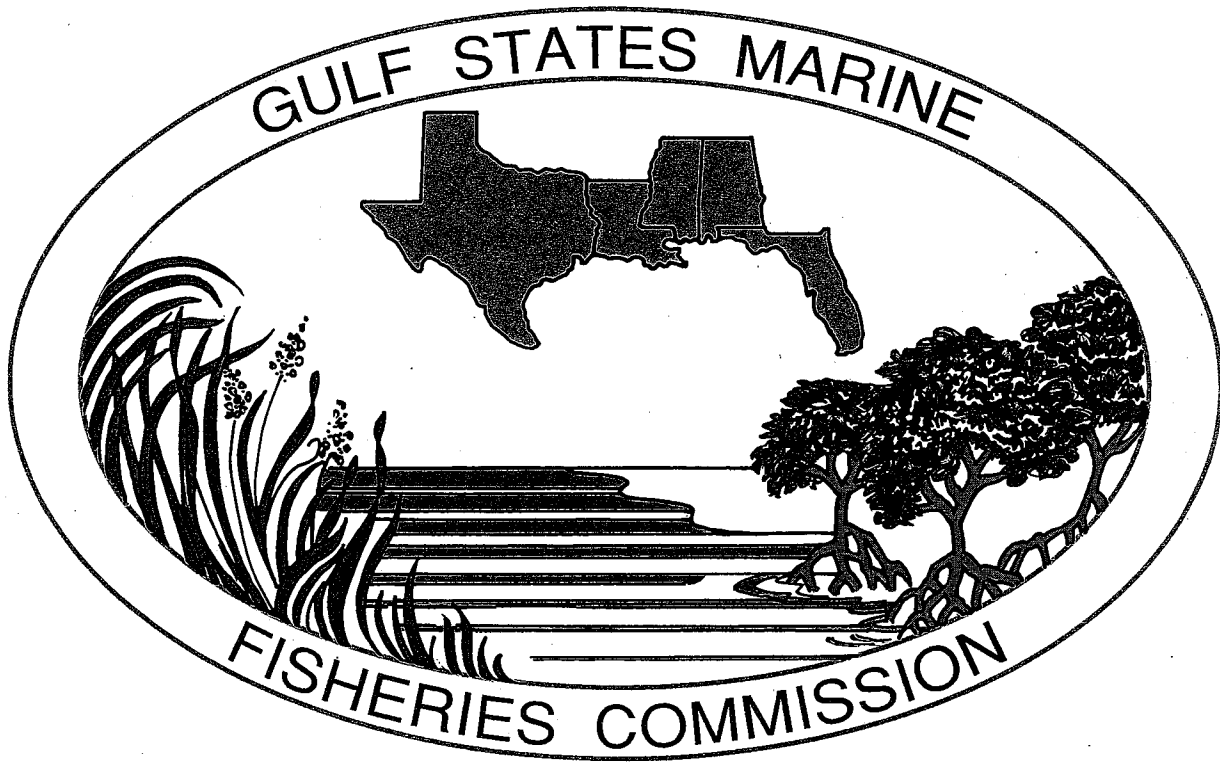


OFFICE COPY ONLY

FORTY-FIRST 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-FIRST ANNUAL REPORT (1989-1990)**

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-first 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-one 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,

Tommy Gollott, Chairman FY90  
Don Duden, Vice Chairman FY90  
Larry B. Simpson, Executive Director

**GULF STATES MARINE FISHERIES COMMISSION**

Forty-first Annual Report (1989-1990)

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Roster of the  
**GULF STATES MARINE FISHERIES COMMISSION**  
October 1, 1989 - December 31, 1990

Chairman: Sen. Tommy Gollott

Vice Chairman: Don Duden

**COMMISSIONERS**

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

**ALABAMA**

James C. Martin, Commissioner  
AL Department of Conservation  
and Natural Resources  
Montgomery, AL  
Taylor F. Harper, Representative  
State of Alabama  
Grand Bay, AL  
John Ray 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**

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

**MISSISSIPPI**

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

**LOUISIANA**

Virginia Van Sickle  
Executive Secretary  
LA Department of  
Wildlife and Fisheries  
Baton Rouge, LA

**TEXAS**

Charles D. Travis  
Executive Director  
TX Parks and Wildlife Dept.  
Austin, TX  
H. Tati Santiesteban, Senator  
State of Texas  
El Paso, Texas  
Charles E. Belaire  
Fulton, TX

**STAFF**

Larry B. Simpson  
Executive Director

Ronald R. Lukens  
Assistant Director

Lucia B. Hourihan  
Publication Specialist

David M. Donaldson  
SEAMAP Coordinator

Nancy K. Marcellus  
Administrative Assistant

Richard L. Leard  
IF Program Coordinator

Cynthia B. Dickens  
IF Staff Assistant

V.K. "Ginny" Herring  
Executive Assistant

Cheryl R. Noble  
SEAMAP/MARFIN Staff Assistant

COMMISSION OFFICERS ELECTED FOR  
FISCAL YEAR 1989-1990

Chairman: Tommy Gollott succeeding Charles E. Belaire  
Vice Chairman: Don Duden succeeding Tommy Gollott  
1st Vice Chairman: Leroy Kiffe

COMMITTEES

Executive Committee . . . . . Tommy Gollott, 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  
Industry Advisory Committee . . . . . John Hoey, Chairman  
Recreational Fisheries Committee . . . . . Virginia Vail, Chairman  
Law Enforcement Committee . . . . . Jerald Waller, Chairman  
Gulf State-Federal Fisheries  
    Management Board . . . . . Hugh Swingle, Chairman  
    Menhaden Advisory Committee . . . . . Vince Guillory, Chairman



## GULF STATES MARINE FISHERIES COMMISSION ACTIVITIES

October 1, 1989 - December 31, 1990

The Gulf States Marine Fisheries Commission now operates on a fiscal year basis beginning January 1 and ending December 31 of each year. Prior to this year the Commission operated on a fiscal year of October 1-September 30. This annual report of the Commission activities will include activities for October 1, 1989 through December 31, 1990 with future reports covering the calendar year only.

Three annual meetings were held during the time period covered by this report. The meetings are rotated among each of the five Gulf States. The October 1989 meeting was held in Biloxi, Mississippi. In March of 1990 the meeting was held in Orange Beach, Alabama and the October 1990 annual meeting was held in Panama City Beach, Florida.

The major activities of this Commission are briefly described in the report in the following pages. A list of the resolutions passed during the annual meetings is a part of this report.

One of the missions of the Gulf States Marine Fisheries Commission is to promote conservation of our marine fishery resources through better management practices and to insure full utilization of these resources for the good of the people of the five Gulf States and the Nation. Achieving these objectives requires that studies and planning be directed to those species which inhabit the states territorial waters -- many of these receive the heaviest fishing pressure. Three of these species are blue crab, oysters and black drum.

The Commission has developed a system, called for by the Interjurisdictional Fisheries Act, to provide regional management planning for certain nearshore species. During this time period technical task forces were organized which utilized extensive effort from state agency expertise, along with commercial and recreational user input and social and economic support from universities. Law enforcement input rounded out each team charged with developing a regional management plan for these animals which are presented to the State-Federal Fisheries Management committee (one representative from each of the five Gulf States, National Marine Fisheries Service (NMFS) and Fish and Wildlife Service) for action and approval.

Following these actions and approval by the full Commission the plans are sent to the Gulf States for implementation. Two such regional fishery management plans have been completed during this report time period under this mechanism -- blue crab and oyster. These two documents will doubtless provide an excellent base for management by the Gulf States of these two important animals.

The Black Drum Plan, which was initiated at the request and urging of the Gulf of Mexico Fishery Management Council, is nearing completion and will be

published in calendar year 1991. Future plans for regional management plan work include striped mullet, scheduled to begin in 1991.

A few of the major concerns of the Commission in recent years are contract and grant administration/approval. In this regard the Commission and others have worked to streamline and consolidate these functions within NMFS. A NOAA grants administration office for the entire United States is located in Washington, DC. While still not the ideal solution, this has enabled the states to obtain service and administration for these vital state/federal activities so important to our region's marine resources.

The Commission was actively involved in helping the Minerals Management Service to utilize commercial shrimp trawlers for certifying bottom areas after oil and gas structure removal as clear of debris from those activities.

The Commission is still concerned with the problems the states are having with access to data supplied from other states into the NMFS Statistical System. The Data Management Subcommittee of the Commission has worked very hard to reach a solution through confidentiality agreements among the states so that retrieval of data from NMFS will function as it originally was envisioned. When achieved, this data retrieval system will be critical to proper function of a Recreational Fisheries Information Network (RecFIN) and the Commercial Fisheries Information Network (ComFIN) which the Commission is currently working with the states to implement.

During FY90, after forty years of existence, the Commission had a major self-evaluation of its roles and responsibilities. The result of this effort has been to modify the Commission's committee structure and internal operations to be more efficient and effective in its activities, both internally and in interfacing with the states. One action, previously mentioned, was to change our fiscal year to a calendar year. Another change effected was delaying spring meeting dates so state legislators could be more active without missing their duties during state sessions. A major change was enacted with regard to the recreational and commercial advisory committees. More direct input from the actual users is anticipated from this restructure. The state-federal committee, focal point for detailed interactions by the states and the federal agencies, was expanded to include the U.S. Fish and Wildlife Service (FWS). FWS now has a heightened role with the passage of Wallop/Breaux in the marine area.

The Commission structure is designed for regional state interchange and with cooperation many positive actions are expected in the future.

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Larry B. Simpson  
Executive Director

RESOLUTION

WHEREAS, fishery management is a cooperative undertaking between the states and the federal government,

WHEREAS, fishery management utilizes statistical data collected by both state and federal agencies,

WHEREAS, some of the statistical data are classified as confidential in order to protect the privacy of individuals,

WHEREAS, the states and the federal government have entered into cooperative agreements for the collection and management of statistical data,

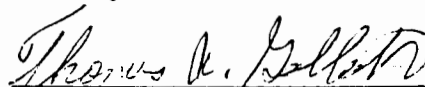
WHEREAS, these agreements include a determination that the state governments have equivalent-to-federal authority to collect and protect the data and furthermore designate a state fishery statistician or federal data base administrator who is responsible for the protection of the data, and

WHEREAS, one of the purposes of the Data Management Subcommittee is to promote the exchange of data and information for the above purposes,

THEREFORE BE IT RESOLVED, that the Gulf States Marine Fisheries Commission recommends to the National Marine Fisheries Service that in its reconsideration of the policies and rules regulating the release and exchange of confidential data that provision be made for 1) exchange of confidential data for a state between that state and the federal government, and 2) exchange of confidential data for two or more states between those states, irrespective of the authority under which the data were collected and who collected it.

BE IT FURTHER RESOLVED THAT, the Gulf States Marine Fisheries Commission believes that both provisions are necessary for the free exchange of information and that the designation of persons at both the state and federal levels of government responsible for the protection of confidential data is adequate safeguard to protect the confidentiality of the source and at the same time meeting the information requirements for management of a public and interjurisdictional resource.

Given this the 19th day of October in the year of Our Lord, One Thousand, Nine Hundred, Eighty-Nine.



Thomas A. Gollott, Chairman

- Member States -

Texas

Louisiana

Mississippi

Alabama

Florida

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Larry B. Simpson  
Executive Director

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#### POLICY ON EXCHANGE OF DATA

At its 40th Annual Fall Meeting in Biloxi, Mississippi during October 16-20, 1989, the Gulf States Marine Fisheries Commission, through its TCC Data Management Subcommittee, fully reviewed a series of issues surrounding the proprietary nature of data which has been collected by state and federal fisheries agencies. The Gulf States Marine Fisheries Commission has concluded that as a minimum effort, to maintain the high quality of professionalism required by fisheries researchers and managers, the following items should be strictly adhered to when using borrowed data for analysis and/or publication:

- 1) Full acknowledgement of the agency from which the data originates, and
- 2) Provisions to allow the agency from which the data originates the opportunity to critically review any document slated for publication prior to peer review.

These are considered to be minimum measures which should be agreed to by both the agency and the requestor.

Given this the 19th day of October in the year of Our Lord, One Thousand, Nine Hundred, Eighty-Nine.

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Thomas A. Gollott  
Chairman

- Member States -

Texas

Louisiana

Mississippi

Alabama

Florida

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Larry B. Simpson  
Executive Director

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R E S O L U T I O N

WHEREAS, the Habitat Subcommittee of the Technical Coordinating Committee of the Gulf States Marine Fisheries Commission recognizes that marsh management plans have been developed to address numerous fish and wildlife resource issues in the coastal zone,

WHEREAS, the TCC Habitat Subcommittee further recognizes that action on these management plans by member states has been somewhat limited, and there is growing concern regarding extensive marsh management proposals,

WHEREAS, in view of the importance of our wetlands resources to the fisheries resources of interest to the Commission, the TCC Habitat Subcommittee recommends that the Commission adopt the following position relative to marsh management activities,

THEREFORE BE IT RESOLVED, that the Gulf States Marine Fisheries Commission supports marsh management plans that:

- (1) maintain the integrity of the wetlands ecosystem and its diversity of fish and wildlife species that utilize these wetlands areas,
- (2) insure ingress and egress of marine species into marsh areas affected by marsh management proposals,
- (3) enhance altered or degraded wetlands to more naturally productive conditions, and
- (4) maintain or improve the natural productivity of fish and wildlife resources which utilize the wetlands.

Given this the 16th day of March in the year of Our Lord, One Thousand, Nine Hundred, Ninety.

Thomas A. Gollott, Chairman

*for*

- Member States -

Texas

Louisiana

Mississippi

Alabama

Florida

## MEETINGS/ACTIVITIES OF THE EXECUTIVE DIRECTOR

### Gulf States Marine Fisheries Commission

Meeting with Chairman Belaire, Vice Chairman Gollott, Past Chairman Harper  
re: budget, Ocean Springs, Mississippi - October 1989  
40th Annual Fall Meeting, Biloxi, Mississippi - October 1989  
U.S. Fish & Wildlife Service Site Visit re: GSMFC Wallop/Breaux Program,  
Ocean Springs, Mississippi - October 1989  
TCC Habitat Subcommittee, Biloxi, Mississippi - December 1989  
GSMFC Ad Hoc Committee, re: Commission reorganization, Baton Rouge, LA -  
December 1989  
IJF Program Coordinator Interviews, Ocean Springs, Mississippi - December  
1989  
TCC Habitat Subcommittee Conference Call, Ocean Springs, Mississippi -  
January 1990  
IJF Crab Technical Task Force, Ocean Springs, Mississippi - January 1990  
SEAMAP Subcommittee Meeting, New Orleans, Louisiana - January 1990  
GSMFC Ad Hoc Committee re: reorganization, Baton Rouge, Louisiana -  
February 1990  
IJF Black Drum Technical Task Force, Mobile, Alabama - February 1990  
Meeting with TCC Habitat Subcommittee Chairman Lewis, Biloxi, Mississippi,  
February 1990  
Marine Fisheries Advisory Committee (MAFAC) DOC, Washington, DC - February  
1990  
40th Annual Spring Meeting, Orange Beach, Alabama - March 1990  
Marine Fisheries Advisory Committee (MAFAC) DOC, Washington, DC - May 1990  
Meeting with PSMFC re: RecFIN/Computerized Financial Program, Portland,  
Oregon - May 1990  
SEAMAP Gulf and South Atlantic Joint Meeting, Charleston, South Carolina -  
July 1990  
IJF Oyster Technical Task Force, Biloxi, Mississippi - July 1990  
Site Visit DOC/NMFS Programs, D. Pritchard, Ocean Springs, Mississippi -  
August 1990  
41st Annual Fall Meeting, Panama City, Florida - October 1990  
Marine Fisheries Advisory Committee (MAFAC) DOC, Washington, DC - November  
1990

### Marine Fisheries Initiative (MARFIN) Program Management Board

December 1989	Conference Call
June 1990	Tampa, Florida
September 1990	New Orleans, Louisiana
October 1990	Orlando, Florida (Principal Investigators Conference)
November 1990	Orlando, Florida

## Gulf of Mexico Fishery Management Council (GMFMC)

November 1989	Charleston, South Carolina - Joint w/SAFMC
January 1990	Corpus Christi, Texas
April 1990	Tampa, Florida
May 1990	Pascagoula, Mississippi - Reefish Stock Assmt Wkshop
June 1990	Mobile, Alabama
July 1990	Miami, Florida
August 1990	Biloxi, Mississippi - Reefish Public Hearing
September 1990	New Orleans, Louisiana
November 1990	Tampa, Florida

## Other Meetings and Activities

Corps of Engineers Environmental Board, Mobile, Alabama - November 1989  
Director Mississippi Laboratories Retirement, Pascagoula, Mississippi -  
December 1989  
Minerals Management Service Speech, New Orleans, Louisiana - December 1989  
American Shrimp Processors Annual Convention, Orange Beach, Alabama - March  
1990  
Speech to EPA Gulf Program re: GSMFC, New Orleans, Louisiana - April 1990  
Louisiana Department of Wildlife and Fisheries Commission re: setting of  
shrimp season, New Orleans, Louisiana - May 1990  
Taping of Menhaden Educational Video, Norfolk, VA - June 1990  
Research with Dr. Condrey re: shrimp project, Ocean Springs, Mississippi -  
August 1990  
ASMFC Annual Meeting and Memorial Service for Irwin Alperin - Hot Springs,  
Virginia - November 1990  
Taping WLOX Special Fisheries Program, Biloxi, Mississippi - December 1990

## Congressional Meetings

Meeting with various Senators and Representatives re: Gulf of Mexico  
issues, Washington, DC - February 1990  
Meeting with Rep. Taylor's Fisheries Aide, Ocean Springs, Mississippi -  
August 1990  
Meeting with Rep. Taylor re: Gulf of Mexico issues, GSMFC office, Ocean  
Springs, Mississippi - September 1990  
Meeting with John Moran, Senate Commerce Committee, GSMFC office, Ocean  
Springs, Mississippi - December 1990

## **SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM**

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 mid-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 1985-1990. Funding allocations to participants for FY86-FY90 were handled through State-Federal cooperative agreements, administered by SERO and the Southeast Fisheries Center (SEFC), National Marine Fisheries Service (NMFS). This report presents a summary of SEAMAP operations, administrative activities, and publications for FY90.

### **PROGRAM MANAGEMENT**

The activities and operations of SEAMAP-Gulf are defined by the SEAMAP Subcommittee of the Gulf States Marine Fisheries Commission's Technical Coordinating Committee. The Gulf committee consists of designated representatives from each member State, NMFS (Mississippi Laboratories), and the Gulf of Mexico Fishery Management Council. The SEAMAP Subcommittee meets several times yearly to review operations, examine priorities, and plan future activities. Daily operations are carried out by the SEAMAP-Gulf Coordinator, assisted by staff of the Gulf States Marine Fisheries Commission (GSMFC) and personnel associated with the SEAMAP Information System, SEAMAP Archiving Center (SAC), and SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

Major SEAMAP-Gulf Subcommittee meetings were held in October 1989 and March 1990, in conjunction with the Annual Fall and Spring Meetings of the GSMFC. Also, an annual meeting was held in January 1990, in New Orleans, Louisiana and representatives from the Gulf program met with the South Atlantic and Caribbean representatives in July 1990 to discuss respective program needs and priorities for FY91. All of the meetings included participation by the several work group leaders, Coordinator, Data Manager, curators, and the GSMFC Executive Director.

SEAMAP-Gulf work groups met this past year to provide recommendations to the Subcommittee for survey and data management needs. The Shrimp/Bottomfish Work Group met in April 1990 in Ocean Springs, Mississippi. The Plankton Work Group met in September 1990. The Adult Finfish Work Group met in October 1990. 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 the Summer Shrimp/Bottomfish survey to management agencies and industry were major functions of SEAMAP management in FY90. 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.

## **RESOURCE SURVEYS**

In FY90, collection of resource survey information continued for the ninth consecutive year. SEAMAP resource surveys include the Fall Shrimp/Groundfish Survey, Louisiana seasonal trawl surveys, Spring Plankton Survey, Summer Shrimp/Bottomfish Survey, Fall Plankton Survey and plankton and environmental data surveys. Special projects and other activities for FY90 included the Status and Trends Benthic Surveillance Project, SEAMAP information services and program management.

### **Fall Shrimp/Groundfish Survey**

The 1989 Fall Shrimp/Groundfish Survey was conducted from October 16 - November 19, 1989, from off Mobile, Alabama to the U.S. Mexican border. Vessels from NMFS, Alabama, Mississippi, Louisiana and Texas sampled inshore and offshore waters to 60 fm, covering a total of 351 trawl stations, in addition to plankton and environmental sampling.

Sampling design was modified from previous fall surveys to conform 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; and
- (4) collect ichthyoplankton samples to determine relative abundance and distribution of eggs and larvae of commercial and recreationally important fish species.

During the survey the NOAA Ship OREGON II sampled offshore waters and territorial Louisiana and Texas waters. The R/V TOMMY MUNRO sampled Mississippi territorial and offshore waters. The R/V PELICAN sampled Louisiana territorial and offshore waters. Texas vessels sampled within territorial waters. The R/V VERRILL sampled Alabama territorial waters.

Of the total 351 trawl samples taken, NMFS completed 211 stations; Alabama 12; Mississippi 17; Louisiana 31; and Texas 80 trawl stations. All vessels took environmental data, including temperature, salinity and oxygen.

The greatest catch rates were encountered east of the Mississippi River Delta. Shrimp catch rates were highest in the 50-59 fm strata while the highest finfish catches were recorded in the 20-29 fm strata. Slightly higher catch rates were observed at night.

Ichthyoplankton data were collected by all vessels except Texas, at sample sites occurring nearest to half-degree intervals of latitude/longitude. A total of 63 stations was sampled with bongo and/or neuston nets, as encountered along cruise tracks: NMFS completed 39 ichthyoplankton stations; Louisiana 21; and Mississippi 3. All samples, except those taken by Louisiana, will be sorted at the Polish Sorting Center with specimens and data archived at the SEAMAP Archiving Centers.

### **Summer Shrimp/Groundfish Trawl Survey**

A planning meeting of the Shrimp/Bottomfish Work Group was held in April 1990 to examine the design for the 1990 Summer Shrimp/Groundfish Trawl 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; and
- (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 1990 SEAMAP summary survey was to work from the eastern Gulf to the Texas/Mexico border, in order to sample during or prior to migration of brown shrimp from bays to the open Gulf area. The entire survey occurred from June 7 to July 13, 1990. SEAMAP sampling conducted east of the Mississippi River, from July 1 to July 13 re-surveyed eastern areas after emigration of brown shrimp from inshore waters. Sampling locations east and west of the Mississippi River Delta, by vessel, are shown in Figures 5-7 for the following dates: combined June and July sampling east of the River (June 7 to July 13), Gulf waters off Texas (June 11 to July 2), and waters off Louisiana west of the River (July 1 to July 13).

During the survey, the NOAA Ship OREGON II and Mississippi's R/V TOMMY MUNRO sampled offshore and inshore Gulf waters with 40-ft trawls. Alabama's R/V VERRILL sampled offshore Alabama waters with 16-ft trawls in waters less than 5 fm and 40-ft trawls in deeper waters. The R/V PELICAN sampled both Louisiana state waters and offshore waters with 40-ft nets, and Texas vessels sampled Texas state waters and offshore waters with 20-ft nets.

A total of 341 trawl samples was taken from coastal and offshore waters out to 50 fm from Perdido 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 low, with a maximum catch of 15.1 lb/hr of 34-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 8.8 lb/hr of 34-count shrimp taken in 11 fm of water off Mobile Bay, Alabama. The next largest pink shrimp catch rate east of the River in June was 7.9 lb/hr of 21-count shrimp south of Petit Bois Island in 12 fm. Finfish catch rates east of the River were generally low, with the largest catch on June 7 of 172 lb/hr with Gulf butterfish predominating.

Moderate catches of brown shrimp were also made off Texas from June 10 to July 2. The largest catch rate occurred June 20 off Brownsville in 16 fm (284.4 lb/hr of 66-count shrimp). White shrimp catches off Texas were low with the largest catch, 39.7 lb/hr of 13-count shrimp, taken off Matagorda Bay in 5 fm. Catch rates for pink shrimp were generally low off Texas, though the largest catch was 11.8 lb/hr of 25-count shrimp south of Galveston Bay in 12 fm. Finfish catch rates were moderate to low in Texas inshore and offshore waters. The largest catch of finfish was 2,436 lb/hr off the entrance to Matagorda Bay with spot predominating.

In July's samples west of the River (Louisiana), brown shrimp catches were low with the largest catch rate of 41.8 lb/hr of 35-count shrimp occurring southeast of Vermilion Bay in 16 fm. White shrimp catches were low, with a maximum catch rate of 2.9 lb/hr of 16-count shrimp taken in 6 fm south of Calcasieu Lake. Catches of pink shrimp were very low off the Louisiana coast with a maximum catch rate of 2.4 lb/hr of 23-count shrimp. Finfish catch rates were moderate with the largest catch rate of 1,181 lb/hr taken on July 1 with trout predominating.

In July sampling east of the Mississippi River, brown shrimp catches were low with the highest rate of 6.3 lb/hr of 85-count shrimp taken south of Horn Island, Mississippi in 8 fm on July 13. Highest catch rate of white shrimp east of the River was 0.2 lb/hr of 14-count shrimp taken west of Chandeleur Islands in 22 fm. The highest pink shrimp catch rate east of the River was 13.2 lb/hr of 30-count shrimp taken east of Chandeleur Islands in 11 fm. Finfish catch rates east of the River in July were low with a maximum catch rate of 709 lb/hr reported in 45 fm east of the mouth of the Mississippi River with croaker predominant in the sample.

West of the Mississippi River Delta, hypoxic bottom waters (less than 2.0 parts per million) were noted in several areas between 89°37.8' and 91°21.1' W. Long. in 7-17 fm.

### **Spring Plankton Survey**

For the eighth season, 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 24°30' N. Lat. and 85°00' W. Long. from

April 19 to May 30, 1990. At irregular intervals during the survey, the NOAA vessel departed from the scheduled cruise track to run a series of stations across ocean fronts and other physical features. Time and location of these special stations were determined from satellite imagery processed by NMFS Mississippi Laboratories, Stennis Space Center. Samples taken at special frontal boundary stations consisted of bongo and neuston tows, chlorophyll and environmental data.

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.

A total of 168 stations was sampled. The OREGON II occupied 147 stations and the R/V HERNAN CORTEZ II sampled 21 stations along the west Florida shelf. Time restraints and inclement weather prevented the OREGON II from occupying nine station sites.

Hydrographic data at all stations included surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom and fore-ule color.

Right bongo and neuston samples from SEAMAP stations will be transshipped by the NMFS Miami Laboratory to the Polish Sorting Center (PSC) in Szczecin, Poland. Left bongo samples are currently archived at the Gulf Coast Research Laboratory in Ocean Springs, Mississippi. Samples from the special frontal boundary stations will be sorted at the Miami Laboratory. Salinity data from the Florida vessels were sent to the NMFS Mississippi Laboratories for interpretation.

### **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, 1987, 1988, 1989 and in the current year covered Gulf waters from Florida Bay to Brownsville, Texas. Vessels from Florida, Alabama, Mississippi, Louisiana, and NMFS surveyed from September 1 through October 19, 1990 for a total of 128 stations.

The NOAA Ship OREGON II sampled 55 stations from Tampa Bay, Florida to Terrebonne Bay, Louisiana at depths from 5 to 100 fm. Chlorophyll samples were filtered at each station. Florida's R/V HERNAN CORTEZ sampled 30 stations from off Tampa Bay south to the Florida Straits. Stations were located along a 30-minute latitude/longitude grid from inshore waters to the shelf edge. An Alabama vessel sampled 10 stations at the mouth and outside Mobile Bay. The R/V TOMMY MUNRO sampled 2 stations south of Mississippi Sound along a 30-minute grid, and the R/V PELICAN sampled 7 stations in Louisiana 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 will be transshipped by the NMFS Miami Laboratory to the PSC; 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. Louisiana sampled with a 0.5-m ring net and a 20.0-cm bongo 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 and 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-Miami 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 sent to Poland, 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 1990, detailed earlier.

### **Benthic Surveillance Project**

For the seventh 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 1990 Benthic Surveillance Project were identical to those of the five previous surveys. Gulf sites included: Apalachicola Bay (FL), Mobile Bay (AL), Mississippi River Delta (LA), Calcasieu Lake (LA), Galveston Bay (TX), Lavaca Bay (TX), Corpus Christi Bay (TX) and Lower Laguna Madre (TX). South Atlantic sites sampled in the summer and fall 1990 included: Pamlico Sound (NC), Savannah River (GA), and Biscayne Bay (FL).

Sampling was conducted from August 14 to October 25, 1990, 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.

Special sediment collections were made at additional sites different from the annual sites at four locations. Mobile Bay (1 site), Mississippi River Delta (2 sites), Calcasieu River (1 site) and Corpus Christi Bay (1 site). An intensive survey was conducted in Galveston Bay where a large number of Atlantic croaker, the primary species, were collected at 3 sites. Special collections of hardhead catfish were made at 4 locations: Savannah River (1 site), Mississippi River Delta (1 site), Calcasieu River (3 sites) and Lavaca Bay (1 site). Special collections of red drum and black drum were made at 2 locations: Galveston Bay (1 site) and Lavaca Bay (1 site).

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.

## **FIVE YEAR PLAN**

Preparation of a joint SEAMAP five-year plan was authorized as a result of the external Joint SEAMAP Program Review conducted in 1987 under contract from the SEFC. North Carolina was funded to prepare this document through the NMFS/North Carolina 1989 SEAMAP cooperative agreement. In FY90, the Southeast Area Monitoring and Assessment Program (SEAMAP) Management Plan: 1990 - 1995, by C. D. Stephan, was completed and approved by the committees and management bodies of the Gulf, South Atlantic and Caribbean SEAMAP components.

## **DATA 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 1982-1989 have been entered into the system and data from 1989 and 1990 surveys are in the process of being verified, edited, and entered for storage and retrieval. Data from SEAMAP-South Atlantic surveys have not yet been entered into the system, but will be transferred from North Carolina and South Carolina data management systems when the modules for survey data in the SEAMAP system are available.

Verified, non-confidential SEAMAP data are available conditionally to all requestors, although the highest priority is assigned to SEAMAP participants. A total of 95 SEAMAP data requests have been received and processed. In some instances, requests were filled promptly; in many cases, however, a substantial lag occurred because of the extremely large amount of data being collected on an increased number of surveys over those of past years. To date, 91 requests have been completed and work is being performed on those remaining.

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 FY90 on the new distributed SEAMAP Data Management System. New modules completed include those for data entry, edit, upload, data query and download. Operational versions are now located at six SEAMAP field sites. Thus, the SEAMAP users will be able to locally, and directly, enter and retrieve data. Software for the proposed system has been distributed to participants for trial runs of data input. Approximately 61% of the total system estimated cost of \$536,500 has been committed to contracts (\$328,744). Approximately 98% of the committed contract money (\$321,390) has been utilized as of June 24, 1990. Delivery of the remaining PS/2's has been completed. All Gulf States are now equipped with the necessary computer hardware and software.

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

Under the new system, outside users may continue to request special data sets for research or study. 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 FY90:

- 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 1983, 1984, 1985, 1986, 1987 and 1988 SEAMAP Biological and Environmental atlases.
- Comparing catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets.
- Compiling the 1984, 1985 and 1986 SEAMAP Ichthyoplankton Atlas.

#### **REAL-TIME DATA**

A major function of the SEAMAP Information System in 1990 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.

#### **SPECIMEN ARCHIVING**

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 FDNR 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. Plans call for SEAMAP samples to be sorted for ichthyoplankton during the PSC contract period of September 1989 through August 1990. Priorities for sorting these samples from the backlog at PSC have been determined. Beginning



in the fall of 1987 plankton samples taken by Louisiana vessels were sorted by LDWF and sorting has continued for 1989-1990 samples. All specimens and data will be provided to the SAC.

Loan of SEAMAP specimens and development of the system and its protocols are supervised by SAC's curator, following policies outlined in the SEAMAP-Gulf Operations Plan. With the complete accessioning of 1986 samples, the catalogue is expected to contain approximately 43,200 lots, a collection of significant size. Due to space constraints and logistical problems with the PSC, the SAC has been hampered which has slowed the increase of the number of samples sorted and cataloged.

### 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 SIPAC was established, managed in conjunction with Gulf Coast Research Laboratory in Biloxi, Mississippi.

During the fiscal year 1989-90, 719 unsorted SEAMAP samples were received and cataloged at SIPAC. As of September 30, 1990, a total of 4,018 unsorted fish larvae samples are held at SIPAC. A total of 354 samples were transferred from the SIPAC collections to NMFS for transshipment to the PSC.

A total of 892 SEAMAP samples have been sorted for selected invertebrate taxa by the SIPAC (518 samples) and the PSC (374 samples) following established protocol. A total of 3,747 lots were obtained from these samples. Portunid megalopae and penaeid postlarvae from the sorted samples have been further identified to the lowest possible taxonomic level. The portunid megalopal data are currently being used by the GSMFC Crab Subcommittee and Dr. James Powers to develop an atlas of portunid megalopal distribution in the northern Gulf of Mexico.

During the next fiscal year, 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.

### INFORMATION DISSEMINATION

The following reports were published and distributed in FY90:

- ° 1990 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.
- ° 1990 SEAMAP Subcommittee Report to the GSMFC Technical Coordinating Committee: a detailed summary of program accomplishments, emphasizing

survey design, material collected, data dissemination, budget information and future survey activities.

- 1990 Annual Report of the SEAMAP Program - October 1, 1988 to September 30, 1989: a summary of 1989 activities and proposed 1990 events for the SEAMAP-Gulf, South Atlantic, and Caribbean Programs.
- Southeast Area Monitoring and Assessment Program (SEAMAP) Management Plan: 1990-1995 (July 1990). C.D. Stephan. A detailed description of the SEAMAP program which outlines the program goals, objectives and management policies and procedures.
- 1986 Environmental and Biological Atlas: a compilation of information obtained from the 1986 SEAMAP surveys including catch rates of shrimp and finfish, a squid/butterfish survey, an ichthyoplankton cruise and environmental data from all surveys.

David M. Donaldson

## **SPORT FISH RESTORATION PROGRAM**

The 1990 project year marked the beginning of our second three-year program to address important recreational fisheries issues through the Administrative Fund of the Federal Aid in Sport Fish Restoration Program administered by the U.S. Fish and Wildlife Service. Activities during the 1990 project year revolved around three primary areas: Anadromous fish restoration, recreational fisheries data, and artificial reefs. Work accomplished under the auspices of the Gulf States Marine Fisheries Commission (GSMFC) Sport Fish Restoration Program is attributable in major part to the diligent efforts of the TCC Anadromous Fish Subcommittee, the TCC Data Management Subcommittee, and the TCC Recreational Fisheries Management Subcommittee.

### **Recreational Fisheries Management Activities**

During this reporting period, the GSMFC Technical Coordinating Committee (TCC) directed the TCC Recreational Fisheries Management Subcommittee to turn its efforts toward consideration of the many complex issues regarding artificial reefs in the marine and estuarine environments. The first major project identified by the Subcommittee was the development of a data base on all legally permitted artificial reefs in the Gulf of Mexico. Data elements include location, water depth, material type, and date constructed. Completion of the data base is expected by the end of December 1991. As a result of the data base project, the Subcommittee will prepare a report which describes state and federal artificial reef programs and significant data elements from the data base. That report will be prepared during 1992. Other important topics identified by the Subcommittee for future action include the use of coal ash waste as artificial reef material, buoying activities, the function of estuarine artificial reefs, and state plans for artificial reef activities.

Currently underway is a report for the U.S. Fish and Wildlife Service which will benefits and successes of projects from the Gulf States using Sport Fish Restoration Act funds. It is anticipated that the document will be used during expected Congressional action to reauthorize and amend the Act. The Federal Aid in Sport Fish Restoration Program has been and continues to be a significantly important source of funding for state research and management activities for recreational fisheries. The document will highlight this fact and convey to Congress the importance of maintaining the integrity and long-term viability of the Program.

### **Recreational Fisheries Data Activities**

During 1989, the TCC Data Management Subcommittee entered into a major initiative to analyze existing marine recreational fishery (MRF) data collection and management programs, both state and federal, and make recommendations for a single, unified, coordinated, state-federal MRF data collection and management program. Resulting from that first year's effort was an activity to analyze MRF

data collection programs for the "for-hire" segment of the recreational fishery (including charter, head, and guide boats), and make recommendations regarding criteria by which those data should be collected and data elements which should be included. After three workshops addressing the issue, a report has been compiled and will be included as a component of the overall report for a comprehensive recreational fishery data collection and management program. Also completed during the 1990 project year is a report entitled "Marine Recreational Fisheries Statistics Survey Intercept Standards for Quality Control" which was begun during 1989. This report will also constitute a component of the larger report on data collection programs.

Another recommendation resulting from the 1989 efforts was that state marine resource management agencies should conduct the intercept/interview portion of any MRF data collection effort. As a result of that recommendation, the GSMFC Commissioners directed the staff to look into a mechanism by which the Gulf States, coordinating through the GSMFC, could become directly involved in collection of recreational fishery data in the Gulf of Mexico. The result of that directive is a joint proposal of the GSMFC and the Pacific and Atlantic States Marine Fisheries Commissions for a cooperative agreement with the National Marine Fisheries Service (NMFS) to have the interstate commissions coordinate their respective member states in collecting MRF data. The proposed state-federal cooperative program is called the Recreational Fisheries Information Network (RecFIN).

Future workshops to continue to refine MRF data collection and management are planned for 1991 and 1992. It is expected that the final results of this effort will result in the most comprehensive recommendations for MRF data collection and management criteria available.

### **Anadromous Fish Restoration and Management Activities**

As a part of its ongoing efforts to coordinate state-federal activities for restoration of anadromous fish populations in the Gulf of Mexico, the TCC Anadromous Fish Subcommittee developed a report entitled "Guidelines for Monitoring Eggs, Larvae, Juveniles, and Adults of Striped Bass." This report addresses such topics as sampling gear, sampling time and duration, sampling locations and other items pertinent to monitoring of striped bass in coastal river systems.

During this project year, the GSMFC learned of a NOAA General Counsel ruling that the GSMFC interstate fishery management plan (FMP) for striped bass did not meet NOAA criteria for an FMP in order to allow states to receive 90-10 funding under the Anadromous Fish Conservation Act (P.L. 89-304). As a result of that ruling, the GSMFC developed a technical amendment to that FMP in order to comply with NOAA criteria and allow states to qualify for 90-10 funding under the Act. During the 1991 project year the Subcommittee will develop Amendment 1 to the Striped Bass FMP, which, if adopted by the GSMFC Commissioners, will supersede the Technical Amendment.

The Apalachicola River Basin harbors what is suspected to be the only remaining population of Gulf of Mexico striped bass. A project begun in 1988 by

researchers at the New York University Medical Center is using DNA fingerprinting techniques to identify the genetic structure of fish collected from the Apalachicola River Basin. The project will result in a mechanism to compare the nuclear DNA make-up of various genotypes of striped bass.

Final phases of the project will be completed in 1993 and will be administered by the GSMFC through a subcontract to the Medical Center. The final phase will allow analysis of the nuclear DNA of striped bass which have been preserved. This will provide for the genetic fingerprint of the original Gulf of Mexico strain of striped bass prior to stockings using Atlantic coast fish. The results of this project will have important management implications.

The 1986 adoption of the GSMFC interstate Striped Bass FMP marked the beginning of a truly cooperative effort to restore and manage striped bass in the Gulf of Mexico region. Following this tradition the GSMFC began a major initiative to develop a strategy for restoration, conservation, research, and management for striped bass. The first step in this initiative was the development and adoption of a "white paper" entitled "Anadromous Fish Restoration Programs in the Gulf of Mexico" which provides a history of funding and programmatic activities undertaken by the states and federal government. A position statement on continued support and increased funding for state-federal cooperative anadromous fish restoration and management was adopted along with the "white paper." A major workshop is scheduled for early 1991 which will result in a strategic plan for restoration, conservation, research, and management of anadromous fish, primarily striped bass, in the Gulf of Mexico region. The "white paper" and the strategic plan will be used to guide state and federal restoration and management activities and to seek increased funding to support those activities.

### Comments

Just as the Federal Aid in Sport Fish Restoration Program is important to the individual states in their efforts to address recreational fisheries management needs, the Administrative Fund of that Program is important to the continuing need to address the interstate and state-federal aspects of recreational fisheries. Without that source of programmatic support, the progress that we have made would not have been possible. We look forward to continued participation in the Sport Fish Restoration Program and to continued efforts to benefit important fishery resources in the Gulf of Mexico.

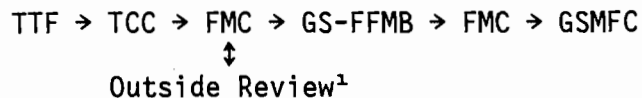
Ronald R. Lukens

## INTERJURISDICTIONAL FISHERIES PROGRAM

In 1990, the Gulf States Marine Fisheries Commission (GSMFC) continued to play an important role in the development of interjurisdictional fisheries management plans (FMPs) under PL 99-659, the Interjurisdictional Fisheries Act of 1986 (IJF). This function was supported by funding under Grant Number NA90AA-D-IJ202 (2-IJ-8-3), "A Project to Develop Interjurisdictional Fisheries Management Plans," for the period January 1, 1990, through December 31, 1990.

In 1990, the GSMFC made significant changes in the procedure by which IJF management plans are reviewed and approved. This was accomplished as part of an extensive review of the Commission's functions and the committees and subcommittees which are a part thereof.

At the beginning of 1990, IJF plans were developed and approved by the following process:



<sup>1</sup>Standing committees, trade associations, general public

Under this process a technical task force (TTF) was formed for each fishery undergoing planning, and it was made up of one appointed member from each gulf state plus an appointed member of the Law Enforcement Committee, the Industry Advisory Committee, and the Recreational Fisheries Committee of the GSMFC. The TTF was responsible for initial development of the fishery management plan (FMP).

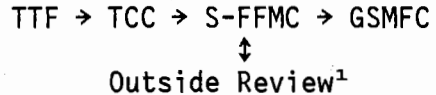
The Technical Coordinating Committee (TCC) being the scientific standing committee of the GSMFC made up of two appointed scientists from each state and one from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (FWS) was responsible for reviewing and editing IJF plans once they were completed. Following approval by the TCC the Fisheries Management Committee of the five gulf state directors of the agencies responsible for marine fishery management was responsible for review, editing, and approval of FMPs.

The Gulf State-Federal Fisheries Management Board (GS-FFMB) was a separate body from the GSMFC but composed of the state director and a legislative member of the Commission from each state along with a member of the NMFS and the FWS. It was responsible for reviewing FMPs and advising the FMC.

The Gulf States Marine Fisheries Commission (GSMFC) as the governing body of the agency was responsible for final approval of all FMPs; however, the Commission could not edit or modify plans. It could only recommend suggested changes to the FMC.

At their meeting in March 1990, the GSMFC modified the approval process for IJF FMPs by eliminating the GS-FFMB and adding the Southeast Regional Director of the NMFS and the Region IV director of the FWS to the FMC. They also changed the name of the FMC to the State-Federal Fisheries Management Committee (S-FFMC).

The new approval process was as follows:



<sup>1</sup>Standing committees, trade associations, general public

During 1990, the IJF program completed two major FMPs for the Gulf of Mexico, United States, and made significant progress on a third. The following discussion describes activities and accomplishments for each plan during the year.

### **Blue Crab (Callinectes sapidus)**

A final draft of the blue crab FMP was completed on January 29, 1990, following a meeting of the Blue Crab TTF on January 18-19, 1990. This draft was subsequently distributed to the TTF and TCC for editing and approval. After incorporation of limited changes, a public review draft was developed and widely distributed to agencies, trade associations, and the general public throughout the Gulf States.

Following the public review period, a revised final draft was submitted to the FMC on March 14, 1990, and it received unanimous approval. On March 15, 1990, the plan was submitted to the GSMFC, and it received their approval without objection.

The FMP was readied for publication following the GSMFC meeting, and printing was completed in late June 1990. Approximately 500 copies were produced and most were distributed to state and federal agencies, trade associations, and other interested persons. Throughout the remainder of the year copies of the FMP were distributed to persons on request.

In October 1990, the TCC Crab Subcommittee met in conjunction with the GSMFC 41st Annual Fall Meeting and discussed the blue crab FMP. They addressed the need to keep and maintain an up to date data base of information regarding blue crab biology and management and agreed to establish a repository for publications, reports, and other documents. This repository was to be maintained by IJF staff in the GSMFC office.

### **Eastern Oyster (Crassostrea virginica)**

The majority of the year's IJF effort focused on the oyster FMP which was in the very early stages of development at the beginning of 1990. Working with TTF members on individual assignments, staff developed a preliminary draft in March 1990, and a TTF meeting was held March 21-22, 1990. An additional meeting

was held on March 23, 1990. At these meetings, staff and TTF members reviewed completed work and determined needs and direction.

Following the March meeting, staff continued to work with individual section authors and was able to develop a near complete document by July 1990. This draft was distributed to the TTF, and a task force meeting was held July 26-27, 1990, for review. At this meeting, the final details of plan needs were established.

By September 1990, a subsequent draft was completed and distributed to the TTF, the TCC, the S-FFMC, and the GSMFC. At the GSMFC 41st Annual Fall Meeting, the TCC, S-FFMC, and GSMFC were provided with an oral presentation of the plan. A great deal of material and ideas were reviewed during these three meetings. Although the plan was substantially complete, some minor changes were needed before the plan would be ready for public distribution and review. With the aid of this additional information, staff and TTF members were able to develop a subsequent draft that was distributed in early December 1990. The plan was subsequently completed with minor changes and printing was accomplished in early 1991.

### **Black Drum (Pogonias cromis)**

The development of the black drum FMP formally started with the first, organizational meeting of the Black Drum TTF in February 1990. At this meeting, the IJF Act, the FMP development and approval process, and other aspects of the IJF program were discussed by the new TTF members. The TTF agreed on a tentative table of contents and a timetable for completion. They also made assignments for drafting of plan sections to individual task force members.

Research and writing of plan sections by staff and TTF members proceeded until mid July 1990. In August 1990, the TTF met to review progress and needs. Much work had been done toward completion of the longest and most complicated sections regarding stock descriptions, biology and stock habitat. These sections were extensively reviewed, and the task force also discussed population dynamics and other plan needs. It was noted that the original task force member from Texas, Mr. Steve Marwitz, had been replaced by Ms. Karen Meador, and she would be assisting in the completion of Mr. Marwitz's assignment.

Following this meeting, staff and TTF members continued to develop preliminary drafts of the outstanding sections. By the end of December, most were in preliminary draft form with the exception of economics, sociology, and management recommendations.

In summary, the IJF program progressed very well during 1990. The blue crab FMP was completed and printed, and the oyster FMP was complete and at the printer. Much progress was made in the development of a black drum FMP.

Richard L. Leard



**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 43 employees of the Administrative, Enforcement and Fisheries sections during fiscal year 1990. A total expenditure of \$2,222,630 was made from the approved budget of \$2,599,000. Revenue of \$2,254,178 was made up from federal aid (32%), license fees (40%), marine gas tax (9%) and other sources (19%).

**ADMINISTRATIVE SECTION**

The Administrative Section provides supervision, clerical, purchasing and general administrative support for the two operational sections, supervises state seismic activities and coordinates with other state, federal and regional agencies on fisheries and environmental matters. The section consisted of the Division Director, six clerical, one custodial and one mechanical employees. Offices are maintained at Dauphin Island, Gulf Shores, Bayou La Batre and Montgomery. The section expenditures were \$532,556 on salaries and operational expenses for Division activities, some of which was reimbursed under federal aid to fisheries programs. A \$400,000 transfer was made by the legislature for shell planting on public reefs. Contracts were let with two oystermen's associations for the renovation work.

Contracts were let to plant oyster shells on public reefs in efforts to rebuild oyster reefs destroyed by three years of record drought. Renovation was completed on the roof of the Dauphin Island office which frequently leaked during heavy rains. The 12,000 square roof was not originally designed to properly drain. A 100% federal grant project was approved to provide \$25,000 to the Enforcement Section. Five training sessions were attended by clerical personnel.

Four computerized IBM typing systems were purchased allowing more effective clerical duties. A total of \$397,961 was expended on oyster reef improvements in Portersville Bay and other public reefs. The Save Our Shells Association, and South Alabama Seafood Association, two nonprofit oyster fishermen's associations, were awarded a contract for the work. A \$300,000 federal grant application was submitted for oyster reef improvements during FY91.

Future plans include slight revisions to legislation passed during 1989 and reintroduction of bills to provide for data collection, penalties for shrimping violations, revision of the bait shrimp law and changes in the Marine Gasoline Tax funding allocation.

## ENFORCEMENT SECTION

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

Facilities and personnel include headquarters at Dauphin Island and district offices in Bayou La Batre and Gulf Shores. At the beginning of FY90 the section consisted of 14 enforcement officers. Eight officers are stationed in Mobile County, five officers are stationed in Baldwin County, and the Chief Enforcement Officer is stationed at Division headquarters in Dauphin Island.

One officer attended the Southwest Alabama Police Academy to comply with minimum standards requirements. Officers attended schools and courses on fish identification, firearms instruction, boating safety, and other state/federal agency law enforcement programs.

An officer was designated as the Division training officer and has attended the FBI Firearms Instructors School and other state/federal training programs. He is in the process of developing additional training for field officers.

Expenditures during the year totaled \$546,590, of which \$25,000 was reimbursed by a grant with the National Marine Fisheries Service. Other expenses for shared services and material such as utilities and gasoline were paid by the Administrative Section.

Enforcement officers conducted 22,373 hours of boat and shore patrol, checked 11,012 boats, made 736 inspections of seafood shops, and issued 316 citations for illegal activities. Violation of rules concerning finfish made up a majority of the citations, followed by shrimp, oyster, and other (which includes boating safety, hunting and other state law violations).

Three new sedans were purchased to replace worn-out models. A new B-Craft boat was purchased to replace a worn-out Boston Whaler. A share of the money from a multi-agency drug bust enabled the Division to replace all officers' old .38 caliber revolvers with new Glock 17 9 mm semi-automatics. Eight hand-held radios were purchased for officers, making field operations more effective and efficient.

The most significant problem is the continuing lack of sufficient personnel to adequately monitor commercial and recreational fishing activities. One officer was hired during FY90 to replace an officer transferred to Game and Fish Division. Hiring an additional officer was also planned for FY90, but lack of funds caused this to be delayed.

Future plans include formulating training programs to upgrade performance, establish a training officer position, maintain adequate equipment and personnel, and effectively conduct operations.

## FISHERIES SECTION

The activities of the Biological Section of the Marine Resources Division are directed toward the management of the commercial and recreational fisheries in Alabama's marine waters. These activities are mostly funded through federal aid programs of the U.S. Department of Commerce and the U.S. Department of Interior, Fish and Wildlife Service. Those biological functions not covered by federal aid programs, such as fish kill investigations, pollution reports, environmental investigations, and oyster management, are all supported by commercial and recreational license fees.

Facilities consist of the Claude Peteet 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, five Biologists Aides III, two Biologist Aides II, three Biologist Aides I, one data entry Clerk Typist II, one Utility Laborer, and two temporary laborers.

Expenditures totaled \$682,852.00, consisting almost entirely of federal aid funds from nine federal aid programs. State funds for required match varied from zero to 25% of the program costs.

Perhaps the most currently stressed resource in our management authority is the oyster resources. Historically, this resource has fluctuated drastically in response to the existing environmental conditions. Last year it reached an all time low and in response to this the Marine Resources Division has initiated its first Oyster Fishery Management Plan. This plan will involve biologists, oyster catchers, oyster dealers, and legislators, and will attempt to minimize the low production periods and increase the highs through long range planning. It will identify what should be done, how much it will cost, and the source of funding.

### Federal-Aid

**Wallop/Breaux** - The expansion of the Sportfish Restoration Act has allowed for federal excise tax monies to be utilized in the management of marine recreational fisheries. Recreational marine fishes including striped bass, spotted seatrout, and snook are being reared to a taggable size and released. Information gathered from the reporting of captured fish will monitor growth, movement, and harvest. In the case of snook, an experimental program is underway to determine the feasibility of introducing snook into specific coastal streams. A project was initiated in October of 1989 to gather data which would characterize the bycatch of recreational finfish by the trawl fishery and to develop indices of the relationships between postlarval and juvenile finfish abundance and adult recreational finfish capture. Funds have been utilized to renovate existing boat access areas and build a new boat ramp in Bayou La Batre. The offshore artificial reef program has been expanded utilizing Wallop/Breaux funds. During 1989, ten new reefs were constructed from bridge rubble and railroad boxcars. Auburn Marine Extension and Research Center and Marine Resources Division staff prepared a pamphlet for public dissemination which lists all public fishing reefs offshore of Alabama.

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

**MARFIN Red Drum** - This project was designed as a gulf-wide research initiative to determine the status of red drum stocks in the Gulf of Mexico and its associated estuaries. Our research efforts have been concentrated in determining escapement rates of inshore stocks to the offshore sexually mature populations. Rearing, tagging, and releasing known age red drum has played an important role in determine escapement rates. During the winter of 1989, 90% of the fingerlings under culture died due to extended cold weather. Approximately 960,000 larval red drum are currently under culture in ponds at the Claude Peteet Mariculture Center. When these fish reach a size of 30-40 grams they will be tagged and released into the Alabama Estuarine System.

**Interjurisdictional Fisheries** - This project was designed to intercept fishermen to collect length and catch information for marine fishes covered by fishery management plans of the Gulf of Mexico Fishery Management Council. Due to a change in the formula for the allocation of funds to each state, funds to Alabama have been severely reduced. Data collected are providing valuable information on the migratory and reef stocks captured off Alabama. New bag and size limits were recently enacted for several species to conform to regulations in federal waters.

**Statistics** - Fishery dependent data is collected under this project by port agents working in Mobile and Baldwin counties. Interviews with commercial dealers determine the volume and value of seafood landings. A Trip Interview Program (TIP) was initiated to gather specific biological data on selected species. Data collected from both fishery independent and fishery dependent programs are managed under this project.

**SEAMAP** - This is a cooperative state/federal program which provides funding for our monitoring and assessment program. Data generated from this project provides information needed to manage the shrimp fishery and evaluate spawning success and juvenile survival for our important recreational and commercial species. The shrimp fishery was opened on June 5, 1990 at 12:00 noon. Samples had indicated a poor season due to the extended flooding during the spring. Initial harvest information appears to confirm this; however, the size of the shrimp has been good.

#### **Non-Federal Aid**

Biological functions not covered by federal aid such as fish kill investigations, pollution investigations, environmental degradation investigations, and all facets of oyster management are supported by commercial and recreational fishing license sales. During this fiscal year, 14 fish kills were investigated by the fisheries staff on kills ranging in severity from 200

to 1,900,000 fish killed. Biologists in Mobile and Baldwin counties conduct investigations and make written comments on all activities within the coastal area requiring either a Section 10 or Section 404 permit from the U.S. Army Corps of Engineers. Fisheries staff conducted routine oyster resource investigations during the year and initiated the development of a long range plan for the Alabama oyster resource. The development of this plan involves biologists, oyster catchers, oyster dealers, state and federal health agencies, U.S. Army Corps of Engineers, and state legislators. The intent of plan development is to establish management methodology for both rebuilding the oyster stocks and stabilizing harvest. Biologists also participated in the ongoing environmental study of Perdido Bay sponsored by Environmental Protection Agency, Florida Department of Natural Resources, and Alabama Department of Environmental Management.

### **Significant Problems and Solutions**

Historical techniques utilized for tracking federal aid expenditures, particularly personnel time charges, were questioned by a state audit and changes suggested by a federal audit were put in place. Those changes are not only satisfying earlier audit criticisms, but also allowing a more precise utilization of personnel time charges to the various federal programs within the division.

Sustained funding for oyster management in Alabama has historically been a problem. Identification of specific objectives and suggested funding sources for these objectives is a viable section of the oyster fishery management plan currently being developed by the Marine Resources Division.

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 300 adult tarpon and 500 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. Adult tarpon appear to undergo a substantial spawning migration from inshore areas frequented during spring and summer to offshore spawning grounds.

Estimates of snook abundance based on a 1990 tag/recapture study in the Port Manatee and the McDill areas of Tampa Bay were 14,000 and 7,000 individuals, respectively. An age validation and tag retention study was initiated in 1990. No mortality was associated with pen held snook during the DNR tagging and handling protocol. Preliminary analyses indicate a life span for snook of about 16-18 years; females reach larger sizes and older ages than males. Sexual maturity appears to occur in the second or third year for males and in the fourth or fifth year for females, although this species is a protandric hermaphrodite and inversion dictates the final age and size at maturity. Total annual mortality of snook, as determined by catch curve analysis, indicates a 46% to 76% rate between the ages of V and VII. In a six square mile area in Boca Ciega Bay, the estimated abundance of the post-exploited phase of red drum larger than 27 inches TL was 4,647 in 1988 and 4,126 fish were estimated. Most of the fish were age III, with some as old as age IV or V.

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

Work continues on a wide variety of other species, including, but not limited to spotted seatrout, black mullet and king mackerel. Manuscripts on sea bass (1966 to 1974 data base), king mackerel (1975 to 1979 data base) and gag grouper (1978 to 1981 data base) are completed and are either in review or have been published.

Florida's continuing participation in the Southeast Area Monitoring and Assessment Program (SEAMAP) in 1990 included completion of two plankton collection cruises during May and October over the West Florida Shelf. Sampling included measurements of chlorophyll concentrations, larval fish abundance as sampled by neuston and bongo nets and hydrographic information. Current holdings of the SEAMAP Archiving Center include approximately 55,000 lots of larval fishes collected from throughout the Gulf of Mexico since 1982.

The baitfish project concentrated on quantifying population dynamic parameters from the coastal waters of east and west Florida, e.g. presence and abundance of different life stages, using multiple techniques such as aerial and hydroacoustic surveys. Also, a trophic dynamic study was initiated.

Tag/recaptures from the 1990-1991 mullet roe season were processed to examine movement, migration and exploitation of the mullet population. Population modeling and stock assessment for mullet were discussed with the Florida Marine Fisheries Commission (MFC) staff. A tagging-handling mortality experiment was conducted.

Analysis of spotted seatrout growth and reproduction data continued. Preliminary analyses were presented to the MFC and east coast conservation groups in March.

The early life history study of five sciaenids in Tampa Bay will be completed in 1991. Investigations on snook nursery habitats found that even small ditches and canals may contribute to the recruitment of postlarval snook. Data from the Little Manatee River (Tampa Bay) project indicate salinities have been steadily increasing since 1988 and could affect distribution of the fish fauna.

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

The first ichthyoplankton survey for assessing clupeid stocks along the eastern Gulf of Mexico was made in February. A total of 70 stations were occupied and sampled for fish eggs and larvae. Samples are being processed at the Florida Marine Research Institute (FMRI) sorting facility.

## INVERTEBRATES

Aspects of growth and biochemical genetics of various Gulf of Mexico populations of hard clams have been examined. Data are in various stages of analysis for publications dealing primarily with clam populations in the Indian River.

A five-year plan for studies on bay scallop distribution, settlement patterns and physical and biological factors influencing distribution and settlement was prepared and preliminary research was initiated. Quantitative adult sampling techniques are being developed at a study site near Crystal River.

Calico and bay scallop samples for biochemical genetics were collected from off the Marquesas Keys and the Homosassa River, respectively and forwarded to cooperating investigators for analysis.

Preparation of a manuscript on blue crab population characteristics in Tampa Bay, Florida, is underway and scheduled for completion in June 1991. Data taken during an investigation of blue crab migration were analyzed to establish the

significance of directional movement, distance traveled, days out and size components of migratory populations. Manuscript completion is scheduled for December 1991. A manuscript "Parasitization of *Loxothylacus texanus* to *Callinectes sapidus*: Aspects of Population Biology and Effects on Host Morphology" was submitted for publication. The Blue Crab Fisheries Management Plan for the Gulf of Mexico was approved by Gulf States Marine Fisheries Commission commissioners and published in April 1990. An investigation of genetic variation in blue crabs throughout their range in the United States was initiated. Tissue samples from crab stocks at 21 sites in 12 states were obtained for electrophoretic and mtDNA restriction fragment pattern analyses.

Long-term ecological research on coral reef communities in the Florida Keys was continued at two previously established sites. Work was conducted at five cooperative National Park Service/FMRI stations at Dry Tortugas and at two stations off Key West. Researchers also provided information to the Florida Marine Fisheries Commission on the issue of marine life collection that resulted in the regulation of collection of certain species and part of which culminated in a decision to phase out live rock collection. Information was provided to the Gulf of Mexico Fishery Management Council for their development of options to modify the Coral Fishery Management Plan, e.g. permits to control octocoral harvest.

Proceedings of a symposium on stone crab biology and management are in preparation and scheduled for completion in 1991. Studies on the genetics, physiology and ecology of hybrids in the northern Florida hybrid zone are in progress. Field studies to determine population structure and collect material for genetic studies began in Tampa Bay. A manuscript describing the effects of temperature and salinity on early life stage survival and development has been submitted for publication. Three other manuscripts are in preparation: (1) one describing growth in post-settlement juvenile Florida stone crabs, (2) one describing techniques for determining the species composition of stone crabs from a given locality and (3) one comparing the effects of temperature and salinity on survival and growth between the two species of stone crabs harvested in Florida.

The spiny lobster team completed a year long tag-recapture study of post-algal juveniles at one site in Florida Bay. Density in this prime soft coral/sponge hardbottom averaged about 200 per hectare during the course of the study. Data on growth of these small lobsters were collected and are now being analyzed. The FMRI lobster team is collaborating with Dr. William Herrnkind from Florida State University and Mark Butler from Old Dominion University in a project designed to explore the effect that limited post-algal habitat may have on abundance of larger sized lobsters.

An ongoing queen conch stock assessment and stock rehabilitation program is entering its fourth year. Vessel-assisted strip transect, tag-recapture and belt transect surveys are utilized to assess and monitor the stocks. Results from the first three years indicated no increase in abundance except for statistically significant increases of adult and total conchs in the reef habitat and a statistically significant decrease of juveniles in the seagrass. Tag-recapture data surveys of all offshore reefs were completed in 1990 to provide baseline data of abundance trends within aggregations. Tag-recapture sampling designs



will expand to address abundance estimations and movements and migrations. A new culture laboratory designed to provide juveniles for stock rehabilitation experiments was completed in September 1990. Thirty-six juveniles were produced that fall. Research goals of the stock rehabilitation program are to identify variables limiting survival in field released hatchery-reared juveniles and to address genetic questions regarding enhancement. Economic feasibility will also be examined.

## PLANKTON BLOOMS

Studies continue on identifying and culturing potentially toxic dinoflagellates and using shape/size analyses as a tool in identification. Maintenance of existing cultures and isolation of additional potentially toxic phytoplankton continues. Two minor blooms of Gymnodinium breve occurred along the gulf coast in 1990. Bivalve harvesting closures and information advisories to the public were accomplished as required.

## ENDANGERED SPECIES

### Sea Turtles

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

The current program is divided into five major components: (1) biological and ecological research, (2) population census, (3) assessment of mortality factors, (4) habitat protection through permit review and (5) coordination of research and management efforts through a state permit system.

The Department continues to pursue various strategies to ensure the future of Florida's sea turtle population. These include promoting the use of turtle excluder devices (TEDs) to reduce incidental mortality of sea turtles in shrimp trawls, increasing the protection of nesting beaches and foraging habitats, assisting with implementation of lighting ordinances, providing standardized guidelines and training to sea turtle conservationists and developing improved turtle nest protection programs on beaches.

### Manatees

The manatee salvage/necropsy program is a pivotal component of the manatee research effort. In 1990, 206 manatee carcasses were documented, with mortalities attributed to natural (66), boat/barge collisions (47), perinatal (44), undetermined (41), other human related (4), crushed/drowned in flood gates or canal locks (3) and verified but not recovered (1). Total deaths were highest in Brevard County (62), followed by Lee (27) and Collier and Duval (13 each). Boat-related deaths were highest in Brevard and Collier counties (7 each),

followed by Lee (5), Martin, St. Lucie and Volusia (4 each) and Duval and Palm Beach (3 each). A severe winter freeze in late December 1989 resulted in numerous cold-stress-related deaths in 1990, accounting for 46 of the 66 other natural mortalities. Since 1974, when collection of comprehensive mortality data began, over 1,700 manatee carcasses have been examined.

Year-round aerial censuses to assess manatee abundance and distribution were continued at several sites during 1990. Field tests were begun in December 1990 to estimate the percentage of manatees missed (variability bias) during winter aerial surveys of manatees at power plants. If successful, this information will be used to correct past and future counts to better track trends in the manatee population.

Staff members from the FMRI in St. Petersburg and the field stations at Tequesta and Jacksonville assisted the USFWS in the Service's east coast telemetry project through tracking of tagged animals in southeast and northeast coastal waters and by providing research equipment. Up to 14 manatees were tagged at any one time with animals spread out from Miami to Georgia. An FMRI telemetry study, originating in Tampa Bay, was approved and research equipment ordered in anticipation of tagging up to five manatees at warm-water discharges in February 1991. With over 100 animals residing in the bay during winter, identification of west coast movement patterns and habitat preferences is necessary to protect manatees in central west coast waters.

The marine mammal portion of the Marine Resources Geographic Information System progressed significantly during the year. New equipment and software were ordered to upgrade the current system to networked SUN workstations from the presently used individual personal computers.

## FISHERIES STATISTICS

The Commercial Fisheries Statistics Cooperative effort with the National Marine Fisheries Service continues. The state Marine Fisheries Trip Ticket Program now 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 to collect data on gear employed on each individual trip and to allow specifying a size code. Other changes include expanding the program to include marine life (tropical) species. Fisheries Independent Monitoring of juvenile fishes continues in the Tampa Bay, Charlotte Harbor and Indian River lagoon/bay systems. 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

About 200,000 phase I and phase II red drum have been tagged and released in Florida watersheds as part of the Experimental Culture and Physiology Section's Stock Enhancement Research Program. In Calendar Year 1990, 132,915 phase I and 69,490 phase II red drum fingerlings were released by FMRI. In January, 2,572 fluorescent pigment-marked fish were released in Volusia County. In February, 20,989 phase II binary coded wire-tagged fingerlings were released. Two thousand five of these fish were released into the Manatee River, 11,624 were stocked in Gordon Pass in Collier County and 7,360 were released in Volusia County. In April, another 4,000 fluorescent pigment-marked fish were released in Volusia County. During June and July, 44,149 phase II fingerlings were released in Volusia County. All but fifteen of these fish were marked with binary coded wire tags. The remaining fifteen were marked with internal anchor tags. Twenty-six tag returns were recorded to date from the Indian River watershed in Volusia County. Mean size at capture was 228 mm TL. Mean distance traveled was 0.77 km and mean free time to initial capture was 222.8 days. Mean daily growth was 0.89 mm/day. Short term survival experiments, predator/prey evaluations, short term movement patterns were reviewed.

The hatchery component of the Stock Enhancement Research Facility produced 14,400,000 Gulf of Mexico stock red drum eggs in spring 1990 and 84,444,000 in fall 1990. Another 26,526,000 Atlantic Ocean stock red drum eggs were produced in spring 1990 and 54,018,000 in fall 1990. Two-hundred-thousand phase I and 70,000 phase II red drum fingerlings were produced in 1990. Improved snook spawning methods were developed, yielding 27,315,600 viable embryos in 1990 compared to 7,542,675 in 1989. Considerable success was achieved in development of out-of-season photothermal spawning for snook.

Treatment protocols for two serious marine fish parasites were tested and refined. Amyloodinium, a parasite on the gills of red drum was controlled with a chemical called chloroquine diphosphate. Caligus, a copepod parasite was totally eliminated from harvested red drum with a 20 minute freshwater dip.

The section produced its first quarterly newsletter, "FISH BYLINES" in 1990. The newsletter reports major activities and accomplishments of enhancement and restoration work in Florida and especially at the FMRI.

## BUREAU OF MARINE RESOURCE REGULATION & 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, Florida Statutes, and Chapters 381 and 386, Florida Statutes, 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 1990, the Oyster Culture Section collected 53,100 bushels of shucked oyster shells and planted 160,536 bushels to restore approximately 40 acres of oyster reefs in Apalachicola Bay.

In 1990, a Legislative appropriation of \$702,200 was 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, Okaloosa and Santa Rosa. Currently 246,112 bushels of live oysters and 133,680 bushels of shell have been planted during FY 1990-91 resource development projects.

Marine Fisheries Information System statistics showed statewide oyster landings declined in 1989 to 1.9 million pounds valued at \$4.0 million. Franklin County landings increased from 132,000 bags in 1989 to 295,000 bags in 1990. Increased landings reported to monitoring stations in Apalachicola Bay, reflect an upward trend in statewide production. The Department determined that extended drought conditions from 1986 through 1988 had injurious effects on oyster resources on a regional level. The Department issued 1,120 Apalachicola Bay Oyster Harvesting Licenses generating \$54,550 in user fees for the Apalachicola Bay Conservation Trust Fund.

Preliminary reports indicated that clam landings in 1990 declined to less than one million pounds with an approximate value of \$5 million. Production declines continued as a result of poor recruitment in natural stocks in the Indian River, especially in Brevard County which is the largest clam producing county. During 1990-91, aquaculture is expected to contribute substantially to hard clam production.

Hard clams harvested from waters classified as restricted or conditionally restricted must be processed through relaying and depuration activities rigorously controlled by the Division of Marine Resources. The Division has promoted depuration as a practical method for cleansing potentially contaminated shellfish, ensuring product quality and protecting public health. In 1990, the Division issued 17 relay permits to leaseholders and depuration facilities; 2 permits were issued to facilities using controlled purification processes; and 38 Special Activity Licenses were issued to promote shellfish resource development.

Provisions of Section 370.16(1)-(11), F.S., allows leasing sovereign submerged bottoms for cultivation of oysters and clams. In 1990, there were 156 shellfish leases in effect totaling 2,059 acres. Cultivation of hard clams and oysters offers a technically feasible and economically practical alternative to increase shellfish production. Additionally, 17 Chapter 253 Aquaculture Lease applications were reviewed by the Division.

The Division certified 222 shellfish processing plants. Four comprehensive shellfish surveys to determine proper classifications of coastal waters for shellfish harvesting were completed in 1990. Nearly 190,000 acres of growing waters were classified by the Shellfish Environmental Assessment Section. The Shellfish Laboratory analyzed 392 shellfish meat samples and 12,157 water samples to insure shellfish quality.

## BUREAU OF MARKETING & EXTENSION SERVICES

The seafood industry today plays an important role in Florida's economy. The Bureau of Marketing and Extension Services is a vital factor in its continuous growth. The Bureau's prime function is to spearhead the state's seafood marketing activities, not only in Florida, but in existing and potential markets both foreign and domestic. With headquarters in Tallahassee, the Bureau consists of six offices located in Florida and Georgia.

The Market potential for Florida seafood continued to grow. Problems known to be limiting the growth of domestic fisheries center on the environmental problems and the competition for traditional species. While allocation of the resource is a common concern affecting consumer prices and supply, the Bureau's attention focused on the expansion of less known fisheries and the utilization of by-products. The underutilized species continued to receive primary education and enhancements attention within the scope of product development and extension efforts. The utilization of by-products and less desirable food fish received attention in the economics development component in cooperation with other agencies and private ventures.

Several new fisheries were studied, including work with gizzard shad and deep water marine eels. A major work effort continued for the Rex eel. Coordinated plans continued with the University of Florida, International Food and Science staff to enhance product development to expand markets for these products.

In addition to marine products, the Bureau attempted to seek funding support for aquaculture products such as catfish, crawfish, alligator, fresh water eel, striped bass and tilapia. These products have the potential to supplement the supply of fish currently demanded in the market place. Coordination with the Department of Agriculture and Consumer Services was heightened in both fisheries development and marketing initiatives.

Domestic market expansion focused on the combined efforts of Southeastern Fisheries Association, Florida Department of Agriculture and Consumer Services, Institute of Food and Science and other groups to formulate a quality assurance program. The Bureau was the catalyst for development of information targeted at improving consumer confidence in seafood. The Bureau entered into an arrangement with Food Marketing Institute to formulate a seafood informational newsletter for the seafood handlers throughout the United States.

The Bureau now maintains a growing library of video tapes to tell the Florida seafood story. The tapes can be used at seafood retail counters as point of sale information and other tapes offering information on capture, handling, processing and food demonstrations are available. Several videos have been produced for educational and informational purposes including one on the Suncoast Fisheries and the Florida "Gem," Florida's farm-raised oysters.

With the placement of a new position in Gainesville, Seafood Nutritionist Specialist, the Bureau provides technical guidance and nutrition research and findings to further promote the benefits of Florida seafood. This program is in

association with the seafood technology program in the Food Science and Human Nutrition Department at the University of Florida. The focus of this program is in the areas of nutrition labeling for the seafood industry, a nutritional database and extension information for health care professionals regarding seafood.

### **BUREAU OF SANCTUARIES & 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 systems 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. Fishing regulations in these areas are established by Florida's Marine Fisheries Commission and are enforced by the Florida Marine Patrol and two Reserve Officers at Rookery Bay. The environmental education programs at the reserves are well developed and provide programs for schools from elementary to college levels. The research programs are in the early developmental stages with research coordinators having been established and hired within the last year. Their focus will be 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, in some instances, to conduct scientific studies with reserve staff.

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 (HR 5909), which designated a 2600 square nautical mile area of the Florida Keys as well as the federal waters out to the 300 foot isobath on the Atlantic Ocean side. 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 50 meters in length from the previously determined "Area To Be Avoided," which coincides closely with the sanctuary boundary, will be effective on the earliest of the following: (a) six months after the date of enactment of the act; (b) the date of publication of a notice to mariners; or, (c) the date of publication of new nautical charts. 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. 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 about coral reef conservation and navigational safety; and (h) incorporate the existing Looe Key and Key Largo National Marine Sanctuaries.

### OFFICE OF FISHERIES MANAGEMENT & ASSISTANCE SERVICES

The major objectives of the Office of Fisheries Management and Assistance Services (OFMAS) are to: 1) act as Department of Natural Resources (DNR) liaison to the Marine Fisheries Commission; 2) act as DNR liaison to Florida's rapidly growing aquaculture industry; 3) establish a marine biological emergency response team to handle short term marine life disasters; 4) to improve and expand Florida's artificial fishing reef development program; 5) establish an informational outreach program for distributing Department and Marine Fisheries Commission rules and regulations and information regarding marine resources to sports and commercial fishermen; 6) establish a fisheries dependent data collection program for recreational and commercial fisheries and 7) act as technical liaison for DNR to Florida's local mosquito control program.

The Office has produced its first edition of the Saltwater Sportfishing Report Newsletter. 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 will provide information on proper identification of fish for compliance with existing rules and various other topics of interest to anglers. The Office answers a large number of informational requests from both native and vacationing fishermen. A list of saltwater fishing license subagents has been completed. Lists of tournaments, fishing clubs and guide/charter boat organizations are presently being developed. The Office has received public comment on the revised Artificial Saltwater Fishing Reef Rule. This rule is being rewritten due to statutory changes and to provide more detailed guidance and coordination on artificial reef development throughout Florida. OFMAS serves on the Aquaculture Interagency Coordinating Council, a legislatively mandated group to improve government cooperation and communications with the industry. The industry representatives serve on the Aquaculture Review Council. OFMAS has formally responded to two major Aquaculture Review Council issues.

This Office coordinates DNR mosquito policy between divisions. OFMAS serves on the Technical Subcommittee on Managed Marshes. The Office also is the DNR's alternate designee on the Coordinating Council on Mosquito Control, which coordinates mosquito control policy between the state agencies, among all local mosquito control districts, citizen groups and environmental representatives. The Office was recently successful in coordinating efforts to prevent expanded use of the organophosphate pesticide Abate (temephos) in the marine environment and on other biological productive and environmental sensitive lands owned by Florida.

**LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES**

**OFFICE OF FISHERIES**

**Fisheries Research Division**

**STOCK ASSESSMENT PROGRAM**

Reorganization of the Office of Fisheries in 1990 resulted in the creation of a Stock Assessment Program. The objectives of this program are to develop stock assessments for: largemouth bass, mullet, sheepshead, catfish, crappie, red drum, shrimp, spotted seatrout, bowfin, blue crab, oyster, pompano and sand seatrout and to provide analyses for fisheries management decision making, e.g. opening and closing of seasons, quota monitoring, etc. The program will also provide stock assessment advice to the Gulf of Mexico Fishery Management Council and the Gulf States Marine Fisheries Commission for federally managed species. It will computerize and maintain databases from fishery independent data and from recreational and commercial fisheries dependent surveys gathered by the Inland Fisheries, Marine Fisheries and Fisheries Research Divisions.

**APPLICATION AND USE OF FLUOROCHROMES IN STOCKING**

The Department entered into an interagency agreement with Louisiana State University to develop fluorochrome markers for tagging red drum and striped bass fingerlings. This project's objectives are to validate marking performance and retention; identify daily growth patterns of otoliths; and evaluate the use of markers in a supplemental stocking program. This project is funded through the Sport Fish Restoration Program.

**LOUISIANA OFFSHORE OIL PORT (LOOP)**

Monthly environmental monitoring of LOOP operations continued in its thirteenth year. Sampling is conducted along a transect from the Gulf Intracoastal Waterway to the superport site located 20 miles offshore from Grand Isle. Nekton, plankton, sediment, benthos, water chemistry and hydrography samples are collected. In addition, tracking of discharges of supersaturated brine solutions and planning/preparation for marine oil spills was accomplished.

**DEPARTMENT OF ENERGY (DOE)**

This DOE funded project is intended to monitor the environmental impacts of supersaturated brine solution discharges into the Gulf of Mexico from the West Hackberry Strategic Petroleum Reserve facility in southwestern Louisiana. This offshore sampling project continues to provide fishery independent data for fishery management.



## SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

Louisiana coastwide sampling of biological and environmental fishery independent data from a series of seven transects within the Territorial Sea continued in its ninth year. These sample cruises are scheduled to coincide with the NMFS summer and fall shrimp/groundfish cruises in the northern Gulf of Mexico. Offshore seasonal sampling within the Federal Exclusive Economic Zone from the mouth of the Mississippi River to Atchafalaya Bay continued in its sixth year.

## CAERNARVON BIOLOGICAL MONITORING

The U.S. Army Corps 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 8000 cubic feet per second. The effect of the diversion on the estuary's ability to support wildlife and fisheries resources is expected to be significant. Diversion of nutrient and sediment rich freshwater will rejuvenate existing marsh, significantly reduce dependence on local rainfall as the principle source of freshwater input to the estuary, reduce peak salinities and induce more regularity in the seasonal salinity pattern. Project benefits involve reducing land loss rate and increasing fish and wildlife production.

The 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 1990, the Department began the final year of the three-year prediversion monitoring program to establish baseline information on oyster, crab, shrimp, finfish, waterfowl, wildlife and vegetation. These studies are designed to gather both fishery dependent and fishery independent data. A four-year postconstruction monitoring program will assess the immediate effects of the diversion on the biological resources in the estuary and will guide the project operation.

## BOATING ACCESS

In 1989 the Department obligated Sport Fish Restoration Funds to two marine boat ramp projects. One project was to construct a new ramp on Freshwater Bayou in Vermilion Parish. The other is a parking lot expansion project for a ramp on Lake Borgne in Orleans Parish.

## THE LOUISIANA ARTIFICIAL REEF PROGRAM

The Louisiana Artificial Reef Program was established in 1986 to offset the loss of recreational and commercial fishing opportunities associated with the removal of offshore oil and gas platforms, which are the destination of over 70% of all offshore recreational fishing trips originating in Louisiana. To comply

with federal regulations and international treaty, these platforms must be removed after an oil or gas field has been depleted. An estimated 470 oil and gas platforms have already been removed from coastal Louisiana, and by the year 2000 approximately 40% of Louisiana's remaining 3,400 offshore platforms will have been removed causing a major loss to Louisiana fishermen. Since the program's inception in 1986 nine obsolete petroleum platforms have been converted to artificial reefs at four locations ranging from 25 to 710 miles offshore. It is projected during the summer of 1991 an additional eleven structures will be added to the State's reef system.

Funding for the Louisiana Reef Program is based primarily upon oil company participation and the donation of a portion of the savings realized through participation in the Program. Monies donated to the Program Fund will be utilized for administration, operation, field support and biological and geological research under the direction of the Council. To date over \$1.5 million has been placed into the program's fund. Utilizing funds generated from the offshore reefs, the Louisiana Artificial Reef Program is currently pursuing development of reefs in Louisiana inshore waters. During the first phase of inshore reef development the reefs will consist primarily of shell or other available material.

### **Marine Fisheries Division**

During 1989 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 FY89/90 the Marine Fisheries Division completed 2,613 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 pm Friday, July 14, 1989, because of significant numbers of juvenile white shrimp being collected in samples taken on the shrimping grounds. Zones 1 and 3 closed at noon on Monday, July 24, 1989 except in Breton and Chandeleur Sounds.

The 1989 fall inshore shrimp season was set to open at 6:00 am on August 21, 1989, 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 both inshore and offshore Louisiana waters (within the territorial sea) closed in Zone 2 at 12:01 am on November 21, 1989. Both inshore and offshore waters (within the territorial sea) in Zone 3 closed at 12:01 am on December 22, 1989; in Zone 1 they closed at 12:01 am on January 1, 1990.

A special five-day pink shrimp season for a portion of Chandeleur Sound was set for April 23 through April 28, 1990. During this season fishing was restricted to the hours from official sunset to official sunrise each night. A total of 110,471 pounds of 21/25 count (whole shrimp per pound) to 40/50 count pink shrimp having a dockside value of \$259,606 were taken.

The annual meeting to set the spring inshore brown shrimp season was held at the University of New Orleans on May 3 and 4, 1990. 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 10, 1990. Data presented at that time also estimated that 50% would be reached in Zone 1 on about May 13, 1990 and in Zone 3 on around May 24, 1990. April environmental conditions indicated that water temperature and the number of hours water temperature was above 20°C was higher than that observed in good shrimp production years. Two other environmental parameters, rainfall and river discharge also ranged in the same area as those figures calculated for good years. Salinity readings for both northern and southern Barataria Bay, however, ranged at about the same levels as found during poor years and number of acres of nursery above 10 ppt coastwide fell about half-way between the averages for good years and bad years. Brown shrimp catch per unit of effort (CPUE) in 6 foot trawls across the coast in each study area and by zone was generally higher prior to the spring shrimp meeting in 1990 than it was in 1989. CPUE in Zone 1 was relatively low as compared to Zones 2 and 3; CPUE in Zone 2 was higher than Zone 1 but not as great as in Zone 3. CPUE was higher in all zones in 1990 than in 1989.

Shrimp sizes across the coast were larger prior to the spring shrimp season in 1990 than in 1989. Sizes were largest in Terrebonne and Barataria Bays where they averaged 68 and 72 mm respectively. Sizes along the rest of the coast ranged from a low of 48 mm in Zone 3 to about 60 mm in Zone 1.

Opening day in Zone 2 was Saturday, May 12, 1990 at 6:00 am, as set by the Louisiana Wildlife and Fisheries Commission. Catches on opening day ranged from very poor in Vermilion Bay possibly due to very bad weather and very low salinities to fairly good in Terrebonne and Caillou Bay areas. Recreational catches in the Vermilion Bay area were virtually non-existent and effort was less than half of that expected for an average year. Commercial boats did not waste much time in Vermilion Bay but those trawling in outside waters off the mouth of the Atchafalaya River did very well with 60/70 count brown shrimp.

Shrimpers fishing south of Houma did much better where recreational fishermen caught up to 3 to 5 ice chests (approximately 50 pound per ice chest)

of shrimp ranging from 70/80 to 90/100 count browns. Catches offshore were very good with some boats landing up to 50 barrels (210 pounds per barrel) of 70/80 browns per trip.

In the Barataria Bay area small boats were averaging from 400-800 pounds of 50/60, 70/80 and 80/100 count browns. Large boats caught an average of 1000-1200 pounds of 50/60 to 80/100 count browns.

Zone 1 opened May 21, 1990 as set by the Commission. Skiffs shrimping in inside waters averaged about 300-400 pounds of 80/100 count browns. Offshore boats averaged 300-400 pounds of 60 count browns. There was a movement of shrimp to offshore waters on or just prior to opening day.

The spring brown shrimp season opened in Zone 3 at 6:00 am on May 23, 1990 (Wednesday). Just prior to the opening a strong front passed through causing conditions to become rough in Calcasieu Lake. Average catch by small boats was about 75 pounds per boat and average catch by large commercial boat was about 400 pounds. Shrimp sizes ranged from 80/100 to 50/60 (graded) brown shrimp. Opening day in Zone 3 was considered to be the best since 1986.

#### Task Forces

During FY89/90 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 1989-90 oyster season on the public oyster seed grounds except for Calcasieu Lake and Sabine Lake began 1/2 hour before sunrise on September 6. The Bay Gardene, Bay Junop and Hackberry Oyster Seed Reservations also opened at that time. The Bay Gardene Oyster Seed Reservation and a portion of the public seed ground were closed October 16. The Hackberry and the Bay Junop Oyster Seed Reservations were also closed October 16.

The public grounds in Calcasieu and Sabine Lakes opened 1/2 hour before sunrise November 1 and remained open into 1990. Gear was restricted to tongs only. Provisions were made to prohibit the harvest of oysters on any of the Public Oyster Seed Grounds or Public Oyster Seed Reservations if the Louisiana

Department of Health and Hospitals declared those waters closed to shellfish harvesting.

#### Lease Auction

An auction of all delinquent oyster leases was held on March 27. The auction included oyster leases on which rent was delinquent. Opening minimum bid for each lease was rental and penalty due of the 3737 acres available, bids were accepted for 1,940 acres.

#### Interjurisdictional Fisheries

Shell plants were conducted on the "Sister Lake Oyster Seed Reservation" and an area east of the Mississippi River on the public grounds in the vicinity of Pelican Island. A total of 75,000 cubic yards of clam shells were planted on these areas.

#### Seed Grounds

Salinity, a prime factor determining oyster production on Louisiana's public oyster seed grounds and reservations, remained higher than optimal in 1989. The introduction of freshwater east of the Mississippi River resulted in localized oyster production; however, in general, production levels were low. Sampling indicating that in historically productive areas of Plaquemines Parish only 2,500 of the 13,000 acres of public reefs produced seed oysters. Those areas produced only 6% of the expected oyster seed needs during the 1989-90 season.

### FINFISH SUBPROGRAM

#### Monitoring

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

The saltwater finfish resources of the state are enjoyed by both commercial and recreational fishing interests. A comprehensive monitoring program was developed in 1985 to protect or enhance these valuable resources by providing information regarding the status of fish stocks that occur in the coastal waters of Louisiana at some time during their life cycle. Three gear types are used coastwide to sample various year classes of estuarine dependent fish. A bag seine is used to sample young of the year and provide information on growth and movement. The seine is 50' in length, 6' in depth and has a 6' x 6' bag as an integral part of and midway the length of the net. The mesh size for this seine is 1/4" bar, 1/2" stretched, Delta 44 knotless mesh. A gill net is used to sample juvenile, sub-adult and adults and provide information on relative abundance, year class strength, movement and gonadal condition. The gill net is 750' in length, 10' in depth and constructed of monofilament. The net is composed of 5 panels, each of the following mesh sizes: (1) 150'x10', 1" bar, 2" stretched mesh, minimum number 104 filament; (2) 150'x10', 1 1/4" bar, 2 1/2" stretched mesh, minimum number 177 filament; (3) 150'x10', 1 1/2" bar, 3" stretched mesh, minimum number 208 filament; (4) 150'x10', 1 3/4" bar, 3 1/2"

stretched mesh, minimum number 208 filament; and (5) 150'x10', 2" bar, 4" stretched mesh, minimum number 208 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, May 6, 1990. 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.

Legislation 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.

### Red Drum

The commercial red drum fishery remained closed as a result of legislation enacted in 1988. The new law also reduced the recreational creel limit to five redfish per day and set a possession limit of five. The minimum size was set at 16"; only one redfish 27" or longer can be taken per day.

The Department continued its juvenile red drum tagging program.

## 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. This year's meeting was held on March 8, 1990.

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 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 a below average 1988 year class (age-1's in 1989) and 1987 year class (age-2's in 1989) to enter the fishery in 1990. The projected Louisiana menhaden landings was in the 550,000-600,000 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 was completed and implementation began in early 1990. The plan 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.

## MISSISSIPPI DEPARTMENT OF WILDLIFE, FISHERIES AND PARKS

### 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 enforcement of state and federal laws that pertain to the regulation of the use and harvest of these valuable coastal, estuarine and marine resources, the BMR's programs are necessarily complex in nature.

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 in regards to 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, Sportfish 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 (GCRL) 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 Lacy Act and investigation of incidents involving both marine mammals and endangered marine turtles has gained increased emphasis in recent years.

The following narratives provide a brief description of each of the major programs 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. Development of data entry software for personnel leave records and other routine record-keeping was accomplished during this time frame. Acquisition of additional computer support was also accomplished this year. 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 MANAGEMENT AND ADMINISTRATION

The primary objective of this project is to provide coordination and for performance of all Saltwater Fisheries Division projects or activities. Specific objectives of the Marine Fisheries Management and Administration Project are:

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.

The Saltwater Fisheries Division drafted Ordinances Numbers 5.006 (An Ordinance to Establish Restrictions Governing the Use of Nets, Fish Traps and Pots Within the Territorial Waters of the State of Mississippi and Establishing Certain Catch Limitations and Quotas), 6.003 (An Ordinance to Establish Rules and Regulations for Live-Bait Shrimping) and 7.005 (An Ordinance to Provide Size Limits and Bag Limits on Certain Fish Species and to Prevent Sale of Fish by Saltwater Sportsfishermen); held public hearings on these proposed ordinances and presented them to the Mississippi Commission on Wildlife, Fisheries and Parks for their approval and adoption.

Saltwater Fisheries Division Personnel participated in various Gulf States Marine Fisheries Commission activities, including:

- Black Drum Fishery Management Plan Task Force
- Oyster Fishery Management Plan Task Force
- State-Federal Fisheries Management Committee
- Technical Coordinating Committee (TCC)
- TCC Data Management Subcommittee
- TCC Recreational Fishery Subcommittee

The Saltwater Fisheries Division also assisted the Southeast Area Monitoring and Assessment Program (SEAMAP). The division was instrumental in preparing grant documents and proposals to secure funding for fisheries management related work including: Marine Fisheries Initiative (MARFIN) funding for a king and Spanish mackerel project, Interjurisdictional Fisheries (IJ) funding for monitoring and assessment projects, Wallop-Breaux (W-B) funding for red drum, cobia, striped bass, artificial reef development and creel survey Projects. Division personnel also handled various requests or inquiries from other government agencies and from the public (i.e. data requests, regulatory questions, science fair judging, assisting at fishing rodeos, etc).

Publications or reports produced by this project include Mississippi Red Drum Fishery Management Plan; Ordinance Number 5.006 - An Ordinance to Establish Restrictions Governing the Use of Nets, Fish Traps and Pots within the Territorial Waters of the State of Mississippi and Establishing Certain Catch Limitations and Quotas; Ordinance Number 6.003 - An Ordinance to Establish Rules and Regulations for Live-Bait Shrimping; and Ordinance Number 7.005 - An Ordinance to Provide Size Limits and Bag Limits on Certain Fish Species and to Prevent the Sale of Fish by Saltwater Sportsfishermen.

MISSISSIPPI/NATIONAL MARINE FISHERIES SERVICE  
COOPERATIVE FISHERIES STATISTICS PROGRAM

Project objectives were:

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. Some minor resistance to data collection activities have been encountered, but have been cleared up with little difficulty. This 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.

Publications or reports produced by this project include weekly contributions to the National Marine Fisheries Services' Fishery Market News Report and the Mississippi Red Drum Fishery Management Plan.

#### SHRIMP MONITORING AND ASSESSMENT

The principle objective of the Shrimp Monitoring and Assessment Project is: to conduct, in a timely fashion, an on-going standardized shrimp sampling program that provides sufficient biological data on which proper management decisions may be based.

Shrimp sampling was conducted as required for commercial, recreational and live bait shrimping. A total of sixty-four shrimp sampling trips were completed. Problems with an aging sampling vessel required many sampling trip cancellations. Repairs were completed as quickly as possible and sampling resumed.

Shrimp season north of the Intracoastal Waterway was opened for commercial and recreational shrimpers in January 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.

Publications or reports produced by this project include reports made to the Mississippi Commission on Wildlife, Fisheries and Parks along with recommendations for season and area openings or closures.

#### MISSISSIPPI/NATIONAL MARINE FISHERIES SERVICE KING AND SPANISH MACKEREL SAMPLING PROGRAM

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 90, the BMR received federal funds from the MARFIN grant number NA90WC-H-MF008. Lengths and biological samples were obtained for king and Spanish mackerel. The information was collected from charter boats, commercial fish houses, recreational fishermen, the GCRL 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 119 lengths and 107 otolith and/or tissue samples collected. One thousand, one hundred and two lengths and 413 otolith and/or tissue samples 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, vermillion snapper, lane snapper, cobia, scamp, gag grouper, crevalle jack and gray triggerfish was collected from commercial fish houses, charter boats and recreational fishermen.

Publications or reports produced by this project were four quarterly reports and one annual completion report.

#### SHELLFISH SANITATION

The principal objectives of this project are prudent management of the state's molluscan shellfish resources and compliance with recommended National

Shellfish Sanitation Program (NSSP) guidelines for the protection of public health.

Management of the molluscan shellfish resources includes harvest management, assessment and monitoring of population dynamics and reef characteristics, and reef rehabilitation and cultivation. Compliance with recommended NSSP guidelines is comprised of component objectives of classification of molluscan shellfish growing waters using sanitary surveys and the sanitary control of the harvesting, processing and distribution of molluscan shellfish. Regulation of oyster, shrimp and other shellfish processing plants is accomplished through inspections of these plants for compliance with established and accepted safe, sanitary processing guidelines.

During FY 90 a data collection system using trip tickets and check stations was implemented to provide data for harvest management. Information on catch per unit of effort, harvest per reef area, harvest per gear type, harvest per license type, and disposition of the catch is collected. Regular samples from reef areas to monitor and assess population dynamics and reef characteristics were collected monthly, bi monthly, or at other intervals depending on reef importance, condition, and informational need. These samples were collected and analyzed by the GCRL under a contractual agreement. Monthly reports were submitted. These two sources of data may be combined to characterize and gauge the oyster resource, oyster industry, and management strategies.

Reef rehabilitation and cultivation efforts included the planting of 6,761 cubic yards of clam shell on reefs in the western Mississippi Sound (cost \$100,000) and relaying 16,089 sacks of oysters and shell to reefs in the eastern Mississippi Sound (cost \$41,615)

Activity on privately leased public water bottoms for oyster reef cultivation was minimal.

Total harvest from Mississippi oyster reefs for the FY 90 season (November 13 to April 30) was 15,778.5 sacks (1 sack = 1.98 cu. ft., approximately 90-110 lbs., yields approximately 1 gallon or 8.54 lbs. of oyster meat). Only about 25% of Mississippi reefs were in production due to poor recruitment resulting from unfavorable environmental conditions. During the November 13 to April 30 season there were only 40 days of allowable harvest due to unacceptable water and oyster quality associated with frequent, heavy rainfall. Mortality resulting from the heavy winter rainfall was noted on one third of the reefs in the western Mississippi Sound and ranged from 50% to 90%. The FY 90 harvest came from areas where rehabilitation and cultivation efforts had previously been directed as indicated from our resource management data base. Project staff participated in the development of an oyster management plan under the auspices of the Gulf States Marine Fisheries Commission.

During FY 90, twelve-year sanitary surveys were completed in five of the eight shellfish growing areas in Mississippi as specified in NSSP guidelines.

Approximately 3500 man hours were expended to collect survey data and 3,076 water and 277 oyster meat samples were collected.

fishery management plans (FMPs), amendments, stock assessments and technical analyses.

During the period from July 1, 1989 through June 30, 1990 the Mississippi Department of Wildlife, Fisheries and Parks, provided technical support to the GMFMC in the development of FMPs, amendments and technical analyses and was represented at meetings and functions relevant to GMFMC matters.

#### 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 FY90 the Coastal Management staff conducted reviews, participated in meetings and initiated revisions to the state's oil spill contingency plan.

Staff responded to a major oil spill in the Mississippi Sound and gained valuable experience about the movement of oil in the Sound.

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 (CZM) Act of 1972 as amended.

During FY90, the BMR received 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 office expenses and travel. Funds were also used to provide support to the Governor's Office of Policy Development for policy coordination in the coastal zone and to the Attorney General's Office for legal assistance.

The Coastal Management staff organized a workshop on potential sea level rise and completed a study relating to the status of the nearshore water quality in the Mississippi Sound. The staff also organized and participated in two coastwide beach clean-ups, an earth day observance, and a Section 312 site evaluation. Finally, Coastal Management staff 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.

Contracts were executed with two local museums to conduct public outreach and public education programs in the coastal area and to a wildlife center for

care and rehabilitation of injured coastal wildlife. Waterfront studies for the Cities of Gautier and D'Iberville were completed and waterfront improvements were recommended. Public access sites along the coast were constructed and public service announcements relating to the importance of our coastal resources were produced.

Seven publications or reports were produced by this project including the proceeding from the workshop:

"Long Term Implications of Sea Level Change for the Mississippi and Alabama Coastlines."

"Mississippi Nearshore Water Quality Assessment."

"The D'Iberville Waterfront Study."

"Gautier Waterfront Opportunities."

"Study on Coastal Hazards and Floodings".

Two additional Marine Discovery Series books were written and illustrated. They are "Learning About the Tides", Book X and "Home Is Where The Wild Things Are, A Look at Coastal Wildlife", Book XI.

#### 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 FY90 by administering the provisions of the Coastal Wetlands Protection Law and the Mississippi Coastal Program. Initial efforts to improve the regulatory provisions of the law were successful and legislative changes in the law eliminated requirements that created confusion in the public sector. 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 FY90.

Coastal Management staff conducted site inspections and environmental assessments, sponsored meetings and acted on a total of 268 wetlands cases in FY90.

#### MARINE DEBRIS

The project objective of the marine debris project is to reduce the amount of marine debris impacting living and non-living resources along the Mississippi Gulf Coast; to increase public awareness about marine debris issues.

During FY90 several milestones in the marine debris program were reached. Rules and regulations relating to the 1989 Mississippi Marine Litter Act were drafted and adopted by the Commission on Wildlife, Fisheries and Parks. The Act was incorporated into the Mississippi Coastal Program as an enforceable policy. The BMR participated in the planning efforts of the Mississippi Marine Trash Task Force and the annual beach clean-ups.

#### COASTAL LAW ENFORCEMENT SECTION COORDINATION

The principal objective of this project is to enforce the seafood laws of the State of Mississippi and the various seafood-related ordinances of the Commission on Wildlife, Fisheries and Parks and to provide enforcement support to the Gulf of Mexico Fisheries Management Council and the regulations which it promulgates under the Fishery Conservation and Management Act.

Over the subject fiscal year, marine enforcement officers made 178 seafood-related arrests, 199 boat and water safety-related arrests, and issued 67 other fish and wildlife-related citations for a total of 444.

For the 1989-90 fiscal year a total of \$45,804.00 in seafood-related fines was collected in each of the three coastal counties.

Marine enforcement officers were also involved with providing assistance in numerous other incidents ranging from the recovery of injured birds and wildlife to the search for drowning victims. Other incidents involving boater assistance, alligator complaints, dolphin strandings and boating accident investigations also occurred over the twelve-month period in routine numbers.

In addition, marine enforcement officers assisted federal officers with the National Marine Fisheries Service in an 18 month-long undercover operation aimed at a number of violations involving Lacy Act regulations and the transport of illegally-caught fisheries products across state lines. This investigation was also in support of similar operations conducted in the states of Louisiana and Texas.



## 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 nine nautical miles in the Gulf of Mexico. More than \$400 million is spent annually in Texas' 4 million acres of saltwater by approximately twenty thousand commercial and over one million recreational fishermen.

The goal of the Coastal Fisheries program is to develop management plans within the concept of optimum yield for selected fisheries that include harvest regulations, resource stock enhancements or habitat enhancements based on monitoring programs 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 research and monitoring programs and the best scientific information available; (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 develop mariculture techniques for selected species and make the information available to commercial mariculturists in Texas; and (5) to educate the consumer regarding high quality, wholesale seafood products. 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 FY90, a total of 36 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 estimates 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 counts are used to assess relative pressure at sampling sites to ensure that proper sampling probabilities are maintained. The charter fishery is randomly sampled on a continual basis within each of the bay systems of the coast by intercepting boats when trips are completed (party boats) or by accompanying the boat on fishing trips and assessing the landings (headboats). 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 functioned through an interagency contract with Texas A&M University, the Texas Agricultural 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 FY 90 Included:

A Shrimp Fishery Management Plan, as part of the six-year plan for the Coastal Fisheries Branch, was approved by the Parks and Wildlife Commission. The Shrimp Fishery Management Plan recommended the formation of a Shrimp Advisory Committee. Upon the adoption of the plan by the Parks and Wildlife Commission a Shrimp Advisory Committee was formed. The Branch also participated in the development, review and revision of ten Gulf of Mexico Fishery Management Council management plans.

Recommended changes in regulations were adopted by the Parks and Wildlife Commission to ensure stability of the resource. Regulations were modified to prevent depletion of spotted seatrout damaged by freezing weather by placing a 15 inch minimum size to increase spawning potential. Size and/or bag limits for gafftopsail catfish, Florida pompano and snook were modified to prevent depletion. Exceptions to red snapper size limits were removed to conform to federal regulations and prevent depletion.

Saltwater and freshwater regulations continued to be clarified, simplified and standardized. Regulations were modified to allow a 5% tolerance of undersize crabs, made crab trap tags valid for only 30 days, defined sharks as gamefish, made it unlawful to use gamefish as bait, better defined snagging and jerking, and prohibited snapper traps and trotlines in the Gulf of Mexico.

Shrimping regulations were modified by extending the Gulf closure, eliminating the exception allowing shrimping in the 4 fathom zone during the closure, restricting night shrimping, creating a new season for pink shrimp, increasing the bag limit and decreasing the fishing time in bays during the spring season, clarifying the use of shrimping licenses, and other measures to protect the resource, reduce incidental mortality of other organisms, increase efficiency, prevent waste, simplify and clarify regulations and enhance law enforcement.

Harmful or potentially harmful exotic fish, shellfish, and aquatic plants were defined and rules for their importation, sale, purchase, propagation, possession or release into Texas public waters were adopted.

A total of 1,470 survey-days was spent to estimate landings and pressure of sport-boat, wade/bank and lighted pier fishermen. There were 760 gill net samples, 1,878 bag seine samples, 294 beach seine samples, 2,680 bay and gulf trawl samples and 2,632 oyster dredge samples collected. A total of 3,781 fishes was tagged and released. Approximately 8% were returned for rewards. The percent of tags returned was consistent with prior years.

Gulf of Mexico waters from Alabama to the Rio Grande were sampled to a depth of 300 feet during November 1989 and June-July 1990 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. Protein profiles of 13 sciaenid and 22 penaeid species were determined using 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.

Special studies assessing hooking mortality of spotted seatrout, summer trotline activity, the shrimp fishery in upper Laguna Madre, winter longline catches and an oil spill in Galveston Bay were completed. Staff estimated almost 6 million fishes were killed because of freezing temperatures in December 1989.

The socioeconomic questionnaire designed to collect data on the motivation, satisfaction and expenses of interview fishermen was reviewed and modified based on data analyses and staff input. Routine sport boat monitoring surveys incorporated these modified questions coastwide on May 15 to begin the fourth year of this data collection effort.

The commercial-vessel landings survey (250 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 marking success studies.

Technical information concerning aquaculture 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**

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

**FISCAL YEAR 1990 ANNUAL REPORT  
TO THE GULF STATES MARINE FISHERIES COMMISSION**

**FISHERY MANAGEMENT (MAGNUSON ACT)**

Gulf of Mexico Reef Fish

Amendment 1 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (FMP) was partially approved and implemented in January, 1990. The amendment, designed to rebuild the overfished reef fish resources, was prepared by the Gulf of Mexico Fishery Management Council (Council). A management measure that would require groundfish trawl vessels to comply with the reef fish bag and size limits was disapproved, since the impacts associated with groundfish vessels sorting the catch at sea were not adequately evaluated in the FMP.

Amendment 1: (1) eliminated current exemptions to the red snapper size limit; (2) established size limits for other major species in the fishery; (3) established bag limits for red snapper, certain other snappers, groupers, and greater amberjack; (4) established commercial quotas for red snapper, deep-water groupers, and shallow-water groupers; (5) placed area restrictions on the use of longline and buoy gear; (6) modified reporting requirements for reef fish fishermen; (7) required permits for the commercial harvest and sale of reef fish; (8) instituted a 50-percent earned income qualification requirement for permits; (9) provided for the assessment of fees to cover the administrative costs of issuing permits and fish trap tags; (10) reduced the number of allowable fish traps per vessel from 200 to 100; (11) eliminated the use of entanglement nets for reef fish; (12) extended the "stressed area" by adding coastal waters off Louisiana and Texas; (13) limited certain vessels in other directed fisheries to the bag and size limits established for reef fishes; and (14) defined overfishing.

The 1990 scientific assessment showed that the Gulf red snapper resource is severely overfished; accordingly, the Reef Fish Scientific Assessment Panel determined that more drastic conservation measures were needed than established under Amendment 1. In response, the Council developed a preferred alternative, which included a seasonal closure of the shrimp trawl fishery to reduce bycatch mortality, and a 1.0-million-pound commercial quota and a 2-fish/person bag limit for red snapper. The preferred alternative was then presented by the Council at public hearings in August, 1990. Public testimony at the hearings overwhelmingly indicated that the economic costs of reducing red snapper bycatch through seasonal closures of the shrimp industry would far exceed any potential benefits.

Fishery representatives also reported that the various management measures implemented under Amendment 1 reduced red snapper fishing mortality much more than the targeted 20% level, and that the Council proposal would cause severe economic impacts on both the directed fisheries and the shrimping trawl fleet. These reports led the Council to conclude that the sharply reduced bag limits, quotas, and shrimping restrictions were unwarranted, and to reject the preferred alternative at its September, 1990 meeting. The Council subsequently prepared a modified proposal for Secretarial review starting in October, 1990.

The harvest and possession of jewfish was prohibited in the Gulf of Mexico exclusive economic zone (EEZ) by emergency action requested by the Council, effective March 2, 1990. Amendment 2, effective August 30, 1990, continued protection of this depleted species following expiration of the emergency rule. Similar actions by the South Atlantic Fishery Management Council and the State of Florida now protect jewfish throughout its range in the continental U.S.

### Gulf of Mexico Shrimp

In early April 1990 a rule was implemented to open and close serially three small areas within the Tortugas sanctuary to shrimp trawling. Area 1 was opened to trawling from April 11 through September 30, 1990; Area 2 from April 11 through July 31, 1990; and Area 3 from May 26 through July 31, 1990. The opening and closing of the areas was timed to avoid conflicts between trap and trawl fishermen while, at the same time, allowing the harvest of marketable-sized shrimp from areas that otherwise would have been closed. Arrangements also have been made to open these specified areas at the same times during 1991.

The EEZ off Texas was closed to shrimping from May 17, until July 8, 1990. The shrimp fishery is closed annually off Texas (Texas Closure) to allow brown shrimp to grow to a larger and more valuable size prior to harvest. The closure of federal waters (9-200 nautical miles) is coordinated to the extent possible with the closure of state waters (0-9 nautical miles), as determined by the migration of small shrimp from coastal systems.

### South Atlantic Shrimp Fishery

Trawling for brown, pink, or white shrimp in the exclusive economic zone (EEZ) off Georgia and South Carolina was prohibited by emergency action, effective April 3, 1990. Extremely cold weather the previous December off Georgia and South Carolina caused high mortalities of white shrimp, according to sampling conducted by both states. The reduction in numbers lowered spawning potential, and emphasized the need for protection through the spring to realize a successful fall fishery. Accordingly, the Georgia Department of Natural Resources and the South Carolina Wildlife and Marine Resources Department requested a trawling ban for the EEZ off their states to complement the closure of waters under state jurisdiction. Since trawl catches may include a mixture of shrimp of the genus Penaeus (brown, pink, and white shrimp), a ban on trawling for all these species was necessary to provide maximum protection to the white shrimp resource. A bycatch of pink shrimp was allowed in the directed fishery for rock shrimp, but could not exceed ten% by weight of the total catch aboard

a vessel. The fishery was reopened on June 1, 1990. The South Atlantic Fishery Management Council is expected to develop an FMP for the shrimp fishery containing provisions for similar closures in the future.

### South Atlantic Snapper/Grouper

Reviewed and implemented Amendment 2 to the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region. Amendment 2 prohibited the harvest or possession of jewfish in or from federal waters in the South Atlantic and defined overfishing for jewfish and other snapper/grouper species. This action was necessary due to the overfished status of jewfish and the requirement of the 602 guidelines that definitions of overfishing be included for each fishery management plan.

An emergency rule effective August 3, 1990, added wreckfish to the snapper/grouper management unit, established a fishing year for wreckfish commencing April 16, 1990, established a commercial quota of 2 million pounds for 1990, and established a catch limit of 10,000 pounds per trip. The Secretary closed the fishery for wreckfish in the EEZ effective August 8, 1990, based on the TAC of 2 million pounds being reached.

The emergency rule was supplanted by Amendment 3, which established a management program for the wreckfish fishery. Actions included: (1) adding wreckfish to the management unit, (2) defining optimum yield, (3) defining overfishing for wreckfish, (4) requiring an annual permit to fish for, land or sell wreckfish, (5) collecting data necessary for effective management, (6) establishing a control date of March 28, 1990, after which there would be no guarantee of inclusion in a limited entry program should one be developed for the area bounded by 33° and 30° N Latitude, (7) establishing a fishing year beginning April 16, (8) establishing a process whereby annual total allowable catch (annual quotas) would be specified with the initial quota being 2 million pounds, (9) establishing a 10,000 pound trip limit and (10) establishing a spawning season closure from January 15 through April 15.

### South Atlantic Red Drum

The Red Drum Fishery Management Plan, prepared by the South Atlantic Fishery Management Council in cooperation with the Mid-Atlantic Fishery Management Council, was implemented in 1990. Actions included: (1) establishing a fishing year of January 1-December 31, (2) establishing a procedure for preparation and review of stock assessments to support specification of total allowable catch (TAC) and allocations in the EEZ by plan amendment, (3) prohibition of harvest or possession of Atlantic red drum in or from the EEZ until a 30% SSBR level is attained and until such time as a TAC is specified by plan amendment that provides for harvest, and (4) requesting States, through adoption of an amended ASMFC Red Drum Fishery Management Plan, to achieve 30% escapement of juvenile fish to the adult stock by reducing the rate of fishing mortality through such actions as gear restrictions, closed seasons, quotas, size limits and bag limits.

## South Atlantic Swordfish

Recent amendments to the Magnuson Fishery Conservation and Management Act transferred authority for management of Atlantic swordfish from the fishery management councils to the Secretary of Commerce. The Southeast Regional Office recently assisted the Headquarters Office with preparation of an emergency regulation package to reduce fishing mortality in the overfished Atlantic swordfish fishery. Emergency regulations would remain in effect for a maximum of 180 days. Prior to expiration of the emergency regulations, normal rulemaking procedures, including public hearings and appropriate consultations with affected entities, would be initiated to implement regulations on a more permanent basis.

## Coastal Migratory Pelagic Resources (Mackerels)

### Events:

- Oct. 24, '89 - Closed commercial king mackerel, Gulf west zone
- Dec. 22, '89 - Closed commercial Atlantic Spanish mackerel
- Jan. 8, '90 - Closed commercial king mackerel, Gulf east zone
- Apr. 13, '90 - Approved resubmitted Amendment 3
- May 21, '90 - Implemented zero bag limits king mackerel, Gulf of Mexico
- Aug 1, '90 - Implemented new mackerel TAC and bag limit adjustments for 1990/91 fishing year
- Aug. 20, '90 - Approved Amendment 5

Two amendments (3 and 5) submitted for Secretarial review were approved, four closure/zero bag limit actions were implemented, and seasonal adjustments to total allowable catch (TAC) and bag limits for mackerels were installed for the 1990/91 fishing year.

Previously disapproved portions of Amendment 3 were resubmitted for Secretarial review in January 1990 and subsequently approved. Resulting regulatory changes became effective April 13, 1990. The amended regulations prohibit capture and possession of all species within the management unit (king mackerel, Spanish mackerel, cero, cobia, dolphin, little tunny, and in the Gulf only, bluefish) by any vessel in the EEZ with a drift gillnet. Also included in the approved final rule was a provision to prohibit purse seines and run-around gillnets from the fishery for Atlantic group king mackerel when the resource is declared overfished or when other authorized gear demonstrate ability to harvest the commercial allocation. The determination will be made by the Gulf of Mexico and South Atlantic Fishery Management Councils if the Stock Assessment Panel concludes that the Atlantic migratory group of king mackerel is overfished. Amendment 3 also added a new FMP objective to minimize waste and bycatch in managed fisheries.

The following management changes contained in Amendment 5 were approved effective August 1990:



1. Extended the management area for king and Spanish mackerel into Mid-Atlantic Council area to include federal waters off Virginia, Maryland, Delaware, Pennsylvania, New Jersey, and New York.
2. Revised Gulf group Spanish mackerel fishing year: Apr - Mar.
3. Revised definitions of overfished and overfishing to comply with 602 FMP Guidelines, and define conflict.
4. Assigned seasonal adjustments of TAC/bag limits of Gulf group mackerels to the Gulf Council and Atlantic groups to the South Atlantic Council.
5. Clarified earned income requirements qualifying corporate owned vessels for commercial permits.
6. Redefined mackerel bag/possession limits as daily limits.
7. Limited Gulf group king mackerel harvest solely to hook and line and run-around gillnets.
8. Established a two cobia recreational/commercial daily bag/possession limit.
9. Imposed a 12-inch minimum size for king mackerel.
10. Deleted FMP provision allowing sale of recreational catch to allow state law to govern sale of species managed under the FMP.
11. Initiated a \$23 fee for commercial and charter boat permits to offset administrative costs beginning March 1991.
12. Clarified the requirement that fish having minimum size regulations must be landed with head and fins intact.
13. Made other minor corrections and clarifications to regulations.

For the 1989/90 fishing year, harvest was closed for only two commercial fisheries (Gulf group king mackerel and Atlantic group Spanish mackerel) and one recreational (Gulf group king mackerel) fishery; commercial and recreational fisheries for Atlantic group king mackerel and Gulf group Spanish mackerel remained open throughout the fishing year. The Gulf group king mackerel was the only migratory group to sustain a complete harvest closure. The commercial fishery in the western zone (Texas to Alabama) closed October 25, 1989 and the eastern zone (Florida) closed January 9, 1990; both zones reopened July 1, 1990. Recreational harvest was closed later in the fishing year when bag/possession limits were reduced to zero for a six-week period, May 21 - June 30, 1990. During the two previous fishing years, zero bag limits were implemented much earlier (mid-December) negatively impacting south Florida's winter recreational fishery.

The commercial fishery for Atlantic group Spanish mackerel was closed December 23, 1989, and reopened April 1, 1990. Although zero bag limits were implemented early in the previous two fishing years (Sep 9, 1987; Oct 3, 1988), recreational harvest was not interrupted during the 1989/90 fishing year. Year-round harvest under the bag limits was attributable to increased TAC and reshaping of commercial/recreational allocations. The allocation to the recreational fishery increased from 0.96 to 2.76 million pounds as a result of an increased TAC (4.0 to 6.0 million pounds) and allocation adjustments under Amendment 4 that would result in a 50/50 recreational/commercial division by 1994 or earlier if TAC exceeds 6.70 million pounds.

Altogether, state responses to NMFS' requests seeking cooperation in managing mackerel resources have not been satisfactory. Although compatible state action has effectively closed commercial fisheries, most states are not responsive to our requests to implement zero bag limits for recreational anglers -- actions required to effectively curtail fishing mortality, increase spawning stock biomass, and promote law enforcement. Florida (Jan 8, 1990) and Louisiana (Nov 25, 1989) did close state waters to commercial king mackerel fishing in response to federal closures. However, only one Gulf state, Louisiana, by emergency action implemented zero bag limits effective June 1 -30, 1990, in conformance with the federal harvest closure of the Gulf group king mackerel recreational fishery. Florida and Alabama reduced their bag limits to one fish per person; Texas and Mississippi did not reduce their 2/3 fish bag limits. Since most king mackerel are taken in federal waters and only a small number of state/federal agents are empowered to enforce federal fisheries regulations, incompatible state action, or inaction, constitutes an open invitation to violate federal law and indicates a lack of commitment to FMP goals and objectives.

#### Gulf and South Atlantic Spiny Lobster

The following regulatory changes were adopted for the spiny lobster season that began on August 6, 1990. The daily bag and possession limits were set at six per person in federal waters, except for commercial vessels fishing under a seasonal permit. A 10-percent earned income from sales of fish during the preceding calendar year was required to qualify for the seasonal permit. A special permit to separate the tails from lobsters aboard vessels on commercial fishing trips of 48 hours or more also was instituted to reduce spoilage, and was subject to the same earned income requirement.

#### Caribbean Shallow-Water Reef Fish

An emergency rule was implemented to cease all fishing in a red hind spawning area from December 6, 1989 through February 1990. The 14-square-mile area, located in federal waters southwest of St. Thomas, Virgin Islands, is now closed annually under a plan amendment to protect red hind spawning aggregations. Since intense fishing effort in spawning aggregation areas has severely decimated the red hind population, other spawning aggregation areas around Puerto Rico and the U.S. Virgin Islands will be closed as they are identified.

#### Secretarial Shark FMP

A draft Secretarial Shark Fishery Management Plan for the Atlantic, Gulf of Mexico and Caribbean Sea was prepared in October 1989. The NMFS Southeast Region coordinated plan development. Among other things, the plan establishes a commercial quota and recreational bag limits, prohibits finning, and establishes a data collection and reporting system. As a result of public comments received during 22 public hearings and internal concerns about the accuracy of stock abundance estimates, NMFS conducted a new stock assessment and revised the draft plan. The draft is expected to be completed in May 1991. Additional public hearings will be held at that time.

## Permits

Issued 3,079 consolidated mackerel, 658 swordfish, 1,590 reef fish, 62 snapper/grouper, 3 coral, 756 spiny lobster, 50 columbian, and 1 caribbean reef fish permit(s).

## General

In our second full year of operation under the Memorandum of Agreement between NMFS and NWS, the Southeast Regional Office continued to use NOAA weather radio broadcasts to announce fishery closures, rule modifications and public hearing schedules. In each case, the requested broadcasts commenced at the selected coastal stations within a few hours of our request. The requested information was broadcast at approximately 30-minute intervals for as long as four days. Liaison with the Director, Southeast Region, NWS, has been outstanding. Information dissemination via this means has been a boon to fishermen and to enforcement agents.

## **PROTECTED SPECIES**

### Public Law 101-162

Technical assistance was provided to the State Department in implementation of Public Law 101-162 Section 609, the Sea Turtle Conservation/Shrimp Embargo Bill. This legislation was passed in late 1989 and requires foreign countries exporting trawl-caught shrimp to the United States to adopt a sea turtle conservation program similar to that of the United States. The President must certify to Congress by May 1, 1991 and annually thereafter that a country has adopted a program and that the catch rate of sea turtles in that respective shrimp trawl fishery is equal to or less than that of the United States. Otherwise, shrimp imports from the affected country will be banned. The State Department has issued guidelines that provide a three year time period for a country to fully adopt and implement a program.

NMFS has provided technical assistance to foreign countries in the form of Turtle Excluder Device training. A TED training seminar was presented to government and fishing industry representatives in Panama City, Panama, for eleven Central and South American countries. TED training has also occurred in Mexico under a grant from the U.S. Agency for International Development.

### U.S. TED Regulations

Several proposed rules have been developed to enhance the enforceability of the U.S. TED regulations and to address the findings of the National Academy of Sciences' study on the status of sea turtles. These regulations should be published in the Federal Register in the summer of 1991 for public review and comment.

## Recovery Plans

Several recovery plans for endangered whales and sea turtles were developed, distributed for public review and soon will be adopted by the agency. These plans, which are required by the Endangered Species Act, set forth actions needed to recover the species.

## Section 7 Consultations

One hundred fifty-two consultations were completed during the year on a wide range of federal activities. Section 7 requires federal agencies to ensure that their activities do not jeopardize any endangered or threatened species. Most federal actions consulted on involved channel dredging, military activities and oil platform removals.

## Marine Mammal Exemption Program

Two hundred-thirty certificates to cover the incidental take of marine mammals were issued to longline fishermen fishing for tuna, swordfish and shark. These fishermen must obtain a certificate to legally fish and report annually on takes or interactions with marine mammals.

The agency is developing a long range program to address incidental takes of marine mammals. The program, described in a draft environmental impact statement, will be available for public review in the summer of 1991.

## Dolphin Rulemaking

In April, the agency issued a rule that would prohibit the feeding of marine mammals in the wild. During the last several years a number of commercial operations have started up that take customers on dolphin feeding trips. Marine mammal behaviorists are concerned that these feeding cruises will alter the natural behavior of the dolphins and make them more susceptible to injury from human interactions.

One commercial operator in Texas challenged the rule in Federal District Court and was granted a temporary restraining order prohibiting the agency from enforcing the rule. The case is pending.

## **MARINE RECREATIONAL FISHERIES**

Southeast Regional Office representatives continued to serve on Marine Fisheries Commissions, state panels, advisory Boards, committees and multiagency and interagency work groups to assist in the development of cooperative solutions to shared marine recreational fisheries (MRF) problems. In addition, personnel at the Southeast Regional Office and Fisheries Center continued to pursue priority program activities identified in the region's MRF Program Plan. Many

of these activities were conducted by staff in the various Regional Office Divisions or in the Fisheries Center and are mentioned in other sections of this report. The following additional activities include those conducted primarily by the Special Assistant for Recreational Fisheries located in the Regional Office.

### Program Coordination

Many of the accomplishments made in 1990 resulted from cooperative efforts with states, other federal agencies, conservation organizations and a myriad of MRF interest groups. Program coordination and cooperative planning is therefore critically important to problem identification and resolution. Examples of accomplishments in this area include the following.

1. Completion of the NMFS MRF Action Plan and Implementation Strategy that incorporates comments received from states, Sea Grant programs, sport fishing organizations, and other interested parties. By more clearly describing NMFS' MRF program, this plan facilitates cooperative program efforts.

2. Several planning sessions were held with the U.S. Fish and Wildlife Service to discuss strategies for improving overall program coordination and cooperation.

3. Participation in a planning session to develop a 5 year strategy to restore striped bass populations in the Gulf of Mexico.

4. Participation in a NMFS/Sea Grant Retreat in Miami, FL, to enhance program cooperation and coordination. The MRF subcommittee identified nine cooperative projects all of which were addressed to some extent during the balance of the year. Some of the accomplishments included a Conference on Angler Based Tagging Programs, cooperation with Florida Sea Grant to develop a nine poster series to help anglers more accurately identify their catches and promote ethical angling practices, completion and distribution of a 5-part video training series for fishing tournament organizers (FL Sea Grant), award of a MARFIN grant to SERO to plan a regional Angler Ethics Conference and develop a regionwide computer-based sport fishing information network, and improved cooperative distribution systems for MRF education and outreach materials.

5. Continued participation on the MRF, Artificial Reef and Data Management committees of the Gulf and Atlantic States Marine Fisheries Commissions.

6. Participation on a Florida Department of Natural Resources Selection Committee to establish funding priorities and assist in the technical evaluation and selection of research and enhancement projects for funding with state saltwater sport fishing license revenue.

## MRF Statistics

Results of a MRF statistics initiative in which Marine Fisheries Initiative (MARFIN) funds were used to substantially enhance NMFS' MRF Statistics Survey in the Gulf of Mexico have demonstrated the Survey's capability to provide more precise and timely data for fisheries management. This project helped break down some of the resistance that has precluded NMFS and the states from moving ahead with a cooperative data collection program in the Gulf area. As a result, several initiatives are underway to generate funds needed to provide for the long-term enhancement of the MRF data-collection program. Most notably, a consensus plan was developed in 1990 through a series of meetings of the GSMFC Data Management Committee to establish a cooperative state-federal marine recreational fisheries data collection program for the Gulf of Mexico. When implemented, this plan will result in direct state involvement in data collection and processing and a near tripling in intercept sampling effort. Significant efforts were also made to facilitate continued involvement of South Atlantic states in the survey.

Southeast Regional Office personnel participated in a Gulf States Marine Fisheries Commission Data Management Committee workshop in April 1990 at the NMFS Panama City Laboratory. The workshop resulted in recommendations for improving the collection of data from charter and headboat fishing operations. Other meetings of the Committee have produced numerous specific recommendations for improved training and supervision of NMFS MRF survey interviewers and enhanced data quality control procedures.

## Fishery Management Related Outreach and Education

This past year saw a major expansion of the Region's angler education and outreach program. This Angler Ethics program is designed to help anglers see themselves as a vital part of the fisheries management team and to remove institutional and information barriers preventing them from assuming this role. Previous accomplishments have included: production of a broadcast quality video and quick reference card teaching catch and release techniques; printing of a summary of federal sport fishing regulations; development and publication of an education series (posters, brochures, cookbook, pamphlet and broadcast quality video) on underutilized sport caught species; production of a five-part video training series on fishing tournaments to encourage their support of fishery conservation programs; development of an expanded angler-based tagging program with substantial involvement of the tackle industry, conservation organizations and the media, and; development of an angler code of ethics poster/sticker series. Many of these materials were revised and/or reprinted during 1990 with continuing efforts to expand their distribution.

A major accomplishment during 1990 included production and printing of an Angler Ethics Pamphlet which ties together all previously developed materials into a more cohesive program. The pamphlet provides a definitive explanation of how each ethical practice contributes to the conservation of marine fishery resource and the future vitality of saltwater sport fishing.

Several major strides were also made in expanding the distribution of outreach materials. Cooperative arrangements were made with several major bait wholesalers for them to distribute these materials directly to bait shops located all along the west coast of Florida and the South Atlantic coast. Further, a mailing list for coastal marinas was purchased and direct mailings of fishing regulations and ethics materials were made to nearly 500 marinas.

To further expand the program, A MARFIN grant was secured to plan and organize a regionwide Angler Ethics Conference and to design a computer-based state/federal sportfishing regulation information system. Work was initiated on both of these projects with implementation of the regulation information system projected for summer 1991 and convening of the symposium in spring of 1992.

Angler and media response to this program has been extremely positive-- so much so that other state, federal and private agencies and organizations have volunteered to distribute and in many cases reprint outreach materials at their own expense. With one exception, all other NMFS regions have likewise responded favorably to this initiative and have implemented similar efforts in their region. In many cases, they are reprinting and using (with minor changes) Southeast Region materials thereby avoiding duplication of effort and expense and contributing to the creation of a unified national program.

In addition to this Angler Ethics initiative, the region has continued to enhance the flow of timely and accurate information to the sport fishing sector through distribution of the NMFS NEWSBREAKER, news releases and technical reports, presentations at conferences, seminars, fishery management council meetings, fishing club meetings and other gatherings, and through guest appearances on television and radio sport fishing shows.

## **HABITAT CONSERVATION**

The habitat program of the NMFS, Southeast Regional Office (SER), is carried out by the Habitat Conservation Division (HCD) for management functions and the Southeast Science Center for research functions. The two units coordinate closely to insure that the needs and direction of both components are met. The NMFS mission is to conserve fishery habitat so that fishery resources of benefit to the people of the United States would continue to be produced. Authority to conserve habitat is provided for mainly by 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, and the National Environmental Policy Act.

Most HCD efforts are geared toward the conservation of coastal habitats since findings of our researchers have demonstrated direct the relationships between habitat quality and abundance and fishery production. Many estuarine-dependent of fish species and shrimp require estuaries at some part of their life cycle. About 96% of commercial and 70% of recreational fishery resources within the SER rely on estuaries or nearshore coastal habitats. These resources provide significant economic and social benefits. For example, commercial fisheries contribute \$5.5 billion annually to the economy and recreational fishermen spend more than \$13.5 billion per year to pursue their sport. In addition to food

production, wetlands and coastal habitats provide many other useful benefits such as storm protection, flood prevention, erosion protection, aesthetics, waterfowl and furbearer production, recreation, and other benefits, but these values are largely unquantified. Some economists have attempted to provide some estimates of values that can be as high as \$82 thousand per acre per year.

The SER covers eight coastal states from North Carolina to Texas, and includes Puerto Rico, and the U.S. Virgin Islands. More than 2,799 miles of coastline, 29,900 miles of tidal shoreline, and 300 estuarine systems are located here. The estuaries contain about 17.2 million acres of marsh and other estuarine habitat and 5.1 million acres of intertidal areas comprising about 83% of the coastal wetlands in the coterminous U.S. The SER contains almost all of the nation's mangrove swamps and most of the seagrasses.

Despite their great importance in the production of fishery resources, wetlands continue to be lost. The reasons are varied, but man-induced perturbation accounts for a significant amount of the coastal wetland loss rate estimated nationally at 20,000 acres per year. In states such as Louisiana the loss rates are much higher and approach 40-50 square miles per year. Since NMFS is the lead federal agency responsible for the management of the nation's living marine resources, habitat conservation is very important to the agency. Based on this concern the NMFS developed a Habitat Conservation Policy in 1982. This policy established 12 strategies that would be used to conserve habitat. These strategies include work under the following categories:

- o Research and Management Coordination
- o Habitat-related Research
- o Coordinate Habitat Issues with Fishery Management Councils
- o Fish and Wildlife Coordination Act Activities
- o Assisting States
- o Interagency Agreements
- o Anadromous Fish
- o Preapplication Planning
- o Integrating Programs
- o Intra NOAA Cooperation
- o Regulatory Relief
- o Communicating Habitat Information

We have determined that in the SER, based on available staff and funds, the habitat conservation goals of the agency could best be met by concentrating on Implementation Strategies 1-4. We especially focus on No. 4 which calls for direct involvement with the wetland regulatory and civil works programs of the Corps of Engineers (COE). In the SER we are the only federal agency that reviews all COE permit proposals to alter coastal wetlands. Other agencies have had to scale back due to manpower limitations and other priorities. The SER reviews more than 56% of all permit requests and federal projects handled by NMFS nationwide. During 1990, the SER HCD reviewed 4,120 proposals to perform work in wetlands.

The need to review individual proposals to alter wetlands by private and federal interests is well documented. For example, nine years of data collection indicates that the more than 9,148 sample projects would have altered almost



684,000 acres of wetlands. Involvement by fish and wildlife agencies could potentially have conserved almost 372,000 acres with mitigation of nearly 177,000 acres. Much of the 684,000 acres proposed for alterations included very small projects that eventually result in a piecemeal loss of large acreages of wetlands. Additionally, preapplication interactions with private, local, state, and federal development interests result in the conservation of thousands of additional acres of wetlands each year.

A summary of the HCD permit program, addressing wetland types, acreages, conservation effort results, and other factors is in preparation and will be available from the SER later this year.

## **PRODUCTS AND SERVICES**

Distributed nine Newsletters and 41 News Releases about Southeast Region programs and activities.

Prepared a Southeast Region Directory which is available from the Regional Director's Office.

## **ECONOMICS AND TRADE ANALYSIS**

The reorganization of the trade and economics functions of the old Fisheries Development Division into a fisheries management and international trade support group has been completed. A staff of six professional economists and one international trade analyst are presently organized under the Southeast Regional Office's Economic and Trade Analysis Division. The Pascagoula and Atlanta field offices for trade analysis have been closed.

The economics staff has consolidated all Regulatory Impact Review work into the responsibilities of a single, senior economist to ensure uniformity of methodology and application to all Fishery Management Plans and Amendments. A consultive approach with Fishery Management Council economists has been established to minimize after-the-fact disruptions. The success rate for quick approval for RIRs has improved significantly.

The economics staff provides leadership to interdisciplinary task teams that have been organized to facilitate the preparation of SAFE Reports to the Councils for each of the FMP fisheries. Council, SEFC and SERO biologists and economists work together on these teams to summarize the Stock and Economic Assessments for each fishery into a current state of the fishery report. Where appropriate, the SAFE Report will identify trends and developments with longer term implications for the fishery and its management.

An Economic Assessment has been developed as a parallel document to the Stock Assessment for each FMP fishery to serve as one of two primary bases for the SAFE Report. To the maximum extent possible, the economic and stock assessments will be conducted in close cooperation between biologists and economists using identical or compatible bioeconomic models. Emphasis in this

initial year is being placed on the shrimp, redfish, reef fish, and migratory coastal pelagic fisheries.

The Division produced 14 publications and made 8 formal presentations over the last year including work on the reduction in shrimp bycatch, the effects of regulation on shrimp fleet size and economics, the impact of alternative management actions on shrimp, mackerels, reef fish and swordfish, limited entry, and a number of specific studies on gear. In general, the past year saw major strides taking place among Councils and NMFS units in organizing a systematic consideration of economic issues.

### **COMPUTER OPERATIONS UNIT**

Ad-hoc requests were received throughout the year in which Computer Operations staff provided data and/or assistance. These included:

Coast Guard:

- commercial and media addresses from Constituency List
- mackerel permit holders

Southeast Fisheries Center:

- permit data
- constituency list data

Computerized applications utilizing databases, word processing, desktop publishing, and graphics were created for a recreational fishing regulations brochure, angler ethics pamphlet, Gulf and South Atlantic seafood companies directory, constituency mailing list, visual aids for conferences and speeches and technical memorandums authored by the regional office economists.

### **COOPERATIVE PROGRAMS**

Financial Assistance Programs in the NMFS Southeast Region include the noncompetitive Interjurisdictional Fisheries Act (P.L. 99-659), the Anadromous Fisheries Act (P.L. 89-304), SEAMAP, and the Cooperative Statistics Program.

Competitive programs include the Marine Fisheries Initiative Program (MARFIN), designed to recover and maintain Gulf of Mexico fisheries and the Saltonstall-Kennedy program (S-K), which is a national research and development program directed at fisheries and processing problems. Both of these programs are announced in the Federal Register when funds become available. All U. S. citizens may apply.

The Regional Program Office developed guidelines and instructions to enhance the ability of state recipients of noncompetitive grant funds to develop and conduct high quality financial assistance programs. The Regional staff also participated in nationwide and regional financial assistance workshops to present methodologies to guide states, universities, commissions, councils and commercial and recreational recipients of financial assistance.

## Interjurisdictional (IJ) and Anadromous Fisheries

The Regional Program Office assisted 11 coastal recipients of Interjurisdictional Fisheries Act financial assistance to develop and conduct substantial projects for the conservation management and enforcement of regulations for territorial sea and EEZ stocks of mackerel, drum, snapper/grouper, oysters, crabs, shrimp, groundfish, flounder, shellfish and baitfish. Seven state and university recipients of Anadromous Fish Conservation Act funding developed and conducted high priority projects for the conservation and management of striped bass, Atlantic sturgeon, shad, and herring.

State grantees in Louisiana and Texas continued projects to rehabilitate public oyster reefs damaged by natural disasters.

## SEAMAP

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a State-Federal program for the collection, management and dissemination of fishery-independent data (data that does not depend on reporting by the fishing industries) in the Southeastern U. S. Three components currently exist in partnership with NMFS: SEAMAP-Gulf; SEAMAP-South Atlantic; and SEAMAP-Caribbean. Funds are allocated to the Southeastern states for surveys and studies, and to the Gulf States Marine Fisheries Commission, Atlantic States Marine Fisheries Commission, and the Caribbean Fishery Management Council for coordination.

The SEAMAP Program has been funded through a Congressional allocation at approximately \$1 million since 1983. Approximately 20% of this is maintained by NMFS for survey work, plankton sorting, and administration. Cooperative agreements are implemented each year under a multi-year plan for each agency.

## State/Federal Statistics Program

The State-Federal Cooperative Fishery Statistics Program is a NMFS Southeastern U.S. program for collection of landings data from the commercial fisheries of the region. This information is used by the states, and the Southeast Fisheries Center of NMFS for determining yields, and by the states, the Southeast Regional Director and Regional Fishery Management Councils to determine allowable catches and user allocations. Funds are provided to the states to maintain port agents, clerical personnel and statistical supervisors involved in the collection and processing of fisheries data. All data are entered through user terminals in the states and maintained in the NMFS computer system in Miami.

This program was initiated in 1982 by the FY 1982 Congressional Budget Resolution. Funding is variable, provided to the states through cooperative agreements that are continued each year under up to a three-year "umbrella" project plan that details project objectives and scopes of work. The eight southeastern states, Puerto Rico, and the U. S. Virgin Islands receive awards beginning on April 1, which continue through March 31st of the following year.

## Marine Fisheries Initiative (MARFIN)

The 3rd MARFIN Conference was held in Orlando, Florida on October 31 - November 1, 1990, to review and disseminate the progress of the MARFIN projects. MARFIN has produced information critical to the management of several Gulf of Mexico fisheries - particularly those in decline such as red drum and king mackerel, those requiring development such as coastal herring, and those involving user conflict such as reef fish and the turtle excluder device (TED) issue in the shrimp fishery. Finfish bycatch in the shrimp trawling industry has emerged as the biggest problem in the region. Studies to document bycatch spatially and temporally in conjunction with methods to reduce bycatch have been initiated.

The Southeast Region developed the Federal Register Notice announcing the request for applications for FY90. This notice gave the research and development priorities based on input from states, universities, the commercial industry, the recreational community, the Gulf Council, the Gulf and South Atlantic Fisheries Development Foundation, the Gulf Commission, and from NMFS scientists. Representatives of these groups (MARFIN Board) recommended to Dr. Kemmerer the MARFIN proposals best suited for funding.

Seventeen of the 83 MARFIN proposals were selected for funding. Fourteen multi-year projects were continued. In addition, 10 NMFS projects were chosen for completion in FY90.

The Executive Summary to the MARFIN Annual Report is available from the Regional Office Cooperative Programs Division and this commission's office.

## Saltonstall-Kennedy (S-K)

The Southeast Region received 27 proposals in response to the FY90 S-K solicitation. S-K projects are now directed toward solving major fishery problems rather than trade and marketing projects. Bycatch, user conflicts, seafood safety, aquaculture, and artificial reef utilization were key priorities in this year's solicitation. The national S-K panel, considering both internal and external technical reviews, selected 13 projects as candidates for funding. Twelve of these received awards. The one project not funded was judged by the Department of Commerce Inspector General's Office to have insufficient involvement by the Gulf and South Atlantic Fisheries Development Foundation.

## **OFFICE OF ENFORCEMENT**

In fiscal year 1990, the Southeast Law Enforcement Office investigated 1,199 violations of laws and regulations within the National Oceanic and Atmospheric Administration's (NOAA) jurisdiction. Seized property was valued at approximately \$279,226. The U.S. Coast Guard and state Cooperative units initiated over one-half of the cases.

## SOUTHEAST FISHERIES CENTER

The Southeast Fisheries Center (SEFC) directly supports Federal programs for the conservation and wise use of living marine resources in the southeastern United States. The Center conducts research and provides scientific and technical information on fishery resources, marine habitats, and the harvest and use of seafood products. Center scientists also conduct research on marine species protected under federal laws and work with international scientific organizations to achieve conservation goals. In addition, Center research programs are coordinated closely with NOAA's broad objectives of understanding and predicting the consequences of environmental modification, especially the effects of such changes on living marine resources.

The Center's research programs are responsive to regional information needs and are conducted in close cooperation with interstate, state and academic organizations. Technical information and scientific reports on the condition of fishery resources are used by Fishery Management Councils to recommend measures to conserve and wisely use these resources. Joint State/Federal research programs such as SEAMAP and Cooperative Statistics, provide data vital for the assessment of the resources and their habitat. Researchers work closely with users of the resource in attempting to solve problems of wasted bycatch, environmental degradation, and provision of safe, high-quality seafood products to consumers. The Center participates actively in the committees and projects of the Atlantic and the Gulf States Marine Fisheries Commissions which seek to coordinate regional fishery research and management activities.

Activities of the SEFC in fiscal year 1990 focused on the major groups of species that are important recreational and commercial fisheries and are described more fully below.

### Small Pelagics

Research in 1990 continued for small pelagics (formerly termed latent resources) on 5 fronts: resource surveys, sampling gear development, port sampling, survey technology development, and processing research.

Three survey cruises were conducted in 1990 between the Florida panhandle and Galveston, Texas in depths of 10-200 fm. Catches were dominated by rough scad, gulf butterfish, longspine porgy, round herring, and longfin squid. The surveys used acoustic technology with semi-pelagic and bottom trawl sampling to study the vertical distribution of acoustic targets and net catches with time of day. Extensive experiments and continued testing occurred to improve midwater or "semi-pelagic" trawling capabilities.

Port sampling concentrated on the collection of data on small pelagic species taken in the industrial bottomfish fishery. The objectives were to determine the species, relative abundance, bathymetric distribution, and size composition. Sampling was conducted from March-December. Butterfish and scaled sardine were captured most frequently, occurring in over 85% of the samples. Rough scad and harvestfish occurred in about 50% of the samples. Most rough scad

appeared in the spring while harvestfish were most prevalent in the summer and fall.

Development continued on the Experimental Seafood Processing Laboratory. The Laboratory was established as a cooperative effort between Mississippi State University and the SEFC.

### Coastal Pelagics

Research on coastal pelagics focused on stock assessments and delineation of coastal pelagic life histories. The following were accomplished during 1990:

1. Vital statistics were collected on king mackerel, Spanish mackerel, cobia, and dolphin, and age-length keys were developed for the mackerels. Data bases resulting from these activities were used in stock assessments.

2. Studies of stock mixing in southeastern Florida were pursued by tagging and releasing 2,054 king mackerel from Fort Pierce to Port Salerno from December 1989 to April 1990. At present, 61 recoveries have been made. Most recoveries were from the Florida east coast with 6 from the Carolinas and 3 from the Gulf of Mexico.

3. A manuscript with information on king mackerel statistics and fisheries was drafted. It includes summaries of management actions, fishery landings by various categories, and descriptions of fishing methods.

4. The Southeast Charterboat Survey continued. Data were obtained for 13,632 hours of trolling and 6,111 hours of non-trolling effort during 1990. The top five species caught by trolling were Spanish mackerel, king mackerel, dolphin, bluefish, and little tunny. The top five species caught by non-trolling were gray triggerfish, vermilion snapper, red snapper, black sea bass, and unidentified pogies.

5. A cooperative MEXUS-GULF cruise aboard the NOAA vessel OREGON II was conducted in February 1990 off the northeast coast of the Yucatan Peninsula in an upwelling area defined by NOAA-Q AVHRR satellite thermal imagery. Forty-eight stations within and near the upwelling area were sampled. Neuston samples clearly indicated higher primary and secondary productivity within the upwelling area. Samples are being analyzed by SEFC and Mexican biologists.

6. Research on the role of the Mississippi River discharge plume in recruitment of northern Gulf of Mexico fishes continued. Distribution and abundance of larvae, spatial variation in larvae growth and mortality, and larval residence time were determined for king mackerel, Spanish mackerel, and yellowfin tuna. Preliminary findings have led to a working hypothesis that larvae in the plume area experience accelerated growth and enhanced survival due to the rich food supply.

7. Annual stock assessment computations for Atlantic and Gulf groups of king and Spanish mackerels were made in April 1990. Best estimates of Allowable

Biological Catches, with lower and upper limits, were made and forwarded to the fishery management councils.

### Menhaden

Research on ecology and assessment of menhaden stocks and fisheries is centered at the Beaufort Laboratory. Data collection and research projects span virtually all Gulf and Atlantic coastal states. Program emphasis includes ecology and dynamics of early life stages, habitat associations, fishery forecasts and stock assessments, purse seine fishery monitoring to obtain landings and age/size catch composition, and scientific advice to the states, industry, and fishery management institutions.

The Charleston Laboratory conducted research on the development and application of fisheries technology to increase exports and domestic consumption of menhaden products. Major goals are increased use of menhaden oils plus the development of minced and surimi menhaden products (see Product Quality and Safety Section).

### Molluscan Shellfish

This year's activities included: (1) conducting research to ascertain if depuration could be used to inactivate enteric viruses and improve methods for detection of enteric viruses (2) reviewing and monitoring numerous Sea Grant, S-K and MARFIN proposals (3) assisting FDA in conducting research grants, (4) initiating a National Water Quality Indicator Study and (5) representing the agency as the voting member of the Interstate Shellfish Sanitation Conference.

### Oceanic Pelagics

Nine swordfish documents were prepared in 1990 by the SEFC for the International Commission for the Conservation of Atlantic Tunas (ICCAT). Several documents describe research undertaken in the analysis of sexually-dimorphic growth and the effects of dimorphic-growth assumptions on stock assessments. One document described a reanalysis of data on swordfish growth by sex. Other documents detailed swordfish size and size-frequency sex ratio data; the effect of neglecting a range of dimorphic growth assumptions in the analysis of swordfish stocks; new methods for incorporating uncertainty in virtual population analyses; preliminary evaluation of production models for the assessment of swordfish stocks; and updated information on swordfish catch-per-unit of effort in the U.S. longline fishery. Examination of catch-per-unit of effort data provided no strong evidence of changes in catchability over the available time series.

A research project was initiated to determine the reproductive biology (sex determination, sex ratio-at-size, and fecundity) of Atlantic swordfish. The project began in January with the cooperation of segments of the U.S. fleet. Swordfish reproductive tissue is being collected through: 1) NMFS contracted observers who monitor the species diversity of each set aboard U.S. vessels using

longline or gillnet gear, and 2) the cooperative assistance of a number of commercial longline vessel owners/captains and their crews. In addition, length and weight data, date of capture, and location are also being recorded. More than 1,000 samples have been received through these efforts. Most of the swordfish sampled were caught off the Mid-Atlantic Bight, George's Bank, and the Grand Banks. Sampling is also being initiated in the Gulf of Mexico, Florida East Coast, and the Caribbean Sea. Joint international cooperation is also being sought with Canada and several countries in the lower Caribbean area to assist in this research endeavor.

Sampling of swordfish by some Caribbean nations will be initiated through the ICCAT Enhanced Billfish Program. Contracts for observer data collections (catch rates, sex ratio, etc.) and data analysis were initiated with funding provided to ICCAT by the SEFC.

During 1990, efforts continued in reviewing and correcting the swordfish logbook database as well as the landings and size frequency databases. A report was completed summarizing the nearly 34,000 logbook records received and processed for 1987 and 1988.

Growth of bluefin tuna was examined in two studies. In the first study, mark-recapture data were used to examine growth rates during different time periods to determine whether growth might have changed in recent years. In the second study, vertebrae and otoliths were used to age nine recaptured tagged bluefin.

The sensitivity of the 1989 SCRS bluefin tuna assessment to alternative weightings of indices used to tune the virtual population analysis was reported upon in May 1990 at the World Bluefin Tuna Meeting in La Jolla, California. The results of this examination suggested that bluefin population point estimates are relatively insensitive to the weights given to different indices. Alternative weights were found to increase variability in terminal year estimates of abundance, especially for large fish.

Routine sampling of recreational billfish tournaments continued along the U.S. Atlantic, Gulf of Mexico, Bahamas, and Caribbean in 1990. In 1990, 140 billfish tournaments were sampled representing over 101,091 hours of fishing effort. This reflected an increase of 25 tournaments and 16,091 hours above that sampled in 1989.

Recreational billfish fishermen were surveyed for catch and effort data at seven docks in the northern Gulf of Mexico. In addition, the sex and morphometric measurements of billfish were taken. Data from billfish landed in the U.S. was greatly reduced in 1990 because of the implementation of the U.S. Fisheries Management Plan for Atlantic Billfishes.

Analyses of microstructural increments on otoliths from young blue marlin (larvae, juveniles and young adults) up to 212 cm were completed. A summary report of the research was prepared.

The ICCAT Enhanced Research Program for Billfish continued to improve catch and effort statistics, establish an international billfish tagging program, and



assist in collecting age and growth data needed to assess the status of the Atlantic billfish stocks. Shore-based and at-sea sampling in the western Atlantic Ocean took place in Venezuela, Grenada, Barbados, St. Maarten, Netherlands Antilles, Dominican Republic, Jamaica, and the United States. Thirteen working documents on various aspects of this work were prepared.

SEFC research on Atlantic yellowfin tuna has been limited to maintenance of the U.S. catch, effort and size data bases needed to support ICCAT and for sampling transhipped tuna in Puerto Rico. Several papers were prepared for ICCAT including a description of the development of the U.S. Gulf of Mexico yellowfin tuna longline fishery, an analysis of length and weight relationships, documentation of trans-Atlantic migrations by large fish, and an analysis of growth data taken from eastern Atlantic yellowfin tuna. The SEFC continued operating a limited domestic longline observer project through Louisiana State University. The University placed observers aboard participating domestic longline vessels fishing in the Gulf of Mexico and targeting yellowfin tuna. The observers collected catch, effort, size-frequency, and environmental data. Data from this and other observer programs are used to analyze survival rates for fish released after capture on longline gear.

In April 1991, the ICCAT Western Tropical Atlantic Yellowfin Working Group convened at the SEFC in Miami. The objective of the meeting was to prepare an analytical data base for use in assessing the western-Atlantic yellowfin stock - the initial step in completing a formal stock assessment.

### Sea Turtles

A total of 16,590 headstarted Kemp's ridleys have been released into the wild since February 1979. As of April 1990, 675 were recovered. Primary recovery locations included Texas, Louisiana and Florida. The principal recovery methods were stranding and incidental capture in shrimp trawls. Most recoveries occurred during May and June. Release of an additional 1,980 ridleys has been scheduled for June 5, 1991 off Galveston, Texas.

A report on amounts and types of marine debris accumulating on the upper Texas and southwest Louisiana beaches was completed. Plastics of various types dominated the samples in weight and number of items collected.

The SEFC, in cooperation with the shrimp industry, collected data for selected shrimp fishing areas in the southeast to document catch rates of shrimp in TED-equipped trawls and in trawls without TEDs. Overall, a mean reduction of 0.7% in shrimp and fish catch-per-unit of effort combined, was experienced by TED-equipped nets (Georgia and Super Shooter TEDs combined). This was not statistically significant (try net catch excluded). Analysis of the Georgia and Super Shooter TEDs separately also showed no significant difference in shrimp catch-per-unit of effort between standard and TED-equipped nets.

Yield was modelled to determine the possible impact of various levels of shrimp loss on production. The model showed that an overall decrease of 2% in fishing mortality rates resulted in no detectable change in the overall yield of major shrimp fisheries in the Gulf of Mexico. Since the actual decrease found in our study was less than 2%, we concluded that there was no detectable loss of

shrimp in the Gulf of Mexico as a result of using properly tuned Georgia and Super Shooter TEDs. Slight decreases in yield would be observed in some shrimp fisheries if shrimp loss rates from TEDs were in the 10-20% range. With the 10% loss rate observed from TEDs during year one of the study, only the pink shrimp fishery showed a calculated loss of 2-4%. No decreases in yield were observed in the white or brown shrimp fisheries.

The SEFC selected a staff member at each of its laboratories to serve as area representatives to the Southeast Marine Mammal Stranding Network. Area representatives facilitate the transfer of data on each stranding to the SEFC in Miami, and expedite necropsies, tissue sampling, and transfer of tissue samples for toxicological analyses.

Tracking of sea turtles using satellite telemetry was initiated in the Gulf of Mexico with four loggerheads (Caretta caretta). Three Kemp's ridleys (Lepidochelys kempii) were monitored in U. S. coastal areas of the Atlantic. Objectives of this study are to explain the movement and dive patterns of sea turtles in relation to ocean currents and temperatures, develop a biological model to make these patterns more predictable and explain the interactions between sea turtles and offshore oil and gas structures. A cursory view of the data suggests that these loggerhead turtles spend time in association with oil and gas structures and have a home range which may encompass 30 to 100 sq. miles. Dive times appear to vary by day, night and season. Movement of the Kemp's ridley in the Atlantic appears to be in response to water temperature and ocean currents. All data are preliminary and more information is necessary to provide information for our biological model.

### Marine Mammals

Low-level monitoring studies for marine mammals are designed to detect large-scale changes (halving or doubling) in local bottlenose dolphin, Tursiops truncatus, populations and provide an enhanced database from which to monitor future population dynamics. The third year of data collection was completed under two low-level monitoring studies contracted by the SEFC and a new monitoring study was initiated in 1990:

1. Mote Marine Laboratory of Sarasota, Florida, completed the third year of a five-year study in Florida's Indian-Banana River complex. This is a replication of aerial surveys conducted in 1979.

2. Dolphin Biology Research Associates, Inc. of Sarasota, Florida completed the third year of a five-year contract for surveying Sarasota and Tampa Bays from small boats using photographic identification techniques. This is a continuation of a long-term study that began over 20 years ago.

3. In 1990, Texas A&M University at Galveston, Texas was awarded a five-year contract to conduct low-level monitoring on the Texas and Florida Gulf coasts. These studies will use small boat surveys and photographic identification of individual dolphins to monitor the populations. The results will establish a database for studying long-term population trends.

In May 1990, a survey of marine mammals in the northern Gulf of Mexico was conducted by the SEFC aboard the NOAA vessel OREGON II. The objective was to evaluate the feasibility of using ship-based surveys to examine marine mammal distribution and abundance and to determine population trends in offshore waters with depths less than 3,300 m. An average of approximately six cetacean herds were sighted each day. Cetacean sightings over 1,986 km of trackline averaged 0.043 herds/km or 0.42 animals/km. The pantropical spotted dolphin (Stenella frontalis) and bottlenose dolphin were the most common of 36 species identified from 96 marine mammal sightings. Pantropical spotted dolphin density in the area surveyed was estimated to be 0.128 dolphins/km and bottlenose dolphin density was estimated to be 0.062 dolphins/km.

Aerial surveys of cetaceans in the northern Gulf of Mexico were conducted for 6-8 days per month from January-June 1990 as a cooperative effort between the SEFC and the Minerals Management Service. The study area included the continental slope south of Alabama, Mississippi, and Louisiana extending 44 km southward from the 200 m depth contour. The six surveys resulted in 145 cetacean herd sightings consisting of 4,199 individuals of 15 species. Pantropical spotted dolphin and striped dolphin (S. coeruleoalba) were the most abundant species.

Bottlenose dolphins in Biscayne Bay, Florida are the focus of a low-level monitoring study initiated by the SEFC in Miami. Boat-based surveys and photographic identification of individuals are being used to characterize T. truncatus in this area of high human population density.

The SEFC responded to an unusually high number of 1990 bottlenose dolphin strandings along the Gulf coast. Most of the stranded dolphins recovered were stranded along the Texas coast. Of the 166 Texas dolphin strandings reported as of June 1990, 161 were recovered. Along the Texas coast the number of stranded dolphins recovered during January, February and March were 43, 39 and 65, respectively--the highest strandings on record for those months. January-March strandings were 2.1 times the '86-'89 average.

A total of 113 animals were recovered along the Gulf coast, excluding Texas. These represented about 40% of the total Gulf coast strandings. A total of 35 dolphins were recovered in Mississippi, 33 in Alabama, 23 in Louisiana, and 22 along the Florida coast from Tampa Bay to the Alabama border. Most strandings were recovered in Mississippi during March (20 of 35), in Florida during February (13 of 22), and in Louisiana during April (13 of 23).

The 1990 Texas strandings were analyzed by the Miami Laboratory to examine the influence of a number of environmental variables on stranding rate. Also, the Charleston Laboratory has investigated the possible role of brevetoxin in Gulf coast strandings. Tissue samples were sent to the U.S. Armed Forces Institute of Pathology for analysis.

The Miami laboratory has consulted with the Southeast Marine Mammal Stranding Network Director in a cooperative effort to upgrade both the quantity and quality of data obtained from stranding events. SEFC investigation of marine mammal strandings has evolved into a multi-disciplinary approach, organized into seven main themes. Four of the themes are concerned with population biology:

population abundance trends, stock identification, age structure of stranded animals and food habits. The other themes relate to the extent and causes of mortality and include studies of biotoxins, contaminants, pathology (including bacteriology and virology), and stranded animal recovery efforts.

With respect to marine strandings, the SEFC has received assistance from the U.S. Armed Forces Institute of Pathology, the University of Miami's Cooperative Institute for Marine and Atmospheric Sciences, the U.S. Environmental Protection Agency, the Florida Department of Natural Resources, Greenpeace, Kansas State University, Louisiana University Marine Consortium, the Marine Mammal Commission, NOAA Aircraft Operations Center, Oak Ridge National Laboratories, Portland State University, Sea World of Florida, the Smithsonian Institution, the Southeast Marine Mammal Stranding Network, Spring Hill College, Texas A&M University, Texas Marine Mammal Stranding Network, U.S. Coast Guard, NMFS Office of Protected Resources, and others.

### Reef Resources

Research was continued to improve monitoring of fisheries throughout the region, to evaluate the effectiveness of regulations, to assess the status of selected Gulf and southeast Atlantic reef fish stocks, and to examine fishery population changes precipitated by human activities.

Preliminary 1990 Gulf of Mexico commercial landings data indicated a major decline occurred for amberjack for the first time. Total annual commercial landings continued to decline for red snapper and gray snapper while landings of vermilion snapper reached record high levels. Total grouper landings for the Gulf of Mexico were down from the previous year while yellowtail snapper and mutton snapper were approximately the same.

Several assessment activities were conducted in support of the Gulf of Mexico Fishery Management Council's effort to update the Reef Fish Management Plan. These included an assessment of gulf red snapper and quarterly ALARM reports which provide estimates of reef fish landings. Dockside samples of commercial catches were expanded through the TIP program with MARFIN funding.

Research was conducted on reef fish bycatch by various fishing gears in the Eastern Gulf of Mexico. A report was generated on potential bycatch survival from capture by fish traps. A paper on effects of fish trap mesh size was published in Marine Fisheries Review. Research was initiated to examine reef fish logbook data for various type of fishing.

Research continued on the potential of permanent marine fishery reserves to be used for reef fish management. One research paper is under review for the Proceedings of the Gulf and Caribbean Fisheries Institute.

A book chapter was published on the application of habitat structure using artificial reefs to manipulate reef fish assemblages.

A review of marine resources in the Caribbean region was published as part of the Large Marine Ecosystems Symposium.

Research into recruitment mechanisms among the SEFC, SEAMAP, SEFCAR, CIMAS, Polish Plankton Sorting Center and MEXUS-Gulf focused in three areas: (1) ocean pelagics, emphasizing bluefin tuna (2) reef fishes emphasizing snappers, groupers and grunts and (3) larval fish ecology, emphasizing their interactions in oceanic waters.

The survey of reef fish catches from headboats continued. Approximately 30,000 individual fish were measured in calendar year 1990 with landing records obtained for about 15,000 individual trips. Overall, approximately 2.7 million fish weighing 3.74 million pounds were taken with 275,000 angler days of fishing effort.

Assessment and monitoring research on stone crab and spiny lobsters continued. Florida landings data and size-frequency data were collected. A spiny lobster assessment workshop was conducted for the U.S. Caribbean region. The total annual spiny lobster landings for Puerto Rico averaged 144,000 kg (317,500 lbs) over 23 years, but have fluctuated over time, increasing from 108,000 kg (237,000 lbs) in 1972 to a high of 233,000 kg (512,000 lbs) in 1979, and then declined to a low of 65,300 kg (143,800 lbs) in 1988. Total reported annual spiny lobster landings from the U.S. Virgin Islands between 1980 and 1988 have remained relatively stable, averaging 16,600 kg (36,500 lbs) for St. Thomas/St. John and 3,300 kg (7,300 lbs) for St. Croix. 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.

### Shrimp and Bottomfish

Shrimp and bottomfish research evaluated the impact of closures, obtained information on the biology and ecology of major shrimp and fish species, and collected recreational and commercial catch and effort effort statistics for management purposes.

Shrimp landings (tail weight) for the three major species (brown, pink and white) were mixed in 1990 when compared to 1989. Louisiana (west of the river) led all Gulf states with 75.8 million pounds (up 13%). Texas was next with 49.8 million pounds (up 18%), followed by Alabama/Mississippi/Louisiana (east of river) with 21.5 million pounds (down 4%). Florida (west coast) landings of 7.8 million pounds were down 14%. Pink shrimp landings in statistical areas 1-9 have declined most years since 1985 when they totaled 15 million pounds. In 1990 they were only 7.1 million pounds.

Stock assessments using 1960-1989 commercial catch statistics show interesting trends. Brown shrimp and white shrimp recruitments in the Gulf of Mexico have generally increased over the 30-year period while pink shrimp recruitment has been stable for most of the period with some declines in recent years. No change in the sizes of parent stocks is apparent over the last three decades for any Gulf shrimp stock and no stock-recruitment relationships can be demonstrated for brown shrimp or pink shrimp. Lastly, even though an apparent stock-recruitment relationship was observed for white shrimp, factors unrelated to fishing could be responsible.

Brown shrimp harvest from offshore Texas was forecast to be 31.5 million pounds for the 1990-1991 season, 15% higher than the historical average of 26.9 million pounds. Prospects for the combined inshore-offshore Louisiana brown shrimp harvest for waters west of the Mississippi River were forecasted to be 60.5 million pounds, well above the long-term average of 28.1 million pounds. Prospects for the 1990-1991 Tortugas pink shrimp fishery were forecasted to be 4.1-4.4 million pounds, lower than the previous year (4.6 million pounds), and well below the long-term average of 8.7 million pounds.

During the spring of 1990, recruitment of postlarval brown shrimp to Galveston Bay was examined. This study evaluated variability in recruitment associated with different coastal locations and different environmental conditions. The results will assist the SEFC in refinement of monitoring and sampling designs, in understanding environmental effects on recruitment success, and in evaluating the utility of the Galveston-based historical postlarval shrimp data for predicting the Texas Gulf brown shrimp harvest each year.

### Fishery Statistics and Data Management

During 1990, the SEFC continued to collect fishery statistics through the general vessel canvass and shrimp and trip interview programs. These programs provided monthly statistics on total pounds and value for all marine species that were landed at ports along the Gulf of Mexico. Information on fishing effort and location from a sample of fishing trips were provided by data collection efforts in the shrimp and trip interview programs. Size frequency data were collected for many of the species that are managed under federally implemented fishery management plans. All data collection activities are administered in coordination with coastal states through the cooperative statistics program.

The SEFC, under the auspices of the Gulf of Mexico Reef Fish Management Plan, implemented a comprehensive logbook reporting program for fishermen catching species in this management unit. This program provides detailed information on the types and quantities of gear, species catch composition, catch per unit of effort and general fishing locations for fisheries within this management unit.

In 1990, data management services were provided to scientists, economists, managers, and cooperating individuals and agencies throughout the year. During FY-90, the Data Management Division implemented new computer systems to allow users to enter, edit and transmit data and information to the mainframe computer. System upgrades included: Gulf Shrimp trip data, information on Fish Tagging and Recaptures, and the Trip Interview Program which handles bioprofile and catch/effort data. In the fourth quarter of FY-90, the Data Management Division made arrangements to have a new and more powerful mainframe computer system installed in Miami. When installed, existing SEFC data systems will be transferred from the NMFS Seattle computer center to the NMFS Miami computer center.

### Fishery Habitat

Research emphasis during 1990 included the distribution and abundance of larval and juvenile fishes, factors influencing larval growth and survival, mapping and characterization of habitats supporting finfish and shellfish, evaluation of mitigation methodologies, impacts of alterations on habitat quantity and quality, feeding habits and, predator-prey interactions.

Research at the Beaufort and Galveston Laboratories included recruitment to estuaries, use of wetland habitat types as a measure of relative habitat value, predator-prey interactions, uses of detrital material, evaluation of pollution impacts, the functional value of mitigated and created seagrasses and salt marshes, information synthesis on wetland acreage and life history studies.

### Product Quality and Safety

Research concerning seafood quality and safety was conducted at the Charleston Laboratory in cooperation with state and federal regulatory and environmental agencies. Specific research areas included production/distribution of fish oil base test materials (in cooperation with NIH, FDA, and ADAMHA), establishment of an Experimental Processing Laboratory in Pascagoula, MS, under an agreement with Mississippi State University, seafood nutrition and quality evaluation, forensic activities concerning identification of endangered species, methods to distinguish wild from cultured fish, chemical and microbiological contamination of fish/shellfish, and identification of marine biotoxins.

**GULF OF MEXICO FISHERY MANAGEMENT COUNCIL**

**ANNUAL PROGRESS REPORT**

**CY 1990 ADMINISTRATIVE COOPERATIVE AGREEMENT NO. NA89-WC-H-FC071**

**JANUARY 1, 1990 THROUGH DECEMBER 31, 1990**

**NMFS STATUS REPORT ON RULES IMPLEMENTING FMPs**

Reef Fish Amendment 1 was implemented. Reef Fish Amendment 2 was implemented by emergency rule and later by rule. The permit requirement of Reef Fish Amendment 1 was implemented. A control date for entry into reef fish fishery was published.

During the first quarter, NMFS closed the commercial fishery for king mackerel in the Eastern zone, and during the fourth quarter closed the commercial fishery for king mackerel in the Western zone. During the second quarter, NMFS closed the Gulf king mackerel recreational fishery. Mackerel Amendment 3 was approved and implemented. Mackerel Amendment 5 was implemented. King and Spanish mackerel quotas and bag limits for 1990-1991 were implemented.

Spiny Lobster Amendment 2 was implemented. Rules for permits and bag limits deferred by NMFS under Spiny Lobster Amendment 1 were implemented.

NMFS held public hearings on a draft Shark FMP.

Shrimp Amendment 4 was implemented.

Certain areas of Tortugas Sanctuary were opened to fishing in 1991.

During the fourth quarter, the commercial fishery for shallow-water grouper was closed.

Proposed rule implementing Coral Amendment 1 was published for comment.

Notice of availability of Swordfish Amendment 1.

**COUNCIL ACTION ON FMPs**

**Billfish FMP.** Council approved and held public hearings on the definition of overfishing and action plan to arrest overfishing.

**Coral FMP.** Staff drafted and held public hearings on Amendment 1 to address the overfishing requirements of 50 CFR 602. Amendment 1 was approved by the Gulf and South Atlantic Councils and submitted to NMFS for implementation.



**Groundfish FMP.** Council included groundfish in Shrimp FMP amendment being developed to address finfish bycatch in shrimp fishery. An operation plan for development of a butterfly FMP was approved by NMFS.

**Mackerel FMP.** The Secretary approved revised Amendment 3 and waived the 30-day cooling-off period at the request of the Councils. The stock assessment prepared by NMFS was reviewed by the Stock Assessment Panel who prepared a report recommending ABC levels for 1990-1991 season. The Scientific and Statistical Committee (SSC) and Mackerel Advisory Panel (AP) reviewed these documents and made recommendations to the Council for Total Allowable Catch (TAC). The Gulf and South Atlantic Councils set TAC levels for Gulf and Atlantic stocks of mackerels. Mackerel Amendment 5 was implemented. Staff worked on development of Amendment 6 to the FMP to modify several provisions of the FMP. The assessment panel projected landings and recommended closure for commercial king mackerel fishery.

**Red Drum FMP.** NMFS completed an abbreviated assessment of stock conditions since escapement rates from state waters cannot be evaluated until next year. Council reviewed stock assessment and recommended no change in TAC for 1991.

**Reef Fish FMP.** Council held five public hearings, AP and SSC reviews on Amendment 2, approved the amendment, and submitted it to the Secretary for implementation. The Council requested and the Secretary approved an emergency rule implementing Amendment 2 which was later implemented by rule. NMFS completed a stock assessment for red snapper indicating the stock is overfished. The scientific assessment group reviewed the stock assessment and recommended the red snapper fishery be closed. The Council scheduled AP and SSC reviews of the stock assessments.

The SSC, Reef Fish AP, and Council reviewed the Scientific Stock Assessment Panel report on red snapper that recommended an Allowable Biological Catch (ABC) level of zero (closure of fishery). Based on economic analyses of the impacts of such action, the Council convened a series of meetings to assess all potential alternatives for restoring the red snapper stock, including reductions of the bycatch of red snapper in the shrimp fishery. A joint meeting of the Shrimp and Reef Fish APs was convened to suggest management alternatives. A special biological task force of NMFS, state and university personnel assessed these and other possible alternatives for restoring the stocks. A special economic task force examined the economic impacts of these and other alternatives. The Scientific Stock Assessment Panel was convened to review the biological and economic information and to draft a report with recommendation to the Council for action in July.

Council held 13 public hearings on alternatives to restore the red snapper stock. The Council reviewed public comment and additional analyses on bycatch and selected rules for 1991 for implementation by regulatory amendment. Included in the regulatory amendment was a proposal to reduce bycatch by 50% in 1993. Council directed staff to prepare Amendment 3 to the Reef Fish FMP, extending the time period for restoring the stocks to 2004. Council directed the assessment panel to examine the use of the red snapper recruitment index as a basis for regulatory action.

Regulatory Amendment setting bag limits and quota for red snapper in 1991 was returned to Council by NMFS for reconsideration. The Council specified a new bag limit and quota which were 48% reductions in red snapper landings and resubmitted the Regulatory Amendment for 1991. The Council revised Amendment 3 to set the target date for restoration of red snapper to the year 2007 and included in the Amendment specification of speckled hind as a deep-water grouper. The Council requested the Amendment's provisions be implemented by emergency rule. Four public hearings were held on draft Amendment 3. The quota review panel recommended closure of shallow-water grouper fishery. The Reef Fish Assessment Panel reviewed recruitment indices for red snapper and advised Council on feasibility of utilizing them to regulate the fishery. The SSC reviewed Assessment Panel recommendations and draft Amendment 3. The Reef Fish and Shrimp APs reviewed draft Amendment 3.

**Shark FMP.** Committee members attended Intercouncil review of the Shark FMP. The Council began the process of selecting alternatives for an amendment to the Secretarial Shark FMP. The Council supported implementation of the proposed rules of the Shark FMP by emergency action by NMFS due to delays in implementing the FMP. Council considered the options paper of alternatives for an amendment to the Secretarial Shark FMP, but deferred action until the Secretarial FMP is revised.

**Shrimp FMP.** The AP, SSC and Council reviewed the Texas closure analyses. The Council recommended a 200-mile closure for 1990. Revised Shrimp Amendment 4 was implemented. The Council reviewed technical analyses and opened a portion of the Tortugas Sanctuary for 1991. After holding five public hearings, draft Shrimp Amendment 5 addressing overfishing was reviewed by SSC, AP and Council and was returned to Committee for revisions. Staff began preparing objectives and research requirements for Draft Amendment 6 which will address finfish bycatch in the shrimp fishery, examining the impacts on species managed under other FMPs and principal groundfish species.

**Spiny Lobster FMP.** NMFS, the SSC and Council staff developed an overfishing definition for an amendment to the FMP which was approved by Council. Two public hearings were held on Amendment 3 addressing overfishing and it was approved by the Gulf and South Atlantic Councils and submitted to NMFS for implementation.

**Stone Crab FMP.** The SSC and NMFS developed a definition and action plan addressing overfishing as required under 50 CFR 602, which was approved by the Council. Draft Amendment 4 to the FMP for overfishing was reviewed by the SSC and AP and two public hearings were held. The Council approved Amendment 4 and submitted it to NMFS for implementation.

**Swordfish FMP.** The Council held five public hearings, AP and SSC reviews and took final action on Amendment 1. The Council reviewed proposed emergency rules for the fishery suggested by the New England Council and recommended to the Secretary that they not be implemented. Amendment 1 was submitted by the South Atlantic Fishery Management Council to NMFS for implementation.

## OTHER ACTIONS

### Habitat Protection

During the first quarter, the Texas Habitat Protection Advisory Panel met in Austin, Texas, and their recommendations were reported to the Habitat Protection Committee and Council.

Requested the Corps of Engineers allocate only 50,000 acre feet of water from Lake Lanier to the Atlanta municipal water supply and defer diversion of the additional amount requested until the Comprehensive Apalachicola/Flint/Chattahoochee River Basin Study was completed.

Supported concept of flooding Bahia Grande area for enhancing marine fisheries productivity. Sent letter of support to Texas General Land Office requesting an opportunity to review final project design and land use policy.

Commended Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service for their support in the Bahia Grande project.

Presented oral testimony to the President's Domestic Council at their public hearing on the MOA for mitigation policy and concerns over no-net-loss policy.

Advised resource agencies and all Habitat Protection Advisory Panel members of Council's interest in monitoring the MOA to notify Council of flagrant violations of the spirit and intent of the MOA.

Reviewed Interagency Issue Paper on Gulf Intercoastal Waterway Operations and Management and sent copy of Issue Paper to appropriate officials.

Presented the progress statement on Section 216 studies to the Texas Habitat Protection Advisory Panel.

Indicated support for the concept to enhance East Matagorda Bay permit application for a diversion channel between East Matagorda Bay and the Colorado River to the Corps of Engineers and the Matagorda County Commissioners.

Urged EPA to prevent construction of the Playa Del Rio Project by invoking veto authority under Section 404(c) of the Clean Water Act.

Sent follow-up correspondence to all agencies (not just federal agencies) submitting nonsubstantive responses to Council inquiries, concerns and recommendations.

Convened the Louisiana Habitat Protection Advisory Panel and the Habitat Protection Committee.

Authorized staff to draft Council letters for the Chairman to agencies that did not respond to a Council letter within the time period required under the Magnuson Act.

Wrote to the Governor supporting the Louisiana Department of Environmental Quality in their effort to upgrade regulatory control of discharges or wastewater associated with oil and natural gas exploration and production activities, and endorsed their proposed additions to current regulations.

Urged the Louisiana Department of Natural Resources the Corps of Engineers to take necessary steps, as required by the permit, to ensure that all environmental monitoring of currently authorized, and future marsh management projects are accomplished, properly documented and information is distributed.

Notified the Corps of Engineers of Council policy regarding entrapment of and/or harvesting shrimp within, or migrating from, impoundments associated with wetland management activities involving levees and water control structures and requested them to define their policy on the issue.

Attended the LaFourche Parish commercial fisherman's organization meeting on mariculture in wetlands.

Notified appropriate Corps Districts and state and federal resource agencies of new Council policies on wetland management plans and on mariculture in wetlands.

Staff attended the EPA Gulf of Mexico program (Gulf Initiative) symposium, in New Orleans, Louisiana on December 2-5, 1990.

Convened the Louisiana/Mississippi Habitat Advisory Panel.

Wrote to Florida Governor and Cabinet noting the importance of seagrass ecosystems, impacts of propeller damage and importance of the Department of Natural Resource's proposed submerged marine resource plan. Urged them to seek and use any regulatory authority within the state agencies to minimize man-induced destruction to seagrass communities.

Contacted all appropriate agencies concerning the extent of seagrass losses and authority in controlling propeller damage to seagrasses.

Alerted Florida DNR, DER and EPA regarding the alleged seagrass die-off caused by discharge from the Fenholloway River. Requested they look into the issue and keep Council apprised of their findings.

Sought membership to the Gulf States Marine Fisheries Commission's Habitat Subcommittee for Dick Hoogland.

Wrote to the Corps of Engineers and the Council on Environmental Quality concerning Gulf Intercoastal Waterway maintenance dredging and associated spoil disposal activities. Indicated concerns expressed in the Texas Issue Paper, such as the need to update the EIS and noncompliance with NEPA.

Convened Texas Habitat Advisory Panel.

## Limited Entry

The Council's Ad Hoc Limited Entry Committee held a workshop where invited experts presented an overview of the world's limited entry systems. The committee presented several discussion papers, a generic limited entry system, and analyses of Gulf fisheries for limited entry systems to the Council. The Council instructed the committee to develop an options paper for limited entry in the Gulf shrimp fishery as a first step in developing an Amendment. The limited entry system for the spiny lobster fishery was approved by the Florida Marine Fisheries Commission.

## U.S. FISH AND WILDLIFE SERVICE

Management and investigative activities conducted by the U.S. Department of the Interior, Fish and Wildlife Service (FWS) during 1990 that are relevant to the interests of the Gulf States Marine Fisheries Commission (GSMFC) mainly included work related to restoration of depleted anadromous fish species in Gulf of Mexico river systems. The striped bass (Morone saxatilis) and Gulf of Mexico sturgeon (Acipenser oxyrhynchus desotoi) are nationally significant fishery resources that have declined precipitously in abundance since the 1950's. Two other anadromous species, the Alabama shad (Alosa alabamae) and the skipjack herring (Alosa chrysochloris), though not as economically important as the sturgeon and striped bass, are also of concern. The FWS has major responsibilities in restoration of anadromous species on the Gulf coast.

### Striped Bass

National Fish Hatcheries (NFH) located in Gulf of Mexico river drainage basins produced and/or reared and distributed striped bass for stocking during 1990. Some of these fish were used in reservoir stocking programs and some in anadromous restoration efforts. Total fish distributed were as follows: Carbon Hill NFH, Alabama - 130,677; Inks Dam NFH, Texas - 11,316; Mammoth Spring NFH, Arkansas - 4,272; Meridian NFH, Mississippi - 638,500; Natchitoches NFH, Louisiana - 517,915; Private John Allen NFH, Mississippi - 160,000; San Marcos NFH, Texas - 6,214; Tishomingo NFH, Oklahoma - 350,900; Warm Springs NFH, Georgia - 45,038; and Welaka NFH, Florida - 3,896,785.

Personnel of the Panama City Field Office (both Fisheries Assistance and Ecological Services) provided transportation to federal fish hatcheries of striped bass brood stock collected in the Apalachicola River by personnel of the Florida Game and Freshwater Fish Commission. Collectively the Warm Springs and Welaka NFHs received 25 female and 34 male broodfish. During FY 1990 an estimated 670,268 fingerling striped bass were stocked in lakes in Alabama, Florida and Georgia from this effort.

The Natchitoches NFH fisheries assistance biologist assisted the Louisiana Department of Wildlife and Fisheries (LDWF) in collecting broodfish for striped bass artificial spawning operations at Toledo Bend Reservoir during the Spring of 1990. Between 500 and 600 fish were captured using gill nets and hook and line in support of the State-operated hatchery at the Toledo Bend Dam. Most of the fingerlings, averaging 10-20 million annually, go to federal hatcheries in several southern and southeastern states for Gulf river stocking.

Under a cooperative agreement between the Fish and Wildlife Service and the Texas Parks and Wildlife Department (TPWD), the Service's Region 2 coordinator for anadromous fish restoration assisted the TPWD in capturing and artificially spawning striped bass broodfish at Lake Livingston, Texas. Fry produced were distributed to state fish hatcheries as well as the San Marcos, Inks Dam and Uvalde NFHs for rearing. Also in cooperation with the TPWD, approximately

2,000,000 Phase I fingerlings were released in the estuaries of the Trinity and Sabine rivers in efforts to restore self-sustaining populations. Approximately 10,000 Phase II fingerlings were implanted with coded wire tags and also released in these rivers.

The Panama City Field Office continued a Phase II striped bass stocking program in the lower Apalachicola River in 1990. The Warm Springs NFH reared 63,480 striped bass to Phase II length, these fish were tagged and released in the Apalachicola River in December. A National Fish and Wildlife Foundation tag reward program initiated in 1989 is thought to have significantly increased the tag return rate in this program. Persons returning a tag for the first time were sent a baseball cap with a logo featuring the Gulf of Mexico and a striped bass circumscribed with "Participant: Gulf of Mexico Striped Bass Conservation". Each tag returned thereafter was rewarded with five dollars cash. The stocking program is believed to be responsible for providing a striped bass fishery in the lower river, which previously had not existed to any significant extent.

The Natchitoches NFH fisheries assistance biologist also participated in a striped bass Phase II tagging/stocking program involving several Louisiana rivers during 1990. This work has been ongoing in conjunction with the LDWF since 1987. Returns have been generally good during the first year after stocking, but drop off significantly thereafter. Abrasion, algal growth, or other factors causing the tags to become illegible after the first year were suspected as contributing to the lack of returns on older fish; a new sheathed tag will be utilized in the future in an effort to reduce any such problems. Persons reporting tagged striped bass were presented a hat and decal provided by the National Fish and Wildlife Foundation, along with a letter of appreciation explaining the goals of the tagging program.

The results of a striped bass thermal refuges study cooperatively conducted by the GSMFC and the Panama City Field Office were published in 1990. The report was titled "Location and identification of thermal refuges for striped bass on the Apalachicola River, Florida".

Tissues were collected from striped bass broodstock during the 1990 spawning season in the Apalachicola-Chattahoochee-Flint rivers system and subjected to mitochondrial DNA analysis. The purpose of this on-going work is to establish the genetic identity of the only known naturally reproducing native striped bass population in a Gulf river system. Five genotypes have been identified within the system. Two molecular geneticists are cooperating with the Panama City Field Office in this work. These are Dr. Ike Wirgin of New York University Medical Center and Dr. Bonnie Brown of East Carolina University. One paper resulting from this work, "The use of DNA fingerprinting in the identification and management of a striped bass population in the southeastern United States", was submitted for publication in July 1990. In conjunction with this work, blood and liver tissue samples were collected by the Natchitoches NFH fisheries assistance biologist and LDWF personnel from striped bass in the Atchafalaya (14), Mississippi (7), and Sabine (2) rivers and Toledo Bend Reservoir (1) reservoir in Louisiana and sent to Dr. Ike Wirgin analysis. All the fish captured in Louisiana were determined to be of Atlantic stock origin.

Striped bass were captured in the Mississippi River by the Natchitoches NFH fisheries assistance biologist for obtaining samples to be analyzed for pesticide and heavy metals analyses. This analyses were being coordinated by the FWS Vicksburg Ecological Services Office.

Age and growth data were collected on approximately 80 striped bass from the Atchafalaya, Mississippi and Sabine rivers by the Natchitoches NFH fisheries assistance biologist. Preliminary results indicate that striped bass individuals in the Sabine River grow faster than those in the Mississippi and Atchafalaya rivers.

The Natchitoches NFH fisheries assistance biologist collected videotape footage of striped bass fishing trips in the Atchafalaya and Mississippi Rivers. This footage was collected for developing a video program to document the fact that striped bass are becoming fairly common in these rivers and represent a potentially growing sport fishery.

A meeting was chaired by the Natchitoches NFH fisheries assistance biologist in Baton Rouge, Louisiana during 1990 to discuss issues and concerns involving striped bass in the Mississippi River. The purpose of the meeting was to initiate better interagency coordination in this area. The meeting was attended by representatives from several state and federal agencies having an interest in the Mississippi River. Population studies, water quality monitoring, funding and other matters were discussed. One outcome of the meeting was a request that the GSMFC, through its Anadromous Fish Subcommittee, coordinate future joint efforts involving anadromous fisheries in the Mississippi River.

### **Gulf of Mexico sturgeon**

The Panama City Field Office and the FWS's National Fisheries Research Center in Gainesville, Florida continued cooperative work on a project to develop techniques and procedures for artificially spawning and rearing Gulf of Mexico sturgeon. The ultimate goal is to produce a spawning and hatching manual for this subspecies. This was the second year the project successfully spawned sturgeon at a temporary hatchery near the mouth of the Suwanee River. A leased house served as quarters, laboratory and hatchery facility. The hatchery was in operation between February 20 and April 16. Over 50 fish were evaluated for use as spawning candidates. A total of five females and nine males were used in the 1990 spawning operation. During 1990 approximately 106,000 eggs were shipped to the Welaka NFH for incubation. About 75,000 eggs were hatched at the Suwanee facility producing 32,000 day-old fry. These were shipped to the National Fisheries Research Center at Gainesville, Florida, the Warm Springs NFH, and the Louisiana Cooperative Fish and Wildlife Research Unit. A manuscript entitled "Hormone induced ovulation and artificial spawning of Gulf of Mexico sturgeon (*Acipenser oxyrhynchus desotoi*)" was submitted for publication.

Panama City Field Office personnel collected tissue samples from all Gulf of Mexico sturgeon incidental mortalities during operation of the Suwanee River sturgeon hatchery. These samples have been frozen for holding until funds are available for contaminants analysis. The results of these analyses will be compared with contaminants data previously collected on Apalachicola River



sturgeon. Mitochondrial DNA investigations involving genetic identification of striped bass were expanded in 1990 to include the Gulf of Mexico sturgeon with tissues being collected for these analyses as well.

A Gulf of Mexico sturgeon telemetry project in the Apalachicola River and Bay begun in 1989 was continued by the Panama City Field Office during 1990, though at a reduced level of effort. Four sturgeon were equipped with external radio tags and three with external sonic tags. These fish were tracked from both boats and aircraft.

A study to estimate the population size of Gulf of Mexico sturgeon in the Apalachicola River below Jim Woodruff Lock and Dam was continued during 1990 by the Panama City Field Office. Sixty-five sturgeon were collected by gill nets; all fish were weighed, measured and tagged. A population estimate for 1990 using the Schnabel mark-recapture method was 108 fish. This population estimate has not varied much over the last several years. The number of juveniles collected in 1990 indicates good natural reproduction for at least the last three years.

Personnel of the Panama City Field Office removed pectoral fin rays from 20 Gulf of Mexico sturgeon during 1990 sturgeon investigations in order to obtain age data from size groups not represented in the current age data base. A progress report was completed on this work. A final report will be produced in 1991.

The FWS Endangered Species Office in Jacksonville, Florida continued gathering information for and working toward listing the Gulf of Mexico sturgeon as a threatened species under the Endangered Species Act. The Panama City Field Office assisted in this effort by providing technical information and data to the Endangered Species Office as well as responding to numerous requests from state and federal agencies regarding the status of the subspecies.

The Natchitoches NFH fisheries assistance biologist accompanied LDWF personnel to Panama City, Florida to assist the Panama City Field Office with netting and tagging operations for Gulf of Mexico sturgeon in the Apalachicola and Choctawhatchee rivers. The LDWF personnel were planning to initiate similar sturgeon investigations in Louisiana, particularly in the Pearl River, which is known to have a population of the anadromous sturgeon.

### **Other Anadromous Species**

The Panama City Field Office initiated a survey investigation on the Apalachicola River to determine the present status of anadromous fish populations and to identify any major changes in the fish communities since the 1970's. The study design is an attempt to gather data comparable to that collected on the river during the 1970's. In conjunction with this survey, the Panama City Field Office began efforts to locate spawning areas and gain a knowledge of the life histories of Alabama shad and skipjack herring. The field office is also working cooperatively with the Warm Springs NFH in culture studies for the two species. Samples for mitochondrial DNA investigations of Alabama shad were collected during 1990 from Apalachicola River fish.

## Other Efforts

The FWS's Ecological Services field offices that are involved with issues in Gulf coast streams evaluated various activities throughout the year that could affect anadromous fish species. These offices provide comments and input to action and/or regulatory agencies through various legal frameworks, including the Fish and Wildlife Coordination Act. These offices are located in Vero Beach, Florida; Panama City, Florida; Cookeville, Tennessee; Daphne, Alabama; Vicksburg, Mississippi; Lafayette, Louisiana; Houston, Texas; Arlington, Texas; Tulsa, Oklahoma; Corpus Christi, Texas; and Albuquerque, New Mexico. Various other field offices respond to similar projects farther north in the upper Mississippi River and its tributaries.

Panama City Field Office personnel involved in Gulf of Mexico sturgeon and striped bass work were featured in several newspaper columns, television newscasts and outdoor magazine articles. The office has also been very active in giving presentations concerning the FWS's work with anadromous fishes to school and civic groups as well as in providing other information to the public.

The Panama City Field Office supervisor continued serving as coordinator of the Apalachicola-Chattahoochee-Flint rivers system striped bass restoration committee under a cooperative agreement signed in 1985. The committee includes representatives from the states of Alabama, Florida and Georgia in addition to the FWS. The committee works on planning and implementation of striped bass restoration in the system. The office supervisor also served as a member of the Anadromous Fish Subcommittee of the GSMFC's Technical Coordinating Committee. The FWS played an active role in working with the GSMFC to update the striped bass fishery management plan and developing a Gulf of Mexico sturgeon fishery management plan.

The Natchitoches NFH fisheries assistance biologist approached representatives of the Coastal Corporation of Houston, Texas, and its subsidiary, Coastal Oil and Gas Corporation of Jackson, Mississippi, concerning the possibility of matching a donation by the National Fish and Wildlife Foundation to produce an educational booklet concerning striped bass. However, the corporation declined to become involved during 1990.

As a result of interviews with the Natchitoches NFH fisheries assistance biologist, three articles featuring striped bass appeared in national magazines during the year. These articles appeared in Trophy Striper, Coastal World, and Field and Stream magazines.

**GULF STATES MARINE FISHERIES COMMISSION  
OCEAN SPRINGS, MISSISSIPPI**

**REPORT ON EXAMINATION OF FINANCIAL  
STATEMENTS AND SUPPLEMENTAL DATA**

**For The Year Ended December 31, 1990**

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

**GULF STATES MARINE FISHERIES COMMISSION  
OCEAN SPRINGS, MISSISSIPPI**

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

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AMERICAN INSTITUTE OF CPA'S

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

We have audited the accompanying financial statements of **Gulf States Marine Fisheries Commission** as of December 31, 1990, and 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 provision of the Office of Management and Budget Circular A-128, "Audits of State and Local Governments." These standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

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, 1990, and the results of its operation and changes in financial position for the year then ended in conformity with generally accepted accounting principles.

*Robert Z. Mosher CPA*

D'Iberville, Mississippi  
March 28, 1991

**GULF STATES MARINE FISHERIES COMMISSION  
 COMBINED BALANCE SHEET - ALL FUND TYPES  
 December 31, 1990**

	<u>Governmental Fund Types</u>		
	<u>General Fund</u>	<u>Special Revenue Funds</u>	<u>Totals (Memorandum only)</u>
<b>ASSETS</b>			
Cash	172,794		172,794
Grant Receivable-Marfin 50-WCNF-0-06053		27,166	27,166
Grant Receivable - Wallop 14-16-009-90-1211		8,670	8,670
Due From Special Revenue Funds	30,490		30,490
Due From General Fund		44,318	44,318
Fixed Assets	101,918		101,918
Less Accumulated Depreciation	(43,220)		(43,220)
Less Contra Account	(46,336)		(46,336)
<b>TOTAL ASSETS</b>	<u>215,646</u>	<u>80,154</u>	<u>295,800</u>
	=====	=====	=====
<b>LIABILITIES</b>			
Accounts payable	434	5,517	5,951
Due To Special Revenue Funds	44,318		44,318
Due To General Fund		30,490	30,490
<b>TOTAL LIABILITIES</b>	<u>44,752</u>	<u>36,007</u>	<u>80,759</u>
<b>FUND EQUITY</b>			
Fund Balance Unrestricted	170,894		170,894
Fund Balance Restricted		44,147	44,147
<b>TOTAL FUND EQUITY</b>	<u>170,894</u>	<u>44,147</u>	<u>215,041</u>
	=====	=====	=====
<b>TOTAL LIABILITIES AND FUND EQUITY</b>	<u>215,646</u>	<u>80,154</u>	<u>295,800</u>
	=====	=====	=====

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

GULF STATES MARINE FISHERIES COMMISSION  
 COMBINED STATEMENT OF REVENUES, EXPENDITURES AND CHANGES  
 IN FUND BALANCE - ALL FUND TYPES  
 For The Year Ended December 31, 1990

	Operating Fund	Sea Map Funds	Interjuris- dictional Fisheries
<b>REVENUES</b>			
Member State Appropriations			
Alabama	11,250		
Florida	45,000		
Louisiana	22,500		
Mississippi	11,250		
Texas	22,500		
Grants and Agreements			
Previous year		10,048	8,310
Current year		98,478	106,826
Interest Earned	4,823		
<b>Total Revenue</b>	<b>117,323</b>	<b>108,526</b>	<b>115,136</b>
<b>EXPENSES</b>			
Salaries	19,649	40,383	52,030
Contract Labor	712	114	
Health Insurance	2,751	5,985	9,210
Retirement	1,375	1,801	2,754
Office Rental	3,409	2,080	3,200
Office Supplies	2,260	2,623	2,157
Postage	138	3,889	960
Travel	8,080	19,484	18,341
Telephone	2,742	2,265	2,817
Copying Expense	792	2,953	1,136
Printing	1,230	6,453	4,686
Meeting Cost	739	1,540	1,415
Dues and Subscription	1,151		
Auto Expense	1,487		52
Insurance	2,798		
Maintenance and Repairs	616	812	1,026
Courtesies	486		
Professional Services	1,641	1,620	1,824
Depreciation	4,086		
Miscellaneous	44		
Taxes-payroll	2,982	3,272	3,989
Office Equipment			1,400
<b>Total Expenses</b>	<b>59,168</b>	<b>95,274</b>	<b>106,997</b>
Revenue over Expenditures	58,155	13,252	8,139
Fund Balance, January 1, 1990	112,739	8,198	(8,310)
Fund Balance, December 31, 1990	170,894	21,450	(171)
	=====	=====	=====

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



<u>Council Funds</u>	<u>Wallop Breaux</u>	<u>Marfin Red Drum</u>	<u>Thermal Refuge</u>	<u>State-Federal Management Funds</u>	<u>Totals</u>
					11,250
					45,000
					22,500
					11,250
					22,500
6,250	20,564	2,768	5,200		53,140
25,000	108,874	57,563			396,741
					4,823
<u>31,250</u>	<u>129,438</u>	<u>60,331</u>	<u>5,200</u>	<u>0</u>	<u>567,204</u>
19,598	61,775	22,620			216,055
					826
					36,338
2,753	11,446	4,193			13,130
1,363	4,322	1,515			11,835
	1,935	1,211			10,887
172	1,713	1,962			7,498
46	815	1,650			89,748
226	28,042	15,575			10,226
115	829	1,458			7,505
211	650	1,763			16,672
41	944	3,318			7,322
	1,493	2,135			1,153
	2				1,549
	10				2,798
69	651	380			3,554
					486
300	2,115	724			8,224
					4,086
					44
1,571	5,041	1,827			18,682
	7,655				9,055
<u>26,465</u>	<u>129,438</u>	<u>60,331</u>	<u>0</u>	<u>0</u>	<u>477,673</u>
4,785	0	0	5,200		89,531
(181)	0	0	(4,800)	17,864	125,510
4,604	0	0	400	17,864	215,041
=====	=====	=====	=====	=====	=====

**GULF STATES MARINE FISHERIES COMMISSION  
 COMBINED STATEMENT OF REVENUES, EXPENDITURES AND CHANGES  
 IN FUND BALANCE -ALL FUNDS - BUDGET AND ACTUAL -  
 ALL FUND TYPES  
 For The Year Ended December 31, 1990**

<b>REVENUES:</b>	<u>Budget</u>	<u>Actual</u>	<b>Variance Favorable (Unfavorable)</b>
State Appropriations	90,000	112,500	22,500
Interest	6,000	4,823	(1,177)
Grants and Agreements	<u>431,497</u>	<u>449,881</u>	<u>18,384</u>
<b>Total Revenues</b>	<b>527,497</b>	<b>567,204</b>	<b>39,707</b>
 <b>EXPENSES:</b>			
Salaries	216,604	216,055	549
Contract Labor	3,862	826	3,036
Health Insurance	30,793	36,338	(5,545)
Retirement	13,463	13,130	333
Office Rental	11,100	11,835	(735)
Office Supplies	8,561	10,887	(2,326)
Postage	9,475	7,498	1,977
Travel	127,693	89,748	37,945
Telephone	9,540	10,226	(686)
Copying Expense	7,980	7,505	475
Printing	23,144	16,672	6,472
Meeting Cost	21,350	7,322	14,028
Dues and Subscriptions	1,200	1,153	47
Auto Expense	1,000	1,549	(549)
Insurance	3,200	2,798	402
Maintenance and Repairs	4,500	3,554	946
Courtesies	400	486	(86)
Professional Services	5,926	8,224	(2,298)
Depreciation		4,086	(4,086)
Miscellaneous	400	44	356
Taxes Payroll	16,430	18,682	(2,252)
Office Equipment	<u>7,850</u>	<u>9,055</u>	<u>(1,205)</u>
<b>Total Expenses</b>	<b><u>524,471</u></b>	<b><u>477,673</u></b>	<b><u>46,798</u></b>
 Revenue over expenditures	 3,026	 89,531	 86,505
 Fund Balance - January 1, 1990	 <u>125,510</u>	 <u>125,510</u>	 <u>0</u>
 Fund Balance - December 31, 1990	 <u>128,536</u>	 <u>215,041</u>	 <u>86,505</u>
	=====	=====	=====

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

**GULF STATES MARINE FISHERIES COMMISSIONS**  
**NOTES TO FINANCIAL STATEMENTS**  
December 31, 1990

**NOTE 1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

(a) **Fund Accounting** - The accounts of the Commission are reported on the basis of funds and account groups each of which is considered a separate accounting entity. The operation of each fund is reported as a separate set of self-balancing accounts that comprise its assets, liabilities, fund equity, revenues and expenditures. Government resources are allocated to and accounted for in individual funds, based upon the purpose for which they are controlled. The various funds are grouped, in the financial statements in this report, into fund categories as follows:

**GOVERNMENTAL FUNDS**

**General Fund** - The general operating fund of the Commission. It is used to account for all financial resources, except those required to be accounted for in another fund.

**Special Revenue Funds** - Used to account for the proceeds of specific revenue sources that are legally restricted to expenditures for specified purposes.

(b) **Fixed Assets** - Fixed assets purchased from unrestricted funds are properly capitalized and set up as fixed assets on the books.

Fixed assets purchased from special revenue funds (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:

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

(c) **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 records of the Gulf States Marine Fisheries Commission are maintained on the accrual method of accounting. Under the accrual method of accounting, revenues are recognized when incurred without regard to actual receipt or disbursement of cash.

(d) **Grants Receivable** - Grants Receivable consist of amounts actually collected subsequent to December 31, 1990 for costs incurred prior to year-end. Therefore, no allowance for uncollectible receivables is considered necessary.

**NOTE 2 - BRIEF HISTORY**

The Commission 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 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".

**NOTE 3 - DUE TO/DUE FROM OTHER FUNDS**

	<u>Due From</u>	<u>Due To</u>
General Fund to Special Funds		44,318
Special Funds to General Fund	30,490	
Special Funds from General Fund	44,318	
General Fund from Special Funds		<u>30,490</u>
	<u>74,808</u>	<u>74,808</u>
	=====	=====

**NOTE 4 - LEASE COMMITMENTS**

The Commission occupies space under long-term lease agreements which expires in the year 2002. The monthly lease payment for the first three (3) years beginning December 1, 1987 is \$875.00. The monthly lease payment will be adjusted every three (3) years using the consumer price index as a guide.

**NOTE 5 - 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 six (6) 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, 1990 was \$13,131.

**NOTE 6 - BUDGET**

The Commission adopts an annual budget for each fund and the overall entity. The budget is presented in these statements in its overall presentation for comparative purpose.

**NOTE 7 - 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 and equal distribution.

**NOTE 8 - INCOME TAXES**

The Commission has not filed for a tax-exempt status, but they believe that they are tax-exempt since their revenue comes from federal grants and agreements and member states appropriations.

**SUPPLEMENTARY INFORMATION**

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

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

We have audited the financial statements of **Gulf States Marine Fisheries Commission** for the year ended December 31, 1990, and have issued our report thereon dated March 28, 1991. These financial statements are the responsibility of **Gulf States Marine Fisheries Commission's** management. Our responsibility is to express an opinion on these financial statements based on our audit.

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

*Robert F. Mosher CPA*

D'IBERVILLE, MISSISSIPPI  
March 28, 1991

GULF STATES MARINE FISHERIES COMMISSION  
 SCHEDULE OF FEDERAL FINANCIAL ASSISTANCE  
 For The Year Ended December 31, 1990

Federal Grantor/Pass-Through Grantor/Program Title	Award #	Program or Award Amount Federal Share	Accumulated Revenue at Jan. 1, 1990 Federal Share	Current Federal Revenue Recognized	Disbursements/ Expenditures Federal Share	Cash/Accrued or (Deferred) Revenue at Dec. 31, 1990
<u>U.S. Department of Commerce</u>						
Southeast Area Monitoring and Assessment Program	NA90AA-H-SM211	98,478	0	98,478	86,223	(12,255)
	NAB9WC-H-SM059	93,476	4,482	10,048	10,048	0
Administration Support of Marine Fisheries Initiative	50-WCNF-0-06053	73,675	0	30,397	57,563	27,166
Coordinating - Red Drum Interjurisdictional Fisheries Management Plans	NAB8WC-H-MF196	7,000	2,768	2,768	2,768	0
	NA90AA-D-IJ202	110,000	0	106,826	98,686	(8,140)
	NAB9WC-D-IJ074	110,000	8,310	8,310	8,310	0
Gulf of Mexico Fishery Management Council	90-70600	25,000	0	25,000	20,212	(4,788)
	89-70600	25,000	6,250	6,250	6,250	0
<u>U.S. Department of Interior</u>						
Cooperative Interstate Fishery						
Management in the Territorial Seas of the Gulf of Mexico	14-16-0009-90-1211	127,556	0	100,204	108,874	8,670
	14-16-0009-87-1203	88,900	20,564	20,564	20,564	0
Thermal Refuge	14-16-0009-89-1202	10,400	5,200	5,200	0	(5,200)
		769,485	47,574	414,045	419,498	5,453
		=====	=====	=====	=====	=====

10



**GULF STATES MARINE FISHERIES COMMISSION**

**REPORT ON INTERNAL ACCOUNTING CONTROLS (ACCOUNTING AND  
ADMINISTRATIVE) BASED ON A STUDY AND EVALUATION MADE AS A PART  
OF AN EXAMINATION OF THE GENERAL PURPOSE FINANCIAL STATEMENTS AND  
THE ADDITIONAL TESTS REQUIRED BY THE SINGLE AUDIT ACT**

**December 31, 1990**

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

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AMERICAN INSTITUTE OF CPAs

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

We have audited the general purpose financial statements of **Gulf States Marine Fisheries Commission** for the year then ended December 31, 1990, and have issued our report thereon dated March 28, 1991. As part of our audit, we made a study and evaluation of the internal control systems, including applicable internal administrative controls, used in administering federal financial assistance programs to the extent we considered necessary to evaluate the systems as required by generally accepted auditing standards, Government Auditing Standards, issued by the Comptroller General of the United States, the Single Audit Act of 1984, and the provisions of OMB Circular A-128, "Audits of State and Local Governments." For the purpose of this report, we have classified the significant internal accounting and administrative controls used in administering federal financial assistance programs in the following categories:

**Cycles of Activity**

- Treasury or financing
- Revenue/receipts
- Purchases/disbursements
- Payroll
- External financial reporting

**General Requirements**

- Political activity
- Davis-Bacon Act
- Civil Rights
- Cash Management
- Relocation assistance and real property acquisition
- Federal financial reports

The management of **Gulf States Marine Fisheries Commission** is responsible for establishing and maintaining internal control systems used in administering federal financial assistance programs. In fulfilling that responsibility, estimates and

judgments by management are required to assess the expected benefits and related costs of control procedures. The objectives of internal control systems used in administering federal financial assistance programs are to provide management with reasonable, but not absolute, assurance that, with respect to federal financial assistance programs, resource use is consistent with laws, regulations, and policies; resources are safeguarded against waste, loss and misuse; and reliable data is obtained, maintained, and fairly disclosed in reports.

Because of inherent limitations in any system of internal accounting and administrative controls used in administering federal financial assistance programs, errors or irregularities may nevertheless occur and not be detected. Also, projection of any evaluation of the systems to future periods is subject to the risk that procedures may become inadequate because of changes in conditions or that the degree of compliance with the procedures may deteriorate.

Our study included all of the applicable control categories listed in the first paragraph. During the year ended December 31, 1990, **Gulf States Marine Fisheries Commission**, had no major federal financial assistance programs and expended 100% of its total federal financial assistance in nonmajor federal financial assistance programs. With respect to internal control systems used in administering these nonmajor federal financial assistance programs, our study and evaluation included considering the types of errors and irregularities that could occur, determining the internal control procedures that should prevent or detect such errors and irregularities, determining whether the necessary procedures are prescribed and are being followed satisfactorily, and evaluating any weaknesses.

With respect to the internal control systems used solely in administering the other nonmajor federal financial assistance programs of **Gulf States Marine Fisheries Commission**, our study and evaluation was limited to a preliminary review of the systems to obtain an understanding of the control environment and the flow of transactions through the accounting system. Our study and evaluation of the internal control systems used solely in administering these nonmajor federal financial assistance programs of **Gulf States Marine Fisheries Commission** did not extend beyond this preliminary review phase.

Our study and evaluation was more limited than would be necessary to express an opinion on the internal control systems used in administering the federal financial assistance programs of **Gulf States Marine Fisheries Commission**. Accordingly, we do not express an opinion on the internal control systems used in administering the federal financial assistance programs of **Gulf States Marine Fisheries Commission**.

Also, our audit, made in accordance with the standards mentioned in the first paragraph, would not necessarily disclose material weaknesses in the internal control systems, for which our study and evaluation was limited to a preliminary review of the systems, as discussed in the fifth paragraph of this report.

However, our study and evaluation and our audit disclosed the following conditions that we believe result in more than a relatively low risk that errors or irregularities in amounts that would be material to a federal financial assistance program may occur and not be detected within a timely period.

#### **EQUIPMENT INVENTORY**

Fixed assets have not been properly tagged with identification tags. The executive assistant has undertaken the job of tagging.

#### **INVOICES & STATEMENTS**

Invoices and statements had not been marked paid, showing check number and date paid. The Commission has ordered a paid stamp so that they can stamp each invoice and statement.

These conditions were considered in determining the nature, timing, and extent of the audit tests to be applied in (1) our audit of the 1990 financial statements and (2) our audit and review of the Commission's compliance with laws and regulations noncompliance with which we believe could have a material effect on the allowability of program expenditures for federal financial assistance programs. This report does not affect our reports of the financial statements and on the Commission's Compliance with laws and regulations dated March 28, 1991.

This report is intended solely for the use of management and relevant federal agencies and should not be used for any other purpose. This restriction is not intended to limit the distribution of this report, which, upon acceptance by the cognizant agent, is a matter of public record.

*Robert F. Mosher CPA*

**D'IBERVILLE, MISSISSIPPI  
March 28, 1991**

**GULF STATES MARINE FISHERIES COMMISSION**

**REPORT ON INTERNAL ACCOUNTING CONTROLS BASED SOLELY ON  
A STUDY AND EVALUATION MADE AS PART OF AN EXAMINATION  
OF THE GENERAL PURPOSE FINANCIAL STATEMENTS**

**December 31, 1990**

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

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

We have audited the financial statements of **Gulf States Marine Fisheries Commission** for the year ended December 31, 1990, and have issued our report thereon dated March 28, 1991.

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, 1990, we considered its internal control structure in order to determine our auditing procedures for the purpose of expressing our opinion on the financial statements and not to provide assurance on the internal control structure.

The management of **Gulf States Marine Fisheries Commission** is responsible for establishing and maintaining an internal control structure. In fulfilling this responsibility, estimates and judgments by management are required to assess the expected benefits and related costs of internal control structure policies and procedures. The objectives of an internal control structure are to provide management with reasonable, but not absolute, assurance that assets are safeguarded against loss from unauthorized use or disposition, and that transactions are executed in accordance with management's authorization and recorded properly to permit the preparation of financial statements in accordance with generally accepted accounting principles. Because of inherent limitations in any internal control structure, errors or irregularities may nevertheless occur and not be detected. Also, projection of any evaluation of the structure to future periods is subject to the risk that procedures may become inadequate because of changes in conditions or that the effectiveness of the design and operation of policies and procedures may deteriorate.

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

**Cycles of Activity**

- Treasury or financing
- Revenue/receipts
- Purchases/disbursements
- Payroll
- External financial reporting

**General Requirement**

- Political activity
- Davis-Bacon Act
- Civil Rights
- Cash management
- Relocation assistance and real property acquisition
- Federal financial reports

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

We noted certain matters involving the internal control structure and its operation that we consider to be reportable conditions under standards established by the American Institute of Certified Public Accountants. Reportable conditions involve matters coming to our attention relating to significant deficiencies in the design or operation of the internal control structure that, in our judgment, could adversely affect the entity's ability to record, process, summarize, and report financial data consistent with the assertions of management in the financial statements.

**EQUIPMENT INVENTORY**

Fixed assets have not been properly tagged with tags. The executive assistant has undertaken the job of tagging.

**INVOICES & STATEMENTS**

Invoices and statements had not been marked paid, showing check number and date paid. The Commission has ordered a paid stamp so that they can stamp each invoice and statement.

A material weakness is a reportable condition in which the design or operation of one or more of the specific internal control structure elements does not reduce to a relatively low level the risk that errors or irregularities in amounts that would be

material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions.

Our consideration of the internal control structure elements does not reduce to a relatively low level the risk that errors or irregularities in amounts that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions.

Our consideration of the internal control structure would not necessarily disclose all matters in the internal control structure that might be reportable conditions and accordingly, would not necessarily disclose all reportable conditions that are also considered to be material weaknesses as defined above. However, we believe none of the reportable conditions described above is a material weakness.

This report is intended for the information of the audit committee, 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  
March 28, 1991



**GULF STATES MARINE FISHERIES COMMISSION**

**REPORT ON COMPLIANCE WITH LAWS AND REGULATION RELATED TO  
NONMAJOR FEDERAL FINANCIAL ASSISTANCE PROGRAMS IN  
CIRCUMSTANCES IN WHICH THE RECIPIENT RECEIVED NO MAJOR  
PROGRAM FUNDING**

**December 31, 1990**

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

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

In connection with our audit of the 1990 financial statements of Gulf States Marine Fisheries Commission, and with our study and evaluation of the Commission's internal control systems used to administer federal financial assistance programs, as required by Office of Management and Budget Circular A-128, "Audits of State and Local Governments," we selected certain transactions applicable to certain nonmajor federal financial assistance programs for the year ended December 31, 1990.

As required by OMB Circular A-128, we have performed auditing procedures to test compliance with the requirements governing types of services allowed or unallowed. Our procedures were substantially less in scope than an audit, the objective of which is the expression of an opinion on the Commission's compliance with these 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 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 requirements.

This report is intended for the information of the 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 F. Mosher CPA*

D'IBERVILLE, MISSISSIPPI  
March 28, 1991

**GULF STATES MARINE FISHERIES COMMISSION**

**REPORT ON COMPLIANCE BASED ON AN EXAMINATION OF GENERAL  
PURPOSE FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE  
WITH GOVERNMENT AUDITING STANDARDS**

**December 31, 1990**

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

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

We have audited the financial statements of **Gulf States Marine Fisheries Commission** as of and for the year ended December 31, 1990, and have issued our report thereon dated March 28, 1991.

We conducted our audit in accordance with generally accepted auditing standards and Government Auditing Standards, issued by the Comptroller General of the United States, and the provisions of Office of Management and Budget Circular A-128, "Audits of State and Local Governments." Those standards and OMB Circular A-128 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 general purpose financial statements are free of material misstatement, we performed tests of the Commission's compliance with certain provisions of laws, regulations, contracts, and grants. However, our objective was not to provide an opinion on overall compliance with such provisions.

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

This report is intended for the information of the audit committee, 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  
March 28, 1991

**GULF STATES FISHERIES COMMISSION  
AUDIT FINDINGS, RECOMMENDATIONS  
AND ANSWERS  
December 31, 1990**

**FINDING:** The Commission has over \$168,000 deposited into one depository, which exceeds the \$100,000 FDIC limit, leaving the remaining balance subject to loss under present circumstances but to the lack of a collateralization agreement.

**RECOMMENDATION:** That the Commission require the depository to issue them \$100,000 in collateral in excess of the \$100,000 insurance that the depository already carries on the first \$100,000 of each account.

**ANSWER:** The executive assistant has already contacted the depository and they are issuing a collateral agreement.

**FINDING:** The one (1) year grants; if expenditures exceed revenue they are not being closed into the operating fund, but have been carried over to the following year's grant fund balance.

**RECOMMENDATION:** All grants after they have been completely spent, if a deficit, needs to be closed into the operating fund.

**ANSWER:** When books are closed grants will also be closed if they have a deficit.

**FINDING:** The Commission does not know whether the wages paid by the Commission are subject to State Unemployment Taxes.

**RECOMMENDATION:** Contact the State Unemployment Commission and request a written ruling.

**ANSWER:** We have contacted the State already, per your advise, and are waiting on a ruling.

**FINDING:** The Commission has never received a formal notice from the Internal Revenue Service stating that they are a non-profit organization. Also a 990 (Non-profit organization tax return) has never been filed.

**RECOMMENDATION:** The Commission needs to file an application for recognition as a Non-profit organization and file returns.

**ANSWER:** They will engage us, Fountain, Seymour, Mosher & Assoc., to make application for the non-profit status.

**FINDING:** Invoices and statements are not being marked paid with date and check number, this could cause a possible double payment.

**RECOMMENDATION:** We recommend that the Commission acquire a paid stamp and stamp all invoices and statements paid showing date of payment and check number.

**ANSWER:** They will order a stamp and start marking all invoices and statements paid including date and check number.

**FINDING:** Fixed assets have not been properly tagged.

**RECOMMENDATION:** All fixed assets (equipment, furniture, fixtures) should be properly tagged so that taking a physical inventory of same would be easier.

**ANSWER:** They will start tagging all fixed assets.







