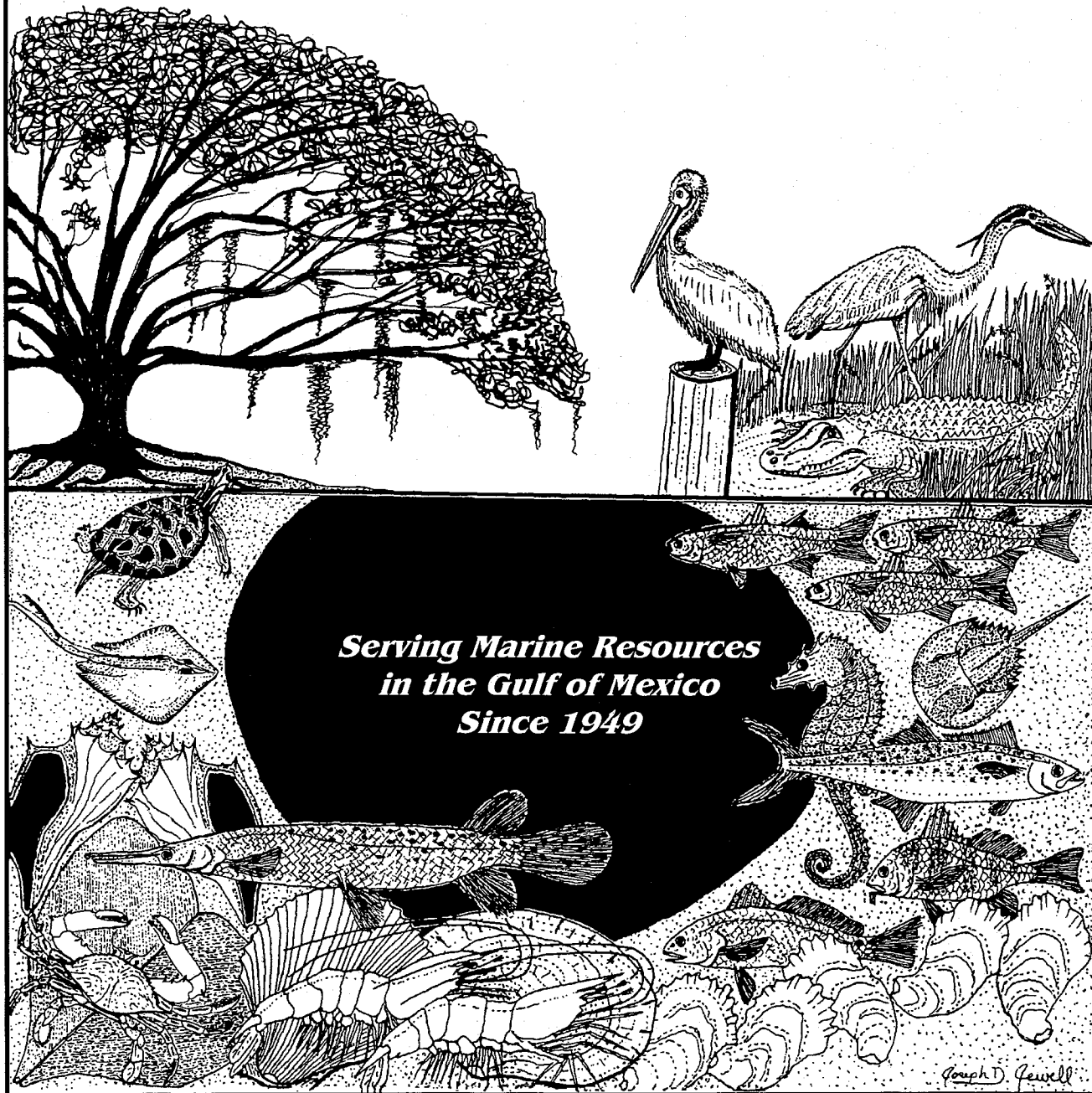


Fifty-first Annual Report
of the
**GULF STATES MARINE
FISHERIES COMMISSION**

For The Year 2000



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

GULF STATES MARINE FISHERIES COMMISSION

FIFTY-FIRST ANNUAL REPORT
(2000)

*to the
Congress of the United States
and to the
Governors and Legislators
of
Alabama, Florida, Louisiana, Mississippi, and Texas*

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



edited by:
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Preserving the Past • Planning the Future • A Cooperative Effort

Charles H. Lyles Award Recipients

The *Charles H. Lyles Award* is awarded annually by the Gulf States Marine Fisheries Commission (GSMFC) to an individual, agency, or organization which has contributed to the betterment of the fisheries of the Gulf of Mexico through significant biological, industrial, legislative, enforcement, or administrative activities.

The recipient is selected by the full Commission from open nominations at the March meeting. The selection is by secret ballot with the highest number of votes being named the recipient. The recipient is awarded the honor at the annual meeting in October.

CHARLES H. LYLES AWARD WINNERS

Charles H. Lyles	1984
Theodore B. Ford	1985
J.Y. Christmas	1986
John Breaux	1987
John Ray Nelson	1988
I.B. "Buck" Byrd	1989
Hugh A. Swingle	1990
John A. Mehos	1991
J. Burton Angelle	1992
Louis A. Villanova	1993
Theodore H. Shepard	1994
Edwin A. Joyce, Jr.	1995
Tommy D. Candies	1996
Walter M. Tatum	1997
Thomas L. Heffernan	1998
Trent Lott	1999
James Barkuloo	2000

Acknowledgments

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

Respectfully submitted,

Virginia Vail, *Chairman*
Vernon Minton, *First Vice Chairman*
Mike Ray, *Second Vice Chairman*
Larry B. Simpson, *Executive Director*

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Commission Roster

Commission Officers

Chairman: Virginia Vail

First Vice Chairman: Vernon Minton

Second Vice Chairman: Mike Ray

Commissioners

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

ALABAMA

Riley Boykin Smith
Alabama Department of Conservation
& Natural Resources
Montgomery, AL

Walter Penry
Alabama House of Representatives
Daphne, AL

Chris Nelson
Bon Secour Fisheries, Inc.
Bon Secour, AL

FLORIDA

Allan L. Egbert
Florida Fish & Wildlife Conservation
Commission
Tallahassee, FL

Legislative Representative - *Vacant*

William Ward
Tampa, FL

LOUISIANA

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

Warren Triche
Louisiana House of Representatives
Thibodaux, LA

Frederic L. Miller
Shreveport, LA

MISSISSIPPI

E. Glade Woods
Mississippi Department of Marine
Resources

Biloxi, MS

Billy Hewes
Mississippi Senate
Gulfport, MS

George Sekul
Gulf Central Seafoods, Inc.
Biloxi, MS

TEXAS

Andrew Sansom
Texas Parks & Wildlife Department
Austin, TX

J.E. "Buster" Brown
Texas Senate
Austin, TX

L. Don Perkins
Houston, TX

Staff

Larry B. Simpson, *Executive Director*

Ronald R. Lukens, *Assistant Director*
Virginia K. Herring, *Executive Assistant*
Nancy K. Marcellus, *Administrative Assistant*
Cynthia B. Yocom, *Staff Assistant*
Cheryl R. Noble, *Staff Assistant*
Madeleine A. Travis, *Staff Assistant*
Deanna L. Valentine, *Data Entry Clerk*
Sharon L. Flurry, *Receptionist/Data Entry Clerk*

David M. Donaldson, *Data Program Manager*
Steven J. VanderKooy, *Program Coordinator*
Jeffrey K. Rester, *Program Coordinator*
Joseph P. Ferrer, III, *Network Administrator*
Gregory S. Bray, *RecFIN(SE) Programmer/Analyst*
Jason S. Keenum, *Accountant*
A. Mike Sestak, III, *FIN Programmer/Analyst*
Douglas J. Snyder, *RecFIN(SE) Survey Coordinator*

Committees

Executive Committee	Virginia Vail Frederic L. Miller R. Vernon Minton Mike Ray William S. "Corky" Perret
Law Enforcement Committee	Jeff Mayne, Chairman Dennis Johnston/Larry Young, Vice Chairman
Commercial/Recreational Fisheries Advisory Panel	Philip Horn, Commercial Chairman <i>Vacant</i> , Commercial Vice Chairman Pat Murray, Recreational Chairman Randy Gros, Recreational Vice Chairman
State-Federal Fisheries Management Committee	Larry B. Simpson, Facilitator
Blue Crab Technical Task Force	Harriet Perry, Chairman
Flounder Technical Task Force	Mike Johnson, Chairman
Menhaden Advisory Committee	Barney White, Chairman
Spotted Seatrout Technical Task Force	Harry Blanchet, Chairman
Stock Assessment Team	Joe Shepard, Chairman
Technical Coordinating Committee	William S. "Corky" Perret, Chairman John Roussel, Vice Chairman
TCC Anadromous Fish Subcommittee	Doug Frugé, Chairman Larry Nicholson, Vice Chairman
TCC Artificial Reef Subcommittee	Rick Kasprzak, Chairman Steve Heath, Vice Chairman
TCC Crab Subcommittee	Harriet Perry, Chairman
TCC Data Management Subcommittee	Joe O'Hop, Chairman Kevin Anson, Vice Chairman
TCC Habitat Subcommittee	Dale Shively, Chairman
TCC SEAMAP Subcommittee	Jim Hanifen, Chairman Richard Waller, Vice Chairman

GULF STATES MARINE FISHERIES COMMISSION EXECUTIVE DIRECTOR'S REPORT

Larry B. Simpson, Executive Director

The Gulf States Marine Fisheries Commission has matured. (Please do not infer that I presume the Commission has arrived as the perfect management agency of marine fisheries.) The Commission has, however, developed into an agency of the states that is providing a higher level of usefulness to the people and resources with which it is charged to benefit.

In the last several years, the Commission has successfully implemented a well-coordinated data collection, entry, and distribution system for Gulf of Mexico marine fishes. Our goals of planning and first level implementation have been met. Comments from both recreational and commercial industry, users, and academics have been positive. This initiative was funded by Congress; and a fundamentally new way to collect data was begun when the states formed a "data partnership" with the Gulf States Marine Fisheries Commission. In the past, there was only a patchwork of programs that were ill coordinated. The proper attention and follow up is now being devoted to the standardization of data collection in the Gulf of Mexico. Our next goal is to fully complete all modules of the program (e.g., biological, economic sampling, bycatch, public access availability, vessel identification systems, and implementation of trip tickets in Texas and Mississippi). Our majority federal partner, the National Marine Fisheries Service, has included funding for this effort in their base budget under the GulfFIN line item.

The Habitat Program, a joint program with the Gulf of Mexico Fisheries Management Council, focuses its activities on environmental factors that affect the health of marine resources. Environmental conditions

are monitored, and comments are made at state and federal levels. Through innovative initiatives, outreach is performed to educate the public of the link between the effects of habitat alteration to marine resources.

The Sportfish Program is involved with several efforts including artificial reefs and nonindigenous species investigation and management. This program has recently provided greatly-needed scientific knowledge about anadromous species here in the Gulf of Mexico along with data coordination for recreational species.

The Interjurisdictional Fisheries Program has kept to its main focus of regional management planning for near shore fisheries and the associated activities necessary for proper management of those species. Progress on important species like spotted seatrout, blue crabs, and flounder are coming to completion. The program has addressed concerns for stock assessment expertise and training for state scientists by ageing otoliths and other hard parts. Publication of protocols for this work will be produced within the coming year. These protocols should enable state and federal partners to perform this work in a more efficient and comparable manner.

The level and diversity of work that the Gulf States Marine Fisheries Commission is accomplishing evolved and matured in 2000. The Commission strives to be an excellent tool to assist and stands poised to act with the states and other partners with the stewardship of marine resources in the Gulf of Mexico.

MEETINGS/ACTIVITIES OF THE EXECUTIVE DIRECTOR

Gulf States Marine Fisheries Commission Meetings

Joint Interstate Executive Directors' Meeting, Washington, D.C. - February 2000
Gulf States Marine Fisheries Commission Spring Meeting, Orange Beach, Alabama - March 2000
Conference Call on the Cooperative Statistics Program, Ocean Springs, Mississippi - April 2000
U.S. Fish and Wildlife Service Program Review, Biloxi, Mississippi - May 2000
Strategic Planning Meeting, Florida Department of Environmental Protection, St. Petersburg, Florida - May 2000
Southeast State Directors' Meeting, Tampa, Florida - August 2000
State Federal Fisheries Management Committee Meeting, New Orleans, Louisiana - August 2000
Pacific States Marine Fisheries Commission Meeting, Anchorage, Alaska - August 2000
Conference Call on the GSMFC Retirement Plan, Ocean Springs, Mississippi - September 2000

Gulf States Marine Fisheries Commission Annual Meeting, Clearwater Beach, Florida - October 2000
Gulf State Directors' Meeting, Mote Marine Laboratory, Florida - November 2000

Gulf of Mexico Fisheries Management Council Meetings

Fort Walton, Florida - January 2000
Council Staff Meeting, Ocean Springs, Mississippi - February 2000
San Antonio, Texas - March 2000
New Orleans, Louisiana - May 2000
Key Largo, Florida - July 2000
Mobile, Alabama - September 2000
Public Hearing on Shrimp Permits, Biloxi - October 2000
Biloxi, Mississippi - November 2000

Congressional Activities

Coastal Legislative Aids Meeting, Biloxi, Mississippi - January 2000
Coastal Delegation Meetings, Washington D.C. - May 2000

Other Meetings/Activities

Marine Fisheries Advisory Committee (MAFAC), Charleston, South Carolina - April 2000
Recreational Fishing Symposium, San Diego, California - June 2000
Marine Fisheries Advisory Committee (MAFAC), Queens, New York - November 2000
Marine Fisheries Initiative (MarFIN), Tampa, Florida - December 2000

Southeast Area Monitoring and Assessment Program (SEAMAP)

Jeffrey K. Rester, Program Coordinator

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

In 2000, SEAMAP resource surveys included the Spring Plankton Survey, Summer Shrimp/Groundfish Survey, Fall Plankton Survey, Fall Shrimp/Groundfish Survey, and plankton and environmental data surveys. Other 2000 activities included SEAMAP information services and program management.

RESOURCE SURVEYS

In 2000, collection of resource survey information continued for the nineteenth consecutive year. The surveys conducted during the year address distinct regional needs and priorities and provide information concerning the marine resources in the Gulf of Mexico.

Spring Plankton Survey

For the nineteenth year, plankton samples were collected during the spring in the northern Gulf of Mexico. The NOAA Ship GORDON GUNTER sampled offshore waters from the western edge of the West Florida Shelf to the Texas-Louisiana border from April 18 to May 30, 2000. A total of 177 stations was sampled. Florida's portion of the spring plankton survey was canceled again this year due to money constraints. Due to rising overhead costs, the number of days allocated for Florida's portion of the spring cruise has been drastically reduced over previous years. The NMFS felt that it would be better to use some of the money allocated for the spring cruise to add a day to the fall cruise.

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 1x2-meter frames towed at the surface for ten minutes. Right bongo and neuston samples were initially preserved in 10% buffered formalin and after 48 hours were transferred to 95% ethyl alcohol for final preservation. Left bongo samples were preserved via an ethanol/ethanol transfer to aid in preservation of larval otoliths. In addition, hydrographic data (surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom, and Forel-ule color) were collected at all stations.

Right bongo and neuston samples collected from SEAMAP stations will be transshipped to the Polish Sorting and Identification Center. Left bongo samples will be archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

Summer Shrimp/Groundfish Survey

During the spring of 2000, there was communication between the Shrimp/Groundfish Work Group members to examine the design for the Summer Shrimp/Groundfish Survey and determine the random station locations for each participant.

Objectives of the survey were to:

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

The overall sampling strategy during the 2000 SEAMAP summer survey was to work from the eastern Gulf to the Texas/Mexico border, in order to sample during or prior to migration of brown shrimp from bays to the open Gulf area. The entire survey occurred from June 5 to July 20, 2000.

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

A total of 388 trawl samples was taken from coastal and offshore waters out to 50 fm from Mobile Bay, Alabama, to Brownsville, Texas. All vessels took environmental data, including temperature, salinity, oxygen, and chlorophyll at each station.

Fall Plankton Survey

The first fall ichthyoplankton survey to assess abundance and distribution of king mackerel eggs and larvae occurred in August 1984. No sampling survey was conducted in 1985; however, expanded surveys in 1986-2000 covered Gulf waters from Florida Bay to Brownsville, Texas. The Fall Plankton cruise took place from September 5-October 16, 2000. Florida, Alabama, NMFS, Mississippi, and Louisiana sampled 148 stations on the west Florida shelf and northern Gulf of Mexico. The objective of this survey is to collect ichthyoplankton samples with bongo and neuston gear for the purpose of estimating abundance and defining the distribution of eggs, larvae, and small juveniles of Gulf of Mexico fishes, particularly king and Spanish mackerel, lutjanids and sciaenids.

Fall Shrimp/Groundfish Survey

The Fall Shrimp/Groundfish Survey was conducted from October 14-December 1, 2000, from off Mobile, Alabama, to the U.S.-Mexican border. Vessels sampled waters out to 60 fm, covering 373 trawl stations, in addition to plankton and environmental sampling.

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

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

relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.

During the survey, the NOAA Ship OREGON II sampled 232 stations from Mobile Bay, Alabama to Brownsville, Texas at depths out to 60 fm. The R/V VERRILL sampled 13 stations at the mouth and outside Mobile Bay. The R/V TOMMY MUNRO sampled 22 stations south of Mississippi Sound along a 30-minute grid. The R/V PELICAN sampled 26 stations in Louisiana territorial waters. Texas vessels sampled 80 stations within their territorial waters.

In addition, ichthyoplankton data were collected by NMFS, Mississippi, and Louisiana vessels at sample sites occurring nearest to half-degree intervals of latitude/longitude. A total of 55 stations was sampled with bongo and/or neuston nets, as encountered along cruise tracks. NMFS completed 46 ichthyoplankton stations, Mississippi completed two stations, and Louisiana completed seven stations. The samples, except those taken by Louisiana, will be sorted by the Polish Sorting and Identification Center. Once sorted, the specimens and data will be archived at the SEAMAP Archiving Center.

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.

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

Samples from the right side of the bongo nets and neuston samples were shipped to the NMFS-Pascagoula Laboratory for shipment to the Polish Sorting and Identification Center, where they will be sorted to the family level (both ichthyoplankton and selected crustacean and molluscan species). The left bongo sample from each station is retained as a back-up

in the event of damage or loss of the specimens and maintained at the SIPAC.

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

INFORMATION SERVICES

Information from the SEAMAP activities is provided to user groups through the program administration and three complementary systems: the SEAMAP Information System, SEAMAP Archiving Center and SIPAC. Products resulting from SEAMAP activities can be grouped into two major categories: data sets (including broadly, digital data and collected specimens) managed by the SEAMAP Information System, SEAMAP Archiving Center and SIPAC; and program information. Program information is discussed in the *PROGRAM MANAGEMENT* Section of this report.

SEAMAP Information System

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, managed in conjunction with NMFS-SEFSC. Raw data are edited by the collecting agency and verified by the SEAMAP Data Manager prior to entry into the system. Data from all SEAMAP-Gulf surveys during 1982-1999 have been entered into the system and data from 2000 surveys are in the process of being verified, edited, and entered for storage and retrieval. Verified, non-confidential SEAMAP data are available conditionally to all requesters, although the highest priority is assigned to SEAMAP participants. A total of 239 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, all requests have been completed.

Requested SEAMAP data were used for a multitude of purposes in 2000:

- 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;
- Evaluating and plotting the size of the hypoxic (Dead Zone) area off of Louisiana;

- 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 2000 SEAMAP Biological and Environmental Atlas; and
- Comparing catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets.

Data Management

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

Work was completed on the newly distributed SEAMAP DMS. New modules completed include those for data entry, edit, upload, data query and download. All of the Gulf States are now equipped with the necessary computer hardware and software.

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

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

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

Real-time Data

A major function of the SEAMAP Information System is 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. For the first time since 1997, SEAMAP real-time data plots were produced during the 2000 Summer Shrimp/Groundfish Survey. Seven weekly mailings were produced and distributed to approximately 260 interested individuals. These plots were also available through the SEAMAP home page. Management agencies also received comprehensive data listings showing penaeid shrimp length frequencies, sampling parameters and environmental conditions.

SEAMAP Archiving Center

Larval fish and fish egg samples sorted to the lowest taxa level possible by the Polish Sorting and Identification Center are returned to the SEAMAP Archiving Center for archiving and loan to researchers. For 2000, 12,217 samples were returned from the Polish Sorting and Identification Center. Data entry for the returned sorted samples has been completed in an improved and simplified SEAMAP DMS. Samples cataloged to date represent 18 orders, 126 families, 235 genera and 245 species.

The SEAMAP Archiving Center, which is managed in conjunction with Florida Fish and Wildlife Conservation Commission (FWC) in St. Petersburg, Florida, processes both specimen loans and requests for

associated plankton survey environmental data. Thirty-five requests have been accommodated in the present year to nine different researchers.

SEAMAP Invertebrate Plankton Archiving Center

The SIPAC is in its sixteenth year of operation. Ken Stuck at the USM/IMS/GCRL serves as SIPAC curator. The overall mission of the SIPAC, to archive and manage the large collection of plankton samples acquired during SEAMAP cruises and to obtain specimens and/or data on selected invertebrate larval stages from those samples, continued during the year but at a reduced level of activity. The SIPAC continues to provide unsorted plankton samples and data or specimens of larval invertebrates to qualified researchers upon request.

One graduate student is employed by SIPAC. In addition to cataloging new samples, maintenance and curation of the existing collection, he is utilizing flatfish from the SEAMAP collections for his thesis research project. Activities were limited to maintenance and curation of the existing collection. The number of samples currently cataloged in the SIPAC collections is 7,358, with 146 samples currently on loan.

In an effort to keep the space required to house the SIPAC collection of unsorted plankton samples to a minimum, samples that have been in the collection for over ten years and duplicate samples sorted and received from the Polish Sorting and Identification Center, are aliquoted to $\frac{1}{4}$ their original volume and placed into 100 ml vials. When possible, the remaining $\frac{3}{4}$ aliquots are donated to educational institutions for use as teaching materials. If the remaining sample must be discarded, sample jars are cleaned and returned to NMFS-Pascagoula for reuse. To date, approximately 2,264 samples collected from 1982-1988 have been aliquoted and prepared for long-term storage. Due to the recent addition of samples to the collection during the year, there is currently no space available for additional samples to be deposited into the SIPAC archives. However, once the ongoing aliquoting of the 1988-1989 SEAMAP samples has been completed, there should be sufficient space available for archiving additional samples.

During the next year, the SIPAC will continue to manage SEAMAP plankton collections, accession samples, and provide unsorted samples, sorted specimens and data from the collection to qualified researchers as requested. Efforts with sorted materials will concentrate on curation and analysis of current holdings and publication of distribution patterns of selected taxa by cruise.

PROGRAM MANAGEMENT

The SEAMAP program is administered by the SEAMAP Subcommittee of the TCC through the SEAMAP Coordinator, who is under the technical direction of the Subcommittee Chairman and administrative supervision of the GSMFC's Executive Director.

Personnel associated with SEAMAP program management include the Coordinator, Data Manager, SEAMAP Archiving Center Curator, SIPAC Curator, and the NMFS-Pascagoula Laboratory Director, serving as Program Monitor.

Planning

Major SEAMAP-Gulf Subcommittee meetings were held in March 2000 and October 2000, in conjunction with the Annual Meetings of the GSMFC. All meetings included participation by various work group leaders, Coordinator, Data Manager, Program Monitor, and other GSMFC staff. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in August 2000 to discuss respective program needs and priorities for FY2001.

Coordination of program surveys and distribution of quick-report summaries of a Gulf-wide survey to management agencies and industry were major functions of SEAMAP management in 2000. Other important management activities included coordinating data provision and specimen loans, preparing publications and documents and assisting in the preparation of state/federal cooperative agreements, including amendments to permit extension of activities

previously not detailed in the agreements.

Information Dissemination

The following documents were published and distributed during this reporting period:

- *2000 SEAMAP Marine Directory*. Inventories of marine agency contacts (state, federal and university) concerned with fishery research in the Gulf of Mexico, and summaries of information provided by these organizations: target species, types of fishery-independent sampling gear and platforms, annual sampling effort, and other materials.
- *Environmental and Biological Atlas of the Gulf of Mexico, 1998*. A compilation of information obtained from the 1998 SEAMAP survey including catch rates of shrimp and finfish, abundance and distribution of plankton in the Gulf of Mexico and environmental data from all surveys.
- *SEAMAP Subcommittee Report to the GSMFC Technical Coordinating Committee - October 1, 1999 to September 30, 2000*. A detailed summary of program accomplishments, emphasizing survey design, material collected, data dissemination, budget information, and future survey activities.
- *Annual Report of the SEAMAP Program - October 1, 1999 to September 30, 2000*. A summary of FY2000 activities and proposed FY2001 events for the SEAMAP-Gulf, South Atlantic, and Caribbean Programs.

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

Ronald R. Lukens, Assistant Director

During 2000, the GSMFC coordinated recreational fisheries programs throughout the Gulf of Mexico through funding provided by the administrative portion of the Federal Aid in Sport Fish Restoration Program, administered by the U.S. Fish and Wildlife Service. As a part of the program activities, the program coordinator sponsored and/or attended and participated in meetings and planning and development activities pertinent to carrying out responsibilities of this program. Minutes, general correspondence, meeting notices, agendas, and other required materials were prepared and distributed to the appropriate persons. Minutes, correspondence, reports, and publications are available from the GSMFC office upon request. A brief report on program progress follows.

ADMINISTRATIVE ISSUES

Beginning in 1999, the GSMFC was informed that there was a shortfall anticipated in funds available from the Federal Aid Administrative Fund which would affect the GSMFC program through 2001 at the least. As a result of that anticipated shortfall, the GSMFC operated with a reduced amount of funding, from \$200,000.00 to \$150,000.00. That reduction required a reduction in the amount of effort, which was agreed to between the GSMFC and the Federal Aid office. Toward the end of calendar 2000, the U.S. Congress passed the *Wildlife and Sport Fish Restoration Programs Improvement Act of 2000* (Act).

Among other things, that Act makes provisions for the three Interstate Marine Fisheries Commissions to receive \$200,000.00 annually to continue the work begun under the Administrative Program. As a result of this Act, the GSMFC Sport Fish Restoration Administrative Program will return to its historic funding level of \$200,000.00 beginning in 2001.

Artificial Reef Activities

Data Base. The TCC Artificial Reef Subcommittee has continued to work on entering data to establish the Gulf of Mexico Artificial Reef Data Base. Data base work in 1998 indicated that there are missing and duplicate files, primarily for the Florida records. Because of this, the GSMFC has continuing to work with the state of Florida to complete its data base. Work has continued to refine and update the artificial reef data base. This year, the GSMFC office was

successful in deleting all known duplicate records from Florida's file. While this is an important step, the probability of additional duplicate records occurring in the data base is high, because of the permit numbering system used in the Jacksonville District Office of the U.S. Army Corps of Engineers (COE). The TCC Artificial Reef Subcommittee will be discussing approaches to work with the COE to minimize the possibility of duplicate records. At the point when records contained in the data base are deemed to be complete, the data base will be made available on the GSMFC web site. During 2001, the GSMFC office hopes to have an online data entry program available to the state programs, so that they can enter new data base records themselves.

National Artificial Reef Plan. The Artificial Reef Subcommittee has continued to work toward completion of the revision of the National Artificial Reef Plan. Mandated by the National Fishing Enhancement Act of 1984, Congress required the NMFS to develop the plan, which was completed in 1985. Because of the significant leadership role displayed by the states regarding artificial reef development and management, the states have felt very strongly that they should also take a leadership role in revising this eleven-year-old plan. The NMFS has provided funding to accomplish some of the associated tasks. This activity is being carried out in conjunction with the Atlantic States Marine Fisheries Commission. As of this report, the draft revision of the plan has been completed and submitted to the NMFS for processing. The NMFS has conducted an internal review and will soon complete a full federal agency review of the document. Hopefully, during 2001, the NMFS will publish availability of the draft plan in the *Federal Register* to allow public review. Following those actions, it is anticipated that recommended changes to the draft plan will be provided to the three interstate commissions and their respective states for consideration. Assuming agreement is reached regarding final changes, the draft plan will then be adopted as national policy for artificial reef development and management.

Literature Data Base. The GSMFC began an activity to enter artificial reef literature, both journal articles and gray literature, into a literature data base called ProCite. We are pleased to report that we entered 404 articles into the data base this year, for a

total of 704 articles in the data base. We also have made the data base available on our GSMFC Internet Home Page at www.gsmfc.org. Individuals can access a query page and request a search for documents by author, title, date, and key words. In the event an article is needed by someone accessing the data base, they can provide the citation and the GSMFC staff can locate the document, copy it, and send it to the individual. We plan to continue this exercise, by entering additional articles into the data base during 2000. Future activities will continue to include compiling and entering literature into this data base, toward the end of developing the most comprehensive clearinghouse/library of artificial reef literature available. In addition, we will also be entering abstracts for documents in the data base to assist reviewers in locating desired articles. This may not begin until after 2001.

Fishery Data Activities

As a part of the Recreational Fisheries Information Network (RecFIN), which was established in large part through the use of Federal Aid in Sportfish Restoration Administrative Funds, the Data Management Subcommittee (DMS) oversaw the development of a strategy for the Gulf States, through the GSMFC, to conduct the National Marine Fisheries Service Marine Recreational Fishery Statistics Survey (MRFSS) in the Gulf of Mexico. With the conclusion of the 1999 federal appropriations process, that goal has been attained, and the GSMFC office and the Gulf States began collecting recreational fisheries data in January 1999. During 2000, the program coordinator worked through the Fisheries Information Network (FIN) to continue collecting and managing recreational and commercial fisheries data through the states and coordinated by the GSMFC. Again, the primary FIN program functions are supported by a separate appropriation through the National Marine Fisheries Service; however, the program was initially established by the GSMFC Sport Fish Restoration Administrative Program, which continues to have a significant role in program management. Timely and reliable fisheries data will continue to be a high priority for the states and federal agencies charged with the management of marine, estuarine, and anadromous fishery resources in the Gulf of Mexico. In that regard, the GSMFC, through its programs, and primarily through the DMS, will continue to provide coordination of those important activities.

Anadromous Fish Activities

Striped Bass FMP Revision. The GSMFC approved the request by the Anadromous Fish

Subcommittee to begin revision of the Striped Bass Fishery Management Plan to begin no sooner than 2000. During 1999, the Subcommittee conducted a review of the existing FMP to determine the scope of the work to be conducted. Progress on other FMPs through the GSMFC Interjurisdictional Fisheries Program has indicated that initiation of the revision of the Striped Bass FMP will not begin until the three plans under development are completed. They include spotted seatrout, blue crab, and flounder. Due to complications associated with the completion of FMPs already in progress, the Striped Bass FMP revision was not started during 2000; however, as of October 2000, the Commission elected to begin the revision process in January 2001. The Subcommittee outlined the following broad areas for revision below.

- Section 2.0 needs to be completely revised. Most of Section 2.0 will be available from GSMFC staff
- Sections 2.1 and 2.2 should be moved to Section 3.0
- Section 2.3 needs to be updated and moved to another section
- Section 2.5, FMP Objectives, needs to be revisited by the Subcommittee
- Section 3.0 needs to be updated and reformatted
- Section 4.0 needs to be completely updated and reformatted to include essential fish habitat provisions
- Data and information from "Habitat Criteria for Striped Bass" needs to be incorporated into Section 4.0
- Amendment 1 to the FMP needs to be incorporated into the appropriate sections, using current regulations
- All genetic data and information needs to be incorporated into the appropriate sections
- Appendix A in the current FMP needs to be taken out
- Appendix B in the current FMP needs to be fully discussed by the Subcommittee
- The Subcommittee will continue to review information and data in preparation of the full revision process to begin in 2001.

The FWS Regional Office in Atlanta provided funding to assist in sponsoring a workshop to examine management and restoration activities for striped bass in the Gulf of Mexico region over the past several years. The workshop was held on November 18 & 19, 1998, in Pensacola Beach, Florida. The proceedings of that workshop have been completed, and a full edit has been conducted. The document will be ready for distribution before March 2001.

Recommendations from the workshop will be incorporated into the review and revision of the Striped Bass Fishery Management Plan. The final proceedings will be available from the GSMFC office upon request.

Associated with striped bass activities, the program coordinator participated in a FWS sponsored initiative to review and reorganize the National Fish Hatchery System (NFHS). While the NFHS is much broader than just striped bass, all of the striped bass made available from the federal government in the Gulf of Mexico region for stock enhancement and restoration are produced by the NFHS. A schedule of meetings in which the program coordinator participated is found under the "Miscellaneous" section below

Fisheries Habitat

In 1996, the U.S. Congress passed significant amendments to the Magnuson-Stevens Fishery Conservation and Management Act, including provisions to identify, describe, enhance, and protect essential fish habitat (EFH). While the Act establishes federal fishery management policies, fisheries habitat is largely located within state jurisdictional waters, a situation which represents the potential for conflict if there is not close coordination between the federal agencies and the states. Also, the GSMFC plans to incorporate the activities related to EFH into GSMFC programmatic activities. In that regard, during 1998, the Program Coordinator assisted in developing guidelines to implement the EFH provisions. The Program Coordinator was instrumental in establishing a joint habitat program between the GSMFC and the Gulf of Mexico Fishery Management Council to address EFH and other, broader habitat issues.

During 2000, the habitat coordinator developed an annotated bibliography of fishing gear impacts, which will serve as a valuable resource for EFH work in the gulf region. That document can be found on our web site and downloaded as a .pdf file. In March 2000, the TCC Habitat Subcommittee began an initiative to develop policy statements on submerged aquatic vegetation and wetlands management. These policies will be considered for adoption by both the GSMFC and the Gulf of Mexico Fishery management council. It was expected that these policies would be completed by the end of 2000; however, they have not yet been completed and submitted for adoption. Completion is expected early in 2001. The habitat coordinator continues to coordinate and participate in a number of activities, including the development of a poster, identification of sensitive habitats, and derelict crab trap clean-up. The Sport Fish Restoration Administrative Program will continue to coordinate

efforts with the Habitat Program.

Recreational Fisheries Advisory Committee Activities

The GSMFC Recreational Fisheries Advisory Committee (RFAC) met twice in conjunction with the Spring and Fall GSMFC Annual Meetings. The following are issues taken up by the RFAC.

- Status of GSMFC Interstate FMPs, including menhaden, spotted seatrout, blue crab, and flounder. The Advisory Committee reviews and comments on all FMPs.
- Review of the GSMFC FIN - An update of the generic trip ticket system and the FIN data management system was presented.
- Update on limited entry for the for-hire fishery - The RFAC agreed to continue to be involved in proposals to limit entry into charter, guide, and headboat fisheries.
- Fishery Information web page - This page is found on the GSMFC web site and provides up-to-the-minute information on regulatory changes, boater safety, news releases, and publications available.
- The establishment of the Fishery Information Radio - The Advisory Committee recommended that the GSMFC support the establishment of this station that would provide real-time information to boaters/fishermen by radio on regulations, area closures, seasons, and other fishery management issues.
- State recreational fishing licenses as a sampling frame - The Advisory is interested in using state recreational fishing licenses as the sampling universe to conduct the recreational fisheries survey, following on the success of a similar effort using a charter boat data base.

Miscellaneous

- January 11, 2000. Attended and participated in a Gulf of Mexico Program meeting regarding management of non-indigenous aquatic nuisance species.
- January 18-20, 2000. Participated in Gulf of Mexico Fishery Management Council meeting to discuss artificial reef issues.
- February 6-8, 2000. Attended and participated in a meeting to review and revise the National Fish Hatchery System.
- February 9-10, 2000. Attended and participated in the annual Morone Workshop to coordinate striped bass restoration activities.
- February 15-16, 2000. Met with EPA officials regarding the London Convention Scientific Group

meeting scheduled for May 2000 in Townsville, Australia. The issue is international status of artificial reef development.

- March 19-21, 2000. Participated in a fish tagging meeting to discuss the need for greater coordination among entities engaged in fish tagging.
- March 24-27, 2000. Attended and participated in the mid-year meetings of the International Association of Fish and Wildlife Agencies.
- April 3-5, 2000. Participated in meeting of the national Aquatic Nuisance Species Task Force.
- April 17-19, 2000. Attended and participated in a meeting to review and revise the National Fish Hatchery System.
- May 11-21, 2000. Attended the London Convention Scientific Group meeting to represent state artificial reef programs.
- June 12-15, 2000. Attended and participated in a meeting to establish a new charter boat survey in Texas and the annual FIN meeting.
- June 25-28, 2000. Made a presentation on recreational fishery data activities in the Gulf of Mexico at the National Recreational Fisheries Symposium in San Diego, California.
- July 31-August 2, 2000. Participated in meeting of the national Aquatic Nuisance Species Task Force.
- August 8, 2000. Met with USFWS staff in Atlanta

to discuss and plan on activities to be addressed during the 2001 project year.

- August 15-16, 2000. Attended and participated in a meeting to review and revise the National Fish Hatchery System.
- August 21-23, 2000. Attended the meeting of the national Zebra Mussel Coordination Committee as a part of the non-indigenous aquatic nuisance species planning and management initiative.
- September 15-18, 2000. Attended and participated in the annual meetings of the International Association of Fish and Wildlife Agencies.
- September 26-29, 2000. Participated in a workshop sponsored by the OGP, an association of offshore oil and gas producers, to discuss the disposition of retired oil and gas structures.
- October 5-6, 2000. Attended and participated in the meetings of the Gulf of Mexico Program Management Committee which also serves as a Regional Panel of the national Aquatic Nuisance Species Task Force.
- October 24-25, 2000. Made a presentation on national artificial reef issues at a conference sponsored by the Minerals Management Service.
- November 13-17, 2000. Participated in the Gulf of Mexico Fishery Management Council meeting to discuss artificial reef and fishery data issues.

INTERJURISDICTIONAL FISHERIES MANAGEMENT PROGRAM

Steven J. VanderKooy, Program Coordinator

The Interjurisdictional Fisheries Program (IJF) continued to provide the Gulf States with quality information and recommendations for interstate management of fisheries. In 2000, four fishery management plans (FMPs) were in various stages of completion. The Flounder FMP was approved by the Technical Coordinating Committee (TCC) and the State-Federal Fisheries Management Committee (S-FFMC) and went out for a 30-day public comment period in May. The full Commission took action on the Flounder FMP at the October meeting of the Gulf States Marine Fisheries Commission (GSMFC), and unanimously approved staff to send the plan to the publisher. The Spotted Seatrout FMP continued to proceed slowly due to the GSMFC's rigorous review process; however, following the annual fall meeting of the GSMFC, the S-FFMC approved the FMP to go out for a 30-day public comment period in November. Although the plan was heavily requested, no comments were received to the IJF office. It was anticipated that the full Commission will give their approval in March 2001.

The revision to the Blue Crab FMP continued in 2000 as minor changes were made to the stock assessment, and the plan went back to the TCC for their continued review. The revision was approved by the TCC in October and the S-FFMC began their review. The Gulf Menhaden FMP continued as an in-house effort by the GSMFC staff. Significant changes were made to a few sections in 2000 – habitat, description of the fishery, economics, sociology, and the stock assessment. The final draft was completed in August 2000 and presented to the Menhaden Advisory Committee who approved it to move to the TCC at the October meeting of the GSMFC for their review.

In 1999, the S-FFMC directed the IJF staff to begin the first revision of the Striped Bass FMP in the spring of 2000. Because the review of the blue crab FMP was delayed due to a problem with the stock assessment, the striped bass revision was rescheduled to begin in 2001.

Activities other than FMP development continued in 2000. In an effort to standardize laboratory protocols, the GSMFC's Stock Assessment Team began to solicit the necessary information from otolith laboratories and ageing experts from around the Gulf. It was agreed that a simple-to-follow handbook

which highlighted the various techniques currently in use would aid in training state personnel. Ideally, this handbook would be a continuously evolving guide to which new techniques and species specific methods could be added. The handbook would have photos of all important gulf species and otolith processing methodologies. It would also include a vendor list for cutting and polishing materials. To this end, an organizational meeting of the Otolith Work Group took place at the NMFS Panama City Laboratory. Several presentations were made by the work group members, and it was quickly determined that there were serious technique differences that would have to be addressed in the next few meetings. The two meetings that followed were held at the Gulf Coast Research Laboratory in Ocean Springs, Mississippi, and the Florida Marine Fisheries Institute in St. Petersburg, Florida. Several species accounts and background sections were drafted and will be edited as the group continues to work into 2001.

The Law Enforcement Committee continued to provide input and review into each of the FMPs in development. An initiative to develop the Gulf-wide Cooperative Law Enforcement Strategic Plan and subsequent yearly operations plans had been approved by the full Commission in October 1999. Development of the Strategic Plan continued through work sessions held in February and July 2000. A conference call was held in August to finalize plans to present the final document to the Commission in October 2000 where it was subsequently approved.

A joint Commission/Council Chaceon crab profile had been approved to begin following completion of the revision to the Blue Crab FMP in 1999. In the spring of 2000, the Crab Subcommittee requested that Council reconsider development of a profile and begin a full FMP for the species complex. The Commission stepped out of the process upon approval from the Council to move forward with a federal FMP.

The IJF staff continued in 2000 to edit the *Proceedings of the Blue Crab Mortality Symposium* held in 1999 in conjunction with the Crustacean Society's 1999 Annual Meeting in Lafayette, Louisiana. It is anticipated that the proceedings will be published by in the spring of 2001.

Fisheries Information Network (FIN)

David M. Donaldson, Program Manager

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

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

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

In 1994, the NMFS initiated a formal process to develop a cooperative state-federal program to collect and manage commercial fishery statistics in the region. Due to previous work and NMFS action, the Southeast Cooperative Statistics Committee (SCSC) developed a MOU and a draft framework plan for the ComFIN. During the development of the ComFIN MOU, the SCSC, in conjunction with the RecFIN(SE) Committee, decided to combine the MOU to

incorporate the RecFIN(SE). The joint MOU created the FIN which is composed of both the ComFIN and RecFIN(SE). The MOU confirmed the intent of the signatory agencies to participate in implementing the ComFIN and RecFIN(SE).

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

The mission of the FIN is to cooperatively collect, manage, and disseminate marine commercial, anadromous, and recreational fishery data and information for the conservation and management of fishery resources in the region and to support the development of a national program. The four goals of the FIN include to plan, manage, and evaluate commercial and recreational fishery data collection activities; to implement a marine commercial and recreational fishery data collection program; to establish and maintain a commercial and recreational fishery data management system; and to support the establishment of a national program.

PROGRAM ORGANIZATION

The organizational structure consists of the FIN Committee, two geographic subcommittees (Caribbean and Gulf), standing and ad hoc subcommittees, technical work groups, and administrative support.

The FIN Committee consist of the signatories to the MOU or their designees, and is responsible for planning, managing, and evaluating the program. Agencies represented by signatories to the MOU are the National Marine Fisheries Service, U.S. Fish and Wildlife Service, National Park Service, Alabama Department of Conservation and Natural Resources, Florida Department of Environmental Protection,

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

Louisiana Department of Wildlife and Fisheries, Mississippi Department of Marine Resources, Puerto Rico Department of Environmental and Natural Resources, Texas Parks and Wildlife Department, U.S. Virgin Islands Department of Planning and Natural Resources, Caribbean Fishery Management Council, Gulf of Mexico Fishery Management Council and Gulf States Marine Fisheries Commission.

As of October 1998, the Georgia Department of Natural Resources, South Carolina Department of Natural Resources, North Carolina Department of Environment, Health, and Natural Resources, South Atlantic Fishery Management Council and Atlantic States Marine Fisheries Commission no longer actively participated on the FIN Committee. Although there is no representation of the South Atlantic on FIN, the South Atlantic continues to participate at the work group level and there is continued participation by staff members from both programs to ensure compatibility and comparability.

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

PROGRAM ACTIVITIES

The FIN is a comprehensive program comprised of coordinated data collection activities, an integrated data management and retrieval system, and procedures for information dissemination. Activities during 2000 were associated with addressing issues and problems regarding data collection and management and developing strategies for dealing with these topics. In addition to committee activities, FIN was involved in various operational activities concerning the collection and management of marine commercial and recreational fisheries data. These activities were conducted by the various state and federal agencies involved in FIN. Each type of activity is discussed below.

Committee Activities

FIN Committee

The major FIN meetings were held in June 2000. The major issues discussed during these meetings included:

- identification and continuation of tasks to be addressed in 2000 and instruction to Administrative Subcommittee and the Data Collection, Biological/Environmental, Social/Economic, Outreach, Data Collection Plan, Registration Tracking (formerly Permitting), Data Management and ad hoc work groups to either begin or continue work on these tasks;
- development of the 2001 FIN Operations Plan which presented the year's activities in data collection, data management, and information dissemination;
- discussion of data management issues;
- review of activities and accomplishments of 2000;
- continued evaluation of adequacy of current marine commercial and recreational fisheries programs for FIN and development of recommendations regarding these programs;
- review findings of and receive recommendations from technical work groups for activities to be carried out during 2001;
- preparation and submission of a proposal for financial assistance to support activities of the FIN; and
- continued internal evaluation of the program.

Subcommittees and Work Groups

The FIN subcommittees and work groups met this year to provide recommendations to the Committee to formulate administrative policies, address specific technical issues for accomplishing many of the FIN goals and objectives, and examine other issues as decided by the Committee. Their activities included:

- Representatives from the Gulf states, GSMFC and NMFS met in February, July and November 2000 to review the performance of the MRFSS intercept survey and review and evaluate January - December (2000) catch and effort data.
- The Data Collection Work Group met in March 2000 to further discuss the development of the biological sampling module for FIN and review of existing quota monitoring activities in the Southeast and Northeast Regions and discuss the development of quota monitoring system for FIN.
- The FIN Outreach Work Group met in March 2000 to discuss and develop a strategy for the outreach

program for the FIN. The group also met via conference call in August to begin the development of a RFP for the development of the FIN outreach strategy.

- The FIN/ACCSP Registration Tracking (formerly Permitting) Work Group met in April 2000 to begin the huge task of developing a system that provides a unique identifier to fishermen, dealers, vessels and other involved in the commercial fisheries that is trackable through geographic location and time.
- The RecFIN Biological/Environmental Work Group met in April 2000 to discuss an update on marine recreational fishery surveys in Puerto Rico and U.S. Virgin Islands, further investigation of collection of night fishing data, discussion of development of sampling techniques for fishing tournaments, and discussion of recreational biological sampling methods.
- The FIN Data Collection Plan Work Group met in May and December 2000 to begin and continue the development of a plan which outlines the needs for stock assessment for the upcoming year as well as tracking of the collection for these data. The FIN has developed a data collection process which outlines a process for developing this plan. The first step of this process is for each partner to coordinate with their agency to identify the type and amount of data needed, and the geographic area over which the data need to be collected for the priority species. The charge to this group was to develop recommendations regarding the number of lengths, weights, otoliths, etc. that are needed to conduct effective stock assessments for the species identified on the priority list. These recommendations will be the basis for the development of the FIN data collection plan and will direct the collection of data for the upcoming year.
- The FIN/ACCSP Compatibility Work Group met in July 2000 to discuss the development of a 3-5 year implementation strategy for ACCSP and FIN as well as discussion regarding the development of additional data management modules for the ACCSP and FIN systems.
- The Gulf of Mexico commercial port samplers met in August 2000 to address a variety of commercial issues. The main topics of discussion were a jack identification and otolith workshop, overview of ComFIN, discussion and review of commercial sampling methods, discussion of ways for building better rapport with dealers, identification of issues and problems associated with field data collection, and other pertinent issues.
- The FIN Data Management Work Group met in September 2000 to review the various data

management issues that need to be resolved before the FIN DMS can become fully operational as well as a status report about the commercial catch/effort software.

- The Caribbean commercial port samplers met in October 2000 to address a variety of commercial issues. The main topics of discussion were the status of ComFIN, field sampling with Puerto Rico commercial fishermen for reef fishes and offshore pelagics, overview of sampling methods for Cooperative Statistics Program (CSP), fisheries research discussions for Puerto Rico and U.S. Virgin Islands, discussion regarding adaptation of sampling strategies for use in the Caribbean as well as round table discussions.

Operational Activities

- Coordination and Administration of RecFIN(SE) and ComFIN Activities - This task provided for the coordination, planning, and administration of FIN activities throughout the year as well as provided recreational and commercial information to the FIN participants and other interested personnel. This is a continuation of an activity from the previous year.
- Collecting, Managing and Disseminating Marine Recreational Fisheries Data - This task provided for the conduct of the MRFSS survey in Louisiana, Mississippi, Alabama, and Florida for shore, for-hire, and private modes, an activity under the RecFIN(SE). This task provided for coordination of the survey, a field intercept survey of shore, for-hire and private boat anglers to estimate angler catch using the existing MRFSS methodology, and entry of the data. These data were combined with the NMFS effort estimate telephone survey. In addition, the states conducted supplemental sampling of the intercept portion for the MRFSS for charter boats in Louisiana, Mississippi, Alabama, and the west coast of Florida. The states also conducted weekly telephone calls to a 10% random sample of the Louisiana, Mississippi, Alabama, and Florida charter boat captains to obtain estimates of charter boat fishing effort which will be compared with the MRFSS estimates. In 2000, NMFS adopted this method as the official methodology for estimation of charter boat effort. This is a continuation of an activity from the previous year. Also, the charter boat telephone survey was expanded to include the east coast of Florida so the entire state is covered by this methodology.
- Head Boat Port Sampling in Texas, Louisiana, and Florida - This task provided for the sampling of catches, collection of catch reports from head boat

personnel, and gathering effort data on head boats which operate primarily in the Exclusive Economic Zone from ports along the coasts of Texas, Louisiana, and Florida. This is a continuation of an activity from the previous year.

- Gulf Menhaden Port Sampling - This task provided for sampling of gulf menhaden catches from menhaden purse-seine vessels which operate in Louisiana. Samples were processed for size and age composition for use in coast-wide stock assessments. In turn, gulf menhaden stock assessments are incorporated into the Fisheries Management Plan for the species, and are also utilized by the Gulf Coast states, the GSMFC, the menhaden industry, and the NMFS. This is a continuation of an activity from the previous year. In the past, it has been accomplished via independent contracts. This is the first year that it will be included in the FIN cooperative agreement.
- Development and Implementation of FIN Data Management System - This task provided for further implementation of a fishery information system for the FIN based on the ACCSP model. This task provided funding for an Information Technology Manager who will, in conjunction with the ACCSP, work on developing more data modules for the FIN and ACCSP data management systems. This is a continuation of development of the FIN data management system. In addition, the Information Technology Manager will be responsible for transferring Louisiana trip ticket data into the FIN data management system on an agreed-upon schedule. It is the next step for implementing a regional system for FIN.
- Upgrade and Expand Florida's Saltwater License Information System - This task provided for the design and initiation of the development of the system necessary to convert the Saltwater Commercial License database to the database management software system Oracle to enhance fisheries management efforts. The ADABAS/Natural software system currently in use is outdated, inflexible and very difficult to maintain. Qualified programmers and trouble shooters to assist saltwater staff are very hard to find. The obsolete IBM mainframe currently housing the database system is being replaced by a more efficient, cost effective network of servers, as it is increasingly difficult to obtain the resources to resolve/prevent problems for systems that still remain on the mainframe. As other related databases are converted to Oracle, it is increasingly difficult to maintain critical linkages; for example: saltwater license, saltwater product landings, finance and accounting receipts records, and law enforcement records databases are currently interfaced to a substantial degree. Although this is a new task, it was discussed and approved for funding last year. However, due to a shortfall of funds, this task was dropped from the list.
- Collection of Shrimp Effort, Area Fished, Size Frequency, and Aging Data - This task provided for the intercept of shrimp fishermen and collection of information on the amount of time the vessel was fishing and the area(s) where fishing occurred. In addition, collection of length and weight data, hard parts and tissue samples from various species under Federal or state fisheries management were accomplished. A principal sub-objective is to increase the amount of size frequency and aging data for red snapper. However, because the commercial fishery for this species is only opened for a limited number of weeks during the year, the size frequency and aging data were collected from other federal or state managed species during the remainder of the year. This is a continuation of an activity from the previous year.
- Trip Ticket Program Development - This task provided for the initiation and development of a commercial trip ticket system for Texas, Mississippi and Alabama, an activity under the ComFIN. This task provided for development of components for a commercial trip ticket system to census the commercial fisheries landings in Texas, Mississippi, and Alabama using the data elements and standards developed by the ComFIN. It will ultimately be combined with other commercial fisheries data collected from around the Gulf of Mexico. In Mississippi and Alabama, the states continued to develop and began initial implementation of a trip ticket program. In Texas, the Department continued to identify the major seafood restaurants and other potential sources of unreported landings by commercial fishermen to determine the extent of non-reporting as well as prepare a list of seafood dealers to participate in outreach meetings to determine the feasibility of implementing a trip ticket system or an alternate means of data collection. In Louisiana, the Department continued the development of a system for dealers to electronically capture and transfer trip ticket data to the Louisiana Department of Wildlife and Fisheries.
- Completion of for-hire vessel directory for Texas - This task provided for the completion of the identification of the current charter boat fleet in Texas and attempted to contact coastal owner/operators in the charter boat industry. After all information about the charter boat vessels has been compiled, Texas, GSMFC and NMFS addressed the issue of implementing the appropriate methodology for collection effort

information. This is a continuation of an activity from the previous year.

Coordination and Administrative Support

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

Information Dissemination

Committee members and staff provided program information in 2000 via a variety of different methods such as distribution of program documents, presentation to various groups interested in the FIN,

via the Internet:

- FIN Committee. 2000. *2000 Operations Plan for Fisheries Information Network (FIN)*. No. 72 Gulf States Marine Fisheries Commission, Ocean Springs. 25 pp + appendix.
- FIN Committee. 2000. *Annual Report of the Fisheries Information Network for the Southeastern United States (FIN) January 1, 1999 - December 31, 1999*. No. 77 Gulf States Marine Fisheries Commission, Ocean Springs. 17 pp + appendices.
- FIN articles in the GSMFC newsletters.
- Variety of informal discussions occurred throughout the year during ASMFC, GSMFC, NMFS, and other participating agencies meetings and workshops.
- NPS personnel periodically provided information concerning the FIN (meeting notices, available documents, etc.) to the EPA's Gulf of Mexico Program computer Bulletin Board System.
- NMFS provides a user-friendly data management system for the MRFSS.
- GSMFC has developed a home page which provides programmatic and operational information regarding FIN.

Joint GSMFC/Gulf of Mexico Fishery Management Council Habitat Program

Jeffrey K. Rester, Program Coordinator

In January, the Gulf of Mexico Fishery Management Council's (Council) Habitat Protection Committee (HPC) met to discuss an update on the NPDES permit for Buckeye Florida on the Fenholloway River in Florida, the NMFS Gear Effects Workshop which was held in December 1999, and the Boca Grande Phosphate Dock in Florida. The NPDES permit for Buckeye Florida still has not been issued. This permit would allow Buckeye Florida to move the discharge point for their mill effluent from the head of the Fenholloway River to an area approximately one mile from the mouth of the river. The Council is opposed to this move because of the impact it would have on seagrass and important fishery resources around the mouth of the River.

The NMFS Gear Effects Workshop was also discussed. The HPC wanted the opportunity to review the minutes from this meeting and make comments and suggestions for future gear impact research. The Boca Grande Phosphate Dock was an area where numerous species of fish congregate. Species that were commonly seen around the dock in large numbers were jewfish, red drum, black drum, mullet, tarpon, snook, flounder, and stone crabs. The Council was concerned about the dock because the owners of the dock wanted to remove it for liability reasons. The dock owners wanted to turn it over to the Florida Office of Coastal and Aquatic Managed Areas. The Council was concerned that the decking, that provides a significant shading effect, would have to be removed before Florida would accept it. It was feared that the loss of shading would decrease the value of the remaining habitat due to the loss of perceived shelter and protection the shading affords. The Council sent a letter to the Office of Coastal and Aquatic Managed Areas requesting that they accept the dock without removing the decking.

The Annotated Bibliography of Fishing Impacts on Habitat was completed in February. The bibliography contains more than 570 references for papers that deal with the physical impacts of recreational and commercial fishing on habitat. The bibliography was printed and copies distributed to interested individuals. The bibliography is also available on the Commission web site at <http://www.gsmfc.org/fishingimpacts.html>. The bibliography is also available as a ProCite database that can be searched over the Internet.

The Habitat Subcommittee met in March in conjunction with the Commission's Annual Spring meeting. Agenda items included discussion on *The Annotated Bibliography of Fishing Impacts on Habitat*, development of Council policies on submerged aquatic vegetation (SAV) and wetland management, and an update on the habitat poster. As part of the joint Commission/Council habitat program, the Habitat Subcommittee volunteered to develop a new SAV policy and revise the existing wetland management policy for the Council. The Habitat Subcommittee drafted new SAV and wetland management policies for the Council's consideration.

The Council met in March to discuss the use of oil dispersants in shallow water and the NMFS sponsored Fishing Gear Impact Workshop. Currently, dispersants can only be used in offshore waters, but there is an ongoing effort to start using dispersants in shallow water and bay systems. The impact of dispersants on marine organisms in shallow water is unknown. An experiment to test the effect and fate of dispersed oil in shallow water in Galveston Bay was being proposed. Four hundred gallons of oil would be spilled and a dispersant applied to study the impact on the environment and marine organisms. While the experiment would have taken place in Galveston Bay, the use of dispersants was being considered for all shallow water areas of the Gulf of Mexico. Several members of the Council were concerned about this issue. The HPC also wanted to review the Fishing Gear Impact Workshop and offer advice on how NMFS should proceed with the study of fishing gear impacts in the southeast region. One of the major NMFS undertakings would be the analysis of the research papers contained within the bibliography to determine what conclusions could be drawn from prior research.

Council meetings were attended during May and July. In May, Sea Grant's Gulf of Mexico Offshore Aquaculture Consortium and Williams Gas Pipeline both made presentations to the Council's Habitat Protection Committee. Williams Gas Pipeline was proposing to install a natural gas pipeline from south Alabama to central Florida. At the July meeting, the Habitat Protection Committee reviewed the Williams Gas Pipeline project and a similar project by Gulfstream Gas Pipeline. The Council was concerned about these proposed pipelines and their impact on the new marine reserves the Council established in the Gulf

of Mexico. The Williams Gas Pipeline would pass through the northern reserve, while the Gulfstream Gas Pipeline would pass through the southern reserve. The Habitat Protection Committee also reviewed the draft Destination Broadwater Environmental Impact Statement. The Council was concerned that the proposed Destination Broadwater Casino Project would have unacceptable adverse impacts on the marine environment.

The Council's Texas Habitat Protection Advisory Panel (AP) meeting was attended in September. The AP discussed several regional habitat issues. The AP also reviewed the Council's submerged aquatic vegetation and wetland management policies. Comments and suggestions were made to the policies. The policies were then forwarded to the Council for their review and approval.

During the Commission's October annual meeting, the Habitat Subcommittee met jointly with the Crab Subcommittee to discuss the Gulf-wide derelict crab trap problem and possible solutions. The subcommittees are working jointly because the nature of the problem requires a coordinated Gulf-wide effort to solve. It takes several years for a crab trap to deteriorate. During this time, the traps can pose many

problems. They can impact fish, crabs, and diamondback terrapin populations by ghost fishing. They can be navigational hazards to boaters and present problems to other user groups, especially shrimpers. A report was drafted detailing the problems and possible solutions. The subcommittees continue to work on the problem.

Also in October, the bibliography was updated to include approximately 50 new entries. The updated references were also added to the ProCite database. The bibliography will be continually updated in the future to include the latest fishing impacts literature.

At the November Council meeting, the Council discussed and approved the submerged aquatic vegetation and wetland management policies that the Commission's Habitat Subcommittee developed. Since freshwater is vitally important to estuaries in the Gulf of Mexico, the Council voted to request that the Habitat Subcommittee develop a freshwater inflow policy for the Council. The Council also reviewed a development project in Gulfport, Mississippi that would impact approximately 700 acres of non-tidally influenced wetlands. The Council felt that the project could potentially affect essential fish habitat in Biloxi Bay but chose not to comment on the project at that time.

ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, MARINE RESOURCES DIVISION

Vernon Minton, Director

The Marine Resources Division is responsible for management of Alabama's marine fisheries resources through research and enforcement programs. Three division facilities supported an average of 46 employees of the Administrative, Enforcement, and Fisheries sections during fiscal year 2000.

SIGNIFICANT ACCOMPLISHMENTS

The Division established and is implementing a trip ticket program for seafood dealers to report commercial seafood landings. Information gathered through this system will greatly improve management of Alabama's marine fisheries.

Three additional inshore artificial reefs were constructed as part of the "Roads to Reefs" program and two previously constructed reefs were enhanced with oyster cultch material.

The tide/informational calendar was produced entirely in-house except for the printing resulting in a significant savings. This calendar remains in high demand from Alabama's fishermen and boaters.

The Director of the Marine Resources Division and the Enforcement Section received citations from the U.S. Coast Guard for participation in Operation Blue Sea Hawk, a two-day joint operation by state and federal law enforcement agencies. The operation resulted in 100 vessel boardings and 76 citations.

A total of 10,000 cubic yards of oyster cultch material was planted west of the Dauphin Island bridge as part of an oyster reef restoration program. The cultch planting was an effort to repair the extensive damage caused by Hurricane Georges.

Dredging and marking of a critical area in the Dauphin Island channel was completed. This increases the depth of the 300-foot by 60-foot area to 6 feet at mean low, low water, which allows charter boats and recreational boats to navigate the area safely.

Biological personnel traveled to Gulf Breeze, Florida, to attend EPA's Environmental Monitoring and Assessment Program (EMAP) training. The Division is cooperating with the Alabama Department of Environmental Management to participate in this annual, national fish, sediment, and water quality

survey.

Legislation was passed that allows the Commissioner of Conservation to close specific waters to the taking of live bait in areas temporarily closed to commercial shrimping and to establish live bait shrimping areas by regulation.

The cooperative red snapper propagation program continued with Auburn University and Alma Bryant High School in Grand Bay, Alabama. The program continues to increase the knowledge of red snapper culture and to provide students an opportunity to learn mariculture techniques.

A new boat ramp was opened in Gulf Shores, Alabama through the cooperation of the Division with the City of Gulf Shores and the Alabama Department of Transportation. This was funded by Sportsfish Restoration funding and matched by the city.

UNOCAL Gas platform 254A was converted to an offshore artificial reef by the Marine Resources Division in cooperation with Spirit Energy 76, Tom Joiner and Associates, and the U.S. Army Corps of Engineers. This reef is located 59 miles offshore in 220 feet of water.

The Coastwatch program was continued, bringing the total number of trained individuals to 106. The cooperation between Division enforcement officers and trained citizens has improved protection of Alabama's marine resources and resulted in a significant savings to the Division.

SIGNIFICANT PROBLEMS AND SOLUTIONS

Several oyster catchers are continuing to challenge various riparian oyster leases granted under Alabama's riparian oyster law. The controversy concerns the state's declaration of certain water bottoms adjacent to private lands as being devoid of natural oyster reef and therefore eligible for planting under the riparian rights law. The Division will continue to work with these individuals to resolve these issues.

Commercial crab fishing was banned from most coastal rivers to reduce pressure on small crabs and eliminate navigation problems resulting from increasing numbers of traps in the rivers in 1999. This

resulted in an increase in the density of traps in Mobile Bay. Property owners have begun to complain about the number of traps in front of their property. The Division will continue to work to resolve this problem.

ADMINISTRATION SECTION

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

Staff for the Administrative Section consisted of the division director, six clerical, and one marine mechanic employee. Offices are maintained at Dauphin Island, Gulf Shores, and Bayou La Batre.

Accomplishments

A 2000 tide/informational calendar was created and published by the division. The document includes twelve monthly tide tables, complete with moon phases, sunrise and sunset times, and tidal times and amplitudes. The document also includes fishing rules and regulations, information regarding Alabama's inshore and offshore artificial reef programs, artificial reef coordinates, helpful fishing tips, and much more. The demand for this calendar has been extremely high and the feedback very positive.

Enforcement officers met with commercial net fishermen to discuss recent changes (area and seasonal closures, and limitations on shark harvest) and possible future changes in the netting laws. The Marine Resources Division is committed to fishery co-management that is based on the best available fishery science and is sensitive to the socioeconomic needs of the coastal community. As changes occur in the fish stocks that support net fisheries, and as the demography of Alabama's coastal human population changes, fishery regulations must change to ensure continued stock health and reduce user conflict.

A cooperative high school mariculture program continued with Auburn University, SEAGRANT, and the new Alma Bryant High School in Mobile County to support a mariculture training center at the high school. This has proven to be a very successful program, which expands students' ability to participate in future fisheries.

A cooperative effort among state, local, and federal government, conservation groups and private industry, named "Roads to Reefs," is using blemished

and recycled concrete road construction materials and other appropriate materials to enhance ten reef sites in Mobile Bay and Mississippi Sound.

Legislation was passed that allows the Commissioner of Conservation to close specific waters to the taking of live bait in areas temporarily closed to commercial shrimping and to establish live bait shrimping areas by regulation.

Future Plans

Legislation will be introduced to accomplish the following: Attempts will be made to secure funding to install a pipeline from the Gulf of Mexico to the Claude Peteet Mariculture Center. This would allow for high salinity, high quality water to be pumped directly to the Center for use in rearing red snapper and other selected marine species

ENFORCEMENT SECTION

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

Facilities for the Enforcement Section consist of headquarters at Dauphin Island and district offices in Bayou La Batre and Gulf Shores. There are 15 enforcement officers in the section, nine stationed in Mobile County, five stationed in Baldwin County, and the Chief Enforcement Officer stationed at Dauphin Island headquarters. There is one vacancy which is scheduled to be filled in FY2000-2001.

Accomplishments

Enforcement officers conducted 14,790 hours of boat and shore patrol, 7,591 boat checks, 1,824 seafood shop inspections, 9,690 recreational fisherman checks, and issued 1,551 citations and warnings for illegal activities. Thirty-two percent of the citations and warnings (497) were for violations of recreational fishing laws and regulations. The 544 violations of commercial fishing laws and regulations comprised

35% of the citations and warnings issued. Officers also issued citations and warnings for 370 violations of boating safety laws and regulations, 82 game and fish, and 58 citations for other state and federal laws and regulations. A total of 8,641 hours was spent on administrative duties, court attendance, training, and equipment maintenance. Officers worked 1,834.5 hours with the National Marine Fisheries Services interjurisdictional fisheries enforcement program. Enforcement officers continued to work with the Alabama Coastal Conservation Association to expand the Coastwatch Program, training citizens to recognize and report violations of saltwater fishing laws and regulations. Information from Coastwatch members has assisted with planning of enforcement patrols and deployment of manpower and other resources resulting in saved man-hours by not responding to inaccurate reports of violations. To date, 106 citizens have been trained at 17 training sessions held in Mobile Baldwin, and Jefferson counties. The response to the program continues to be very positive.

Officers attended training courses on boat handling, criminal investigation, self-defense, supervision, and other state and federal agency law enforcement programs.

Future Plans

The Enforcement Section will continue to develop mechanisms to improve the Coastwatch Program and better communicate important information; continue to review enforcement policies and procedures for consistency and uniformity; and work with other Gulf states and the National Marine Fisheries Service to develop a Gulfwide strategic fisheries enforcement plan.

FISHERIES SECTION

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

Alabama's coastal waters, territorial sea, and adjacent federal waters in the Gulf of Mexico, and comment on all applications for U.S. Army Corps of Engineer permits in the coastal area.

Fisheries facilities consist of the Claude Peteet Mariculture Center in Gulf Shores and the Marine Resources Laboratory on Dauphin Island. Personnel consisted of one Biologist V, one Biologist IV, one Biologist III, three Biologist II's, one Biologist I, four Biologist Aide III's, seven Biologist Aide I/II's, one ASA I/II, one bi-weekly laborers, and two temporary laborers.

Accomplishments

The Alabama Department of Conservation /Marine Resources Division planted 10,000 cubic yards of oyster shell in FY2000. All oyster shell was planted on Cedar Point reef west of the Dauphin Island bridge to rehabilitate an area of the reef damaged by Hurricane Georges in 1998. High salinity water over the area planted resulted in a large increase in oyster drill populations which inhibited survival of spat on the newly planted shell in the summer of 2000. Funds from the Fisheries Restoration Act were used to replace pilings and signs affixed to pilings that serve to protect Alabama oyster reefs from shrimping activities. Hurricanes Danny and Georges had destroyed most of the former markers.

The first full year of sampling was completed under the cooperative program with the Alabama Department of Environmental Management (ADEM) to integrate the division's assessment and monitoring program with ADEM's water quality monitoring program to allow both organizations to increase the intensity of sampling and improve data collection at little or no increase in cost.

The infrastructure of Claude Peteet Mariculture Center (CPMC) was improved to provide increased overwintering facilities for red snapper fingerlings Also, new facilities for red snapper brood fish maturation studies by use of light and temperature manipulation were completed at CPMC. This will create opportunities for increased research in both mariculture and management of red snapper.

The third year of a cooperative project with Auburn University at the CPMC continued to investigate the techniques for raising shrimp in ponds at increased densities using auxiliary aeration and nursery trial studies. This resulted in a harvest of an average of slightly under 4000/lbs per acre of 26-30 count shrimp. Some of the techniques pioneered at CPMC will be

used in a developing shrimp farm industry in North Central Alabama.

During the year 835 fisheries assessment samples were taken, 96 habitat assessments were performed, and, 4251 fishermen were interviewed during creel surveys.

Wallop/Breaux: Wallop/Breaux funds are administered through the U.S. Fish and Wildlife Service. Funds used from this source by the Marine Resources Division were directed toward a creel survey of Alabama's saltwater recreational anglers, production of the 2000 edition of the popular Marine Information Calendar, construction of artificial fishing reefs in the Gulf of Mexico offshore from Alabama and inshore in Mobile Bay, maintaining equipment and facilities in Gulf Shores and Dauphin Island, managing the public artificial fishing reef permits issuing system in the Gulf of Mexico off Alabama, assisting individuals in designing artificial reefs, conducting mariculture research on red snapper, maintaining and enhancing boat ramps for boating access; conducting a study of the attraction of juvenile red snapper to small patch reefs; and testing various offshore artificial reef modules with respect to attractant qualities and durability. An additional project to coordinate all federal aid programs within the Division and cooperate with other Gulf states was also funded from this source.

Cooperative Statistics: Federal aid funds for this program are administered by the National Marine Fisheries Service, Department of Commerce and are utilized by the Marine Resources Division to collect data on commercial shrimp, oyster, crab and finfish landings. Additionally, information on processed seafood such as picked crab meat is compiled. Landings information was collected on fish, shrimp, crabs and oysters. Biological information was collected on blue crabs, striped mullet, flounder, red snapper and Spanish mackerel. Commercial license information was kept in a computer database. The cooperative statistics project continued to provide monthly dealer mail-in forms for those dealers not visited by port agents. All landings are processed on a monthly basis for inclusion in Alabama's database and forwarded to the National Marine Fisheries Service.

Southeast Area Monitoring and Assessment Program (SEAMAP): Funds from this program are administered by the National Marine Fisheries Service, Department of Commerce and are utilized in Alabama for the development of a long term fishery-independent data base on recreationally and commercially important marine and estuarine fishery stocks. This project provides funds to manage the Alabama shrimp fishery and evaluate spawning success and juvenile survival for

important recreational and commercial species. It also provides funds for a project to independently assess red snapper population by video camera and fish trap sampling. This study is being conducted in Alabama's offshore artificial reef permit areas in the Gulf of Mexico.

The Marine Recreational Fisheries Statistics Survey (MRFSS): Beginning in January of 1999, Division personnel conducted this survey for all types of recreational saltwater fishing in Alabama. The increased number of interviews will provide greater accuracy in the estimate of Alabama's recreational harvest. A pilot telephone survey to collect more detailed information on fishing effort by Gulf coast for-hire anglers was accepted by the National Marine Fisheries Service and will become the standard method for estimating charter boat effort starting in the year 2000. This method was proposed in order to increase the accuracy of harvest by the recreational for-hire sector.

Commercial Trip Ticket Program: Funding for this program is provided by the Department of Commerce through the National Marine Fisheries Service. In August the section initiated a trip ticket program in Alabama to collect fishery information from each commercial fishing trip. This program is part of a Gulf-wide effort to generate more specific information for each fishery. This program, once fully implemented, will replace the current method of collecting landings information by the National Marine Fisheries Service and Division personnel. Trip tickets are printed in triplicate form and supplied to Alabama seafood dealers. Seafood dealers are required to complete the trip ticket for each transaction. Data from the completed trip tickets is scanned into a computer, verified and edited. In 2001 monthly data will be sent to the Gulf States Marine Fisheries Commission. The data will ultimately be supplied to the National Marine Fisheries Service

Mobile Bay Oyster Reef Enhancement: Portions of two marginally productive oyster reefs in Mobile Bay were surrounded with concrete pipes as the initial step in placing oyster cultch material at those site to enhance oyster growth and provide structure for an inshore artificial fishing reef. Sand Reef, in lower Mobile Bay off Little Dauphin Island, and Hollinger's Island Reef, in upper Mobile Bay off Gaillard Island, were the areas selected for this activity.

Fisheries Restoration Act: The money ADCNR/MRD received from this fund was expended in the FY00 cultch planting efforts. The Cedar Point reef planting west of the Dauphin Island Bridge was

completely paid for by this program.

Non-Federal Aid

Biological and enforcement personnel worked together to collect data at oyster checkpoints, enabling the development of sound management measures for sustaining the oyster resources. Data collected assisted in increasing the accuracy of assessment of the health of Alabama's oyster resource. The Biological Section monitored shell planting activities in which 10,000 cubic yards of oyster cultch on Cedar Point reef.

Meetings were held with oil company representatives periodically to discuss options for accomplishment of pipeline projects. Biological personnel checked areas of proposed drilling platform locations and associated pipeline corridors for potential impact to oyster resources.

The division also continued the cooperative endeavor with Auburn University and the new Alma May Bryant High School in Mobile County to provide a mariculture training center at the high school. This has proven to be a very successful program which expands students' ability to participate in future fisheries.

Personnel maintained and improved the home page for the Division, which is associated with and accessed through the Departmental home page at "www.dcnr.state.al.us". The feedback to this site has been extremely positive and it has proven to be a tremendous asset in getting information and assistance to the public.

Personnel developed and printed the third informational calendar, which included a very

informative tide calendar along with other useful information. The demand for this calendar was extremely high and the feedback positive. Plans are underway to provide a year 2001 edition.

Future Plans

The Fisheries Biological Section will continue to collect appropriate data and work with recreational and commercial fishermen and other resource user groups to provide Division administrators with recommendations for strategies and regulations for management.

Development of fishery independent assessment and monitoring of adult finfish will continue, using multi-panel variable mesh gill nets.

Development of mariculture procedures for commercially important marine organisms will continue.

Cooperative projects will continue to be initiated with Auburn University, the Dauphin Island Sealab, and the University of South Alabama to investigate artificial reef benefits and red snapper production enhancement.

Inshore assessment and monitoring work will be continued monthly with the addition of new stations in order to provide a more comprehensive depiction of Alabama's marine waters and resources.

The continuation of the complete Marine Recreational Fisheries Statistics Survey in Alabama to include creel of charter boats, private boats, ramps, and shoreline, and the telephone survey will continue to better define effort within the fishery.

F LORIDA FISH & WILDLIFE CONSERVATION COMMISSION DIVISION OF MARINE FISHERIES *Roy E. Crabtree, Director*

The major responsibilities of the Division of Marine Fisheries include: 1) development and implementation of marine fisheries management policies, 2) issuance and reconciliation of commercial fishing licenses, 3) angler outreach and marine aquatic resource education, (4) the state artificial reef program, 5) monitoring compliance with the marine fisheries trip ticket reporting requirements through audits of applicable fish house records, 6) implementation and administration of the spiny lobster and stone crab effort management [i.e., trap certificate] programs, 7) closure of fishing seasons for species managed by quotas as quotas are reached, 8) civil penalty assessments for violations of certain fisheries regulations, and 9) issuance of Special Activity Permits. Highlights of staff efforts in 2000 include:

MARINE FISHERIES MANAGEMENT AND POLICY DEVELOPMENT

Staff drafted and solicited public input on a rule that caps effort (i.e., trap number) in the stone crab fishery at the current level and establishes a procedure to gradually reduce the number of traps being fished. The Commission approved this rule, to be effective July 1, 2000, at their February 2000 meeting. The Commission also began the process to alter the way in which the number of spiny lobster traps is reduced in the future; through a combination of passive and active reduction actions, an annual four percent decline in total trap numbers would be achieved. The Commission was briefed about Tortugas 2000 by staff of the Florida Keys National Marine Sanctuary. The FWC will adopt the state waters portion of the marine protected areas adjacent to the Tortugas National Park for spawning protection. Spotted seatrout regulations became effective in July 2000, after a year of development; north Florida creel limits were reduced in order to meet the Commission's recovery goal for this species. The Commission also adopted new regulations for cobia, king mackerel, Gulf gag and black grouper, Spanish mackerel, red porgy, seabasses and greater amberjack. The Commission also enacted a prohibition on possession, importation, and transporting of the exotic mitten crab. Approximately 120 Special Activity Permits were issued to universities, public aquaria, research institutes and other organizations for various

activities, including coral transplanting, shark research, and angelfish aquaculture.

Angler Outreach and Aquatic Resource Education

Staff continue to provide information on fishing license requirements, fishing opportunities, Commission fisheries management projects, and the importance of habitat to the fisheries. In 2000 staff participated in more than 36 scheduled events (boat shows, the Florida State Fair, Kids Fishing Clinics, Ladies Let's Go Fishing Clinics) reaching over 100,000 people. All 3,439 participants in the Kids Fishing Clinics received rods and reels. In addition, staff were frequently featured on local radio and television shows to discuss issues of importance to anglers. Marine aquatic educational activities conducted at the Cedar Key Field Laboratory attracted 1,660 participants.

Artificial Reef Program

A Federal Aid in Sport Fish Restoration grant, in concert with state fishing license revenues, provided funding to 14 local coastal governments and two non-profit organizations for development of marine artificial reefs. All 16 projects were successfully completed, resulting in the construction of 28 reefs using vessels, limestone rock, and concrete materials. The Northwest Florida socio-economic study of use and value of artificial reefs was completed during this period. A sidescan sonar project initiated to locate and map some northwest Florida artificial reefs was not as successful as hoped because of inadequate planning and access only to small vessels which were not up to the task.

Marine Fisheries Services

In addition to issuing the different commercial saltwater fishing licenses and permits (24 basic types) and administration of the trap certificate programs, the Bureau conducted audits of five saltwater products dealers plus performed statistical reviews of documentation from five prior years. Thirty nine administrative hearings were conducted in response to agency denials of commercial license/permit applications.

FLORIDA MARINE RESEARCH INSTITUTE (FMRI)

Kenneth D. Haddad, Director

FINFISH

Gamefish, Reefish and Directed Life History Studies

During 2000, FMRI provided the Division of Marine Fisheries, Florida Fish and Wildlife Conservation Commission with data to support stock assessments for snook (*Centropomus undecimalis*) and Florida pompano (*Trachinotus carolinus*).

Work describing the life history of bonefish has been completed. However, FMRI continued cooperative work with the University of Florida and the University of South Florida to evaluate potential genetic differences between *Albula vulpes* and an undescribed species from the Florida Keys. A manuscript entitled "The evolutionary enigma of bonefishes (*Albula* spp.): cryptic species and ancient separations in a globally distributed shorefish" has been submitted for publication in the journal *Evolution*.

FMRI completed work on evaluating the feasibility of using ultrasonic tags for tracking tarpon in the Florida Keys. Results indicated that the use of short and mid-range ultrasonic tags is not a viable means of monitoring movement patterns and habitat utilization by tarpon. Field results suggest that tarpon's large size and wide home range requires the use of satellite-based or remotely operated telemetry equipment.

FMRI completed a two-year project to evaluate if capture and release of snook caught from spawning aggregations along the Florida East Coast is detrimental to reproduction. Results indicated that the stress of hook-and-line catch-and-release practices did not cause females to terminate spawning. Released females were consistently recaptured from the aggregation, and levels of ovarian atresia and spawning activity were similar for both recaptured fish and control fish. A manuscript with the results of this study is being submitted for publication in a peer-reviewed journal. Also, the manuscript entitled: "Catch and release mortality of common snook, *Centropomus undecimalis*, in Florida" was recently published in *North American Journal of Fisheries Management*.

FMRI continued a three-year study of spotted seatrout (*Cynoscion nebulosus*)

reproduction in Tampa Bay. This study supplements an earlier study conducted on the east coast of Florida and aims at determining age-specific schedules of spawning frequency and batch fecundity, as well as geographically-specific maturity schedules, to refine the accuracy of spawning potential ratio (SPR) estimates for spotted seatrout in Florida waters.

FMRI continued work on the biology and ecology of reef fishes in southeast Florida. Work on the life history and feeding ecology of yellowtail snapper (*Ocyurus chrysurus*), gray snapper (*Lutjanus griseus*), mutton snapper (*Lutjanus analis*), and lane snapper (*Lutjanus synagris*) has continued. FMRI have also initiated a study on the utility of otolith minor and trace elements as a means of determining the connectivity of gray snapper populations along the southeast Florida mainland and the Florida Keys.

FMRI continued a two-year research project on dolphin (*Coryphaena hippurus*) that focus on collecting fishery and biological data for stock assessment purposes. Samples are being collected primarily in the Florida Keys, but comparative specimens are also being collected from offshore waters near Melbourne (central east coast of Florida) and Apalachicola (Florida panhandle).

FMRI initiated a new study on age, growth, and reproduction of Florida pompano (*Trachinotus carolinus*) along the Gulf coast of Florida. The objective of this study is to use a less-selective gear to catch pompano in a fishery-independent manner that should yield better estimates of age, growth, and fecundity than previous studies. The new study will describe the post-net ban age- and size-structure of Florida pompano, estimate growth and mortality rates of Florida pompano, and describe maturity schedules and age-specific fecundity of Florida pompano along the Gulf coast.

FMRI completed a study outlining the spawning grounds of two halfbeaks species — ballyhoo (*Hemiramphus brasiliensis*) and balao (*H. balao*) — in south Florida. A net fishery for bait targets both of these species. Manuscripts are now being prepared for publication in peer-reviewed literature.

FMRI completed work on a two-year MARFIN study describing the life history of hogfish in Florida waters. A final report entitled "Age, growth, and reproduction of hogfish,

Lachnolaimus maximus, Final Report (NOAA Award Number NA87FF0422) was submitted to the U.S. Dept of Commerce, NOAA, NMFS, Southeast Fisheries Center. Manuscripts are now being prepared for publication in peer-reviewed literature.

Baitfish

In this fiscal year, FMRI conducted a sixth acoustic/trawl survey during month of April along the west central coast of Florida. This survey was conducted to determine spatial distribution and abundance of important baitfish species such as Spanish sardine, Atlantic thread herring, round scad, and scaled sardine. The results of this survey along with previous surveys were used to develop a stock assessment report on sardine/herring stocks in Florida. FMRI has completed the development of a trophic dynamic fisheries ecosystem model that will be used to investigate the ecosystem impacts of fishing and/or environmental anomalies on forage species such as sardine/herring species.

Mullet

The first three years of sampling for a MARFIN grant being conducted in association with three other state agencies (Georgia, South Carolina, and North Carolina) has been completed. Reports are being prepared.

BIVALVE FISHERIES RESEARCH

Bivalve fisheries research at the Florida Marine Research Institute encompasses bay scallops (*Argopecten irradians*), calico scallops (*Argopecten gibbus*), and hard clams (*Mercenaria* spp.), with consideration of other indigenous (e.g., *Chione*, *Macrocallista*) and non-indigenous (e.g., *Dreissena*, *Perna*) genera as needed. A separate branch of the Florida Department of Agriculture conducts assessment and monitoring of oysters (*Crassostrea*).

Bay scallop research continues to be directed towards assessing biological and environmental factors influencing the depletion or loss of scallop populations in peninsular Florida. Adult abundance monitoring continues in Pine Island Sound, Anclote Estuary, Hernando, Homosassa, Cedar Keys, and Steinhatchee in peninsular Florida and St. Joseph Bay and St. Andrew Bay/Sound in the Florida panhandle. Recruitment monitoring suggests that recruitment limitation is preventing the recovery of depleted populations. Federal disaster relief funds have

been acquired to conduct a restoration program in the area between Tampa Bay and Homosassa, with the intent of enhancing larval availability and rates of recruitment. Quantifying the abundance of a unique genetic "tag" in subsequent year classes will assess the success of the restoration program.

Hard clam research is focused on developing methods to enhance natural populations in the Indian River lagoon, Florida. Three methods of enhancement (spawner transplants, seeding, direct larval injection) are being compared for the biological and economic suitability. Preliminary results suggest that releasing recently fertilized eggs directly into the lagoon may provide a cheap and effective means of enhancing local populations.

CRUSTACEAN FISHERIES RESEARCH

In the crustacean fisheries research program, staff conducts fisheries-oriented biological and ecological studies on crustacean species of economic importance to Florida. During 2000, staff continued to evaluate the effectiveness of bycatch reduction devices in various types of shrimp trawls. A manuscript based on a component of that research and entitled "Efficiency of bycatch reduction devices in small otter trawls used in the Florida shrimp fishery" was accepted for publication in *Fishery Bulletin*. Field studies of the population biology of stone crabs in the vicinity of Tampa Bay also continued. Staff participated in workshops being conducted statewide for the purpose of defining shrimping zones in the nearshore waters of Florida. Staff is working with the FMRI CAMRA group to prepare maps integrating nearshore habitat and allowed shrimping zones for management of the shrimp fishery. Staff also worked with special committees of the Atlantic States Marine Fisheries Commission on developing regulations for the horseshoe crab fishery and on utilization of bycatch. Genetics based stock identification studies were nearly completed for pink, white, and brown shrimp and reports on the results were initiated. A manuscript for publication on the genetic stock identification of blue crabs was revised. The results of all work are provided to appropriate fishery management agencies and presented routinely at scientific meetings and other public forums. Perry, H.M., C.B. Trigg, R.P. Henry, T.M. Bert, and W. Brehm. In prep. Salinity and temperature tolerance of adult stone crabs of the genus *Menippe*.

FISHERIES GENETICS RESEARCH

The fisheries genetics research program has two principal directions: 1) genetic stock identification of economically important marine organisms, and 2) monitoring the effects of FMRI SERF hatchery operations on the gene pools of wild populations supplemented with hatchery reared organisms and monitoring the success of stock restoration efforts. A work plan for the Fisheries Genetics program was developed based on needs specified by the Florida Fish and Wildlife Conservation Commission.

Laboratory analysis of genetic stock structure in spotted seatrout was completed and in sheepshead was nearly completed and manuscripts that identify the geographic ranges of stocks of these fish species are in preparation. Laboratory analysis of samples to assess the success of the bay scallop stock restoration effort continued. Further progress was made for genetic stock structure studies of vermilion snapper, yellowtail snapper, gray snapper, dog snapper, and dolphin fishes.

Genetic monitoring of the FMRI red drum stock enhancement program and of the joint University of South Florida/ FMRI/ Mote Marine Laboratory bay scallop stock enhancement program continued. A Master's Thesis in which the genetic diversity of red drum hatchery broods is compared to that of the wild population, parent/offspring identification, and developing genetically efficient breeding protocols has been completed. Development of a more precise genetic tag for red drum, involving the addition of several microsatellite DNA loci to our present mitochondrial DNA genetic tag, was initiated. The genetic tag developed for hatchery red drum is being used to determine the percentage of hatchery-reared red drum in samples obtained from areas where stock enhancement or restoration is ongoing. Data from all studies are provided to appropriate fishery management agencies and are routinely presented at scientific meetings and other public forums. Two symposia on the genetic and ecological implications of aquaculture activities (particularly stock enhancement and other activities in which cultured animals are purposefully or accidentally released into the environment) were conducted. The proceedings of these symposia are being compiled for publication as a book in the series *Reviews in Fish Biology and Fisheries*.

Several manuscripts were prepared and submitted for publication: 1) "Methodologies for conservation assessments of the genetic biodiversity of aquatic macro-organisms" (in

revision), 2) "Development, assessment, and application of a mitochondrial DNA genetic tag for the bay scallop (*Argopecten irradians*)" (in revision), 3) "Development and application of genetic tags for ecological aquaculture" In, B. Costa-Pierce, ed. *Ecological Aquaculture*. Blackwell Scientific (in press), 4) "The effects of various aquacultural breeding strategies on the genetic diversity of successive broods" In, Z. Zakariah, ed., *Mariculture at the Crossroads: Proceedings of the Conference on "Mariculture and the Environment: Towards the New Millennium*, Kuala Lumpur, 24-25 August 1999, Maritime Institute of Malaysia (in press). Several more manuscripts are in various stages of preparation.

FISHERIES STATISTICS

Fisheries Independent Monitoring Program

Fisheries-independent monitoring (FIM) of fishes continues in the Tampa Bay, Charlotte Harbor, Indian River Lagoon, Cedar Key, Apalachicola, and the Florida Keys. A fisheries-independent monitoring program is being developed in the St. Johns River estuarine system. The FIM program uses a systematic sampling strategy to collect fish free from the biases associated with collecting data from recreational and commercial fisheries. Data have been used for numerous stock assessments for several inshore species. The program has been restructured to place more emphasis on assessing the population of subadult/adult fishes rather than on young-of-the-year fishes. The subadult/adult FIM program is used to help monitor the current status of Florida's estuarine fish stocks. Staff has spent much time developing models that describe fish abundance associated with different habitats. Additionally, staff in this program has been involved in the mercury concentration in fish program, fish health assessment, environmental health, as well as studying the fishes from the rivers feeding Charlotte Harbor and Tampa Bay.

Commercial Landings Statistics

Information on the commercial harvest of fish, invertebrates, and other marine resources (including marine life and live rock used in the aquarium trade and some aquaculture products) is reported by more than 1,300 wholesale and retail dealers to the Florida Marine Fisheries Information System. Approximately 320,000 marine fisheries trip tickets containing information on catch, gear, time, and area fished, price, and commercial

fishing licenses are reported annually under the mandatory reporting rules. These data are used in stock assessments, for quota monitoring, for design of sampling programs, and for summaries of landings and trips by species, qualification of fishermen for state and federal license endorsements and permits, and determination of participation in fisheries. Many of these data are incorporated into state and federal fishery management plans and stock assessments. In 2000, the commercial fisheries harvest in Florida was over 100 million pounds with a dockside value worth over \$200 million. Also in 2000 (as in 1999), the reporting of aquaculture-raised saltwater products to the department was no longer required, but we still received and computerized this information when supplied to facilitate qualification for license endorsements for these fishermen.

The programming effort to convert the trip ticket data, associated biological profiles used for editing, and the editing application from Adabase/Natural to an Oracle data base and application was completed in May 2000. The data base and computer application were moved to St. Petersburg in September 2000. In mid-April 2001, we contracted work on enhancements to the trip ticket editing program and the data base. Fields to record the start date of the trip, number of crew, product grade, and disposition of the catch were added to the data base structure and editing application to help attain the standards adopted by the Fisheries Information Network (FIN) and the Atlantic Coastal Cooperative Statistics Program (ACCSP) programs. Other programming enhancements included additional editing checks on various fields on the trip tickets. The contract for these programming enhancements ended on July 6, 2001, and the new system is in production at this time. Florida was selected by the ACCSP to be one of the sites for the development of the prototype of the ACCSP commercial fisheries data base during 1998, and edited data has been supplied for the 1998-2000 period.

Biostatistical Sampling

This cooperative state/federal project is designed to obtain fish and invertebrate species length-frequency measurements and fishing trip characteristics (gears used, duration, effort, area fished, etc.) directly through dockside interviews with commercial fishermen. These data are also used to crosscheck information reported in the marine fisheries trip ticket program. The commercial port samplers are located in Pensacola,

Apalachicola, Cedar Key, St. Petersburg, Port Charlotte, Marathon, Tequesta, Melbourne, and Jacksonville. From April 1, 2000 to March 31, 2001, the port samplers measured 78,645 organisms (fish and invertebrates) from 1,081 trip interviews. In addition, the field staff involved with sampling recreational fisheries (including head boats) provided over 54,000 lengths and weights of fish during 2000. On selected species, the port samplers and recreational fisheries samplers have begun taking hard parts (primarily otoliths) for age determinations, gonads of selected species (mostly from at-sea sampling activities), additional measurements for use in developing conversion factors, and tissue samples for mercury, and DNA assays during the second half of 2000. The port samplers and head boat samplers are occasionally tasked with at-sea sampling duties or additional duties as required. Beginning in October 1997, samplers were tasked with obtaining additional commercial fishing trip interviews to provide information and samples of lengths of striped mullet harvested weekly during the roe season in order to provide additional data for an upcoming stock assessment.

Recreational Surveys, License Monitoring, and Statistics

The Florida Fish and Wildlife Commission issues Saltwater Fishing Licenses and computerizes all license information. For recreational landings estimates and other types of analyses, data from the National Marine Fisheries Service (NMFS) Marine Recreational Fisheries Statistics Survey (MRFSS) is utilized. Beginning in September 1997, the Fisheries Dependent Monitoring group has participated in the Pilot Charter Boat Survey for the Gulf of Mexico conducted in cooperation with the NMFS MRFSS, the Gulf States Marine Fisheries Commission, and the states of Louisiana, Mississippi, and Alabama. Fishing effort for the pilot charter boat survey was obtained through telephone interviews of a randomly selected 10% sample of charter boats (including fishing guides) on the Gulf Coast. The goal of the pilot charter boat survey is to compare the experimental method (telephone interviews of charter boat captains to improve precision) of estimating fishing effort to that obtained during the standard MRFSS random-digit dialing of households with telephones to interview recreational anglers. The pilot charter boat survey was continued through 1999, and the methodology was adopted as part of the MRFSS in 2000 for sampling and for catch and effort estimation where this method of data collection is implemented (i.e.,

Louisiana, Mississippi, Alabama, and Florida).

Beginning in November 1998, Florida (along with Alabama, Mississippi, and Louisiana) also conducted the field intercept portion of the MRFSS for all fishing modes (shore-based, charter boats, and private/rental boats). Florida conducts its portion of the survey on both the Atlantic and Gulf of Mexico coasts and employs over 32 samplers at field locations around Florida (Jacksonville, New Smyrna Beach, Melbourne, Tequesta, Miami, Marathon, Port Charlotte, St. Petersburg, Cedar Key, Apalachicola, Destin, and Pensacola). Two researchers in St. Petersburg provide coordination for the field sampling and are responsible for the training of new staff, reviewing status of the sampling, and quality assurance for the project. Docksides/shore sampling during 2000 exceeded the base level of sampling normally conducted by the MRFSS for all modes of fishing in Florida. In 2000, we provided a total of 17,058 angler interviews for the Atlantic Coast of Florida (base quota for interviews was 11,874; an increase of 1.44 over base). On the Gulf Coast in 2000, we interviewed a total of 27,145 anglers (base quota for interviews [including 6X for charter boat surveys] was 20,392; an increase of 1.33 over base). We measured the lengths and/or weights from 54,954 fish caught by recreational anglers interviewed in this survey during 2000. The Fisheries Dependent Monitoring group also participates in the NMFS Beaufort Laboratory Head Boat Survey, and has two samplers (Naples to Cedar Key area, and Miami to Jupiter area) dedicated to this logbook and docksides-sampling program.

STOCK ASSESSMENT AND POPULATION MODELING OF FLORIDA'S INSHORE SPECIES

In December 2000, the assessment group released an annual trend report that summarized fisheries-dependent and -independent data through 1999 and provided detailed narratives on 48 popular species in Florida. The assessment group developed stock assessments for bluefish, weakfish, common snook, sheepshead, spiny lobster, and striped mullet in 2000. These assessments were made using a variety of analytical methods including age-structured models such as tuned sequential population analysis, separable virtual population analyses, non-equilibrium surplus production models, and modified DeLury Depletion models. The group used a stochastic extension of the 1997 bootstrapping-Monte Carlo, hybrid deterministic

model to evaluate more than 90 management options for the spotted seatrout fishery. We participated in a joint effort with the Fishery Dependent Monitoring group to summarize historical landings, catch rates, regional stock assessments, and age and growth, reproduction for dolphin, *Coryphaena hippurus*, for the FWC's Division of Marine Fisheries.

Members of the assessment group also serve on several state and federal committees charged with reviewing assessments of marine species in the Gulf of Mexico and along the Atlantic coast. In 2000, we participated in the Gulf of Mexico Fishery Management Council's assessment of the condition of red drum, reef fishes, and mackerels; the Atlantic States Marine Fisheries Commission's assessments for bluefish and weakfish, and the Gulf States Marine Fisheries Commission's Stock Assessment Team and FIN Data Collection Work Group. Members of the group continue to supply technical advice to other researchers in and out of the FWC and to participate on graduate student committees. We also provided peer review for articles submitted to *North American Journal of Fisheries Management*, *Transactions of the American Fisheries Society*, *Fishery Bulletin*, and *Bulletin of Marine Science*. The *North American Journal of Fisheries Management* accepted a paper on nearshore red drum adults for publication and manuscripts on pinfish and spotted seatrout life history were submitted to *Fishery Bulletin*. We organized and recruited speakers for a session on the effects of bag and size limits for the American Fisheries Society's Southern Division meeting held in February 2001. We participated in the review of the Atlantic menhaden stock assessment for the Atlantic States Marine Fisheries Commission, a review of the gulf menhaden stock assessment for the Gulf States Marine Fisheries Commission, and attended the multi-species panel meeting for the Atlantic States Marine Fisheries Commission.

We conducted a pilot study that used an airborne sensor (LIDAR) to assess the biomass of baitfish schools off Tampa Bay and Charlotte Harbor. During December 4-5, LIDAR flights were made west of Tampa Bay, and during December 6-8, LIDAR flights were conducted off Charlotte Harbor. We contracted with a commercial spotter pilot to be in the plane so as to be able to help locate, identify, and quantify bait and mullet schools. The flights coincided with cold fronts; and we were able to document and quantify offshore mullet schools as well as mixed bait schools and schools of blue runner. The

digital acoustic data supported the LIDAR. This work demonstrated the feasibility of using LIDAR to survey Florida's shelf quickly and inexpensively.

The group also continued investigating or developing new stock assessment methodologies. A team of consultants met together at FMRI during 2000 to develop and review ECOSIM and ECOSPACE models for the nearshore eastern Gulf of Mexico marine communities. We organized and ran a workshop on incorporating hermaphroditism into stock assessment in September 2000. Researchers from Australia, Woods Hole, University of Florida, Florida State University met the stock assessment group September 18-20 to discuss techniques for integrating hermaphroditism into stock assessments. The outcome was that species such as groupers (*protogynous hermaphrodites*) were more problematic because of the potential to have sperm limitation whereas species such as snook (*protandrous hermaphrodites*) were considered less of a problem because management measures typically the use female biomass. The group identified possible methods of incorporating sex-allocation models into stock assessment models.

RESOURCE HEALTH AND ASSESSMENT

Environmental Monitoring and Assessment

A statewide estuarine monitoring initiative known as IMAP (Inshore Marine Monitoring and Assessment Program) began sampling in summer 2000. Funded by Environmental Protection Agency (EPA) through 2004, IMAP builds on the EPA's Environmental Monitoring and Assessment Program (EMAP) to allow a statistically-valid assessment of ecological condition in Florida's nearshore waters using a set of physical, chemical, and biological indicators. Florida's effort is a single component of a nationwide assessment initiative known as Coastal 2000. These indicators include water quality measurements, fisheries, macrobenthos, and submerged aquatic vegetation (SAV) community structure, contaminants in sediment and fish tissue, and presence of heterotrophic dinoflagellates in sediments. The sample design is two-tiered, consisting of a broad-scale statewide grid and smaller-scale sampling units within the five Water Management Districts. The inshore marine monitoring and assessment program (IMAP) will be coordinated by staff of the Florida Fish and Wildlife Conservation Commission's Florida Marine Research Institute (FMRI), headquartered

in St. Petersburg, FL. The FMRI operates field labs in Melbourne, Marathon, Charlotte Harbor, Tampa Bay, Cedar Key, Tequesta and East Point (Apalachicola). These field labs will be used as bases of operation for implementing IMAP statewide. Preliminary results for 2000 IMAP sampling are summarized in the IMAP Year 2 Annual Report, which is available on FMRI's web site.

Coral Reef and Hardground Monitoring and Assessment

During the past year, the fifth annual sampling of 43 previously established reef sampling sites from Key Largo to Dry Tortugas was conducted by Coral/hardbottom Monitoring Project (CRMP) scientists.

Researchers are using a combination of species count methods and video to document coral species richness and cover of stony coral and other selected benthos to determine change over time. Point count analysis of video data for 1996 through 1998 was completed and statistically analyzed. Sanctuary-wide, the project documented a 38% loss of stony coral cover during this time. Initially funded for five years by EPA, the grant, managed by FWC Florida Marine Research Institute, has been extended through FY 00/01 with NOAA joining EPA in funding the research for the last two quarters of the year.

FMRI continues to provide expertise in surveys and litigation of ship groundings. Funds from the Hind grounding have provided additional staff and equipment necessary to conduct the work. Contracts have been funded through FMRI to conduct restoration and monitoring of the Hind site through summer 2001.

Staff will be assisting the South Atlantic Fishery Management Council in their deliberations relative to Marine Reserves. Federal Essential Fish Habitat regulations have been given high consideration in FMRI's review of the natural gas pipeline mitigation plan for the Gulf of Mexico and Tampa Bay. Staff also continue to provide technical expertise to the Florida Keys National Marine Sanctuary and the state of Florida in reviewing collecting permit requests, and zoning issues.

Aquatic Health

The Aquatic Health Group (AHG) is involved in a multi-disciplinary project, the Tampa

Bay Red Drum Stock Enhancement Project, which began in January 2000. Staff monitored the health and survival of cultured juvenile red drum that were stocked into two Tampa Bay tributaries. Varying environmental conditions, husbandry techniques, and parental fitness can have significant health impacts on fish in captivity and ultimately on the survival of cultured fish once they are released into the wild. AHG staff prior to release into the wild evaluates a sub-sample of fish from each culture batch for selected health criteria at least twice. Additionally, an independent veterinarian prior to release certifies fish. Fish are examined externally and internally for abnormalities, signs of disease, and parasites. Three hundred fifty-two red drum from SERF and 327 wild or recaptured hatchery-reared red drum from the Alafia River were evaluated. Fish health data from this long-term project will help determine if stock enhancement in a large marine ecosystem is feasible and effective.

Six hundred thirty-four calls were made to the statewide marine fish kill hotline (1-800-636-0511) in 2000. Five hundred thirty-three of those callers reported fish kills, fish with parasites, other aquatic mortality or disease events, or requested information. During 2000, the AHG investigated twelve fish kills west central Florida. Ten of the fish kills were related to low dissolved oxygen levels in the water. The others were related to a cold water kill in February and a suspected chemical spill that was jointly investigated with FDEP in a tidal creek of the Manatee River in December. Three hundred fifty-two fish were submitted to the AHG for health evaluations; most were collected by other FMRI research groups. Species included snook, mullet, hardhead catfish, grouper, pinfish, shad, and snappers.

An automated bacterial identification system, Biolog Microlog™, has greatly increased our capability to identify bacteria from diseased fish and other aquatic organisms. This system has the capacity to identify many environmental bacteria including *Vibrio sp.* We are able to accurately identify bacterial pathogens based on a particular metabolic fingerprint. If we are unable to positively identify an isolate, we are able to store the pattern produced by the bacterium into a data base we create. If that particular microbe should occur in one of our samples again, we will know since we have its metabolic pattern stored in our ever-expanding data base.

Harmful Algal Blooms (HAB)

The Red Tide Monitoring Program, ECOHAB: Florida projects and Task Force contracts continue to be the primary focus of the Harmful Algal Blooms group. Red tide in Southwest Florida is historically a well-documented event, with red tides in almost every year since the increase in monitoring during the 1970s. In October 2000, Dr. Steidinger gave a presentation on occurrence and effects *Karenia brevis* blooms, at the Harmful Algal BloomS Observing Systems Meeting (HABSOS), Pensacola Beach, FL. This presentation highlighted much of the scientific data gathered from this monitoring. Also this year, the successful implementation of an FMRI-coordinated volunteer sampling program improved HAB monitoring around the state. A poster on this program was presented at Woods Hole (WHOI) in December. Volunteer monitoring also led to the identification of *K. brevis*-like species in bloom concentrations. The two species, not usually seen in our waters were *K. cf. selliformis* and *K. cf. papilionaceum*. Staff are attempting to isolate clonal cultures of these cells for toxin, genetic and life cycle analysis. At the December WHOI meeting, a poster was presented on our phytoplankton isolation and culture collection methods. This year, aside from the ECOHAB cruise samples and routine live samples from state agencies (numbering 1,126), twenty volunteers submitted 281 fixed samples from around the state. There were sustained red tide blooms in both Northwest and Southwest Florida during 2000. The former led to shellfish bed closures until the brevetoxin levels in the meats fell below closure limits. We have put into place alternative methods to the mouse bioassay for brevetoxins and other algal toxins. In association with our collaborators, we hope to have an acceptable method proposal for FDA in the near future. Using these methods our labs analyzed tissue samples from the shark die-off in the Panhandle. While brevetoxins were present, we are still working on analyzing a cross-section of tissues and species to determine a normal or background toxin level in a given species. Aside from red tide, we also investigate other microalgal or phytoplankton bloom formations and events related to marine mortalities, fish kills, or lesioned fish. The flagellate, *Chattonella*, associated with fish kills is such an example. It had been found in Florida waters and again this year. The *Alexandrium* and *Certium* blooms in Tampa Bay this year are another example. Finally, as part of our preparation for ECOHAB 2001 cruise samplings, we began the development of new technique. It involves the isolation of dinoflagellate cysts from sediment samples. This

might be a vital tool in determining the life cycle of these cells.

The accessibility of data among colleagues, collaborators, and the public has been a long-term goal of ECOHAB: Florida. This fits well with the FMRI Strategic Plan. To this end, we continue to work on the Historical Red Tide Data Base. This data base will have query abilities. It will include the metadata of 30 Principal Investigators and associates. At year's end 2000, we were only missing 11. Work began on the CD, which will be available for distribution in 2001. HAB outreach continued this year. Colleagues either visited our labs for instruction or submitted samples for our analyses or interpretations. We also began planning the annual conference on Harmful Algal Blooms to be held at the Tradewinds Resort, St. Petersburg Beach, October 2002. We also began organizing an informal phytoplankton course to be held at FMRI during mid 2001. We concentrated some of our efforts on launching the new FMRI Red Tide Website. Due to the high number of "hits" the old site usually received, attempt was made to make the site "user-friendly" and answering most FAQs. Among other things, it will include up to the moment maps of red tide cell sampled counts around the state.

The Florida Marine Research Institute administered over a dozen contracts in accordance with The Harmful Algal Bloom Task Force recommendations. They included contracts for increased survey work and toxin analyses, development of new toxin detection techniques, development of molecular probes for species and toxins, identification of bioactive compounds produced by *Pfiesteria*-like organisms, economic loss assessment, testing of fish removal machinery at sea, public health risks of red tide aerosol, and survey of toxic blue green algae blooms in Florida waters.

Other projects that continue involve the monitoring for *Pfiesteria* and *Pfiesteria*-like organisms in Florida coastal waters. At the CDC conference in Atlanta, Dr. Steidinger presented a talk on the morphology and genetics of these species. A manuscript on the same is in preparation. As an extension of this project, a monitoring laboratory was established at the St. John's River. Work also continued on a deployable, autonomous sensing platform. In 2001, it be should possible for anyone to access this platform via an "800" telephone number for up to the moment water and atmospheric data. This

too, fits well with the FMRI Strategic Plan. Articles on this project can be found on the red tide portion of the FMRI website: www.florida.marine.org.

Habitat Assessment and Restoration

Habitat assessment projects seek to assess the ecological status of coastal fisheries habitats, are identifying physical and biological factors that stress coastal plant communities, and are evaluating trends in coastal ecosystem health. FMRI staff are also developing ecologically and economically sound practices, materials, and recommendations for coastal habitat restoration to enhance fisheries, promote shoreline protection, and enhance water quality statewide. Although work activities are conceptually divided between assessment and restoration, staff within this work group conducted research related to both topics. Seagrass disease associated with the pathogenic slime mold known as *Labyrinthula* is also being studied, and the effect of this pathogen on seagrass mortality is being determined. Staff are also evaluating biological monitoring techniques to assess environmental stress and estuarine health.

FMRI staff members participating in habitat assessment research are 1) developing methods to measure those characteristics (ecoindicators) that may be used to document status and trends in the ecological and physiological condition of vegetated fisheries habitats, 2) assessing scale-based variability in seagrass ecoindicators in selected regions, 3) determining the effects of salinity on the growth and survival of turtle grass (*Thalassia testudinum*) and widgeon grass (*Ruppia maritima*), 4) measuring plant and sediment characteristics that can be used to assess Florida Bay's status, 5) evaluating the different conclusions that may result from qualitative versus quantitative assessment data, 6) determining the effects of propeller scarring on seagrass associated fauna, and 7) determining the distribution of the pathogenic slime mold *Labyrinthula* on seagrass in Florida Bay and its role in seagrass mortality.

FMRI staff members participating in habitat restoration are conducting research to 1) develop tissue culture techniques to produce seagrass planting units in the laboratory, 2) evaluate alternative methods to ensure survival of planting units at restoration sites, 3) develop an artificial aquatic system for experimental manipulation of submerged and intertidal plant communities, and 4) assist resource managers in

evaluating sites and designing restoration plans.

FISHERIES STOCK ENHANCEMENT

During 2000, stock enhancement of finfish continued to focus on red drum (*Sciaenops ocellatus*) and common snook (*Centropomus undecimalis*) while molluscan enhancement projects target queen conch (*Strombus gigas*).

The project to restore red drum in Biscayne Bay is completed other than continued monitoring of creels to identify hatchery released fish. This project is conducted in partnership with Mote Marine Laboratory (MML) and Dade County Environmental Resources Management. Tracking and locating fish is accomplished using angler intercepts, traditional fishing methods and gear, and the use of sonic-tagged fish.

The Tampa Bay red drum stock enhancement project continues. This project is designed to more clearly answer the questions of size at release, season of release, and release habitat as well as improve the catch rates of red drum by recreational anglers by 25%. This program is a collaboration with three other FMRI programs. Our Fisheries Independent Program is monitoring short-term survival of wild and hatchery raised fish. The Fisheries Dependent Program is monitoring recreational fisherman's creels for wild and hatchery fish. The Fisheries Biology, Genetics Program is responsible for the identification of recaptured fish that were either too small to tag in other ways or lost tags. This collaboration will help us identify appropriate release habitat and provide a mechanism for tracking the fish from the time they are released through their entry into the fishery at minimal additional cost.

A pilot project to develop and evaluate release and sampling strategies for common snook in Sarasota Bay and southern Tampa Bay, begun in 1996, continued through this reporting period. This project is a partnership between MML, National Marine Fisheries Service and FWC. Approximately 38,000 hatchery-reared snook have been released, the majority in Sarasota Bay and the remainder in southern Tampa Bay. Most of the snook released were reared at Mote Aquaculture while approximately 1,100 were reared by FWC and Harbor Branch Oceanographic Institution. MML staff, with assistance from Washington Department of Fish and Wildlife, tagged all snook released.

The queen conch restoration project, located at the FWC Keys Marine Laboratory, continued through this reporting period. This project, begun in 1990, is designed to assist with rehabilitation of Florida's queen conch stock by releasing hatchery-reared animals in the wild. Additional information on this project can be found in the South Florida Regional Laboratory portion of this report.

Health Management and Disease Control

The primary objective of health management and disease control is to produce animals that are healthy and well adapted for survival after release into the wild. This serves to maximize the potential for successful stock enhancement, as well as to protect public health and our marine resources. A secondary objective is to minimize disease-related mortality during culture in order to maximize production efficiency. Our health-management program is effective and the objectives are being met.

Effective health management consists of: 1) superior husbandry, 2) constant disease surveillance, 3) refining handling and culture methods to minimize stress and disease, 4) testing and refining of treatment methods, 5) health training and information for staff, interns, volunteers, and aquaculturists, and 6) interaction and coordination with regulatory agencies, aquaculturists, and fish-health professionals.

Superior husbandry is focused on the needs of the animal and is fully integrated with other areas of hatchery management. It avoids disease by detecting and correcting conditions before they lead to disease. Protocols that exemplify superior husbandry are prepared, tested, refined, and made available to train staff, interns, volunteers, and aquaculturists.

Constant and comprehensive disease surveillance is necessary to detect developing disease conditions while stocks are still at a treatable stage. Advanced diagnostic methods and tools have been used as necessary to characterize a disease or pathological condition, e.g. necropsy, histology, light or electron microscopy, and bacterial culture. Diagnostic methods have been adapted to the unique health problems of each life history stage including eggs, larvae, juveniles, subadult, and broodstock. Thirty-two health reports were prepared and distributed during 1999. Most reports were necropsy-based evaluations of subadult or younger red drum. Red drum parasites

and disease conditions encountered in 1999 included *Amyloodinium*, *Caligus*, *Trichodinella*, *Trichodina*, *Cryptobia*, peritonitis related to internal anchor and sonic tagging, spinal cord damage from dart tag insertion, systemic *Vibrio* infections, and gas bubble disease. Early disease detection has resulted in reduced mortality and improved production efficiency. Finfish aquaculturists have been provided with information on our disease surveillance methods.

Our culture methods are continuously being refined in order to minimize stress and disease. When major stressors, such as those associated with harvest, handling, tagging, transport, and anesthesia are identified, methods are developed to reduce or mitigate them. Husbandry-based best management practices are identified and incorporated into the culture process. Reduction in some of the major culture stressors has resulted in an overall improvement in the health and vigor of released stocks. This has facilitated the survival and adaptation of cultured fish in the wild and improved the cost effectiveness of stock enhancement.

Many new disease treatment methods have been developed and tested over the past decade. The most lethal parasites, such as *Amyloodinium* in red drum, are now largely under control after application of various experimentally derived treatments and parasite-prevention strategies. Likewise, control of opportunistic bacterial diseases is improving; however, debility and mortality due to bacterial infection is still a serious problem. Red drum losses due to *Vibrio* infections have been significant for all stages of development except broodstock. *Aeromonas* infections can also be a problem during low-salinity culture. Bacterial monitoring of both red drum and bay scallop larvae is intensive while incubators are in use because larvae are typically more susceptible to bacterial infection than any other stage. For example, mortality of scallop larvae routinely exceeds 99% within a few days after hatch. This mortality is usually associated with *Vibrio* proliferation. Probiotic and environmental methods of bacterial control are being developed as safe and inexpensive alternatives to antibiotic treatments, which have limitations, related to resistance, residues, withdrawal times, toxicity, and cost. There is a serious need for more applied bacterial research, particularly collaborative efforts that cross-traditional institutional barriers. As better bacterial control methods are developed for red drum and scallops, they will be applied to other species of

aquaculture interest. Research results will be published in peer-reviewed journals to widely disseminate data necessary to support more successful commercial aquaculture and stock enhancement of finfish and bivalves.

Hands-on health training, phone consultations, written material, and other forms of health support have been made available to SERF staff and outside aquaculturists. This training has been integrated with the outreach and training efforts of other groups, such as University of Florida/Institute of Food and Agricultural Sciences, whenever possible. Consultations and other forms of health support have provided stakeholders with up-to-the-minute health data that may not yet be available in publications or is otherwise not readily accessible.

Interaction and coordination with other regulatory agencies, aquaculturists, and fish-health professionals have been maintained to ensure the best available health information and support reaches the stakeholders. Health policy and certification requirements related to marine stock enhancement are still slowly evolving with input from many sectors. We are encouraging diagnosticians to become more directly involved with the culturists and their culture system, including site visits and the immediate diagnostic evaluation of fish that become diseased during culture. We are assisting the Florida Department of Agriculture and Consumer Services as they develop policies and rules related to health and best management practices in commercial aquaculture.

ENDANGERED AND THREATENED SPECIES

Marine Mammals

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

Manatee Mortality

Watercraft-related Deaths. During 1999, 30% of the manatee deaths (82) were a result of collisions with watercraft. As in years past, the majority of deaths resulted from impact with watercrafts and not being cut by the propellers. The county leader of watercraft-related deaths for 1974-1999 was Brevard County with 171. Lee County was second with 114. In 1999, Brevard had the highest number of watercraft-related deaths with 12. Lee and Collier counties were the second highest for 1999 with ten each.

Flood Gates/Canal Locks. Deaths resulting from entrapment in water-control structures and navigational locks totaled 15 for 1999. The greatest number of deaths since 1974 have occurred in Dade County. During 1999, Dade County also led the state in structure deaths with five. Martin County came in second with four.

Other Human Related. Deaths categorized as "Other Human-related" accounted for eight deaths in 1999. Only one other year has surpassed this total, with nine in 1979. Human-related deaths are those that are caused by entanglement in man-made materials (i.e., monofilament line, crab traps, etc.), entrapment in culverts and pipes, ingestion of foreign materials, trauma from unknown origin, poaching, and others. Historically, Dade County has had the greatest number of deaths attributed to various human activities with 24, followed by Brevard County with 15. During 1999, Dade County was highest for the year with three other human-related deaths.

Perinatal. Deaths of perinatal manatee's (52) comprised 19% of the deaths during 1999. The majority, 67%, of these carcasses were in bad condition, and none of these showed signs of trauma. Carcasses were most frequently recovered from Brevard County (15), 29% of the annual total. The county with the second most frequent number was Lee (14). Brevard County also led the state for the most perinatals for the past 26 years with 203. Lee County was second with 107.

Natural. Natural-related deaths are those attributed to cold stress, red tide toxicity, infectious and non-infectious diseases, birth complications, and natural accidents and catastrophes. Natural-related deaths accounted for 16% (43) of the deaths in 1999. Brevard County had the highest number with nine, followed by Lee County with six. Historically, Lee County ranks first in total deaths from natural causes with 161. Brevard County is

second with 127.

Undetermined. The majority of carcasses in the undetermined category are so badly decomposed that a cause of death can not be determined. Deaths in the undetermined category comprised 69 of the total in 1999. Brevard County led the state with 16% (11). Overall, from 1974-1999, Lee County was the leader with 216 total, and Brevard County was second with 206.

Manatee Population Monitoring

Aerial surveys are an important method for acquiring information on manatee distribution, relative abundance, and use of habitat types. Synoptic aerial surveys of all manatee wintering habitats in Florida and southeast Georgia are useful in determining a minimum manatee population estimate. Data from aerial surveys, mortality, life history, and ecology studies are being combined to create a population model that will estimate trends in regional population sizes. Two inter-agency synoptic manatee aerial surveys were flown in 2000; January 16 numbered 1,629 manatees and January 27 numbered 2,222 manatees. These counts were somewhat lower than the 1996 synoptic counts, which had a high count of 2,639 in February 1996, probably due to a warmer winter. Teams totaling 40 observers from 17 state, federal, and county agencies, research labs and universities, searched for manatees in 26 areas on both coasts. Observers were 20 aircraft or ten ground teams and counted manatees at power plants and waterways. Sightings from aerial surveys are rapidly entered into the GIS system for analysis. Thirty-eight aerial data sets are now available to users on the new manatee GIS CD-Rom, with additional data sets in preparation. Tandem aerial surveys were conducted in Sarasota County to estimate manatees missed in year-round distribution surveys. Two planes, from FWC and Mote Marine Lab, covered the same route 30 minutes apart to compare the two counts and estimate the number of manatees missed using mark-recapture methods. An innovative study to calibrate winter aerial counts at four Tampa Bay power plants was conducted. Replicate counts were made to test our survey procedures, assess their accuracy, and to better track population trends. A total of 49 flights were made from November 2000 to March 2001. Flights were made twice per week from November to March and before and after three cold fronts. The power plants were counted twice each day. Ground and boat counts were also made for comparison on some days.

New innovations included five radio-tagged manatees that had time-depth recorders, and 15 manatees with identifiable marker flags. Time-depth recorders estimate the fraction of time manatees were below the surface. Radio-tags show when manatees left the powerplants to feed. These flights are designed to calibrate the aerial counts and estimate the proportion of manatees missed. The purpose was to determine the best time to do surveys, when manatees can be most accurately counted. The surveys document the variability in counts and the effects of weather, air and water temperatures, time of day, and different observers on counts. Manatee adult survival rates are being estimated for the first time from photo-identification data from Tampa Bay and southwest Florida. Over 7,000 photos of recognizable manatees since 1983 are being analyzed.

Ecology and Migration

Research on how manatees use the coastal habitats of Florida is essential to understanding what resources the population requires to expand and flourish. By following the movements of individual manatees in fresh, brackish, and saltwater habitats, valuable information is obtained about manatee behavior, migratory routes, and preferred habitats. Researchers place satellite and radio transmitters on manatees using a belt fastened around the narrow part of the tailstock and attach a floating transmitter housing to the belt. Signals from the satellite transmitters are processed by a commercial satellite service and delivered to FMRI daily via the Internet. Research teams working in the field use the satellite locations to determine general areas where manatees are located and then use the VHF radio signals to find the individual manatees. Staff can then observe the manatee and record its behavior and movements.

Rehabilitated manatees were tagged and monitored to assess the success of their introduction or reintroduction to the wild. Five rehabilitated manatees were released from captivity during this fiscal year. The rehabilitated animals included three orphaned manatees in captivity from three-six years and two captive-born manatees in captivity five-six years. One orphan was released into Salt Creek, a tributary of the Myakka River in Charlotte County, on January 28, 2000. Warm Mineral Springs is located at the end of Salt Creek and approximately 30 manatees use it as a wintering site. The remaining orphaned and captive born manatees were released into

Everglades National Park on March 15, 2000. Three manatees still tagged were captured for a health assessment two to three months after their release. They were in good health and released back into the wild. At the end of the fiscal year, only two of the five animals released continued to be monitored.

Life History and Biology

Information on aspects of manatee life history is essential in formulating an assessment of manatee population dynamics and recovery. Data on long-term growth and survival of individuals, reproductive capability of mature females, and health of wild manatees are essential to a population model and comes from a variety of research projects including the photo-identification catalog, use of passive integrated transponder tags, and non-invasive body condition indices. The FMRI partners with the USGS Sirenia Project and Mote Marine Laboratory to co-manage photo-identification catalog data collected in the southeastern United States. FMRI actively collects data on the west coast of Florida from areas extending from Tampa Bay to the Everglades and on the east coast from areas near Jacksonville, Tequesta, and Melbourne. The FMRI also has cooperative agreements with Lee County Parks, the National Park Service, the US Corps of Engineers, and others to assist with manatee-related photographic and environmental data collection. The West Coast portion of the catalog includes more than 3,000 images and 7,000 sighting records representing 591 fully photo-documented, scarred manatee individuals

Geographic Information Systems

Staff working on the MMGIS continued to create numerous manatee spatial data layers including carcass recovery sites, aerial survey locations of manatees and right whales, and locations of animals tracked by satellites. The MMGIS staff worked with both research and management project teams to provide manatee data and analyses for manatee protection and ecosystem management. Staff used analysis tools in GIS to estimate manatee and right whale density and distribution from aerial survey observations.

Work was initiated to characterize statewide boat-strike manatee mortality. This work, so far, involved two characterizations. The first is a fixed-grid method where a grid is draped over a map of manatee boat-strike deaths, and the total counts/cell are determined. The problem with

this method is that the positioning of the grid is arbitrary and can greatly influence the result. This problem was resolved by combining the results of several fixed grid maps where the grid was positioned randomly, the result being a contoured boat-strike characterization. The second characterization is a nearest-neighbor method based on Thiessen polygons. Thiessen polygons are generated by drawing lines that evenly separate points, in this case boat-strike carcass recovery sites and continuing the lines until they intersect with another line. The result is a map of polygons formed around the points of interest. Points clustered together will result in many small polygons. One problem with this method is that polygons are drawn with respect to the points only, not to other features of the landscape, such as land. This problem was solved by creating an algorithm such that Thiessen polygons could only be drawn in manatee habitat. Future work will involve including these characterizations as part of a multivariate assessment of manatee boat-strike mortality, manatee habitat, and human uses.

GIS staff are members of the manatee Warm-water Task Force. The Manatee Warm-water Task force was formed under the auspices of the manatee recovery plan to address issues associated with the ephemeral nature of anthropogenic warm water discharge sites. One task identified by the group was the development of a model that estimates effects on manatees of different scenarios of warm-water shutdown. Such a model was considered necessary, because of the complexity of the manatee/warm-water relationship — there are an infinite number of weather, water temperature, and warm-water discharge scenarios that can occur and influence manatee distribution and abundance. Capturing the variation of these scenarios from field data and being able to quantitatively associate them with changes in manatee distribution and abundance is logistically unrealistic. A model can fill this void by generating simulations of different combinations of environmental variables and estimating the effects on manatee distribution and abundance. Ultimately, this model will be applied in an adaptive management framework with the goal of minimizing the effect to manatees from the eventual cessation of industrial warm water.

FMRI GIS staff are making significant efforts to build a comprehensive GIS for right whale managers and researchers. Biological and human-related data bases including right whale sighting locations; various agencies and organizations have collected survey effort and ship

locations. These datasets have been incorporated into GIS to help illustrate areas where right whales inhabit and describe ship traffic patterns in and near critical whale habitats. Ship traffic information generated from the federal Mandatory Ship Reporting Systems has been an important focus of our work over the past year. Ship strikes are a significant factor contributing to the slow recovery of rights whales. We hope that these analyses will assist in identifying steps needed to reduce this threat.

Other accomplishments included: acceptance of a manuscript entitled: "Applying a variable-shaped spatial filter to map relative abundance of manatees (*Trichechus manatus latirostris*)" by R. Flamm, L. Ward, and B. Weigle and two meetings of the Manatee GIS Working Group which continued to focus on application development, data sharing ethics, habitat analyses, and several presentations at professional conferences and workshops.

Right Whales

Florida manatees are not the only endangered marine mammal of concern for Fish and Wildlife Conservation Commission staff at the Florida Marine Research Institute (FMRI). Staff involved in the FMRI's Right Whale Conservation Project focus on efforts to aid in the recovery and protection of the endangered North Atlantic right whale. Right whales are the most endangered large whale in the world, and the North Atlantic population contains less than 350 individuals. The National Marine Fisheries Service (NMFS) coordinates the recovery effort and in 1991 published the Final Recovery Plan for the Northern Right Whale (*Eubalaena glacialis*). North Atlantic right whales range from Florida to Nova Scotia (Canada) with individuals ranging as far north and east as Labrador, Iceland, and Norway.

The coastal waters of Georgia and the Atlantic coast of Florida are the only known calving area for the species and were designated as one of three critical habitats in US waters in 1994 (SEUS). FMRI has conducted aerial surveys of Florida and adjacent waters since 1991 to monitor the seasonal occurrence of right whales. This effort focuses on alerting vessels to the presence of right whales within the southeast critical habitat. Right whales are individually distinct, and using photo-identification techniques, researchers can compile life histories of individual whales. On the calving ground, this includes knowing which females are giving birth, and how frequently. All

data collected during aerial surveys are incorporated into the FMRI's Marine Resources Right Whale Geographic Information System in St. Petersburg, FL.

As charter members of the multi-agency Southeast Implementation Team for the Recovery of the Northern Right Whale, FMRI researchers continue to monitor the calving ground for right whales and other endangered or threatened species, as well as develop educational material, give presentations and perform outreach activities. FMRI staff continue to organize a wide area communication network and work closely with the US military, private organizations, and the shipping and fishing industries regarding potential issues pertaining to right whales in the SEUS.

FMRI GIS staff are making significant efforts to build a comprehensive GIS for right whale managers and researchers. Biological and human-related data bases are included for right whale sighting locations; various agencies and organizations have collected survey effort and ship locations. These data have been incorporated into GIS to help illustrate areas where right whales inhabit and describe ship traffic patterns in and near critical whale habitats. Ship traffic information generated from the federal Mandatory Ship Reporting Systems has been an important focus of our work over the past year. Ship strikes are a significant factor contributing to the slow recovery of rights whales.

Marine Turtles

The FWC Marine Turtle Research Program is headquartered at the FMRI in downtown St. Petersburg. Additional staff is located in Jacksonville and at field stations in Melbourne and Tequesta.

Salvage, Rescue, and Necropsy. FMRI staff coordinate the Florida portion of the Sea Turtle Stranding and Salvage Network (STSSN), an 18-state program administered by the National Marine Fisheries Service (NMFS). A total of 1,169 sea turtle strandings were documented in Florida during 2000, 77 of which involved live animals. By species, there were 661 loggerheads (*Caretta caretta*), 330 green turtles (*Chelonia mydas*), 113 Kemp's ridleys (*Lepidochelys kempii*), 22 hawksbills (*Eretmochelys imbricata*), 20 leatherbacks (*Dermochelys coriacea*), and an additional 23 sea turtle strandings not identified to species. Staff reviewed, edited, and entered all stranding reports, responded to or coordinated the

response to more than 400 strandings, conducted gross necropsies on 122 of the carcasses, and collected organ samples from seven turtles to determine exposure to brevetoxin and/or okadaic acid. One fresh carcass was sent to the University of Florida for detailed pathobiology. Staff conducted several workshops around Florida to train STSSN participants in standardized data collection methodology, and created an internet ListServ in order to pass on current stranding data and information, and communicate with stranding permit holders. Florida stranding updates were provided weekly to NMFS for incorporation into the Sea Turtle-Shrimp Fishery Management Report. Detailed Florida stranding reports were generated monthly and included month-specific and year-to-date data by county and species. The narratives that were associated with each report addressed stranding trends by species and county and the most common and/or most notable carcass anomalies.

Population Monitoring. This long-term monitoring program involves the collection of nesting and habitat information throughout the geographic range of marine turtles in Florida. Approximately 90% of the world's largest loggerhead nesting aggregation occurs in Florida, and the green turtle nesting population is of one of regional significance. FMRI assesses nesting abundance and reproductive output by monitoring nesting beaches. A coordinated network of state, federal and volunteer permit holders gathers information. FMRI establishes scientifically sound monitoring designs, provides training, resolves data collection problems, assesses data collection error rates, analyzes data trends, and serves as a clearinghouse for information on marine turtle populations and habitats. Two overlapping monitoring programs are carried out, each with separate objectives.

The Statewide Nesting Beach Survey Program, initiated in 1979, achieves nearly complete coverage of the state's nesting beaches to provide data on total nest numbers, nest geographic distribution, and nesting seasonality for each species. Managers use results to minimize human impacts to turtles and nesting beach habitats, and to identify important areas for land acquisition or enhanced protection. In 2000, 180 survey areas were monitored, comprising 1,283 km of beaches. This program documented a total of 84,386 loggerhead nests, 8,404 green turtle nests, and 453 leatherback nests. FMRI disseminates results of the Statewide Nesting Beach Survey Program through scientific publications, presentations,

reports, the Internet, and the CD entitled "Florida Atlas of Marine Resources."

The Index Nesting Beach Survey program differs from the Statewide Nesting Beach Survey program in collecting more detailed data from a smaller set of index beaches. Staff conducting Index surveys identify each sea turtle track to species, identify the tracks as a nest or abandoned attempt, and locate nests within an approximate half-mile beach zone. Annual surveyor training, on-site verification, and consistency of the methods used during the twelve years of the program make the resulting data base a representative and unbiased assessment of sea turtle nesting. It is the most reliable indication of temporal and spatial trends in Florida sea turtle abundance. An analysis of these data was completed in 2000 and presented at the 21st Annual Symposium on Sea Turtle Biology and Conservation. Results showed that the annual number of loggerhead nests at the core set of index beaches ranges from 39,091-59,918 nests (mean 50,762); the annual number of green turtle nests at the core set of index beaches ranged from 267-6,240 (mean=1,759) and the annual number of leatherback nests at the core set of index beaches ranged 30-230 (mean=89). All three species showed significant increases in nesting on the 316-km of Index Nesting Beaches during the 12-year period.

Ecology, Life History, Migration. Most research on marine turtles has been conducted on the nesting beach although turtles spend only a small fraction of their lives there. Recovery efforts depend on a broad knowledge of population biology, life history, ecology, and migrations. Complicated turtle management efforts necessitate both long-term and international approaches to conservation. Ongoing projects in the Western Florida Current, Florida Bay, Bermuda, and Panama involve capturing live animals at sea. Studies target four species of marine turtles and several life history stages, and address population structure (including natural sex ratios), growth rates, genetic identity, life history, health, diet, habitat preferences, and migrations.

In 2000, FMRI captured and released 221 post-hatchling loggerheads in the Western Gulf Stream off Central Florida. Staff recorded physical oceanographic measurements, turtle behavior, the spatial relationships of turtles to floating objects and other organisms, turtle morphometric data, and evidence of ingested plastics and tar. These data help describe the importance of certain

oceanographic surface features to young sea turtles and help researchers understand threats to sea turtle survival that occur there.

In July 2000, FMRI sea turtle recovery staff, in cooperation with researchers from the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, attached satellite transmitters to five nesting loggerheads in the Panhandle and to nine nesting loggerheads in southwest Florida. The transmitters send the locations (latitude and longitude) of all of the turtles allowing staff to track post-nesting movements. This research focuses on locating the migratory routes and principal foraging habitat(s) of loggerheads that nest in Florida. Understanding migratory routes and locating foraging grounds will allow staff to determine threats and measures needed to protect the turtles and their habitats away from the nesting beach.

In late June, marine turtle staff conducted a rigorous ten-day sampling trip in Florida Bay resulting in the capture of 101 turtles (loggerheads, green turtles, and Kemp's ridleys). Each animal was measured, tagged, photographed, and released. Blood samples were obtained from most of the turtles and sent out for health assessment profiles. Twelve loggerheads and one green turtle had fibropapillomas. Two satellite tags were deployed on male turtles.

As part of a cooperative research project with the government of Bermuda, 64 immature green turtles were captured with nets, tagged, measured, and released in 2000. A hand-capture method was tested successfully for hawksbills, resulting in two captures. Over 2,000 green turtles have been tagged as part of this project which has been ongoing since 1968. DNA sequence data have shown that the one-third of the population of immature green turtles that inhabit Bermuda waters is derived from Florida nesting beaches. Two recaptures represented ten-year intervals, providing valuable information on growth rates, site fidelity, and residency times. Captures of conventionally-tagged turtles from this project have documented migrations to feeding grounds in Nicaragua, Cuba, the Dominican Republic, Panama, Venezuela, St. Lucia, and Grenada, showing the need for international cooperation in research and management of this endangered species.

A long-term study in Caribbean Panama continued in 2000 with the in-water capture of 12 green turtles, five hawksbills, one loggerhead, and the satellite tracking of an adult-mated pair of

green turtles. The female was monitored during her migration to the nesting beach at Tortuguero, Costa Rica, and her subsequent stay for several months at this site. The male also traveled to the nesting beach but then proceeded to the Miskito Cays area of Nicaragua, which is its apparent feeding ground. The satellite tracks provide information on migratory routes that are not provided by point-to-point tag returns and enables more effective management.

SPECIMEN INFORMATION SERVICES

The invertebrate and fish collections maintained by members of the Specimen Information Services group are recognized as important repositories of reference specimens, voucher specimens, and ecological data dealing with Florida's unique ecosystems. A properly maintained reference collection helps to ensure continuity, consistency, accuracy in taxonomic identification, and provides a trustworthy foundation for the veracity of the computerized portion of the long-term data base. It is vital for long-term monitoring studies that identifications be accurate, precise, and consistent. Without reference and voucher material to examine, the accuracy and reliability of the computerized portion of the data base comes into question.

During 2000, 2,543 invertebrate specimens were lent to 15 investigators at 12 domestic and three foreign institutions, and 16 other loans of 568 specimens were used for educational purposes. Similarly, 1,100 fish specimens were loaned to 15 investigators at eight domestic institutions, and 27 other loans of approximately 620 specimens were used for educational purposes. In addition to specimens loaned, 253 requests for information on specimens and/or field data associated with specimens were processed in 2000, 157 requests for assistance were handled, and 20 requests for educational material resulted in the distribution of 3,828 Specimen Information Services packets. In 2000, 2,325 lots of invertebrates containing 10,875 specimens and 248 lots of fishes containing approximately 785 specimens were accessioned into the collections.

The Gulf of Mexico Ichthyoplankton Survey was initiated in 1982. The Institute is the designated repository for the program, which is funded by SEAMAP. The Ichthyoplankton Collection, now one of the largest collections dedicated to ichthyoplankton in the United States, is an important resource for state and federal

managers, educators, and ecologists throughout the southeast U.S. The collection currently contains more than 200,000 lots of larval fishes. One fall sampling cruise was planned and successfully completed during 2000. All of the cruise data, both biological and hydrographic, has been processed and sent to the SEAMAP data manager for inclusion in the Oracle system. The biological samples have been processed and delivered to the NMFS Pascagoula laboratory for shipment to the Polish Sorting Center. Samples collected during 1998 and 1999 representing twelve cruises were received from the Polish Sorting Center in 2000. Approximately 50,000 additional lots were shelved in 2000. A total of 71 loan and information requests were processed during 2000.

Members of the SIS group provide QA/QC services to researchers in the Florida Fish and Wildlife Conservation Commission (FWC) and provide technical advice and assistance to researchers in and out of the FWC.

COASTAL AND MARINE RESOURCE ASSESSMENT

The FMRI's Coastal and Marine Resource Assessment (CAMRA) group continues to support the Florida Fish and Wildlife Conservation Commission (FWC) through the application of geographic information systems (GIS) and remote sensing technologies. Issues relative to habitat protection, user conflict, and seafood quality vary among regions requiring geographically targeted policy responses. CAMRA developed the Resource Impact Map (RIM) series of eight chart-sized maps to assist the FWC statewide in making shrimp and crab fishery-related resource decisions. Today these paper maps have been replaced by laptop PC-based GIS applications, which allow for interactive participation during commission workshops by all concerned individuals.

An electronic logbook (ELB) system was developed and is being evaluated by the Florida Marine Research Institute (FMRI) in collaboration with a shrimp company and an electronics firm in Tampa, Florida. The system synoptically compiles real-time catch, effort, and associated environmental data gathered by a CTD data logger. A Vessel Monitoring System (VMS) integrated with the ELB captures geographic positions and transmits the data records by OrbComm satellites to the shrimp company main office in Tampa and FMRI in St. Petersburg. The system was tested on three shrimp vessels for five months. The data

collected were analyzed to determine the spatial distributions of shrimp species in relation to environmental variables (salinity, temperature, depth, and bottom type) to determine the environmental conditions associated with high shrimp catches off the west coast of Florida. Habitat affinities are being determined, and habitat layers and species distributions were created as maps using geographic information systems.

FMRI, in partnership with the South Florida Water Management District (SFWMD), is documenting the distribution of submerged aquatic vegetation within Pine Island Sound, Matlacha Pass, San Carlos Pass, the lower Caloosahatchee River, and Estero Bay. Aerial photography was obtained in December 1999 when conditions were optimal. During 2000/2001 the photography was interpreted and field verified by a contractor according to specifications established by FMRI and SFWMD. The contractor then created ArcInfo GIS layers, which were delivered to FMRI and SFWMD. FMRI intends to use these habitat layers in work being done to determine essential fish habitat as well as base line data for future "status and trends" analysis. This work supports FMRI's BlueWays project which is aimed at supporting marine resources managers through the development of a comprehensive model that incorporates ecological, human use, and management frameworks.

Another research program with strong ties to BlueWays is habitat suitability modeling. An interagency team consisting of staff from FMRI, the University of Miami, and the NOAA/NOS Center for Coastal Monitoring and Assessment have developed new methods to geographically predict fish/habitat distributions. Data sets derived from fisheries-independent monitoring (FIM) conducted by FMRI staff were used to standardize catch rates (CPUEs) among gear types. Polynomial regression models were developed to determine abundance-based suitability curves across environmental gradients. Methods were also developed to spatially average point data using a GIS to create habitat-layers for temperature, salinity, depth, and bottom type. The abundance indices applied to the habitat layers were used in raster-based habitat suitability models using the ArcView-GIS Spatial Analyst module to produce maps which predict the seasonal distributions of Spotted Seatrout (*Cynoscion nebulosus*), Pinfish (*Lagodon rhomboides*), and Bay Anchovy (*Anchoa mitchilli*) by life stages in Tampa Bay and Charlotte Harbor. The models are being refined to predict mean densities by zones in

estuaries with and without fisheries monitoring. The research is being expanded to determine habitat affinities of additional fish and macro-invertebrate species in Florida estuaries.

DATA ACCESS

Through the Data Access Initiative, three contracts were obtained with outside vendors to assist with three distinct projects. The first contract is for Oracle programming services to code enhancements to the current Fisheries Dependent Monitoring production application. The second contract is for Oracle design and programming services to create a new application for the Fisheries Independent Monitoring program. The third contract is for web services to integrate a redesigned Information Request System with FMRI's new website. Additionally, the Data Access Initiative group created the Data Access Manual which outlines all FMRI data base standards including naming conventions, standard table structures, common table structures, software requirements, hardware requirement minimums, archiving requirements, metadata requirements, and design requirements.

The institute's protocols for metadata are included in the FMRI *Data Access Manual*. The FMRI-wide metadata implementation began last quarter with training for the IS&M section on Federal Geographic Data Committee compliant metadata and the use of the Spatial Metadata Management System (SMMS) software. Ninety corporate data layers are being documented for inclusion in a FMRI Interactive Map Server. The Fisheries Independent Monitoring section will be the next section to be trained. Each FMRI section will be trained and a point person will be charged with overseeing that section's data documentation. The corporate metadata for FMRI will be promoted to an SMMS data base on an Oracle server after QA/QC is completed.

FMRI staff continues similar activities in various regions of the state to support the Commission on an ad-hoc basis.

SOUTH FLORIDA REGIONAL LABORATORY

The spiny lobster research program continues to monitor harvest and other important fishery components for all three-user groups harvesting spiny lobster. During the 1999-2000 fishing season (August 1999-March 2000), we completed 71 onboard surveys of the commercial

lobster fishing vessels. Landings were 7.6 million pounds, the highest landings recorded within the last ten years. The landings estimate for the 2000-2001 fishing season is 5.5 million pounds, considered low but within normal range of variation. Recreational lobster license holders returned nearly 2,000 surveys, and preliminary estimates indicate that 407,000 lobsters were harvested by recreational fishers during the special two-day sport season. These fishers harvested an additional 1,356,000 lobsters during the first month of the 2000 regular season. Harvest of the 330 special recreational crawfish license holders was approximately 36,000 lobsters for the entire 2000 season.

We completed the fourth year of monitoring the effects of marine reserves in the Florida Keys National Marine Sanctuary on spiny lobsters. Overall lobster abundance has fluctuated over the course of the study, but the abundance of legal-sized lobsters has progressively increased inside Sanctuary Preservation Areas relative to unprotected areas. Additionally, the Western Sambo Ecological reserve has shown a steady increase of large male lobsters, indicating that some long-term retention of individuals is occurring.

Preliminary work has begun to determine age and subsequently growth rates of spiny lobsters. A process to examine lipofuscin (a breakdown product of cellular lipids) has recently shown promising results in determining the metabolic age in crustaceans. By analyzing the lipofuscin found in the eyestalks of spiny lobsters, we hope to determine the age distribution of lobsters and ultimately determine the factors that influence growth rates. Understanding the age structure of Florida's spiny lobster population is fundamental for effective fishery management.

Outreach efforts to better educate stakeholders of the importance of effective fishery management and resource protection have been initiated. Representatives from FMRI have participated in local community events where fishery information and materials were distributed; however, person to person question and answer interactions were the primary focus. The importance of these efforts is difficult to measure quantitatively, but sharing of information with the members of the community is of crucial importance to furthering the goals of the FWC.

The south Florida queen conch spawning stock increased in 2000 to approximately 18,000

adults in the offshore aggregations. This represents an increase of approximately 8,000 individuals over 1999. Densities within the aggregations remained approximately the same; however, the area encompassed by the aggregations increased substantially. We observed a recruitment event in the middle Keys which resulted in substantial population of juvenile conch at both Sombrero Reef and Delta Shoal. This is the first large-scale recruitment to occur in these historically important breeding aggregations in a decade.

In 2000, we conducted plankton surveys funded by the US Fish and Wildlife Service and the Nature Conservancy to determine the spatial and temporal distribution of conch larvae. To summarize, we found that the area where substantial conch larvae move offshore to the Gulf Stream was around Looe Key; the site to the west (i.e., Sand Key) produced very few conch that were transported offshore. This suggests that a rehabilitation strategy should focus on releasing conch in the area around Looe Key. These results are now incorporated into our stock rehabilitation strategy. Histological examinations of gonadal tissue from the nearshore, non-spawning adult conch population and offshore spawning conch showed a deficit in gonadal condition in both males and females from the nearshore population. We also collected gonadal tissue from similar areas in the Bahamas. In that location, however, gonads were developed suggesting that there is some variable in the nearshore environment of the Florida Keys which negatively impacts the development of gonads.

In 2000, we received a grant to implement a conch stock-recovery program focusing on transplanting wild conch from the nearshore, non-spawning populations to the offshore spawning aggregations. Since our previous research demonstrated that those individuals will regain their ability to reproduce, this represents a low-cost alternative to hatchery-production of juvenile conch for release. We shifted our rehabilitation strategy to transplantation while continuing to develop partnerships with local NGOs who will grow conch for release.

OFFICE OF ENVIRONMENTAL SERVICES

Bradley J. Hartman, Director

The Bureau of Protected Species Management (BPSM) based in Tallahassee serves as the management component of the Florida Fish

and Wildlife Conservation Commission's marine mammal and marine turtle programs. The BPSM is responsible for the planning and implementation of management activities directed toward the protection and recovery of manatees, right whales, and five species of marine turtles. Marine turtle activities are funded from the Marine Resources Conservation Trust Fund. Manatee and right whale protection efforts are funded from the Save the Manatee Trust Fund.

MARINE TURTLES

Marine Turtle Protection Program staff continues to work for the protection of threatened and endangered marine turtles and their critical nesting beaches, developmental habitat, and foraging habitat along Florida's coast. The state is listed as the lead or a cooperating agency for the implementation of approximately 91 tasks identified in the U.S. Fish and Wildlife Service and National Marine Fisheries Service recovery plans for the five species of marine turtles that occur in Florida. Staff participates in development of the scientific information necessary to guide recovery efforts (research), in review of ongoing and proposed human activities that could impact marine turtles and their nesting and foraging habitats (management), and in public education about marine turtles.

Accomplishments in 2000

The marine turtle license plate went on sale in February 1998. During 2000, approximately 42,000 plates were sold, generating approximately \$749,735 in revenue for the state (including vehicle registration fees).

During 2000, Bureau staff initiated the rule making process to allow the agency to implement the Marine Turtle Grants Program, which distributes a portion of the proceeds from the sale of the Sea Turtle License plate back to specific organizations involved in the conservation of Florida's sea turtles. Florida Statute 270.12 1.(h) requires the agency "to provide grants to coastal local governments, educational institutions, and Florida-based nonprofit organizations to conduct marine turtle research, conservation, and education activities within the state. The (agency) shall adopt by rule procedures for submitting grant applications and criteria for allocating available funds." Staff developed draft language for the rule, coordinated review of this language by affected parties, and conducted public workshops.

BPSM issued approximately 137 Marine Turtle Permits during 2000. Oversight of this program included numerous meetings with permit holders in the field to provide training and technical advice, participation in training workshops, and revision of the FWC's Marine Turtle Permit Holder Guidelines.

Staff continued to monitor the approximately 21 captive facilities in the state that rehabilitate marine turtles or hold turtles (loggerhead and non-releasable turtles only) for educational purposes. Staff participated in the annual Rehab workshop held at Hidden Harbor Sea Turtle Hospital.

Permitted volunteers conducting nesting beach surveys documented a total of 84,386 loggerhead nests, 8,404 green turtle (*Chelonia mydas*) nests, and 558 leatherback turtle (*Dermochelys coriacea*) nests along the 1,283 kilometers of Florida's shoreline surveyed during 2000.

In June, staff assisted the Governor and Cabinet in recognizing the Marine Turtle Permit Holders for their efforts in protecting Florida's marine turtles. A resolution was signed in their honor. Staff then hosted a short, informal meeting at the Bryant Building and presented certificates of appreciation to the permit holders.

The Bureau of Protected Species Management continued to work with the U.S. Fish and Wildlife Service on a grant-funded project to minimize lighting impacts to marine turtles. An OPS biologist in the Tequesta office manages the hatchling disorientation data base, contacts local government, and formulates appropriate actions to resolve problem lights on Florida's nesting beaches. During the 2000 nesting season, a total of 924 disorientation events were reported for the state, involving approximately 35,000 turtles. The increase in the number of documented disorientations, and the number of turtles impacted, could reflect in part an increase in survey effort and reporting for disorientation events.

Staff provided technical expertise on marine turtle protection during review of over 150 Department of Environmental Protection (DEP) and other state permits. These included permits issued by the Office of Beaches and Coastal Systems pursuant to Florida Statute 161, permits issued by the DEP Districts or the Water Management Districts pursuant to F.S. 373, and coastal zone consistency reviews. This included

approximately 200 meetings with other agencies and applicants to discuss projects and minimization of impacts to marine turtles. Staff participated in the design, implementation, and review of monitoring to assess the impacts of permitted activities on marine turtles, their nests, and hatchlings.

Staff worked with the U.S. Fish & Wildlife to revise and update existing conditions for beach restoration projects. This included a two-day interagency meeting with representatives from FWS's field offices, the DEP, and other federal agencies to discuss the proposed revisions. Staff continues to serve on the Endangered Species Team with representatives from the Army Corps of Engineers and DEP. This Team assists in the resolution of endangered species issues during Corps activities.

During 2000, staff participated in a number of educational meetings designed to increase protection for Florida's sea turtle. Staff assisted in the 2000 International Sea Turtle Symposium held in Orlando, Florida. During this symposium, staff hosted or cohosted three workshops, one on predator impacts to nests, one on lighting impacts, and a permit holder workshop. Staff's efforts were recognized by a Team Award from the agency's Florida Marine Research Institute.

Staff analyzed information on lighting disorientations on Florida's nesting beaches and on the amount of coastal armoring on Florida's index nesting beaches and presented results as posters at the 2000 Symposium.

Educational activities for marine turtle conservation included the development and distribution of brochures; distribution of informational booklets; responses to numerous requests for information from interested parties, attendance and participation in coastal-related conferences and forums; participation on committees on marine turtles and their nesting habitat; presentation of slide shows and lectures to groups; updating of the existing web site; and general promotion of the program and its fundraising activities. Marine turtle program staff have developed ten colorful, marine turtle decals and two posters that depict the marine turtle species that occur in Florida and their marine habitat. Proceeds from the sale of these marine turtle decals, primarily associated with boat registrations, and the sea turtle license plate are the primary source of dedicated funding for the agency's

marine turtle program.

Manatees

The Bureau of Protected Species Management implements many tasks of the Florida Manatee Recovery Plan. The activities are focused in five program areas.

- Development and implementation of county-based manatee protection plans (MPPs).
- Promulgation of boat speed regulations to protect manatees.
- Review of permitted activities to minimize negative impacts to manatees.
- Various directed efforts to protect manatee habitat, particularly seagrasses.
- Outreach activities to provide education and information to the public.

Manatee Protection Plan (MPP) staff continued its law enforcement outreach program by providing laminated speed zone maps, educational materials, and presenting information at district meetings and the Law Enforcement Academy. A special enforcement and education campaign was undertaken in four counties (Lee, Collier, Dade and Brevard) due to an increased number of watercraft related deaths in the first four months of the year.

West Coast U.S. Coast Guard facilities received training on manatees from FWC and the U.S.F.W.S. Many other presentations were made across the state to U.S. Coast Guard Auxiliaries, local power squadrons, and volunteer patrols.

Staff continued involvement in the Tampa Bay Manatee Advisory Committee. Local manatee protection zones were adopted by both Pinellas and Hillsborough counties.

MPP staff continued involvement in the quarterly meetings of the Dade County Manatee Advisory Group.

BPSM staff reviewed and prepared final comments on both the Volusia and Brevard County Manatee Protection Plan (MPP) drafts. Volusia County's submittal did not include a boat facility siting component.

BPSM provided grant funding to Lee, Martin, and St. Lucie counties to develop the boat facility siting plan portions of their comprehensive Manatee Protection Plans (MPPs). This work, subcontracted to the Regional Planning Councils,

was completed in November 2000. Contracts and scopes of work were negotiated with Broward, Martin, St. Lucie, and Sarasota counties to continue the manatee protection planning process.

On November 3, 2000, the FWC approved the Indian River County MPP. The plan represents one of the most protective plans approved at this time because it prohibits development in areas of high manatee use and high water-craft related deaths.

Staff worked with the Florida Inland Navigation District to post signs and buoys to mark the additional manatee protection zones that were established in late 1998 at the Florida Power and Light and Reliant Corporation (formerly Orlando Utilities) power plants in Brevard County. Posting was completed in early 1999.

Amendments to the Duval County manatee protection rule were proposed in April 2000 and adopted three months later in July. In addition to revising the zones in Duval County, the amendments also added new zones in Doctors Lake (in Clay County) and in the St. Johns River in northern Clay County and St. Johns County.

Amendments to the Lee County manatee protection rule were proposed in February 2000 to add a depth-dependent zone in Mullock Creek in northern Estero Bay. The changes were proposed to allow residents to more easily access their waterfront properties during low water conditions. Although the Commission approved the amendments in May 2000, the changes could not be adopted because of an administrative challenge that was filed in opposition to the changes. The challenge was still pending at the end of 2000.

In August 2000, the state Division of Administrative Hearings (DOAH) affirmed the validity of three existing manatee protection zones in the Canaveral Barge Canal area of Brevard County. The challenge was filed by a local resident in December 1999 and the DOAH hearing was held in June 2000.

Staff began developing proposed amendments to the Brevard County manatee protection rule during the latter half of 2000. Meetings were held with some local residents and organizations in August and again in November and December. A Rule Development Workshop was also held in October 2000.

Staff coordinated with the Florida Inland

Navigation District and numerous local governments to post signs and buoys in several different parts of the state during 2000. Sign posting for the Lee County manatee protection rule, which began in late 1999, continued throughout 2000. Re-posting of several existing zones in Brevard County was completed during the first half of 2000, and work began to post signs in Duval County, Clay County, and St. Johns County to mark the rule amendments that were adopted in July 2000.

Staff also handled many requests for authorization to exceed the restrictions imposed by the manatee protection rules. In addition to approximately 150 requests by commercial fishers and professional fishing guides, staff also processed requests to reissue Boston Whaler's vessel testing permit for Volusia County and Mote Marine Laboratory's access permit for research in Sarasota County. Permits were also issued to allow access to the Virginia Key "No Entry" zone in Miami-Dade County and to the "Motorboats Prohibited" zone at the Tampa Electric Company power plant in Hillsborough County. The purpose of both of these permits was related to conducting research.

Activities permitted by state agencies (Department of Environmental Protection, Water Management Districts, and Department of Community Affairs) can produce adverse impacts to the endangered manatee. The Bureau reviews these projects and offers opinions to reduce or eliminate potential negative effects. Staff performed 497 reviews during the year, with 253 as standard comments, 191 requesting additional information, 25 as critical comments, and 28 miscellaneous correspondence.

Staff assisted with the update of the Florida Manatee Recovery Plan, the FPL Manatee booklet, and provided information for the "How to Boat Smart" boating safety booklet.

A new educational tool was created for use with middle school and high school students. The student activity workbook, "The Manatee – Florida's Endangered Marine Mammal," was created to fill the education material gap that was found within the program. This 28-page workbook provides information about manatees, boating safety, volunteer opportunities and web site addresses to students.

Staff responded to more than 1,000 requests for manatee information from individuals,

teachers, and other educational staff. Depending on the nature of the request, staff has many varied materials that can be distributed including brochures, technical reports, posters, and coloring and activity books.

BPSM staff participated in the U.S. Fish and Wildlife Service's Warm-water Task Force which is assessing the importance, effects and long term stability of industrial, natural and non-industrial warm water sites to the Florida manatee population. This task force provides a forum that allows for industry, government and public representatives to share their current and future concerns and ideas regarding manatees and warm water refugia. It is also responsible for assisting in directing manatee warm water refuge research and management efforts.

BPSM staff coordinated with the FDEP Division of Recreation and Parks, U.S. Fish and Wildlife and St. Johns Water Management District to protect the natural flow of Blue Spring in Volusia County. A Blue Spring Minimum Flow Working Group was established and our staff produced a report regarding historical manatee behavioral use of the Blues Spring run. Interpretive data from this report is being addressed during development of the minimum flow model, which will be used in establishing a minimum flow rule for this system.

Protection of natural warm water refuge areas, in particular artesian springs, used by manatees was continued through BPSM participation in the FDEP Springs Task Force meetings.

Right Whales

BPSM staff participated in a meeting of the Southeastern Right Whale Implementation Team in May 2000 in Brunswick, Georgia.

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

Division of Aquaculture

Chapter 597, Florida Statutes, sets forth the Department of Agriculture and Consumer Services (DACS) responsibilities for managing shellfish resources and the public health aspects of the shellfish industry. Additionally, DACS is the lead agency for aquaculture in the state. Aquaculture activities are primarily conducted by

the Division of Aquaculture. The Division of Aquaculture was created within DACS on July 1, 1999. The Division presently has two Bureaus: the Bureau of Aquaculture Environmental Services and the Bureau of Aquaculture Development.

The Bureau of Aquaculture Environmental Services houses the shellfish evaluation and assessment programs, shellfish processing plant inspection, and the shellfish laboratory. The two major program activities conducted by the Bureau are: classifying and managing shellfish harvesting areas and licensing, inspection, educating and ensuring regulatory compliance of shellfish processing facilities.

The Shellfish Environmental Assessment Section classifies and manages Florida coastal waters for maximum use of shellfish resource, protection of public health, and promotion of a healthy coastal environment. A total of 37 shellfish harvesting areas are currently classified and managed statewide, encompassing over 1.1 million acres. During Fiscal Year (FY) 1999/2000, 20,779 water samples were analyzed for the presence and quantity of fecal coliform bacteria.

The Shellfish Processing Inspection Section ensures wholesome shellfish products through inspection, education, and enforcement of state regulations and national guidelines. The program ensures Florida's compliance with the provisions of the National Shellfish Sanitation Program. A total of 120 shellfish processing plant certification licenses were issued during FY 1999/2000.

The Bureau of Aquaculture Development houses the aquaculture component of the Department. The Department continues its commitment to encourage the development of the aquaculture industry in Florida. This commitment is based on the belief that aquaculture will become an integral segment of Florida's agricultural and economic future by providing high quality aquacultural products to worldwide markets while advancing resource management. The Bureau is divided into four primary program components.

The Oyster Culture and Shellfish Resource Development Program is under the mandate to improve, enlarge, and protect the oyster and clam resources of the state. The Bureau is actively engaged in enhancing shellfish resources and restoring oyster reefs on public submerged lands. During 2000, the Bureau collected 185,000

bushels of processed oyster shell from processors in Franklin County and planted 42,000 bushels on public reefs. Oyster resource development projects were conducted in cooperation with local oystermen's associations in four coastal counties. A total of 195,727 bushels of live oysters were re-planted on public reefs in Franklin, Wakulla, Dixie, and Levy counties.

The Sovereign Submerged Lands Leasing Program has the statutory authority to administer the aquaculture leasing program and is provided in Sections 253.67-253.75, Florida Statutes (F.S.). On July 25, 2000, the Board of Trustees delegated authority to the Commissioner of Agriculture to perform duties and functions on behalf of the Board for actions associated with aquaculture on sovereignty submerged lands. Pursuant to Chapter 253 F.S., the Bureau administers 690 aquaculture leases containing about 1,700 acres. Aquaculture leases are located in the following counties: Brevard, Charlotte, Dixie, Indian River, Lee, Levy, Monroe, Pinellas, and Volusia. In response to its statutory mandate, the Bureau identifies tracts of submerged lands throughout the state that are suitable for aquacultural development; the aquaculture section has designated 19 special aquaculture use areas in seven coastal counties including: Dixie, Levy, Charlotte, Lee, Indian River, Brevard, and Volusia. The Department has also entered into a management use agreement with Citrus County to locate an experimental bay

scallop aquaculture project in coastal waters off of Crystal River. The Bureau also administers 122 shellfish leases occupying about 1,725 acres under the provisions of Chapter 597, F.S.

The Aquaculture Certification Program requires aquaculturists to annually obtain certification from the Department. The aquaculture certification identifies crops as aquaculture products and, thus, as agriculture. The certification ensures that aquaculturists receive all the rights, privileges, and regulations of any other agriculture commodity. Additionally, the certification serves as the basis of the new regulatory program of best management practices for aquaculture. Farmers, in applying for certification, are certifying that they will comply with best management practices for aquaculture or appropriate interim measures. During the 1999-2000 fiscal year, 849 aquaculture certificates were issued. Florida ranked third behind Mississippi and Arkansas with \$76.7 million in aquaculture sales in 1998.

The department received \$89,000 in user fee revenues from the issuance of 890 Apalachicola Bay oyster harvesting licenses. Reported oyster landings in 1999 were 2,338,093 pounds valued at \$3.7 million. Sales of hard clams produced by Florida growers totaled \$15.9 million in 1999, according to the Florida Agriculture Statistics Service.

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES OFFICE OF FISHERIES *James H. Jenkins, Secretary*

The mission of the Louisiana Department of Wildlife and Fisheries (LDWF) Office of Fisheries is to conserve and protect Louisiana's renewable aquatic resources for present and future generations of Louisiana citizens by controlling harvest and by replenishing and enhancing stocks and habitat. The mission is accomplished through the activities of the various programs within the Marine Fisheries Division. The programs are: shellfish (shrimp and crabs), mollusc (oyster), finfish, habitat, and research. The clients served by these programs include present and future generations of Louisiana citizens, as well as national and international interests that derive benefits from consumptive and non-consumptive use of Louisiana's fisheries resources. The Department sets seasons and size and possession limits, restricts fishing gear use, or uses other means of protecting key resources. Other conservation/protection methods include replenishing species and enhancing or developing species or habitats as needed to provide for the needs of consumptive and non-consumptive users or environmental health. The Department also conducts research to provide insight into the proper functioning of natural systems and educates the public and promotes wise use of resources. This report describes program activities that support this mission.

SHELLFISH PROGRAM

The Marine Fisheries Division continued its long-term fishery independent trawl sampling throughout coastal Louisiana. Data from these samples were used to set season frameworks for both the fall and spring inshore shrimp seasons and the winter offshore shrimp season. Additionally, these same data were used to recommend season extensions and special shrimp seasons.

Shrimp

Offshore Shrimp Season

The state's offshore territorial waters from the Houma Navigational Canal Channel to the eastern shore of Freshwater Bayou were closed on February 7, 2000, to protect significant numbers of over-wintering white shrimp smaller than legal size. A portion of these offshore waters extending from the Houma Navigational Canal Channel westward to the Atchafalya River Ship Channel were reopened to shrimping on March 20, 2000. The remaining portion of these closed waters reopened to shrimping on May 8,

2000, in conjunction with the opening of inshore waters in Zones 2 and 3.

Inshore Shrimp Season

The year began with the closure of the open waters of Breton and Chandeleur sounds in Shrimp Management Zone 1 on March 31, 2000, followed by their reopening on May 15, 2000. The inshore waters of Zones 2 and 3 opened May 8, 2000, followed by the opening of the remainder of Zone 1 on May 22, 2000. Zone 3 and that portion of Zone 2 west of the western shore of Bayou Lafourche were closed to shrimping on June 24, 2000. The remaining portion of Zone 2 from the western shore of Bayou Lafourche to the eastern shore of South Pass of the Mississippi River was closed July 3, 2000. On July 17, 2000, the spring shrimp season was closed in the southern portion of Zone 1 south and west of the Mississippi River Gulf Outlet (MRGO) and south of the Intracoastal Waterway from its juncture with MRGO to its juncture with the Industrial Canal. The remaining portion of Zone 1 closed to shrimping on July 25, 2000.

The 2000 Fall Shrimp Season opened coastwide in Louisiana's inshore waters on August 21, 2000, except for the waters of Breton and Chandeleur sounds which opened to shrimping on August 7, 2000. Zones 2 and 3 closed on December 20, 2000, and Zone 1 closed on December 31, 2000, with the exception of Breton and Chandeleur sounds which remained open.

According to preliminary 2000 National Marine Fisheries Service (NMFS) state landings statistics, Louisiana landings measured 92.2 million pounds (all species combined/heads off weight) which ranked as the second highest annual landings total on record. The NMFS preliminary statistics indicate that 2000 Louisiana catch measured 106.4 million pounds (all species combined/heads off weight) which exceeded all previous annual catch totals.

Crabs

Effective March 20, 2000, new rules for crab-trap marking were established. The new rule required that all crab traps be marked with a solid float, six inches in diameter or greater, attached with non-floating line one-quarter inch minimum diameter or greater. Additionally, crab fishermen were given the option of using a plastic bait box cover to mark their traps for ownership rather than a two-inch stainless steel, self-

locking tag attached to the trap ceiling. Both must be legibly engraved or embossed with the commercial fishermen's license number or recreational crab trap gear license number. According to trip ticket reporting data, 2000 Louisiana blue crab landings totaled 52.0 million pounds and exceeded the previous year total by 5.8 million pounds. Stone crab landings for the year totaled 49.9 thousand pounds, the highest on record.

The Crab Task Force has continued to meet and address issues that confront the industry. The Crab Subcommittee of the Gulf States Marine Fisheries Commission began development of mortality symposium proceedings as well as a derelict crab trap white paper.

MOLLUSC PROGRAM

Oyster Seasons

The 1999/2000 Louisiana oyster season on the public seed grounds and the Bay Gardene, Hackberry Bay, and Sister Lake oyster seed reservations opened September 8, 1999. The Sister Lake oyster seed reservation opened for ten days on September 8, closed on September 17, reopened October 1, 1999, and closed May 15, 2000. A designated sacking-only area east of the Mississippi River, described as Lake Fortuna and Lake Machias to a line from Mozambique Point to Point Gardner to Grace Point at the Mississippi River Gulf Outlet opened September 8, 1999. The oyster season on the public oyster seed grounds and oyster seed reservations east of the Mississippi River and the Hackberry Bay oyster seed reservation was extended by the Wildlife and Fisheries Commission and closed April 30, 2000. The Calcasieu and Sabine Lake public tonging areas opened on October 16, 1999 and closed April 30, 2000.

Oyster production on the public seed grounds and seed reservations during the Fall 1999/Spring 2000 season totaled 1.1 million sacks of market oysters and 103 thousand barrels of seed oysters and continued on an above average trend, particularly on the public grounds east of the Mississippi River.

The Louisiana Wildlife and Fisheries Commission ratified a notice of intent to create additional public seed grounds in Terrebonne, Lafourche, and Jefferson parishes. The proposed new seed grounds include portions of Lake Mechant, Lake Tambour, Lake Chien, Lake Felicity, Deep Lake, and Barataria Bay.

Oyster Leasing

During 2000, 32 leases were auctioned,

comprising 807 acres of waterbottoms. Nine hundred and eighty-four (984) new and renewal lease applications were accepted, and six hundred and sixty-two (662) new leases were issued.

The Oyster Lease Survey Section continued to update the web page to better serve the public. The section's oyster lease GIS database is available for viewing on the Internet at <http://oysterweb.dnr.state.la.us/oyster>.

Disaster Oyster Programs

A \$5.1 million federal grant was obtained through the Dire Emergency Supplemental Appropriations Act (P.L. 102-368) to restore oyster resources damaged by Hurricane Andrew. Although the Louisiana Shellfish Restoration and Enhancement Project was completed with the submission of the final report on June 30, 1997, the Department continued to monitor production in the restored areas during 2000 to further evaluate the longer term success of the project. There was continued commercial and seed harvest from the reefs restored with federal funds received as the result of Hurricane Andrew damages in 1992.

The Department was awarded another NOAA grant in July 1999 to investigate the use of recovered oyster shells and alternative cultch materials for oyster reef restoration. Louisiana's Oyster Shell Recovery Pilot Project will develop a framework for an ongoing program of oyster shell recycling and carry out a pilot project to collect and plant recycled shell in suitable areas, comparing recycled shell with other available cultch material.

FINFISH PROGRAM

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

Monitoring

A comprehensive monitoring program was developed in 1985 to protect or enhance these valuable resources by providing information regarding the status of fish stocks that occur in the coastal waters of Louisiana at some time during their life cycle. Three gear types are used coastwide to sample various year classes of estuarine dependent fish. A bag seine is used to sample young of the year and provide information on growth and movement. The seine is 50' in length, 6' in depth, and has a 6'x 6' bag as an integral part of and midway the length of the net. The mesh size for this

seine is ¼" bar, ½" stretched, Delta 44 knotless mesh. A gill net is used to sample juvenile, sub-adult, and adult fish and provide information on relative abundance, year class strength, movement, and gonadal condition. The gill net is 750' in length, 8' in depth, and constructed of monofilament. The net is composed of five panels each of the following mesh sizes: (1) 150'x8', 1" bar, 2" stretched mesh, 0.4 mm diameter filament; (2) 150'x8', 1¼" bar, 2½" stretched mesh, 0.52 mm diameter filament; (3) 150'x8', 1½" bar, 3" stretched mesh, 0.52 mm diameter filament; (4) 150'x8', 1¾" bar, 3½" stretched mesh, 0.52 mm diameter filament; and (5) 150'x8', 2" bar, 4" stretched mesh, 0.52 mm diameter filament. A trammel net is used to provide information on relative abundance, standing crop, and movement. The trammel net is 750' in length, 6' in depth, and constructed of nylon. The entire net has a 2:1 sag, and the mesh sizes are as follows: inner wall - 1⅝" bar, 3⅝" stretched, number 6 twine; outer wall - 6" bar, 12" stretched, number 9 twine.

Gill net samples are taken semi-monthly from April through September, and monthly from October through March; trammel net samples are taken monthly from October through March, and seine samples are taken monthly from January through August, and semi-monthly from September through December. Hydrological readings (conductivity, salinity, and water temperature) are taken each time a biological sample is taken. Also, estimates of 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.

State/Federal Cooperative Fishery Statistics

The collection of commercial landing statistics through a trip ticket program has continued. Landings are self-reported by wholesale/retail dealers licensed to purchase fish in Louisiana. Louisiana also participates in the collection of trip interviews (TIP). Port samplers obtain interviews in Plaquemines, St. Bernard, Lafourche, Terrebonne, Jefferson, St. Mary, Iberia, and Cameron parishes. The information provided by landing statistics and trip interviews have been used by the NMFS, the LDWF, the Gulf States Marine Fisheries Commission (GSMFC), and the Gulf of Mexico Fisheries Management Council (GMFMC) to evaluate the status of various species currently under intensive management. The continuing goal of the program is to

collect commercial fisheries data necessary to better manage those species of concern.

Sport Fish Restoration

In 2000, Louisiana used the marine share of its Sport Fish Restoration Funds in two activities – development of access for fishermen and finfish age and growth research (described under the Research Program).

HABITAT PROGRAM

Artificial Reefs

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

Since the program's inception in 1986, 33 different petroleum companies have participated in the program and donated the jackets of 100 structures. In addition to the material, the participating companies also contributed to Louisiana's Artificial Reef Trust Fund for operation, maintenance, and reef research. In 2000, 12 projects across the coast were completed

In addition, we have entered into a cooperative agreement with the Lake Pontchartrain Basin Foundation and The Terrebonne Chapter of the Coastal Conservation Association to construct two inshore reefs made of limestone.

Department of Energy (DOE)

This project ended this year with the completion of the standardized data dictionary that includes information about all identified databases collected or managed by the LDWF Marine Fisheries Division as well as other biological and environmental databases from Louisiana and Gulf of Mexico waters. The dictionary describes the projects under which the data were collected, the parameters measured including methods, station locations, data formats, and contact information for additional information. Electronic editions of the dictionary are available on CD.

Southeast Area Monitoring and Assessment Program (SEAMAP)

SEAMAP is a state/federal/university program that collects, manages, and disseminates fishery-

independent data and information in the southeastern United States. Louisiana participated in planning and resource surveys during the twentieth year of this National Marine Fisheries Service-funded cooperative project. Planning activities included identifying priorities for data acquisition and coordinating Gulf-wide resource surveys by SEAMAP participants. The Department also conducted summer, fall, and winter sample surveys in the Louisiana territorial sea and nearshore EEZ from the Mississippi River to Atchafalaya Bay. These seasonal day-night surveys provide information on the abundance and distribution of critical life stages of major Gulf of Mexico species. Shrimp/groundfish and zooplankton communities were sampled, as were associated environmental parameters. Summer and fall surveys coincided with NMFS resource survey activity off the Louisiana coast.

Oil Spill Contingency Planning and Response

The Department's Oil Spill Task Force focussed on Natural Resource Damage Assessment (NRDA) and developing restoration plans and coast-wide monitoring designs during 1999. With other state and federal trustees, Department representatives developed a pilot plan for a regional restoration plan, which would provide restoration alternatives for small spills. In addition, the Department participated in the development of a coast wide monitoring program that will provide important baseline information about Louisiana's natural resources along the coast.

On November 28, 2000, the T/V Westchester grounded in the Mississippi River at River Mile 38 and discharged approximately 500,000 gallons of crude oil into the Mississippi River in Plaquemine Parish. Several thousand acres of surface waters and shoreline and marsh habitats were exposed to oil as a result of this discharge. The Mississippi River and delta area supports a wide variety of wildlife and many different habitats, ranging from freshwater to marine. The area is a major wintering ground for waterfowl, and Pass-a-Loutre State Wildlife Management Area and Delta National Wildlife Refuge are located immediately downstream from the spill site. The Department is participating with other state and federal natural resource trustees in a NRDA to restore the public ecological and recreational resources that were lost as a result of this spill.

The habitat restoration/enhancement project for the May 1997 Texaco Pipeline spill in Lake Barre, Terrebonne Parish, was implemented during 2000. That enhancement project, planting salt marsh vegetation on a CWPPRA-created area on E. Timbalier Island, thus far has resulted in establishment *Spartina alterniflora* marsh at low elevations, but drought

conditions precluded growth of *S. patens* at higher elevations. The trustees and Texaco are continuing to monitor the project.

The discovery in June of 1997 of a pipeline leak in coastal Vermilion Parish marsh led the Department and other state trustees to pursue a NRDA with the Apache Corporation. The leak had apparently been occurring for some time; the US Coast Guard estimated that 2,000 barrels of oil may have been released over time. The area was burned, and vegetative recovery of the resulting 6-acre burn area was monitored while restoration planning activities continued in 1999.

On August 8, 1997, a blowout from the Sonat Goins #7 well near Cravens, Louisiana, in Vernon Parish resulted in 55 acres of injured pine and streamside wetland habitat. In 1999, LDWF staff continued to work with other state and federal trustees to determine the extent of natural resource injuries resulting from the spill and develop suitable restoration alternatives.

A September 1998 blowout of the Equinox Cockerell-Moran #176 in Lake Grand Ecaille, Plaquemines Parish Louisiana oiled 1,233 acres in coastal marsh near the Gulf shore. In 2000 the Department continued to participate in settlement discussions to restore the resulting injuries to natural resources. A marsh creation project near the spill site has been selected for implementation pending completion of a consent decree.

A Chevron pipeline near Grand Terre Island, Plaquemines Parish Louisiana spilled crude oil onto beaches and marsh from Quatre Bayou Pass to Caminada Pass on November 24, 1999. The Department participated in NRDA actions during 2000 in cooperation with other state and federal trustees. Chevron investigated the possibility of enhancing a migratory bird sanctuary owned by the Nature Conservancy as a way of restoring the public resources lost due to the spill.

Seismic Monitoring

The Seismic program was created in 1939 specifically to protect oysters, fish, shrimp, and other wildlife from injury due to seismic exploration. The Department continued to monitor seismic activity in 2000.

Statewide Hydrographic Monitoring

The LDWF, through an interagency agreement with the U.S. Geological Survey, continued to collect

constant records of salinity, water temperature, tide level, wind speed and direction, and barometric pressure from a network of 15 stations located across coastal Louisiana. The data are collected in near real-time, and LDWF provides database management for the program. The data were used for managing marine fisheries (shrimp, oysters, and finfish) and for investigating the extent and impact of a variety of environmental conditions such as tropical weather systems, drought, hypoxia, and red tide in Louisiana coastal waters. The data also are provided on request to other state and federal agencies, as well as university researchers. The near real-time data are available to the public via the internet through the LDWF website (<http://www.wlf.state.la.us/apps/netgear/index.asp?cn=lawlf&pid=884>) or the USGS Louisiana Hydrowatch website (<http://www.la.lbrg.er.usgs.gov/hydrowatch.htm>). These data are posted in raw, unedited form within approximately four hours of the time the instrument measurement was recorded in the field. The data are updated frequently to provide the best, most accurate information possible.

Gulf-Wide Information System (G-WIS)

The LDWF continued to participate in this Minerals Management Service-funded program to develop a Geographic Information System (GIS) database of environmental sensitivity for the Gulf coast. Biological and environmental data collected by the Department are being incorporated into the system. The end product will be a series of databases that can be used to identify environmentally sensitive areas as an aid in planning for activities in the coastal zone. A draft version of the data was reviewed by LDWF biologists in 2000. The project is scheduled for completion in mid-2001. All the data will be available to the public via the internet by the end of 2001.

Caernarvon Biological Monitoring

Beginning in 1991, the U.S. Army Corps of Engineers, with support from the Louisiana Department of Natural Resources and the Louisiana Department of Wildlife and Fisheries, has operated a project for the controlled diversion of freshwater from the Mississippi river into the Breton Sound Estuary. The diversion structure is located in the mainline Mississippi River levee at Caernarvon, Louisiana, and has a design flow capacity of 8,000 cubic feet per second. Diversion of nutrient and sediment rich freshwater has rejuvenated existing marsh, significantly reduced dependence on local rainfall as the principle source of freshwater input to the estuary, reduced peak salinity, and induced more regularity in the seasonal salinity pattern. Long-term benefits involve reducing land loss rates and increasing fish and wildlife production.

The Louisiana Department of Wildlife and Fisheries conducts extensive monitoring activities in the Breton Sound Estuary and is continuing a biological monitoring program to accurately measure the success of the diversion project. Biological monitoring of the project has been undertaken by LDWF in three phases: preconstruction (4 years), to determine the conditions in the basin before the project went on-line; postconstruction (four years), an intensive study of the biological effects of the diversion; and long-term (46 years), to monitor the extended project effects. To determine how fish and shellfish populations may be affected, thousands of oyster, shrimp, crab and finfish samples are being taken, at stations situated from the diversion outfall to the Gulf. The fifth year of the long-term phase of the post-diversion monitoring program was in 2000. The overall objective of this program is to assess the long-term effects of diversions on the fisheries, waterfowl, wildlife and vegetation as well as to determine the success of diversions in meeting project goals while helping to guide future project operations. These studies were designed to gather both fishery dependent and fishery independent data.

An analysis of the first eight years of data has shown few changes in overall finfish and crustacean populations attributable to the diversion project. The areas of best oyster production have shifted seaward, with phenomenal production from seaward beds after years of high winter/spring diversions. The monitoring precision of commercial finfish landings was limited by coincident changes in the fishery from legislation. Some changes in the distribution of finfish and crustacean populations have been indicated by the monitoring data.

Large beds of Submersed Aquatic Vegetation (SAV, a component of prime aquatic habitat) developed in the landward zone, and a spectacular largemouth bass fishery has developed. Post-operation vegetative surveys have found increased species diversity, with seven of eight new species characterized as fresh or brackish-adapted; brackish marsh is encroaching into saltmarsh zones. A sample zone of 2,289 acres has shown an increase of 406 acres of emergent marsh, or 5.9% per year for 1992-94.

Davis Pond Biological Monitoring

Louisiana Department of Wildlife and Fisheries personnel have begun a three-phase venture spanning more than 50 years to monitor effects of the Davis Pond Freshwater Diversion Structure. The Louisiana Department of Natural Resources is leading the overall monitoring effort in coordination with the U.S. Army Corps of Engineers.

Work began on Davis Pond, in St. Charles Parish, in January 1997. By fall of 2001 the project will be capable of diverting up to 10,650 cubic feet per second of Mississippi River water into the Barataria Basin estuary. The diversion project aims to imitate spring overflows which historically brought a rush of marsh-supporting freshwater, nutrients and sediment to Louisiana's coastal zone. Levee construction along the Mississippi for flood control has since blocked spring overflows causing wetland loss across coastal areas. The Davis Pond project intends to compensate for this by providing a controlled flow of nutrients and freshwater from the Mississippi into a target area in the Barataria Bay estuary to benefit thousands of acres of marshland.

Biological monitoring of the preconstruction phase began in January 1998. When the diversion is complete, the post-construction monitoring phase will begin a four year-long intensive study of biological effects of the diversion. The final phase of the study is set to last 46 years and will monitor extended effects of the project. To determine how fish and shellfish populations change, thousands of oyster, shrimp, crab and finfish samples will be taken at stations situated from the diversion outfall to the Gulf. Commercial fishery harvests will also be monitored. In addition, LDWF biologists take water quality readings at 38 locations within the basin each month, to provide a complete picture of how salinity and flow patterns are changing.

An extensive study of recreational fishing began in July 1999. This creel study covers the entire Barataria basin, from the freshwater zones in the north to the Gulf barrier islands in the south. Species composition, sizes, catch rates, and amount and location of fishing effort will be monitored. Point-access surveys and aerial counting/mapping surveys are being employed. These data will help to define population changes and the health of the resource in general and will show how species composition, areas of concentration, growth rates and fishing success change in the estuary as this critical restoration project takes effect.

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

Monitoring the Impact of Environmental Perturbations on Commercial Fishermen

The objective of this project is to establish a data collection program capable of determining the impacts of adverse environmental and/or climatological conditions on the fishing patterns and subsequent income of commercial fishers and charterboats. Events such as hurricanes, red tides, floods, oil spills, and oxygen-depleted bottom waters affect the harvest of Louisiana's marine fishery resources and, therefore, the economy of the state. Individual harvesters may be forced to spend additional time and effort in locating targeted species, prevented from working traditional fishing grounds, or prevented from fishing at all. This project is intended to provide a basis for an objective determination of the effects of such events on commercial fishing and allow integration of these events into the management regime for those fisheries.

Project components include trip tickets, logbooks, and environmental monitoring. Trip tickets are used by wholesale/retail dealers to document purchases from commercial harvesters. Commercial harvesters and charterboats use logbooks that identify vessel movement, fishing location, and catch. The environmental monitoring segment gathers data about major climatological and/or environmental disturbances that affect the coast and emphasizes the hypoxic zone that develops each summer offshore from Jefferson, Lafourche, and Terrebonne parishes. The data will be analyzed to determine if changes in effort and fishing location can be documented in relation to known perturbations.

The LDWF processed 261,000 trip tickets that were turned in during 2000. During the same period the logbook program consisted of 60 participants (commercial shrimp fishers and charterboat operators, combined). A continuation of the abnormally low rainfall in 2000 contributed to the official designation of a drought in coastal Louisiana. Instances of hypoxia in the monitoring zone dropped from 37% in 1999 to 19% in 2000.

Other Habitat Issues

In 2000, the Marine Fisheries Division continued to work with the state Wetlands Conservation and Restoration Task Force and the federal Coastal Wetlands Planning, Protection and Restoration Act Task Force in developing projects and strategies for slowing the rate of coastal wetlands loss in Louisiana. The Coast 2050 Plan, an overarching strategy to address most of the coastal deterioration occurring in Louisiana, is being used as a template for major new restoration efforts in the Barataria Basin.

Marine Fisheries Division personnel continued work on the lease relocation procedure for oyster leaseholders that may be adversely impacted by coastal restoration projects.

RESEARCH PROGRAM

Lyle S. St. Amant Marine Laboratory

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

Age, Growth, and Fecundity

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

During 2000, otoliths were collected and processed from 954 red drum, 842 spotted seatrout, 694 black drum, 384 sheepshead, 504 southern flounder, and 585 striped mullet. In 2000 the laboratory continued processing gray snapper otoliths taken from charterboat catches; 153 gray snapper otoliths were processed during 2000. Gonads from 101 gray snapper were collected and analyzed. From charterboat catches of red snapper, laboratory personnel took 98 pairs of otoliths and 12 ovarian samples and forwarded these to National Marine Fisheries Service in Panama City, Florida.

Cooperative University Research

During 2000, the Laboratory continued cooperating in onsite research conducted by Louisiana universities under the Gulf Oyster Industry Program administered by the Louisiana Sea Grant Program. These research projects are: "Novel methods for deterring black drum predation on oyster leases" (Louisiana State University, Biological Sciences); "Modeling the response of the hooked mussel, *Ischadium recurvum* (Rafinesque 1820), to relaying as a remediation technique to reduce biofouling on oysters, and documenting its distribution in a Louisiana estuary" (Nicholls State University, Department of Biology); and "Natural dermo resistance and its role in the development of hatcheries for the Gulf of Mexico" (Louisiana State University, Department of Veterinary Science).

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES *Earl Glade Woods, Executive Director*

MARINE FISHERIES MANAGEMENT

Marine fisheries projects and activities coordinated through the Office of Marine Fisheries include:

- 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;
- Develop management recommendations based on specific criteria;
- Monitor the existing condition of the stocks and the fisheries that depend on them;
- Provide information transfer and liaison activities with regional fisheries management entities and others;
- Provide technical support to the Mississippi Commission on Marine Resources in developing fishery management plans, amendments, stock assessments, and technical analysis;
- Provide a state representative to serve on fisheries related boards, committees, panels, etc. as may be required; and
- Provide for administrative services, general maintenance, the locating of suitable funding sources, and other fisheries management support services as may be required.

During Fiscal Year 2000, the Marine Fisheries Office drafted changes to the following ordinance: Ordinance 7.024—An Ordinance to Provide Size Limits and Bag Limits on Certain Fish Species and to Prevent Sale of Seafood by Recreational Fishermen (effective April 2000).

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

Marine fisheries personnel served on regional management activities of the Gulf States Marine Fisheries Commission, including its State/Federal Fisheries Management Committee, Technical Coordinating Committee, TCC Artificial Reef, Data Management, and Recreational Fishery subcommittees, and the Flounder Technical Task Force. The Marine Fisheries Office was instrumental in preparing grant documents and proposals to secure funding for the following fisheries management projects: Sport Fish Restoration Act with the U.S. Department of the

Interior and the Cooperative Fishery Statistics Program and the Interjurisdictional Fisheries Act with the U.S. Department of Commerce.

MARINE FISHERIES STATISTICS PROGRAM

Objectives

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

Status

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

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

Data for selected pelagic and reef fishes were 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. These data are utilized by both state and federal fisheries managers to properly manage valuable marine resources.

MISSISSIPPI SHELLFISH MANAGEMENT PROGRAM

Oysters, as sessile filter feeders, are subject to the influence of environmental conditions to a greater extent than mobile species. Consequently, oyster

landings can change dramatically from year to year according to the quality of the water. In addition to fluctuations in the amount of rainfall, problems with upland pollution can render abundant supplies of oysters unavailable for harvest. During the oyster season and throughout the year, field sampling trips are made to stations located throughout the oyster reefs to collect water samples that are analyzed for fecal coliform content. Opening and closing of the reef areas is based primarily on the levels of fecal coliform in the water column at the time of sampling. Oyster harvesting must be closed after significant rainfall events until it can be determined that the water quality has improved sufficiently to allow harvesting to resume. To accomplish this, multiple stations are sampled in each reef area (sub-areas), and two consecutive clean samples separated by at least 48 hours must be obtained from each area before it can be reopened for harvest following a closure. Water quality samples are obtained throughout the year to classify shellfish growing waters.

The Shellfish Sanitation Program is one of the agency's most labor-intensive efforts, requiring almost daily, routine water-quality sampling and laboratory analysis of samples for fecal coliform bacteria. The data are used to classify oyster growing-waters in accordance with National Shellfish Sanitation Program guidelines and to provide necessary justification for reopening oyster reefs following rainfall events that degrade water quality to levels requiring that reefs be closed to protect public health.

For areas to be classified as "Approved," the geometric mean fecal coliform level most probable number (MPN) cannot exceed 14 and not more than ten percent of the samples taken can exceed an MPN of 43. Additionally, U.S. Food and Drug Administration requirements also specify minimum sampling frequencies at each of nearly 170 sampling stations in Mississippi Sound. Approved areas are those in which water quality does not degrade at any rainfall level. In Mississippi, currently only Area II Approved meets this most stringent requirement for shellfish-growing waters.

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

Objectives

- Maintaining program compliance with the Interstate Shellfish Sanitation Conferences' National Shellfish Sanitation Program;
- Mapping of Mississippi's oyster reefs;

- Surveying of potential cultivation sites and cultch planting sites;
- Cultivation of oyster reefs; and
- Deposition of oyster cultch material.

Status

A total of 410,903 sacks of oysters were harvested during the 1999-2000 season, breaking a 32-year record. State oyster harvesting waters are divided geographically into eight areas, which are monitored closely and opened and closed accordingly. The office also completed the surveying of potential cultivation and cultch planting sites.

Major Accomplishments

- Oyster reef enhancement by planting 4,474 cubic yards of cultch material;
- Over 200 acres of oyster reef were cultivated with MDMR equipment and personnel;
- The fieldwork was completed for a joint side scan sonar bottom-mapping project with NASA of the Western Mississippi Sound;
- As mandated by state statute, a shell retention fee collection process was implemented to generate funds for shell planting and reef revitalization;
- A scannable oyster trip ticket system was implemented; and
- Hydrological surveys were conducted in selected areas in the Western Mississippi Sound.

SHRIMP AND CRAB MANAGEMENT

Objectives

The Shrimp and Crab Bureau provides management of the state's commercial and recreational shrimp and crab fisheries. Cooperation and coordination with adjoining state marine fisheries agencies, as well as regional and federal fishery authorities, are integral to the success of shrimp and crab management activities. The program includes monitoring and research of both the shrimp and crab fisheries, coordination of the Mississippi Blue Crab Task Force, issuance of scientific collection permits, inspection and licensing of live bait shrimp facilities, installation and maintenance of constant recorder instruments, coordination of Wallop-Breaux grants with the U.S. Fish and Wildlife Service, administration of the Federal Brown Shrimp Disaster Grant, and the Derelict Crab Trap Recycling Program.

Additionally, these fisheries are managed by the setting of seasons, gear regulations, and other related management measures as required. Shrimp and Crab Bureau biologists work cooperatively with other

agencies including the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Gulf States Marine Fisheries Commission, Gulf of Mexico Fisheries Management Council, and the U.S. Geological Service. Cooperating state marine resource agencies and other organizations include the University of Southern Mississippi's Institute of Marine Science, Department of Environmental Quality, and Department of Wildlife, Fisheries and Parks.

Key Responsibilities

- Long-term monitoring of shrimp and crab populations in order to make management recommendations;
- Inspection of live bait shrimp operations and compilation of confidential live bait dealer reports;
- Continuation of the Blue Crab Task Force in order to allow the various user groups to provide input and voice concerns;
- Continued development of constant recorder instruments along the coast for real-time hydrological monitoring; continued issuance of saltwater scientific collection permits;
- Coordination of Sport Fish Restoration grants with U.S. Fish and Wildlife Service;
- Administration of the National Marine Fisheries Service Federal Brown Shrimp Disaster Grant; and
- Derelict Crab Trap Recycling Program.

Program staff works with appropriate federal and state agencies and respective fishery user groups and the public to regulate and promote the shrimp and crab fisheries in Mississippi's marine waters. The issuance of saltwater scientific collection permits will be done in a manner that protects Mississippi's marine resources while allowing legitimate study to occur. Constant recorder instruments will be monitored and maintained to allow optimum data availability. Sport Fish Restoration coordination will be done to ensure grants are received and administered.

INVESTIGATION – TRIPLETAIL (*LOBOTES SURINAMENSIS*) AND COBIA (*RACHYCENTRON CANADUM*) IN MISSISSIPPI MARINE WATERS AND ADJACENT GULF WATERS

Objectives

The project conducted under a subgrant with the Institute of Marine Science, Gulf Coast Research Laboratory looks to determine age, seasonal movement patterns, and growth by utilizing an extensive tag and release program within Mississippi marine waters and adjacent Gulf waters.

Status

In Fiscal Year 2000, the MDMR received federal funds made possible by the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 669-669i) 50 CFR Part 80, administered by the U.S. Fish and Wildlife Service. A portion of these funds were expended in a cooperative cobia and tripletail study with the Gulf Coast Research Laboratory.

Tagging fish to study movement patterns is being accomplished by GCRL staff, private fishermen, and charter boat fishermen along the Gulf Coast. Gulf Coast Research Laboratory staff are collecting, slicing, and reading otoliths for age determination and back-calculating lengths at annular formation for growth estimates. Aspects of reproductive biology, which have been done and are ongoing, are (1) time of peak spawning; (2) ovarian maturation phases; and (3) egg counts for fecundity estimates.

STRIPED BASS (*MORONE SAXATILUS*) RESTORATION PROGRAM FOR THE PEARL AND PASCAGOULA RIVERS OF MISSISSIPPI

Objectives

Conducted through a subgrant with the Institute of Marine Science, Gulf Coast Research Laboratory, the primary objective of this study was to restore the striped bass population to coastal waters of Mississippi. Secondary objectives include monitoring and evaluation of the stocking effort.

Status

The project is funded through funds made available through the MDMR to the Gulf Coast Research Laboratory by the Anadromous Fish Act (PL89-304) and the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 669-669i) 50 CFR Part 80. The project is ongoing and through Fiscal Year 2000, over 12 million striped bass fingerlings were stocked in the coastal tributaries of Mississippi. Fingerlings of approximately 50 grams each (less than .10 pounds) are tagged and released in coastal streams. Evaluation of tag returns from fish tagged in previous years and interviews with sport fishermen, commercial fishermen, and fish camp operators indicate an increase in the striped bass population as a result of the restocking program.

MARINE RECREATIONAL FISHERIES STATISTICS SURVEY

Objectives

The principal objective of this project is to continue a state-federal cooperative program for the collection and management of marine recreational fisheries data from charter boats along the Mississippi Gulf Coast and integrate charter boat data and those collected from pier and private boat anglers. Field interviews of anglers, using existing Marine Recreational Fisheries Statistics Survey methodology, are used to estimate angler catch. Additionally, telephone interviews with charter boat captains estimate fishing effort and are compared with existing Marine Recreational Fisheries Statistics estimates.

Status

During this first calendar year, a total of 2,112 field interviews of recreational anglers were assigned to be collected from charter boat fishermen, pier and jetty anglers, and those fishing from private boats. Information included number of each species caught, lengths and weights if possible, and some economic data about the fishing trip. Field data sheets were electronically processed at the Gulf States Marine Fisheries Commission along with those from other Gulf states for inclusion in recreational fishing estimates made by Washington's National Marine Fisheries Service. Weekly telephone interviews of ten percent of the charter boat sampling fleet, randomly selected, were also coded and sent to GSMFC for processing. Estimates of catch and effort for the entire Gulf of Mexico are currently under way.

SPOTTED SEATROUT (*CYNOSCION NEBULOSUS*) STUDIES IN MISSISSIPPI COASTAL WATERS

Conducted through a cooperative grant with the Institute of Marine Science, Gulf Coast Research Laboratory, this work continues a long-term tagging effort of spotted seatrout in Mississippi estuarine waters primarily by volunteer recreational anglers.

Objectives

- Assess and monitor the population of adult/sub-adult spotted seatrout in Mississippi coastal waters using protocols established in previously completed work;
- Investigate and delineate the male to female ratio as it occurs in juvenile and sub-adult spotted seatrout in Mississippi coastal waters;
- Tag and release spotted seatrout in Mississippi

coastal waters in order to acquire information on seasonal movements within coastal Mississippi estuarine systems; and

• Coordinate a series of public workshops to provide for the exchange of information on fishery research and management procedures regarding the spotted seatrout sport fish fishery in Mississippi coastal waters.

Status

Field sampling utilized a multi-mesh gill net and hook and line equipment sampling at various stations along the Mississippi coastline. All the fish collected were returned to the laboratory for processing that included measuring length, total weight, sex, maturity, and otoliths were removed for age determination during Fiscal Year 2000. Additional smaller specimens were taken to augment the database for growth estimates and further delineate the male to female ratio at younger ages.

SEAFOOD TECHNOLOGY PROGRAM

Objectives

- Provide technical advice to those in the Mississippi Seafood processing industry so that they can maintain safe seafood and comply with seafood sanitation and health safety regulations;
- Conduct regulatory inspections of shellfish processing and transporting facilities to determine compliance with state and federal seafood sanitation and health safety regulations;
- Provide technical advice to the seafood processing industry regarding new technologies and new products that provide added value, new market and employment opportunities, and economic enhancement for the seafood industry;
- Provide technical advice to those interested in becoming involved and those already involved in aquaculture to compete against the rapidly increasing U.S. seafood imports and to aid in creating expanded economic and employment opportunities;
- Provide advice and support work for the Mississippi Department of Agriculture and Commerce regarding aquaculture regulatory matters; and
- Provide administrative support to the activities of the Office, the department and the Mississippi Commission on Marine Resources.

SEAFOOD TECHNOLOGY BUREAU

A total of 2,658 technical assistance actions were provided in 2000. Examples include:

- Provided technical advice and conducted support inspections for the Mississippi Department of Agriculture and Commerce regarding regulated aquaculture activities;
- Prepared a shrimp waste solids resource/utilization package for use by those interested in handling and using shrimp waste solids;
- Provided comments to the Environmental Protection Agency regarding a draft *Pfiesteria* technical report;
- Reviewed and prepared comments on Interstate Shellfish Sanitation Conference issues for the Interstate Shellfish Sanitation Conference 17th and 18th Annual Meetings;
- Provided seafood processors with OSHA's proposed Ergonomics Standard, which could have an economic impact on industries that the Standard, if adopted, would apply to;
- Completed a map to show the locations of Mississippi-permitted seafood dealers by location and type;
- Provided the Interstate Shellfish Sanitation Conference *Vibrio vulnificus* professional information flyer to a large number of medical doctors located in the three coastal counties;
- Reviewed and evaluated a National Shellfish Sanitation Program Hazard Analysis & Critical Control Point Plan prepared by Sea Grant and provided National Shellfish Sanitation Program standardized ratings and comments to correct the Hazard Analysis & Critical Control Point Plan to align with National Shellfish Sanitation Program guidelines to prevent users of the Plan from receiving National Shellfish Sanitation Program non-compliance;
- Assisted in reviewing the department's 12-year National Shellfish Sanitation Program sanitary survey reports associated with Mississippi's shellfish growing waters;
- Attended the Food Safety Task Force meetings in Jackson, Mississippi, involving the Food and Drug Administration, MDMR, Department of Health, and Department of Agriculture and Commerce;
- Reviewed and provided comments on Interstate Shellfish Sanitation Conference draft interpretations of some National Shellfish Sanitation Program guidelines;
- Conducted oyster-processing experiments with oyster processors;
- Worked on backflow preventers and water line decontamination guidance for processors;
- Attended the MDMR/Gulf Coast Research Laboratory's Harmful Algal Bloom Meeting;
- Reviewed and compiled regulations applicable to Mississippi marine aquaculture and met with department legal staff for further review;
- Attended and prepared meeting summary on the

- Ports and Harbor Senate Hearing on Seafood Regulations;
- Participated in the Strategic Planning Priorities for the Mississippi/Alabama Sea Grant Consortium;
- Met with Mississippi/Alabama Sea Grant Legal Services to provide information on marine aquaculture regulations applicable to a research project;
- Worked to develop a minimum requirement Crustacean Hazard Analysis & Critical Control Point Plan for use by small dealers to aid in requested technical assistance;
- Prepared comments and recommendations on the new National Shellfish Management Program and the associated new Office of Shellfish;
- Reviewed the 1995 Manual of Operations and the 1997 Model Ordinance for the Interstate Shellfish Sanitation Conference to determine whether substantive changes were made to the National Shellfish Sanitation Program during conversion process;
- Reviewed and commented on a draft report from the Interstate Shellfish Sanitation Conference *Vibrio vulnificus* Subcommittee;
- Reviewed and commented on Interstate Shellfish Sanitation Conference Subcommittee proposed modifications to the National Shellfish Sanitation Program Model Ordinance for clarification of Shellstock Shipper Facility requirements; and
- Worked to develop a National Shellfish Sanitation Program sanitation form to increase data recording productivity and to reduce paper volume.

SHELLFISH SANITATION AND HEALTH SAFETY REGULATORY ACTIVITIES

- Inspected Mississippi permitted shellfish processing, storage, and distribution facilities to determine compliances with state and federal sanitation and seafood safety regulations; to provide the public confidence in Mississippi inspected seafood products and to aid in marketing Mississippi seafood products. A strong public confidence in these products helps sustain a high market demand for Mississippi seafood products;
- Participated in the shellfish processing plant regulatory review and evaluation by the Food and Drug Administration;
- Permitted and routinely inspected seafood facilities by type:

Type/Number of Seafood Sanitation/ Processing Permits	
Shrimp	28
Crab	16
Oyster	<u>33</u>
Total	77

These 77 permits represent 147 inspected seafood units.

Staff of the Seafood Technology Bureau conducted shellfish sanitation and health safety regulatory activities as follows: 1,045 seafood facility inspections and associated actions; 155 collections of processing source water samples for testing; 1,200 total seafood sanitation regulatory activities. Staff also conducted inspections and associated actions to determine compliance with the following sanitation and seafood health safety regulations:

- Molluscan shellfish sanitation specifications covered under the National Shellfish Sanitation Program;
- Seafood species sanitation regulations other than molluscan shellfish sanitation regulations to aid the industry in meeting compliance conditions when the Food and Drug Administration conducted official inspections;
- Conducted quarterly inspections of all permitted facilities and conducted follow-up inspections as needed;
- Worked with seafood processors to correct deficiencies to meet Food and Drug Administration seafood compliance criteria;
- Worked on management criteria and forms for dealers converting selected Critical Control Points from under Hazard Analysis & Critical Control Point management to management under Standard Operating Procedures;
- Prepared and submitted response to Food and Drug Administration pertaining to the Food and Drug Administration Program Element Evaluation Report describing results of the FY1999 Food and Drug Administration evaluation of the Mississippi Shellfish Sanitation Program Plant Sanitation

Element;

- Worked with molluscan shellfish dealers prepared to convert selected critical limits from under Hazard Analysis & Critical Control Point management to management under Standard Operating Procedures;
- Prepared for the Food and Drug Administration the consolidated report of inspection results for National Shellfish Sanitation Program Sanitation Item: Condition and Cleanliness of Food Contact Surfaces;
- Placed a seafood dealer's oysters on hold for possible back-flow hose contamination. Tests revealed product safe and were released for marketing;
- Provided editorial comments for the Food and Drug Administration Mississippi National Shellfish Sanitation Program Annual Report;
- Worked on Memorandum of Understanding and coordination form for MDMR, Department of Agriculture and Commerce, and Department of Health. Met with Department of Health and Department of Agriculture and Commerce in Jackson regarding seafood inspection coordination;
- Met with Food and Drug Administration to review MDMR National Shellfish Sanitation Program Fiscal Year 2000 evaluation results and prepared response to Food and Drug Administration Program Element Evaluation Report summary of seafood processing facilities and Inspector Standardization;
- Attended Seafood Hazard Analysis & Critical Control Point Regulator Training I/II in Jackson, Mississippi;
- Attended Food and Drug Administration STT 150 Basic Plant Sanitation Course; and
- Completed recertification inspections of certified dealers and issued new permits.

TEXAS PARKS AND WILDLIFE DEPARTMENT COASTAL FISHERIES RESEARCH MANAGEMENT PROGRAMS *Hal Osburn, Division Director*

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

COASTAL DIVISION OBJECTIVES

The goal of the Coastal Fisheries Program is to develop management plans for selected fisheries using the concept of optimum yield. These plans include recommended harvest regulations, resource stock enhancements, and habitat enhancements based on fisheries independent and dependent monitoring program data utilizing the best scientific information available. Objectives of the division are: (1) to recommend management strategies for aquatic marine resources to the executive director, the Texas Parks and Wildlife Commission (TPWC), and the Legislature based on sound scientific data; (2) to determine trends in abundance of finfish and shellfish populations affected by environmental conditions and fishing; (3) to determine landings of marine species and associated social and economic characteristics of the fisheries; (4) to restore, manage, and enhance existing fishery populations through stock identification, life history, genetic and reproductive physiology research, establishing appropriate stocking ratios for selected marine organisms in Texas bays, and assessing impacts of stocking on present populations and existing fisheries; and (5) to promote, develop, maintain, monitor, and enhance the artificial reef potential in the marine waters off Texas.

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

Activities in FY 2000 included participation in the development, review, and revision of Gulf of Mexico Fishery Management Council and Gulf States Marine Fisheries Commission fishery management

plans. Personnel participated in workshops and advisory meetings as state representatives on both the council and commission, as well as other management authorities.

In addition, numerous technical reports and scientific journal articles about various aspects of the Texas coastal fishery resources were completed.

RESOURCE AND HARVEST MONITORING

Monitoring of the relative abundance of adult fin fishes 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 trawls (20 feet long) are used to determine abundance of juvenile finfish, shrimp, blue crabs, and associated organisms. Oyster dredges (19.5 inches wide) are used to collect oyster abundance data.

Gulf of Mexico water from Alabama to the Rio Grande were sampled to a depth of 300 feet during October 1999 and June-July 2000 with the other Gulf States and the NMFS. This effort, Southeast Area Monitoring and Assessment Program (SEAMAP), was coordinated by the GSMFC. Results of sampling were used to evaluate closure of Gulf waters to shrimping and to determine relative abundance of associated organisms.

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

A total of 1,141 survey days was spent to estimate landings and pressure of private and party boat fishermen. There were 739 gill net samples; 2,040 bag seine samples; 2,634 bay and Gulf trawl samples; and 1,014 oyster dredge samples collected.

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

from commercial seafood dealers through submission of Monthly Aquatic Products Reports (MAPR).

RESEARCH

The Perry R. Bass Marine Fisheries Research Station at Palacios provided information and techniques necessary for improvement of Texas fisheries management strategies. Effort was directed toward research in genetics and life history of important recreational and commercial species and sea grasses with a goal of providing information which can be used to improve management or restoration of those species.

In the past year, genetics studies were conducted or completed on Atlantic croaker, sand seatrout, bonnethead and blacktip sharks, tarpon, brown shrimp, blue crab and shoalgrass. The mitochondrial DNA (mtDNA) PCR/RFLP analysis of population structure in Atlantic croaker was completed. Allozyme and mtDNA analyses of variation in the three commercially important penaeid shrimp species were completed and reports were written. An analysis of DNA variation in blue crabs has been initiated and collections made. Informative markers are being evaluated in both nuclear and mitochondrial genomes. The analysis of variation in mtDNA in sand seatrout has continued. Studies on genetic variation in bonnethead and blacktip sharks also progressed, with examinations of both mtDNA and nuclear DNA markers. Collections were made of shoalgrass from bays along the Texas coast and preservation and genomic DNA recovery protocols were perfected. Two studies on tarpon genetics were completed. The range-wide survey of mtDNA PCR/RFLP variation was accomplished, and a manuscript has been submitted for peer review and possible inclusion in a special issue of *Contributions to Marine Science*. A survey of allozyme variation in the western Gulf of Mexico conducted in cooperation with colleagues at the Instituto Tecnológico de Ciudad Victoria has also been completed and a manuscript submitted to the same journal. Sequencing of the 12S gene for tarpon from five populations in the Gulf of Mexico has been accomplished with the help of colleagues at the University of Texas Health Science Center in Houston and awaits analysis. Progress on the tarpon microsatellite library continues.

A four-year study comparing red drum populations in stocked bays with those of an unstocked area, Cedar Lakes, was completed and a report submitted. Collection of otoliths from red drum and spotted seatrout were continued to estimate age structure of these populations in Texas waters and to develop age-length keys for these fishes. A study of the age structure and growth rates of Texas Atlantic croaker

was completed. A study to evaluate the effect of winterkill on spotted seatrout reproductive biology and to compare reproductive biology of upper and lower coast spotted seatrout populations was completed. An ongoing study of the age structure and growth rates of southern flounder populations continues. Tarpon life history in Texas waters is being examined with work concentrated on juvenile abundance and tagging of juveniles and adults. A project to identify spotted seatrout spawning areas was begun.

A study comparing the fish-eye and seaeagle BRD's was conducted on Galveston Bay. Data suggests both BRD types hold promise for reducing bycatch, but further testing is required. In addition, ten hatchery-reared juvenile red drum were fitted with acoustic transmitters and released into the upper Laguna Madre. The fishes movements were monitored to better understand the relationship between fish and their environment.

LEGISLATIVE AND REGULATORY CHANGES

The Texas Legislature did not meet in 2000. The Texas Parks and Wildlife Commission adopted several rule changes to ensure stability of the resources. In the recreational fishery, blue marlin and white marlin size limits were increased to 131 and 86 inches, respectively. Sailfish minimum length was increased to 84 inches, and the bag limit on sharks was decreased to one with a 24 inch minimum. This provided better enforcement and consistency with federal regulations.

In other actions, a Finfish Fishery Proclamation was approved to establish the elements of a finfish license management program including rules to establish: a commercial finfish fishing license, eligibility requirements to receive the license in the 2000-2001 license year and subsequent years, provisions for transfer of licenses, the number of licenses an individual may possess, and rules regarding license requirements when commercial finfish fishing.

A shrimp management proclamation was adopted that proposed regulations concerning harvest of shrimp from Texas bays and the Texas Territorial Sea, and proposed increases to selected commercial fishing and business licenses to supplement management and enforcement of commercial fishing in Texas.

In addition, the recreational saltwater fishing stamp was raised in price from \$7 to \$10 to increase revenue for management programs.

FISH STOCKING

Effort directed toward spawning and rearing marine fish continued. Controlled photoperiod and temperature regime to induce sexual maturity and spawning resulted in over 28 million red drum fingerlings and 3 million spotted seatrout fingerlings being stocked into marine water. Technical information concerning fish hatchery development was provided to other coastal states in a cooperative effort to enhance coastal marine fisheries.

A new a state-of-the-art marine fish hatchery and visitors center opened in Lake Jackson in March 1996 and was operated very successfully during 2000. Sea Center Texas is a joint venture between the Texas Parks and Wildlife Department; The Dow Chemical Company, Texas Operations; and the Coastal Conservation Association. The center was constructed using \$13 million in Sportfish Restoration funds. The facility represents a unique merging of fisheries science and visitor education. Touted as the world's largest red drum (redfish) hatchery, Sea Center Texas has become a major attraction both locally and for visitors to the area and has welcomed 470,642 visitors since March 1996.

Sea Center's visitor appeal centers around its interpretive displays, a touch tank, and 25,000-52,000-gallon aquaria. Brood fish are spawned in the facility's 22,000-square-foot hatchery, which houses 24, 12-foot diameter spawning tanks. During peak spawning periods, hatchery personnel collect between 1.5 and 2 million eggs each night from the brood stock tanks. After hatching, the larvae are then transferred to the 35 one-acre rearing ponds. Although established primarily as a red drum and spotted seatrout production hatchery, Sea Center also serves as a testing ground for production of other marine species, such as flounder, Atlantic croaker, snook and tarpon.

ARTIFICIAL REEF PROGRAM

The Artificial Reef Program enhanced three deep water sites in 2000. The Program is responsible for maintaining 34 permitted reef sites; six unlighted buoys (High Island A-462 Reef, High Island A-477 Reef, High Island A-570 Reef, Port Mansfield Liberty Ship Reef, George Vancouver Liberty Ship Reef, and the Port Isabel/South Padre Island Reef) and one lighted buoy at the Mitchell's 12-mile Reef in Outer Continental Shelf (OCS) leasing block Galveston 189. The U.S. Coast Guard granted waivers on the buoy marking requirements at Basco's Reef, North Padre Island A-72 Reef, North Padre Island 967 Reef, High Island A-515, and Galveston A-125 Reef sites.

The Program received the donation offer of three obsolete oil and gas structures, which were converted into artificial reefs by partial mechanical removal methods from OCS leasing blocks High Island A-462, A-477 and A-570. The cost savings to CNG Oil Corporation/ Dominion Resources Company for these three structures resulted in the donation of \$705,000 to the Texas Artificial Reef Fund.

The Program also received the donation of several complex, durable land-based materials to enhance near shore reefs: 64 one-ton natural quarry rocks and 154 hollow concrete power poles. They will be deployed to Basco's and SALT Reefs in 2001. A 55-ton U.S. Navy buoy used to mark submerged barges was transferred as surplus property to the Program at the end of 2000. Plans to cut it into manageable sections and transport it to Basco's Reef are planned for 2001.

In June 2000, the Artificial Reef Program provided an exhibit and workshop for children at the Sea Space Exposition in Houston. The exhibit attempted to promote understanding and identification of artificial reefs and the fish and invertebrates that inhabit them.

Staff set up five monitoring stations in 2000 at High Island A-532 to measure the growth and settlement rate of the tunicate *Didemnum perlucidum*. Growth rates were measured on a quarterly basis and sampling continues in 2001. The tunicate's average growth rate on four one-meter scraped areas has been measured at approximately 0.425 cm per day, or 3 cm per week. Other organisms settling on the metal surface of these sampling stations were soon overgrown by the tunicate, similar to what has been observed over the entire two, eight-pile structures. Although diversity of the sessile invertebrates has been reduced to only one organism, fish densities and diversity on the reef appear to remain stable.

BROWN TIDE

A persistent algal (brown tide) bloom continues in the upper Laguna Madre area. This algal bloom began in 1990. In 2000, the algae bloomed sporadically in several hot spots in the upper Laguna Madre and Baffin Bay but at a much-reduced level. About 3% of seagrass beds in water over three-feet deep disappeared during the bloom; however, these beds are now recovering. Texas Parks and Wildlife Coastal Fisheries Division monitoring programs have detected no harmful effects of the bloom on fisheries resources.

NATIONAL MARINE FISHERIES SERVICE, SOUTHEAST REGIONAL OFFICE NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

William T. Hogarth, Regional Director

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

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

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

The NMFS Southeast Regional Office (SER) is in St. Petersburg, Florida. The Regional Administrator serves as the regional representative of the Assistant Administrator with state conservation agencies, recreational interests, commercial industries, consumers, environmentalists, and the public. The region is responsible for planning, organizing, and implementing fishery management and conservation programs including regulatory requirements, fishery management plans, recreational fisheries, international fisheries and services through the range of NMFS programs. It provides administrative and technical support to regional fishery management councils and is responsible for program planning and evaluation, budgeting, and administrative support services. These

support services are also provided to other NOAA and NMFS elements collocated with the regional office.

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

Significant 2000 fishery actions include:

FISHERY RESOURCE CONSERVATION AND MANAGEMENT

Coastal Migratory Pelagic Fishes

The NMFS published a final rule that implemented changes in the fisheries for Gulf of Mexico group king and Spanish mackerels. A new opening date has been established for the gillnet fishery for Gulf group king mackerel. The fishery opens at 6:00 a.m. eastern standard time on the Tuesday following the Martin Luther King, Jr., holiday. The following weekend will be open as long as the quota has not been taken. All subsequent weekends and holidays would be closed. The total allowable catch (TAC) for Gulf group Spanish mackerel is increased to 9.1 million pounds (MP) (3.913 MP recreational, 5.187 MP commercial). The bag limit for Gulf group Spanish mackerel is increased to 15 fish per person per day for the entire exclusive economic zone (EEZ) in the Gulf of Mexico (Florida through Texas).

The NMFS published a final rule that implemented a number of changes in the catch specifications for king and Spanish mackerel. The fishing year for Gulf group king mackerel is July 1

through June 30, except for the run-around gillnet fishery. Commercial seasons close when the respective quotas are met. The TAC for this group is 10.6 MP (MP). The recreational allocation is 7.21 MP, and the commercial quota is 3.39 MP. The daily bag limit is two king mackerel per person, except for a zero-fish bag limit for captains and crews of for-hire vessels. The Florida west coast subzone has been divided into a northern and southern area. The northern area extends in federal waters from the Alabama/Florida boundary to the Lee/Collier County line year-round. The southern area extends in federal waters from the Lee/Collier County line to the Monroe/Miami-Dade County line (i.e., off Collier and Monroe counties) from November 1 through March 31, and from the Lee/Collier County line to the Collier/Monroe County line (i.e., off Collier County) from April 1 through October 31. A specific quota is in effect for each of the subzones.

To reduce waste in the commercial fisheries, possession of cut-off (damaged) king or Spanish mackerel that comply with the minimum size limits and the trip limits will be allowed in the Gulf of Mexico EEZ. Sale of such cut-off fish will be allowed. This is in addition to the existing allowance for possession and retention of a maximum of five cut-off (damaged) king mackerel that are not subject to the size limits or trip limits, but that cannot be sold or purchased, nor counted against the trip limit.

The minimum size limit for king mackerel is 24 inches, and 12 inches for Spanish mackerel.

The NMFS published a final rule that implemented Amendment 12 to the Fishery Management Plan for Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. Amendment 12 extended the expiration date of the commercial king mackerel vessel permit moratorium from its current expiration date of October 15, 2000, to October 15, 2005, or until the moratorium can be replaced with a license limitation, limited access, and/or individual fishing quota or individual transferrable quota system, whichever occurs earlier.

The NMFS monitored quotas for the three commercial fisheries targeting Gulf group king mackerel and closed the western zone (Texas - Alabama) from August 26, 2000 to June 30, 2001, and the hook-and-line and run-around gillnet fisheries in the Florida west coast subzone from November 19, 2000 to June 30, 2001 when landings estimates indicated the quotas had been harvested.

GULF REEF FISH FISHERIES

The NMFS published a final rule that implemented new fish trap regulations for the Gulf of Mexico effective January 10, 2000, to: (1) provide for a fish trap vessel inspection, (2) require fish trap vessels to submit trip initiation and trip termination reports, and (3) prohibit the possession of reef fish exhibiting the condition of trap rash on board any vessel without a valid fish trap endorsement. In addition to the existing reporting requirements, the owner or operator of a vessel for which a fish trap endorsement has been issued, must comply with the following requirements.

The NMFS published a final rule that implemented four measures intended to prevent overfishing of gag, black grouper, and red grouper. These measures establish: (1) A 22-inch recreational minimum size limit for gag and black groupers; (2) a 24-inch commercial minimum size limit for gag and black grouper; (3) a closure of the Gulf commercial fishery for gag, black grouper, and red grouper from February 15 to March 15; and (4) two closed areas in the eastern Gulf (219 square nautical miles) to all fishing, except highly migratory species.

The NMFS published a final rule that implemented six measures intended to rebuild the overfished red snapper resource in the Gulf of Mexico. These measures: (1) changed the starting date of the fall commercial season from September 1 to October 1; (2) allocated two-thirds of the commercial red snapper quota to the spring season with the remainder available for the fall season; (3) continued the ten-day openings each month of the spring red snapper commercial season; (4) continued the recreational minimum size limit of 16 inches (commercial minimum size limit remains 15 inches); (5) continued a recreational season of April 21 to October 31; and (6) continued the four-fish bag limit for captain and crew of for-hire vessels.

For red snapper in the Gulf of Mexico, the NMFS monitored the recreational quota (4.47 million pounds) and the two seasonal commercial quotas (3.06 million pounds for first season beginning February 1, 2000, and the remainder of the 4.65 MP for the second season beginning September 1, 2000). The NMFS closed the corresponding fisheries when landing estimates indicated the quotas were met and closed the fishery on May 8, 2000 for the first commercial season and on December 8, 2000 for the second season. The recreational fishery was closed on November 1, 2000 and will reopen April 21, 2001.

GULF SHRIMP FISHERY

The NMFS closed federal waters off Texas to commercial shrimping on May 11, 2000 and reopened the fishery on July 5, 2000. This closure of federal waters corresponded with the period that Texas closed its waters to shrimp trawling. This annual closure of the shrimp fishery in the western Gulf off Texas was established to allow brown shrimp to reach a larger and more valuable size prior to harvest and to prevent the discard and waste of brown shrimp smaller than the preferred market size.

PROTECTED SPECIES MANAGEMENT

1. Responded to numerous requests from fishermen regarding TED requirements and provided summaries of current TED rules.
2. Finalized rule to increase the escape opening size of TEDs.
3. Advertised in tourist magazine (*See Magazine*) informing public that harassing or feeding wild dolphins is illegal under the Marine Mammal Protection Act.
4. Distributed thousands of "Protect Dolphins" brochures and posters, as well as posted metal signs at various marinas for prohibitions such as feeding and swimming.
5. Partnered with Mote Marine Laboratory to implement a docent program to educate the public against feeding a lone sociable dolphin known as "Beggar," developed a proposal (for a portion of Florida's dolphin license tag revenue) for a dolphin outreach coordinator, secured funding (from the same source) to produce an educational video targeted at the southeast's constant flux of tourists seeking interactions with wild dolphins, and conducted meetings with local wildlife tour operators to promote SER's safe "marine mammal and sea turtle viewing guidelines."
6. Distributed the "Guide to Marine Mammals and Turtles of the U.S. Atlantic and Gulf of Mexico," to U.S. Atlantic Shark gillnet and Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline fishery.
7. Finalized the Highly Migratory Species Biological Opinion on impacts of U.S. pelagic longline fisheries on listed species.
8. Published a proposed rule to list the U.S. distinct

population segment (DPS) of the smalltooth sawfish (*Pristis pectinata*) as endangered under the Endangered Species Act (ESA). The smalltooth sawfish decline was caused mainly by incidental captures in various fishing gear, especially gillnets, and likely compounded by habitat degradation. If this proposed listing is finalized, the protective measures of the ESA will be extended to U.S. DPS of smalltooth sawfish, a recovery plan will be prepared and implemented, and critical habitat may be designated.

9. Prepared and signed biological opinions for Lease Sale 181 and Destin Dome for Minerals Management Service, and two for Mesh Groyne (Naples and Eglin Air Force Bases).
10. Re-evaluated the Marine Mammal Protection Act fisheries classifications in the Gulf of Mexico and evaluated two fisheries (Gulf of Mexico crab pot and Gulf of Mexico gillnet) from Category III ("rare" interactions) to Category II ("occasional" interaction).

HABITAT PROTECTION

The SER's Habitat Conservation Division (HCD) uses statutory authorities found in various federal laws to interact on activities that affect fishery habitats and ultimately the production of fishery resources. Activities during FY2000 focused on individual and essential fish habitat consultations involving federal regulatory programs, pre- and post-application planning, federal projects affecting habitat, National Environmental Policy Act consultations, watershed planning, partnerships and coordination with others (e.g., fishery management councils), coordination between science and management, outreach efforts, and a heightened involvement in habitat restoration, enhancement, creation, and preservation activities.

The front-line habitat conservation responsibilities are achieved principally through the efforts of HCD personnel stationed at five branch offices in locations throughout the SER. Acting under authority of various federal laws and statutes, field personnel interact directly with federal, state, and local officials, and with private citizens seeking to perform work in coastal waters of the SER. Through consultative services involving field inspections, meetings, public hearings, and document review, biologists provide recommendations for sequentially avoiding, minimizing, and offsetting adverse impacts to habitat. During the year we accomplished the following:

- The NMFS conducted 244 preapplication consultations for proposed water development projects. This process is especially useful in protecting fishery habitat because potential permit applicants usually have not invested heavily in project plans. They are therefore often more amenable to accepting recommendations from resource agencies aimed at reducing environmental impact. The process also allows the NMFS to deal with the regulated public in a forum that is less adversarial than when project plans have been developed and advertised for public review. The amount of habitat that can be involved in this process is substantial.
- The NMFS reviewed 5,395 individual proposals (including preapplication consultations) to develop in wetlands. This number was up by 372 over FY1999. Most of these activities (about 61 and two percent, respectively) were found to either pose no significant threat to fishery resources or were deferred to other agencies. Many of the projects with minimal environmental impact resulted as a consequence of preapplication planning. About 17% (944 projects) were of concern because they involved substantial environmental impact. These projects required modification or denial of federal authorization to protect fisheries resources. About 19% (1,062 projects) of the review opportunities could not be accommodated because of manpower and funding constraints.
- Federal water development projects include construction and maintenance of federal navigation channels, beach erosion and hurricane protection, flood control, port expansion and deepening, and other similar actions. The Corps of Engineers (COE) is the principal federal agency in the coastal zone for the planning, design, and implementation of such projects. Environmental review is conducted by the COE, Fish and Wildlife Service, Environmental Protection Agency (EPA), NMFS, and state natural resource agencies. The NMFS's review of federal projects is conducted largely in connection with provisions of the Fish and Wildlife Coordination Act; however, other statutes such as the Magnuson-Stevens Fishery Conservation and Management Act and National Environmental Policy Act (NEPA) also apply. These laws encourage our review and input with respect to anticipated impacts and means by which adverse impacts can be avoided and offset. The HCD reviewed 97 federally-constructed or sponsored projects during the year.
- Nineteen Essential Fish Habitat (EFH) findings have been completed or are in negotiation. The SER negotiated the first interagency finding and the first programmatic consultation (with the Minerals Management Service completed by the NMFS). Processes have been developed for consultation on fishery management plan amendments and damage assessment/restoration activities undertaken by NOAA. About 2,264 EFH consultations have been initiated by federal action agencies this fiscal year. Most of these actions were found to not adversely affect EFH. The NMFS recommended detailed measures to conserve and protect EFH on 225 of the consultation requests.
- The NEPA requires preparation of an Environmental Impact Statement for major federal actions having significant effects on the human environment. The NMFS reviews these documents to ensure that they adequately address impacts to fishery resources and to provide recommendations on the least damaging alternatives. During FY2000, 124 such reviews occurred. The review process can be a powerful tool for the NMFS in its advocacy role on behalf of fishery resources and their habitat. The NMFS comments must be considered and addressed by the lead federal agency. If NMFS views are not adequately considered, NEPA provides for an appeals process that allows the issue to be mediated at higher organizational levels.
- The NMFS participated in numerous activities associated with mitigation planning and habitat restoration that are unrelated to other habitat restoration programs and activities addressed in this report. The majority of these opportunities are related to federal regulatory programs. The NMFS devoted considerable effort in planning for mitigation bank development, mitigation guideline development, and general mitigation planning. Activities related to the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) continue to be a major habitat restoration activity in the Southeast. This year was extremely active in this arena of the habitat program, and substantial accomplishments are evident in all parts of the habitat program. We conservatively estimate that we interacted on proposals this year that will preserve, enhance, restore, or create more than 46,529 acres of fishery habitat. This includes more than 13,153 acres associated with mitigation banks and more than 32,326 acres of restoration and enhancement projects that the NMFS participates in under the

CWPPRA program.

- The National Estuary Program is a comprehensive, multi-agency evaluation, planning, and action oriented initiative for preserving, protecting, and restoring the aquatic resources within entire estuarine ecosystems. The EPA is the lead federal agency. The NMFS represented NOAA and provided technical assistance. Estuary programs in effect and requiring effort include: Galveston and Corpus Christi bays, Texas; Barataria-Terrebonne Bays Complex, Louisiana; Tampa Bay, Sarasota Bay, Indian River, and Charlotte Harbor, Florida; Mobile Bay, Alabama; and Albemarle-Pamlico Sound, North Carolina.
- Both the NOAA and NMFS have responsibilities related to habitat protection in the Southeast, and these responsibilities are often intertwined. The NMFS SER also performs actions directly for NOAA and NMFS headquarters. Consequently, coordination and cooperation among these entities are essential and form a large share of the habitat protection activities undertaken during the year.
- Outreach efforts included formal and informal presentations, production of reports and informational materials, and publication of research and management related material for peer and public use. Information requests by private, local, state, and federal entities were answered. The NMFS disseminated habitat information through presentations at scientific and management meetings, journal publications, poster sessions, classroom and organization lectures, and interaction with environmental groups and the media.

COOPERATIVE AGREEMENT AND GRANT PROGRAMS

In 2000, 41 grants and cooperative agreements totaling \$3,176,086 were awarded to states, universities, non-profit/profit institutions, and individuals through the programs mentioned below.

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a state-federal program for the collection, management and dissemination of fishery-independent data in the Southeastern U.S. Three components currently exist in partnership with NMFS: SEAMAP-Gulf; SEAMAP-South Atlantic; and SEAMAP-Caribbean. The program allocates funds 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 as coordinating agencies, through programmatic appropriations mutually agreed-upon by the participants. Eleven cooperative agreements totaling \$754,082 were awarded this year.

The State-Federal Cooperative Fishery Statistics Program is a NMFS Southeastern U.S. Program for collection of landings data from the commercial and recreational fisheries of the region. This information is used by the states, and the SEFSC in determining yields, and by the Southeast Regional Administrator and Regional Fishery Management Councils to assist them in formulating fisheries management plans. A total of \$547,927 was awarded by cooperative agreement to ten states in 2000.

The Anadromous and Interjurisdictional Fisheries Programs are national programs that provide funding for grants and cooperative agreements to obtain catch and effort statistics and other fisheries information. This information is used to support management decisions both at the state level and those required under the Magnuson-Stevens Fishery Conservation and Management Act, and the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). Also, under the Atlantic Coastal Act, financial assistance is provided in order to support and encourage the development, implementation, and enforcement of effective interstate conservation and management of Atlantic coastal resources. For 2000, three southeast states received \$112,880 for the Anadromous Fisheries program. The Interjurisdictional Fisheries program funded eleven recipients for \$994,819, and the ACFCMA programs provided \$726,680 to four states. This was the second year that funds were provided for the Atlantic Coastal Cooperative Statistics Program (ACCSP) in the Southeast. Two states received \$39,698 under the ACCSP.

The Marine Fisheries Initiative (MARFIN) program promotes and endorses projects which seek to optimize economic and social benefits from marine fishery resources through cooperative efforts that evoke the best research and management talents of the Southeast Region. The intent is to focus projects funded by MARFIN into cooperative efforts that provide clear answers for fishery needs covered by the NMFS Strategic Plan. An annual MARFIN Report is distributed throughout the nation. In 2000, nine MARFIN cooperative agreement continuation agreements totaling \$951,774 were awarded.

The NMFS participates in the Saltonstall-Kennedy (S-K) Grant Program which is a national

competitive program administered by the NMFS Headquarters office. The program provides financial assistance (grants or cooperative agreements) for research and development projects to benefit the U.S. fishing industry. Four grants were awarded in the Southeast Region totaling \$340,869.

Three fishery management councils in the Southeast U.S. received a total of \$4.061 million in 2000 to conduct fisheries management activities in accordance with the Magnuson-Stevens Fishery Conservation and Management Act.

Under the Unallied Science Program, grants and cooperative agreements in the amount of nearly \$2.73 million were provided to several states and research groups. Work included research on aquaculture and enhancement of wild stocks and included efforts to protect endangered species.

The Unallied Management Projects provided \$893,600 for shrimp trawling and red snapper research.

ECONOMICS PROGRAM

The Economics Program worked with the three southeast Fishery Management Councils to develop the economic and social portion of Operations Plans which list dated products and services to be delivered to the Councils during FY2000. All three were provided to the Councils with progress reports.

An assessment was conducted of the economic consequences of fixed season options for the 2000 Gulf of Mexico recreational red snapper fishery.

Commercial and recreational economic assessments were conducted for the Gulf of Mexico and South Atlantic coastal migratory pelagics (king mackerel, Spanish mackerel, cobia, dolphin, and wahoo) fisheries and made presentations to the Gulf of Mexico's Socio-Economics Panel.

In conjunction with headquarters staff, the current marine recreational data initiatives in the U.S. Caribbean were investigated and summarized

An assessment of the economic effects of ten-day mini-seasons for the Gulf of Mexico commercial red snapper fishery was conducted.

A report on summary statistics from the 1997-1998 Southeast Region marine recreational economics survey was written.

An assessment of data and modeling issues in

the Gulf of Mexico shrimp fishery was conducted.

Commercial and recreational data support for a bioeconomic model of the Gulf of Mexico red snapper fishery developed was provided under contract by researchers at the University of Delaware.

Commercial and recreational economic assessments for Gulf of Mexico red snapper were conducted; presentations were made to the Gulf of Mexico's Socio-Economics Panel fall meeting.

Catch and effort assessments of the reef fish fisheries in the Gulf of Mexico and South Atlantic were conducted.

SAFE files were updated and provided to Councils and others with latest SAFE listings.

A proposal was written to obtain funding, develop request for proposals, and monitor a contract to assess the economic value of recreationally harvested red snapper, king mackerel, and gag.

The development and monitoring of a pilot commercial cost and earnings survey for the Georgia blue crab fishery was developed along with the development of a pilot commercial cost and earnings survey for the Atlantic summer flounder fishery in conjunction with the Atlantic Coastal Cooperative Statistics Program.

A proposal was developed and the grant was monitored to the South Atlantic Fishery Management Council to fund the initial outreach phase of a cost-returns data collection initiative for the South Atlantic commercial snapper-grouper fishery.

Qualitative estimates were developed of the overcapacity status of managed fisheries in the Southeast and helped develop the National overcapacity status report .

Technical work groups, panels, and committees were represented as part of the Atlantic Coastal Cooperative Statistics Program and the Fisheries Information Network.

Eighteen staff reports were produced and distributed on the results of analyses conducted for the Councils and other customers.

**GULF OF MEXICO FIELD OFFICE OF NMFS'
OFFICE OF INTERGOVERNMENTAL AND
RECREATIONAL FISHERIES (IRF)**

- IRF established and maintains a Gulf of Mexico recreational fisheries field office in the region.
- In partnership with the Florida Foundation for Responsible Angling, IRF cosponsors numerous "Take-A-Kid Fishing" programs aimed at increasing participation by children in marine recreational angling.
- In partnership with "Ladies, Let's Go Fishing," and the Florida Foundation for Responsible Angling, IRF cosponsors fishing events aimed at increasing participation by women in marine recreational angling.
- In partnership with the Mississippi Department of Marine Resources, IRF cosponsors the Annual Mississippi Very Special Fishing Rodeo," aimed at increasing participation by differently-abled children in marine recreational angling.
- In partnership with the Florida Foundation for Responsible Angling, IRF cosponsors an educational outreach program for children which is aimed at building appreciation and knowledge of marine resources through hand's-on learning experiences.
- In partnership with the Mote Marine Laboratory, and the Florida Coastal Conservation Association, IRF cosponsored the Gulf Coast Shark Census Assessment. The shark census assessment is considered to be "The world's only 100% catch & release shark tournament for research, where only information is landed."
- IRF staff has been named to represent NMFS on the Gulf States Marine Fisheries Commission (GSMFC) Technical Coordinating Committee Anadromous Fish Subcommittee.
- IRF staff has been named to represent NMFS on the GSMFC's Technical Coordinating Committee Artificial Reef Subcommittee.
- IRF staff has been named to represent NMFS on the GSMFC Fisheries Information Network Education and Outreach Subcommittee.
- With support from the GSMFC, IRF and the National Sea Grant College Program cosponsored "RecFish 2000, Managing Marine Recreational

Fisheries in the 21st Century" June 25-28 in San Diego, California.

**SOUTHEAST FISHERIES SCIENCE CENTER
PROJECTS**

Predicting Sex Ratios of Benthic Immature Sea Turtles

Serum testosterone in immature sea turtles is sometimes used as an indicator of sex. Levels of testosterone, however, may be affected by ambient temperature, which then may result in an inaccurate prediction of the male-female ratio for turtle populations. The SEFSC research indicates that lower temperatures do impact circulating turtle testosterone levels and hence the reliability of testosterone as a predictor of sex in immature loggerheads.

New Aging Techniques for Sea Turtles

New aging techniques for sea turtles were developed from humeri taken from loggerhead and Kemp's ridley flippers. By analyzing growth mark patterns, the ages of headstart Kemp's ridleys and wire-tagged animals were accurately identified. Also, the humeri growth mark deposited between the transition from pelagic to nearshore benthic habitats in loggerheads and Kemp's ridleys was identifiable using stable isotopes.

Essential Jewfish Habitat

Data from tagged juvenile jewfish in the Ten Thousand Islands region of Florida has enabled SEFSC scientists to develop maps of critical habitat and to derive estimates of jewfish abundance in associated mangrove habitats. An acoustic study was also conducted to study jewfish movement and associated habitat use. The latter suggests that jewfish populations are site faithful, many remaining on offshore aggregations for months after spawning.

Sperm Whale Surveys

A pilot cruise in the Gulf of Mexico in June-July 2000 tested and refined methods for studying sperm whales at sea. Scientists from a number of agencies and universities in Europe and the United States participated aboard the NOAA Ship *Gordon Gunter*. Acoustic tags, attached by suction cups, were applied to sperm whales, and data were collected on activities and sounds associated with sperm whales. Also, forty-five tissue samples were obtained for study, and more than fifty individual sperm whale flukes were photographed and catalogued for future sperm whale

identification on follow-up cruises in 2001.

Tortugas Species and Habitat Distribution

The SEFSC scientists conducted 1,122 research dives throughout the Tortugas region, including Dry Tortugas National Park in 2000. These added to an existing database of 1,036 similar dives from 1999. Various data for 230 species of fish and dozens of corals and sponges were collected for analysis. The divers also discovered new areas of luxuriant coral reefs and isolated pockets with large fish abundance. But preliminary results indicate that the overall number and size of targeted snappers and groupers were down considerably from their presumed historical levels.

Pink Shrimp as Biological Indicator in Florida Bay

The SEFSC is studying the use of pink shrimp as a biological indicator for the Everglades Restoration Initiative. The object is to determine the relationship between salinity in Florida Bay (as determined by freshwater inflow from the Everglades restoration) and pink shrimp abundance. SEFSC research has focused on: 1) *conditioning*, defined as the impact of gradual salinity changes on juvenile shrimp, and 2) *immigration pathways*, defined as the path taken by postlarvae shrimp entering the Bay after having been spawned off the Dry Tortugas, 120 miles to the southwest. Preliminary results indicate that conditioning makes little difference to the extremely low survival rate of juveniles in low salinities but it seems to increase survival of juveniles in high salinities. Preliminary results also indicate that seasonal postlarvae shrimp entering from the Atlantic Ocean and from the Gulf of Mexico, both appear to be important pathways contributing to early settlement stages.

Regulatory Options on Shrimp Fishery

A review of the brown shrimp fishery off the Texas and Louisiana coasts during the 1999 season showed that brown shrimp production was below average off both the Texas and Louisiana coasts. Inshore production was about average in both Texas and Louisiana. As in all other years, an economic benefit was shown when the 200-mile closure was compared to a no closure scenario. Benefits of the closure at dockside facilities were negligible. A review of the Tortugas pink shrimp fishery through December 1999 indicated that catch and recruitment were above average levels.

Shrimp Forecast

The 2000 Texas indices of brown shrimp recruitment indicated an above average year of production in offshore Texas waters from July 2000 through June 2001. The Galveston Bay bait index forecasted a yield of 30.0 million pounds, approximately 3.4 million pounds below the 1960-1998 historical average. The 2000 Louisiana indices suggested an above average harvest of brown shrimp this season from west of the Mississippi River to the Texas-Louisiana border. Production from Louisiana inshore and nearshore water is forecast to be 47.1 million pounds, approximately 18.1 million pounds above the historical average. Hence, the western Gulf of Mexico should expect a combined annual brown shrimp production of at least 77.1 million pounds during the 2000-2001 season, well above the historical average of 55.6 million pounds for the two-state area.

Brown Shrimp

Brown shrimp catch has dropped from the 1990 apex, reaching a low of 67.3 million pounds in 1994. Catch increased to 77.0 million pounds in 1995, but dropped down to 73.2 million pounds in 1996, and to 66.3 million pounds in 1997. Catch in 1998 was 79.4 million pounds, which is an increase over values obtained since 1991. A slight increase to 81.3 million pounds was realized in 1999. The estimated number of parents during a given monthly period were estimated by the VPA. Brown shrimp had their lowest parent numbers in the early 1980s. Values are currently above recruitment over fishing index levels (i.e., no recruitment over fishing).

White Shrimp

White shrimp catch has declined from the maximum over the past several years and was at 49.2 million pounds in 1995, and only 34.8 million pounds in 1996. In 1997 the catch increased to 39.1 million pounds. In 1998, the catch level again increased to 54.8 million pounds and remained at this level in 1999. White shrimp had their lowest parent numbers in the early 1960's. Values are currently above recruitment over fishing index levels (i.e., no recruitment over fishing).

Pink Shrimp

Pink shrimp catch dropped dramatically in 1986 and reached a low of 6.1 million pounds in 1991. Pink shrimp catch increased over the next four years, reaching 10.3 million pounds during 1994, and 17.0 million pounds in 1995. A slight decrease was

experienced in 1996, when the value dropped to 16.4 million pounds. The 1997 catch was 14.7 million pounds. This level is lower than the 1995 and 1996 values, but above the values in previous years. In biological year 1998, a slight decrease to 11.4 million pounds was experienced in the fishery—the third straight year to encounter a decrease since the high in 1995. Pink shrimp had lowest parent numbers in the early 1990s. Values are currently above recruitment over fishing index levels (i.e., no recruitment over fishing).

King and Spanish Mackerel

The SEFSC projections indicate that Gulf king mackerel stock size might be in excess of 0.8 BMSY (the proposed MSST for this stock) a result of lower than allowable catches taken over the past two years. Atlantic king and both Spanish mackerel stocks are estimated to be at biomass levels exceeding BMSY and with corresponding fishing mortality rates lower than MFMT.

Atlantic Yellowfin Tuna

Recent analyses imply that although catches could be slightly lower than MSY levels, effort may be either above or below the MSY level, depending on the assumptions made about changes in fishing power. Consistent with the production model results, yield-per-recruit analyses also indicate that current (1999) fishing mortality rates could either be above or about level with that which could produce MSY. Yield-per-recruit analyses further indicate that an increase in effort is likely to decrease the yield per recruit, while reductions in fishing mortality on fish less than 3.2 kg could result in substantial gains in yield per recruit and modest gains in spawning biomass per recruit.

South Atlantic Albacore

The current assessment (based largely on an age-structured production model) indicates that the stock is not being over fished and that the recent (1997-1999) level of landings for the southern albacore stock can probably be maintained into the near future without causing a substantial decline in spawning stock biomass.

West Atlantic Bluefin Tuna

The current assessment indicates that the stock is over fished according to the objective of maintaining ICCAT stocks at the MSY-biomass level. The assessment also indicates that current fishing mortality is greater than that associated with MSY.

Atlantic Blue Marlin

The current analysis suggests that the total Atlantic stock is approximately 40% of BMSY and that over fishing has taken place in the last 10-15 years. But this assessment also suggests a less productive stock than previously estimated, with an MSY of about 2,000 MT and a current fishing mortality that is about four times higher than FMSY.

Atlantic White Marlin

The most recent assessment suggests that the total Atlantic stock is less than 15% of BMSY, that over fishing has taken place for over three decades, and that the stock is less productive than previously estimated, with an MSY smaller than 1,300 MT. Current fishing mortality is estimated to be seven times higher than FMSY, or higher.

Gulf Greater Amberjack

The most recent stock assessment of Gulf of Mexico Greater Amberjack indicates that the resource was over fished and undergoing over fishing in 1997. The assessment may not fully represent the full effects of the closed season (started in 1998) and recent bag limits instituted by the Gulf Council for greater amberjack. At present, the stock may be over fished, but may not be experiencing over fishing if these recent regulations have reduced fishing mortality. Under recent (1999) levels of catch, the stock is expected to increase toward MSST while F is expected to be about or somewhat less than MFMT.

Gulf Red Grouper

Additional stock evaluation trials for Gulf red grouper were reviewed by the Gulf of Mexico's Reef Fish Stock Assessment Panel at its December 2000 meeting. The panel evaluated the sensitivity of the assessment to 1) different assumptions about release mortality rates for the longline fishery, 2) disregarding the earliest part of the catch-effort time series, and 3) the combination of effects 1 and 2. Although the sensitivities resulted in somewhat more optimistic appraisals of stock status, the evaluations indicated that red grouper in the Gulf of Mexico were both over fished and undergoing over fishing. The panel recommended reducing catch to levels that would be expected to allow the stock to recover to BMSY within ten years.

Gulf Red Snapper

Extensive sensitivity analysis of the most

recent red snapper stock assessment was presented to the Reef Fish Stock Assessment Panel at its December 2000 meeting. Robustness of the assessment of stock status (relative to MSST and MFMT) and of the Reef Fish Stock Assessment Panel's management advice to issues of concern raised by consultants to the Gulf shrimp industry was addressed by the sensitivities. All evaluations were based on the stock recruitment parameters the Reef Fish Stock Assessment Panel used in formulating management advice to the Council. Under all of the 54 combinations, the red snapper stock was determined to be over fished and undergoing over fishing, indicating robustness of the assessment of stock status to these variations. Although, in general, assumptions which lead to higher bycatch and lower juvenile mortality rates resulted in lower MSY estimates, higher BMSY and B-current estimates, and lower FMSY and F-current estimates, the differences were not significant enough to impact the Reef Fish Stock Assessment Panel's management advice. The

Reef Fish Stock Assessment Panel concluded that the assessment model was robust to these alternative assumptions and parameter values.

Large Coastal Sharks

A report on the status of shark fishery resources was prepared that focused on updating commercial and recreational landings, bycatch, and average weights up to 1998 and providing estimates for 1999 of Atlantic sharks harvested by U.S. fishers. The U.S. commercial shark fishery is primarily a southern coastal fishery extending from North Carolina to Texas. Total commercial landings in 1998 and 1999 exceeded the allowed quotas. This can be attributed to state landings occurring after each of the two federal semi-annual season closures. Recreational fishing also resulted in significant harvests of large coastal and other shark species.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

Wayne Swingle, Executive Director

The Gulf of Mexico Fishery Management Council (Council) is one of eight regional Fishery Management Councils which were established by the Fishery Conservation and Management Act in 1976 (now called the Magnuson-Stevens Fishery Conservation and Magnuson Act). The Council prepares fishery plans which are designed to manage fishery resources from where state waters end out to the 200-mile limit of the Gulf of Mexico. These waters are also known as the Exclusive Economic Zone (EEZ).

The Council consists of 17 voting members as follows: the southeast regional director of the NMFS (or his designee), the directors of the five Gulf state marine resource management agencies (or their designees), and 11 members who are nominated by the state governors and appointed by the Secretary of Commerce for three-year terms (and can serve for a maximum of three consecutive terms). In addition, four nonvoting members represent the U.S. Coast Guard, Fish and Wildlife Service, Department of State, and the Gulf States Marine Fisheries Commission.

The Council meets every two months at various locations around the Gulf Coast. Before final action on any proposed rule change is taken, public

hearings are held throughout the Gulf as well as at the Council meeting where final action is scheduled. Proposed rule changes are then submitted to the NMFS for further review and approval before being implemented.

When reviewing potential rule changes, the Council draws upon the services of knowledgeable people from other state and federal agencies, universities and the public who serve on the following panels and committees:

- **Advisory Panels:** recreational and commercial fishermen, charterboat operators, buyers, sellers, and consumers who are knowledgeable about a particular fishery.
- **Scientific and Statistical Committees:** economists, biologists, sociologists, and natural resource attorneys who are knowledgeable about the technical aspects of fisheries in the Gulf.
- **Stock Assessment Panels:** biologists who are trained in the specialized field of population dynamics and who assess the available biological data and advise the Council on the status of stocks and level of allowable biological catch.

STATUS OF FISHERY MANAGEMENT PLAN DEVELOPMENT

Fishery Management Unit	Completed Implementation as of December 2000	Target Date	Remarks
Billfish	Amendment 1 implemented	1988	
Coastal Herring	Final profile completed	None	No further action
Coral	Amendments 1, 2, and 3 implemented	1984	
Dolphin/Wahoo	Final FMP pending completion	2001	
Groundfish	Draft FMP completed, FMP development suspended	None	
Mackerel ^{1,2}	Amendments 1 through 12 implemented	1983	
Reef Fish ^{1,2}	Amendments 1 through 17 implemented. Amendments 8 and 10 withdrawn	1984	Amendment 18 under development
Red Drum ^{1,2}	Amendments 1, 2, and 3 implemented	1986	

Fishery Management Unit	Completed Implementation as of December 2000	Target Date	Remarks
Shark/Swordfish/Tuna*	HMS FMP implemented	1999	
Shrimp ^{1,2}	Amendments 1 through 9 implemented	1981	Amendment 11 pending approval, Amendment 10 under development
Spiny Lobster ^{1,2}	Amendments 1 through 6 implemented	1982	Amendment 7 proposed
Stone Crab ^{1,2}	Amendments 1 through 6 implemented	1979	Amendment 7 (effort reduction) pending approval
EFH Amendment	Amendment implemented (partially disapproved)	1999	Amendment 2 submitted for implementation
SFA Amendment	Amendment implemented (partially disapproved)	2000	Resubmission document being drafted

¹Monitoring report completed.

²Operations plan completed or under development.

*Secretarial FMP affecting Gulf. The Council has a consultation role and may convene SSC, AP, or committees for advice on regulatory measures. Shark, tuna, and swordfish are in a single FMP.

UNITED STATES FISH AND WILDLIFE SERVICE

Douglas J. Frugé, Gulf Coast Fisheries Coordinator

The U.S. Fish and Wildlife Service's (FWS) Assistant Director for the newly organized Division of Fisheries and Habitat Conservation, Cathleen Short, addressed the plenary session of the joint meeting of the Atlantic and Gulf states marine fisheries commissions in Clearwater, Florida, on October 17. Numerous FWS personnel from the Southwest, Southeast and Northeast regions attended this meeting.

ANADROMOUS FISHERIES

Gulf Coast Fisheries Coordinator Doug Frugé presented a briefing to the Anadromous Fisheries Subcommittee at its March 14 meeting in Orange Beach, Alabama, on a project that had been conducted for the GSMFC by Brown and Mitchell, Inc. of Gulfport, Mississippi, in 1998. The purpose of the project was to develop a basic Geographic Information System of the Pascagoula River watershed to assist in anadromous fish management efforts in that system. Mr. Frugé was re-elected chairman of the subcommittee at the fall meeting on October 17 in Clearwater, Florida.

Shawn Alam of the FWS Panama City, Florida Fisheries Resource Office (FRO) published a paper titled "Concentrations of heavy and trace metals in muscle and blood of juvenile Gulf sturgeon (*Acipenser oxyrinchus desotoi*) from the Suwannee River, Florida" and submitted for publication a paper titled "Organochlorine pesticides and heavy metals in muscle and ovaries of Gulf coast striped bass (*Morone saxatilis*) from the Apalachicola River, Florida, USA."

Striped Bass Fishery Management Plan Revision

As assigned at the fall 1999 Anadromous Fish Subcommittee meeting, Doug Frugé reviewed Chapter 8 of the Striped Bass Fishery Management Plan (FMP) and prepared comments in preparation for the FMP revision. Copies of the comments were distributed to the subcommittee at its meeting on March 14.

Fisheries Stewardship Initiative Project

Work continued on project components of a project titled "Restoration of striped bass in three Gulf of Mexico river systems" funded by the FWS under its Fisheries Stewardship Initiative that began in Fiscal Year (FY) 1997. The project focuses on striped bass

restoration in the Apalachicola-Chattahoochee-Flint (ACF) rivers system of Alabama, Florida, and Georgia; the Pascagoula River, Mississippi; and the Lake Pontchartrain basin, Louisiana and Mississippi. Funding in the amount of \$296,000 per year was provided for federal FYs 1997-1999. The FWS and GSMFC enacted a cooperative agreement in June 1997 to facilitate cooperative efforts in implementing the multi-faceted project.

Project components were being carried out by state fish and wildlife agencies and universities, most of which were under subcontract to the GSMFC, including the Florida Fish and Wildlife Conservation Commission (FFWCC), the Georgia Department of Natural Resources (GDNR), the Gulf Coast Research Laboratory (GCRL), the Louisiana Department of Wildlife and Fisheries (LDWF), and Mississippi State University (MSU). The FWS developed a separate intra-agency agreement with the Louisiana Cooperative Fish and Wildlife Research Unit for certain aspects of the project in the Lake Pontchartrain basin. All field work on these projects was completed by the fall of 2000, and all final reports were due by December 31. The final report from MSU was received March 14, 2000. Final reports on all but one of the component projects were submitted by the deadline.

As in the previous two years of the project, the FWS contracted with the New York University Medical Center for mitochondrial DNA genetics analyses on tissue samples from fish collected as part of the Fisheries Stewardship Initiative project components. Final data on genetic identity of 221 samples were provided on August 9 to project cooperators who had collected samples.

Apalachicola-Chattahoochee-Flint Rivers Striped Bass Restoration Technical Committee

Numerous FWS personnel participated in the the 17th Annual *Morone* Workshop in Albany, Georgia, on February 9-10 to discuss aspects of Gulf striped bass restoration in the Apalachicola-Chattahoochee-Flint (ACF) rivers system in Alabama, Georgia, and Florida. The meeting was hosted by the Georgia Department of Natural Resources. A report on the meeting was produced by the Panama City FRO.

Striped Bass Fry/Fingerling Production and Stocking

Gulf race striped bass production and stocking goals were discussed and agreed upon by state and federal fishery biologists at the annual *Morone* workshop. A large portion of the Gulf striped bass stocked in Gulf rivers are spawned and produced on national fish hatcheries (NFH). The Panama City FRO assisted state and NFH personnel in collection and transport of Gulf striped bass broodstock to NFHs as well as state fish hatcheries for spawning. Personnel of the Baton Rouge FRO also assisted the LDWF during March with striped bass broodfish collection and spawning at that agency's Toledo Bend Reservoir Research Facility.

Laura Jenkins of the FWS Panama City FRO coordinated Gulf race striped bass broodfish collection, fry and fingerling production, and stocking across the Gulf of Mexico in 2000. Welaka NFH, Florida, produced 6,200,000 Gulf race striped bass fry for fingerling production in 2000. National fish hatcheries (Private John Allen, Mississippi; Warm Springs, Georgia; and Welaka, Florida) produced and stocked approximately 1,930,000 Phase I and 149,000 Phase II Gulf race striped bass in the ACF system, the Blackwater River, Florida, and Lewis Smith Lake, Alabama, in 2000 and early 2001. Almost 500,000 Phase I and about 2,000 Phase II Atlantic race striped bass were stocked by Natchitoches NFH in Toledo Bend Reservoir between Louisiana and Texas. Natchitoches NFH also stocked about 141,000 Phase I Atlantic race striped bass in the Ouachita River in Louisiana. The Natchitoches NFH also stocked Phase I Gulf race striped bass in several Louisiana rivers and lakes, including about 30,000 in False River; about 22,000 in the Tchefuncte River; and about 31,000 in the Pearl River. All striped bass fingerlings were stocked in support of the GSMFC's striped bass restoration program and also contributed to recreational fisheries in the five Gulf states.

As in previous years, the Gulf Coast FCO coordinated and administered a contract for genetic screening of striped bass broodfish used in producing fry for the Gulf striped bass restoration program. This year, however, there were serious administrative problems with the process, primarily due to timing of budget allocations and submission of the acquisition request, and this almost prevented a contract being issued. The Gulf Coast FCO prepared an acquisition request for the 2001 spawning season and submitted it to the FWS Southeast regional contracting office on December 19, well before the time frame these documents had been submitted in previous years, even

though funding had not yet been allocated to the field station.

Other Striped Bass Activities

In April, the Warm Springs NFH conducted a trial of the JenSorter electronic fry counter for counting striped bass fry. Fry counters may provide personnel a means to more accurately and quickly count fry. The machine was found to be capable of counting in excess of 60,000 fry per hour, though drawbacks noted were the counting of unhatched eggs, dead fry, and air bubbles.

A letter was sent by the Gulf Coast FCO to the Federal Energy Regulatory Commission (FERC) regional office in Atlanta, Georgia, on June 28 emphasizing the need for caution in opening spillway gates at Toledo Bend Dam on the Sabine River (Louisiana-Texas) during summer, as this may affect critical thermal refuge habitat for striped bass in the river.

The Warm Springs NFH conducted an evaluation of tag retention and survival using a "photonic" mark on Phase II striped bass. The marking procedure, which was done on Phase I fish in June, required the fish to be anaesthetized for handling and examination. The tag is illuminated using a long wave length blacklight and filter glasses. In November, there appeared to be no differences in survival between tagged and untagged fish after six months. Tag retention was good, although marks were often very small and may be difficult to read in full sunlight.

Gulf Sturgeon Recovery Activities

The FWS continued coordination and planning with the LDWF on plans for a study of Gulf sturgeon habitat use and population characteristics in Lake Pontchartrain rivers for which the LDWF is being funded by the National Fish and Wildlife Foundation (NFWF). Components of the project included tracking of sonic-tagged sturgeon, as well as systematic sampling with trammel nets in four Lake Pontchartrain rivers. Personnel of the Baton Rouge FRO and Louisiana Ecological Services Field Office (ESFO) assisted the LDWF with pre-project sampling for Gulf sturgeon in the Bogue Chitto and Pearl rivers during July and August. Personnel of the two agencies met on October 26 in Baton Rouge, Louisiana, to finalize coordination for field activities. Baton Rouge FRO personnel participated in seven sampling trips during November and two during December to collect sturgeon for sonic tagging as well as search for sturgeon that had previously been tagged.

Doug Frugé, Gulf Coast FCO, attended a public meeting in Hattiesburg, Mississippi, on May 11 regarding the results of a feasibility study for developing a surface water supply source in the Bouie River Watershed, a Pascagoula River tributary. The proposal would involve constructing a dam in the vicinity of the only known Gulf sturgeon spawning site in Mississippi. Following the meeting the project site was visited.

Personnel of several FWS offices attended a coordination meeting on Gulf sturgeon that was held at the Stennis Space Center near Bay St. Louis, Mississippi, on September 13-14. That meeting was coordinated by Dr. Wendell Lorio of Mississippi State University Science and Technology Research Center, who was on an interagency personnel assignment (IPA) with the FWS at the time. The purpose of the meeting, was to better coordinate the various organizations and individuals across the Gulf working on Gulf sturgeon research projects or issues.

The Panama City FRO conducted a Gulf sturgeon population survey in the lower Choctawhatchee River during October and November to coincide with the species' fall migration from freshwater to the marine environment. A total of 196 Gulf sturgeon were collected, tagged, and released – less than half of what was tagged in a similar assessment in 1999. Two fish weighing 130.0 and 147.0 pounds were equipped with external LTD (light, temperature, depth) archival tags. The LTD tag is able to fix the location of the fish by calculating the angle of the sun. This was done to help provide data on offshore movements and habitat use by the species in the Gulf of Mexico.

The Panama City FRO continued working at various levels on concerns regarding use of non-native and Gulf sturgeon in aquaculture in Florida.

OTHER COASTAL FISHERIES

The Gulf Coast FCO participated in a biological review of J.N. "Ding" Darling, Caloosahatchie, Island Bay, Matlacha Pass, and Pine Island National Wildlife Refuges (NWR) at Sanibel, Florida, during April 3-7. A summary of information developed during the review regarding fisheries and aquatic resources was drafted and provided to the refuge staff on April 19. Part of this review involved coastal fisheries resources.

Information on a variety of grant opportunities available for coastal fisheries research was provided to the Sanibel-Captiva Conservation Foundation of

Sanibel, Florida, on May 8 in response to a request from that organization.

The FWS provided comments on the draft revision of the GSMFC Gulf Menhaden Fishery Management Plan in December.

HABITAT PROTECTION/ENHANCEMENT

The Gulf Coast FCO participated in developing submerged aquatic vegetation and wetland management policies for the Gulf of Mexico Fishery Management Council (GMFMC) through the GSMFC's Habitat Subcommittee and as chair of the GMFMC's Habitat Protection Committee, a process which began early in the year. Both policies were finalized by the GMFMC at its November meeting.

The Gulf Coast FCO also worked with the GMFMC Habitat Protection Committee in developing GMFMC comments on several major actions affecting essential fish habitat in the Gulf of Mexico, including U.S. Army, Corps of Engineers (CE) Section 404 permit notices, several involving marsh management projects in Louisiana and an artificial reef permit modification in Okaloosa County, Florida. Other issues reviewed included two proposed natural gas pipelines across the Gulf and an environmental impact statement (EIS) for a proposed casino in Biloxi, Mississippi.

The Alabama-Coosa-Tallapoosa Basin Commission and the Apalachicola-Chattahoochee-Flint Basin Commission agreed to extend their water allocation negotiations for these basins through May 2001. Technical assistance by the Panama City, Florida, and Daphne, Alabama, ESFOs to the Federal Commissioner involved in these negotiations continued through the year, and both offices participated in a mediation process involving the states on this issue.

A paper by Shawn Alam, of the Panama City FRO, titled "Organochlorine, PCB, PAH, and Metal concentrations in eggs of loggerhead sea turtles (*Caretta caretta*) from northwest Florida, USA" was accepted for publication.

The Panama City and Athens, Georgia, ESFOs provided comments to the state of Georgia on provisions of the Flint River Drought Protection Act that would establish an in stream flow standard for the Act to protect aquatic life in the basin.

The FWS ESFOs at Vero Beach, Florida; Panama City, Florida; Daphne, Alabama; Lafayette, Louisiana; Houston, Texas; and Corpus Christi, Texas, continued efforts to protect and restore coastal habitats

through a variety of activities, many involving review of CE permit applications, consultations involving potential effects on species listed under the Endangered Species Act, and activities under the FWS Environmental Contaminants and Coastal programs. Prominent among these activities were:

- progress on the West Bay (St. Andrew Bay) ecosystem plan involving a major sewage treatment effluent discharge alternative for the City of Panama City Beach that would help to restore up to 300 acres of seagrass beds that have been lost due to degraded water quality in the bay;
- continued work on a Habitat Conservation Plan to address incidental take of sea turtles in Gulf County, Florida, due to beach lighting problems;
- meetings with the Florida Coastal Zone Management program staff and the Nature Conservancy to develop a partnership strategy for a new Northwest Florida Coastal Ecosystem program;
- participation in scoping for a CE EIS on cumulative impacts of permits issued for large-scale development projects in coastal Mississippi; and
- continued work in project planning and implementation in coastal Louisiana under the Coastal Wetlands Planning, Protection and Restoration Act.

Gulf of Mexico Program

Doug Frugé, of the Gulf Coast FCO, attended the Gulf of Mexico Symposium at Mobile, Alabama, during portions of April 10-12. On the morning of April 12, he made a presentation titled "Nutrient Enrichment: Necessity and Nemesis" at the Gulf of Mexico Program (GMP) focus session on nutrient enrichment. In the afternoon on April 12, he participated in the GMP Nonindigenous Species Focus Team meeting.

In June Columbus Brown was assigned as the FWS Southeast Region Special Assistant to the Regional Director for Councils, Commissions, and the GMP. He and Doug Frugé attended the comprehensive meeting of the GMP on June 20-21 in New Orleans, Louisiana. Meetings of the Nutrient Enrichment and Nonindigenous Species focus teams (FT), as well as the Data and Information Transfer Committee were attended by FWS personnel. Frugé also participated in the meeting of the Nutrient Enrichment FT at Stennis Space Center, Mississippi, on November 28-29.

Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

David Frugé, Field Supervisor of the Lafayette ESFO, participated in a meeting of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force on June 15-16 and a conference call of the Task Force's Coordination Committee on June 23. The Task Force, on which the U.S. Department of the Interior is represented, is focused on investigating the causes and developing an Action Plan to reduce the size, severity, and duration of the zone of bottom hypoxia ("dead zone") that forms on the Louisiana-Texas continental shelf each summer. This hypoxic zone has been growing larger in extent and severity since the early 1980s. In July, Doug Frugé, of the Gulf Coast FCO, was designated as the FWS representative on the Coordinating Committee. He participated in conference calls of the committee on August 3, September 7 and 22, and October 5. As a member of the committee, he developed a summary of public comments received on the draft "Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico" on October 3 and provided it to the Washington, DC office of the Environmental Protection Agency (EPA). Dale Hall, FWS Southeast Deputy Regional Director and David Frugé, Field Supervisor of the FWS ESFO at Lafayette, Louisiana, participated in a meeting of the Task Force on October 10-11. The FWS provided comments at various times through the year on the draft Action Plan, which was finalized on November 22. Also on December 11, a draft budget initiative called for as Item 1 of the Action Plan was reviewed and comments provided to EPA.

Fish Passage

Doug Frugé, Gulf Coast FCO, attended a workshop on passage of warm-water fishes at dams that was held by the CE in Wilmington, North Carolina, during April 25-27.

On July 18 Mr. Frugé visited Radium Springs at Albany, Georgia, to make a field inspection of a low-head dam where the spring flow enters the Flint River. The Georgia Department of Natural Resources is interested in enhancing thermal refuge habitat for striped bass at the site, and the ability to move striped bass upstream of the dam would be advantageous. The FWS was asked by GDNR to provide technical assistance in developing potential strategies for fish passage at the site, or otherwise enhancing thermal refuge habitat.

Doug Frugé attended a meeting at Hickory Knob State Park, South Carolina, on August 2 to discuss initial steps toward preparation of an aquatic resources management plan for the Mobile River basin that can be filed with the FERC as a comprehensive

plan under Section 10(a) of the Federal Power Act. The plan will provide a basis for FWS participation in the relicensing processes for seven hydroelectric facilities in the basin due for relicensing by 2005.

Mobile River Aquatic Resource Management Plan

On April 25 Doug Frugé, Gulf Coast FCO, met as chairman of the FWS Central Gulf Ecosystem Team with several other FWS personnel to discuss a strategy for developing a comprehensive plan for the Mobile River basin that can be filed with the FERC as a comprehensive plan under Section 10(a) of the Federal Power Act in preparation for dam relicensing negotiations under procedures of the FERC. Mr. Frugé chaired a follow-up meeting at Hickory Knob State Park, South Carolina, on August 2 to discuss initial steps toward preparation of the plan. The plan will provide a basis for FWS participation in the relicensing processes for seven hydroelectric facilities in the basin due for relicensing by 2005.

On October 11 Mr. Frugé chaired a meeting in Montgomery, Alabama, with representatives of the state fish and wildlife agencies of Alabama and Georgia, as well as other federal natural resource agencies, regarding the proposed comprehensive plan. Basic information on the plan concept was provided to the agency representatives. The plan was discussed with regard to its structure and purposes, as well as potential interest by the other agencies in co-sponsoring the plan or assisting in its development.

PUBLIC OUTREACH/EDUCATION

The Gulf Coast FCO provided photographs of Alabama sturgeon to the Harrison County Soil and Water Conservation District on May 25, as requested, for their next newsletter.

The Panama City ESFO and FRO provided six volunteers for a National Fishing Week event held at the Panama City Beach Pier in June. The event was sponsored by the FFWCC, and over 400 kids registered and proceeded to five different stations to learn about fish habitat, fishing ethics, casting, knot-tying, and fishing safety. The kids then received a free fishing pole and reel.

The Panama City ESFO made several presentations to elected officials in Bay County,

Florida, regarding estuary protection and restoration needs.

The Panama City ESFO also provided exhibits on sea turtles at two events that were non-environmentally related, which provided an opportunity to reach people who may not otherwise have been reached. Lorna Patrick of that office also assisted a middle school student on her school science project on sea turtles and sand incubation.

Joe DeVivo, of the Panama City ESFO, conducted environmental outreach activities at Longwood Elementary School in Shalimar, Florida, on water quality and sturgeon biology.

Panama City ESFO employee Patty Kelly was interviewed by the *St. Petersburg Times* (Florida) on FWS concerns with possible placement of a dam on the Yellow River in Florida, including potential impacts to the Gulf Sturgeon.

Earth Wave Productions, Inc. completed work in late summer on a 15-minute video on Gulf sturgeon that was funded by the FWS and the CE.

Numerous coastal ESFOs, national wildlife refuges and FROs conducted public outreach events throughout the year, many of which focused on Gulf sturgeon, sea turtles and other coastal resources.

As one of the few offices clearly identified in the Mississippi coast's telephone directory as a fish and wildlife agency, the Gulf Coast FCO served as an initial point of contact for many south Mississippi citizens, as well as some nonresidents, looking for fish, wildlife and environmental information. Many of the information requests involved marine resources, and these were usually referred to the Mississippi Department of Marine Resources.

FEDERAL AID FUNDING

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

GULF STATES MARINE FISHERIES COMMISSION

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

for the year ended
December 31, 2000

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

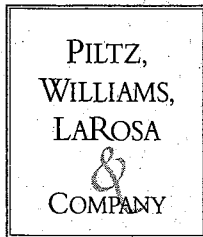
Gulf States Marine Fisheries Commission
Ocean Springs, Mississippi

Financial Statements

December 31, 2000

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Stanford A. Williams, Jr. CPA (Retired)

Independent Auditors' Report

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

We have audited the accompanying statements of assets, liabilities and net assets-modified cash basis as of December 31, 2000 and 1999, and the related statements of revenues and expenses-modified cash basis, and cash flows-modified cash basis for the years then ended. These financial statements are the responsibility of Gulf States Marine Fisheries Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

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

In our opinion, the financial statements referred to above present fairly, in all material respects, the assets, liabilities and net assets-modified cash basis of Gulf States Marine Fisheries Commission as of December 31, 2000 and 1999, and its revenues and expenses and changes in its net assets-modified cash basis, and its cash flows-modified cash basis for the years then ended in conformity with generally accepted accounting principles.

In accordance with *Government Auditing Standards*, we have also issued our report dated February 7, 2001 on our consideration of Gulf States Marine Fisheries Commission's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts and grants.

Our audit was performed for the purpose of forming an opinion on the basic financial statements of Gulf States Marine Fisheries Commission taken as a whole. The accompanying financial information listed as supplemental information in the Index to Report, including Schedule of Expenditures of Federal Awards which is required by U.S. Office of Management and Budget Circular A-133, *Audits of States, Local Governments, and Non-Profit Organizations*, is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, is fairly stated, in all material respects, in relation to the basic financial statements taken as a whole.

Pitz, Williams, Jacobs & Co.
Certified Public Accountants

Biloxi, Mississippi
February 7, 2001

Section I

Financial Statements

Gulf States Marine Fisheries Commission
Statements of Assets, Liabilities and Net Assets-Modified Cash Basis

Assets	December 31,	
	<u>2000</u>	<u>1999</u>
Current assets		
Cash	\$ 239,447	\$ 148,976
Salary advance	<u>175</u>	<u>175</u>
Total current assets	<u>239,622</u>	<u>149,151</u>
 Property & equipment, net of accumulated depreciation	 <u>621,238</u>	 <u>711,630</u>
 Totals	 <u>\$ 860,860</u>	 <u>\$ 860,781</u>
 Liabilities & Net Assets		
Current liabilities		
Note payments, due within one year	\$ <u>10,003</u>	\$ <u>9,234</u>
 Long-term liabilities		
Note payments, due beyond one year	<u>130,534</u>	<u>140,322</u>
 Net assets		
Unrestricted:		
Operating	292,616	201,144
Temporarily restricted	2,864	6,883
Investment in property and equipment, restricted	<u>424,843</u>	<u>503,198</u>
Total net assets	<u>720,323</u>	<u>711,225</u>
 Totals	 <u>\$ 860,860</u>	 <u>\$ 860,781</u>

See Notes to Financial Statements.

Gulf States Marine Fisheries Commission
Statements of Revenues and Expenses – Modified Cash Basis

	Unrestricted		Temporarily Restricted		Total	
	2000	1999	2000	1999	2000	1999
Revenues & reclassifications						
Member state appropriations	\$ 112,500	\$ 112,500	\$	\$	\$ 112,500	\$ 112,500
Grant/contract support			3,841,027	4,106,583	3,841,027	4,106,583
Rental income	20,020	9,478			20,020	9,478
Fees	9,195	7,844			9,195	7,844
Interest income	11,575	16,013			11,575	16,013
Other	4,055	2,259			4,055	2,259
Net assets released from restrictions	3,838,160	4,122,951	(3,838,160)	(4,122,951)		
Total revenues & reclassifications	3,995,505	4,271,045	2,867	(16,368)	3,998,372	4,254,677
Expenses						
Programs:						
Fishery Management Council	28,798	28,917			28,798	28,917
Port Samplers		158,571				158,571
Fish & Wildlife	36,820	30,964			36,820	30,964
Interjurisdictional Fisheries	303,447	195,938			303,447	195,938
SEAMAP	100,902	68,398			100,902	68,398
RECFIN/COMFIN	3,073,785	2,812,308			3,073,785	2,812,308
Sportfish Restoration	166,246	164,687			166,246	164,687
Striped Bass	6,346	254,690			6,346	254,690
Habitat	43,191	46,321			43,191	46,321
Transition		399,801				399,801
Totals	3,759,535	4,160,595			3,759,535	4,160,595
General & administrative	151,384	151,118			151,384	151,118
Total expenses	3,910,919	4,311,713			3,910,919	4,311,713
Excess (deficiency) of revenues and reclassifications over expenses	84,586	(40,668)	2,867	(16,368)	87,453	(57,036)
Change in net assets						
Transfers in (out)	6,886	39,280	(6,886)	(39,280)		
Total changes in net assets	91,472	(1,388)	(4,019)	(55,648)	87,453	(57,036)
Net assets, beginning of year	201,144	202,532	6,883	62,531	208,027	265,063
Net assets, end of year	\$ 292,616	\$ 201,144	\$ 2,864	\$ 6,883	\$ 295,480	\$ 208,027

See Notes to Financial Statements.

Gulf States Marine Fisheries Commission
Statements of Cash Flows-Modified Cash Basis

	Year Ended December 31,	
	<u>2000</u>	<u>1999</u>
Cash flows from operating activities		
Changes in net assets	\$ 87,453	\$(57,036)
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Abandonment loss		3,793
Depreciation	12,038	11,561
Acquisition cost of vehicles and equipment included in operating activities	<u>50,188</u>	<u>393,809</u>
Net cash provided by operating activities	<u>149,679</u>	<u>352,127</u>
Cash flows from investing activities		
Purchase of vehicles & equipment	(50,188)	(408,819)
Unexpended insurance proceeds		(21,515)
Net cash used in investing activities	<u>(50,188)</u>	<u>(430,334)</u>
Cash flows from financing activities		
Note proceeds, equipment		15,010
Note payments	(9,020)	(7,118)
Net cash provided by financing activities	<u>(9,020)</u>	<u>7,892</u>
Net increase (decrease) in cash	90,471	(70,315)
Cash, beginning of year	<u>148,976</u>	<u>219,291</u>
Cash, end of year	\$ <u>239,447</u>	\$ <u>148,976</u>
Interest paid	\$ <u>12,533</u>	\$ <u>11,969</u>

See Notes to Financial Statements.

Gulf States Marine Fisheries Commission
Notes to Financial Statements
Year Ended December 31, 2000

Note A – Summary of Significant Accounting Policies

Operations – The Gulf States Marine Fisheries Commission, a not-for-profit organization, was formally created, with the consent of the 81st Congress of the United States, granted by Public Law 66 and approved May 19, 1949. Congress authorized an interstate compact relating to the better utilization of the fisheries of the Gulf of Mexico. Parties to the agreement are the states of Alabama, Florida, Louisiana, Mississippi and Texas. The commission's office is centrally located in Ocean Springs, Mississippi.

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

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

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

Fixed assets – The Commission has adopted a policy of capitalizing assets with an acquisition cost of \$500 or more. Fixed assets purchased from unrestricted funds are recorded at cost. Fixed assets purchased from restricted funds are expensed in the fund making the expenditures. They are then recorded as a capital addition at cost, with an offsetting entry to an equity account. Depreciation is computed on the straight-line method over the estimated useful lives of the assets.

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

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

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

Gulf States Marine Fisheries Commission
Notes to Financial Statements
(Continued)

Note B – Concentration of Credit Risk

The Commission maintains two bank accounts at one financial institution. These account balances may be shown as follows:

<u>Description</u>	<u>December 31, 2000</u>		<u>December 31, 1999</u>	
	<u>Carrying Amount</u>	<u>Bank Balance</u>	<u>Carrying Value</u>	<u>Bank Balance</u>
Regular accounts	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Repurchase account	229,422	234,417	138,951	395,927
Totals	<u>\$ 239,422</u>	<u>\$ 244,417</u>	<u>\$ 148,951</u>	<u>\$ 405,927</u>

These bank balances are categorized as follows:

	<u>December 31,</u>	
	<u>2000</u>	<u>1999</u>
Amount insured or collateralized with securities held by the Commission or its agent in the Commission's name	\$ 10,000	\$ 10,000
Uncollateralized, or held by the pledging financial institution's trust department or agent in the financial institution's name	<u>234,417</u>	<u>395,927</u>
Total bank balance	<u>\$ 244,417</u>	<u>\$ 405,927</u>

Note C – Property, Plan and Equipment

The Organization's land, depreciable property and equipment may be stated as follows:

	<u>December 31,</u>	
	<u>2000</u>	<u>1999</u>
Land, pledged	\$ 20,000	\$ 20,000
Building, pledged	182,817	182,817
Vehicles	71,363	48,010
Office equipment	<u>695,223</u>	<u>669,138</u>
Totals	969,403	919,965
Less accumulated depreciation	<u>348,165</u>	<u>208,335</u>
Total property and equipment	<u>\$ 621,238</u>	<u>\$ 711,630</u>
Depreciation expense		
Unrestricted	\$ 12,038	\$ 11,561
Restricted	<u>128,543</u>	<u>79,714</u>
Total	<u>\$ 140,581</u>	<u>\$ 91,275</u>

Gulf States Marine Fisheries Commission
Notes to Financial Statements
(Continued)

Note D – Temporarily Restricted Net Assets

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

	December 31,	
	<u>2000</u>	<u>1999</u>
Interjurisdictional	\$ 95	\$
Fish and Wildlife		5,682
Fishery Management Council		1,201
RECFIN/COMFIN	<u>2,769</u>	
Total temporarily restricted net assets	<u>\$ 2,864</u>	<u>\$ 6,883</u>

Note E – Property & Equipment – Restricted

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

	December 31,	
	<u>2000</u>	<u>1999</u>
Balance, beginning of year	\$ 503,198	\$ 194,184
Add:		
Federal funds expended for capital additions	<u>50,188</u>	<u>393,809</u>
Totals	<u>553,386</u>	<u>587,993</u>
Deduct:		
Assets disposed of during year		9,870
Adjustment to record beginning of year accumulated depreciation		(4,789)
Current year depreciation	<u>128,543</u>	<u>79,714</u>
Total deductions	<u>128,543</u>	<u>84,795</u>
Balance, end of year	<u>\$ 424,843</u>	<u>\$ 503,198</u>

Note F – Release of Net Assets

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

	December 31,	
	<u>2000</u>	<u>1999</u>
Purpose restriction accomplished:		
Fishery Management Council	\$ 28,798	\$ 28,916
Port Samplers		158,571
Fish and Wildlife	33,983	36,157
Interjurisdictional Fisheries	315,252	196,614
SEAMAP	107,650	61,981
RECFIN/COMFIN	3,124,805	2,761,034
Sportfish Restoration	172,670	158,263
Striped Bass	12,986	255,681
Habitat	42,016	48,235
Transition		<u>417,499</u>
Total restrictions released	<u>\$ 3,838,160</u>	<u>\$ 4,122,951</u>

Gulf States Marine Fisheries Commission
Notes to Financial Statements
(Continued)

Note G – Notes Payable

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

Original loan amount	\$ 150,008
Interest rate	8.5%
Payment terms	60 monthly payments of \$1,488, plus 1 of remaining balance
Collateral	Land and building at 204 Government St. Ocean Springs, MS

During the current year the Commission acquired a new copy machine under a lease/purchase agreement. The financing details are as follows:

Cost of copier	\$ 35,101
Interest rate	8.5%
Payment terms	Initial payment of \$20,000 plus 60 payments of \$308
Collateral	Xerox copier
Purchase option	Ownership at end of lease

	December 31,	
	2000	1999
Hancock Bank, building purchase	\$ 129,384	\$ 135,777
Copier purchase	11,153	13,779
Totals	140,537	149,556
Less amounts due within one year	10,003	9,234
Amounts due beyond one year	\$ 130,534	\$ 140,322

Maturities by years are as follows:

<u>Year Ending</u>	<u>Total</u>	<u>Building</u>	<u>Copier</u>
12/31/01	\$ 9,988	\$ 7,131	\$ 2,857
12/31/02	125,363	122,253	3,110
12/31/03	3,384		3,384
12/31/04	1,802		1,802
12/31/05			
Totals	\$ 140,537	\$ 129,384	\$ 11,153

Note H – Functional Allocation or Expenses

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

Gulf States Marine Fisheries Commission
Notes to Financial Statements
(Continued)

Note I – Retirement Plan

The Commission has a tax sheltered annuity plan for all employees that have been employed for at least six (6) months. The Commission contributes seven (7) percent of each eligible employee's base pay with the amounts being fully vested upon payment by the Commission. The total expenses for the years ended December 31, 2000 and 1999 was \$48,020 and \$38,894, respectively.

Note J – Lease

During a prior year, the Commission entered into a lease for a 1998 GMC Suburban. This lease was treated as an operating lease. During the current year, this vehicle was stolen and has not been replaced. Lease expense under this lease was \$5,568 and \$5,568 for the years ended December 31, 2000 and 1999.

Section II
Supplemental Information

Restricted

SEAMAP Funds	RECFIN/ COMFIN	Sportfish Restoration	Striped Bass	Habitat	Total
\$ 34,623	\$ 411,281	\$ 69,012	\$ 4,715	\$ 26,682	\$ 671,901
2,802	34,449	5,526	388	2,149	55,430
6,599	62,716	9,488	908	4,185	110,163
2,671	24,168	4,425	197	1,767	43,205
					5,400
11,869	17,749	9,419		551	43,353
2,637	6,529	1,136		417	13,122
15,054	94,198	33,380		1,175	249,719
2,056	14,333	2,877	64	709	25,399
2,194	4,360	1,517	74	1,000	14,734
5,751	6,840	3,335		3,572	20,217
3,235	11,226	8,359		4	29,907
23	469	387		3	1,147
33	83	8,958		76	10,962
4,368	64,081	210		55	69,088
141	1,432	271		59	2,316
960	12,713	1,635		395	35,230
233	2,314	502		44	3,782
	2,278,739	3,000			2,286,739
602	5,991	1,954		158	10,561
446	4,434	855		190	7,228
4,605	15,674				49,926
	6				6
<u>\$ 100,902</u>	<u>\$ 3,073,785</u>	<u>\$ 166,246</u>	<u>\$ 6,346</u>	<u>\$ 43,191</u>	<u>\$ 3,759,535</u>

See Independent Auditors' Report.

Gulf States Marine Fisheries Commission
Schedule of Expenditures of Federal Awards – Modified Cash Basis
For the Year Ended December 31, 2000

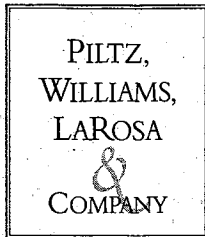
<u>Federal Grantor/Program Title</u>	<u>Catalog of Federal Domestic Assistance</u>	<u>Federal Expenditures</u>
U.S. Department of Interior		
Striped Bass Stewardship Project	15.600	\$ 6,346
Sports Fish Restoration Program	15.605	<u>166,246</u>
Total U. S. Department of Interior		<u>172,592</u>
U.S. Department of Commerce		
Interjurisdictional Fisheries Management Plan	11.407	303,447
Recreational Fisheries Information Network (RECFIN) and Commercial Fisheries Information Network (COMFIN)	11.434	3,073,785
Southeast Area Monitoring and Assessment Program (SEAMAP)	11.435	100,902
Habitat Conservation	11.463	<u>43,191</u>
Total U. S. Department of Commerce		<u>3,521,325</u>
Totals for all federal awards		<u>\$ 3,693,917</u>

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

See Independent Auditors' Report.

Section III

Reports on Compliance and Internal Control



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

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

We have audited the general purpose financial statements of Gulf States Marine Fisheries Commission as of and for the year ended December 31, 2000, and have issued our report thereon dated February 7, 2001. We conducted our audit in accordance with generally accepted auditing standards and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

Compliance

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

Internal Control Over Financial Reporting

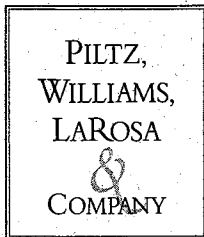
In planning and performing our audit, we considered Gulf States Marine Fisheries Commission's internal control over financial reporting in order to determine our auditing procedures for the purpose of expressing our opinion on the financial statements and not to provide assurance on the internal control over financial reporting. Our consideration of the internal control over financial reporting would not necessarily disclose all matters in the internal control over financial reporting that might be material weaknesses.

A material weakness is a condition in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements in amounts that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. We noted no matters involving the internal control over financial reporting and its operation that we consider to be material weaknesses.

This report is intended solely for the information of the Commission, management, others within the organization and federal awarding agencies and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

Peltz, Williams, Tolson & Co.
Certified Public Accountants

Biloxi, Mississippi
February 7, 2001



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Stephen P. Theobald, CPA
Margaret D. Closson, CPA
Darrell L. Galey, CPA
Michael D. O'Neill, CPA
John L. Kenna, Jr., CPA

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Sam J. LaRosa, Jr., CPA
Gerald Piltz, CPA (Retired)
Stanford A. Williams, Jr. CPA (Retired)

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

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

Compliance

We have audited the compliance of Gulf States Marine Fisheries Commission with the types of compliance requirements described in the U.S. Office of Management and Budget (OMB) Circular A-133 Compliance Supplement that are applicable to each of its major federal programs for the year ended December 31, 2000. Gulf States Marine Fisheries Commission's major federal programs are identified in the summary of auditors' results section of the accompanying Schedule of Findings and Questioned Costs. Compliance with the requirements of laws, regulations, contracts and grants applicable to each of its major federal programs is the responsibility of Gulf States Marine Fisheries Commission's management. Our responsibility is to express an opinion on Gulf States Marine Fisheries Commission's compliance based on our audit.

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

In our opinion, Gulf States Marine Fisheries Commission complied, in all material respects, with the requirements referred to above that are applicable to each of its major federal programs for the year ended December 31, 2000.

Internal Control Over Compliance

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

Our consideration of the internal control over compliance would not necessarily disclose all matters in the internal control that might be material weaknesses. A material weakness is a condition in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that noncompliance with applicable requirements of laws, regulations, contracts and grants that would be material in relation to a major federal program being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. We noted no matters involving the internal control over compliance and its operation that we consider to be material weaknesses.

This report is intended solely for the information of the Commission, management, others within the organization and federal awarding agencies and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

Petty, Williams, DeRose & Co.
Certified Public Accountants

Biloxi, Mississippi
February 7, 2001

Section IV

Other Items

Gulf States Marine Fisheries Commission
Schedule of Findings and Questioned Costs
For the Year Ended December 31, 2000

Section 1 – Summary of Auditors' Results

1. An unqualified opinion was issued on the general-purpose financial statements.
2. The audit of the general-purpose financial statements did not disclose any material weaknesses in internal control.
3. The audit did not disclose any noncompliance which is material to the general-purpose financial statements.
4. The audit did not disclose any material weaknesses in internal control over major programs.
5. An unqualified opinion was issued on compliance for major programs.
6. The audit disclosed no audit findings which were required to be reported under Section ____ .510(a) of OMB Circular A-133.
7. The major programs were: Recreational Fisheries Information Network and Commercial Fisheries Information Network – 11.434; Interjurisdictional Fisheries – 11.407.
8. The dollar threshold used to distinguish between Type A and Type B Programs was \$300,000.
9. The auditee does qualify as a low-risk auditee.

Section 2 – Findings Related to the Financial Statements

None

Section 3 – Findings and Questioned Costs for Federal Awards

None