

SAVE THE MANATEE TRUST FUND

ANNUAL REPORT

Fiscal Year 2000-2001



Florida Fish and Wildlife Conservation Commission

December 2001

EXECUTIVE SUMMARY

This is the annual status report on expenditures from the Save The Manatee Trust Fund (STMTF). This report is provided to the President of the Florida Senate and the Speaker of the Florida House of Representatives each year.

Funding for the State's manatee related research and management activities is provided primarily from the STMTF, which receives money from sales of manatee license plates and decals, boat registration fees, and voluntary donations. Revenues for FY 2000-2001 totaled \$4,028,844. Appropriations for the same fiscal year were approximately \$4,075,284. Details are presented in the accompanying pie charts. Appropriations from the STMTF supported the FWC manatee program: \$1,520,921 was spent for research activities coordinated by the Florida Marine Research Institute (FMRI) in St. Petersburg; and \$1,438,719 for management activities within the Office of Environmental Services' Bureau of Protected Species Management (BPSM). Budgetary breakdowns for individual program units under both the research and management efforts are included followed by summaries of the work performed at the FMRI and the BPSM.

The Florida manatee is native to Florida's coastal and riverine waters and is listed by both the U.S. Fish and Wildlife Service (USFWS) and the Florida Fish and Wildlife Conservation Commission (FWC) as an endangered species. Florida has protected manatees since 1892. Current state efforts to recover the population are guided by the Florida Manatee Sanctuary Act of 1978 and the federally approved Florida Manatee Recovery Plan of 2001. In addition, the manatee is protected under the federal Marine Mammal Protection Act (MMPA).

During the past year, a record number of manatees (3,276) were counted during a statewide winter count. Scientists believe sub-populations in at least two areas, Florida's northwest coast (including Crystal River) and the upper St. Johns River, are increasing while manatees living along Florida's east coast may not be faring as well. The status of the manatees in southwest Florida is unclear. Nevertheless, the higher statewide count and apparent population growth in at least sections of the state has fueled public debate on the manatee's status and long-term prospects. The FWC remains cautiously optimistic that the manatee population will survive and will be secure enough to remove the animal's endangered status in the future. For this to occur, we must continue to implement the many tasks outlined in the Florida Manatee Recovery Plan. By taking steps to reduce human-related injury and death, and by protecting habitat, the long-term survival of this species can be ensured.

MANATEE BASICS

Common name:	Florida manatee
Scientific name:	<i>Trichechus manatus latirostris</i>
Status:	Endangered (federal and state)
Range:	Throughout Florida, (the summer months into southeastern states)
Maximum census:	3,276 counted in 2001
History:	Native species found in fossil record and recorded by earliest explorers
Diet:	Freshwater and marine species of plants
Reproduction:	Breed year-round, most calves are born in the spring, a mature female can produce one calf approximately every three years
Life span:	Can live over 50 years but this is rare; most manatees die by the age of twelve
Unusual fact:	Manatee teeth are continuously replaced

A CLOSER LOOK



Adult manatees typically average 8-10 feet in length and weigh around 1,000 pounds. The largest manatees may reach 13 feet in length and weigh over 3,500 pounds. Adults are gray in color, with very sparse fine hairs distributed over much of the body. Stiff whiskers grow around the face and lips. Algae growing on the skin may make the animal appear green or brown. Manatees that live in saltwater may also have barnacles growing on their skin. Despite their large size, manatees can be difficult to see in the wild. Manatees eat a variety of aquatic plants and are often seen near natural or artificial fresh water sources.

During the colder months, manatees in the southeastern United States must migrate to relatively warm water. This warm water may be in south Florida or may be the warm water of an artesian spring or industrial discharge. Gestation lasts approximately 13 months and results in the birth of a single calf (rarely twins) measuring 3-5 feet in length. The calves remain with their mothers for up to two years.

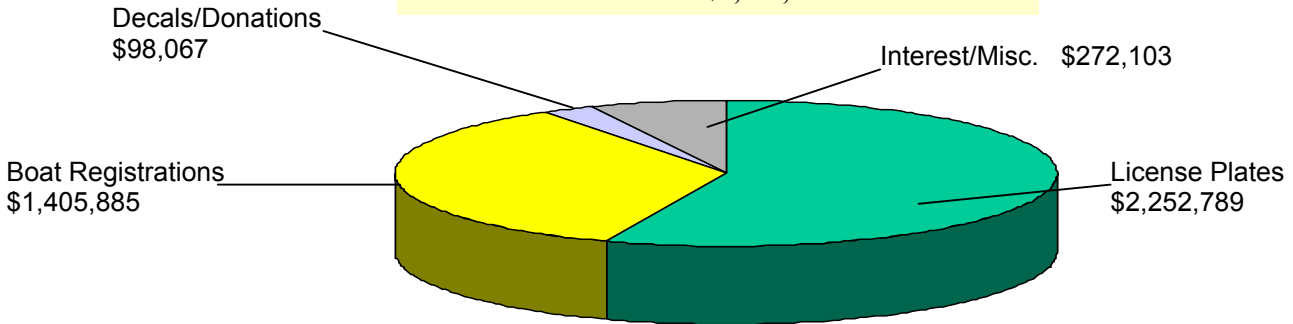


Manatees are killed or injured by a variety of human-related causes (e.g., being struck by watercraft, being crushed in water control gates and boat locks, and becoming entangled in fishing gear). Manatees also die as a result of exposure to harmful algal blooms (red tide), the effects of cold water, and disease. Manatee habitat loss or degradation is also of concern, including future changes in artificial warm water refugia upon which many have become dependent.

Save the Manatee Trust Fund Revenues

Fiscal Year 2000-2001

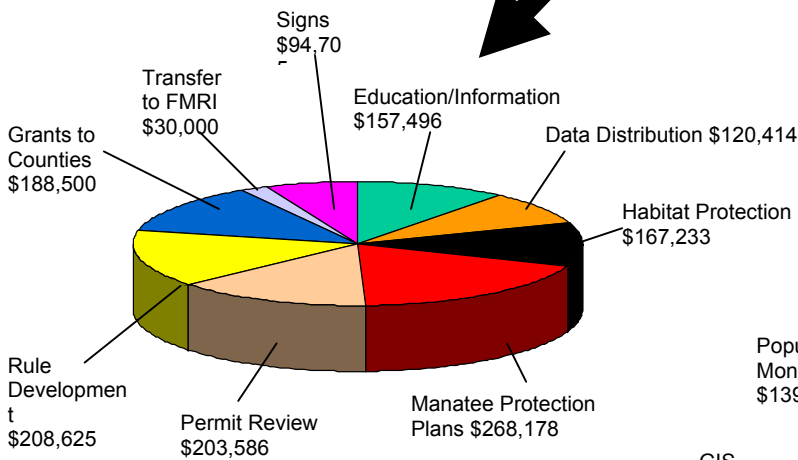
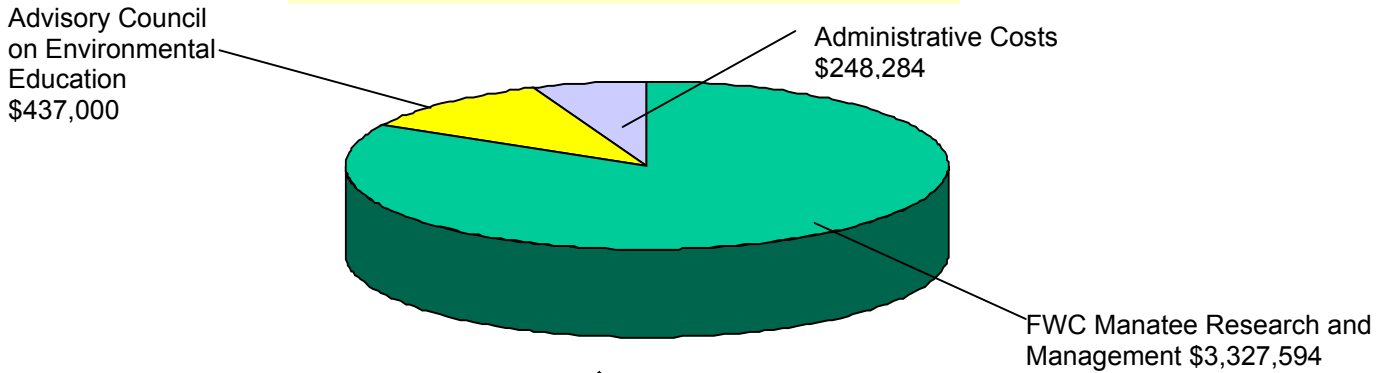
Total = \$4,028,844



Save the Manatee Trust Fund Appropriations

Fiscal Year 2000-2001

Total = \$4,075,285



FWC Management Expenses

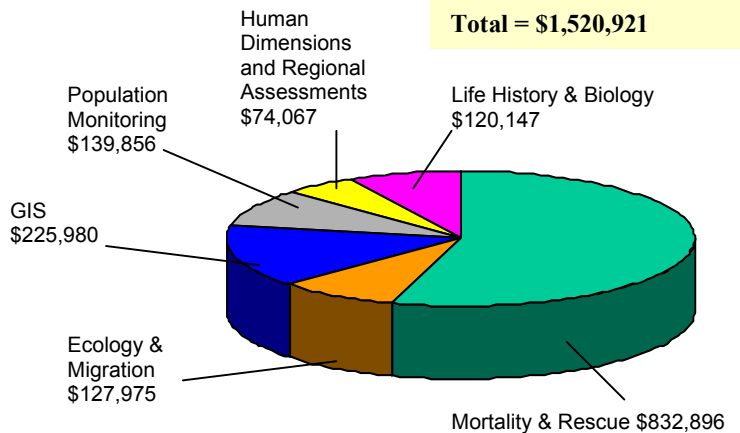
Fiscal Year 2000-2001

Total = \$1,438,719

FWC Research Expenses

Fiscal Year 2000-2001

Total = \$1,520,921



INTERGOVERNMENTAL COORDINATION

The recovery of the manatee requires coordination and cooperation between federal, state, and local branches of government. The USFWS is the lead agency coordinating the recovery of this federally listed species. During 2000-2001, FWC staff spent a significant amount of time on cooperative efforts to clarify the future of manatee conservation programs.

Recovery Plan

An important tool in the recovery process is the development of a recovery plan. Recovery plans delineate reasonable actions believed to be required to recover and/or protect listed species. The USFWS developed the initial recovery plan for the West Indian manatee in 1980. This initial plan focused primarily on manatees in Florida, but also included Antillean manatees in Puerto Rico and the U.S. Virgin Islands. In 1989 the USFWS updated the recovery plan and focused exclusively on the Florida manatee. This first revision covered a five-year planning period ending in 1994. USFWS revised and updated the plan again in 1996, which again covered a five-year planning period ending in 2000. In 1999, USFWS initiated the process to revise the plan for the third time. An 18-member recovery team consisting of representatives of the public, of agencies, and of groups that have an interest in manatee recovery or could be effected by proposed actions was established to draft this revision. Two FWC employees served on the team and several others participated as alternates or as advisors. During FY 2000-2001, FWC staff worked closely with USFWS and the recovery team to finalize the revised plan.

The latest revision of the recovery plan lists specific criteria, which, when met, should ensure a healthy, self sustaining population of manatees in Florida by reducing or removing threats to the species' existence. In order for the USFWS to change the manatee from endangered to threatened status, the threats to manatee habitat or range as well as threats from natural and human factors must be reduced. These actions include:

- ◆ Identifying minimum spring flows;
- ◆ Protection of selected warm-water refuge sites;
- ◆ Identifying for protection foraging habitat associated with the warm-water refuge sites;
- ◆ Identifying for protection other important manatee areas; and

- ◆ Reducing unauthorized human caused "take."

In addition, the following population benchmarks must be achieved over the most recent 10-year time frame:

- ◆ Statistical confidence that the average annual rate of adult survival is 90% or greater;
- ◆ Statistical confidence that the average percentage of adult female manatees accompanied by a first or second year calf in the winter is at least 40%; and
- ◆ Statistical confidence that the average annual rate of population growth is equal to or greater than zero.

It is important to note that the above benchmarks are in the federal recovery plan but are not found in State statute or rule. The criteria used by the State to determine the status of manatee are significantly different from the federal criteria. However, in terms of legal protection, the federal listing status is most significant. As long as the manatee is listed as an endangered species federally, and is protected under the federal Marine Mammal Protection Act, the State will have a certain responsibility to avoid unauthorized "take."

Manatee Population Status Working Group

The population benchmarks listed in the Florida Manatee Recovery Plan were derived from recommendations of the Manatee Population Status Working Group (MPSWG). This group was convened to provide advice and guidance to the USFWS on manatee population status issues. FWC staff are members of this working group and actively participated during FY 2000-2001 in the development of population criteria as well as assessment of the manatee status.

Marine Mammal Protection Act

Another intergovernmental, coordinated activity that began during FY 2000-2001 was consideration of the promulgation of federal rules to allow "take" under the Marine Mammal Protection Act (MMPA). Currently no level of "take" is authorized. That means that no action that is determined to contribute to a "take" can

be authorized. This has significant relevance to the permit review process. The USFWS has started a process of promulgating a rule to authorize a specific level of “take” which would not significantly affect the population of manatees. While this is a federal rule-promulgation process, state agencies including FWC, Department of Environmental Protection,

Department of Transportation, Department of Highway Safety and Motor Vehicles, and the Governor’s Office attended the first meeting to discuss the implications of this proposed rule. Because of the potential relevance to state programs, FWC staff will continue to monitor developments of the rule-promulgation process.

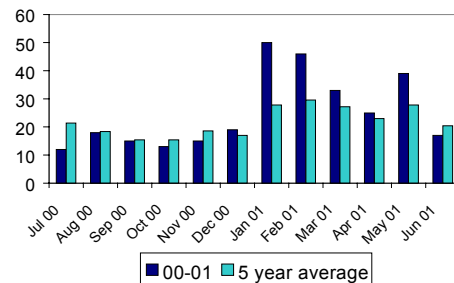
FLORIDA MARINE RESEARCH INSTITUTE MARINE MAMMAL RESEARCH

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 (MMPL) in St. Petersburg and at field stations in Port Charlotte, Jacksonville, Melbourne, and Tequesta. Manatee research is organized into six projects: mortality and rescue, population monitoring, ecology and migration, life history and biology, marine mammal geographic information system (GIS), and human dimensions. 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 to recover manatee carcasses and provide assistance to injured manatees. The mortality and rescue program now rests largely with the Florida Fish and Wildlife Conservation Commission. All carcasses are retrieved by dedicated staff statewide and thoroughly examined (necropsied) in order to determine cause of death. Most necropsies occur at the Marine Mammal Pathobiology Laboratory, opened in 1993 in St. Petersburg. Information gained through carcass salvage, rescue, and rehabilitation is crucial in providing wildlife managers with information about manatee health, life history, general and reproductive biology, and also provides data to help in developing population models.

Florida Manatee Mortality
All Causes by Month
Fiscal Year 2000-2001



- A relatively large number of manatee carcasses (301) was documented in Florida during the 2000-2001 fiscal year and all but four animals were recovered and examined. Human-related causes accounted for 77 (26%) of these deaths. Of the human-related deaths, 69 were watercraft-related, three were caused by floodgates or canal locks, and five were determined to be human-other (i.e. entanglement in fishing gear, ingestion of foreign objects, etc). Sixty-four (21%) manatees were perinatals (total body length less than 150cm) at the time of death.
- FWC Staff and cooperators rescued 54 manatees statewide under the federal rescue program. These were the causes: 17 watercraft-related injuries, 9 entanglements, 5 entrapments, 7 orphans, 14 natural, and 2 other. Five of the manatees were assisted and released on site. The remaining animals were transported to one of three oceanaria participating in the rehabilitation program for treatment. Manatee rescues provide specific information on causes for, and geographic locations of, manatee injuries. Additionally, 26 of the manatees undergoing treatment in

captive facilities were released back into the wild. Releases of rehabilitated animals directly contributes to the recovery of Florida's manatee population. The information obtained during the rehabilitation and treatment process greatly improves our understanding of the causes of manatee injuries, illnesses, and deaths.

- An abstract on manatee thermoregulation was accepted for presentation at the meeting of the Society for Integrative and Comparative Biology held in January 2001. Additionally, staff presented results of studies involving thermoregulation capabilities of manatees at the International Symposium on Marine Mammals as part of the International Congress on Morphological Sciences in Kyoto, Japan. A manuscript on the mechanical and physical properties of manatee skin has been submitted for publication.
- Staff continued to establish living cell cultures of manatees. The cell cultures can reveal host-specific responses to pathogens. While cell cultures do not replace the response provided by the whole animal, they are vital to investigation of disease in an endangered species. Cell cultures are now considered important in the investigation of toxicants, especially endocrine disruptors.
- At a Marine Mammal Commission meeting in the fall of 2000, staff discussed the inadequacies in the current underwater pressure shock model as regards to effect of underwater noise and explosions on manatees.

POPULATION MONITORING

Aerial surveys are important for acquiring information on manatee distribution, relative abundance, and use of habitat types. Statewide winter aerial surveys of all manatee wintering habitats in Florida and southeast Georgia are conducted after cold fronts, 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. Other aerial surveys are done year-round to map seasonal distributions of manatees.

Population models are being developed using data from aerial surveys and from mortality, life

history, and ecology studies, to estimate trends in regional population sizes. While population models are preliminary, most point toward a slowly increasing population of manatees. The record number of deaths in recent years remains a concern in 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.

2000-2001 Highlights:

- A total of 75 flights were made during fiscal year 00-01.
- One interagency, statewide "synoptic" aerial survey of manatees was conducted in 2001, funded by FMRI. The record high count was 3,276 manatees on January 5-6, 2001 (east coast, 1,520; west coast, 1,756). Manatees were counted on 28 survey routes. A total of 39 biologists from 15 state, federal, and county agencies and from research labs and universities participated. Teams of observers included 16 aircraft crews and ten crews on the ground. The highest count in the previous year was 2,222 manatees on January 27, 2000. Counts vary depending on weather conditions and manatee response to cold weather. The extreme and sustained record-breaking cold in January 2001 facilitated these counts, by bringing manatees together at warm-water sites. Excellent weather conditions contributed to the highest count to date.
- FMRI flew intensive aerial surveys this winter to assess the accuracy of counts at the Tampa Bay power plants, in cooperation with Eckerd College and Mote Marine Lab (MML). Replicate aerial counts were made to calibrate survey procedures and to better track manatee population trends. Three Tampa power plants were counted, twice each day, for a total of 100 counts on 50 days. Flights were made twice weekly and on 4-6 consecutive days during three cold fronts. Aerial and ground counts were made. Counts are being analyzed in relation to air and water temperatures. Ground and boat counts were also made. Time depth recorders were used for the first time to document the percent of time manatees are at the surface and can be counted. A new record count in Tampa Bay, 356 manatees,

was achieved on January 6, 2001, under perfect counting conditions.

- Sightings from aerial surveys were entered into the GIS system for assessment of manatee distribution for management decisions. These data are in high demand for management decisions and for lawsuits and hearings.
- Research on population modeling continues, incorporating year 2000 mortality data and year 2001 synoptic survey counts. Information on population status was provided to the interagency Population Status Working Group, to the Manatee Recovery Team, and to the Manatee Technical Advisory Council.
- Adult survival rates were estimated from photo-identification data from Tampa Bay and southwest Florida (8000 sightings of 700 recognizable individuals). State-of-the-art "sight-resight" statistics were used to estimate survival rates based on whether individuals are seen at least once during each winter.

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 then 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.

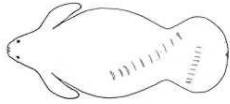
Rehabilitated manatees were tagged and monitored in order to assess the success of their introduction or reintroduction into the wild. Six rehabilitated manatees were released from captivity during this fiscal year. Three of them were tagged and tracked by FMRI. The tagged animals included one entanglement animal

released at Islamorada with gear purchased by STMC but tracked by FMRI staff. This animal was tracked for two weeks before losing the gear. Two cold-stressed adults were released at South Lake Okeechobee and tracked for three and four weeks, respectively, before losing their gear. One rehabilitated manatee released into the Everglades in October 2000 was given a final health assessment in April 2001 and all gear removed at that time. The animal was deemed to have successfully readapted to the wild.

2000-2001 Highlights:

- Warm Mineral Springs in Sarasota County is used by over 70 manatees as a warm water wintering site. In January 2001, four manatees were captured and tagged there for a habitat use and behavioral study. These animals were tracked while tagged. As of June 2001, one animal was still tagged for this study. Additionally, extensive photo identification was accomplished for a majority of animals using this site.
- Fifteen manatees were captured and tagged by FMRI staff at the Teco power plant in Tampa for a calibration study. Five of these animals were outfitted with satellite tracking gear and the remaining ten were outfitted with flag belts for aerial identification.
- A GPS tag was deployed on a manatee tagged at Warm Mineral Springs during the winter of 2001. Data were collected from February 14-19. On April 5, 2001, the tag was deployed on a rehabilitated manatee with a history of re-entangling at the animal's release back to the wild in Islamorada. Data were collected from April 5-14.
- The telemetry technical report was completed and proofs printed. The proofs are being reviewed by the principle author of the report.
- FMRI staff participated in two Interagency/Oceanaria working group meetings, one held in the fall and one in the spring. Work is ongoing for the management of the Florida Manatee Rehabilitation Reimbursement program with the Oceanaria.

LIFE HISTORY AND BIOLOGY



Information on manatee life histories 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 including the photo-identification catalog, use of passive integrated transponders (PIT tags), and non-invasive body condition indices such as ultrasound measurements of blubber thickness.

Many individual manatees are recognized by both natural markings and scars inflicted mainly by interactions with powerboats or entanglement with fishery gear. The US Geological Survey Sirenia Project (USGS) developed the photo-identification protocols and the image-based computerized database, known as MIPS (Manatee Individual Photo-identification System) currently used by the Sirenia Project, by the FWC, and by MML. Federal, state, and local organizations contribute data to a southeastern U.S. manatee photo-identification catalog. The FMRI coordinates and maintains the portion of the catalog for west-central and southwest Florida. In addition, FMRI field station staff photo-document manatees statewide.

PIT tags are small, un-powered microchips that are placed under the skin of a manatee to provide long-term marking of individuals for identification purposes. All manatees handled for rescue, rehabilitation or radio tagging are marked with PIT tags. All dead manatees are scanned for PIT tags before necropsy in order to identify known individuals for life history and distribution data and to assess the success of the reintroduction of rehabilitated animals to the wild.

2000-2001 Highlights:

- Currently, the west-central and southwest MIPS catalog consists of approximately 3,300 images and 7,500 sightings representing 700 manatees. FMRI staff added 27 fully documented animals to the MIPS database this fiscal year. A database manager was employed to oversee the SWFL MIPS database and to work with population assessment staff to estimate adult survival rates.

- FMRI photo-identification staff worked cooperatively with Mote Marine Laboratory, the US Geological Survey Sirenia Project, Lee County Parks, Florida Gulf Coast University, the US Army Corps of Engineers, the National Park Service, and others to photo-document animals in southwest Florida. In addition, staff collaborated with MML on photo-identification related STMTF contracts.
- Tampa Electric Company (TECO) funded photo-identification studies at the Big Bend power plant in Apollo Beach, Florida for the fifth consecutive winter (approximately \$4,000). FMRI staff provided assistance to the Manatee Viewing Center staff in updating manatee-related public outreach information and displays on site, assisted with training of docents, and served on their Environmental Education Advisory Board.
- In cooperation with the Save the Manatee Club (SMC), FMRI photo-identification staff have provided information, images, and maps for the Adopt-a-Tampa-Bay Manatee project. Staff provided quarterly updates for the SMC member newsletter.
- The FMRI photo-identification internship program continues to grow. Interns collect photographic, geo-spatial, behavioral, biological, and environmental manatee-related data year-round. During fiscal year 2000-2001, 20 interns from across the country have participated in photo-identification related activities.
- A remote control PIT tag reader was built and tested at a winter aggregation site. Modifications to this device are required before it can be used successfully.

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 survey locations, and locations of animals tracked by satellite. The MMGIS is a module of the comprehensive Marine Resources GIS (MRGIS), which facilitates access by scientists and managers to

a wide variety of data on the marine environment. The MRGIS is a primary tool for marine resource research and management. GIS applications facilitate an ecosystem approach to coastal resource management by allowing users to combine and query coverages representing different data themes relevant to the coastal environment. For example, GIS users can map and analyze manatee locations in relationship to habitat features such as depth contours, seagrass, aids to navigation, and managed areas. The MMGIS facilitates the exchange of ideas and information by interfacing both management and research activities. 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 analyses and modeling capabilities for manatee protection and ecosystem management. The staff also map sightings of bottlenose dolphins and right whales.

2000-2001 Highlights:

- More than 400 CDRoms of the Version 1.3 Atlas of Marine Resources CD-ROM's were provided to scientists, managers, educators, and consultants. Data are stored as ARCVIEW shapefiles for use in GIS. Data are provided on manatee mortality, results of aerial surveys, aerial survey flight paths, manatee density polygons, and protection zones. Base data include the Florida shoreline, depth contours, seagrass distribution, aids to navigation, and other habitat-related features.
- The computer model developed by FMRI MMGIS staff for estimating manatee relative abundance from locations mapped from aerial surveys was published in the journal *Landscape Ecology*. The goal of the model was to help standardize interpretations of bounded areas where manatees are observed in relatively high abundance. This work was represented at the Landscape Ecology conference held in Arizona in April 2001
- A statewide characterization of boat-strike manatee deaths was initiated. This work involved two approaches. The first was a fixed-grid method where a grid is draped over a map of manatee boat-strike deaths and the total counts are added per cell. Several fixed-grid maps, where the grid was positioned randomly over the maps of carcass locations, were combined to create

a contoured boat-strike characterization. Maps of trends in boat-strike deaths were also generated. The second approach was a nearest-neighbor method based on Thiessen polygons. The product of this approach is a map of zones formed around the carcass recovery points. Points clustered together will result in many small adjacent zones, indicating the relatively high occurrence of boat-strike deaths.

- GIS methods are being used to model aerial survey efforts and whale distributions, map and analyze ship traffic, and to explore whale affinity for specific habitat features. In concert, these methods have the potential to assist managers by providing a process for supporting data-driven decisions in assessments of risk. Specifically, whale sightings and ship traffic data can be used to help identify temporal and spatial distribution patterns and relative abundance estimates in combination with threats of collisions with ships. FMRI staff, NOAA Fisheries, the New England Aquarium, and the Georgia Department of Natural Resources are working in collaboration to combine several years of aerial survey data collected in the southeastern U.S. to map the relative abundance and distribution of right whales in the winter calving grounds. Along with aerial survey data, ship traffic and volume were evaluated using data generated by the federally implemented Mandatory Ship Reporting System (MSRS). Under the system, all commercial ships greater than 300 gross tons are required to report to the MSRS when they enter either of two areas surrounding designated critical habitat: one in waters off the northeast U.S., the other off the southeast U.S. Data from the first year of the system's operation was used to characterize traffic patterns within the critical habitat and to describe ship speeds.

HUMAN DIMENSIONS

Understanding how humans affect the welfare of manatees is an important element in effective manatee protection. Factors such as pollution, and mortality from boat strikes, and changes in habitat distribution are all related to human activities. To make wise decisions with respect to habitat protection, boat speeds, refuge and sanctuary delineation, harassment, and compliance, a deep understanding of human behaviors and motivations is necessary.

Examples of human-dimension studies include gathering observation data on boating distributions and speed-zone compliance, assessing knowledge and attitudes via telephone or mail surveys, and evaluating the effectiveness of educational materials in disseminating appropriate manatee-protection messages.

2000-2001 Highlights

- The first draft of a characterization of recreational boating in Charlotte Harbor was completed. This work, which was a team effort among Florida SeaGrant, FMRI, MML, and the University of Florida, characterized boating knowledge from three sources: aerial surveys of boats, boating activity areas mapped in workshops with experts, and boating patterns and motivations collected through telephone and mail surveys. The next step is the integration of the three characterizations into a single representation of boating in Charlotte Harbor. The results of the study have wide application, including decision-making with respect to manatees.
- FMRI staff in coordination with MML staff, field station staff and volunteers completed a baseline statewide study of boater compliance with speed zones. Staff collected information regarding boat traffic, vessel speeds, and compliance rates over the course of one year (July 2000-June 2001). Boat traffic and boater compliance information was evaluated by season, and within and among six sites around the state. The rate of compliance with posted speed zones averaged 50%. Several variables were found to affect vessel speeds and compliance. These variables include vessel size and type, boating conditions, day of the week, time of day, and season.
- During fall 2000, FMRI completed a time-halo effect enforcement study of boater compliance with speed zones. Data were collected at manatee zones in Collier, Palm Beach, and eastern and western Volusia Counties. This study determined that compliance significantly increased with the presence of law enforcement. Law enforcement presence was found to override all of the other variables identified in the baseline boater compliance study described above. Results were presented at the American Society of Mammalogists 81st

Annual Conference, Friends of the St. Sebastian Manatee Compliance Round Table Discussion, and the Manatee Speed Zone Compliance Plan Task Force meeting, and will be presented at the 14th Biennial Conference of the Society of Marine Mammalogists.

- FMRI is participating in the statewide manatee speed zone task force. This group consists of members from FWC Department of Law Enforcement, Office of the Executive Director, Office of Information Services, and the Bureau of Protected Species Management. Plan objectives are to increase statewide compliance with manatee speed zones, both in the presence and absence of law enforcement.
- FMRI initiated a boater compliance study in Dade County near the Miami River. This work is the joint effort of FWC's Bureau of Protected Species Management and FMRI, the Florida Inland Navigation District, and Florida International University. The goal is to monitor boating and compliance along the east side of Brickell Key, which is a boating safety zone embedded within a manatee slow-speed zone. Approximately 11,000 observations of boaters were recorded during the summer of 2000. A telephone survey was then conducted of the observed boaters to determine the motivation behind their compliance, or lack of compliance. Compliance rates were low, with over 50% of the boaters recorded as non-compliant for motoring at or above speeds in the idle zone.
- The second year of a three-year study comparing education and regulation as tools for manatee protection was completed. This project operates under the guidance of the Tampa Bay Estuary Program's Manatee Awareness Coalition and involves several organizations, including FWC, Tampa Baywatch, and the University of Florida. This first year served as the baseline characterization of boaters in two study areas. During three sample periods, information including boat type, activities, and whether boats remained in a designated channel were collected on over 3,771 unique vessels. A sub-sample of these boaters were included in a telephone survey conducted by the University of Florida to measure pre-education/regulation knowledge and attitudes of boating,

manatees, and environmental stewardship in general. Results of the survey revealed that normative influences and law enforcement, had the strongest effect on motivating boater decisions.

RIGHT WHALES



In addition to manatee recovery efforts, the FWC is involved in recovery efforts for other endangered marine mammals, including the northern right whale, *Eubalaena glacialis*, the most endangered of the world's large whales. 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 estimated to number less than 350 individuals. The National Marine Fisheries Service (NMFS) designated Florida and Georgia coastal waters as critical habitat for the right whale in 1994. This region is the only known calving ground of the northern right whale. FWC is dedicated to assisting NMFS in its efforts to protect the northern right whale as outlined in the 1991 Northern Right Whale Recovery Plan.

Efforts to protect right whales in the Florida/Georgia critical habitat have resulted in the formation of the Southeastern U.S. Implementation Team for the Recovery of the Northern Right Whale, a multi-agency/citizens advisory group. The Team makes management and research recommendations and assists in implementing the Recovery Plan. The FWC has been a member of the Implementation Team since its inception in 1993, and in 2000 a FWC researcher was appointed chairperson. Since 1987, FMRI staff have conducted numerous aerial surveys to monitor seasonal presence of right whales, to determine the number of calves born, and to mitigate ship/whale collisions.

2000–2001 Highlights:

- The 2001 winter season resulted in comprehensive aerial survey coverage of the right whale calving grounds and surrounding areas. This included over 100 coastal, offshore, and public sighting surveys flown by FWC. FMRI, the New England Aquarium, and the Georgia Department of Natural Resources (GDNR) sighted 29 mother/calf pairs this season, the highest calving numbers on record.
- FMRI received a \$45,000 grant from NMFS to assist in right whale recovery efforts. Funding was used for coastal aerial surveys, for confirming public sighting reports along Florida's East Coast, for funding an early warning system communication network, and for management and education activities. FWC continues work to establish an agreement with NMFS that will provide additional funding toward the effort for right whale recovery.
- FMRI continued to coordinate a complex communication network utilizing 25 alphanumeric pagers to disseminate right whale sighting locations to all mariners in the southeastern United States in an effort to prevent ship collisions with right whales.
- A cooperative offshore aerial survey effort between FMRI and GDNR was funded by NMFS, who provided \$99,900 to FMRI for aircraft services to cover 50-60 offshore flights.
- Presentations were given at scientific meetings and shipping seminars, and to the general public to educate Floridians about the plight of the right whale.
- The Marine Mammal GIS at FMRI continued to be an integral part of the right whale program, incorporating results of FMRI aerial surveys, ocean surface water temperatures, water depths, and other valuable information.
- Additional funding was received from NMFS to substantially increase FMRI's right whale GIS activities.

OFFICE OF ENVIRONMENTAL SERVICES

BUREAU OF PROTECTED SPECIES MANAGEMENT

The Bureau of Protected Species Management (BPSM) in Tallahassee serves as the management component of the FWC marine mammals program. It is responsible for planning and implementation of management activities directed toward the protection and recovery of manatees, the endangered right whale, and of marine turtles and their essential habitats. Manatee and right whale activities are funded from the STMTF. BPSM serves as the Commission's primary liaison on manatee issues by working closely with federal, state, and local governments to facilitate strong comprehensive planning and implementing tasks of the federal manatee recovery plan. Protection activities are principally implemented in four ways: state rules are developed, manatee protection plans are developed and implemented with the assistance of local governments, permit applications for resource development are reviewed and commented on, and Floridians and visitors are educated on how manatees and their habitat can be protected.

RULE ADMINISTRATION

The Rule Administration Section focuses primarily on establishing comprehensive manatee protection boat speed and access zones and administering activities related to these zones such as sign-posting, permit issuance and variance reviews. The first state-designated boat speed zones for manatee protection were established in 1979. There were 13 counties identified in 1989 by the Governor and Cabinet as high priority for establishment of countywide speed zones: Brevard, Broward, Citrus, Collier, Dade, Duval, Indian River, Lee, Martin, Palm Beach, Sarasota, St. Lucie, and Volusia. Countywide rules have been established in all of these counties and much of this fiscal year's efforts focused on the review of existing rules and assessment of protection needs in other areas of the state.

2000-2001 Highlights:

- The amendments to the Duval County rule (68C-22.027, FAC) that were approved by the Commission in May 2000 were adopted on July 12, 2000. In addition to revising the zones in Duval County, the rule added new zones in the St. Johns River area of northern Clay County and St. Johns County. BPSM staff coordinated with the Florida Inland Navigation District (FIND) and others to develop a plan to post the regulatory signs. FIND's responsibilities included sign posting for the zones in Duval County and St. Johns County, while the Commission was responsible for the zones in Clay County. The signs in Clay County were posted in April 2001, and FIND completed its posting work in June 2001.
- An administrative challenge to the Brevard County rule (68C-22.006, FAC) that had been filed by a county resident in December 1999 was resolved in the Commission's favor in August 2000. The Final Order (DOAH Case No. 99-5366RX) affirmed the validity of the three contested zones in the Canaveral Barge Canal and Sykes Creek. The order was not appealed.
- In September 2000, the Commission authorized the initiation of rule-making in Brevard County to determine if changes to the existing rules (68C-22.006, 68C-22.018, and 68C-22.021, FAC) should be proposed. A Notice of Rule Development was published in the Florida Administrative Weekly (FAW) in October 2000, and staff held public workshops in Brevard County in October 2000 and March 2001. Staff also had informal meetings with representatives of local boating and environmental groups in November and December 2000 to give them the opportunity to submit and discuss their recommendations for rule changes. Following publication of a Notice of Proposed Rulemaking in the FAW in April 2001, two public hearings were held in May 2001. At the conclusion of the final public hearing on May 23, the Commission approved the proposed amendments with several small changes. A Notice of Change was published in the FAW on June 15. Three separate rule challenges were filed during the 10-day window following the final public hearing. The state Division of Administrative Hearings (DOAH) consolidated the challenges (DOAH Case Nos. 01-2114RP, 01-2197RP, and 01-2198RP) into a single proceeding and

initially scheduled the hearing to begin on June 25, 2001. The hearing was held in the fall but the outcome was not known at the time of this publication.

- In November 2000, pursuant to §370.12(2)(o), FS, the Commission formally approved the local manatee protection ordinance that had been adopted by Hillsborough County in August 2000. The ordinance created new Slow Speed zones in the Apollo Beach area of the county. At the end of the fiscal year, the County was considering expanding the area covered by the ordinance, but no formal action had been taken.
- BPSM staff coordinated with Lee County staff and others to develop a plan to post the amendments to the Lee County rule (68C-22.005, FAC) that were adopted in November 1999. Signs were posted at the mouth of the Caloosahatchee River in November 1999, but on-water work in the rest of the county was hampered by logistical delays. Signs were posted in the Estero Bay portion of the county in July 2000 and throughout most of the rest of the county by December 2000.
- A Southwest Florida public forum on manatee protection was held on March 1, 2001 at the Charlotte County Memorial Auditorium. This meeting brought together an array of governmental officials to address the public regarding future manatee protection measures in South Florida. The Charlotte County Board of County Commissioners appointed a new task force to develop recommendations for manatee protection speed zones in county waters. These recommendations for increased manatee protection were presented to, and unanimously accepted by, the Charlotte County Marine Advisory Committee in June 2001. BPSM staff will continue to work over the next year with county level representatives for State rulemaking in Charlotte County.
- In April 2001 the Commission voted to approve a settlement agreement with Save the Manatee Club et al. The agreement calls for the Commission to proceed with additional manatee protection rule making in a number of areas around the state. The first phase identified 16 areas for possible additional protection. Eight staff members

from BPSM were given additional duties to investigate these areas. They compiled data, made site inspections, and identified and contacted local and statewide stakeholders. They also held multiple stakeholder meetings to solicit recommendations and input on these areas. Participants included representatives from potentially affected boater and environmental interest groups; local, state and federal law enforcement and environmental agencies; and concerned homeowners associations.

- In April 2001, the Save the Manatee Club withdrew its administrative challenge to the proposed amendment to the Lee County rule (68C-22.005, FAC) that had been filed in March 2000. The amendment, which allows higher speeds during low tides in a portion of Mullock Creek, was adopted on June 27, 2001. As of the end of the fiscal year, BPSM staff was coordinating with Lee County staff and others to post revised regulatory signs.
- BPSM staff worked with Collier County staff, Florida Department of Environmental Protection staff, and law enforcement personnel to fine-tune sign posting in the county. Additional signs were posted in March 2001. BPSM staff also worked to finalize an agreement with the County whereby the County would take over the responsibility for maintenance of the signs used to mark the state-designated zones. A final agreement had not been reached by the end of the fiscal year but discussions with the County are continuing.
- Staff continued to issue permits (in accordance with 68C-22.003, FAC) for commercial fishing and professional fishing guide activities in Volusia, Brevard, Indian River, St. Lucie, Lee, and Collier counties. Most of the permits were issued for professional guiding as opposed to commercial fishing. Several other permits were issued during the 2000-01 fiscal year. A permit was issued in November 2000 to allow a consulting firm to enter the Virginia Key No Entry zone in Dade County during a three-day window in November to map seagrass beds pursuant to a contract with the US Army Corps of Engineers. In December 2000, a permit was issued to allow Commission staff from FMRI to operate an unmanned, remote controlled

vessel in the TECO power plant Motorboats Prohibited zone in Hillsborough County to conduct research. A similar permit was issued in February 2001 to allow Mote Marine Laboratory staff to access the TECO zone to perform water quality monitoring. Several permits were issued to allow residents to access waterfront property within various limited-entry areas around the state.

- Considerable time was once again spent this year on sign posting issues. BPSM staff coordinated closely with the Commission's Division of Law Enforcement, navigation districts, staff from various counties and cities, and others to discuss ways to improve how the manatee protection zones are marked. Staff also conducted numerous field inspections to assess the adequacy of existing sign plans and the condition of previously-posted signs. Changes in sign design continue to be implemented to make the signs more legible and understandable to boaters.

MANATEE PROTECTION PLANS

Manatee protection plans (MPPs) are one tool that can assist in the long-term preservation of manatees and their habitat. The 1989 high priority designation by the Governor and Cabinet included development of MPPs in the 13 counties listed in the Rule Section above. MPPs address boat-facility siting, habitat protection, local educational campaigns, and waterway-use regulations. County-specific boat speed zones can be a component of these plans, however, a separate rule making process is required for state rules. The plans can also address solutions for manatee mortality caused by locks, gates, large vessels, ships, and commercial fishing practices. Indirectly, MPPs may also increase the safety of boaters, facilitate recreational planning, and protect aquatic habitat critical to many other species. Because of the complexity of issues a county must address in its plan and the range of information that must be collected, plans can take several years to develop. The preferred mechanism for implementing plans is for each local government to adopt them as an amendment to their comprehensive plan and adopt appropriate implementing regulations. MPP staff coordinate assistance with protection planning for the following counties and others as requested by local governments.

2000-2001 Highlights

- "Florida's manatees are not going to vanish on my watch," Governor Bush vowed in late July of 2000. In an effort to protect this endangered species, the Governor convened a manatee summit in Tallahassee on October 19, 2000. A panel of environmentalists, boaters and government officials attempted to reach a consensus on recommended proposals aimed at reducing manatee mortality in the state of Florida. The panel agreed unanimously that improved law enforcement efforts and improved boater education constitute top priorities.
- On August 22, 2000, MPP Staff attended a meeting of the Indian River County Board of County Commissioners during which the MPP was passed with minor revisions. The plan takes a strong approach to manatee protection by prohibiting development in areas of high manatee use and high watercraft-related manatee mortality. During the last quarter of 2000, the Indian River Manatee Protection and Boating Plan was approved by the FWC. This is the fifth state-approved MPP and the first to be approved by the FWC.
- A legislative appropriation of \$241,000 enabled BPSM to fund contracts in 2000 with Lee, St. Lucie and Martin counties to develop boat facility siting plans (BFSP). These plans were completed on schedule December 1, 2000. Further revisions to the Lee County plan are expected before its adoption by the County BOCC or its approval by the FWC. At public workshops in June 2001, St. Lucie County approved the BFSP in concept and Martin County adopted its plan. St. Lucie and Martin counties received additional funding in 2001 to complete their countywide comprehensive MPPs and completed two progress reports. Sarasota County also received funding from BPSM to develop a boat facility siting plan. Work on the St. Lucie, and Martin MPPs and the Sarasota BFSPs will be completed by December 1, 2001.
- The first contract report was submitted by Broward County for its innovative manatee protection plan contract. The county also submitted a comprehensive plan amendment to the Department of Community Affairs in late March of 2001 and

it was approved on June 26. A letter of determination for “achieving significant progress” toward completing the MPP was sent to the County on June 25. BPSM funded a grant request submitted by the county for a pilot program to produce a boater education video for distribution to high school science teachers and two remote videoconferences to allow for interactive environmental field trips. The Center for Environmental Education and Research, Inc., a non-profit organization, is producing the videos.

- A Coastal Management Workshop entitled “Manatees - Using Science and Education to Improve Management” was held at Rookery Bay Aquatic Preserve in Collier County on March 1, 2001. MPP staff presented an overview of the State’s manatee protection efforts. Improvements in public education and new areas for future research were recommended.
- At the Governor’s Summit, Clay County staff expressed their willingness to complete a manatee protection plan originally drafted in 1994. During the first quarter of 2001, BPSM completed an evaluation of the County’s MPP draft. Input on the plan was also received from the U.S. Fish and Wildlife Service, Jacksonville Office. The plan is deemed a good first draft that can be strengthened with some additional information related to habitat protection, future boating facilities and manatee-related education initiatives. Clay County should be commended for its proactive stance in developing an MPP.
- Volusia County staff began work on Phase II of the Volusia County Manatee Protection Plan during the second quarter of 2001. The plan addresses boat facility siting with the goal of directing future marina and boat ramp development away from the important manatee areas and other environmental resources.
- In the third quarter of 2000, ACEE funded a grant proposal submitted by Palm Beach County to revise and reprint the Lake Worth Lagoon Boater’s Guide and distribute other manatee outreach materials in the DEP Southeast District. BPSM worked with county staff to provide technical accuracy in the design of materials. BPSM staff also met with representatives of FIND, DEP


Southeast District, and Palm Beach County DERM during the second quarter of 2001 to discuss manatee protection needs on the Loxahatchee River.

LAW ENFORCEMENT COORDINATION

BPSM and FMRI staff continued to increase involvement and coordination with federal, state, and local law enforcement agencies. This was done by training law enforcement recruits, distributing maps and educational materials to officers, and holding coordination meetings with law enforcement agencies, especially the FWC.

2000-2001 Highlights

- Throughout the year BPSM staff met with DLE staff to ensure the timely exchange of data to assist in manatee enforcement efforts. A manatee enforcement plan was prepared as a product of these meetings.
- In a continuing effort to increase boater compliance with the newly posted manatee speed zones in Lee County, BPSM created several different site specific speed zone brochures for law enforcement officers to distribute to first time offenders.
- In an effort dubbed the Ramp Ranger program, local, state and federal law enforcement officers, DEP staff, along with volunteers from local environmental organizations, Power Squadrons and U.S. Coast Guard Auxiliaries helped distribute a variety of manatee information to the public at boat ramps. The Ramp Ranger program was also initiated in Brevard County.
- FMRI and BPSM staff spent a day on the Manatee River in Manatee County on July 17, 2000, with an FWC inland law enforcement officer, establishing contact with residents concerned about issues of manatee protection and providing *Caution-Manatee Area* signs to interested citizens
- On August 29, 2000, BPSM staff joined FWC inland law enforcement officers for a day of manatee zone enforcement on Sarasota waterways. Laminated speed zone maps of the county, produced by BPSM were distributed to law enforcement officers in May of 2001.


- The U.S. Coast Guard Station Miami Beach, in conjunction with state and local law enforcement agencies, held its third and fourth “Operation Sea Cow” events over the Sept. 22-24 and November 18-19 weekends. The maneuvers are designed to increase boater awareness of seasonal shifting of speed zones throughout the county.
- In October 2000, MPP and FMRI field staff were invited to present pertinent manatee information to members of the Fort Myers Power Squadron. Power Squadron members have used this information to increase local citizen awareness of manatee issues in Lee County.
- BPSM staff attended the annual, law enforcement coordination meeting designed to kick off the manatee “season” in Citrus County.  The meeting, hosted by USFWS, was held in Crystal River on Nov. 3, 2000. BPSM recognized several officers and presented awards for their efforts manatee protection efforts over the past two years.
- BPSM staff presented information regarding the Bureau’s role in managing the state manatee program at a law enforcement workshop held by the County on June 7. FMRI field staff presented an overview of the research component of the state program. The workshop was designed to update local, state, and federal law enforcement officers on the newly posted Lee County manatee speed zones. Laminated citation maps of the county manatee speed zones, along with packets of additional manatee materials were provided to all workshop participants.

PERMIT REVIEW

Activities permitted by state agencies (Department of Environmental Protection, all water management districts, and the Department of Community Affairs) can produce adverse impacts to the endangered manatee. BPSM reviews these projects and drafts agency opinions to reduce or eliminate negative effects. Staff also provides technical support for the U.S.

Fish and Wildlife Service during their consultation process.

2000-2001 Highlights:

- Staff reviewed 608 projects during the year and offered biological opinions and recommendations to reduce or eliminate potential negative effects of the proposed activities.
- BPSM represented the FWC at the Submerged Lands Tactical Advisory Committee meetings.
- Staff provided expert testimony for two administrative hearings on the issuance of permits.
- Permanent manatee signs vendors were contacted and revisions were made to the signs. Examples of the signs were also sent to the bureau to assess the quality of the signs produced. Signs are required for most marina projects.
- Staff attended numerous Cabinet Aides meetings to assist with agenda items regarding impacts to manatees.
- Comments were sent to the USACOE concerning the manatee key. Staff also provided comments to the USFWS concerning their interim strategy guidance documents for review of manatee impacts.
- The U.S. Coast Guard was notified that the FWC was no longer going to be directly involved in the consultation on marine events. This was done to streamline the process, reduce a duplication of effort, and improve FWC efficiency. The USFWS will continue to provide biological review of marine event to the Coast Guard. The FWC will consult with the USFWS when requested. If an event is proposed for a State designated speed zone, permission will still need to be obtained from the FWC.
- Five projects involving blasting were reviewed or performed (two bridges, two ports for deepening and one channel for a marina). 

- Coordination meetings with various agencies were held, as well as meetings with consultants and applicants. Multiple site visits were also performed.

STRUCTURE-RELATED MANATEE DEATHS

Second to watercraft, more manatee deaths are attributed to structures (navigation locks and water control gates) than any other human cause. From 1974-2000, 166 manatees were crushed or drowned by navigation locks or water control structures in Florida. There were eight structure-caused manatee deaths in calendar year 2000. FWC staff has taken an active role in



coordinating with the USACE and the South Florida Water Management District (SFWMD) and DEP to develop

solutions to this serious problem. The Task Force recognizes that a number of actions will be needed, the most important of which is the development of technology that would make locks and water control structures “manatee-safe.”

2000- 2001 Highlights:

- The extended drought in Florida had some unexpected consequence for manatees. Because of the extremely low levels of lake Okeechobee, some gates and culverts that are normally closed were opened which allow manatees additional access to the labyrinth of canals of the south Florida system. As water levels changed and these structures were closed, some manatee became trapped. To prevent this problem in the future, FWC staff coordinated with the USACE and SFWMD to begin the process of designing grating for specific culverts to prevent manatee access to dangerous canals.
- Through consultation with DEP the lock at Rodman Reservoir was closed to boat traffic to prevent manatee access into the reservoir. The lock itself poses a risk to manatees not only from the gates as they close, but also from the underwater tunnels used to raise and lower the water level. DEP designed grating to cover the intake ports

both inside the lock as well as at the approaches. In addition, design of an acoustic array system for the lock doors was begun. By preventing manatees from entering the reservoir through the lock, the risk from the dam has been eliminated. DEP also began the process of designing grates for the dam so that once the lock is reopened, the dam will also be safer.

- The interagency task force to eliminate structure deaths met once during FY 2000-2001.

HABITAT CHARACTERIZATION, ASSESSMENT AND PROTECTION

The recovery of the manatee population in Florida cannot occur without suitable habitat. Human population in Florida, and associated extensive 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. Reductions in the flow of warm spring waters, due to consumptive human uses, threaten significant natural warm water refuges in the northern half of the state. An uncertain future for the power industry, with looming deregulation and existing power plant senescence, also poses possible threats to established artificial warm water refuges. Understanding the manatee’s habitat needs and assessing habitat health and stability is a primary focus of habitat protection programs.

2000- 2001 Highlights:

- A cold-season herbicide treatment plan was developed by BPSM staff in coordination with the Crystal River Interagency Working Group in Kings Bay and the Homosassa River. The springs in these areas are used by over 300 manatees during the cold season. A moratorium on all aquatic plant management activity in these systems was in effect from October 1 through April 1 due to reduced aquatic vegetation abundance and increased numbers of manatees observed using this system. The working group encouraged the harvesting of floating mats of the blue-green alga *Lyngbya* sp. in an effort to encourage the growth of preferred manatee forage plant species.

- BPSM staff developed a report that characterized the warm-water habitat within Blue Spring in Volusia County in order to assist with the development of a minimum flow rule for this system. Staff also worked with the Blue Spring Minimum Flow Interagency Working Group to address concerns for development of a flow model that would reflect the need for protection of sustained historical flow from this spring. This is especially important due to the documented growth of this well studied manatee population. Minimum flow criteria are being developed based on the projected growth of this population.
- Manatee concerns for protection of natural spring habitat were addressed through participation in the DEP's Springs Task Force Phase II. Allocation of over \$2 million for spring system assessments, research, education and protection is the focus of this new task force. This effort will affect focused protection of springs used by manatees around the state.
- In order to address protection of manatees using power plants, FWC coordinates with the DEP's National Pollution Discharge Elimination System (NPDES) program to address short and long-term concerns regarding industrial thermal discharges. Part of this process involves the development of protection plans for NPDES permitted facilities. This year, staff approved five new power plant manatee protection plans. To date, eleven such plans have been approved and put into effect. Two power plants in Tampa Bay are not yet approved to have manatee protection plans. Staff from the USFWS, USGS Sirenia Project, BPSM and the power production industry worked together as the interagency Warm Water Refuge Task Force to address long-term provision of warm water at or near these sites or development of alternative warm-water sites for manatees. BPSM staff also developed a "white paper" to guide the coordinated effort to address the long-term future of industrial warm-water refuges.
- BPSM and the DEP, Office of Coastal and Aquatic Managed Areas completed the investigation of the effect of structures (docks, piers) on seagrass community health. Regular monitoring of experimental docks developed over existing seagrasses in the lower Indian River Lagoon has been

completed. A variety of dock designs were used to assess the effect that dock height and construction material use has on light levels



reaching seagrass plants surrounding the structures. Higher docks with

grating as decking material allow greater light transmittance, which allows improved seagrass growth under and around these structures. These results are being prepared for publication. BPSM staff completed a study of seagrass using a Before/After Control/Impact (BACI) design at two sampling locations. Comparison of seagrass communities surrounding experimentally designed docks and those constructed based on current requirements will help determine the relative effectiveness of regulations for current dock design criteria. The focus of this research is to develop innovative designs and construction criteria that will allow seagrasses to persist below and adjacent to such structures.

DATA DISTRIBUTION AND TECHNICAL SUPPORT

Timely, accurate distribution of data is essential to make management decisions. Data from FMRI and many other sources is acquired by BPSM and used by managers in the promulgation of rules, the development of MPPs, and the review of permits. Use of a Geographic Information System (GIS) allows for spatial display and analysis of the databases. In addition to internal use, BPSM responds to many requests for data from the public each year.

2000-2001 Highlights

- BPSM staff distributed 78 GIS maps, 367 AutoCAD maps and 104 digital data sets to external customers.
- Conversion of countywide speed zone maps from AutoCAD to Arc INFO continued.
- During the Brevard County rule, development process BPSM posted the proposed speed zones maps on the web

page. Based on positive feed back received staff began the process of adding all state speed zones to the web page.

ENVIRONMENTAL EDUCATION

Public support of government conservation programs is vital to their success. In order to engender support, the public must be well informed. We hope to foster an understanding of the problems facing



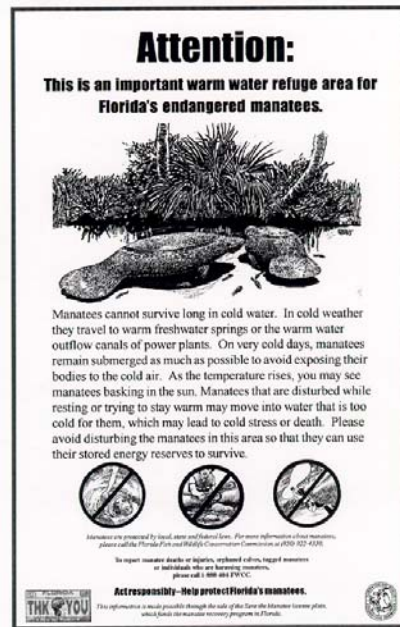
manatees, as well as the steps that need to be taken to recover the species. In addition, it is important to target specific user groups that have impacts on manatees. Knowledge of manatee habitat requirements, behavior, and general biology can contribute towards the reduction of manatee disturbance, harassment, injury and death. The Bureau of Protected Species distributes a wide array of information to a variety of audiences. Our goal is to provide factual, timely information appropriate to the target user group.

2000-2001 Highlights

- Staff redesigned the web pages to comply with the Governor's request for more streamlined information dissemination. The new look and updated information is found on <http://www.floridaconservation.org/psm>.
- A traveling exhibit, "Manatees: The Edge of Extinction" debuted in Florida at the Museum of Natural History in Gainesville. Staff reviewed the exhibit and provided additional pictures, research posters and materials to further enhance the exhibit.
- Staff distributed education materials to 650 individuals or groups requesting information. Bulk orders to various education facilities are included in this number. The Manatee News Quarterly continues to be popular--currently about 400 individuals receive the newsletter on a quarterly basis. The newsletter is also posted on BPSM web pages. Bulk mailings to tax collection offices, chambers of commerce and libraries also occurred this year.

- Education staff continue to support groups who sponsor manatee related festivals around the state. Exhibits and materials are available to those groups we know about and to those who contact us to attend. Additionally, staff targets conferences for the Florida Marine Science Educators Association (FMSEA), the League of Environmental Education in Florida (LEEF) and the Florida Association of Science Teachers (FAST).
- Three videos were produced this year to use for education purposes. One video is about general manatee information, one instructs boaters about what to do in manatee habitat and the last video is a loop video that combines several clips and programs about manatees, wetlands, watersheds and what individuals can do to protect these resources.
- Teacher kits were finished this year for distribution to schools in the counties surrounding Tallahassee. The kits will be evaluated for one year by schools in this area before the successful programs are distributed to other locations.
- ACEE funded a proposal submitted by Citrus County for the production of 100,000 boater's guides and *Mind Your Waterways* placards, five educational kiosks and two outreach events. BPSM worked with county staff to provide technical accuracy in the design of the placards and boater's guides, which were completed in May 2001.
- Each year during June BPSM coordinates with county tax collectors in conducting the Voluntary Contribution Campaign for manatees and marine turtles. A manatee decal is given to anyone who donates \$5 to the manatee program. In addition to decal sales many counties hold other fund raising events that benefit the manatee trust fund. This year the campaign experienced numerous changes as the tax offices changed to a birth month registration period. An overlap of decals from one year to the next occurred in May as counties tried to meet the demand of vessel registrants whose birthdays fell during May. In FY 00/01 Florida's tax collectors distributed approximately 16,322 manatee decals and brought in over \$81,000 to the Save the Manatee Trust Fund.

- Natural warm-water refuges are increasingly important as a wintertime habitat for manatees. The BPSM developed new warm-water refuge information signs that have been distributed around the state and posted at such locations as Salt Creek in Sarasota County and around Homosassa Springs in Citrus County.



ADVISORY COUNCIL ON ENVIRONMENTAL EDUCATION

In fiscal year 2000-01, the Legislature provided \$437,000 from the STMTF for manatee-related environmental education projects. Of this amount, the Advisory Council on Environmental Education awarded \$354,065 in grants through a competitive-selection process. The balance was not awarded due to factors such as a lack of acceptable proposals or the inability to come to contract terms with proposers.

The council, whose members are appointed by the Commission, serves as a forum for the discussion and study of problems affecting the environment that can be alleviated in part through education. It also recommends environmental education projects for funding from the STMTF. The council awarded funding to eight proposers, who then entered into contracts with the Commission.

Projects receiving funding included:

- Educating 3rd grade students and teachers in Charlotte and DeSoto counties about manatees, sea grass habitats and man-made threats to their well-being;
- Two 7-10 minute videos to increase awareness and understanding among residents and visitors about the

- importance of coastal and related freshwater ecosystems to the manatee;
- Production of localized TV PSAs and waterproof placards about boating safety education benefiting manatees and their habitats;
- Training St. Lucie County students about the environmental and economic importance of sea grass habitats;
- Producing five educational kiosks and laminated boaters guides in Citrus County focusing on the importance of sea grass habitats and how to reduce negative impacts;
- Educating Tampa Bay boaters about how to minimize boating-related manatee injuries and habitat degradation;
- Development of outreach efforts at the Tampa Electric Company Manatee Viewing Center;
- Production of 12 manatee and boating safety related kiosks for placement at boat ramps in Brevard County and Indian River Lagoon.

These projects are scheduled for completion by December 2001.

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION



Manatee decals can be purchased at your local tax collector's office.
Decals from past years can be ordered from the Bureau of Protected Species Management.

Office of Environmental Services
Bureau of Protected Species Management
620 South Meridian Street
Tallahassee, FL 32399
Phone: (850) 922-4330
Fax: (850) 922-4338
Internet: <http://www.floridaconservation/fwc/psm/>

Florida Marine Research Institute
Marine Mammal Program
100 Eighth Avenue, SE
St. Petersburg, FL 33701-5095
Phone: (727) 896-8626
Fax: (727) 893-9176
Internet: <http://floridamarine.org>



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



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