on the proposed ordinances and findings presented to the Commission on Wildlife, Fisheries and Parks for their approval and adoption.

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

Marine Fisheries Statistics

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

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

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

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

Monitor and Assess Shrimp Populations

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

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

King and Spanish Mackerel Studies

The primary objective of this project is to provide the National Marine Fisheries Service with length information and biological samples from king and Spanish mackerel and other species to be utilized for updating and formulating management measures.

During FY 92, the BMR received federal funds from a MARFIN grant. Lengths and biological samples were obtained for king and Spanish mackerel. The information was collected from charter boats, commercial fish houses, recreational fishermen, the Gulf Coast Research Laboratory and fishing tournaments. Otolith and tissue samples were taken and mailed, along with length information, to the Panama City National Marine Fisheries Laboratory for analysis. Totals for king mackerel are 156 lengths and 61 otolith and/or tissue samples collected. 1,222 lengths were collected for Spanish mackerel. Samples were obtained from several gear types including hook and line, gill net, beach seine and trawl.

In addition to mackerel, information on other species was collected. Lengths and biological samples were obtained for dolphin, amberjack, bluefish and little tunny from charter boats and fishing tournaments. Length information for red snapper, vermilion snapper, lane snapper, cobia, scamp, gag grouper, crevalle jack and gray triggerfish was collected from commercial fish houses, charter boats and recreational fishermen.

Mississippi Sound Creel Survey

The primary objective of this project is to conduct a point access creel survey of sportboat fishermen. Specifically, this project is designed to provide information on relative pressure at boat launch sites and piers along the Mississippi Gulf coast. Data 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).

A total of 37 aerial counts were conducted on 41 boat launch sites and 39 pier and jetty sites. The 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. Pier and jetty counts were conducted this year for use in the following year.

525 interviews were conducted from sport boat trips along the Mississippi Gulf coast. Thirteen species of fish comprised 97.41% of the catch; with sand seatrout, southern flounder and striped mullet constituting the most abundant species by number caught and retained. Estimates of total fishing pressure, catch and CPUE were 687.3 thousand angler hours, 406.5 thousand pounds and 1.69 fish per angler hour.

Monitor and Assessment, Mississippi Sound

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

In FY 92 the BMR received federal funds made possible from the Interjurisdictional Fisheries Act of 1986 (PL 99-659) and subcontracted with the Gulf Coast Research Laboratory for the work conducted by this project. This is an on-going project that samples the estuarine and marine biota with gillnets, dredges, trawls and seines. Monthly samples utilizing variable mesh sizes and located at different habitats yielded information on various life history stages of the major species exploited in Mississippi estuarine and marine waters. Investigations of biological and environmental data in this project include collection and analysis of data on commercial species of marine shellfish and finfishes in Mississippi territorial waters; biological data collection of certain select fishes with emphasis on mark/recapture studies, reproductive state assessment, otolith collections for age and growth studies; monitoring shrimp postlarvae and juveniles in coastal Mississippi waters; sampling survey of portunid crabs; live bait and commercial shrimp monitoring; and analysis of the roe mullet fishery in Mississippi waters.

Cobia Study

The project objectives are to determine age and growth, movement pattern, describe reproductive biology, and food habits of cobia occurring within Mississippi marine water and adjacent gulf waters and also to develop technique and information on maintaining cobia and culturing cobia.

In FY 92 the BMR 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 Gulf coast Research Laboratory (GCRL) for the study of cobia.

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

Red Drum Study

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

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

Striped Bass Study

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 BMR to the Gulf Coast Research Laboratory by the Anadromous Fish Act (PL89-304) and the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 669-669i) 50 CFR Part 80. The project is ongoing and in FY 92 approximately 14,312 striped bass fingerlings were tagged and stocked in the coastal tributaries of Mississippi. Evaluation of tag returns from fish tagged in previous years and interviews with sport fishermen, commercial fishermen, and fish camp operators indicate an increase in the striped bass population as a result of the restocking program.

Red Drum Reproduction Study

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

This project is partially funded through monies made available through the BMR to the Gulf Coast Research Laboratory by the Federal Aid in Sport Fish Restoration Act (Wallop-Breaux). These funds were utilized for one fall 1991 cruise to determine the abundance and densities of red drum larvae in coastal waters between the Mississippi River delta and Mobile Bay, as well as to complete analyzing previous samples.

Initial biomass estimates remain low. Factors contributing to this underestimation include extrusion of some of the smallest larvae through meshes of the sampling net and failure to account for unfertilized or non-viable eggs. Adjustments for these biases will be incorporated in final estimates. The timing of the cruises is a critical factor for this study, since environmental fluctuations often affect reproduction as well as physical sampling abilities.

Dramatic increases in larval abundance were found in studies on striped bass in Chesapeake Bay after regulations there protected the spawning stocks. Similar increases in red drum larval abundance have yet to be found here. Increased abundance of 1 - 2 year old red drum found here, may be attributed to the effectiveness of state and federal fisheries management practices for this species.

Spotted Seatrout Study

1. Develop and implement a fishery independent sampling protocol for the assessment of the population of adult/sub-adult spotted seatrout in Mississippi coastal waters.
2. Develop length-at-age estimates and population age structure for the population of adult/sub-adult spotted seatrout in Mississippi coastal waters.

3. Compile, analyze and summarize available data for the development of a stock assessment for the population of spotted seatrout in Mississippi coastal waters.
4. Develop and 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.

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

Oil and Gas Technical Assistance

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

During FY91 the Coastal Management staff conducted reviews, participated in meetings and initiated revisions to the state's oil spill contingency plan. Staff continued to track changes in federal oil spill legislation for potential application to the Mississippi Sound and other state waters and coastal wetland areas. Because of the limited oil and gas activities within the State's coastal waters much of the staff's attention was directed to activities occurring in Federal waters in the Outer Continental Shelf.

Coastal Zone Management Assistance

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

During FY92, the BMR received \$539,000 in federal funds from the Office of Ocean and Coastal Resource Management to meet coastal management objectives. Funds were used to provide administrative 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. The Coastal Management staff participated in two coastwide beach clean-ups, and reviewed all major federal actions in the coastal zone to determine if the activities were consistent with the State's coastal management plan. This review included dredging projects and oil and gas activities in the Outer Continental Shelf.

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

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

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

Wetlands Education and Protection

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

The Coastal Management staff achieved project objectives during FY92 by administering the provisions of the Coastal Wetlands Protection Law and the Mississippi Coastal Program. Staff began to review project applications for dockside gaming facilities in coastal areas during this reporting period with the anticipation of several more gaming projects review to follow. Significant staff efforts were made to develop aquaculture guidelines to address permitting requirements for both net pen operations proposed for an area south of Horn Island and for oyster culture near Cat Island. These guidelines resulted from the FY92 publication "Offshore and Sub-tidal Aquacultural Environmental Activities". There was a high level of cooperation among state and federal resource agencies and significant emphasis was placed on habitat restoration and enhancement activities during FY92. The wetlands staff developed a research project that will address historic erosion rates at Bellefontaine in Jackson County as well as continuing a cooperative effort in determining the value of wetlands via an EPA grant in Jackson County for future mitigation or wetlands replacement purposes.

Part of the state's fledgling "Coastal Preserves" reported under Coastal Zone Management Assistance, and one of the first actions of the program was the transfer from The Nature Conservancy to the Department of Wildlife, Fisheries & Parks/Bureau of Marine Resources, of approximately 575 acres of wetlands within the Graveline Bay system of Jackson County. Graveline Bay is a small estuarine system that serves an important role as a nursery area for commercial and recreationally important species.

The staff conducted site inspections and environmental assessments, sponsored meetings, and acted on a total of 300 wetlands cases in FY92.

Public Tidelands Trust

Mississippi Code Annotated 29-15-9 (Rev. 1990) provides for the disbursement of Public Trust Tidelands Fund to the Bureau of Marine Resources for certain activities for new programs for tidelands management. Such programs may include wetland research, acquisition, conservation and the enhancement of public access to the public trust tidelands status report.

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

TEXAS PARKS AND WILDLIFE DEPARTMENT

Texas Parks and Wildlife Coastal Fisheries Research Management Programs

The Coastal Fisheries Branch of the Texas Parks and Wildlife Department (TPWD) is responsible for making management recommendations regarding the state's saltwater fishery resources within the bays and estuaries and out to 9 nautical miles in the Gulf of Mexico. More than \$400 million is spent annually in Texas' 4 million acres of saltwater by approximately 20,000 commercial and over 1,000,000 recreational fishermen.

The goal of the Coastal Fisheries program is to develop management plans for selected fisheries within the concept of optimum yield. These plans include recommended harvest regulations, resource stock enhancements or habitat enhancements based on monitoring program data and the best scientific information available. The objectives of the Coastal Fisheries Branch are: (1) to recommend management strategies for the aquatic marine resources to the Division Director, the Executive Director, the Parks and Wildlife Commission and the Legislature based on the results of the scientific studies; (2) to determine the sizes and changes in the sizes of finfish and shellfish populations caused by environmental conditions and fishing; (3) to determine the landings of marine species and the associated social and economic characteristics of the fisheries; (4) to educate the consumer regarding high quality seafood products; (5) to restore, manage and enhance existing fishery populations through stock identification, life history, genetic and reproductive physiology research; establishing appropriate stocking ratios for selected marine organisms in Texas bays; and assessing the impacts of stocking on present populations and existing fisheries; and (6) to promote, develop, maintain, monitor, and enhance the artificial reef potential in the marine waters off Texas.

To achieve these objectives, the Branch is organized into five major functions or programs: Administration, Fisheries Resource Monitoring, Fisheries Harvest Monitoring, Marine Culture and Enhancement and Seafood Marketing. In FY91, a total of 39 technical reports, scientific journal articles and magazine articles about various aspects of the Texas coastal fishery resources were completed to aid in meeting the objectives.

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

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

The sport landings and fishermen activities are estimated from on-site creel interviews of sport boat fishermen at the completion of their trip. Samples are selected in proportion to the activity at a site (probability sampling); thus the higher use sites are sampled more frequently. Roving trailer and wet slip counts are used to assess relative pressure at sampling sites to ensure that proper sampling probabilities

are maintained. The charger fishery is randomly sampled on a continual basis within each of the bay systems of the coast by intercepting boats when trips are completed (party boats) or by accompanying the boat on fishing trips and assessing the landings (headboats). Shore-based (wade/bank, lighted piers, jetties) sport landings and fishermen activities are estimated through on-site surveys similar to those used for sport boat fishermen. Commercial landings are obtained from commercial seafood dealers through submission of Monthly Marine Products Reports and through on-site interviews of commercial fishermen at the completion of their trip.

The Perry R. Bass Marine Fisheries Research Station at Palacios was established to provide information and techniques necessary for the improvements of Texas fisheries management plans. Research effort is directed toward methods for improving fisheries management techniques and spawning and rearing marine fish and shellfish. Once developed, such techniques will be used to provide animals for stocking coastal bays and freshwater reservoirs and information on techniques will be made available to commercial mariculturists in Texas. Coastal Fisheries personnel cooperate with other coastal states in marine fisheries enhancement efforts through the transmittal of information and supply of available fishes.

As directed by the Texas Legislature, the Seafood Marketing Program was initiated to increase the utilization and value of seafood products. This charge is aimed at all functional levels within the marketing channel. The Seafood Marketing Program has operated through an interagency contract with Texas A&M University, the Texas Agriculture Extension Service, the Sea Grant College Program's Marine Advisory Service and the Texas Department of Agriculture. Several fisheries development foundations nationwide have also supported various work completed by the Seafood Marketing Program.

Activities in FY91 Included:

An Artificial Reef Management Plan was approved by the Parks and Wildlife Commission. Upon the adoption of the plan by the Parks and Wildlife Commission an Artificial Reef Advisory Committee was formed. The Branch also participated in the development, review and revision of Gulf of Mexico Fishery Management Council and Gulf States Marine Fisheries Commission management plans.

Recommended changes in regulations were adopted by the Parks and Wildlife Commissions to ensure stability of the resource. New size, and/or bag limits were adopted for greater amberjack, cobia, jewfish, mullet, lane snapper, red snapper, vermilion snapper and tarpon to prevent depletion and/or to conform with Federal regulations.

New rules were adopted which provide the Parks and Wildlife Commission the authority to regulate importation of commercially protected finfish into Texas. This proclamation provides packaging and shipping requirements for commercially protected finfish that are exported, imported or transported intrastate.

A total of 1,625 survey-days was spent to estimate landings and pressure of sport boat and shore-based fishermen. There were 760 gill net samples, 2,022 bag seine samples, 294 beach seine samples, 2,832 bay and gulf trawl samples and 2,472 oyster dredge samples collected. A total of 3,480 fishes was tagged and released. Approximately 8% were returned for rewards. The percent of tags returned was consistent with prior years.

About 4,100 yd³ of shell were used to rehabilitate about 80 acres of oyster reef in Galveston Bay.

Gulf of Mexico waters from Alabama to the Rio Grande were sampled to a depth of 300 feet during November 1990 and June-July 1991 with other Gulf States and NMFS. This effort, entitled the Southeast Area Monitoring and Assessment Program (SEAMAP), was coordinated by the GSMFC. Results

of sampling were used to evaluate the closure of gulf waters to shrimping and determine relative abundance of associated organisms.

Eastern oysters, red drum and spotted seatrout were collected in bays for electrophoresis analysis. Red drum were collected in the bays and Gulf of Mexico for mtDNA analysis in coordination with Texas A&M using MARFIN funds.

The commercial-vessel landings survey (210 survey days) was continued. Sites with seafood dealers were treated as a separate sampling stratum. Bait shrimp dealers and commercial-vessel docking structures were sampled in conjunction with the seafood dealer stratum or with the boat access site stratum.

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

Research effort directed toward spawning and rearing marine fish and shellfish was continued at the Perry R. Bass Marine Fisheries Research Station. Several fishes were maintained on a controlled photoperiod and temperature regime to induce sexual maturity and spawning which resulted in about 3.3 million spotted seatrout larvae for experimentation and stocking into bays. Pond culture studies included juvenile tarpon collected and being reared to maturity, spotted seatrout stock identification, red drum and oyster genetics research, oyster spawning, and otolith marking success studies.

Technical information concerning mariculture and commercial fish hatchery development was provided to other coastal states in a cooperative effort to enhance coastal marine fisheries.

The Seafood Marketing Program developed and distributed educational material, media articles, seafood curriculum newsletters and Texas seafood recipes through seafood outlets, media efforts, state fair events and state agencies. Educational programs and training courses were conducted for groups such as county agents, seafood producers and wholesalers and home economists. Several seafood cook-offs were coordinated for professional chefs in preparation for nationwide competitions.

NATIONAL MARINE FISHERIES SERVICE SOUTHEAST REGION (NMFS)

NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION (NOAA) U.S. DEPARTMENT OF COMMERCE

FISCAL YEAR 1991 ANNUAL REPORT

The National Marine Fisheries Service (NMFS) is an agency of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA).

The mission of the National Marine Fisheries Service is stewardship of the Nation's living marine resources. Through conservation and wise use, these resources and their habitat can be managed to benefit the Nation without jeopardizing options for the future.

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

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

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

The Southeast Fisheries Science Center is located in Miami, Florida, with laboratories located in Miami and Panama City, Florida; Pascagoula and Stennis Space Center, Mississippi; Beaufort, North Carolina; Charleston, South Carolina and Galveston, Texas. The Center conducts multidisciplinary research programs to provide management information to support national and regional programs of NMFS, and to respond to the needs of Regional Fishery Management Councils and other user groups. The Center develops the scientific base 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 development, fishery oceanography, food sciences, and fishery economics.

FISHERY RESOURCES

Goal: Improve the Status of Fishery Resources

Under the Magnuson Fishery Conservation and Management Act goal of "Americanization", the nation's fishery resources are almost fully utilized and many fish stocks have suffered from excessive fishing effort. Increasing competition for limited resources resulted in conflicts among users. The increase in effort often involves significant incidental catches of nontarget and protected species.

It has long been recognized that conservation and wise use of living marine resources require a sound management basis. NMFS prepares many specialized scientific reports to support management responsibilities and its ongoing scientific mission. A national report being prepared by NMFS is the most comprehensive status review of U.S. living marine resources ever made. It provides the best available scientific information on the health and abundance of important marine populations based on the latest assessments available in mid-1991. The Southeast Region completed the draft report for living marine resources in the southeast and Caribbean in August, 1991.

The report indicates the combined Long-term Potential Yield (LTPY) for southeast Atlantic, Gulf of Mexico and Caribbean living marine resources is estimated at about 1.4 million tons (16% of the national LTPY); recent catches have run about 80% of Current Potential Yield (CPY) and 77% of LTPY, and 17% of the United States total. Atlantic swordfish and bluefin tuna, many southeast Atlantic snappers and groupers, and Caribbean reef fish have been overutilized and some stocks are at low levels. The status of many other reef fish stocks is unknown, but likely to be overutilized. Individually, these stocks are minor portions of the catch, but in aggregate they have supported important recreational and commercial fisheries. The recreationally and commercially important coastal pelagic species (e.g., mackerels, and cobia) yield only about 53% of their estimated aggregate LTPY as a result of overutilization. Certain individual stocks are severely depressed, as are Gulf of Mexico king mackerel.

Currently, all commercially important shrimp species are being harvested at the LTPY level, but they could produce similar yields with considerably less effort if fishing mortality were reduced. The dominant catches are Gulf of Mexico brown, white, and pink shrimp, which represent 89% of the total shrimp catch, nationally. In 1990, those three species produced a total catch of 111,702 tons valued in excess of \$405 million.

Southeast Region Status of Stocks Highlights and significant FY 91 fishery management actions are addressed by species.

ATLANTIC HIGHLY MIGRATORY PELAGIC FISHERIES

The Atlantic oceanic pelagic resources are highly migratory species harvested over large geographic regions. U.S. fleets targeting these species are found in the northwestern Atlantic Ocean, Gulf of Mexico, and Caribbean Sea and are regulated by the Magnuson Fishery Conservation And Management Act as well as by the Atlantic Tunas Convention Act, consistent with the International Convention for the Conservation of Atlantic Tuna (ICCAT). The status of oceanic pelagic resources are evaluated for ICCAT by the ICCAT Standing Committee on Research and Statistics (SCRS).

Oceanic pelagics include: swordfish, bluefin tuna, yellowfin tuna, big eye tuna, albacore tuna, skipjack tuna, blue marlin, white marlin, sailfish, and longbill spearfish. Occasionally other tunas and pelagic species are taken.

A large recreational fishery for billfish exists in the United States and harvests significant amounts of blue marlin, white marlin, and sailfish, and occasionally longbill spearfish. Commercial harvest and sale of these species in the U.S. has been prohibited since September 1988. The species are subject to incidental capture on tuna and swordfish longlines.

Because of their highly migratory nature and ocean-wide distributions, both national and international organizations are involved in management of oceanic pelagics. Scientific stock assessments provide the bases for regulations. In the United States, fishery management plans have been developed for swordfish and the recreational billfish: blue marlin, white marlin, sailfish, and spearfish. Internationally, regulations on swordfish were implemented in 1991 and restrictions on bluefin tuna have been in effect for nearly a decade.

At least two Atlantic species, bluefin tuna and swordfish, are significantly overfished. In recent years fishing mortality for Atlantic swordfish has been excessive resulting in overfishing. Although international agreements for restricting swordfish harvests exist, additional measures may be needed to avoid further reductions in the productivity of the stock. Over-exploitation of bluefin tuna led to severely reduced and continuing declines in stock sizes.

The bycatch of marlins and sailfish in the tuna and swordfish fisheries is a concern, especially as commercial fisheries expand their efforts in areas of recreational billfish concentrations. The U.S. longline fishery directed at yellowfin tuna in the Gulf of Mexico and the expansion of the Spanish longline fleet in the tropical zone of the eastern Atlantic raise the specter of greater mortality on Atlantic tunas, swordfish, and recreational billfish.

Swordfish: The Fishery Conservation Amendments of 1990 transferred authority for management of Atlantic swordfish from the regional fishery management councils to the Secretary of Commerce. On June 12, 1991, the Secretary implemented emergency regulations for the Atlantic swordfish fishery that, in part: (1) established a minimum size limit; (2) set a total allowable catch that is allocated among the directed and bycatch fisheries as well as by gear categories; (3) provided for observer coverage; and (4) redefined the management unit to include the entire North Atlantic Ocean north of 5°N latitude. The emergency regulations were consistent with the 1990 ICCAT swordfish recommendations, but expired on December 9, 1991. On December 10, 1991, the Secretary implemented final regulations, under the Atlantic Tunas Convention Act, that continued the basic provisions of the emergency regulations and also revised some of the permitting and reporting requirements. An amendment to incorporate these, and possibly other measures, under Magnuson Act authority will be initiated in 1992. The NMFS Southeast Science Director serves as Coordinator for the ICCAT Billfish Enhancement Research Program. The large pelagic tagging program was significantly enhanced.

Atlantic Shark Fisheries

About 350 species of sharks have been described, with 72 species inhabiting waters along the eastern United States, Mexico, Puerto Rico, and the U.S. Virgin Islands. Pelagic sharks are exploited by longline fisheries both directly and as a bycatch. Shark meat has become a popular seafood. A substantial recreational fishery and directed commercial shark fishery occur in the same areas in the U.S. Atlantic coastal waters. Both fisheries target coastal sharks.

Recreational and commercial fishermen voiced concern regarding a perceived downward trend in shark availability. Finning, the removal of fins and discarding the carcasses reportedly a very common practice in commercial fishing operations, is criticized by several public elements. These problems were difficult to address in the past due to a rather severe lack of data from the fisheries. New reporting requirements were used to overcome the data deficiencies well enough to address the fishery under the standards and guidelines of the Magnuson Fishery Conservation and Management Act. A Secretarial Fishery Management Plan that addresses these and other concerns is expected to become effective in 1992.

The plan addresses the decline in abundance using quotas and a rebuilding plan, prevents finning by requiring that the fins be landed in proportion (5:1) to the number of carcasses, and deals with the lack of statistics by requiring logbooks and bills of sale. Problems still persist. Due to the poor quality of the available fishery statistics, the analytical results that are the bases of the plan are very uncertain. As additional data is collected through procedures in the FMP, these problems will be mitigated. It will take several years.

Atlantic Coastal Migratory Pelagic Fisheries

Coastal pelagics include king mackerel, Spanish mackerel, cero mackerel, dolphins and cobia and in the Gulf bluefish. The resources are distributed southward over a large region extending from the Gulf of Maine along the eastern United States and into Cuba, Central America, and South America as far as Brazil. Coastal pelagics are more inshore than the oceanic pelagics, but at times are preyed upon by nearshore oceanic pelagics, sharks, and bottlenose dolphins. The resource is sought by a variety of recreational and commercial interests.

Management of coastal pelagic resources is carried out under the Coastal Migratory Pelagic Fishery Management Plan. Joint management plans are established for this complex with regulations adopted by the Mid Atlantic, South Atlantic, and Gulf of Mexico Fishery Management Councils. Purse seines and drift gill nets are prohibited by regulations under the Coastal Pelagic Fishery Management Plan. Annual stock assessments are conducted for each separate stock. Only U.S. fishermen are regulated, but Mexican commercial yields are believed to be significant.

King and Spanish mackerel are managed by a combination of federal and state regulations. Commercial quotas were established in 1982, recreational bag limits in 1986, and allocations within user groups in 1987. Gear restrictions have been adopted on drift gill nets in the Gulf in 1987, purse seines in the Gulf in 1987, and drift gill nets in the Atlantic in 1990. There are permit systems and seasonal closures for commercial users and charterboat operators.

Large recreational fisheries for dolphin and cobia exist in the Atlantic and produce greater than 90% of the total annual yield. Some commercial catches of cobia occur incidentally in the mackerel hook and line fisheries. Dolphin and cobia are managed mainly through minimum harvest size regulations and creel limits adopted under the Coastal Pelagic Fishery Management Plan and by the states. A minimum size limit of 33 inches, fork-length, is in effect for cobia and 18 inches for dolphin. In addition, several states have adopted daily creel limits for both species. At present, no federal regulations exist for dolphin, Cero mackerel, little tunny or bluefish.

A major portion of the managed coastal pelagic resource is near or over maximum harvest. The coastal pelagic group is yielding about 53% of its perceived long term potential productivity. Three of the four mackerel stocks are overfished and have been managed according to a rigid rebuilding schedule since 1983. The mackerel stock likely to contribute the greatest yield over the long term, the Gulf king mackerel stock, is also the unit currently yielding the least. This stock is severely depressed. Recent average annual production from this unit is 25% of the maximum. The reduction in stock size and subsequent lost production potential was likely due to excessive fishing mortality occurring in the late 1970s through the early 1980s. Sparse data coupled with nonconservative management in the face of those uncertain data resulted in no significant management actions taken to reduce the mortality until 1986.

The Atlantic group of king mackerel is near maximum production. Spanish mackerel are below maximum levels of production, but are recovering.

ATLANTIC/GULF OF MEXICO/CARIBBEAN REEF FISH FISHERIES

Reef fish include species that prefer coral reefs, artificial structures or other hard-bottom areas, and tilefish that prefer sandy bottom areas. The range of reef fish extends from the shoreline to depths of approximately 150 fm, depending on the particular species and area. Excluding fishes taken in the marine aquarium trade, the management unit for reef fish includes approximately 100 species. Within the southeastern region of the United States, the unit is managed by three councils for federal waters, eight states, the Territory of U.S. Virgin Islands, and the Commonwealth of Puerto Rico.

Over 100 reef species are considered commercially or recreationally important. Although landings and value for an individual species are not large, reef fish in aggregate contribute significant landings, weight and value. Recent average commercial catch for the U.S. Atlantic and Gulf has been approximately 9000 mt with an ex-vessel value of \$48 million. Recreational fisheries for reef fish include more than 20 million angler-trips annually.

Reef fishes are prone to overfishing because of their life history characteristics that include long lives, slow growth, low natural mortality, large body size, delayed reproduction, and sex changes for some species. Most traditional fisheries are probably fully exploited or overfished. The red snapper, traditionally the most important reef fish in the Gulf of Mexico, is growth and recruitment overfished partly because of bycatch mortality involving the shrimp fishery. Eight out of the ten major species in the Atlantic headboat fishery show significant declines in average size since 1972. In the Caribbean, traditional mainstays of the fishery, such as Nassau grouper, practically disappeared and major target species in recent years, such as red hind, declined in total landings since the late 1970s. Increased landings for some species (amberjack, lane snapper, vermilion snapper) can be attributed to shifts in the fishery away from major traditional species.

Virtually all stocks for which quantitative reef fish assessments have been done were determined to be overutilized. Quantitative potential production estimates do not exist and the exact status of most stocks are unknown. It is expected that many of these stocks are overfished, and that the recreational and commercial sectors are probably losing a large potential yield. A large recreational component exists in the Atlantic and Gulf of Mexico. In the Caribbean Sea there exists a large artisanal fishery that historically harvested reef fish.

As stocks became less abundant, sequential overfishing occurred--fishermen shifted their effort to new species. Examples are the move to wreckfish in the Atlantic or to amberjack in Gulf and Atlantic from the historical target reef species. Some species, like grunts and triggerfish, are now large components of the recreational and commercial fishery stocks. These species have become important as more traditional species become increasingly difficult to catch.

There is a significant bycatch of red snapper in the shrimp trawl fishery. The incidental harvest and discard of red snapper juveniles and the fishing pressure on existing adult stocks have led to declines in red snapper recruitment. There is, also, indirect evidence of over utilization of reef fish stocks in the Atlantic. Catches demonstrate large declines in average size that are usually indicative of high mortality and declining stocks.

Research and management issues of concern are: (1) bycatch reduction for red snapper and other species in shrimp fisheries, (2) release mortality of undersized fishes, especially those caught from deeper waters, (3) identifying stocks (i.e., determine genetic structure and sources of recruitment on a geographical basis), (4) determining the importance and causes of recruitment variability, (5) determining long term potential yield by area and species, (6) recovering from overfishing of specific stocks (i.e., Jewfish, Nassau grouper, red snapper), (7) assessing fishing and bycatch mortality by specific gears (i.e., long-lines, wire fish traps), and (8) assessing the appropriateness of marine fishery reserves to manage reef fisheries, and (9) determining stock effects of habitat alteration and degradation (e.g., sea grasses, coral

reefs, mangroves, estuaries). An additional problem unique to reef fisheries is the need to balance traditional fisheries use with alternative uses such as ecotourism and sport diving.

Management Actions: An emergency action was prompted by the Gulf of Mexico Fishery Management Council to transfer speckled hind from the shallow-water to the deep-water grouper complex to eliminate a waste of speckled hind. After the quota for shallow-water groupers was harvested and the fishery was closed, a large number of speckled hind were taken in the deep-water fishery but could not be retained legally. An amendment to the Reef Fish FMP was processed to make this transfer permanent.

A regulatory amendment was approved that established a 4.0-million-pound total allowable catch (TAC) for red snapper. The TAC decreased the commercial quota from 3.10 to 2.04 million pounds, and maintained a 7-fish/person recreational bag limit. The commercial fishery reached its quota on August 24 and was closed.

An amendment to the shallow-water reef fish fishery of Puerto Rico and the Virgin Islands was approved. In addition to containing a definition of overfishing, the rule prohibited the harvest of Nassau grouper, closed an area to fishing during the red hind spawning season, and increased the minimum allowable mesh size for fish traps from 1.25 to 1.5 inches.

An emergency rule package was approved to prohibit bottom longlining on the wreckfish fishing grounds -- a geographically limited area of the Blake Plateau in the south Atlantic. The emergency was an increased potential for gear conflict. A small number of bottom longlines could preempt the limited fishing grounds from users of traditional vertically fished gear and cause irreparable damage to the Plateau by lost gear, coupled with the loss of wreckfish hooked on the lost gear. This prohibition is part of amendment 4.

Amendment 4 established size and bag limits for virtually all of the recreationally and commercially important reef fish species, provided for seasonal closures, and extensive gear restrictions. One of the most controversial gear restrictions was a prohibition of fish traps. NMFS Southeast Regional Operations Office and Southeast Fisheries Science Center provided extensive assistance to the Council in developing this amendment.

A regulatory amendment was approved that allowed a quota for wreckfish of 3 million pounds for the 1991/92 fishing season. The first million pounds was available during the first 3 months of the season, April 16 through July 15, and the second million pounds available from July 16 through October 15. The third million pounds was not made available during the last months of the fishing season, October 16 through January 14 (the fishery is closed during the spawning season -- January 15 through April 15), since the first 2 million pounds was not taken by the end of the season.

NMFS assisted the South Atlantic Council staff in performing economic analyses of the wreckfish Individual Transferable Quota (IT) system and provided extensive economic analyses of measures contained in Amendment 4 to the Snapper-Grouper FMP (bag limits, gear restrictions, size limits and spawning closures).

A final rule prohibiting the harvest and possession of jewfish in the south Atlantic exclusive economic zone (EEZ) was approved. Jewfish are now protected throughout their range in U.S. federal waters. A similar prohibition is contemplated by the Caribbean Council for waters under its jurisdiction.

SOUTHEAST DRUM AND CROAKER FISHERIES

These fisheries are supported by various species of the family Sciaenidae, and constitute important commercial and recreational resources in the southeast. They consist primarily of Atlantic croaker, spot,

red drum, black drum, kingfishes (whiting) and several species of sea trout predominated by spotted sea trout.

Large numbers of Atlantic croakers, spot and sand and silver seatrout are caught and killed as incidental catch of the shrimp industry. The most recent estimates of the 1972-1989 bycatch in the offshore shrimp fishery in the Gulf of Mexico averaged about 500 million spot, 1 billion sea trout and 7.5 billion croaker. These species constitute the bulk of biomass of the offshore finfish bycatch which averaged about 175 thousand metric tons during the 1980s.

The recreational harvest of these species in aggregate has been about equal in magnitude to the commercial harvest sold for human consumption. Most of the harvest of these species occurs in waters under state jurisdiction and are under state management authority. In recent years several states have established regulations that favor recreational use of the resources. This is particularly true for red drum and spotted sea trout where some states have prohibited commercial harvest.

A commercial purse seine fishery for adult red drum in federal waters of the Gulf of Mexico developed rapidly in the mid 1980s as a market developed based upon a new recipe for "blackened redfish." Prior to that time, nearly all red drum were harvested in inshore state waters as juvenile fish.

This situation eventually led to the development of a fishery management plan for Gulf of Mexico red drum and later to a similar plan for the Atlantic stock. Both plans ban fisheries for red drum in federal waters until prescribed escapement rates of juveniles into the adult stocks are achieved. This effectively bars any significant fishery on the adults so long as state regulations favor the continuation of substantial inshore fisheries on juveniles. State management actions to date have preserved the inshore nature of the harvest and allocated most or all of the harvest to recreational users.

The FMP for Atlantic Coast Red Drum prohibits the harvest of red drum in the EEZ off the mid-and South-Atlantic states until the resource is restored to a level that will support a fishery. The FMP is being coordinated with the Atlantic States Marine Fisheries Commission (ASMFC) red drum plan, currently being prepared.

SOUTHEASTERN MENHADEN AND BUTTERFISH FISHERIES

Menhaden: Menhaden are euryhaline species found in coastal and estuarine waters. Two species, the Atlantic and Gulf of Mexico menhaden, form large surface schools that support a large industrial fishery to produce fish meal, oil, and solubles. By weight sanded, menhaden is the largest fishery in the United States. The industry is vertically integrated with companies generally owning the vessels, spotter aircraft, and processing plants. An active bait fishery along the Atlantic and Gulf coasts harvests about 5% of that landed by the industrial fishery. Management for these fisheries is conducted by individual states through the Atlantic States Marine Fisheries Commission (ASMFC) and the Gulf States Marine Fisheries Commission (GSMFC).

The commercial value of Atlantic menhaden from 1985-1989 averaged \$31.9 million per year. The primary management concern for this stock has been growth overfishing, but maximum spawning potential also has remained low (less than 10%) since 1962. A management plan was adopted in 1982 by the ASMFC but not adopted by all states, and the fishery management plan is being rewritten by ASMFC.

The commercial value of Gulf menhaden for 1985-1989 averaged \$66.2 million dollars per year. Because this species is short-lived and has a high natural mortality, growth overfishing has not been of major concern. Management coordinated through the GSMFC consists of a six-month season (mid-April through mid-October) and closure of inside waters across the northern Gulf of Mexico.

The annual assessment of menhaden in the Gulf and south Atlantic was completed and presented to industry and affected state agencies.

Butterfish: A small purse seine fishery for butterfish is developing in the Gulf of Mexico. Although the potential for this fishery is relatively large (in excess of 30,000 mt), this potential has not been achieved. Annual yield peaked in 1988 at 4800 mt, and the average annual yield in 1986-90 excluding 1988 was 570 mt.

SOUTHEAST AND CARIBBEAN INVERTEBRATE FISHERIES

Shrimp: Commercial shrimp fisheries have existed since the latter part of the 19th century. At present, all commercially important shrimp species are being harvested at maximum levels. The fishery is over-capitalized and additional increases in effort will not significantly increase yield. Fishery management regulations in the Gulf of Mexico restrict shrimping by two closures of the shrimping grounds (brown shrimp off Texas and pink shrimp off Florida) and by a white shrimp size limit when taken in federal offshore waters and landed in Louisiana. These regulations are an attempt to optimize the economic yield of the fishery.

The dominant catches in the Gulf of Mexico consist of brown, white and pink shrimps. Their combined yield represents 89% of the total shrimp catch and 86% of the total for the U.S. landings. In 1990 alone, these three species had a total combined catch of 111,702 metric tons with a value of over \$405 million.

These three shrimp species are found in all continental shelf waters in the U.S. Gulf of Mexico inside 60 fathoms (fm). The greatest portion of the reported offshore catch of brown shrimp is taken at depths of 11-20 fm, white shrimp in 5 fm or less, and pink shrimp in 11-15 fm. The largest densities of brown shrimp occur off the Texas/Louisiana coast; the largest densities of pink shrimp occur off the southwest coast of Florida.

Gulf of Mexico shrimp fishery trends for the past 30 years indicate that both brown and white shrimp catch levels have significantly increased, while pink shrimp catch, which was very stable until about 1985, has declined the past few seasons and is now at an all time low. Recruitment levels for each of the species have generally shown the same trends as catch.

There has been a significant increase in the number of recruits produced per parent for brown shrimp, but no such significant increase is seen for white and pink shrimp. The increase for brown shrimp appears to be related to alterations in marsh habitat. Coastal subsidence and sea level rise in the northwestern Gulf is causing intertidal marshes to inundate longer and become more favorable for production of food for shrimp. It also has increased accessibility by creating more marsh edge, expanded estuarine area by salt water intrusion, and provided more protection from predation. As a result, the nursery function of marshes has been greatly magnified, resulting in an expansion in recruitment to the brown shrimp fishery. Since continued subsidence will lead to marsh deterioration and ultimate loss of supporting wetlands, current high fishery yields may not be indefinitely sustainable.

Gulf of Mexico Shrimp Plan: Completed an amendment to the Gulf Shrimp FMP that provides for rotational opening and closing of three separate areas to shrimping in the Tortugas Sanctuary for specified time periods.

The annual Tortugas pink shrimp fishery analysis was completed. The analysis shows that landings continue to decline. The cause appears to be environmental as fishing mortality is not sufficient to cause the decline.

An analysis of the Texas closure was completed and a Gulf-wide evaluation of similar closures in other parts of the Gulf was completed. This latter analysis showed that closures could increase the value of shrimp landings in the Gulf by more than \$30 million annually.

SOUTHEAST FLORIDA SPINY LOBSTER

Florida Spiny Lobster are managed under a joint Gulf of Mexico and South Atlantic Council Fishery Management Plan which is coordinated with Florida regulations. Management is based on a 3 inch minimum carapace size, a closed season from April 31 to August 5 to protect egg bearing females, some closed nursery areas, and recreational bag limits (6 per person per day or 24 per boat, whichever is greater). A controversial two day "sport" season occurs during the last full weekend before opening the regular season in August.

Total annual spiny lobster landings have been fairly stable during the 1980's fluctuating around 2,700 mt in the Gulf of Mexico. Record landings in 1989 of 3,200 mt were valued at approximately \$20 million. In the U.S. southern Atlantic region landings have averaged around 230 mt with a value of \$2 million. The fishery is considered overcapitalized with approximately 500,000 traps being used. The same yield could be obtained with half that number of traps. The fishery operates by using live undersized lobster to bait traps. These attract other lobster but due to mortality of attractants, approximately 30 to 50% of the yield is lost. The recreational component is large at the beginning of the season but the actual level of harvest is unknown. Yield depends on recruitment; few lobster large enough to enter the fishery escape capture to survive into the next season.

CARIBBEAN SPINY LOBSTER

Spiny lobster are caught primarily by fish traps, lobster traps, and divers. The Spiny Lobster Plan for the Caribbean fishery includes federal waters surrounding Puerto Rico and the U.S. Virgin Islands. Management is based on a minimum size of 3.5 inches carapace length and protection of egg bearing females.

The total annual spiny lobster landings for Puerto Rico averaged 144 mt over 23 years, but have fluctuated over time. They increased from 108 mt in 1972 to a high of 233 mt in 1979, and then declined to a low of 65 mt in 1988. Total reported annual spiny lobster landings from the U.S. Virgin Islands between 1980 and 1988 have remained relatively stable, averaging 19 mt. In Puerto Rico, growth overfishing appears to be a significant problem based on the large number of undersized lobster being landed and a nine-year decline in total landings. No precise data are available on fishing effort. The fishery appears fully exploited in U.S.V.I. and probably overexploited in Puerto Rico.

STONE CRABS

The Stone Crab fishery occurs primarily in southern Florida with some landings from more northern areas along the west Florida Coast. The Gulf of Mexico Stone Crab Fishery Management Plan was implemented in September 1979. Its regulations generally extend Florida regulations into the exclusive economic zone (EEZ). Regulations are based on a minimum claw size of 2 3/4 inches, biodegradable panels on traps, and closed seasons to protect egg bearing females. Depending on the size of the crab, there is a potential for claw regeneration when molting occurs. A continuing gear conflict between stone crab fishermen using traps and shrimp fishermen using trawls has existed off southwestern Florida. This has been mostly resolved in the EEZ by establishing a line between the two fisheries and by seasonal closures.

Annual catches (claw weight) have fluctuated around 1,200 to 1,400 mt in the Gulf of Mexico through the 1980's with a recent annual value of \$12 to \$15 million. Landings in the U.S. southern Atlantic region were much smaller averaging around 34 mt with a value of \$120,000. The number of traps

increased from 295,000 in 1979-80 to a high of 567,000 in 1984-85 and has since been relatively stable. Although the number of traps has remained relatively stable during recent years, the estimated seasonal fishing effort increased from 3.6 million trap-hauls in 1985 to 4.8 million in 1987. The net result has been a greater proportion of the total landings being harvested earlier in the season and a shortening of the effective season.

Recruitment to the fishery is dependent on habitat, particularly water quality and water flow management through the Everglades. The minimum size regulations ensure that harvested crabs have reproduced at least once before entering the fishery. It is unlikely under present recruitment conditions that the maximum production can exceed recent landings on a sustainable basis.

CONCH

Conch fisheries include primarily the queen conch (*Strombus gigas*) and other species of lesser importance. Conch are mostly harvested by divers and are easily overfished. Conch fisheries are currently closed in state and federal waters in Florida and in U.S. Virgin Islands territorial waters. A fishery management plan is being developed to manage the fishery in Puerto Rico and the U.S. Virgin Islands.

CORALS

Corals are managed as two groups: hard corals and soft corals. Hard corals are currently protected from harvest except for very small collections, under permit, for research and educational purposes only. Harvest is severely restricted because hard corals are generally slow growing and provide critical habitat for a host of species. The habitat value of corals is considered more important than their commercial value.

Soft corals include gorgonians and sea fans. Gorgonians are exploited on a limited basis (approximately 50,000 colonies per year) for the aquarium and pharmaceutical industries. Growth potential for most species is considered limited. Sea fans are protected from all exploitation except under permit for research and educational purposes only.

Gulf of Mexico and South Atlantic Coral Plan: Completed an amendment to the Coral FMP (joint Gulf and South Atlantic FMP) that establishes a quota for the harvest of octocorals.

SHRIMP BYCATCH

A regional planning program was initiated through the Gulf and South Atlantic Fisheries Development Foundation to develop a research plan for reducing shrimp trawler bycatch in the Gulf and south Atlantic shrimp fisheries. This is an "industry" led effort, but includes extensive involvement with state agencies, councils, commissions, recreational fishing organizations, environmental groups, Sea Grant, and NMFS. It is responding to the 1990 Magnuson Act bycatch amendment which mandates a 3-year research program before imposing management measures to reduce bycatch. This unique approach to planning and involvement of other interested parties was necessitated due to attitudes in the shrimp industry toward NMFS as a direct result of the trawler efficiency device (TED) regulations.

A research requirements document was prepared to expedite the bycatch planning effort and respond to the 1990 Magnuson Act bycatch amendment. This comprehensive document should help keep the research planning effort fully on track and will allow NMFS to "hit the ground running" if funds are available in 1992 for a greatly expanded bycatch study.

Extensive research was initiated in fiscal year 1991 to begin investigating gear options for reducing shrimp trawler bycatch. This is being done in full cooperation with industry (MARFIN funds provided in grants to industry to test and evaluate bycatch reduction devices (BRDs) and monitor bycatch).

Additionally, a limited amount of bycatch characterization research was initiated internally and through MARFIN and S-K grant awards.

FISHERY PERMITS

Processed 6,625 applications for permits, obtained and distributed 13,527 fish trap tags, and collected \$134,424 in fees. The table contains fishery-by-fishery totals.

FISHERY	PERMIT NUMBER	NUMBER TAGS	FEEES COLLECTED
Colombian	62		
Spiny Lobster	808		17,238.00
Octocoral	26		508.00
Mackerel	3306		64,653.00
Reef Fish	1622	10,133	52,025.00
Snapper/Grouper	58	3,394	
Swordfish	655		
Wreckfish	88		
TOTAL	6625	13,527	\$134,424.00

Computer programs were developed for handling all permit data and monitoring operations of the permitting tasks. A system was developed and implemented notifying permit holders on a twice-yearly basis of deficiencies in the submission of required catch and effort reports.

PROTECTED SPECIES

GOAL: INTEGRATE CONSERVATION OF PROTECTED SPECIES AND FISHERIES MANAGEMENT

Living marine resources that are afforded protection under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) are known as "protected species". NMFS is responsible for administering these laws. The Fish and Wildlife Service shares some responsibilities. The MMPA requires, among other things, assessing the populations of marine mammals and the level of incidental take per fishery to determine measures necessary to conserve the populations through fisheries management. Fishery resources and protected species are interactive members of the same ecosystems. Protected species are sometimes taken in fishery operations and some of these eat the same species as fishermen catch. NMFS, under the Magnuson Fishery Conservation and Management Act, has the legislative mandate to conserve, manage, and protect fisheries resources. Often the objectives of these laws conflict. NMFS' goal is to effectively manage fisheries and protect species in the marine ecosystem.

The NMFS national status of stocks draft report completed in August, 1991, addressed sea turtle and marine mammal stocks. The MMPA and ESA require regular status updates.

Thirty-six species of marine mammals inhabit waters of the western North Atlantic Ocean and the Gulf of Mexico, including 34 species of whales, dolphins, and porpoises. Six species found off the east coast are listed as endangered under the ESA. Of these, Atlantic right whales are critically depleted and

their long-term survival is in doubt. There is serious concern about mid-Atlantic coastal bottlenose dolphins. There are not enough data on other species to judge the current health of individual stocks.

Five species of sea turtles, the Kemp's ridley, loggerhead, green, hawksbill, and leather back, regularly spend all or part of their lives off the United States Atlantic coast, in U.S. territorial waters of the Caribbean and Gulf of Mexico. Very few stock assessment data exist for any sea turtle species in U.S. waters.

Studies of nesting densities provide a partial picture of population trends. The Kemp's ridley population experienced a major decline since 1947 from an estimated 40,000 nesting females in one day to less than 1,000 nests per year between 1978 and 1988. In recent years this number increased slightly. Loggerhead nesting populations have declined over the last 20-30 years on more northern U.S. beaches (e.g., Georgia and South Carolina). On the Atlantic beaches of south Florida, loggerheads have not shown a decline, and might even be increasing. Green turtle nestings on Florida beaches are low, but increased between 1971 and 1989. Hawksbill turtles are too few in U.S. waters for a trend analysis. Leatherbacks nest on beaches of the Virgin Islands and Puerto Rico. Although nesting records are too few to detect trends, their numbers do not appear to be declining.

Kemp's ridleys, leatherbacks, and hawksbills are listed as endangered throughout their ranges; green turtles are endangered in Florida, and threatened in all other locations; and loggerheads are listed as threatened throughout their range. Currently all five species are protected under the Endangered Species Act.

The ESA requires NMFS to develop and implement recovery plans for species that are listed as endangered or threatened. NMFS focused much of its ESA effort on sea turtles and some marine mammals. Teams were established by the NMFS and U.S. Fish and Wildlife Service in 1989 to prepare recovery plans for five species of sea turtles that occur in Southeast waters.

Four plans were completed for loggerhead, green, Kemp's ridley, and leatherback. The plans are undergoing agency and public review. A fifth plan for hawksbill turtles is being prepared.

Since 1978, NMFS has participated in a binational conservation program aimed at preventing extinction of the Kemp's Ridley sea turtle (*Lepidochelys kempi*). Headstarting is an experiment and represents a subordinate part of the overall recovery program whose primary focuses are protection of the nesting beach at Rancho Nuevo, Tamaulipas, Mexico, and reduction of mortality of sea turtles at sea. Headstarting of 2,000 or fewer Kemp's ridleys annually greatly increases survival during their first year of life as compared to their wild counterparts. Survivors are multi-tagged and released into the Gulf of Mexico in hopes that they will survive, grow, mature and reproduce.

A total of 2,000 hatching Kemp's Ridley sea turtles of the 1991 year-class arrived at the NMFS Galveston Laboratory on July 10, 1991 to continue the head start experiment. They are from the primary nesting site at Rancho Nuevo, Tamaulipas, Mexico. This is the 14th year-class of hatchlings received from Mexico since the recovery program began in 1978. The turtles will be reared at Galveston for about nine months, then tagged in several ways before release into the Gulf of Mexico.

Another major concern focuses on the incidental take of protected species in both domestic and foreign fisheries. Efforts in the Southeast are directed toward reducing the mortality of endangered and threatened sea turtles associated with domestic and foreign shrimp trawl fisheries.

The Department of Commerce published a final rule on June 29, 1987 requiring shrimp trawlers to adopt conservation measures to reduce sea turtle mortalities. The regulations were controversial and a series of legal challenges delayed implementation of these regulations. Regulations began in offshore waters on May 1, 1989 and in inshore waters on May 1, 1990.

Since enforcement of TED regulations began, compliance with the law improved. Most shrimpers operating in the Gulf of Mexico and southeast Atlantic now have TEDs in their nets when required.

A proposed rule was prepared to enhance compliance with the current regulations, improve enforcement capabilities and provide additional protection to turtles. The rule prohibits shrimp fishermen from modifying TEDs in any manner not specifically authorized in the regulations. It makes it mandatory for trawlers to install TEDs in each net rigged for fishing at all times in areas where TEDs are required, makes it illegal to fish for or take shrimp if not in compliance with the TED regulations, and establishes a generic description for hard TEDs.

NMFS drafted a separate rule that proposes to extend the seasonal requirement for the use of TEDs to year-round in all areas, requires the use of TEDs in inshore waters by shrimp vessels which do not use power or mechanically assisted trawl retrieval systems to retrieve trawls, eliminates the exemption from TED use in the rock shrimp fishery, exempts beam trawls, wing nets and bait shrimpers from the TED requirements, and makes other technical changes. The two rules were combined and are expected to be published for public review and comment in early 1992.

Meetings were held with the shrimp industry and environmental community to discuss the TED enforcement and conservation regulations. Workshops were held for shrimpers which defined current TED regulations and demonstrated legal and illegal TEDs. Meetings were conducted with a large number of gear manufacturers to explain current TED regulations.

Voluntary TED certification proposals were developed. Shrimp loss gear trials as a precursor to TED certification were conducted in cooperation with industry representatives. This involved permitting and placing observers on shrimp trawlers. TED certification trials were conducted in Canaveral Channel and off Panama City, Florida. The latter was done with headstarted loggerhead sea turtles. Two TEDs passed the certification trials.

A permitting policy for shrimpers to conduct shrimp loss tests and evaluate new TED concepts was prepared and submitted to NMFS headquarters.

Sea turtle research included stranding surveys, head starting, TED technology transfer, turtle distribution as a function of season and area, and shrimp loss in the shrimp fishery due to TEDs. The latter work showed that shrimp loss could be held to less than one percent with trained vessel crews.

Several grants were provided under MARFIN and S-K for TED technology transfer to Sea Grant programs and the Gulf and South Atlantic Fisheries Development Foundation.

Assistance was provided to the State Department to inform countries in Central and South America of the provisions of the new sea turtle conservation/shrimp embargo legislation (P.L. 101-162, Section 609). A statistical sampling design was developed for countries to conduct sea turtle incidental studies to prove compliance with the Legislation.

Proposals were developed for the Agency for International Development (AID) funding of TED technology transfer activities for foreign countries to comply with Sea Turtle Conservation/Shrimp Embargo Legislation (Public Law 101-162). A comprehensive proposal for all countries was developed. In addition, specific proposals were developed for Columbia, Venezuela, Honduras and El Salvador.

A comprehensive TED technology transfer training session was conducted for 11 countries in Panama City, Panama. As a direct result of the Panama training effort, a special workshop was held in Honduras, and one is planned in El Salvador. This work was funded by AID and conducted in cooperation with the State Department.

An association between sea turtle strandings and nominal shrimp fishing effort was observed in numerous shrimping areas of the southeast, but not in the northwestern Gulf of Mexico until recently. The relationship between sea turtle strandings and nominal shrimping effort in the northwestern Gulf of Mexico during 1986-1989 was examined. Significant positive correlations were detected between intervals on the upper coast and intervals on the lower coast, where intense shrimping took place. Loggerhead (*Caretta caretta*) and Kemp's ridley (*Lepidochelys kempi*) sea turtles were the dominant species in the strandings. Peak strandings occurred in April-May with a secondary peak in August. The observed correlations are consistent with direct observations from other studies that sea turtles are caught, stressed, and killed during shrimping.

NMFS cooperated with North Carolina to protect sea turtles during finfish trawling. Fifty sea turtles stranded coincident with the beginning of trawling for summer flounder. North Carolina closed state waters for two weeks in December, 1990, to finfish trawling. Examination of sea surface temperatures from satellites received by NMFS through NOAA's Coastwatch Program indicated the presence of extremely warm Gulf Stream water which it is believed provided a haven for fish and turtles, concentrating them along the beach. When the waters reopened vessels were required to use a modified TED and to keep a logbook to evaluate its effectiveness. NMFS provided assistance to local net makers on proper installation and use of the modified TED.

The affected area continues to be monitored. NMFS provides observers for aerial surveys and monitors sea surface temperatures. North Carolina plans to require the use of reduced tow times in this area until decreasing water temperatures force the turtles offshore and/or south.

A *Federal Register* notice (an advance Notice of Proposed Rulemaking) was prepared for considering and identifying other fisheries which take sea turtles.

Protected species are sometimes taken in or impacted by non-fishery operations.

Regulations were issued that prohibit feeding of marine mammals in the wild. Public hearings were held in Panama City, Florida and Corpus Christi, Texas. Final regulations were published.

Many operations that impact protected species involve habitat modification such as dredging of ship channels. A study was funded by the U.S. Army Corps of Engineers to assess the potential impacts on endangered and threatened sea turtles of dredging activities on the Texas coast. NMFS conducted a tracking study of one loggerhead and four green sea turtles at South Padre Island, Texas. Trackers use radio and sonic telemetry to monitor movements and diving behavior of turtles. The study was exceptionally successful in capturing, tagging and following turtles in several different inshore areas.

Guide lines were developed for ensuring sea turtle safety during powerboat races. This was in response to letters received from concerned citizens regarding turtles killed during a powerboat race offshore of Florida. The guidelines were widely distributed and discussed with the Coast Guard, State agencies and the Racing Association.

Section 7 of the ESA requires federal agencies to consult with NMFS to ensure that their activities do not adversely impact endangered species.

Formal consultations were conducted regarding amendments to the Gulf of Mexico Fishery Management Plans for Spiny Lobster, Stone Crab, and Shrimp and on proposed regulations governing U.S. fishing in Colombia's Treaty waters. Formal consultations were conducted on removal of oil well platforms by major oil companies in Texas; proposed deepening of Brunswick Harbor and Savannah Harbor in Georgia; proposed maintenance dredging of Georgetown Harbor, South Carolina; and Mineral Management Service's (MMS) proposed Lease Sale 139 off the mid-Atlantic.

A meeting was held with the Navy to discuss EMPRESS II Section 7 alternatives. The Navy currently is funding a major research effort to evaluate potential impacts of EMPRESS II on sea turtles and marine mammals.

A major breakthrough was achieved with the Corps of Engineers in establishing a regional policy for dredging channels. It will save hundreds of sea turtles annually. The policy prohibits hopper dredging except during a 4-month winter window unless data show that dredging will not kill significant numbers of turtles. Hopper dredging will be prohibited in Canaveral Channel indefinitely. This policy was incorporated into a draft biological opinion.

NMFS cooperated with the Minerals Management Service to remove oil platforms in the Gulf of Mexico. A long-term research program is being developed and funded by MMS to determine sea turtle and fish kills as a result of explosive rig removals, and ways to avoid this kill.

Information was developed in coordination with the Minerals Management Service and Corps of Engineers aimed at reducing impacts of projects affecting marine mammals. This coordination resulted in significant funding for NMFS and other research organizations in the Southeast Region for critically needed research projects.

MARINE MAMMAL EXEMPTION PROGRAM

NMFS is developing a long term program to address the incidental take of marine mammals in commercial fisheries. A draft Environmental Impact Statement is being prepared.

The Marine Mammal Exemption Program was established by Congress in recent amendments to the MMPA. The exemption program provides a five year period during which fishermen, under a certification program, report their incidental takes of marine mammals in commercial fisheries. With new and more complete data on the species and levels of marine mammal take, NMFS will develop a long-term management program to reduce or eliminate this take. Under the program 65 Marine Mammal Exemption Certificate renewals were processed and 14 new certificates were issued.

The voluntary marine mammal stranding network was administered to respond to numerous marine mammal strandings in the region and collect scientific data on stranded animals. The 1990 bottlenose dolphin anomalous mortality to the March-April 1991 strandings of pilot whales in Florida illustrated that the Southeast Marine Mammal Stranding Network faced inconsistencies in regular data collection and reporting that resulted in a lack of baseline information and the inability to monitor the stranding rate in a timely fashion. In an effort to assist the Network, NMFS provided funding and expertise to upgrade the network. NMFS staff at each laboratory and the Regional Operations Office were designated as area representatives to establish contacts with Network participants in their areas. This will facilitate near real-time monitoring and reporting of strandings. Quarterly newsletters and biennial meetings are planned.

INTERNATIONAL RELATIONS

The first U.S. regulations governing fishing by U.S. vessels in Colombian treaty waters was implemented. Certificates were obtained from Colombia and issued U.S. permits for 62 vessels to fish in treaty waters.

Southeast Fisheries Science Center scientists participated in a number of meetings and other activities related to swordfish and tuna management under ICCAT. Due primarily to the solid resource assessment, ICCAT proposed significant management measures to reduce fishing mortality of swordfish. NMFS regional management specialists cooperated extensively with headquarters personnel in drafting emergency regulations for swordfish and in developing regulations for bluefin tuna. The U.S. scientific

delegation for ICCAT held special planning sessions with headquarters, the northeast region and with constituency groups.

The Center provides technical representation in fisheries for WECAFE. The Science Director is the U.S. delegate to IOCARIBE and was part of the U.S. delegation to Venezuela for the Science and Technology agreement.

HABITAT AND ENVIRONMENT

GOAL: IMPROVE HABITAT PROTECTION

Habitat conservation of fishery habitat for continued production of fishery resources that are of benefit to the Nation is one of the National Marine Fisheries Service's missions. Associated resource management functions were carried out in close coordination with the Southeast Fisheries Science Center which conducted related research and provided needed technical assistance. Habitat conservation was attained principally through active participation in the planning and review of federal water-development projects; review of applications for work in waters of the United States; and a variety of local, state, and other federal conservation initiatives. Work was performed under authority of several major conservation statutes including: the Fish and Wildlife Coordination Act, the Magnuson Fishery Conservation and Management Act, the Marine Protection Research and Sanctuaries Act, the Endangered Species Act, the Marine Mammal Protection Act, the Clean Water Act, the National Environmental Policy Act, the Oil Pollution Control Act, and the Federal Power Act.

In 1991, action was taken on more than 3,521 activities in eight coastal states from North Carolina to Texas, as well as Puerto Rico and the U.S. Virgin Islands. This area includes more than 2,799 miles of coastline, 29,900 miles of tidal shoreline, and 300 estuarine systems. Associated estuaries contain about 17.2 million acres of marsh and other estuarine habitat, and about 5.1 million acres of intertidal area. They comprise about 83% of the coastal wetlands in the coterminous United States and include almost all of the Nation's mangrove swamps and most of its seagrasses.

Most efforts were geared toward activities that effectuated direct conservation of coastal habitats through minimization of adverse impacts. This approach is based on research findings that have demonstrated direct relationships between coastal habitat quality and abundance, and fishery production. In the southeastern United States, about 96% of the commercial and 70% of the recreationally caught fishery resources rely on estuaries during some phase of their life cycle. The utilization of these resources generates about \$20 billion in annual benefits for combined commercial and recreational activities. In addition to food production and recreation, wetlands and coastal habitats provide other useful benefits such as storm protection, flood-water retention, erosion protection, natural aesthetics, and waterfowl and fur bearer production.

Resource conservation within the NMFS was carried out in accordance with the agency's Strategic Plan and Habitat Conservation Policy. These specify a comprehensive functional approach to protecting and preserving coastal habitats and focuses on the following areas:

1. Review, Advisory, and Consultative Services
2. Coordination with Fishery Management Councils
3. Habitat Research and Management Coordination
4. National Oceanic and Atmospheric Administration (NOAA) Department of the Army Cooperative Agreement for a Program to Restore and Create Fish Habitat
5. Coastal Wetland Protection, Planning, and Restoration Act
6. Oil Spill Regional Response Team Activities

REVIEW, ADVISORY, AND CONSULTATIVE SERVICES

Coastal and estuarine areas of the southeastern United States provide habitat necessary for the production of commercially and recreationally important fishery resources. Fisheries are on the decline throughout the region and one of the main causative factors is the loss and degradation of habitat. If existing fisheries are to be maintained, habitat conservation must be a cornerstone of any fishery management effort. Review, advisory, and consultative services are structured to influence individual decisions of federal and state regulatory and construction agencies that have direct control over activities that adversely affect fishery habitats. Direct NMFS involvement in such decisions is one of the few mechanisms available whereby NMFS can actively influence human-induced habitat alterations. Since its inception, this activity affected thousands of proposals that, without our input, would have permitted the destruction of hundreds of thousands of acres of fishery habitat.

Under provisions of the Fish and Wildlife Conservation Act, the Rivers and Harbors Act, and the Clean Water Act, recommendations were provided on activities involving private and government proposals for work in waters of the United States. The importance of involvement in this area is revealed by our data on water-development activities involving Corps Of Engineers civil works and regulatory functions. In FY 1991, more than 3,521 projects involving wetlands alteration were reviewed. These included individual permit actions and Corps civil works projects. Table 1 provides data on a survey of habitat conservation efforts by state and Table 2 provides a summary of activities related to the various authorities we comment under. More than 18,789 wetland acres were proposed for alteration by 721 of the 3,521 projects reviewed this fiscal year. The Region recommended against altering 18,643 acres and accepted habitat modifications involving 4,559 acres. Approximately 14,230 acres were potentially conserved through implementation of NMFS recommendations. In addition, 128,740 acres of habitat mitigation projects also were recommended for implementation.

Specific activities undertaken this fiscal year are summarized in Tables 3 and 4.

COORDINATION WITH FISHERY MANAGEMENT COUNCILS

The Regional Fishery Management Councils must address habitat considerations in their fishery management plans. Plans must include identification of habitat requirements of the stock(s) comprising the management unit; an assessment of the condition of these habitats as they relate to the continued abundance and distribution of the species; identification of causes of pollution and habitat degradation; description of programs to protect, restore, preserve and enhance the habitat of stock(s) from destruction or degradation; and, proposed measures intended to preserve, protect, and restore habitat determined to be necessary for the life functions of the stock(s). Failure to adequately describe the condition of the fishery habitat and any likely changes to it may preclude fulfillment of several national standards and section 303(a)(1) of the Magnuson Act. Federal regulatory agencies must ensure that their actions are consistent with fishery management plans and are required to respond in detail (within 45 days) to issues addressed by the Councils. This mechanism provides an avenue where habitat considerations can be elevated in importance in association with public interest reviews and other mechanisms such as public hearings. These mechanisms are often valuable in meeting agency habitat conservation goals and in achieving the goal of no-net-loss of wetlands.

The Region is a member of the Gulf of Mexico, South Atlantic, and Caribbean Councils' Habitat Advisory Panels. Through close coordination, including attendance at AP meetings, assistance was provided to Councils Habitat Committees concerning issues that could affect FMP species. Assistance was provided the Fishery Management Councils in the development of habitat sections upon which conservation efforts for managed fisheries are based. Advice was provided the Councils regarding participation in habitat issues, provided assistance in the development of documentation and position statements, and provided briefings on relevant habitat related issues.

HABITAT RESEARCH AND MANAGEMENT COORDINATION

As mentioned previously, coastal and estuarine areas of the southeastern United States provide habitat necessary for the production of commercially and recreationally important fishery resources. The loss and degradation of habitat is one of the principal factors in the serious decline of many fish stocks. If existing fisheries are to be maintained, habitat conservation must be a cornerstone of fishery management efforts. In this vein, it is essential that appropriate research and analyses be conducted upon which management decisions regarding effects of various activities on fishery habitats can be based. Additionally, methods must be developed to mitigate for damages, including historical losses, and for habitat creation and enhancement. This requires close coordination between NMFS science and management branches to ensure that needs are prioritized and that appropriate issues requiring science attention are addressed.

Research and management staffs in the southeast have developed an effective and productive coordination process for addressing habitat-related matters. Examples include on significant water-development activities and especially those projects destined for higher level review in the Corps of Engineers; collaboration on preparation and reviews of scientific papers and research proposals; and continued dialogue on ongoing mitigation studies. Specific examples of this interaction include:

Reviewed and provided comments on a NMFS Southeast Fisheries Science Center information paper on Sargassum and its associated fauna. Sargassum is currently being harvested off NC with unknown impacts to sea turtles and other fishery resources.

Reviewed and provided comments on the Emergent Wetlands/Adjacent Uplands Protocol for the CoastWatch wetland mapping effort of the NOAA Coastal Ocean Program.

Participated with the Galveston Laboratory staff in a meeting involving the Houston-Galveston Ship Channel protect. Galveston Laboratory staff presented a draft plan for predator exclusion studies that will be performed in conjunction with planned benthic recovery studies.

Reviewed the proposed scope of work for benthic studies to be undertaken in the Gulfport Harbor Thin Layer Demonstration Project, MS. Final review and comment regarding the NMFS position will be provided by the Beaufort Laboratory.

Provided technical assistance concerning documents and planned action concerning the NOAA Strategic Plan for Coastal Habitat Conservation and National Ocean Service data synthesis efforts.

Coordinated with the Miami Laboratory staff in the review of a proposed technical publication on the importance of freshwater inflow into estuaries.

Participated with Galveston Laboratory staff in manning a public education booth at the Bay Day Festival. Bay Day is a two-day environmental awareness event sponsored by the Galveston Bay Foundation and the Galveston Bay National Estuary Program.

Coordinated with Center personnel in association with identification of habitat restoration sites to be considered by the NMFS Restoration Center.

Co-hosted a meeting in Atlanta with the Corps of Engineers and the Southeast Fisheries Science Center concerning the NMFS/Corps agreement for restoring coastal habitat. Washington, regional, and laboratory and field staffs discussed the new Cooperative Agreement and agency guidance for its implementation.

Provided comments to the Review Committee examining the utility of the NOAA/SAB Coastal Ocean Management, Planning, and Assessment System.

NOAA/DEPARTMENT OF THE ARMY COOPERATIVE AGREEMENT FOR A PROGRAM TO RESTORE AND CREATE FISH HABITAT

Within NOAA, the NMFS has primary responsibility for conservation, management, and development of the Nation's living marine resources. The NMFS Habitat Conservation Policy recognizes that mankind will inevitably alter marine, estuarine, and anadromous fish and shellfish habitats which are essential to maintaining the Nation's fisheries. The ability of these habitats to support fish production is diminishing while pressures for conversion for other uses are continuing. In accordance with the Policy, NMFS is proceeding to initiate and support habitat restoration and creation by federal, state, and local resource, construction, and regulatory agencies and the private sector. The basis and authority for this action are contained in the January 31, 1991, NOAA/Department of the Army Cooperative Agreement for a Program to Restore and Create Fish Habitat. This agreement was signed by the NOAA Under Secretary for Oceans and Atmosphere and the Acting Assistant Secretary of the Army (Civil Works).

Program guidance was received late in the fiscal year. A meeting was conducted with NMFS and U.S. Army Corps of Engineers and NMFS Headquarter's staffs for the purpose of familiarizing staff personnel with the NMFS/Corps Memorandum of Agreement concerning the restoration of aquatic habitats. Provisions of the Memorandum of Agreement were reviewed and tentative guidance regarding initiation of needed action was given. Coordination with the various Fishery Management Councils and appropriate state and federal agencies was also initiated. Development of potential fish restoration/creation features are well underway in some states.

COASTAL WETLAND PROTECTION, PLANNING, AND RESTORATION ACT

The NMFS is an active member of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Task Force involved in the development of a long-range plan to restore and protect coastal wetlands in the state of LA. As a Task Force participant, NMFS is responsible for identifying coastal wetlands areas that have suffered significant degradation and overall habitat value loss. These wetland areas are then evaluated for application of possible restoration or conservation measures. Consistent with long-range plans, the Task Force annually selects a number of wetland restoration projects that will be considered for funding by the Act. NMFS activities under this project have been delegated by the NOAA pursuant to requirements for agency participation under the Act (H.R. 5390, Title III).

Regional staff represented NOAA on various CWPPRA work groups and Task Force and Technical Committee activities. Assistance was provided in the development and review of habitat restoration projects and assisted the NMFS Restoration Center in the preparation of planning documents and with budget and manpower needs.

OIL SPILL REGIONAL RESPONSE TEAM ACTIVITIES

The Oil Pollution Act of 1990 and the Comprehensive Environmental Response, Compensation, and Liability Act require NOAA participation in activities related to the spill or release of oil or other hazardous substances. The primary function is to ensure that NOAA trust resources are considered within various processes. Work may range from participating in Oil Spill Regional Response Team activities, to assessment of damages, cleanup, and to restoration. NOAA does not presently have the capability (funds or manpower) to conduct this program throughout the Southeast. Consequently, NOAA has requested, and NMFS has agreed to assume this function for one year within the Regional Response Team Region VI which covers the western Gulf of Mexico.

Specific activities related to this element included:

Represented NOAA as Caribbean Response Team member for the VISTA BELLA oil spill in the U.S. Virgin Islands and Puerto Rico. The barge sank in about 2,000 feet of water and No. 6 fuel oil fouled local beaches. NOAA concerns were provided through conference calls with the federal On-Scene Coordinator and other Regional Response Team members.

Represented the Department of Commerce at meetings of the Federal Region VI Regional Response Team Preparedness and Management Committees and at Coast Guard spill drill including oil spill simulation drills and preparatory meetings involving the LA Offshore Oil Port, Inc., and Shell Oil Corporation. This included working with the Coast Guard federal On Scene Coordinator on planning for bioremediation and in-situ burning during spill simulation.

Presented a proposed Federal Region VI Environmental Monitoring Plan for Dispersant Use in Non-Life Threatening Situations. The Plan was forwarded to the full Regional Response Team where it was adopted and will be included in the Region VI Oil and Hazardous Materials Spill Contingency Plan

Attended a meeting of the Implementation Subgroup Subcommittee on National Bioremediation Spill Response. The meeting was conducted by EPA and involved development of the Region VI Team Bioremediation Spill Response Plan.

Represented the Department of Commerce at the quarterly meeting of the Region IV Standing Team and Team Work Groups in Nashville, TN. Discussed oil spill response, including various counter measures and monitoring, with the Director of the Texas A&M University Oil Spill School, who has been recently appointed Oil Spill Response Director for the TX General Land Office.

Participated in a workshop on the Oil Pollution Act Natural Resources Damage Assessment and Restoration Regulations. The regulations are being developed by NOAA General Counsel. Topics included coordination between spill response and natural resource trustee entities, early sampling and data collection, and early natural resource protection and restoration.

Provided comments on proposed federal Natural Resource Damage Assessment Regulations. The regulations are designed for use in implementing provisions of the Comprehensive Environmental Response, Compensation, and Liability Act.

TABLE 1. NMFS Habitat Conservation Efforts by State during Fiscal Year 1991

State	N1	N2	Acres Proposed for Alteration by Applicants	Acres Accepted by NMFS	Acres Potentially Conserved	Recommended Mitigation
NC	323	205	2106	1630	476	120
SC	354	146	929	475	454	199
GA	120	32	3203	536	2667	749
FL	1179	166	453	201	252	73
AL	178	31	106	98	8	87
MS	112	12	58	39	19	13

LA	700	63	10163	1035	9128	126972
TX	436	65	1767	545	1222	525
PR	91	1	4	0	4	0
VI	28	-	-	-	-	-
TOTAL	3521	729	18789	4559	14230	128738

N1 - Total Projects Reviewed

N2 - Number of Projects Sampled for Acreage Data

Table 2. Acres of habitat alterations proposed by applicants and reviewed by NMFS during Fiscal Year 1991 under the various federal regulatory programs.

Kind	N1	N2	Acres Proposed for Alteration by Applicants	Acres Accepted by NMFS	Acres Potentially Conserved	Recom- mended Mitigation
10	1364	97	986	432	54	249
10/404	1174	425	13133	1599	11534	127066
404	721	126	2309	730	1579	1035
CFP	42	26	2028	1742	286	56
CG	37	4	14	14	0	10
I10	17	1	1	0	1	0
I10/404	47	19	177	40	137	312
I404	118	23	141	2	139	12
EIS	1	-	-	-	-	-

N1 - Total projects reviewed in this category.

N2 - Number of projects where acreage was determined

10 = projects requested pursuant to Section 10 of the River and Harbor Act; 404 - projects requested pursuant to the Clean Water Act; 10/404 = projects advertised under Section 10 and 404 authorities; CFP = Corps Federal Project; CG = U.S. Coast Guard bridge/causeway permit application; I10, I404, and I10/404 = unauthorized projects; EIS = Environmental Impact Statement

COOPERATIVE PROGRAMS AND GRANTS

The Southeast Region 1991 Application Package State/federal and Anadromous Fish Grants Program was selected by NOAA Grants for use as a model to develop NOAA-wide guidelines.

Grants management guidelines were developed and issued to improve program efficiency and effectiveness. A Technical Monitor course and manual were prepared for NMFS Southeast Region programs. A tracking system for financial status reports for all Southeast Region grant programs and cash transactions was developed.

A MARFIN draft operating procedures handbook was prepared.

A Pioneer Grant was received to develop a Grants Application Automation System.

Staff served on a Gulf States Marine Fisheries Commission Steering Committee to develop a striped bass research/management strategy for restoration and management of stripers in the Gulf of Mexico. The planning system was discussed with state representatives and their efforts solicited to develop a comprehensive strategy that may result in a new funding initiative that will support cooperative Gulf striped bass research and management activities that emphasize the restoration of stripers through habitat, stock assessment, information and education, coordination of fishing regulations and fish population enhancement programs. Staff participated in the Commission's development of a five-year Gulf of Mexico Striped Bass Management Strategy. Assisted with the development of a Gulf-wide state/federal strategy for collecting data and managing striped bass in the Gulf of Mexico.

Fiscal Year 91 FINANCIAL ASSISTANCE AWARDS

Program	# of Awards	Total Amount
State/Federal Projects	10	\$ 805,135
PI 99-659	13	\$1,435,867
PL 89-304	7	\$ 131,958
SEAMAP	9	\$ 708,997
SK (FY 90)	18	\$1,304,315
MARFIN 25 1,530,153	25	\$1,530,153
Fishery Management Councils	3	\$2,817,000

FEDERAL AID IN FISHERIES REPORT

The annual "Federal Aid in Fisheries" report for Anadromous Fish Conservation and Interjurisdictional Fisheries Financial Assistance Programs was completed and is available.

ECONOMICS

The economics program was restructured due to the transfer and privatization of the Market News Service. It is dedicated to regulatory impact assessments and reviews, economic assessment analyses, bioeconomic stock assessments, and limited entry. The economics unit chairs the SAFE Report Task Groups in the Region. Accomplishments include an RIR for Shark Secretarial FMP, and economic analysis of regulatory options for an amendment to the Coastal Migratory Pelagics Plan, an analysis of regulatory options for an amendment to the Snapper-Grouper Plan, prepared economic sections for the DEIS on

marine mammal interactions with commercial fisheries, an assessment of the impact of TED adoption on the harvesting sector of the Gulf of Mexico shrimp industry, RIRs for the TED regulations.

Progress was made in developing an indirect cost model of the Southeast shrimp fishing industry and a fleet size model of the Gulf of Mexico shrimp fishery.

A shrimp bioeconomic model was developed to analyze the impacts of the Texas closure. This work was supplemented by cooperative work with Texas A&M University in improving their General Bioeconomic Fisheries Simulation model of the Gulf of Mexico shrimp fishery and with Louisiana State University in analyzing the inshore shrimp fishery in Louisiana and the impact of shrimp imports.

An economic analysis was provided of management alternatives for the Gulf of Mexico red snapper fishery in time for the Council to consider implications before reaching a decision of precise management measures.

An economic analysis was provided of the effects of establishing minimum size limits on 5 species of reef fish for the South Atlantic Council.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL
CY 1991 ADMINISTRATIVE COOPERATIVE AGREEMENT
JANUARY 1, 1991 THROUGH DECEMBER 31, 1991

NMFS STATUS REPORT ON FISHERIES MANAGEMENT PLAN (FMP) RULES

Amendment 1 to Coral FMP was implemented.
Certain areas of Tortugas Sanctuary were opened to shrimp fishing in 1991.
Proposed rule implementing Shrimp Amendment 5 was published for comment.
Stone Crab Amendment 4 was approved.
Spiny Lobster Amendment 3 was implemented.
Proposed rule implementing Reef Fish Amendment 3 was published for comment.
Commercial fishery for king mackerel in Eastern zone was closed.
The Gulf recreational fishery for Gulf king mackerel was closed.
Notice of withdrawal of Swordfish Amendment 1 was published.

COUNCIL ACTION ON FMPs

Coral FMP. Amendment 1 providing a definition of overfishing and regulating the harvest of octocoral was implemented. A petition on harvest of "live" rock was received. Action on a petition on harvest of "live" rock was deferred to March 1992.

Groundfish FMP. A stock assessment for the butterfish fishery was prepared by NMFS for the Council's review in the fall. A stock assessment for the butterfish fishery was reviewed by the Council and submitted to the Scientific and Statistical Committee (SSC) for peer review and to the Advisory Panel (AP) for advice on development of an FMP.

Mackerel FMP. Staff completed the options paper for Amendment 6 to the FMP. Options paper for Amendment 6 to the FMP was acted on by Gulf and South Atlantic Councils. Staff revised document. Stock Assessment Panel set Allowable Biological Catch (ABC) for Gulf and south Atlantic groups of mackerel. AP, SSC, and Council revised Assessment Panel report. Council set Total Allowable Catch (TAC) and bag limits and quotas for 1991/1992. These were submitted to NMFS by regulatory amendment. Draft Amendment 6 to the FMP was acted on by Gulf and South Atlantic Councils. Public hearings and AP/SSC reviews of the draft amendment were scheduled. Draft Amendment 6 was reviewed by the AP, SSC and public at seven hearings. Final action by the Council was scheduled for January 1992. An options paper for a limited entry system for the fishery was completed by staff and submitted to the management committee.

Red Drum FMP. Stock assessments by NMFS, FDNR and LDWF were reviewed by the Stock Assessment Panel, Socioeconomic Panel and SSC. The Stock Assessment Panel recommended ABC = zero. The Council set TAC at zero for the EEZ. The Council took action on an options paper for Amendment 3 to the FMP.

Reef Fish FMP. The Council's bag limit and quota under a TAC of 4 million pounds submitted as Regulatory Amendment for 1991 was approved. Amendment 3 to set the target date for restoration

of red snapper to the year 2007 was approved. The Council reviewed the use of explosives for removal of oil rigs with MMS and recommended the practice be terminated until studies on the impact of fish are completed. Staff drafted Amendment 4 to the FMP. The Council's bag limit and quota under a TAC of 4 million pounds submitted as Regulatory Amendment for 1991 was implemented. Amendment 4 was approved by the Council for implementation after holding public hearings (6) and AP/SSC reviews. Amendment 4 includes a four-year moratorium on issuance of commercial vessel permits. The stock assessment panel was convened to review assessments for red grouper, vermilion snapper, and amberjack. Stock assessments on red grouper and vermilion snapper and updated information on greater amberjack prepared by NMFS were reviewed by the Stock Assessment Panel who set ABC ranges for red grouper and vermilion snapper. The stock assessment and stock assessment panel report were reviewed by the Socioeconomic Assessment Panel, Reef Fish AP and SSC. The Council after considering recommendations of these groups and the public set TAC for shallow-water grouper in 1992 at 1.6 million pounds above the level for 1991. A regulatory amendment/RIR implementing this proposed change was submitted to NMFS. Amendment 4 instituting a three-year moratorium on issuing vessel permits was submitted to NMFS for review and implementation. NMFS and FMFC/FDNR were requested to complete biological and economic analyses related to adjusting the longline prohibited area and stressed area for Council review in May 1992. The Reef Fish Quota Monitoring Panel reported on projected commercial grouper and snapper landings for 1991.

Shark FMP. Council reviewed the Secretarial Shark FMP and recommended changes to NMFS. The Final Secretarial Shark FMP was distributed to Council for review in January 1992. Staff summarized previous Council comment on the draft FMP.

Shrimp FMP. Staff prepared an options paper for an amendment to FMP. Shrimp Amendment 5 addressing overfishing was approved by NMFS for implementation. The SSC and Shrimp AP reviewed monitoring information on the Tortugas closure. Ad Hoc Limited Entry Committee reviewed the first draft of a limited entry options paper. The Council approved and submitted to NMFS a regulatory amendment seasonally opening three small areas of the Tortugas Sanctuary. The Council approved Draft Amendment 6 for public hearings this fall. The amendment includes a definition of overfishing for white shrimp and proposed permits for all shrimp vessels. The Council referred the discussion paper for a shrimp limited access system to the AP for review and advice on setting up industry workshops. The Council participated in the regional Bycatch Steering Committee which is developing an industry-driven research program to monitor finfish bycatch and develop gear that reduces bycatch. Staff participated in a NMFS-funded economic task team that is developing an ITQ system. Staff participated in the shrimp resources workshop hosted by NMFS. The SSC, Shrimp AP and public at 11 hearings reviewed Draft Amendment 6/RIR. The amendment proposes permitting all vessels, requiring observers on vessels and defines overfishing for white shrimp. The Council will take final action on the amendment in January 1992. The limited entry options paper was reviewed by the AP who recommended workshops not be held until the States considered actions on limiting shrimping effort in their waters. The Council contracted the States regarding their proposed actions. The Council's representatives participated in the Bycatch Steering Committee which is developing the research protocol for assessing bycatch associated with shrimping and gear to reduce bycatch. Staff participated in the NOAA task team that is developing a discussion paper on ITQ systems for the fishery.

Spiny Lobster FMP. The Florida legislature approved a limited entry system for the fishery. Staff drafted an options paper for Amendment 4 which will extend the effort reduction system adopted by the Florida Legislative to the EEZ. This will be acted on in January and submitted to South Atlantic Council for their action.

Swordfish. Emergency rules were implemented. The final rule became effective.

Generic Amendment. The Council and committee took final action on an options paper to standardize the permitting and data collection provisions of the seven FMPs administered by the Council. Staff is developing the amendment for action in January 1992.

OTHER ACTIONS

Habitat Protection

Expressed Council's concern to Minerals Management Service about the effects of removing obsolete oil and gas production structures with explosives on Gulf finfish populations, especially red snapper, and requested that removal of structures consisting of more than three supports with explosives be halted until MMS completes its studies to determine fish mortality from explosives, and to determine effects of losing the platform environment on fish stocks.

Expressed dissatisfaction to EPA with their response to Council letter pertaining to their Mitigation Memorandum of Agreement with the Corps of Engineers, and listed specific questions for them to answer.

Sent reminders to agencies that failed to meet the 45-day response requirement within two weeks following due date.

Reviewed and endorsed the habitat protection recommendations of the National Symposium on Coastal Fish Habitat and the National Coalition for Marine Conservation's resolution to protect America's wetlands.

Texas Habitat Protection AP, Mississippi/Louisiana Habitat Protection AP and the Florida/Alabama Habitat Protection AP were convened to address habitat problems in those states. The Council modified its habitat policy (SOPPs) to provide for more expeditious action by the Council in addressing projects that impact the habitat. The Council commented on and supported the Corps of Engineers' feasibility report for the Sargent Beach segment of the Gulf Intracoastal Waterway project. The Council indicated to the chief of the Corps of Engineers the Council's interest in the completion of their Gulf Intracoastal Waterway investigation of maintenance dredging problems, stressing the importance of continued funding. The Council apprised the EPA, Texas Water Commission, and other institutions of Dream, Incorporated's experience with high mortality of shrimp nauplii when culturing in waters from Galveston Bay and vicinity and requested information on their awareness of the phenomenon, stressing the need for investigating it.

Limited Entry

Staff completed the first draft of a limited entry options paper of the shrimp fishery which was then reviewed and modified by Ad Hoc Limited Entry Committee. NMFS (Washington) initiated contractual agreements for developing the shrimp limited entry system for the Gulf with fishery economists. The Council submitted the discussion paper for the limited access system for the shrimp fishery to the AP and requested the States advise them of plans for effort control systems for state waters.

The spiny lobster limited entry program was drafted as a bill, introduced before the Florida legislature and subsequently enacted. Staff drafted an FMP amendment for spiny lobster to extend the state effort management system into the EEZ.

The Council submitted for implementation of Amendment 4, providing for a three-year moratorium on issuance of permits in the reef fish fishery, while provisions for a limited entry system are developed.

The Council proposed a similar moratorium in Draft Amendment 6 to the Mackerel FMP that was reviewed at public hearings.

Staff completed and submitted to the Committee an options paper for limited entry in the coastal migratory species (mackerel) fishery.

U.S. FISH AND WILDLIFE SERVICE

Gulf Coast Fisheries Coordination Office

A cooperative agreement was signed on December 11, 1990 between the Gulf States Marine Fisheries Commission (GSMFC), and the Fish and Wildlife Service (Service). This cooperative agreement focuses on several specific areas of cooperation in fisheries management in the Gulf of Mexico. A major focus is restoration of striped bass and other anadromous fishes. Under the agreement the Service established an office in Ocean Springs, Mississippi co-located with the GSMFC.

Administratively part of the Service's Fisheries Assistance Office (FAO) at Natchitoches, Louisiana, the Gulf Coast Fisheries Coordination Office (FCO) was established May 21, 1991. The Gulf Coast FCO provides a focal point for planning, program evaluation, and coordination of the Service's involvement in a variety of fisheries issues across the Gulf Coast, but primarily in efforts to restore and protect depleted stocks of interjurisdictional and other fish species. These primarily include anadromous species, such as striped bass, Gulf of Mexico sturgeon and Alabama shad, but also species listed as threatened or endangered, such as pallid sturgeon, or candidates for listing, such as paddlefish. The Gulf Coast FCO also provides a coordination role for Service activities related to estuarine fisheries and habitats. The Gulf Coast Fisheries Coordinator functions in promoting communication and supportive linkages between the Service, GSMFC, state agencies, other federal agencies and local organizations involved in Gulf of Mexico fisheries issues.

Anadromous Fisheries

Anadromous fish restoration strategic plan. Numerous Service personnel participated in developing the GSMFC's "Strategic plan for restoration and management of Gulf of Mexico anadromous fishes in the Gulf of Mexico" during a meeting in Mobile, Alabama, February 25-28, 1991. As part of an effort to begin implementing the strategic plan, the Natchitoches FAO gathered information on striped bass tagging across the Gulf as a step toward a summary of these activities. The Panama City FAO surveyed fish hatcheries involved with Gulf striped bass concerning fish handling and stocking practices. Also in this regard, the Gulf Coast FCO worked on a summary of legislative, regulatory and administrative mechanisms for protecting, enhancing or restoring anadromous fish habitats. Additionally, the Gulf Coast FCO summarized existing environmental education and public outreach efforts specifically targeted at anadromous fish restoration on the Gulf Coast. These summaries were presented at the GSMFC's fall meeting in October 1991.

Mississippi River coordination. The Natchitoches FAO chaired a second annual interagency (state and federal) meeting in Baton Rouge, Louisiana on February 6, 1991 to discuss striped bass in the Mississippi River. Participation in the meeting confirmed that there is considerable interest in striped bass as a resource in the lower Mississippi River. Partly in follow-up to this meeting, but also prompted by the recently-signed Mississippi Interstate Cooperative Resource Agreement (MICRA), and interest generated through the Mississippi Chapter of the American Fisheries Society, the Service began an effort to facilitate formation of a group to help coordinate management of Mississippi River resources, including anadromous fishes, south of the Missouri River. A coordination group composed of state agency representatives from the states along the lower river could serve as a forum for discussing and coordinating joint solutions to management problems common to the states along the river. Such a group

could function similarly to the Upper Mississippi River Conservation Committee, which has been in existence since the 1940's.

The Service's Regional Director issued a letter to state directors of the fish and wildlife agencies in Arkansas, Kentucky, Louisiana, Mississippi and Tennessee in January 1991 inquiring as to interest in establishing a lower Mississippi River coordination group. Positive responses were received from most of the directors, and interest was also expressed by the Missouri Department of Conservation. On June 3 Service officials met with representatives of the U.S. Army Corps of Engineers (CE), Lower Mississippi Valley Division (LMVD) in Vicksburg, Mississippi to begin planning an interagency meeting to discuss the formation of such a coordination body. Letters of invitation to such a meeting were sent to the directors of the state fish and wildlife agencies and water quality regulatory agencies of the lower Mississippi River states and key federal agencies on October 1, 1991. The meeting was planned for winter or spring of 1992.

Apalachicola-Chattahoochee-Flint rivers coordination. The Panama City FAO continued serving as coordinator of the Apalachicola-Chattahoochee-Flint River Striped Bass Restoration Committee. This committee, including the states of Alabama, Georgia and Florida, was established in 1985 and coordinates and plans striped bass broodstock collection, hatchery spawning and rearing programs and stocking strategies for the system. The committee holds a meeting each winter ("*Morone*" meeting) to discuss current issues.

Striped bass artificial spawning. During March 1991, Warm Springs National Fish Hatchery (NFH) (Georgia) personnel coordinated transport of wild broodstock captured by State of Georgia personnel in the Flint and Chattahoochee rivers. Broodstock were hauled to Warm Springs NFH for spawning, with the first broodfish arriving on March 23. Spawning activities were not as successful as in years past. Six captive and three wild broodfish were spawned. The wild fish produced 708,000 eggs; none hatched. The captive fish produced 2,275,000 eggs, with only 9,350 hatching. The fry produced at Warm Springs were supplemented with fry received from Mammoth Spring NFH, Arkansas for growout to phases I and II.

During April 1991 the Natchitoches FAO assisted Louisiana Department of Wildlife and Fisheries (LDWF) and Texas Parks and Wildlife Department (TPWD) personnel with striped bass broodfish collections at Toledo Bend Reservoir for fry production at the LDWF research facility there. Unusually heavy spring rains hampered collection of adequate numbers of broodfish, and hatchery operations were terminated, leaving over 60% of the quota of 12 million fry unmet. Fry produced at this hatchery were distributed to various state and federal hatcheries in Louisiana and Texas for growth to Phases I and II. A total of 3,826,000 fry were sent to the Natchitoches NFH.

Also during April, personnel from the San Marcos FAO (Texas), the San Marcos NFH and Technology Center, and the Region 2 (Albuquerque, New Mexico) office assisted TPWD personnel with broodfish capture in the Trinity River.

The Panama City FAO delivered 39 striped bass broodstock collected by the Florida Game and Freshwater Fish Commission in the Apalachicola River to Welaka NFH, Florida and Blackwater State Fish Hatchery, Florida, for spawning.

Warm Springs and Mammoth Spring (Arkansas) NFHs cooperated with Dr. Craig Sullivan of North Carolina State University in experimental use of hormone implants for artificially spawning resident striped bass broodstock. Using the technique, Mammoth Spring NFH produced almost 2 million Gulf striped bass during April 1991. Many more eligible brood fish could have been spawned if sufficient spawning tanks had been available.

Striped bass production, stocking and tagging. During Fall 1991 the Natchitoches FAO and Natchitoches NFH, Natchitoches, Louisiana, assisted the LDWF in tagging and transporting Phase II striped bass for release in Louisiana rivers. A total of 2,500 tagged fish were released into the Mississippi, Tangipahoa, Pearl, Calcasieu, and Sabine Rivers as well as Toledo Bend Reservoir during autumn. Since 1987 10,000 Phase II fish have been released in these rivers. Less than 50 tag returns have resulted from these releases, and approximately half of these have come from the Calcasieu River, the only river where fish were released into brackish water. Tags from very few fish over 1.5 years old were returned. These fish were all produced from broodstock collected at Toledo Bend Reservoir.

Welaka NFH, Florida, received 20 female and 15 male striped bass broodfish from the Apalachicola River during Spring 1991. Of the fry produced from these fish, 130,500 were distributed as fingerlings to Lake Seminole, Georgia, 42,000 to Lake Talquin, Florida, and 115,600 released into the Lower Apalachicola River, Florida. In addition, Welaka NFH retained 1400 fingerlings as broodstock.

During Fall 1991 Carbon Hill NFH, Alabama, delivered 52,900 Phase II striped bass to the State of Alabama at Gulf Shores to be tagged and released in Alabama coastal waters.

Warm Springs NFH, Georgia, provided the Service's Southeastern Fish Cultural Laboratory in Marion, Alabama, with 1100 Phase II Gulf race striped bass in November 1990 for a study comparing the use of various salts and concentrations in hauling Phase II striped bass from a soft water hatchery. In December 1990 Warm Springs NFH, with assistance from Welaka NFH and the Panama City FAO released 16,800 Gulf race striped bass into the Apalachicola River. The hatchery released 460 Phase II striped bass at the mouth of the Apalachicola River on April 10, 1991; these fish were excess 1990 broodfish. Warm Springs NFH stocked 17,240 Phase II striped bass in Apalachicola River and Bay in 1991. At the end of 1991 the Warm Springs was holding 3000 fingerling striped bass produced from 1991 Apalachicola River broodstock; these fingerlings were being held for future broodstock.

Fish and Wildlife Service hatcheries in Texas spawned broodfish and reared fingerlings for restoration stocking on the Texas Gulf Coast in 1991. A total of 250,000 Phase I striped bass were stocked in the Trinity River and 183,400 in the Sabine River. In addition, 6,260 Phase II fingerlings were reared at San Marcos NFH, tagged with coded wire tags, and stocked in the Trinity River.

Personnel from Edenton NFH, North Carolina, visited Warm Springs and Mammoth Spring NFHs during December 1991 to provide suggestions and ideas concerning striped bass rearing techniques. The insights provided should benefit Gulf striped bass restoration efforts.

Striped bass Phase II stocking evaluation, Lower Apalachicola River. A total of 2050 Phase II striped bass of three genotypes were tagged and released into the Lower Apalachicola River in December 1990. The Panama City FAO is studying comparative survival, growth and movement of the three genotypes as well as comparing tag return rates from two stocking locations with different salinities. A reward program was used to encourage tag return by anglers. By the end of 1991, 43 tags had been returned. Preliminary data indicate a higher return rate for the C-2 genotype, less movement by the B-2 genotype, and greater return rates for fish stocked in higher salinity water.

Striped bass genetic studies. The Panama City FAO contracted with Dr. Ike Wirgin of the University of New York Medical Center to conduct mitochondrial DNA and nuclear DNA analyses to determine genetic characteristics of striped bass collected from the Apalachicola-Chattahoochee-Flint rivers system during 1991. Thirty striped bass analyzed contained four basic genotypes. Also as part of this study, Welaka NFH sent 170,000 Gulf striped bass eggs to Dr. Wirgin in April; this study is ongoing. Warm Springs NFH supplied Dr. Reginal Harrell of the University of South Carolina with Gulf race striped bass in August 1991 for use in mitochondrial DNA studies and genetic probe development.

Striped bass culture studies. Warm Springs NFH, Georgia initiated a study on broodstock diet during 1990; however, the study was inconclusive due to the poor overall spawning results in 1991. Another study at Warm Springs involved the use of a heat exchanger system to control temperature in tanks holding striped bass broodfish. Broodfish were held in the temperature controlled tanks for varying periods during 1990 and 1991. Since the fish in the test tanks as well as the controls were unsuccessful spawners in 1991, the results are inconclusive. Following the 1991 spawning season the Warm Springs hatchery began experimenting with photoperiod as well as temperature control in the holding tanks and the use of incandescent lights instead of fluorescent lights in the spawning building.

Warm Springs and Mammoth Spring (Arkansas) NFHs cooperated with Dr. Craig Sullivan of North Carolina State University in experimental use of hormone implants for artificially spawning captive striped bass broodstock.

Striped bass age and growth in the Mississippi River. The Natchitoches FAO obtained otoliths and length/weight data from almost 100 age 2-6 striped bass from the Sabine, Mississippi and Atchafalaya river systems for age and growth comparisons. Four volunteers were also recruited to collect and return striped bass otoliths, with length and weight data, from the states of Mississippi and Louisiana. There are indications that striped bass in the Mississippi River grow at a much slower rate than do those in some other rivers. Sabine River fish may reach over 40 pounds, are in good condition, and are growing to 9-11 pounds by Age 3+. However, fish from the Mississippi and Atchafalaya Rivers are more lean and average only 3-4 pounds at 3+ years. Reports have been received, however, of large striped bass (15-40 pounds) being caught by commercial fishermen in the Mississippi River near Greenville, Mississippi. The FAO will seek opportunities to gather age data from such fish during winter 1991-92 and will continue to build a data set on age and condition of striped bass in these river systems. While observations at this point are still preliminary, the results of the effort will be prepared for publication once an adequate data set has been developed. Dr. Jan Dean, Professor of Biology and Fisheries at Northwestern State University (NSU) in Natchitoches, Louisiana, is assisting with data analysis.

Striped bass movements and habitats in the Sabine and Mississippi rivers. In March 1991 the Natchitoches FAO developed a proposal to study movements of striped bass in the Sabine and Mississippi Rivers; the proposal was submitted to BP America (BP) in support of a challenge grant request. The request resulted in a grant by BP to the Service of \$20,800 for partially funding the study. Service funds were obligated for purchase of transmitters and telemetry monitoring equipment late in 1991.

Striped bass reproduction studies. The Natchitoches FAO assisted LDWF biologists with beach seine collections near the mouth of the Mississippi River in June 1991 as part of a project funded by the National Marine Fisheries Service (NMFS) to investigate the possible presence of juvenile striped bass. Many young *Morone* were collected, but from field identification they all appeared to be yellow or white bass. Representative specimens were preserved for laboratory examination.

Gulf of Mexico sturgeon listing and recovery. The Gulf of Mexico (Gulf) sturgeon was listed as a threatened species on October 1, 1991. The listing action involved personnel of the Service's Fish and Wildlife Enhancement (FWE) office at Jacksonville and the FWE Office and FAO at Panama City, Florida. Personnel of the Service participated in meetings held October 1-2 and December 11-12, 1991 at Panama City, Florida, to continue work on a GSMFC fishery management plan (FMP) for the species. Following listing as threatened, a decision was made to utilize the draft FMP as a springboard for developing a recovery plan for the Gulf sturgeon, and a recovery team was formed late in December. The recovery plan and FMP will be combined in a single document.

Gulf sturgeon telemetry study in the Apalachicola River/estuary. The Panama City FAO continued intermittent tracking of Gulf sturgeon previously tagged with radio and sonic transmitters. Two additional fish were also tagged during November 1990. Additional tagging will be discontinued

pending completion of the Gulf sturgeon recovery plan and completion of testing for the combination radio/sonic transmitter presently being developed. Intermittent checks of previously tagged fish will continue opportunistically in conjunction with other projects.

Gulf sturgeon population study in the Apalachicola River. This study of population size and individual growth rates by the Panama City FAO has been ongoing since 1983. High water conditions prevented adequate sampling and an accurate population estimate for 1991. However, 62% of the fish collected were less than five years old, reinforcing the belief that successful natural reproduction by the this species is occurring in the Apalachicola River.

Gulf sturgeon age and growth in the Apalachicola River. This study by the Panama City FAO involved estimating age using pectoral fin rays collected from 76 Gulf sturgeon in the Apalachicola River during 1982-1990. Specific objectives were to determine age class structure, growth, validation of annual rings, and determination of age at which transition from juvenile to adult takes place. An age-length key was developed using total lengths and ages of known-aged fish. Strong year classes were observed for 1979 and 1982. Determination of juvenile transition was inconclusive. The report on this project will be prepared for publication in 1992.

Gulf sturgeon artificial propagation study in the Suwannee River. The Panama City FAO concluded this three-year study during 1991. Objectives were to develop techniques of artificial propagation for the species and produce a spawning and hatching manual. The Caribbean Conservation Corporation and Dr. Frank Chapman of the University of Florida, Gainesville, cooperated in the effort. The hatchery was operated from February 10 to April 23. Fewer sturgeon were available as spawning candidates due to high water. One female was induced and ovulated. About 51,000 eggs were fertilized with milt from two males. The 6,200 fry produced were transferred to the National Fisheries Research Center in Gainesville, Florida for fish culture research. Spawning and hatching techniques were described in a draft paper.

Food habits studies on the Gulf sturgeon in the Suwannee River, Florida. The National Fisheries Research Center - Gainesville, Florida (NFRC-G) analyzed data collected during 1987-1991 and published results of this study in the Suwannee River. In addition to food habits of the Gulf sturgeon the study also focused on the effects of human and natural disturbances on the sturgeon's food resources and methods for production-scale culture of key sturgeon foods.

Early life history and relative abundance of Gulf sturgeon in the Suwannee River, Florida. This six-year study, begun in 1988 by the NFRC-G has involved the collection of Gulf sturgeon by gill netting and studying movements of individuals throughout the lower 205 kilometers of the Suwannee River; both temperature-sensing radio transmitters and ultrasonic transmitters have been used. Other individuals have also been marked with external anchor tags and passive integrated transponder (PIT) tags. The study has shown that subadult and adult sturgeon immigrate into the river from the Gulf of Mexico during mid to late February, with most arriving during late March or early April. Subadult and adult sturgeon leave the river and return to the Gulf by mid November to early December. Young sturgeon remain at the river mouth during winter and spring. Information on growth rates indicate that subadult and adult Gulf sturgeon gain weight only during the winter while in marine waters. Likewise, young fish captured near the river mouth in winter and spring increased in weight. The sturgeon apparently do not feed while in freshwater during the spring and summer.

Development of combination radio/sonic transponder fish tag. The Panama City FAO coordinated a contract study being conducted by Ocean Communication Systems, Inc. to develop a long-range combination telemetry system. The contract calls for development, testing and provision of six operational tags by October 1992. The transponder tag will incorporate long distance signal strength with multiple year battery life to allow efficient tracking in open ocean environments and could be a significant advancement in biotelemetry technology with special advantages when used for anadromous fish studies.

Gulf sturgeon stock identification. The Panama City FAO contracted with Dr. Ike Wirgin of the University of New York Medical Center to conduct Restriction Fragment Length Polymorphism (RFLP) analyses of mitochondrial DNA to determine if genetic differences exist among Gulf sturgeon from different river drainages. Tissues were obtained and processed from 72 individuals from the Suwannee, Apalachicola, Ochlockonee, Blackwater, Choctawhatchee and Pearl rivers. Data analysis will be completed in 1992.

Status of Gulf sturgeon populations in Gulf of Mexico river systems. This is an ongoing project of the Panama City FAO to determine the species' status in Gulf river systems. The investigation was extended to the Ochlockonee River, Florida in 1991. Four Gulf sturgeon were collected, all in the 3-4 year age classes.

Biology of Alabama shad and skipjack herring in Gulf of Mexico riverine systems. The Alabama shad (*Alosa alabamae*) is recognized as an anadromous species, though there is debate as to this designation for the skipjack herring (*Alosa chrysochloris*). Evaluations of the population status of both species are needed. The Panama City FAO conducted searches for available literature and data sets for both species. Based upon information gathered to date, the Panama City FAO plans to review literature and raw data available, coordinate with other fisheries agencies to gather additional information and produce separate status reports on these species within the next two years.

Fish health. The Warm Springs Regional Fisheries Center, Warm Springs, Georgia, evaluated numerous individuals of Gulf race striped bass and Gulf sturgeon during the year for viral infections, but all results were negative.

Contaminants studies. During Fall 1990 the Service's FWE Field Office at Vicksburg, Mississippi, with assistance from the Natchitoches FAO, collected striped bass from the Mississippi River for age, condition and contaminants analyses.

Proposed Apalachicola fish hatchery. The Panama City FAO prepared information on and had numerous discussions with various entities concerning a proposed hatchery on the Apalachicola River for striped bass and Gulf sturgeon. The hatchery has been proposed as a U.S. Army Corps of Engineers project.

Anadromous fish habitat protection/enhancement. During June and July 1991 the Gulf Coast FCO consulted with staff at several of the Service's FWE field offices concerning hydropower dam relicensing in Gulf coastal streams.

Panama City FAO/FWE personnel participated in discussions during December 1991 with the Corps of Engineers and other agencies concerning proposed rehabilitation of the Jim Woodruff Lock and Dam powerhouse and shoaling below the dam in the Apalachicola River. Gulf sturgeon and striped bass utilize the habitat proposed for alteration.

Estuarine Fisheries

Corpus Christi FAO. A new fisheries assistance office was established on September 22, 1991, primarily to formulate and implement fisheries management plans and otherwise assist national wildlife refuges on the Texas Gulf Coast with fisheries management. The office is located on the campus of Corpus Christi State University, Corpus Christi, Texas.

St. Marks National Wildlife Refuge red drum fishery. Following a Panama City FAO fisheries investigation of St. Marks National Wildlife Refuge (NWR), Florida, a cooperative agreement was

proposed with the Florida Department of Natural Resources for developing a red drum sport fishery on the refuge, which may also have application to other coastal refuges.

Estuarine fish habitat protection/enhancement. The field supervisor of the FWE office at Daphne, Alabama served as the Service's primary contact with the Environmental Protection Agency's (EPA) Gulf of Mexico Program during 1991. Most intensive involvement was with the Habitat Degradation Subcommittee. The field supervisor of the Panama City FWE Office was involved with the Gulf of Mexico Program's Living Aquatic Resources Subcommittee during the fall of 1991. Field supervisors from the coastal FWE offices met in Lafayette, Louisiana on October 24, 1991 to discuss future strategies for the Service's involvement in the Gulf of Mexico Program.

The field supervisor of the FWE office at Lafayette, Louisiana served as chairman of the Louisiana-Mississippi Habitat Advisory Panel for the Gulf of Mexico Fishery Management Council's Habitat Committee.

The Lafayette FWE Office was heavily involved in efforts to address wetlands loss in coastal Louisiana through activities authorized by the Coastal Wetlands Planning, Protection and Restoration Act of 1990 (Breaux Bill). The office participated on a task force that approved 14 priority wetland restoration projects totaling \$48 million; five of the projects would be constructed by the Service.

The Lafayette FWE Office provided technical assistance to landowners and the Louisiana Department of Natural Resources to help improve management of nearly 16,700 acres of privately-owned coastal wetlands.

Two FWE offices were heavily involved in EPA National Estuary Program efforts. The FWE office in Houston, Texas has a major role in the Galveston Bay program, as does the Lafayette FWE Office in the Barataria-Terrebonne program.

Personnel from the Lafayette FWE Office participated in a number of meetings of the Cameron-Creole Watershed Project Advisory Committee during the year to discuss shrimp harvest conflicts on Sabine NWR and adjacent private lands. Although the watershed project is enhancing wetlands and allowing access by estuarine organisms to marsh areas, shrimp harvest has changed from an open commercial harvest in Calcasieu Lake to a privately-operated commercial and recreational harvest on private lands within the project area.

The Panama City FWE Office initiated a baseline contaminants study of sediments in St. Joe Bay, Florida. Field work was completed for a mercury assessment/fish investigation at St. Marks NWR. Also, in St. Andrew Bay, Florida, a fish bioconcentration study for dioxin at Bay County's Military Point industrial/municipal treatment lagoon was conducted.

Public Outreach/Education

Gulf Coast FCO. The Gulf Coast FCO staffed an information table at the Gulf Coast Fisherman's Association Fishing Tournament in Gulfport, Mississippi on August 31 through September 3, 1991. Approximately 200 persons attended the event. The staff also assisted personnel of the Mississippi Sandhill Crane NWR in staffing an information table at the Singing River Mall in Gautier, Mississippi, for National Hunting and Fishing Day on September 21. On November 23 the Gulf Coast FCO cooperated with the National Wetlands Research Center of Slidell, Louisiana in staffing an information booth at an event held at Pass Christian, Mississippi. The event, "Pass Christian Celebrates the Gulf" was held in conjunction with an annual schooner race in Mississippi Sound. A large number of people turned out for the event, and many brochures were distributed and personal contacts made.

Panama City FCO. The Panama City FAO cooperated with Tyndall Air Force Base in hosting 18 special education students for a fishing trip during National Fishing Week. The event received significant local news coverage. The office also presented educational programs to a local Boy Scout troop and 50 day camp children and set up an informational display at the Jr. Museum of Bay County, which was promoting "Conservation Month". The office's Suwannee River sturgeon hatchery was photographed for an article in the *National Geographic* magazine, and the office's Gulf sturgeon investigations were featured in an outdoors television program on WTBY-TV, Dothan, Alabama. The stocking of Phase II striped bass by Warm Springs NFH in Apalachicola Bay in November 1991 was covered by radio, television and newspapers in the Panama City, Florida area. The office also continued work with the U.S. Environmental Protection Agency and the public on evaluation of Perdido Bay, Alabama/Florida. The Service collected and analyzed various species of fishes and specific fish tissues for contaminants.

Federal Aid Funding

The Service provided funds to the Gulf of Mexico states for a number of anadromous, estuarine or marine sport fish restoration projects under the Federal Aid in Sport Fish Restoration Act and the Anadromous Fish Conservation Act. The projects funded during 1991 included the following:

Alabama Department of Conservation and Natural Resources.

The enhancement of recreational fishing in coastal Alabama.

Coastal Alabama striped bass assessment and monitoring program.

Survey of the Gulf sturgeon and Alabama shad in Alabama -- their distribution and reasons for decline.

Florida Department of Natural Resources.

Survey of marine recreational fishing sites in Florida.

The development and testing of alternative gears and development methods for the monitoring of juvenile fish.

Short-term monitoring of hatchery-released fish.

Long-term monitoring of juvenile finfish in Florida.

Development and implementation of a recreational fisheries component to the Marine Resources Geographic Information System.

Coastal production and sportfish plankton dynamics of the Florida Shelf.

Florida Game and Freshwater Fish Commission.

Evaluation of introductions of *Morone* sport fishes in rivers of north Florida.

Characterization of recreational fisheries of northwest Florida.

Mississippi Department of Wildlife, Fisheries and Parks.

Monitoring of striped bass eggs, larvae, juveniles, and adults in the lower Pearl River.

Creel survey of Mississippi Sound and adjacent waters.

Investigations of the cobia (*Rachycentron canadum*) in Mississippi marine waters and adjacent Gulf waters.

Red drum studies in Mississippi.

**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, 1991

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

GULF STATES MARINE FISHERIES COMMISSION
December 31, 1991

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INDEPENDENT AUDITOR'S REPORT

To the Board of Commissioners of
Gulf States Marine Fisheries Commission

We have audited the accompanying balance sheet of Gulf States Marine Fisheries Commission (a non-profit organization) as of December 31, 1991, and the related statements of revenue, expenditures and changes in fund balance and cash flows for the year then ended. These financial statements are the responsibility of Gulf States Marine Fisheries Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

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

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Gulf States Marine Fisheries Commission as of December 31, 1991, and the results of its operations and cash flows for the year then ended in conformity with generally accepted accounting principles.

Robert J. Mosher CPA

D'Iberville, Mississippi
February 25, 1992

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FIRM MEMBERSHIP
AICPA SEC PRACTICE SECTION
AICPA PRIVATE PRACTICE SECTION

GULF STATES MARINE FISHERIES COMMISSION
BALANCE SHEET
December 31, 1991

	<u>Un- Restricted Fund</u>	<u>Restricted Funds</u>	<u>Total All Funds</u>
ASSETS			
CURRENT ASSETS:			
Cash	\$125,703	\$	\$125,703
Grants Receivable	<u>125,703</u>	<u>77,989</u>	<u>77,989</u>
		77,989	203,692
PROPERTY AND EQUIPMENT:			
Fixed Assets	38,219	57,931	96,150
Less Accumulated Depreciation	(30,166)		(30,166)
Less Contra Account		<u>(53,917)</u>	<u>(53,917)</u>
	<u>8,053</u>	4,014	12,067
TOTAL ASSETS	<u>133,756</u>	<u>82,003</u>	<u>215,759</u>
	=====	=====	=====
LIABILITIES AND FUND BALANCE			
CURRENT LIABILITIES:			
Deferred Amounts	<u> </u>	<u>5,643</u>	<u>5,643</u>
TOTAL LIABILITIES	-0-	5,643	5,643
FUND EQUITY			
Fund Balance Unrestricted	133,756		160,980
Fund Balance Restricted	<u> </u>	<u>76,360</u>	<u>49,136</u>
TOTAL FUND EQUITY	<u>133,756</u>	<u>76,360</u>	<u>210,116</u>
TOTAL LIABILITIES AND FUND EQUITY	<u>\$ 133,756</u>	<u>\$ 82,003</u>	<u>\$ 215,759</u>

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

**GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF REVENUES, EXPENDITURES AND
CHANGES IN FUND BALANCE
For The Year Ended December 31, 1991**

	<u>Un- Restricted Funds</u>	<u>Restricted Funds</u>	<u>Total All Funds</u>
<u>REVENUES</u>			
Member State Appropriations			
Florida	\$ 22,500	\$	\$ 22,500
Louisiana	11,250		11,250
Mississippi	11,250		11,250
Texas	22,500		22,500
Grants and Agreements		421,987	421,987
Interest Earned	6,171		6,171
Miscellaneous Income	50		50
Total Revenue	<u>73,721</u>	<u>421,987</u>	<u>495,708</u>
<u>EXPENSES</u>			
Salaries	30,379	192,853	223,232
Health Insurance	4,582	36,659	41,241
Retirement	1,873	13,445	15,318
Office Rental	2,794	14,042	16,836
Office Supplies	3,727	9,016	12,743
Postage	639	8,929	9,568
Travel	12,244	82,368	94,612
Telephone	567	8,090	8,657
Copying Expense	433	2,599	3,032
Printing	2,499	14,278	16,777
Meeting Cost	1,677	4,293	5,970
Dues and Subscription	1,059	500	1,559
Auto Expense	1,885	514	2,399
Insurance	2,960	350	3,310
Maintenance and Repairs	1,087	4,508	5,595
Courtesies	214		214
Professional Services	4,660	5,436	10,096
Depreciation	5,085		5,085
Taxes-payroll	2,743	14,781	17,524
Total Expenses	<u>81,107</u>	<u>412,661</u>	<u>493,768</u>

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

**GULF STATES MARINE FISHERIES COMMISSION
STATEMENT OF REVENUES, EXPENDITURES AND
CHANGES IN FUND BALANCE - CONTINUED
For The Year Ended December 31, 1991**

	<u>Un- Restricted Funds</u>	<u>Restricted Funds</u>	<u>Total All Funds</u>
Excess of Revenue over Expenses before Capital Additions	\$ (7,386)	\$ 9,326	\$ (1,940)
Capital Additions	<u>1,143</u>	<u>7,087</u>	<u>8,230</u>
Excess of Revenue over Expenses after Capital Additions	(8,529)	2,239	(6,290)
Loss on Disposal	(1,385)		(1,385)
Prior Period Adjustments	<u>(27,224)</u>	<u>29,974</u>	<u>2,750</u>
Increase (decrease) in Fund Balance	(37,138)	32,213	(4,925)
Fund Balance, January 1, 1991	<u>170,894</u>	<u>44,147</u>	<u>215,041</u>
Fund Balance, December 31, 1991	<u>\$133,756</u> =====	<u>\$ 76,360</u> =====	<u>\$210,116</u> =====

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

**GULF STATE MARINE FISHERIES COMMISSION
 STATEMENTS OF CASH FLOWS - ALL FUND TYPES
 For the Year ended December 31, 1991**

CASH FLOWS FROM OPERATING ACTIVITIES:	
Net Decrease in Fund Balance	\$ (7,675)
Adjustments to Reconcile Net Decrease in Fund Balance to Net Cash Used by Operating Activities -	
Depreciation	5,085
Loss on Disposal	1,385
Prior Period Adjustment	2,749
Changes in Operating Assets and Liabilities -	
Increase in Receivables	(42,153)
Decrease in Payables	(5,951)
Increase in Deferred Amounts	<u>5,643</u>
Net Cash Used by Operating Activities	(40,917)
CASH FLOWS FROM INVESTING ACTIVITIES:	
Purchase of Fixed Assets	(14,404)
Add back: Amount Expensed	<u>8,230</u>
Net Cash Used by Investing Activities	<u>(6,174)</u>
Net Decrease in Cash	(47,091)
Cash at beginning of Year	<u>172,794</u>
Cash at End of Year	<u>\$125,703</u> =====

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

GULF STATES MARINE FISHERIES COMMISSIONS
NOTES TO FINANCIAL STATEMENTS
December 31, 1991

NOTE 1 - ORGANIZATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

(a) **Organization** - The Gulf States Marine Fisheries Commission, a nonprofit 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 be from time to time appropriated for its use by the participating governing authorities, and makes application for and receives and expends funds available under appropriate Federal programs. The Commission may also receive and expend funds from any other sources not "prohibited by law".

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

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

Restricted Fund
Unrestricted Fund

GULF STATES MARINE FISHERIES COMMISSIONS
NOTES TO FINANCIAL STATEMENTS CONTINUED
December 31, 1991

(c) Fund Accounting - In order to assure observance of limitations and restrictions placed on the use of the resources available to the Commission, the accounts are maintained in accordance with the principles of "fund accounting". This is the procedure by which resources for various purposes are classified for accounting and reporting purposes into funds that are in accordance with activities or objectives specified. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups. Accordingly, all financial transactions have been recorded and reported by fund group.

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

(d) Grants Receivable - In accordance with the accrual basis of accounting, revenues are recognized when earned. In the case of grant revenue, amounts are earned when the related expenditures are incurred. At December 31, 1991, expenditures in the amount of \$77,789 had been incurred for which the commission had not been reimbursed.

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

**GULF STATES MARINE FISHERIES COMMISSIONS
 NOTES TO FINANCIAL STATEMENTS CONTINUED
 December 31, 1991**

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

<u>TYPE OF ASSET</u>	<u>LIFE (YEARS)</u>
Office Equipment and Furniture	10
Automotive	5

Depreciation recorded for the year ended December 31, 1991 was \$5,085.

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, 1991 are as follows:

1992	11,100
1993	11,100
1994	12,300
1995	12,300
1996	12,300
1997-2002	<u>80,725</u>
Total	\$ 139,825
	=====

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 employees' base pay with the amounts being fully vested upon payment by the Commission. The total expense for the year ended December 31, 1991 was \$15,318.

GULF STATES MARINE FISHERIES COMMISSIONS
NOTES TO FINANCIAL STATEMENTS CONTINUED
December 31, 1991

NOTE 4 - ALLOCATION OF EXPENSES

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

NOTE 5 - INCOME TAXES

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

NOTE 6 - PRIOR PERIOD ADJUSTMENT

The commission's financial statements as of December 31, 1990, contained an error relating to grants receivable and deferred revenues, which had the net effect of understating fund balance by \$2,750. The adjustment had no income tax effect since the commission is exempt from income taxes.

SUPPLEMENTARY INFORMATION



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INDEPENDENT AUDITOR'S REPORT ON SCHEDULE OF FEDERAL AWARDS

To the Board of Commissioners
Gulf States Marine Fisheries Commission

We have audited the financial statements of Gulf States Marine Fisheries Commission (a non-profit organization) for the year ended December 31, 1991, and have issued our report thereon dated February 25, 1992. These financial statements are the responsibility of Gulf States Marine Fisheries Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

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

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

Robert J. Mosher CPA

D'IBERVILLE, MISSISSIPPI
February 25, 1992

GULF STATES MARINE FISHERIES COMMISSION
 SCHEDULE OF FEDERAL AWARDS
 For The Year Ended December 31, 1991

Federal Grantor/Program Title	Award #	Federal CFDA Number	Program or Award Amount	Accrued Revenue at Jan. 1, 1990	Current Receipts Revenue	Disbursements/ Expenditures	Accrued Revenue at Dec. 31, 1990
MAJOR PROGRAMS							
<u>Department of Commerce</u>							
Southeast Area Monitoring and Assessment Program	NA17FS0036-01 NA90AA-H-SM211	11.300	\$ 90,326 98,478	0 (9,763)	\$ 74,259 0	\$ 90,431 9,763	\$ 16,172 0
Interjurisdictional Fisheries Management Plans	NA16F10034-01 NA90AA-D-IJ202	11.300	110,000 <u>110,000</u>	0 <u>(8,705)</u>	95,796 <u>0</u>	101,173 <u>8,705</u>	5,377 <u>0</u>
TOTAL DEPARTMENT OF COMMERCE			408,804 -----	(18,468) -----	170,055 -----	210,072 -----	21,549 -----
<u>Department of Interior</u>							
Cooperative Interstate Fishery Management in the Territorial Seas of the Gulf of Mexico	14-16-0009-90-1211	15.605	<u>270,155</u>	<u>0</u>	<u>124,578</u>	<u>136,688</u>	<u>39,474</u>
TOTAL DEPARTMENT OF INTERIOR			270,155 -----	0 -----	124,578 -----	136,688 -----	39,474 -----
<u>Other Federal Assistance</u>							
Department of Commerce							
Administration Support of Marine Fisheries Initiative	50-WCNF-0-06053	11.300	118,592	26,481	72,010	61,596	16,066
Gulf of Mexico Fishery Management Council	91-65-07600	11.300	25,000	0	25,000	25,068	68
Department of Interior							
The Development and use of Restriction Fragment Length Polymorphism Probes for Striped Bass Identification	14-16-0004-91-920	15.605	65,000	0	7,000	1,357	(5,643)
Cooperative Agreement to Provide Clerical Support	14-16-0004-91-904	15.605	<u>16,842</u>	<u>0</u>	<u>4,842</u>	<u>5,742</u>	<u>900</u>
TOTAL OTHER FEDERAL ASSISTANCE			\$225,434 -----	\$ 26,481 -----	\$108,852 -----	\$ 93,763 -----	\$ 11,391 -----

See accompanying Independent Auditor's Report
 on Federal Awards.

*
 Above amounts for revenues and expenditures are presented on the
 cash basis, which differ from amounts in the financial statements,
 which are presented on the accrual basis.



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**INDEPENDENT AUDITOR'S REPORT
ON ADDITIONAL INFORMATION**

**To the Board of Commissioners
Gulf States Marine Fisheries Commission**

Our report on our audit of the basic financial statements of Gulf States Marine Fisheries Commission (a non-profit organization) for 1991 appears on page 1. We conducted our audit in accordance with generally accepted auditing standards Government Auditing Standards issued by the Comptroller General of the United States, and the provisions of Office of Management and Budget Circular A-133, "Audits of Institutions of Higher Education and Other Non-profit Institutions", for the purpose of forming an opinion on the basic financial statements taken as a whole. The schedule of expenses on restricted funds is presented for the purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

Robert F. Mosher CPA

**D'Iberville, Mississippi
February 25, 1992**

GULF STATES MARINE FISHERIES COMMISSION
 SCHEDULE OF EXPENSES - RESTRICTED FUNDS
 For the Year Ended December 31, 1991

	Council Funds	Striped Bass	Fish & Wildlife Services	Inter- Jurisdictional	MARFIN Funds	SEANAP Funds	WALLOP- Breaux	TOTAL All Funds
Salaries	\$18,748	\$ 1,028	\$ 2,034	\$ 49,936	\$ 22,098	\$ 39,728	\$ 59,281	\$192,853
Payroll Taxes	1,438	87	173	3,801	1,731	2,988	4,563	14,781
Health Insurance	2,685	144	296	9,881	4,723	7,796	11,134	36,659
Retirement	1,286	61	125	3,662	1,509	2,652	4,150	13,445
Office Rent			2,435	3,428	1,616	2,918	3,645	14,042
Office Supplies	9		242	1,986	1,005	3,599	2,175	9,016
Postage	150	16		1,328	975	4,870	1,590	8,929
Travel-Committee				15,282	16,251	13,248	24,533	69,314
Travel-Administrative				2,039	2,891	4	8,110	13,054
Telephone	355	16	111	2,063	834	1,634	3,077	8,090
Office Equipment			129	1,205	2,011	990	2,753	7,087
Copy Expense	57		154	682	373	843	490	2,599
Printing				1,102	2,847	5,936	4,393	14,278
Meeting Costs				1,447	805	621	1,421	4,293
Subscriptions and Dues				42	48	54	356	500
Auto Expense				155	14	48	296	514
Insurance							350	350
Maintenance	78	4	27	1,178	805	985	1,431	4,508
Professional Services	240		17	1,385	930	1,215	1,648	5,436
Total	\$ 25,046	\$ 1,356	\$ 5,743	\$100,602	\$ 61,466	\$ 90,129	\$135,406	\$419,748

See accompanying Independent Auditor's Report on
 Additional Information.

AUDITOR'S REPORTS ON INTERNAL CONTROLS



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

To the Board of Commissioners
Gulf States Marine Fisheries Commission

We have audited the financial statements of Gulf States Marine Fisheries Commission (a non-profit organization) for the year ended December 31, 1991 and have issued our report thereon dated February 25, 1992. We have also audited the Organization's compliance with requirements applicable to major federal financial assistance programs and have issued our report thereon dated February 25, 1992.

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

In planning and performing our audits of the financial statements of Gulf States Marine Fisheries Commission for the year ended December 31, 1991, we considered its internal control structure in order to determine our auditing procedures for the purpose of expressing opinions on the financial statements and on its compliance with requirements applicable to major federal financial assistance programs and not to provide assurance on the internal control structure.

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

that transactions are executed in accordance with managements authorization and recorded properly to permit the preparation of financial statements in accordance with generally accepted accounting principles, and that federal assistance programs are managed in compliance with applicable laws and regulations. Because of inherent limitations in any internal control structure, errors, irregularities, or instances of noncompliance may nevertheless occur and not be detected. Also, projection of any evaluation of the structure to future periods is subject to the risk that procedures may be inadequate because of changes in conditions or that the effectiveness of the design and operation of policies and procedures may deteriorate.

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

Cycles of Activity

- Treasury or Financing
- Revenue/Receipts
- Purchases/Disbursements
- Payroll
- External financial reporting

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

During the year ended December 31, 1991, Gulf States Marine Fisheries Commission expended 56 percent of its total federal financial assistance under major federal financial assistance programs.

We 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 we considered relevant to preventing or detecting material noncompliance with specific requirements, general requirements, and requirements governing claims for advances and reimbursements and amounts claimed or used for matching

that are applicable to each of the Organization's major federal financial assistance programs, which are identified in the accompanying schedules of federal awards. Our procedures were less in scope than would be necessary to render an opinion on these internal control structure policies and procedures. Accordingly, we do not express such an opinion.

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.

Robert J. Mosher CPA

D'Iberville, Mississippi
February 25, 1992



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

**To the Board of Commissioners
Gulf States Marine Fisheries Commission**

We have audited the financial statements of Gulf States Marine Fisheries Commission (a nonprofit organization) for the year ended December 31, 1991, and have issued our report thereon dated February 25, 1992.

We conducted our audit in accordance with generally accepted auditing standards and Government Auditing Standards, issued by the Comptroller General of the

United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

In planning and performing our audit of the financial statements of Gulf States Marine Fisheries Commission for the year ended December 31, 1991, we considered its internal control structure in order to determine our auditing procedures for the purpose of expressing an opinion on the financial statements and not to provide assurance on the internal control structure.

The management of Gulf States Marine Fisheries Commission is responsible for establishing and maintaining an internal control structure. In fulfilling this responsibility, estimates and 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, 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 limitations in any internal control structure, errors or irregularities may nevertheless occur and not be detected. Also, projection of any evaluation of the structure for future periods is subject to the risk that procedures may become

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

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

Cycles of Activity

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

General Requirement

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

Specific Requirements

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

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

Our consideration of the internal control structure would not necessarily disclose all matters in the internal control structure that might be material weakness under standards established by the American Institute of Certified Public Accountants. A material weakness is a reportable condition in which the design or operation of the specific internal control structure elements does not reduce to a relatively low level the risk that errors or irregularities in amount that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. We noted no matters involving the internal control structure and its operation 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.

Robert J. Mosher CPA

**D'Iberville, Mississippi
February 25, 1992**

AUDITOR'S REPORTS ON COMPLIANCE

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


**To the Board of Commissioners
Gulf States Marine Fisheries Commission**

We have audited the financial statements of Gulf States Marine Fisheries Commission, a non-profit organization, as of and for the year ended December 31, 1991, and have issued our report thereon dated February 25, 1992.

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

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

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



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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.

Robert J. Mosher CPA

**D'Iberville, Mississippi
February 25, 1992**



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

**To the Board of Commissioners
Gulf States Marine Fisheries Commission**

We have audited Gulf States Marine Fisheries Commission's (a nonprofit organization) compliance with the requirements governing types of services allowed or unallowed; eligibility; matching, level of effort, or earmarking; reporting; claims for advances and reimbursements; and amounts claimed or used for matching that are applicable to each of its major federal financial assistance programs, which are identified in the accompanying schedule of federal awards, for the year ended December 31, 1991. The management of Gulf States Marine Fisheries Commission is responsible for the Organization's compliance with those requirements. Our responsibility is to express an opinion on compliance with those requirements based on our audit.

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

In our opinion, Gulf States Marine Fisheries Commission complied, in all material respects, with the requirements governing types of services allowed or unallowed; eligibility; matching, level of effort, or earmarking; reporting; claims for advances and reimbursements; and amounts claimed or used for matching that are applicable to each of its major federal financial assistance programs for the year ended December 31, 1991.

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In connection with our audit of the December 31, 1991 financial statements of **Gulf States Marine Fisheries Commission**, and with our obtaining an understanding of the Organization's internal control structure elements related to administering federal financial assistance programs, as required by OMB Circular A-133, we selected certain transactions applicable to certain nonmajor federal financial assistance programs for the year ended December 31, 1991. As required by OMB Circular A-133, we have performed auditing procedures to test compliance with the requirements governing types of services allowed or unallowed; eligibility; and that are applicable to those transactions. Also, we have applied procedures to test **Gulf States Marine Fisheries Commission's** compliance with the following requirements applicable to each of its federal financial assistance programs, the major programs of which are identified in the accompanying schedule of federal awards, for the year ended December 31, 1991.

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

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

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

Robert J. Mosher CPA

D'Iberville, Mississippi
February 25, 1992