



SAVE THE MANATEE TRUST FUND
FISCAL YEAR ANNUAL REPORT
JULY 1, 2013—JUNE 30, 2014



Florida Fish and Wildlife
Conservation Commission
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to report fish and wildlife violations, as well as manatee injuries and mortalities

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SAVE THE MANATEE TRUST FUND

Annual Report
FY 2013-2014



Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
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SUBMITTED BY
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
Fish and Wildlife Research Institute
and
Division of Habitat and Species Conservation

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Executive Summary

The Florida Fish and Wildlife Conservation Commission (FWC) is pleased to submit this annual report on the expenditures from the Save the Manatee Trust Fund (Trust Fund), per section 379.2431(4)(b), Florida Statutes (F.S.). The Trust Fund is the primary source of funding for the State's manatee-related research and conservation activities. As required by Florida law, the report is provided to the President of the Florida Senate and the Speaker of the Florida House of Representatives by December 1, each year. This report covers the period from July 1, 2013, through June 30, 2014.

Unparalleled manatee mortality levels reported last year notably decreased following the cessation of the related Brevetoxicosis (red tide) event on the southwest coast of Florida in spring 2013. FWC staff prepared an official request for the National Working Group of Marine Mammal Unusual Mortality Events to declare the status of the mortality event as over. The Working Group approved the FWC closure request for the Manatee Brevetoxicosis Repeat Mortality Event for southwestern Florida, however, although reduced in number, cases associated with the Manatee Unusual Mortality Event (UME) declared for the central Florida East Coast continue to be reported and the UME status remains open. The investigation into the associated cause for mortality is ongoing. Agency staff are working to complete the final review of several hundred mortality records generated as a result of recent mortality events in addition to baseline and ongoing mortality. The effort to document and better understand threats and stressors to the manatee population is critical in order to recognize and inform needed conservation steps.

Current management efforts are focused on meeting with selected counties to begin the process of revisiting existing Manatee Protection Plans so they can be updated where necessary and continue to provide the best information available to local governments. Information from research related to manatee habitat is growing along with efforts to restore and conserve manatee habitat. Multiple years of monitoring the repowering of three east coast power plants will be winding down over the next few years. The information collected during the monitoring of these warm-water sites has, and will continue to provide new insights into manatee behavior as it relates to warm-water habitat. This information will be very useful to the program's efforts to map out a long-term plan to address warm-water habitat. Although power plant discharges will continue to provide warm-water habitat in several areas of the State, at some point in the future FWC expects this to change, and planning for that new landscape is an important effort in securing the manatee population for future generations.

Parallel efforts by the program have focused on restoration of manatee warm water habitat associated with springs. FWC staff have partnered on various spring restoration efforts that have resulted in the removal of accumulated sediments, replanting of submerged vegetation, and stabilizing spring shorelines. These efforts not only benefit manatee habitat, but habitat for many other native species and for Floridians who enjoy the natural springs of Florida.

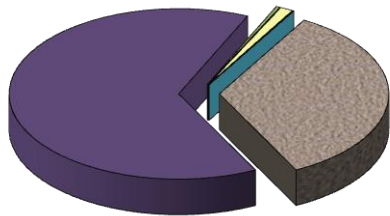
These activities are possible because of the funding of the Save the Manatee Trust Fund. The Trust Fund receives money from sales of manatee license plates and decals, boat registration fees, and voluntary donations. Revenues for FY 2013-2014 totaled \$3,743,905. Appropriations from the Trust Fund for the same period were \$4,280,201, with \$325,000 provided for manatee research activities at Mote Marine Laboratory, and a service charge to General Revenue of \$258,242 that most trust funds are required by law to pay. In FY 2013-2014, FWC's Division of Habitat and Species Conservation expended \$979,927 for conservation activities and the Fish and Wildlife Research Institute expended \$1,939,917 on research and monitoring. Details of revenues, appropriations, and expenditures are shown on page seven of this report.



A photo of manatees congregating near Three Sisters Springs in Crystal River, Florida.

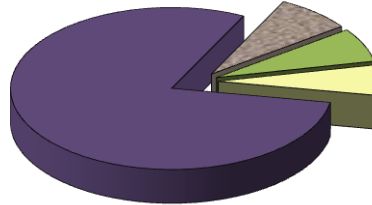
Trust Fund FY 2013–2014 Revenues and Expenditures

REVENUES \$3,743,903



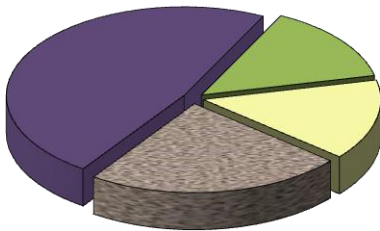
- Save the Manatee License Plate (\$1,280,265)
- Vessel Registrations (\$2,401,064)
- Interest (\$13,647)
- Decals and Donations (\$46,313)
- Sale of Surplus Property (\$2,614)

APPROPRIATIONS \$4,280,201



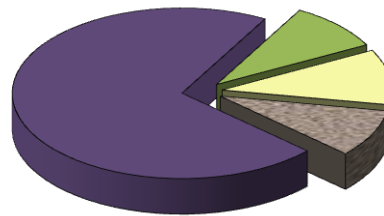
- FWC Manatee Program (\$3,406,980)
- Mote Marine Laboratory (\$325,000)
- Administrative Overhead (\$289,979)
- Service Charge to General Revenue (\$258,242)

FWC MANATEE PROGRAM CONSERVATION MANAGEMENT EXPENDITURES \$979,927



- Manatee Protection Zones (\$230,159)
- Plan and Permit Reviews (\$468,311)
- Habitat Protection (\$138,006)
- Public Outreach (\$143,451)

FWC MANATEE PROGRAM RESEARCH EXPENDITURES \$1,939,917



- Behavioral Ecology (\$174,820)
- Mortality and Rescue (\$1,384,354)
- Photo Identification (Life History) (\$177,359)
- Population Assessment and Monitoring (\$203,384)

Manatee Basics

COMMON NAME Florida manatee

SCIENTIFIC NAME *Trichechus manatus latirostris* (Order: Sirenia)

STATUS Endangered (federal and state)

RANGE Throughout Florida (summer months into southeastern states but reported as far north as Cape Cod and as far west as Texas)

MAXIMUM CENSUS 5,076 in 2010

HISTORY A native species found in Florida's fossil record and recorded by earliest explorers

DIET Freshwater and marine species of plants

REPRODUCTION Breed year-round; most calves born in spring; mature female can produce one calf approximately every three years, rarely twins

LIFE SPAN Can live over 60 years; of manatees that reach adulthood, about half are expected to survive at least into their early 20's

A CLOSER LOOK

Adult manatees average 8-10 feet (2.5-3 meters) in length and weigh around 1,000 pounds (450 kg). The largest manatees may reach 14 feet (4.2 m) in length and weigh over 3,500 pounds (1,450 kg). Adults are gray in color, with sparse hairs distributed over much of the body. Algae growing on the skin may make them appear green or brown. Manatees that live in saltwater may also have barnacles growing on their skin. Stiff whiskers (called "vibrissae") grow around the face and lips. Despite their large size, manatees can be difficult to see in the wild because of their color and behavior.

Manatees eat a variety of marine and freshwater aquatic plants and are often seen near natural or artificial freshwater sources. Manatees mate year-round; however, most calves are born in the spring. Gestation lasts approximately 13 months and results in the birth of a calf (rarely twins) measuring 3-4 feet (1-1.2 m) in length. The calves remain with their mothers for up to two years.

There are a variety of threats to manatees, both natural and human-related. They may die from exposure to harmful algal blooms (red tide), the effects of cold weather, and disease. Human-related causes of death include collisions with watercraft, crushing in water control gates and boat locks, and entanglement in fishing gear. During periods of cold weather, manatees gather in waters warmer than 68°F (20°C). This warm water may be in south Florida or may be from an artesian spring or industrial discharge. Manatee habitat loss, including future changes in artificial warm-water refuges and reductions in natural spring flows, is also of concern.

Florida Manatee Management Plan

GOAL

“To remove the manatee from the State imperiled species list and effectively manage the population in perpetuity throughout Florida by securing habitat and minimizing threats.”

Approved at the December 2007 FWC Commission meeting, the Florida Manatee Management Plan (Plan) guides key conservation work supported through the Save the Manatee Trust Fund. The 267-page document provides an overview of the myriad programs, initiatives, and strategies implemented to protect and conserve manatees and their habitat along with a detailed listing of tasks with timelines for both research and management activities.

The primary objectives of the Plan upon which the individual tasks are based are:

- Implement improved methods to estimate manatee population and trends
- Reduce the human-caused mortality rate by reducing human-caused threats
- Develop and implement plans to address future changes in power plant operation
- Assist in the development of minimum flow rules at Florida springs
- Enhance management practices to secure seagrass and freshwater vegetation
- Use measurable biological goals to measure progress toward recovery

The Plan relies on the ongoing collection of manatee-related data to support science-informed decisions and to guide management actions. The major areas of focus are:

- Speed zone review
- Improve enforcement efforts
- Improve permit review process
- Review and development of county-level Manatee Protection Plans
- Secure warm-water resources
- Monitor and protect seagrass
- Retrofit water control structures
- Launch new outreach initiatives

This annual report serves as a way to present progress in implementing key conservation strategies described in the Plan. Copies can be downloaded from the FWC Web site:

http://www.myfwc.com/media/415297/Manatee_MgmtPlan.pdf

Mortality and Rescue

research activities



This photo shows a rescued manatee being transported to a rehabilitation facility for treatment.

A network of researchers and law enforcement agencies was established in 1974 to recover manatee carcasses and assist injured manatees. In 1985, the responsibility of the manatee carcass salvage, necropsy, and field coordination of the rescue program were transferred to the State of Florida by the U.S. Fish and Wildlife Service (USFWS) and, therefore, now rests largely with FWC's Fish and Wildlife Research Institute (FWRI).






FWC staff members from five coastal field stations retrieve all reported carcasses, a key monitoring activity described in the Florida Manatee Management Plan. These stations are located around the State: Jacksonville, Melbourne, Tequesta, Port Charlotte, and St. Petersburg. Most recovered carcasses are transported by field personnel from recovery locations to FWC's Marine Mammal Pathobiology Laboratory (MMPL) in St. Petersburg. MMPL performs consistent, high quality, post-mortem examinations to determine cause of death. Information gained from the carcass salvage and manatee rescue program is crucial to providing wildlife managers with information about manatee health, mortality factors, life history, and general and reproductive biology as well as potential causes for Unusual Mortality Events¹ (UMEs). Through this work, FWC contributes significantly to the evaluation of threats facing Florida manatees and provides key information to resource managers and partner agencies. MMPL makes timely mortality information available on the FWC website (<http://myfwc.com/research/manatee/rescue-mortality-response/mortality-statistics/>).

In addition to manatee carcass salvage, FWC receives calls from the public reporting manatees in distress. Field staff members respond to these calls and coordinate a network of personnel from various agencies and organizations to work with FWC biologists to rescue and, when necessary, transport manatees to rehabilitation facilities.

FWC is a contributing organization to multiagency efforts to release and track rehabilitated manatees that were rescued due to injury, cold stress, or other problems. The Manatee Rehabilitation Partnership consists of representatives from federal and state agencies (USFWS, U.S. Geological Survey - USGS, DEP, FWC), academic institutions (University of Florida), non-governmental organizations (Caribbean Stranding Network, Hubbs-Sea World Research Institute, Save the Manatee Club, Sea to Shore Alliance), and private oceanaria (Cincinnati Zoo, Columbus Zoo, Lowry Park Zoo, Jacksonville Zoo, Miami Seaquarium, Mote Marine Laboratory, The Seas at Epcot, Sea World Orlando, South Florida Museum).

¹Unusual Mortality Events are defined by the Marine Mammal Protection Act as "a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response." See <http://www.nmfs.noaa.gov/pr/health/mmume/> for more information.

FY 2013–2014 highlights

-  Statewide, there were 382 manatee carcasses documented in Florida during FY 2013-2014. All but 13 were recovered and examined. Additionally, three carcasses were documented in Georgia, two in Mississippi, two in Louisiana, one in Alabama, and one in North Carolina.
-  Eighty-two rescues were performed statewide during FY 2013-2014. As of July 2014, 35 of these rescued manatees were released back into the wild, 17 died, and the remaining 30 animals were still being rehabilitated in facilities around the State.
-  A Manatee Unusual Mortality Event declared for Indian and Banana Rivers in Brevard County in 2012 continued during FY 2013-2014. During this FY, 25 manatee deaths were documented in this event, which also included the Halifax River in Volusia County. The cause of this event is still under investigation.
-  Researchers collected tissue samples for genetic analysis from most carcasses. Other samples were collected for histology, aging, and requests from external researchers.
-  MMPL staff members conducted several necropsy training workshops and classes in order to build and sustain a network of trained stranding partners.

Manatee Mortality FY 2013-2014

<i>Cause of Death</i>	<i>Number of Deaths</i>
Human—Flood Gate or Canal Lock	4
Human—Other (entanglements, etc.)	7
Human—Watercraft Related	71
Natural—Cold Stress	23
Natural—Other (includes red tide)	26
Perinatal (total body length less than 150 centimeters or about 5 feet)	97
Undetermined (decomposed or other)	141
Verified, Not Recovered	13
Total Carcasses July 1, 2013- June 30, 2014	382

Manatee Rescues FY 2013-2014

<i>Type of Rescue</i>	<i>Number of Rescues</i>
Calf—Alone	12
Calf—With Rescued Mother	1
Mother—With Rescued Calf	2
Human—Entanglement	12
Human— Entrapment*	4
Human—Watercraft-Related	19
Human—Other	1
Natural—Includes Red Tide	29
Undetermined: Other	2
Total	82

*includes power plant intake canals, irrigation canals, weirs, culverts, man-made canals, manmade lakes, etc.

Population Monitoring and Assessment *research activities*

FWC scientists use a variety of methods to assess and monitor the current and future status of the Florida manatee population. Population assessments currently include: a) conducting manatee counts at winter aggregation sites; b) aerial surveys to determine regional distribution of manatees and to assess habitat use; and c) estimating survival, population growth, and reproductive rates through photo-identification and genetic identification. Assessments also include estimates of risk to the population, including projected declines in population size and probability of persistence into the future (i.e., risk of extinction).

FWC conducts surveys that provide minimum counts and information about habitat use and seasonal distribution. These synoptic surveys are flown statewide and provide a minimum count of manatees at known aggregation sites and other sites in winter. Synoptic surveys are conducted annually, weather permitting, pursuant to section 379.2431(4)(a), F.S., requiring an impartial scientific benchmark census of the manatee population in the State. The survey is flown after cold fronts, and under specific weather conditions, when animals aggregate at natural springs and thermal discharges from power plants. Because weather and water conditions (among other factors) change year-to-year, the ability to see manatees on any given day, at any given site, may change appreciably. Therefore, statistical estimates of total population size are not currently possible from these surveys.

In 2014, FWC conducted a statewide synoptic survey over two days in January (January 24 and 27). A team of 20 observers from nine organizations counted 4,824 manatees (2,315 manatees on Florida's east coast and 2,509 on the west coast). This count was the third highest FWC has recorded since the first statewide aerial synoptic survey in 1991.

Currently, FWC researchers are developing new survey techniques with the goal of providing precise and reliable estimates of population size and improved information on manatee distribution. These new abundance estimation methods and resulting data will incorporate information about how well observers detect manatees from the air and will relate environmental variables to the number of animals counted by observers. Details of the abundance estimation method are described in the Florida Manatee Management Plan (see Chapter 9, Monitoring Activities p. 86 and Chapter 10, Ongoing and Future Research p.114).

Information on manatee life history is essential for assessing manatee population dynamics and recovery. Specifically, long-term data on growth and survival of individuals, reproductive performance of mature females, and health of manatees are important to the development of reliable population models. Manatee photo-identification is a research technique that uses the unique pattern of scars and mutilations on a manatee's body and tail to identify individual animals over time. The scars usually are the result of encounters with boats, but they can also be caused by entanglement in fishing gear, cold-stress lesions, and by infections. This research is conducted through a partnership between FWC, the U.S. Geological Survey (USGS), and Mote Marine Laboratory (Mote). Partners work

collaboratively to photograph Florida manatees throughout their range, process images, identify manatees, and manage an integrated sightings database, known as the Manatee Individual Photo-Identification System (MIPS). The records in MIPS provide insights into manatee movements, site fidelity (i.e., the tendency to return to the same location year after year), adult survival rates, and reproductive parameters such as calving intervals (time between births) and length of calf dependency.

Concerted effort has been ongoing to address critical data gaps in Florida manatee population assessments. Three demographic parameters are in need of refinement to better model manatee status and recovery: annual reproductive rates, annual gender-specific movement between the northwest and southwest regions, and gender-specific adult survival rates in the southwest region. These vital statistics can sometimes be difficult to estimate through photo-identification because of unfavorable photographic conditions and limited animal accessibility. Identification of individuals through the analysis of genetic markers, also known as DNA fingerprinting or genotyping, offers a complementary means to analyze life history that could greatly enhance existing manatee monitoring and population assessment studies statewide, particularly in the southwest. Genetic analysis can help in the identification of calves and other individuals with no markings, as well as carcasses in an advanced state of decomposition. Genetic markers can also be used to determine the gender of identified individuals. FWC implemented a genetic identification (ID) program in 2008 to collect skin biopsy samples from wild manatees through dedicated genetic sampling surveys. Staff has included the samples from wild manatees in a genetic-ID database. Once the genetic-ID database includes enough years of sampling, it could be used to estimate population dynamics through statistical analysis. FWC continues to conduct dedicated genetic sampling surveys in southwest Florida during the winter. Additionally, FWC is collaborating with USGS to develop statistical models that integrate population data from photo-identification, genetic-identification surveys, and the carcass recovery program.

FY 2013–2014 highlights

- 🐬 FWC staff members and interns spent over 125 days conducting land and boat-based photo-ID research during 250+ visits to sites used by manatees in the Tampa Bay area and southwest Florida. Additionally, other FWC volunteers, research partners and field lab staff statewide photo-documented manatees with unique features. More than 16,000 images documenting the unique features of individual manatees were taken and archived.
- 🐬 Manatee photo-ID data were analyzed and will yield an updated estimate of adult survival rate for southwest Florida.
- 🐬 One hundred seven manatees meeting specific photo-ID criteria were added to the southwest portion of the MIPS catalog of uniquely identifiable animals.
- 🐬 Genetic sampling surveys were conducted in southwest Florida. A total of 351 samples were collected from free swimming manatees: 56 samples at Port of the Islands (Collier County) during three survey days, 118 samples in the Orange River (Lee County) during two survey days, and 177 samples in the Tampa Bay area during eleven genetic and photo-ID survey days.
- 🐬 The manatee genetic-ID database currently includes 963 unique individuals identified by skin samples collected from live manatees in southwest Florida.



Photo of a manatee drinking water in Tampa Bay.



Photo of researcher recovering manatee GPS tag in the water.

Behavioral Ecology

research activities

Research on manatee use of Florida's coastal and riverine habitats is essential to understanding the resources required to recover and sustain a healthy population. By tracking the movements of individual manatees through their aquatic environment, FWC biologists obtain valuable information about manatee seasonal and daily movements, migratory behavior, site fidelity, diving behavior, and habitat requirements. To track manatees, researchers place a padded belt around a manatee's tail and attach a buoyant radio-tag containing a satellite-linked transmitter to the belt. The Global Positioning System (GPS) locations provide a detailed record of manatee movements over long periods. In the field, biologists locate these study animals by homing in on the tag's unique radio signals in order to obtain data on behavior, group size, habitat, and movements. Processed data are mapped in a Geographic Information System (GIS) and are used in devising strategies for manatee conservation and recovery.

Warm-water habitat is of particular concern because the predicted future loss or decline of industrial and natural spring sources is deemed a key long-term threat to the manatee population. With the shutdown of four power plants along the east coast over the past five years, one permanently and three for repowering, the warm-water network that manatees have relied on has been changing. The focus of multiagency monitoring efforts has been on how manatees respond to a change in primary warm-water habitat associated with the modernization of the Florida Power & Light (FPL) Cape Canaveral power plant in the northern Indian River Lagoon near Titusville. This winter was the fourth year of a five-year study, and the first in which FPL operated its newly repowered plant. In partnership with the USGS and primarily funded by FPL, FWC conducted a tracking study to characterize manatee movements and use of warm-water sources and foraging habitat in the region. Temperature monitoring of known and potential warm-water sites is also a crucial part of the effort. The Florida Manatee Management Plan provides further information on this issue (see Chapter 10, "Ongoing and Future Research" pp. 102).

Watercraft collision is the single greatest human threat to manatees in Florida. In collaboration with researchers at Florida State University, Duke University, and Woods Hole Oceanographic Institution, FWC conducted a study on interactions between tagged manatees and motorized boats in southwest Florida and these data are being prepared for publication. The goal of the project was to create a combined picture of manatee behavior, acoustics, and vessel paths to document manatee responses to approaching boats and the acoustic cues that may elicit such responses. The research combined state-of-the-art, manatee-borne electronic tags with boat-based observations and aerial videography. During previous years, 20 tagged manatees carried multi-sensor digital acoustic recording tags (DTAG) and GPS tags. The DTAG provided a continuous record of sound (ambient noise, vocalizations and boat noise) and recorded a suite of behavioral parameters, allowing a three-dimensional reconstruction of movements, depth, and orientation underwater. This project is a key component identified in the Florida Manatee Management Plan (see Chapter 10, "Ongoing and Future Research" p. 107).

FY 2013–2014 highlights

- 🐬 To investigate winter attendance patterns and foraging movements around the FPL Canaveral power plant and passive thermal basins in the northern Indian River Lagoon, biologists captured, tagged and released 13 manatees in the area. The manatees carried satellite-linked GPS tags and temperature loggers that provided data on fine-scale movements, habitat use, and water temperatures experienced throughout the winter.
- 🐬 A team of scientists and veterinarians from FWC, USGS, and the University of Florida assessed the health and body condition of captured and released manatees to further understand the health of the wild population, which has suffered an unusual mortality event of unknown cause in this region.
- 🐬 Researchers tracked 13 manatees in Brevard County through late March 2014, when they recovered tagging gear. Six of the tagged manatees migrated considerable distances out of the county for part of the winter; the combined winter range extended along 258 mi (416 km) of coastline from Daytona Beach to Miami.
- 🐬 FWC monitored water temperatures during the winter with data loggers placed at many warm-water and associated ambient sites throughout much of the manatees' winter range. A relational database of verified temperature data and descriptive statistics was created and used to characterize thermal dynamics. Several passive thermal sites (i.e., non-discharge sites such as canals) were being investigated for their potential to provide sufficient warmth to sustain manatees through cold winter periods.
- 🐬 FWC and Florida State University staff analyzed a large amount of manatee, boat, and acoustic data collected during the field study to characterize manatee response to approaching vessels. The research was used in a doctoral dissertation at FSU and the findings are being prepared for publication.



Photo of manatee feeding on bank vegetation in the Sebastian River (Brevard County)



Photo of a young female right whale,
Catalog #4092

Right Whales

research activities

In addition to manatee recovery efforts, FWC is involved in the recovery of other endangered marine mammals, including the North Atlantic right whale, *Eubalaena glacialis*. Most of this work is supported by grant funding provided by the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA Fisheries Service); however, portions of some staff salaries are provided by the Trust Fund (section 379.2431(4), F.S). FWC collaborates with Federal, State, and non-governmental organization partners to carry out field research, mainly aerial surveys, biopsy sampling, disentanglement and stranding events, and is dedicated to assisting NOAA Fisheries Service in its efforts to protect this species as outlined in the North Atlantic Right Whale Recovery Plan (http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_right_northatlantic.pdf). With a population estimated at fewer than 500 individuals, the North Atlantic right whale is one of the most endangered large whales in the world. Vessel collisions and entanglement in fishing gear are the leading known causes of death in this species. Even one unnatural death per year could have a significant effect on the population; efforts to prevent human-caused mortality are a priority.

The southeastern U.S. is the primary calving area for the North Atlantic right whale and in 1994 NOAA Fisheries Service designated portions of Florida and Georgia coastal waters as critical habitat. Federal and state efforts to protect right whales in their calving area resulted in the formation of the Southeast U.S. Right Whale Recovery Plan Implementation Team (SEIT), a multi-agency and citizen advisory group. FWC has been a member of the SEIT since its 1993 inception.

Since 1987, FWC has conducted aerial surveys to monitor seasonal presence of right whales, mitigate vessel-whale collisions, and assess population dynamics. An Early Warning System communication network, coordinated by NOAA Fisheries Service with assistance from FWC staff, is designed to protect right whales from vessel collisions by notifying key agencies, ports, and mariners via email or text message when and where right whales have been sighted. This near real-time information allows ships to take action if necessary to avoid whales. FWC is one of a handful of major contributors to the North Atlantic Right Whale Identification Database—the central repository for archiving and maintaining photographs and sighting data on right whales. Photographs taken by staff are used to identify individual right whales based on the callosity pattern (a natural growth of rough, cornified skin) on their heads as well as human-related scars. Over time, population demographics, reproductive success, mortality, and trends in health are monitored in part through this photo-identification research. FWC

has also worked closely with partners to compile years of aerial survey data into a GIS program. Analysis of these spatial data help scientists and managers to evaluate right whale distribution patterns in the calving grounds in relation to environmental factors, such as sea surface temperatures and water depth, and human activities, such as vessel traffic.

FWC has developed the infrastructure and analytical tools for monitoring commercial vessel traffic in the right whale calving area using the Automatic Identification System. Commercial vessels are required by U.S. federal regulations to be equipped with an Automatic Identification System transponder and to broadcast their location and speed as determined by GPS. Ongoing analyses characterize vessel traffic patterns and estimate compliance with federal speed regulations. Data on whale distribution, habitat preferences, environmental conditions, and vessel traffic provide a framework for quantifying the risk of vessel strikes and inform and evaluate the effectiveness of proposed management plans.

FY 2013–2014 highlights

- ✦ FWC staff completed work on an updated right whale habitat model. The model can be used to inform a variety of management decisions and help direct aerial survey effort.
- ✦ During this year's calving season (Dec.-March), two FWC teams conducted right whale aerial surveys in the central and southern sections of the Early Warning System area. Combined, these two teams regularly surveyed from Canaveral National Seashore, Florida, to Tybee Island, Georgia, out to approximately 20 nautical miles offshore. FWC identified 220 right whales during preliminary photo analysis, of which 38 (including calves) were unique individuals. An additional 14 individuals were documented, mainly in northern Georgia, by partners including Sea to Shore and the Georgia Department of Natural Resources.
- ✦ In total, 10 cow-calf pairs were documented in the southeastern U.S. during the calving season. One additional cow-calf pair was sighted in the Great South Channel off Cape Cod, Massachusetts, in May 2014, bringing the total number of calves documented to 11.
- ✦ Biopsy sampling was conducted in collaboration with NOAA Fisheries Service and the Georgia Department of Natural Resources. During the calving season, 43 right whale biopsy sampling trips were conducted, resulting in samples from eight calves, four juveniles and two adult males. The skin samples will be used for individual identification, gender determination and health assessment, as well as information on kinship, stock identity, and genetic variability within the population.
- ✦ No right whale stranding events occurred in the southeastern U.S. during the calving season. However, right whale Catalog #1301 is known (through photo-identification) to have lost her newborn calf while in the southeastern U.S.; the calf is presumed dead though the carcass was not recovered. The FWC aerial survey team also located a badly decomposed whale that was reported near Ponce Inlet, Florida, and verified the species as a humpback. It was too decomposed to determine a cause of death.
- ✦ One entangled whale was sighted in the southeastern U.S. during the calving season. FWC as well as the Sea to Shore Alliance, Georgia Department of Natural Resources, NOAA Fisheries Service, Duke University, University of North Carolina-Wilmington,

Provincetown Center for Coastal Studies, New England Aquarium, and others participated in the documentation and disentanglement response. Over the course of two days, the four year-old right whale (Catalog #4057) was assessed, tagged, and partially disentangled. Nearly 500 feet of fishing rope was removed from the whale. The rope is not consistent with that used by fisheries in the southeastern U.S., and the whale likely migrated with the gear attached.

FWC photo-documented two adult whales with recent entanglement wounds of low to medium severity on their head and tail region. Medium to high severity injuries were documented on the right flipper, head region, and tail region of a third whale. Documentation of injuries like these has shown that over 80% of the North Atlantic right whale population bears scars from fishing gear interactions, and over half of these whales have been entangled more than once. Ongoing research indicates that entanglements have a negative impact on the overall health and reproductive success of the species.

FWC researchers collaborate with local volunteer sighting networks to gather information about public reports of whales. These efforts are especially helpful in Central and Southeast Florida where right whale sightings are less common, but also typically occur nearshore where the potential for human interaction is greater.



Photo of right whale #4057 after the disentanglement effort. The whale is seen swimming off with a small amount of fishing rope. Responders were not able to remove all the rope because the rope is likely tangled through and around the whale's baleen in its mouth. The whale is swimming more freely with considerably less drag, and researchers hope the whale can free itself of the remaining rope. Past entanglements like this have shown that some whales are able to shed the remaining rope and stay healthy, while others may suffer long-term effects from the entanglement.

Research Publications and Reports

research activities

FY 2013-2014

Deutsch, C. J. and **M. E. Barlas.** (2013). Manatee response to the conversion of the FPL Cape Canaveral power plant: Movements, warm-water habitat use, and thermal regime of satellite-tagged manatees during winter 2012-2013. Annual Report to Florida Power & Light Company. FWC/FWRI file F2864-10-A3. 77 pp.

Dorazio, R.M., **J. Martin**, **H.H. Edwards** (2013) Estimating abundance while accounting for rarity, correlated behavior, and other sources of variation in counts. *Ecology*, 94, 1472-1478.

Edwards, H.H., (2013). Potential impacts of climate change on warmwater megafauna: the Florida Manatee example (*Trichechus manatus latirostris*). *Climatic Change*. 12 p. doi: 10.1007/s10584-013-0921-2

Gowan, T. A. and J. G. Ortega-Ortiz. (2014). Wintering habitat model for the North Atlantic right whale (*Eubalaena glacialis*) in the Southeastern United States. *PLoS ONE* 9:e95126.

Grossman, C.J., R.E. Hamilton, **M. De Wit**, J. Johnson and R. Faul et al., (2014). The vocalization mechanism of the Florida manatee (*Trichechus manatus latirostris*). *OnLine J. Biol. Sci.*, 14: 127-149.

Kosempa, M., **J. Martin**, F. Johnson, **R. Mezich**, B. Stith, **C. Deutsch**, M. Masi, and **H. Edwards.** (2014). Structured decision making for management of warm-water habitat for manatees. Final report to U.S. Fish and Wildlife Service. FWC/FWRI file F2852-10-14-F. 24 pp. plus appendices.

Martin, J., **H.H. Edwards**, F. Bled, C.J. Fonnesebeck, J.A. Dupuis, B. Gardner, **S.M. Koslovsky**, **L.I. Ward-Geiger**, R.H. Carmichael, **D.E. Fagan**, M. A. Ross, A. M. Aven, J. A. Royle (2014). Estimating upper bounds for occupancy and number of manatees in areas potentially affected by oil from the Deepwater Horizon oil spill. *PLoS ONE* 9, e91683.

Nichols, J.D., M. J. Eaton, **J. Martin.** (2014) Thresholds for conservation and management: structured decision making as a conceptual framework. Application of Threshold Concepts in Natural Resource Decision Making. P Geissler, J Gross, G Guntenspergen (ed.), Springer-Verlag, Berlin, Heildeberg.

Walsh, M.T. and **M. de Wit.** (2014). Sirenia. In: Fowler's Zoo and Wild Animal Medicine, Volume Eight. R.E. Miller, M.E. Fowler, eds. Saunders, Elsevier Inc., St. Louis, MO. Pp 450-456.







FWC authors in bold typeface.

Mote Marine Laboratory

Manatee Research Projects

research activities

The Legislature annually appropriates \$325,000 from the Save the Manatee Trust Fund for the Manatee Research Program at Mote Marine Laboratory (Mote), in Sarasota, Florida. The following projects were funded in FY 2013-2014:

-  Photo-Identification and Genetic Sampling Studies of Manatees in Southwest Florida — The objectives of this project were to: 1) ensure that Mote’s photographic catalog and data are thoroughly checked for quality and completeness and are shared with partner organizations, FWC and USGS; 2) continue field work to perpetuate the long-term photo-identification and other data collection efforts in southwest Florida; and 3) contribute to genetic sampling of wild manatees.
-  Manatee Rescue and Verification—Mote is a federally-registered partner in the manatee carcass salvage and rescue program. Mote researchers are permitted to verify carcasses and assist in rescues of injured or trapped manatees, primarily in Manatee and Sarasota counties.
-  Assessment of Manatee Use of the Hillsborough River—Mote staff reviewed existing manatee data for the Hillsborough River and conducted land-based and aerial surveys of the area from October to March.
-  Effects of Cold Stress on Manatees and Conservation Applications of Biomarkers—Mote continued using selected biomarkers to assess effects of cold stress in manatees, assess rehabilitation time requirements for cold-stressed manatees, and shed light on impacts of cold stress on exposed manatee populations.
-  Aerial Surveys of Manatees—Mote staff participated in the state-wide synoptic survey in January 2014.
-  Program Oversight—The program leader is responsible for periodic reports, coordination with state scientists and managers for activities associated with manatee recovery planning, and oversight of manatee research projects conducted by Mote.

Manatee Forum

management activities

In 2004, FWC and the USFWS established the Manatee Forum, a diverse stakeholder group with the goal of reducing litigation by establishing areas of common ground, identifying problems or conflicts, developing potential solutions, and accepting differences through increased communication. During FY 2013-2014, the Manatee Forum met twice, once in October and once in May. During the October meeting, presentations on the algal blooms in the Indian River Lagoon, a study of manatee response to vessel traffic, and updates on the red tide and east coast manatee mortality events were provided. The May meeting included updates on Florida seagrass, manatee genetics, warm water habitat, and a structured decision making model developed to assist in prioritizing habitat restoration projects. FWC believes in the importance of having a stakeholder group focused on manatee issues. The opportunity for information exchange and the discussion of ideas is very valuable to all parties.



Photo shows a tagged manatee at Wakulla Springs State Park (Wakulla County).






By Susan Lowe

Manatee Protection Plans and Permit Reviews

management activities

FWC reviews proposed development projects and provides biological opinions to State regulatory agencies for Environmental Resource Permits, Sovereign Submerged Land leases, State Clearinghouse projects, Comprehensive Everglades Restoration Plan projects, and Developments of Regional Impact. FWC is also heavily involved in the development and implementation of county-specific Manatee Protection Plans (MPPs), and provides comments concerning manatees for various types of planning documents such as county Comprehensive Plans. See Chapter 7 “Management Actions” in the Manatee Management Plan for further details about these programs (p.45 for Permit Review and p. 49 for MPPs).

FY 2013 – 2014 highlights

-  FWC reviewed 362 requests to provide comments and provided opinions on 286 proposed regulatory actions regarding potential adverse impacts to manatees for the Department of Environmental Protection (DEP), the Water Management Districts (WMDs), the State Clearinghouse, the Department of Economic Opportunity (DEO), the Florida Department of Transportation, Florida ports, the Army Corps of Engineers, and the USFWS.
-  Fifteen boat facilities coordinated with FWC for manatee education materials or manatee informational signs. Manatee watch plans were reviewed and approved by FWC for four projects with in-water work in important manatee habitat.
-  FWC has provided technical assistance to the USFWS regarding several new high speed boat races proposed in Florida, including the Manatee River F2 powerboat race, Tampa Grand Prix of the Seas P1 powerboat race, and the Clearwater Super Boat National Championship.
-  An incident of a manatee becoming trapped and dying in a submerged pipe occurred on Captiva Island (Lee County). Through coordination with FWC staff, the owner of the property has installed barriers to prohibit future manatee access into the pipe.
-  Staff reviewed and provided comments to proposed rulemaking by DEP, including the Statewide Environmental Resource Permitting program, proposed General Permit for dredging activities by the West Coast Inland Navigational District in Charlotte County, and a proposed General Permit for mooring fields for local governments.

Florida Port Activities

FWC provided opinions on how to offset expected impacts to manatees for proposed port projects, including submitted permit applications for the Port of Palm Beach expansion (Lake Worth Inlet) and Port Canaveral (East Boat Ramp and Cruise ship slip). FWC also

provided comments to the State Clearinghouse regarding the Tampa Port Authority expansion (Big Bend Channel expansion).

Manatee Protection Plans

- 🐬 FWC created a guidance document for counties for developing and revising Manatee Protection Plans, which is currently being finalized in coordination with the USFWS.
- 🐬 **Charlotte County MPP:** Charlotte County, the USFWS, and FWC continue working to develop an MPP for Charlotte County.
- 🐬 **Duval County MPP:** A draft accepted by the County, the USFWS, and FWC has been completed and is currently going through the public commenting process.
- 🐬 **Miami-Dade County MPP:** FWC provided an informal review of potential edits to the Miami-Dade County MPP and continues to work with the County to revise the existing plan.








Photo of the Ulele Springs restoration project under construction in Tampa, Florida, during 2014. The Ulele Springs project will provide new manatee warm-water habitat to the Hillsborough River. FWC is one of several partners who has joined with Ecosphere Restoration Institute to construct the project.


Manatee Protection Zones

management activities

FWC establishes manatee protection rules, including boat speed zones and restricted access areas, and administers activities related to these rules. Staff evaluates data and develops proposed rules for consideration by the FWC Commission and also reviews and comments on local manatee protection ordinances developed by city and county governments. (See Chapter 7, “Management Actions,” p. 36, Manatee Management Plan)

FY 2013–2014 highlights

-  **Pinellas County** (68C-22.016, F.A.C.) — The Florida Manatee Management Plan identifies the western portion of Pinellas County as an area to be evaluated for consideration of new manatee protection zones. FWC staff began working on this project in late 2010, and considerable coordination with County staff and others occurred before this fiscal year. FWC staff made presentations to several local groups between July and September 2013. In January 2014, FWC formally notified the County that potential manatee protection zones were being considered, and the County subsequently formed a Local Rule Review Committee (LRRC), as required by statute. The LRRC met seven times between May and June 2014 to review FWC’s potential manatee protection zones, discuss issues, and review information provided by FWC staff. The LRRC submitted its final report to FWC in late June. As of the end of June, staff was reviewing the LRRC report and developing staff recommendations to the proposed rule for consideration by the FWC Commission.
-  **Collier County** (68C-22.023, F.A.C.) — The city of Naples submitted a petition in June 2014 requesting an amendment to the rule for Collier County. The amendment would add FWC manatee protection zones in the Doctors Pass/Moorings Bay system. As of the end of June, staff was reviewing the petition and preparing a response.
-  **Local Ordinances** — FWC staff coordinated with staff from several local governments on issues related to potential or existing local manatee protection ordinances, but no formal actions were taken at the local level.
-  **Regulated Areas** — FWC staff continued work to develop county-specific GIS data layers that combine FWC manatee protection zones, boating safety zones, and USFWS manatee protection zones. This allows the calculation of acres of regulated water for each county and will eventually allow composite maps to be produced that show all three zones on the same maps (with the maps depicting the most restrictive zone if more than one apply to the same area). Work was completed for the following counties: Brevard, Broward, Duval, Martin, Palm Beach, and the upper St. Johns River (Volusia County).
-  **Variations and Waivers** — The variance and waiver process is governed by section 120.542, F.S., and Chapter 28-104, F.A.C. FWC did not receive any requests for variances or waivers from manatee protection rules during FY 2013-2014.

 **Permits** — Rule 68C-22.003, F.A.C., allows FWC to issue a number of different types of permits for activities that would otherwise be prohibited by the manatee protection rules. Most of these permits are for commercial fishing or professional fishing guide activities. There are typically 150 – 200 of these permits in effect at any given time. FWC worked on four requests for these types of permits during FY 2013-2014.



- In September 2013, FWRI submitted two separate requests for new permits to allow access to multiple safe haven zones around the State for research activities related to manatee genetics and behavior associated with warm water aggregation areas. The behavioral research project is being conducted along the Atlantic Coast while the genetics research is taking place at selected sites on both coasts. Both permits were issued in September 2013.
- In December 2013, the Chappell Group submitted a request for access to the year-round safe haven zone at the Port Everglades power plant in Broward County, for activities associated with a mangrove mitigation project. After requesting and receiving additional information, a permit was issued in January 2014.
- In February 2014, Bombardier Recreational Products U.S. submitted a request to reissue a permit to allow vessel testing activities in a waterway off of the South Fork of the St. Lucie River in Martin County. The previous permit had expired in 2011. A new permit was issued in late February.







Habitat Characterization, Assessment and Protection

management activities

The long-term conservation of manatees relies on having enough healthy, suitable habitats available throughout their range in Florida. Human-related activities over time have resulted in habitat degradation, reduced water quality, and decreased spring flows. These activities have caused loss of seagrasses – the manatee’s primary food. Reductions in the flow of warm spring waters threaten significant natural warm-water refuges. Anticipated operational changes at power plants and future power plant retirements also pose threats to established artificial warm-water refuges. Understanding the manatee’s habitat needs and habitat carrying capacity and assuring habitat health and stability is a primary focus of habitat protection programs. (See Chapter 7, “Management Actions,” p. 55 Florida Manatee Management Plan)

FY 2013–2014 highlights

-  FWC worked with FPL to ensure the presence of manatee warm-water refuges at three power plants on the east coast (Cape Canaveral, Riviera Beach, and Port Everglades) during the conversions of these plants from oil burning to more efficient combined cycle natural gas units. Plant conversions are complete at the FPL Cape Canaveral and Riviera Beach Energy Centers. The last year of monitoring manatee use of the Cape Canaveral power plant’s discharge and water temperatures in the warm-water refuge will be completed during the winter of 2014-2015. All manatee monitoring at the FPL Riviera Energy Center has already concluded and a final report will be provided to FWC by FPL in 2015. The Port Everglades plant is entering the second winter with an interim heating system, and manatee monitoring will continue at this site until the plant conversion is completed. The data collected during the conversions of these three plants will provide information regarding how manatees responded to the changes in warm water availability along the east coast of Florida during the winter season. It will be useful to FWC and agency partners in developing future warm-water habitat plans.
-  FWC continues to work with the WMDs in the development of Minimum Flows and Levels (MFLs) for spring systems that provide warm-water habitat for manatees. During 2014, FWC staff reviewed the MFL for the lower Santa Fe River and Ichetucknee Springs and worked with the Suwannee River Water Management District to ensure naturally fluctuating water levels were sufficient to allow manatee passage up river of shoal areas to warm water spring systems. Past MFL coordination at springs with manatee habitat include Volusia Blue Spring, Manatee Springs (Levy County), Fanning Springs (Gilchrist and Levy counties), Weeki Wachee Spring system (Hernando County) Homosassa River (Citrus County) and the Chassahowitzka River and spring (Citrus County).

-  FWC is working with a variety of partners to identify and complete restoration and enhancement projects for Florida springs systems that will improve manatee access to natural warm-water habitat at Salt Creek and Warm Mineral Springs Creek (Sarasota County). Agency staff are also working with the City of Crystal River, Citrus County, the USFWS, and the SWFWMD to stabilize the banks of the warm water refuge at Three Sisters Springs (Citrus County). Agency funding will be matched with SWFWMD funds to implement the shoreline stabilization project using natural limerock and sediment fill from 2014 to 2016.
-  FWC worked with staff from the St. John's River Water Management District and the University of Florida to monitor the effects of repeated and prolonged algal blooms in the Indian River Lagoon, Mosquito Lagoon, and Banana River systems caused in part by persistent high salinity and nutrient conditions. The bloom continued to reduce the available seagrass forage for manatees in the affected systems over the last year, and manatees responded by moving to areas where the effects of the bloom were less pronounced. Monitoring of these systems for recurrent blooms and available seagrass foraging habitat continue with partner coordination.
-  FWC continued working to address the protection of Florida's seagrass resources. These efforts have provided seagrass protection protocols and recommendations for coastal construction permits as well as initiating restoration and monitoring projects.
-  FWC works to control invasive, nonnative aquatic plants and encourage the establishment of native species, particularly in springs systems used by manatees. This is achieved by participation on various aquatic plant working groups. The Blue Spring Aquatic Plant Working Group is one such group that works to implement an invasive aquatic plant management plan, and address warm and cold season treatment activities and other protection measures for manatees. FWC also coordinated extensively over the past year with the USFWS, Citrus County, DEP, and SFWMD on aquatic plant management activities as they relate to manatee warm water refuge issues in the Crystal and Homosassa River systems.
-  FWC participated in interagency coordination through the Kings Bay Working Group, with efforts aimed at the continued conservation and restoration of submerged aquatic and emergent vegetation in Kings Bay (Citrus County). FWC has coordinated with the SFWMD regarding a pilot project to reestablish freshwater vegetation near Hunter Springs.
-  Manatees can be killed in water control structures and navigation locks. FWC works with agencies responsible for these structures to eliminate these types of deaths. Four manatees died in 2013 as a result of interactions with a water control structure. These deaths increased the overall total of water control structure-related deaths to 214 since 1974. The average annual number of structure-related deaths before retro-fitting structures with manatee protection devices was 6.2 manatees per year from 1974-2000. That number has decreased to a post-retrofitting average of 3.9 manatees per year (2001-2013).

- 🐢 FWC coordinates with the Army Corps of Engineers, the South Florida WMD and the Southwest Florida WMD to address central and south Florida water control structure-related manatee mortality issues through the Interagency Task Force for Water Control Structures. The Task Force meets annually.



Photo of Turtle grass (a common food source for the Florida Manatee) and Merman's shaving brush algae.

Public Outreach

management activities

FY 2013-2014 highlights

Public outreach regarding manatee conservation programs is important so that the public is well informed about manatees and understands the reasons for various manatee protection activities. Knowledge of manatee habitat requirements, behavior, and general biology can help the public and waterway users understand ways they can reduce human-related risks to manatees such as harassment, entanglement in discarded monofilament line, and obeying posted speed zones to reduce injury and death from boat collisions.

-  The well-publicized manatee harassment conviction of two individuals who video-taped and posted their harassment of a mother and calf pair on Facebook contributed to manatee educational efforts in regard to consequences of illegal activities. The original alert came to FWC through AskFWC in 2012. FWC law enforcement investigated the incident. While unfortunate, occasional incidents like this help educate others about appropriate behavior regarding endangered manatees.
-  Routine updates and reprinting of manatee materials is an ongoing task for FWC. During FY 2013-2014, staff completed reprints of the “Florida manatee—A Florida Treasure” and the “Where are Florida’s manatees?” brochures for distribution through the county tax collector offices and other appropriate educational outlets. The “Florida manatees—A Florida Treasure” brochure provides guidelines for boating, diving, and snorkeling around manatees. FWC assisted with the reprinting of the multi-lingual (English, Spanish, French, and German) Waterway Signs card developed by the Save the Manatee Club.
-  The agency’s AskFWC online service generated 166 hits for 11 of the posted manatee related commonly asked questions. The top two questions viewed related to manatee speed zones and how to interact near manatees. FWC staff reviewed and responded to 405 AskFWC online requests (which included queries for other species, as well) and fulfilled 114 manatee-related bulk order or individual requests for printed materials for schools, eco-tour businesses, and visitor centers. In keeping up with today’s social networks, staff gathered information about imperiled species to submit to the agency’s Community Relations staff for posting on Facebook and Twitter feeds. A social media seasonal push for manatee decal sales occurred during the winter holiday season.
-  New outreach opportunities included use of the manatee mascot at an Orlando Magic pre-game event in March and a display at FWC’s Beau Turner Day in April. Staff traveled to Weeki Wachee State Park and participated in the Swamp Festival and sent the mascot and materials for staff use at the Blue Spring Manatee Festival. Other events included an exhibit and activity at the St. Marks National Wildlife

Refuge and the annual FWC Creating the Next Generation that Cares event at the Capitol Courtyard. Staff completed two manatee educational boxes that provide teaching resources for the Florida Youth Conservation Center Network (FYCCN) office. The boxes are tagged for use at Weedon Island and the Joe Budd Center. One of the boxes was used at Kate Sullivan Elementary School at the end of the school year and at a summer camp program before returning to FYCCN.



Photo of Three Sisters Springs, a natural warm-water refuge for the Florida manatee, in Crystal River, Florida

Appendix

Appendix A: Acronyms and Abbreviations

Appendix B: Boat Speed Definitions
Manatee License Plate and Decal Program

Appendix A:

Acronyms and Abbreviations

°C — degrees Celsius

DEP—Florida Department of Environmental Protection

DTAG — Digital Acoustic Recording Tag

°F — degrees Fahrenheit

F.A.C. — Florida Administrative Code

FPL – Florida Power and Light Company

F.S. — Florida Statutes

FWC — Florida Fish and Wildlife Conservation Commission

FY — Fiscal Year

FYCCN – Florida Youth Conservation Center Network

GIS — Geographic Information System

GPS — Global Positioning System

kg — kilogram

m – meter

MFL — Minimum Flows and Levels

MIPS — Manatee Individual PhotoIdentification System

MMPL — Marine Mammal Pathobiology Laboratory

Mote — Mote Marine Laboratory

MPP — Manatee Protection Plan

NOAA Fisheries Service — National Oceanic and Atmospheric Administration, National Marine Fisheries Service

Plan — Florida Manatee Management Plan

Trust Fund — Save the Manatee Trust Fund

USFWS — U.S. Fish and Wildlife Service

USGS — U.S. Geological Survey

WMD— Water Management District

Appendix B: Boat Speed Definitions

**All boat operators must
comply with posted signs**

S = Spanish - Español
F = French - Français
G = German



Lowest speed needed to maintain
steerage and forward motion.
(Speed ~2-3 mph/3-5 kph*)



S: La velocidad más lenta que se necesita para mantener gobierno.
**F: Vitesse la plus basse nécessaire pour maintenir le
steerage et le mouvement avant.**
G: Die niedrigste Geschwindigkeit, um das Boot auf Kurs zu halten
und vorwärts Bewegung zu machen.



Little or no wake. Vessel must be
completely settled in the water.
(Speed ~5-7 mph/8-11 kph*)



S: Asentado en el agua, sin surcar, estela mínima que no ponga en
peligro a otras embarcaciones.
**F: Peu ou pas de sillage. Le bateau doit être complètement
arrangé dans l'eau.**
G: Das Boot ganz im Wasser mit Kielwasser das nicht andere
Fahrzeugen oder Wasser Strasse Benutzern gefährden.



Resume normal safe speed
according to current water
traffic conditions.



S: Reanude velocidad normal.
**F: Reprenez une vitesse sûre selon des états de transport par voie
navigable.**
G: Fangen Sie eine sichere geschwindigkeit an.

***Note: The specific speed may vary with the size and hull design of the vessel.**



Florida Fish and Wildlife
Conservation Commission
MyFWC.com

In an emergency:

**Wildlife Alert: 1-888-404-FWCC (3922)
Mobile: #FWC, *FWC VHF Radio: Channel 16**

Manatee License Plate and Decal Program

Manatee License Plate

The manatee license plate was created in 1990 as per section 320.08058(1)(c), and section 379.2431(4)(d), F.S., to raise funds for manatee research and protection. The manatee license plate generated \$1,280,265 in FY 2013-2014. These revenues are deposited in full into the Save the Manatee Trust Fund.



Manatee Decal

Section 328.72, F.S., provides that a sticker or decal can be given to citizens who donate \$5 or more to the Save the Manatee Trust Fund. Each year tax collectors participate by selling decals at their offices. Revenues from the decals support manatee protection efforts such as rescue, rehabilitation, research, and outreach. During FY 2013-2014, 4,589 manatee decals were sold, and they raised approximately \$22,495 for manatee conservation. This year's decal was designed by FWC staff.

