

# SAVE THE MANATEE TRUST FUND FISCAL YEAR 1996-1997 ANNUAL REPORT



Florida Department of Environmental Protection  
Division of Marine Resources

December 1, 1997

## EXECUTIVE SUMMARY

Florida manatees are marine mammals that inhabit the coastal and riverine waters of the state throughout the year. They have been listed by the federal government as an endangered species. The largest animals in the population may reach fourteen feet in length and weigh almost 3800 pounds, but most individuals are shorter and smaller. Manatees are herbivores (eating aquatic plants), and are not aggressive towards humans. Female manatees usually give birth to a single calf measuring about three to four feet in length; calves remain with their mothers for up to two years. The recovery of the manatee population is impeded by mortalities from human-related causes (e.g., from collisions with watercraft, becoming trapped in floodgates and locks, and becoming entangled in fishing gear), as well as from degradation of their habitat.

Protection of manatees in Florida has been legislatively mandated since 1892. Current state efforts to recover the population are guided by the Florida Manatee Sanctuary Act of 1978 and the revised Florida Manatee Recovery Plan of 1995. The Florida Manatee Sanctuary Act declared the state to be a refuge and sanctuary for the manatee. The Act and subsequent amendments gave the Department of Environmental Protection (formerly the Department of Natural Resources) the authority to protect manatees from disturbance and harassment, injury, and intentional mortality. The Florida Manatee Recovery Plan lists 126 separate tasks that need to be accomplished to recover the Florida population of the West Indian manatee. Many of these tasks are addressed through a cooperative effort between federal, state, and local governments.

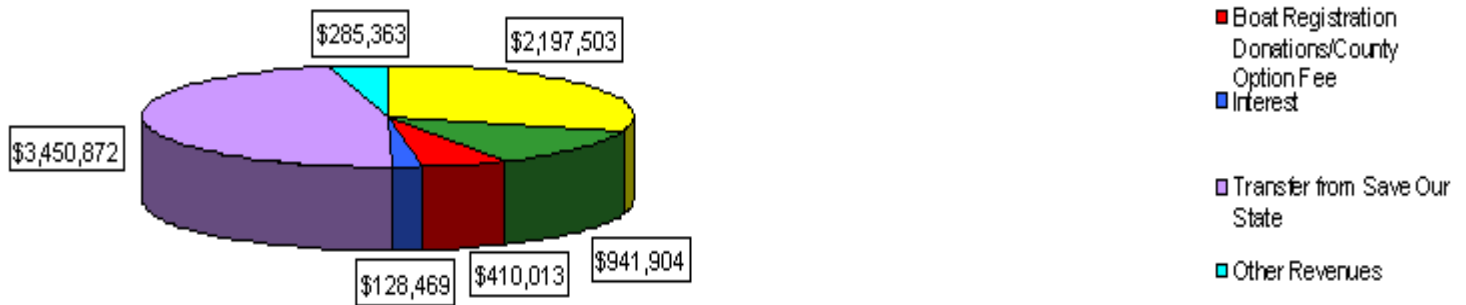
Funding for research and management activities in Florida was authorized through the Save the Manatee Trust Fund, which contains money from sales of a manatee specialty license plate, partial proceeds from state boat registration fees, county-imposed boat registration fees, voluntary contributions, and interest income. Revenues for the Save the Manatee Trust Fund for Fiscal Year 1996-97 totaled almost \$7.5 million, as shown in the accompanying pie chart; the revenue was unusually high this year due to a redistribution of funds when the Save Our State Environmental Education Trust Fund was eliminated. The legislative appropriation for manatee and marine mammal programs in 1996-97 was allocated to FDEP manatee and marine mammals research and management programs within the Division of Marine Resources, contracts to other research organizations, and oceanaria participating in the rescue and rehabilitation of manatees. Research activities coordinated by the Division's Florida Marine Research Institute in St. Petersburg totaled \$1,995,746. Management activities conducted by the Division's Bureau of Protected Species Management, including oceanaria contracts, totaled \$2,665,449. Environmental education through the Florida Game and Fresh Water Fish Commission was supported by \$1,070,770 from the Fund. Budgetary breakdowns for individual program units for both the research and management efforts are depicted on the next page, followed by summaries of the work performed by FDEP personnel at the Florida Marine Research Institute and the Bureau of Protected Species Management.

The human-related problems that manatees and their aquatic ecosystem face did not develop suddenly, and they will not be solved quickly. The solutions are complex and time consuming, as documented in the Florida Manatee Recovery Plan and as evidenced by the complexity of tasks undertaken by FDEP each year. Through the cooperation of local, federal, and state agencies, private organizations, and corporations, effective partnerships have been created to constructively address the recovery of the manatee population. FDEP persists in its efforts to heighten the environmental awareness of Florida's citizens and visitors, realizing that each person can make a significant contribution to the preservation of manatees and Florida's ecosystems by becoming aware of and complying with regulations that were designed both to protect this endangered species and to accommodate the growth of Florida's human population. FDEP will continue to coordinate its applied marine research programs with ecosystem management practices and clean water regulatory controls, assuring that the habitat quality that sustains manatees can be improved and maintained within the State of Florida.

### SAVE THE MANATEE TRUST FUND REVENUES

Fiscal Year 1996-97

Total Revenues = \$7,417,124

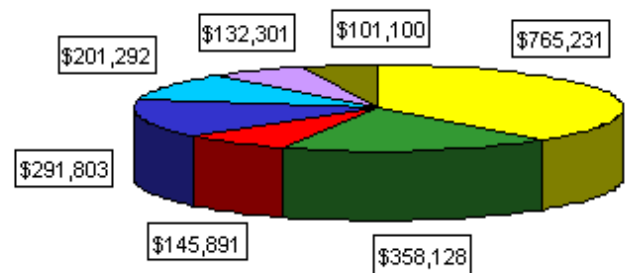


### Expenditures for Marine Mammal Research

Fiscal Year 1996-1997

Total Expenditures = \$1,995,746

- Mortality & Rescue
- Ecology & Migration
- Outside Contracts
- Geographic Information System
- Population Monitoring
- Right Whale Survey
- Life History & Biology

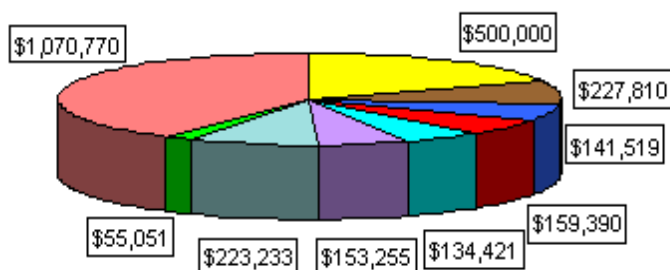


### Expenditures for Management Implementation

Fiscal Year 1996-1997

Total Expenditures = \$2,665,449

- Oceanaria Reimbursement Assistance Contracts
- Education & Information
- Permit Review
- Rule Promulgation
- Geographic Information System
- Habitat Protection
- Manatee Protection Plans
- Regulatory Signs
- Environmental Education



## FMRI MARINE MAMMALS RESEARCH

The Marine Mammal Research Program is headquartered at the Florida Marine Research Institute (FMRI) in downtown St. Petersburg. Additional staff are located at the FMRI Marine Mammal Pathobiology Laboratory 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 marine mammal geographic information systems (GIS). Research on the endangered North Atlantic right whale is coordinated by program staff at the Jacksonville field station.

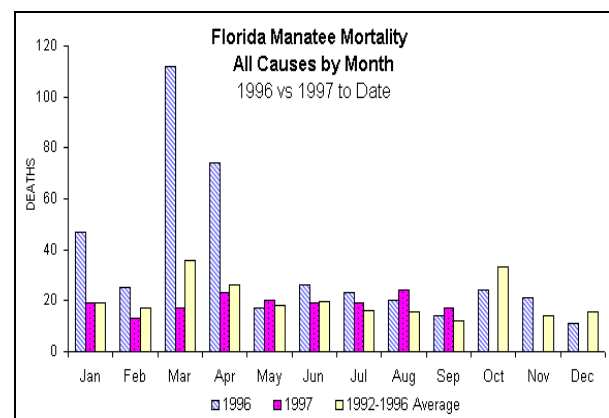
## MORTALITY AND RESCUE

A network of researchers and law enforcement agencies was established in 1974 for the purpose of recovery of manatees carcasses or response to assist injured manatees. The network was initiated by the U.S. Fish and Wildlife Service (USFWS) and researchers at the University of Miami. Over time, the program continued to expand and now rests largely with the FDEP. There is a dedicated staff statewide available for not only the collection of carcasses, but also to conduct research on statewide or regional issues involving manatees. A thorough examination (called a necropsy) is conducted on every carcass in order to determine the cause of death. Most necropsies occur at the state-of-the-art Marine Mammal Pathobiology Laboratory, opened in 1993 in St. Petersburg.



During the late winter of 1996, a large and persistent red tide bloom occurred off the coast of Lee, Charlotte and Collier counties.

Eventually, it was determined that this harmful algal bloom was responsible for the deaths of 149 manatees. During most of the event, called an epizootic, investigators from numerous governmental agencies and research institutions were involved. This single event virtually wiped out the projected annual budget for the necropsy and rescue program within an 8-week period. The investigation carried on long after the last carcass was recovered. Requests to the Legislature for emergency funds to replenish the resources exhausted during the event and to conduct follow up research were authorized and monies were awarded in November 1996. While the event was unfolding, there was also an unprecedented high number of manatee deaths unrelated to the red tide crisis. An additional 264 manatees died from causes ordinarily documented during the year. This was the highest total ever reported during the last 23 years. The combined deaths from "normal" causes and the red tide totaled 415 manatees statewide. This total represented approximately 16% of the statewide population based upon the aerial survey count conducted in February 1996.



## 1996-1997 Highlights

- Much of the work conducted after the die-off focused on follow-up research and data synthesis. A great deal of time was spent finalizing results from various analyses of tissues and samples collected during the event to assure that the appropriate cause was determined. In early July of 1997, the Department along with several collaborators officially announced its findings. This announcement culminated the concentrated efforts of scores of Department employees as well as researchers from 16 different institutions.



- Special new diagnostic capabilities were developed to accurately and quickly diagnose the presence of red tide toxin in the tissues of manatees. This test was developed as a direct result of the red tide associated deaths. This new method was tested against the collection of stored manatee tissues and confirmed that manatees have been exposed (in some cases to a lethal level) to weaker red tides in the past.
- The Congressionally appointed Marine Mammal Commission conducted a review of the response to the manatee die-off. This was a thorough review requiring a great deal of effort on the part of the Department in preparation and presentation to the Commission. The Commission was favorably impressed with the efforts extended by the Department and they made several good suggestions on improvements. The Commission's suggestions were incorporated in a Contingency Plan document that was initiated during 1997. This plan will better organize the Department by clearly establishing roles of personnel and allocating resources in a more planned manner rather than in the heat of the moment.
- In order to more effectively respond to calls about dead and injured manatees, the Necropsy and Rescue program established a rotating statewide contact network that enhanced the existing regional network. The new network is technologically based on a cloned paging system and a rotating schedule for staff. This system allows near constant contact without over taxing staff.

## POPULATION MONITORING

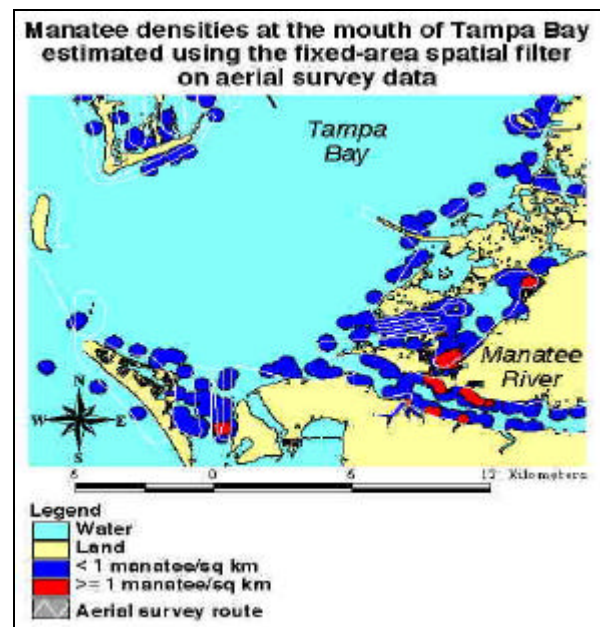
Aerial surveys are invaluable in acquiring information on manatee distribution, relative abundance, and use of habitat types. State-wide winter aerial surveys of all manatee wintering habitats in Florida and southeast Georgia are conducted after cold front passages, when the animals aggregate at warm springs and thermal discharges from power plants and industries. These surveys are useful in determining minimum estimates of manatee populations. Data from aerial surveys and from mortality, life-history, and ecology studies are being combined to create a population model

that will estimate trends in regional population sizes.

Despite the record number of deaths in Southwest Florida in 1996, the 1997 aerial count on the west coast was the highest yet at 1,329. While population models are preliminary, most point toward a slowly increasing population of manatees. However, there is no reason to believe that manatees are any less endangered than before or that any ongoing manatee conservation strategies should be halted. The record number of deaths in recent years remains a major impediment to the recovery of the species. Continued high rates of mortality from watercraft collisions, as well as habitat loss and environmental degradation are serious, ongoing concerns.

### 1996-97 Highlights:

- Two interagency, comprehensive "synoptic" aerial surveys of manatees were conducted in 1997: 2,229 manatees on January 19-20 and 1,709 on February 13. Manatees were counted on 20 survey routes. A total of 26 biologists from 12 state, federal, county and private agencies participated, with a total of 34 flights made for the two synoptic surveys.



- Twice-monthly aerial surveys of manatee distribution were conducted by DEP staff in Apalachicola Bay, Wakulla County, Tampa Bay, and Lee County.

- Surveys in Lee County were continued as part of the follow-up assessment of the 1996 mortality event. Sightings from these surveys were entered into the GIS system for assessment of manatees at risk during the manatee epizootic. Maps of the aerial survey counts and the flight paths are now widely available on the FMRI Atlas of Marine Resources CD-ROM.
- Tests to determine the accuracy of using the Global Positioning System (GPS) for the rapid entry of aerial sighting locations were initiated. GPS is used to document flight paths for aerial surveys.

## 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 tail stock 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.

A telemetry project to track manatees along Florida's west coast was initiated in Tampa Bay and conducted between February 1991 and December 1996. Fifty-nine free-ranging and rehabilitated manatees were tagged and tracked during this time period. Wild manatees tagged in Tampa Bay were tracked as far south as the Ten Thousand Islands in Everglades National Park and as far north as Keaton Beach. Most of the tagged animals returned to the Tampa Bay power plants in the winter. Several of the manatees released back into the wild from rehabilitation facilities were also tagged to monitor the success of their reintroduction.

To better understand the dynamics of the southwest Florida manatee population, a pilot telemetry project was initiated in Lee County in February 1997. Some of the goals of the project were to document daily and seasonal movement patterns and establish blood chemistry profiles on the tagged animals.

### 1996-1997 Highlights:

- Fieldwork for the Tampa Bay telemetry project was completed. A five member team of telemetry and GIS staff focused on analyzing data, creating and verifying GIS coverages, and initiating a technical report to be completed in early 1998.
- In February 1997, twenty-one manatees were caught in Lee County's Caloosahatchee River, San Carlos Bay and Tarpon Bay. Eight manatees were tagged including six females and two males. The tagged females included four mother/calf pairs. The tagged manatees were recaptured in April and June to obtain bio-medical information including blood samples, blubber thickness, weight, and length.
- Eight animals rehabilitated from injury or raised in captivity were tracked during the year. Sweet Pea, an animal rescued during the winter of 1995 in Texas, was released on the west coast of Florida in April 1996. She traveled to the Panhandle for the summer and then moved down the west coast, through the Everglades, and up the east coast to Brevard County before losing her tag in March 1997. Valentine, an orphaned male manatee tagged and released in Everglades National Park in

1995, moved out of Everglades to the east coast in May 1997. By late June, he was in the North Fork of the St. Lucie River. Five of the tagged rehabilitated manatees were tagged for more than a year and are believed to have fully adapted to being in the wild. Two of the five were survivors of encounters with red tide in 1995 and 1996 and were periodically recaptured in 1997 to collect bio-medical information.

## 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 are gathered from a variety of research projects: the scar catalog, use of passive integrated transponders (PIT tags), and non-invasive body condition indices.



The development of the manatee scar catalog program and the Manatee Individual Photo-identification System (MIPS) was innovated by the federal Sirenia Project in Gainesville, Florida. Many individual manatees can be recognized by scars on their bodies and tails resulting from wounds inflicted primarily by powerboats. The scar catalog is maintained as a computer database that comprises images, sketches, coded scar features, and sighting data. FMRI is responsible for managing the scar-catalog data from manatees in areas extending from south of Crystal River to the Everglades on the west coast of Florida. The catalog contains data from scarred manatees found all along the coast, but most of the FMRI

data comes from the Tampa Bay, Sarasota Bay, Fort Myers, and Marco Island areas.

PIT tags are small, unpowered microchips that are placed under the skin of a manatee to provide long-term marking of individuals for identification purposes. Following a successful pilot study by FMRI staff, all manatees handled for rescue, rehabilitation, or tagging are now marked using two PIT tags. To help assess the success of reintroducing rehabilitated animals to the wild, all dead manatees are scanned for tags before necropsy.

FMRI staff are conducting a study in which a portable ultrasound device is used to measure blubber thickness. Staff use this measurement and data concerning the manatee's length, weight, and girth to assess the body condition of individual wild and captive manatees. Data concerning animals captured during the telemetry project and animals at oceanaria have been used to establish baseline values that are helpful in assessing whether free-ranging manatees are undernourished and may require care.

### 1996-97 Highlights:

- The FMRI scar catalog consists of approximately 2070 images representing 430 photo-documented scarred manatees. Scar catalog cooperators have met to redesign the computerized catalog and improve the quality of data collection. Use of volunteers and interns to assist in research activities has increased. For instance, Tampa Electric Company funded an intern who conducted photo-identification research during the winter at the Apollo Beach power plant.
- PIT tags have been deployed in 144 manatees using FMRI protocol. Several carcasses have been identified because of this identification technique. Tag scanners are available at all field stations so that staff can check for markers in badly decomposed carcasses. A scientific manuscript on using PIT tags for manatee identification was accepted for publication in Marine Mammal Science.
- Results from the FMRI body-condition study have proven effective in evaluating manatees in the field and in a clinical



setting. Morphometric condition indices have been used to help evaluate the reintroduction of rehabilitated captives to the wild. The completion of this work resulted in a Master's thesis, which is available in print. Training of staff in this technique is ongoing.

## MARINE MAMMALS GEOGRAPHIC INFORMATION SYSTEM



A geographic information system (GIS) is a computer-based mapping system designed to manipulate, analyze, and display large volumes of geographically referenced data called coverages. Staff working on the Marine Mammals GIS (MMGIS) have created numerous manatee data coverages including carcass recovery sites, aerial sighting locations, and locations of animals tracked by satellites. The MMGIS is a module of the large Marine Resources GIS, which facilitates access by scientists and managers to a wide variety of data on the marine environment. One key feature of GIS allows users to combine coverages representing different data themes to pictorially or numerically answer questions relevant to manatees and their environment. GIS users can access these data coverages to analyze manatee data in association with habitat features like sea grass, water depth, boating channels, boat ramps, and warm-water discharges. The MMGIS staff work with both research and management project teams to provide manatee data in GIS format to the public and to develop spatial analysis and modeling capabilities for manatee protection and ecosystem management.

## 1996-97 Highlights:

- An analysis tool developed by MMGIS staff to transform locations of manatees seen during aerial surveys into estimates of manatee density was used in an assessment of manatee distribution and abundance in Tampa Bay and in a marina siting study funded by Charlotte County. Variations of the spatial filter tool are being explored as well as applying it to define associations between areas of high manatee use and habitat features.
- A computer model developed by MMGIS staff for estimating manatee travel patterns from satellite telemetry and visual locations was completed. Using the model, travel paths for over 30 tagged animals were delineated. Additional analyses were designed to examine manatee travel patterns and specific area use in relation to time of day, season, and habitat features.
- A right whale component for the MMGIS continued to be developed at FMRI. To identify critical right whale habitat, staff worked cooperatively with the New England Aquarium to map the distribution of satellite-tagged right whales in relation to sea surface temperature and water depth. Whale locations from aerial surveys were also integrated into GIS with other pertinent data layers including managed areas, vessel activities, and environmental variables.
- The Manatee GIS Working Group completed work on data sharing ethics and initiated demonstrations of how GIS data analyzed and used. With a focus on data collection, sharing, analysis, and application issues, the twice-yearly Working Group meetings have created an environment in which access to data is facilitated and knowledge about analytical methods is available to all participants.
- Version 1.1 of the FDEP Atlas of Marine Resources on CD-ROM was completed and made available to GIS users at no charge. This second release includes many new coverages, a data directory to assist users in locating data not on the CD-ROM, products of the Manatee GIS Working Group, and annual mortality statistics.



## RIGHT WHALES

In addition to manatee recovery efforts, the FDEP is involved in recovery efforts for the northern right whale, *Eubalaena glacialis*, the most endangered of the world's large whales. Northeast Florida and Georgia coastal waters were designated as critical habitat for the right whale in 1994 by the National Marine Fisheries Service (NMFS). This region is the only known calving ground of the northern right whale. FDEP is assisting NMFS in the protection of right whales as outlined in the 1991 Northern Right Whale Recovery Plan. Efforts have been heightened to prevent human caused mortality in this species, where even one death per year has a significant impact on the population believed to be numbered at less than 350 individuals.



**Right Whale Mother and Calf**

The FDEP has been a member of a multi-agency/citizens advisory group, the Southeastern U.S. Implementation Team for the Recovery of the Northern Right, since its inception in 1993. The Team makes management and research recommendations and assists in implementing the Recovery Plan. In addition, FMRI staff have conducted aerial surveys of right whales in Florida waters since 1987 to monitor seasonal presence of whales and to determine the number of calves born during the season.

### 1996-97 Highlights:

- The 1996-97 winter season represented the most comprehensive aerial survey coverage to date of the right whale calving grounds and surrounding areas. This included coastal and offshore surveys flown by FDEP.

- FDEP/FMRI, the New England Aquarium, and the Georgia Department of Natural Resources documented 18 mother and calf pairs, and at least 9 other individual right whales, for a total of at least 45 whales during the 1996-97 season. Although the number of calves was lower than last season, the number was well above average seasonal estimates for the calving grounds.
- FMRI received a \$40,000 grant from NMFS to assist in right whale recovery efforts. Funding was used for nearshore aerial surveys, replicate surveys used to test for right whale sightability, and for confirming public sighting reports along Florida's east coast. FDEP continues work to establish an ESA Section 6 Agreement with NMFS that will provide additional funding for right whale recovery efforts.
- A cooperative offshore survey effort between FMRI and Georgia DNR was also funded by NMFS, who provided \$40,000 to FMRI for observer salaries and \$104,000 directly to the National Oceanic and Atmospheric Administration's (NOAA) Air Corps for aircraft services.
- A single death of a right whale calf was documented during the 1996-97 calving season. FMRI staff assisted in the confirmation, recovery and necropsy of the calf, which was determined to have died of natural causes.
- The MMGIS at FMRI continued to be an integral part of the right whale program, incorporating results of all FMRI right whale surveys, as well as oceanic surface temperatures and water depths.

## SCIENTIFIC AND PUBLIC OUTREACH

At the U.S. Marine Mammal Commission meeting at Amelia Island on 11-13 November 1996, staff presented information on the 1996 red-tide mortality, statewide synoptic surveys, population dynamics, GIS, manatee management, and right whale research. Presentations were also given at a national information transfer meeting on red tide ecology, detection, and its effects on manatees and other species hosted at FMRI on 6-7 November 1996.

During the year, five manuscripts were submitted to journals for publication and 13 publications appeared in print. Marine Mammals staff also made 22 presentations at 14 national or regional conferences this year.

Marine Mammals staff participated in Project Oceanography, a weekly educational series on marine topics for middle and high school students produced live by the University of South Florida. The six presentations on manatee topics were transmitted by satellite to 60 school districts around the U.S. from January 17 to February 21.

New displays were created for the DEP pavilion at the State Fair in Tampa and staff were present to answer questions and participate in public outreach throughout the fair. Staff also participated in the FMRI Marine Quest open house from May 15-17. Approximately 6000 visitors and 1000 students attended.

DEP presented Individual Achievement Awards to Scott Wright, Tom Pitchford, and Donna Banowetz Szemer for their outstanding work on the 1996 Manatee Epizootic Event. A DEP Team Award was also conveyed to 110 people throughout the Department for their contribution to the Epizootic response.

## **BUREAU OF PROTECTED SPECIES MANAGEMENT**

The Bureau of Protected Species Management (BPSM), based in Tallahassee, serves as the management component of the FDEP marine mammals program. It is responsible for the planning and implementation of management activities directed toward the protection and recovery of manatees, of other marine mammals such as the endangered right whale, and of marine turtles and their essential habitats. Marine turtle activities are funded from the Marine Resources Conservation Trust Fund and a grant from the Game and Fresh Water Fish Commission. BPSM serves as the Department's primary liaison with appropriate federal, state, and local governments to facilitate strong comprehensive planning, including mandates of federal endangered species recovery plans. Protection activities are principally implemented in three ways: state rules are developed, permit applications for resource development are reviewed and commented on, and manatee protection plans are

developed and implemented, often with the assistance of local governments.

## **MANATEE PROTECTION PLAN DEVELOPMENT AND IMPLEMENTATION**

Manatee protection plans (MPPs) are essential to the long-term preservation of the species and its habitat and to the implementation of the FDEP's ecosystem approach to environmental protection. Approved MPPs are designed to include boat-facility siting policies, habitat protection, local educational campaigns, and waterway-use regulations. County-specific boat speed zones are a primary component of these plans. The plans will also address finding solutions to manatee mortality caused by locks, gates, large vessels and ships while reducing any adverse effects that commercial fishing practices have upon manatees. The preferred mechanism to put an MPP into effect is for each local government to append the plan into its comprehensive plan. Priority in developing these plans has been given to 13 key counties where manatee mortality rates and essential habitat protection needs are the greatest. BPSM staff assists with protection planning for counties other than the key counties when requested by a specific local government.

The individual MPP components, such as the boat facility siting policies, must be compatible with local policies and ordinances. In setting policies to safeguard manatees and their habitats, the MPPs also have the effect of increasing the safety of boaters, facilitating recreational planning, and protecting aquatic habitat critical to many species that depend on the associated ecosystems. Because of the complexity of issues a county must address in its plan and the range of information that must be collected, plans take several years to develop and implement.

### **1996-97 Highlights:**

- Three draft plans were considered by DEP, but not approved. The Brevard County MPP was a revision substantially of one submitted by an Ad-hoc committee that worked over a two year period with BPSM staff assistance. The plan lacks recommendations that minimize the adverse affects of population growth and development on manatees. Duval County's MPP; was not approved due to the need for additional speed zone protection in one

area. Staff worked with Volusia County to develop an MPP, however, the County draft is insufficient at this time. Volusia County hired a conflict- resolution facilitator to assist with completion of the MPP.

- The draft Lee County MPP was reviewed for a second time and recommendations to county staff were given on ways to improve the existing document. MPP staff also worked with Lee County on a county wide education curriculum for public schools, a Lee County Boater's Guide, education and outreach efforts at Manatee Park and other county parks, and marking of existing manatee protection speedzones. In the later half of this budget year, BPSM staff began working with Lee County and Mote Marine Laboratory staff on a series of boating and compliance studies aimed at completing the MPP and providing much needed information on boating activity and compliance in various portions of the county. MPP staff have also begun the development of a shoreline parcel and marine facility inventory which will also be included as part of the Lee County MPP.
- Citrus County was the first (and only) plan to be adopted as an optional element into the County's Comprehensive Plan. The County was also the first to go through the 5-year review of the Comp plan called the Evaluation and Appraisal Report (EAR) process. BPSM staff participated in updating the MPP which was revised and adopted by the County as a plan amendment.
- Implementation of the Collier MPP has focused on speed zone related issues, development of a Collier County Boater's Guide project, outreach to resource managers and others in public forums, and work with resource managers on seagrass and benthic habitat protection.
- MPP staff began implementation of the Dade County MPP and the Collier County MPP. In coordination with Dade County Department of Environmental Resource Management staff, the Dade County Education Advisory Group was created. Also in accordance with the Dade MPP, a high quality educational video was created which describes manatee use of Dade

County and county specific protection measures. MPP staff have also been active in developing the Biscayne Bay Boater's Guide.

- BPSM staff have tried to increase enforcement and district permitting capabilities by providing training and public information materials to on-water officers and district Environmental Resources Permitting staff. Information packets, manatee data and laminated maps containing speed zone citation information were developed for several counties. Efforts will continue in the next year to include all key counties and districts.
- A major study of seagrasses was undertaken in Palm Beach County during the summers of 1996 and 1997 as part of the effort to plan for new boat facilities in the county. A total of 110 sites were surveyed throughout the county and some significant resources were found. BPSM staff coordinated the study involving six agencies and over 20 scientists. An agreement was made with the U.S. Fish and Wildlife Service to map the data, a savings of several tens of thousands of dollars to the State. Preliminary data shows many available sites for new development.
- BPSM staff reviewed approximately two dozen other types of plans for their potential affects on manatees. These include city and county Evaluation and Appraisal Reports, state park management plans, and aquatic preserve plans.

## STRUCTURE-RELATED MANATEE DEATHS

More manatee deaths are attributed to structures (such as navigation locks and water control gates) than any other human cause except for watercraft. From 1974-1996, 128 manatees were crushed or drowned by navigation locks or water control structures. FDEP has taken an active role in coordinating with the Army Corps of Engineers (Corps) and the South Florida Water Management District (SFWMD) to develop solutions to this problem and continue to participate on an Interagency Task Force assembled to solve this serious problem. The Task Force recognized that a number of actions would be needed to reach this goal, the most important of which is the development of

technology that would make the locks and water control structures “manatee-safe.”



The SFWMD in conjunction with Harbor Branch Oceanographic Institute designed a new version of the manatee protection device. This version uses strips of piezo electric film embedded in blocks of polyurethane and placed on either side of the lift gate. The device can sense when force is applied, but has the distinct advantage of not having any moving parts that can foul or corrode. This refined version has been installed on two gates and has experienced no significant problems. Plans have been made for installation on at least 10 additional lift gates in the years to come.

#### 1996-97 Highlights:

- Structure-caused manatee deaths increased in 1996 to ten, up from eight in 1995. Most notable were four deaths at the Canaveral Navigation locks. There had been no manatee deaths at this structure since 1991. Task force members met at the locks to try to determine what might be causing this sudden increase. Lock tenders reported that both manatee use and boat traffic has significantly increased in this area. On a positive note, the Corps agreed to seek funding to retrofit this structure with manatee protection devices in the future. The Canaveral Port Authority agreed to be the local sponsor of this environmental restoration project.
- FDEP provided data and review to the Corps for their reports entitled, “Manatee Protection Plan at Selected Navigation & Water Control Structures, Parts I & II.”

## GEOGRAPHIC INFORMATION SYSTEM, STATISTICS, AND GRAPHICS

The BPSM GIS, Statistics and Graphics Section provides BPSM management staff with the most recent marine mammal research data with the cooperation of FMRI staff in St. Petersburg. Most data layers are acquired from FMRI, although data layers are acquired from other government sources, contracts with academic institutions or created within BPSM. All data created by or contracted for by BPSM are provided to FMRI GIS staff for inclusion in the Marine Resources GIS. Graphic materials for presentation are produced using color printers and a 35mm slide maker.

#### 1996-97 Highlights:

- Updated manatee GIS data were received from FMRI for use in rule making, protection planning, permitting, and public information response activities of BPSM.
- Hardware was upgraded to provide additional data storage and backup capability. The GIS operating system was switched from Sun Solaris to Windows NT. GIS software was upgraded to the latest software editions to facilitate greater usability.
- The Tallahassee GIS section distributed 324 GIS maps to people outside of BPSM, 106 GIS maps to BPSM staff, 142 Digital data sets [all to outside requests], 200 AutoCAD maps to outside requests and 180 AutoCAD maps to BPSM. The proportion of maps plotted for use outside of BPSM has increased.
- Assistance was provided to other GIS or graphic groups in the Department's Divisions of Law Enforcement, Marine Resources, Recreation and Parks, and State Lands.

## HABITAT CHARACTERIZATION, ASSESSMENT AND PROTECTION

A viable population of manatees will not persist without suitable habitat. Florida's increasing human population, and particularly the associated coastal development, is a long-term threat to the manatee's habitat. Historically, coastal development has resulted in degradation of water quality and destruction of seagrasses - the



manatee's primary food. Ways to minimize negative effects of coastal development are being explored. The first step is to better understand the manatee's habitat needs and to monitor and assess habitat health and stability.



Loss of aquatic habitat continues despite existing protection measures around the state. Seagrass is a primary food source for manatees. Since 1950, coastal development and decreased water quality have resulted in a loss of an estimated 81 percent of the seagrasses historically found in Tampa Bay, an area heavily used by manatees and other marine mammals on Florida's west coast. Water quality continues to decline in areas of critical importance to the manatee as industrial effluent contamination, non-point source runoff from agricultural and civic lands, and disturbance-related sediment loads in the water column continue to increase in most areas. There is reason for hope, however, as seen in the recent return of seagrass beds to Hillsborough Bay after point source nutrient loads were reduced through regulatory means. The health of any habitat is important as an indicator of that habitat's ability to sustain a viable population of manatees and other marine species.

#### 1996-1997 Highlights:

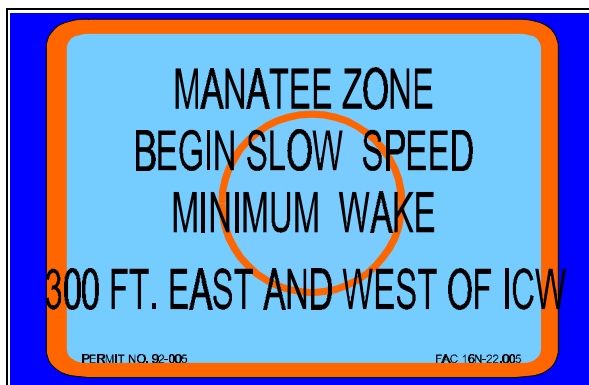
- BPSM staff continued to serve on the Crystal River Interagency Working Group to establish plans for using aquatic herbicides in Kings Bay and the Homosassa River. Staff also monitored the now seasonal reduction of exotic vegetation used as a foraging resource by manatees in Crystal River. This phenomenon has occurred each winter since 1994 due to a combination of

higher salinities because of reductions in spring flow, alga blooms caused by nutrient additions from the groundwater, and increased consumption by wintering manatees. Manatees using this natural warm water refuge are subject to increased stress and threat of injury relative to past years due to this loss of foraging habitat. Monitoring of manatee numbers and aquatic vegetation abundance has led to the decision to continue the October 1 through April 1 moratorium on all aquatic plant management activity in Kings Bay and the Homosassa River. Harvesting of floating mats of the blue-green alga *Lyngbya* sp. will continue in an effort to encourage the growth of preferred manatee forage plant species.

- BPSM coordinated the Blue Spring Interagency Working Group to ensure that manatee habitat in this area will be sustained and monitored on a regular basis. The group continued a ban from October to April on aquatic plant management activities in the vicinity of Blue Spring from Lake Beresford to channel marker 85 on the St. Johns River. Recent surveys of aquifer discharge at Blue Spring have indicated that a reduction of 20% of the water flow has been registered at the spring due largely to water withdrawals by regional residents. This places at question the long-term status of Blue Spring as an important natural warm water refuge for the St. Johns River manatee population.
- Staff from BPSM established a formal review process with the Department's National Pollution Discharge Elimination System (NPDES) program, within the Division of Water Facilities, to address short and long term concerns for the permitting of artificial manatee warm water refuges such as power plants and industrial plants. The formal review process will involve development of manatee protection plans for each plant that will address emergency maintenance of warm water flow during peak use periods by manatees, collection of important data used by manatee researchers and managers, and long-term operation plans. Manatee protection plans will be provided to the Department and reviewed by BPSM for assessment.

- A two-year study was initiated by the BPSM in conjunction with the DMR's Bureau of Coastal and Aquatic Managed Areas (BCAMA) to address the effect of structures on seagrass community health in the lower Indian River Lagoon. Experimental docks will be developed over existing seagrasses to test the effect that dock height and construction material use have on light levels reaching these aquatic plants. It is hoped that the research may result in innovative designs or development of construction criteria that will allow seagrasses to persist below such over water structures.
- The efficacy of propeller guard use for the protection of manatees and their habitat was also addressed by BPSM. Habitat staff worked to plan for a propeller guard assessment study that will be funded by the Save the Manatee Trust Fund in fiscal year 1997-98. Information was provided to the Boating Advisory Council and Manatee Technical Advisory Council on several occasions. The BPSM plans to work in conjunction with ongoing propeller guard studies funded by the U.S. Coast Guard in the coming year.
- Staff from the BPSM developed a report concerning the effect of the restoration of the Oklawaha River for the Office of Greenways and Trails (OGT). This report summarizes the recorded manatee use, mortality and habitat information for this system and its adjacent tributaries. The report was distributed to interagency working group staff and is available upon request from the BPSM.

## RULE PROMULGATION



Rule promulgation efforts focus primarily on establishing comprehensive manatee protection boat speed zones in 13 key counties and in other essential areas. The first state-designated boat speed zones for manatee protection were established in 1979. The 13 key counties are Brevard, Broward, Citrus, Collier, Dade, Duval, Indian River, Lee, Martin, Palm Beach, Sarasota, St. Lucie, and Volusia. Besides speed zone development, future rule-making activities may involve establishing rules to protect essential manatee habitat and to govern the construction or expansion of marine facilities. The rule making process is described in Appendix A.

### 1996-97 Highlights:

- BPSM staff continued development of amendments to the Lee County rule (62N-22.005, FAC). A Notice of Rule Development was published in the Florida Administrative Weekly (FAW) in November 1996 and a workshop was held in December 1996 and a workshop was held in December 1996 in Ft. Myers. Development of these amendments has taken a lot longer than originally anticipated, mainly because of the need to collect more information for the new required Statement of Estimated Regulatory Costs (SERC). Since this is the first SERC to be prepared for a manatee protection rule and because of the controversy surrounding past rule-making efforts in Lee County, staff dedicated a great deal of time to the development of surveys to be used by the economist to collect information from the boating public and water-related businesses. In March 1997, surveys were sent to 2,698 randomly-selected registered boat owners in Lee and Charlotte counties (2,000 in Lee and 698 in Charlotte) to collect information on current boating activities in Lee County. In April, surveys were mailed to 605 registered boat owners in Lee County to collect information on potential changes in their boating activity if the proposed rule were adopted. Most of these boat owners were randomly selected, but the recipients were 53 individuals who asked to be included in the survey at the December 1996 workshop. In May, surveys were mailed to 159 marinas, 223 water-related businesses, and to 285 randomly selected professional guiding, commercial fishing, and charter businesses to collect information about potential economic impacts on area

businesses if the proposed rule were adopted. Letters were also sent to Lee County and several municipal governments to solicit preliminary comments on the draft proposal and to request information on potential economic impacts. In June, the last of the surveys were mailed to 102 real estate companies in Lee County to obtain information on what determines the value of waterfront real estate and whether the existence of boat speed regulations was considered to be an important factor. Both of the boat owner surveys had excellent response rates but the other surveys did not. Data are now being entered into a computer database for analysis. Staff now anticipates that a rule proposal will be published in the FAW in late 1997 or early 1998.

- The Department proposed amendments to the Collier County rule (62N-22.023, FAC) in August 1996 to implement elements of the County's Manatee Protection Plan. After accepting comments on the proposal and conducting a public hearing in Naples in September, the Department noticed that it intended to make several changes to the proposal, including making the zones in Rookery Bay more restrictive. Collier County filed a rule challenge to the changes and Save the Manatee Club (SMC) intervened on the Department's behalf. The Department, Collier County and SMC agreed to a settlement in May 1997 whereby the zones in Rookery Bay would be left as originally proposed, but that they would be reassessed and changed if additional review indicated that more restrictive zones were needed. The amendments were filed for adoption later in May and plans were immediately begun to prepare a sign plan to post the new zones. A Notice of Rule Development was then published in June announcing the reassessment of the Rookery Bay zones and scheduling a workshop for July. (NOTE: After the end of fiscal year 1996-97, the Department held a workshop, re-evaluated the situation, and decided to leave the zones as adopted.)
- The need to amend other rules was considered by several counties during fiscal year 1996-97, but no amendments were proposed. Duval County, Volusia County, and Brevard County were all in the process

of considering whether to make recommendations to change their respective zones as part of their efforts to develop manatee protection plans, but none of the processes had concluded by the end of the fiscal year. Sarasota County was also investigating whether zone changes were warranted for the Myakka River area. All of these issues will probably be considered next fiscal year.

- A subcommittee of the Boating Advisory Council (BAC) met several times between September 1996 and January 1997 to review the General Provisions of Chapter 62N-22 (62N-22.001 through 62N-22.003, FAC). These rules describe the processes the Department uses to establish zones and issue authorizations to conduct activities that are otherwise prohibited by manatee protection rules. BPSM staff, as well as DLE staff, provided support to the subcommittee and assisted in the review. The subcommittee's recommendations were accepted by the BAC and forwarded to the Department for the amendments to be considered. BPSM staff is now in the process of formally proposing the changes.
- In March 1997, the DEP's Policy Coordinating Committee directed BPSM staff to publish a Notice of Rule Development to consider whether a rule was needed to address issues regarding marina expansion and construction. This notice was published in April and a workshop was held in Tallahassee later that month. No decision on how to proceed had been made by the end of the fiscal year.
- The Department continued to issue permits for commercial fishing and professional guiding activities in several counties (predominately Volusia, Brevard, and Indian River). At the end of the fiscal year, approximately 84 permits (to 43 individuals) had been issued for commercial fishing or professional guiding purposes statewide.
- Department staff also responded to numerous requests for rule-related information. Most requests concerned why a particular area did or did not have boat speed restrictions. The most frequent response was a letter providing information on manatee use of the area and describing

the process the Department uses to establish zones. Individuals requesting more restrictive regulation were usually urged to contact their local government first to determine if adoption of a local ordinance was possible.

## PERMIT REVIEW

Coastal development and activities such as dredge and fill projects, marina and boat ramp construction, movie production and marine events can have significant negative effects on manatees and their habitat. Reviewing these projects allows FDEP to reduce or eliminate potential negative effects by recommending special permit conditions or, in rare cases, permit denials. BPSM staff work with applicants, the U.S. Fish and Wildlife Service, FDEP and Water Management District Environmental Resource Permitting staff, the U.S. Coast Guard, the Army Corps of Engineers, Port Authorities, Regional Planning Councils, local governments and the Department of Community Affairs.

### 1996-1997 Highlights:

- Staff performed 297 manatee impact reviews, as requested by various agencies. Of these reviews, 68 were considered "critical" because of their complexity or potential to significantly impact manatees or their habitat.
- Point Source discharge of warm water at the Jefferson Smurfit plant in Nassau County was proposed to be diffused, making it unavailable to manatees. Staff coordinated with the U.S. Fish and Wildlife Service and the applicant to appropriately permit this activity while not seriously endangering the animals that use it for a warm water refuge. Staff also assisted in the development of a research plan to monitor manatee use of the discharge before and after the proposed change. This information will be valuable in the review of future projects where discharges are proposed to be discontinued in areas of greater manatee use.
- A proposal to moor a cruise ship and ancillary vessels immediately adjacent to the warm water discharge at the Riviera Beach power plant was reviewed. Pending a denial letter from BPSM and a large public

outcry, the applicant withdrew the application from consideration.

- Staff coordinated with the U.S. Fish and Wildlife Service to revise a decision-making tool jointly developed to streamline permitting. This effort was initiated as a result of the proposed expansion of the State Programmatic General Permit (SPGP). This General Permit effectively delegates the responsibility of Federal permitting to DEP for a wide range of activities.
- Movie production continues to be a major concern for marine resources due to the frequent use of explosives and high-speed vessels. Staff continued to initiate coordination with movie studio coordinators and other DEP staff. Permits for the movie G.I. Jane, as well as a Hulk Hogan television series episode, were reviewed.
- Staff coordinated with Dade DERM, DEP Southeast District and the Miami Seaquarium to use seagrasses that would have been destroyed off Virginia Key. These seagrasses were collected and used at the Seaquarium for manatees to eat before their release into the wild.

## PUBLIC EDUCATION AND INFORMATION (E&I)

An integral component of the Florida Manatee Recovery Plan involves educating the public. In addition to Florida's citizens, the FDEP also targets the state's 40.5 million annual visitors to increase public awareness of manatees. BPSM continues to participate in the development of public service announcements, television messages, brochures, teachers' guides, posters, pamphlets, and informational and marketing displays for public educational purposes.

### 1996-97 Highlights:

- The remainder of the manatee educational materials developed under the guidelines of the Florida Advisory Council of Environmental Education were completed in the first part of the year. Most of the new materials were then distributed to educational facilities around the state. The new Manatee Behavior poster and the mini-poster were very well received. As part of



this contract, Florida Welcome Centers received new manatee education travel activity sheets designed to target families travelling to coastal areas.

- At the beginning of the new year, education staff distributed manatee information to all of the libraries and Chambers of Commerce around the state. Additional requests were met after this initial distribution effort.
- More than 1,000 requests were answered from individuals, teachers or other educational staff. Requests for manatee video footage has increased considerably this past year as more people are interested in educating others about this endangered species.
- The Bureau's internet site offers another way that the information is distributed. Several requests for surplus decals attest to its use.
- Education staff targeted their outreach efforts in several counties this year. Staff visited education facilities, marinas and parks in these counties: Sarasota, Lee, Charlotte, Palm Beach, Brevard, St. Lucie, Indian River, Martin, Citrus, and Hillsborough Counties. Educational materials and staff were also available at the state fair in Tampa.
- Staff continued to participate as administrative support for the Manatee Technical Advisory Council (MTAC). Four meetings were held this year at facilities around the state. The MTAC Update newsletter received a new look and a name change--the new newsletter is called the Manatee News Quarterly, which better reflects the content of the information. Requests for this publication have increased considerably.
- The Voluntary Contribution Campaign occurs each year in June during the state's vessel registration period. County tax collection offices provide a manatee decal to each person who donates \$5 or more to the Save the Manatee Trust Fund. Revenue collected from the 1996-97 manatee decals brought in a little over \$106,000 to the manatee program for the year beginning in June 1996 and ending May 1997. The new 1997-98 decals

brought in over \$109,000 in June 1997 alone due to the competitiveness of a few counties in the campaign. The winning counties (for the 1997-98 VCC) are Sarasota County, Okaloosa County, Manatee County, St. Johns County and Charlotte County. After this next year, the VCC will be changed to reflect the change in the registration period going to the birth month registration period. A portion of these funds (the third and fourth dollar of each donation) goes to the oceanaria facilities (Lowry Park Zoo, Miami Seaquarium and Sea World) engaged in the rescue, rehabilitation and release of wild manatees.



## APPENDIX A - RULE MAKING PROCEDURE

In 1989, the Governor and Cabinet approved the Department's recommendations to improve manatee protection and directed the Department to work with the 13 key counties to develop protection zones adequate to protect manatees in these essential manatee use areas. The Florida Manatee Sanctuary Act (370.12(2), Florida Statutes [FS]) gives the Secretary of the Department the authority to adopt rules to regulate boat speeds and to limit other activities where necessary to protect manatees. Under some circumstances, the Governor and Cabinet, sitting as the Florida Land and Water Adjudicatory Commission, may review rules that have been approved by the Department.

Development of a rule proposal addressing manatee protection needs throughout a county is a major undertaking. BPSM staff works closely with county staff and the appropriate municipal governments, collecting, exchanging, and assessing data, conducting site visits, assessing boating activities, and discussing appropriate speed zone measures in light of both manatee- and public-use needs. Staff also coordinates with other government agencies, special interest organizations, and parties who may be affected by the zones. The Department's Division of Law Enforcement (DLE) reviews recommendations for boating safety and other navigational considerations. A Notice of Rule Development is also published and at least one workshop is normally held before a proposal is finalized to give all parties the opportunity to provide preliminary comments and ask questions. Data summaries and other documentation justifying the rule proposals are then prepared. The documentation includes detailed descriptions of the zone boundaries, computer-generated maps showing the proposed zones and, in most cases, a Statement of Estimated Regulatory Costs (SERC). If prepared, a SERC must include an estimate of: the number of individuals and entities likely to be required to comply with the rule; the cost to the Department and any other state and local government to implement and enforce the rule; the transactional costs likely to be incurred by individuals and entities required to comply with the rule, and; the impact on small businesses, small counties, and small cities. For rule proposals that affect large areas, such as a countywide rule, preparation of a SERC will begin at least several months before the proposal is finalized.

Once a rule proposal is finalized, it is once again offered to all interested parties for comment and at least one public hearing is usually held within the affected area. Comments are also solicited from other agencies concerned with the adequacy or regulatory effects of the rule (U.S. Fish and Wildlife Service, Sirenia Project, U.S. Army Corps of Engineers, U.S. Coast Guard, Marine Mammal Commission and Manatee Technical Advisory Council) and from special interest groups (boating and marine industry associations and conservation organizations). If a SERC is being prepared, a draft is made available for review at this time to give interested parties the opportunity to comment on whether it adequately addresses all expected impacts. BPSM staff carefully assesses all comments prior to sending the proposed rule to the Secretary for approval. Comments may bring about revisions to a proposal to either increase the restrictions to provide additional manatee protection or decrease the restrictions to accommodate public use or recreational needs. The SERC may also be revised on the basis of comments or to account for changes made to the proposal. This process helps to ensure that adequate protection is provided without unduly restricting use of the waterways. After a rule is approved by the Secretary, it is filed for adoption with the Department of State. Plans for posting regulatory signs are then prepared and reviewed by BPSM and DLE staff. Enforcement of a rule begins as soon as the areas are properly posted.

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Florida residents can buy manatee license plates for their vehicles.  
Receipts from tag sales are available for marine mammal research and  
management efforts through the Save the Manatee Trust Fund.