

Manatee Time Line

What are some Important Dates or Notable Information about Manatees in Florida?

1492 – 1785

1903 – 1965

1976 – 1985

1996 - 2005

1824 – 1893

1966 – 1975

1986 – 1995

2006 - 2016

References

2006 – The most recent population analysis showed that manatee numbers were growing in three out of four regions of the state, with the exception being southwest Florida, where data suggested that estimates of adult survival were lower than in other regions.

- At the direction of the FWC Commissioners, staff began development of Florida’s first ever Manatee Management Plan. The overall goal of the plan was to remove the manatee from the State’s imperiled species list and effectively manage the population in perpetuity throughout Florida. Securing habitat and minimizing threats were prominent in the plan.
- FWC approved the Clay County Manatee Protection Plan.
- FWC approved the first revision of the Duval County Manatee Protection Plan.
- Philippe Cousteau, grandson of the famous explorer/oceanographer Jacques Cousteau, visited Blue Spring State Park where his grandfather and father filmed, “The Forgotten Mermaids” over 30 years ago. Some of the manatees that over-winter at this park were present when the elder Cousteau filmed this documentary. Philippe’s visit of discovery at Blue Spring brought this response, “Perhaps if we protect the natural systems that allow manatees to flourish, future generations will know some of the magic I’ve experienced at Blue Spring during my own



visit...and these forgotten mermaids will forever be remembered.”
(Living on Earth)

- Leslie Ward was selected as the new administrator for the FWC manatee research program. Elsa Haubold moved to another position in FWC in the Division of Habitat and Species Conservation.
- Sixty-six manatee rescues were conducted statewide. Of those manatees, 39 were released back into the wild, 17 died, and the remaining animals stayed in rehabilitation facilities as of the end of the 2006-2007 fiscal year.
- FWC staff continued its work on Phase II of a computer model that simulates boat traffic. The goal of this work was to be able to estimate how boating patterns might be altered with changes in land use (e.g. addition of boating facilities).
- FWC FWRI staff initiated a preliminary risk assessment analysis of collisions between manatees and boats, using Brevard County as a test area. Manatee and boat aerial surveys were used to map manatee and boat common use areas.
- FWC (FWRI, LE and ISM) staff completed a boat speed analysis with the goal of identifying a single speed that provides a reasonable balance among vessel performance, boating safety and manatee protection. **The study concluded that there was no single speed that could adequately balance all three areas.**
- Research staff completed initial analysis of boat traffic data collected for baseline measurements on the Manatee River. The goal of this study was to monitor changes in boat traffic resulting from permitted residential developments (data will be collected for several years).
- Mote Marine Laboratory Manatee Research Projects – 2006-2007
 - Photo-identification studies of manatees in southwestern Florida
 - Development of methods for field sampling and variable genetic markers in the Florida manatee: Molecular biologist postdoctoral position – FWC/MML Partnership developed 18 new, variable, microsatellite DNA markers that can be used to identify individual genotypes of a sampled animal.
 - Manatee rescue and verification (primarily in Manatee and Sarasota counties).

- Manatee health studies: Contaminants and biomarkers of effects
 - 1) contaminant levels in tissues, 2) clarify exposure to and effects of contaminants.
 - Recreational boat traffic surveys of Brevard County, FL – conduct first comprehensive aerial survey of boat traffic in the county in order to determine traffic patterns and effectiveness of speed zones and risks.
- ISM held an Interagency Group meeting of the 13 key counties that have developed Manatee Protection Plans. (Hosted by Sarasota County)
 - FWC adopted manatee protection zones within Tampa Bay. Signage installed by June 2007.
 - FWC LE coordinated the inaugural Manatee Protection Workshop to develop networks and discuss consistent and effective enforcement between local, state, and federal law enforcement agencies.
 - FWC LE continued ongoing coordination of Marine Law Enforcement Task Forces in Florida. These task forces address all marine law enforcement on the water with a focus on protecting manatees. Each task force was comprised of many local law enforcement, parks, and safety departments as well as government agencies:
 - Lee County Marine Law Enforcement Task Force – established in 2003.
 - Southwest Florida Marine & Uplands Alliance (Collier County)
 - Northeast Regional Law Enforcement Maritime Alliance (founded 2006 – Volusia, Brevard, and Flagler Counties)
 - The 2006-2007 manatee decal series showcased artwork designed by Berry Donovan Foster, a middle school student from Citrus County.

2007 – Staff contributed to a population projection model for the Florida manatee, which was used to integrate information about manatee life history, in order to predict population changes under various environmental and management scenarios.

- A study conducted with federal partners included a quantitative “threats” analysis that suggested watercraft mortality has the greatest impact on manatee population growth and resilience.

- Over the course of the year, FWC staff developed the first ever draft Manatee Management Plan for Florida. Previously the state program used the federal Manatee Recovery Plan to generally guide the program. The draft was approved at the December 2007 Commission meeting. The approved Manatee Management Plan provides the FWC manatee program managers and researchers with guidelines and direction for the next five years and beyond.
- Staff developed Measurable Biological Goals related to the dynamics of the manatee population as described by the population model:
 - Mature population size exceeding 2,500 mature adult manatees statewide
 - Sufficient regional adult survival rates to ensure a less than 1% probability of population declines greater than 30% (over a 60 year timeframe), given available warm-water resources
 - Sufficient regional warm-water carrying capacity to ensure a less than 1% probability of population declines greater than 30% over the next three generations (~60 years), given estimates of adult survival.
- Amendments were adopted in the state manatee protection rule for Duval County to make the state zones in the downtown Jacksonville area the same as the federal zones (as revised in 2005).
- LE Operation Mermaid was conducted (January) as the first simultaneous statewide enforcement effort directed toward enforcement of manatee protection zones. During this operation, 1,752 vessels were stopped, resulting in 757 written warnings, 389 citations, and 20 physical arrests.
- FWC LE and the USFWS signed a Radio Services Agreement that provided authority for FWC LE to provide dispatch services for USFWS agents in Florida. The partnership allows USFWS agents to get immediate checks for prior violations and/or wanted persons, stolen vessels or other property, and other sensitive LE information.
- FWC approved the Palm Beach County Manatee Protection Plan.
- Manatees remain on the endangered species list. FWC Commissioners directed staff to review criteria for reclassifying species listed as endangered, threatened, or species of special concern.
- FWC approved the Broward County Manatee Protection Plan, the 13th and final county required to have an MPP. The approval of this plan

signals the completion of various manatee conservation tasks that were laid out by the Governor and Cabinet in October 1989.

- Staff developed new synoptic aerial survey methods designed to provide more precise and reliable estimates of population size (See 2008 for test info.)
- The annual statewide synoptic survey was conducted in January/February. Seventeen observers (15 in air and 2 on the ground) counted 2,817 manatees in 20 areas on both coasts: Gulf coast – 1,405 and East coast – 1,412 manatees.
- Three separate manatee Unusual Mortality Events (UME) occurred in Florida due to manatees being exposed to red tide toxin (brevetoxin):
 - Southwest Florida - 38 manatees died
 - Everglades National Park – 24 manatees died
 - Caloosahatchee River estuary – 40 manatees died
(Note: See 1996, 2002, 2003, 2005 and 2006 for other UME red tide deaths)
- The newly designed Save the Manatee license plate debuted at the end of 2007. Florida artist Nancy Blauers designed the plate. The new design was the first redesign of the plate since its introduction in March 1990. Revenue from the plate sales will continue to fund manatee-related research and conservation management activities.



(New plate design)



(Original plate design)

- FWC manatee research staff scanned over 31,500 manatee carcass slides dating back to 1980 to improve digital access to the data.
- (2004 and 2005) Hurricane damaged waterway signs and markers were replaced or repaired in Volusia and Brevard counties.
- First draft of "Approved Uniform Waterway Marker Standards for Posting Manatee Protection Zones in Florida's Waterways" was sent out for public review.

- Another document under public review was the, "Guidelines for Posting Uniform Waterway Markers in Florida's Waterways".
 - A new On-Call Response Program was developed to allow the general public an avenue to report damaged and missing waterway signs via a toll-free number or on the internet.
 - The behavioral ecology program launched a new research initiative to study manatee interactions with motorized watercraft. This work was done in collaboration with marine mammal bio-acousticians at Florida State University and marine engineers at Woods Hole Oceanographic Institution. The study involved two phases:
 - Research, development, and pilot testing of a state-of-the-art digital acoustic recording tag (aka "dTag") designed to record manatee responses to vessels.
 - Field/analytical component
- Other:
- Testing was done on a captive manatee at Mote Marine Lab and pilot tested on a wild manatee in Crystal River.
 - The dTag was designed with a quick release mechanism to retrieve the tag without recapturing the animal.
- The 2007-2008 manatee decal series artwork was designed by Natasha Thornton, a 9th-grade student from Miami-Dade County.
 - In September 2007, the USFWS held a meeting to officially disband the federal Manatee Recovery Team, acknowledge accomplishments of the various working groups and express appreciation for work conducted on behalf of manatee recovery.

2008 – The [Florida Manatee Management Plan \(MMP\)](#) was implemented this year after being approved at the December 2007 FWC Commission meeting. The overall conservation goal of the Plan is:

"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."

- No Unusual Mortality Events (UME) were declared during FY 2007-2008; however, for the first time, multiple manatee deaths were attributed to the red tide toxin on the east coast of Florida. Eleven red

tide-related carcasses were recovered from the waterways between Volusia and Indian River counties.

- Eighty-four rescues were performed during FY 2007-2008. Forty-seven of these rescued manatees were released back into the wild, 14 died, and the remaining 23 animals were still at rehabilitation facilities by the end of the year.
- Distribution surveys incorporating the new survey methods were conducted in Collier County. A separate pilot study to test new methods for the statewide synoptic survey was flown in southwest Florida. (These methods were not dependent on cold weather)
- The annual statewide manatee synoptic survey was not conducted during the winter due to above average temperatures and no significant cold fronts. (La Nina conditions in Florida led to winter temperatures well above average.)
- FWC completed the scanning and archiving of all manatee carcass slides. Over 43,000 slides dating back to 1980 were scanned.
- During the summer of 2007 and the spring/summer of 2008, 18 wild manatees were captured and tagged with multi-sensor archival dTags and Global Positioning System (GPS) tags linked through the Argos satellite system. The GPS tags provided a detailed record of manatee locations, movements and habitat use at 5-minute intervals for 1-2 months. The dTag provided a continuous 36-48 hour record of sound (ambient noise, vocalizations and boat noise) and also recorded a suite of behavioral parameters permitting detailed three-dimensional reconstruction of the manatee's movements, behavior, depth, and orientation under water.
- FWRI participated as a contributing organization to the multi-agency Manatee Rehabilitation Partnership consisting of representatives from federal, state, academic, and private oceanaria.
- Staff developed a framework for conducting analyses of risk of collision between boats and manatees.
- ISM and FWRI staff developed new boat speed zone evaluation tools that may be useful in future evaluations around the state. Staff's work focused on the development of an analytical approach that used aerial survey data to investigate spatial coincidence of manatees and boats.

Work continued for alternative ways to process both the manatee and boating aerial survey data.

- FWRI scientists and Imperiled Species Management staff, along with partners at USFWS and USGS, started development of a carrying capacity research framework to define habitat carrying capacity for manatees in Florida waters.
- FWC continued its work with the Kings Bay Advisory Group (Citrus County) to restore submerged aquatic vegetation to Kings Bay in Crystal River.
- FWC ISM outreach staff coordinated with a Brevard County volunteer and environmental groups to debut an outreach program called, "Wild Treasures of Brevard County—the imperiled species discovery series." The program utilized all 17 libraries in the county and involved imperiled species education materials, presentations, and displays. The emphasis was on species awareness, habitat conservation, and education about how human behavior impacts wildlife.
- FWC's customer service, "AskFWC", was implemented to handle the manatee program's commonly asked questions and customer requests. The overall personal requests for information (previously sent via letters to the agency) dropped off as individuals expanded their use of the internet to find information.
- The on-line manatee e-field trip provided an engaging self-guided tour into the life of the manatee and gave elementary to high school students a tool to learn about manatees without traveling to Florida. A total of 291 schools registered to use the field trip during the 2007-2008 school year.
- The popular manatee coloring and activity booklet underwent a major overhaul with new graphics and more science based and research information included.
- The redesigned license plate and new marketing campaign was launched in early 2008. The commission's campaign, "It matters to us what plate you buy" appeared in a variety of print media. The Wildlife Foundation of Florida created a new website www.buyaplate.com to promote all of the license plates that benefit FWC wildlife programs.
- The 2008-2009 Manatee Decal Art Contest winner was Austyn Bynon, a junior at West Boca Raton High School.



2009 – FWC and its partners made significant strides to advance the long term goals and objectives of the Florida Manatee Management Plan.

- Manatee protection devices on the Canaveral Locks failed in the winter of 2008 and there were three manatee deaths attributed to the locks before repairs could be made.
- A relatively high number of manatees (62) succumbed to complications from exposure to cold water temperatures this winter.
- Eighty-one manatee rescues were performed statewide. Of these, 35 manatees were released back into the wild, 28 died, and the remaining 18 animals stayed in rehabilitation facilities.
- During the week of January 19, 2009, a team of 21 observers from nine organizations counted an all-time high total of 3,802 manatees statewide. (2,148 manatees on Florida's east coast and 1,654 manatees on Florida's west coast)
- Pinellas County started a two year manatee distributional survey (flown twice monthly) that incorporated new survey methods. (August 2010).
- A separate pilot study to test new methods for the statewide synoptic survey was flown in the winters of 2008 and 2009 in southwest Florida. Data were evaluated and results used to refine the design of an improved statewide synoptic survey.
- FWC successfully tested a new method to collect skin samples from free-swimming manatees in winter 2008. During the winter of 2009, FWC conducted genetic sampling surveys employing this new

methodology. The results will help design future genetic sample surveys. (93 samples were collected at Port of the Islands in Collier County and 107 biopsies were collected at Orange River in Lee County.)

- A “Manatee Key,” specific to dredging activities and their potential impacts to manatees, was drafted and converted to a GIS format to facilitate state permitting and complement the federal permit process.
- FWC worked with its partners to develop research plans that address key management issues regarding warm-water habitat, nearby foraging habitat, and carrying capacity estimates for regional manatee populations.
- In collaboration with researchers at Florida State University, Duke University and Woods Hole Oceanographic Institution, FWC staff worked to complete field research on interactions between tagged manatees and motorized watercraft in southwest Florida. The goal of this project was to create a combined picture of manatee behavior, acoustics, and vessel trajectories to better understand the responses displayed by manatees when approached by boats and the acoustic cues that may elicit such responses.
- FWC coordinated with the USFWS to investigate manatee-human interactions in Kings Bay/Crystal River and the greater Citrus County area. Issues considered:
 - Whether rule changes are needed to address harassment issues
 - Should federal sanctuaries be expanded at the Crystal River NWR
 - Modification of special use permits
 - Changes to educational approaches

A public listening session was conducted in Citrus County to gather input and recommendations on these actions. FWC commissioners encouraged further evaluation and work on these issues.

- Duval and Collier County Manatee Protection Plans underwent revision.
- Sarasota County formed a Local Rule Review Committee to provide input on any potential manatee protection zone changes.
- Broward County Manatee Protection Plan amendments incorporated into the County’s Comprehensive Plan.

- FWC and USFWS staff coordinated with power companies to identify timelines, methods and procedures for reducing the risk to manatees in the event of a change in plant operations that affect existing warm-water habitat.
- Minimum Flows and Levels (MFLs) for Volusia Blue Spring, Manatee Springs, Fanning Springs, and the Weeki Wachee Spring system were developed using criteria to protect winter warm-water manatee use areas.
- FWC environmental commenting staff updated the permanent manatee sign required at boat facilities that have a Florida Department of Environmental Protection for permit or lease conditions.



- During the 2009 Session of the Florida Legislature, FWC proposed legislation protecting seagrasses from propeller scarring in saltwater aquatic preserves. HB1423 passed and was signed into law (Chapter 2009-86, Laws of Florida), effective October 1, 2009.
- Park and FWC staffs have noted that there was an increase of manatee use of the Edward Ball Wakulla Spring State Park spring and river system over recent years. While manatees were known to use the St. Marks/Wakulla Springs system in the warmer summer months, until recently, manatees were not documented overwintering at the park. Increased education of park staff, the development of manatee protection procedures, and modifications to river tour boats helped prepare the park for the year-round presence of manatees in the park.

One manatee rescue and numerous cold-stress related evaluations were conducted during the winter.

- The manatee educational brochure, “Florida Manatees, A Florida Treasure,” was translated to Spanish and funded by outside groups for distribution.
- The “Wild Treasures of Brevard County” outreach program continued this year. Twenty-three manatee programs, displays or presentations occurred at various County libraries.
- The 2009-2010 Manatee Decal Art Contest winner was Deanna Parsons, a junior at Rockledge High School in Brevard County. Several other students at the school were recognized for their entries that placed in the top ten in the state.



2010 – On January 15th, the low temperature in Tallahassee was 30 degrees Fahrenheit. While that qualified as cold for most Floridians, it was not a record low. What was a record was the fact that it was the 14th straight day in a row of sub-freezing temperatures in Florida’s capital city. Similar conditions occurred in many places around the state. This was a historic cold snap in terms of both duration and magnitude—and one that created havoc for Florida’s wildlife...

- During the second week of January, FWC scientists and partners performed the annual manatee synoptic survey and observed a record 5,076 manatees at Florida’s warm-water sites. While the media and manatee lovers were celebrating the record count, FWC staff braced for

what they knew would be sure to follow the extreme cold weather: cold-stressed manatees and numerous deaths.

- From January through April, 503 manatee carcasses were reported and at least 252 were attributed to the cold. The majority of the carcasses with undetermined cause of death (197) were likely due to the unprecedented weather as well. Mortality was particularly high in Florida's central-east and southwest regions.
- On February 26, 2010, the Working Group on Marine Mammal Unusual Mortality Events declared the cold weather event to be an official UME and a response team assembled to direct the course of the daily operations. Responding to this event was truly a team effort of many partner agencies and organizations, law enforcement, volunteers, and numerous FWC staff.
- One hundred-eight manatee rescues were performed during the year. Forty-five of these rescued manatees were released back into the wild, 32 died and the remaining 31 animals remained at rehabilitation facilities for later release. Thirty-nine of the rescues were related to cold-stress.
- Four manatees died as a result of interactions with water control structures during the year.
- With the scheduled shutdown of three power plants along the east coast during this year, one that may be permanent and two for multi-year repowering, the warm-water network that manatees rely on could change. FWC carried out studies to provide baseline data on abundance, distribution, movements, and behavior of manatees that spend the winter in Brevard County.
- On April 20, 2010, another disaster struck—the Deepwater Horizon oil platform burned and sunk to the bottom of the Gulf of Mexico and began what would become the world's largest accidental oil spill. Response and rescue plans were developed and marine mammal rescue equipment was moved to staging locations in preparation for the possible worst-case scenarios. Fortunately, this man-caused disaster did not have any known immediate impacts on manatees in that no manatee deaths or rescues were attributed to the spill. Possible long-term impacts to manatee habitat are not known.

- FWC and Sarasota County staff worked with several volunteers to remove a weir from the Warm Mineral springs run, which will enhance spring flow and increase manatee access to natural warm water.
- FWC completed negotiations with Florida Power and Light regarding the necessary short- and long-term measures that are needed for manatee protection during the conversions of the Cape Canaveral and Riviera Beach power plants.
 - Both plants were required to have an interim warm-water refuge while their primary discharges are offline.
 - Both were required to develop Environmental and Biological Monitoring Plans for implementation during and after conversion process.
 - Daily health assessments at the interim warm-water refuge were required so any manatees that were suffering from cold-stress related symptoms could be quickly identified and assisted.
- Although FWC coordinated with all power companies to make sure that the warm-water sites were operational during the winter, the extreme cold of 2010-2011 resulted in numerous mechanical difficulties that complicated the operation of power plants throughout the state.
- FWC staff conducted seagrass surveys to provide baseline information in anticipation of the Deepwater Horizon oil spill reaching the Florida shoreline.
- ISM outreach staff concluded the “Wild Treasures of Brevard County—the imperiled species discovery series” and produced a final report. The program was entered into a nationwide environmental education contest and received recognition as the leader in its category.
- During December 2010, record cold temperatures again caused a cold related Unusual Mortality Event for the central-east and central-west regions of Florida. At least 71 manatees died from cold exposure. The cold temperatures carried on into 2011 and affected all sizes of manatees.
- In the fall of 2010, a new gate opening was installed at the bridge across the Homosassa Springs State Park spring run. The gate allowed wild manatees access to the main spring boil for the first time in years. Fencing was added inside the main spring area to provide a separate and secure area for the captive manatees that live at the park. Park

staff counted as many as 80 manatees using the spring during the first winter.

- Outreach staff developed a new “Where are Florida’s manatees?” brochure and web page to assist Florida visitors and residents in finding locations to see manatees in captivity and in the wild.
- The 2010-2011 manatee decal was designed by FWC graphic artist AnnMarie Tavares.



2011 – On January 20 and 24, a team of 20 observers from 11 organizations counted 2,432 manatees on Florida’s east coast and 2,402 on the west coast for a total of 4,834 manatees statewide.

- FWC continued its genetic identification sampling surveys in southwest Florida. Genetic analysis helps with the identification of calves and other individuals with no markings and provides information that may be used in studies of manatee demographics, population and survival estimates.
- Ongoing research: 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 (see Chapter 10, Manatee Management Plan – 2007). A large amount of data was entered, verified and processed.
- Ten manatees were captured, tagged and released at the site of the former FPL Canaveral power plant to investigate winter attendance patterns and foraging movements around the interim warm-water refuge and passive thermal basins in the northern Indian River Lagoon.
- FWC monitored water temperature during the 2010-2011 winter with data loggers placed at many warm-water and associated ambient sites throughout much of the manatees’ winter range.

- Mote Marine Laboratory Manatee Research Projects continued – The Save the Manatee Trust Fund appropriates funds to the lab to conduct the following programs:
 - Photo-identification and Genetic Sampling Studies of Manatees in Southwest Florida
 - Manatee rescue and verification (primarily in Manatee and Sarasota counties)
 - Aerial surveys – distributional surveys of manatees using waterways in Martin and Sarasota counties
 - Effects of cold stress on manatees and conservation applications of biomarkers – Staff use selected biomarkers to assess effects of cold stress in manatees; assess rehabilitation time requirements for cold-stressed manatees; and to shed light on impacts of cold stress on exposed manatee populations
- FWC completed work on a Manatee Protection Plan template that counties can use to develop MPPs for their own county.
- The Charlotte County Board of County Commissioners approved the development of an MPP (in February) at the recommendation of the MPP Advisory Committee.
- FWC provided technical assistance and funding for native vegetation for a project designed by Ecosphere to restore Ulele Spring (Hillsborough County). This project restored the spring run and the connection to the Hillsborough River now makes the spring accessible to manatees as a warm-water site.
- Tampa Electric Company’s Manatee Visitor Center celebrated its 25th anniversary with a community-wide festival.

- The 2011-2012 manatee decal caption “Support Manatee Conservation” highlights 20 years of support for manatee conservation in Florida. The decal art-work was created by Bekah Scoville from Orange County Circle Christian High School. In addition to Bekah, several students from Jensen Beach High School also received recognition for their artwork in the Manatee Decal Design contest.



- [BOATING SAFETY LAW CHANGE NOTICE](#) - Effective October 1, 2011: Florida Virtual School (FLVS®) started offering high school students (grades 9-12) the ability to complete their Hunter Safety and Boater Safety certification while earning 0.5 credit for high school. The new physical education course is available free to Florida students.
- Effective July 1, 2011, section 403.813(3), F.S. included a maintenance dredging exemption for ports, provided the work would not violate the protections for manatees under section 379.2431(2)(d) F.S. FWC worked with Port Canaveral, Port Everglades, the Tampa Port Authority, the Port of Pam Beach, the Port of Panama City and the Port of Pensacola in drafting appropriate conservation measures that each port should follow to reduce the impacts to manatees.
- In July 2011, a manatee death, (MSE 157), occurred during a dredging project in a Miami-Dade canal that was associated with bridge construction. The necropsy report concluded that the cause of death was from injuries sustained by the backhoe dredge. After the investigation, and in addition to the on-site observers, FWC and USFWS staff decided that other conservation measures should be developed to reduce the possibility of a similar incident occurring in the future.
- In October 2011, FWC approved Sarasota County’s MPP revisions along with adopting Broward County’s MPP final rule amendments.

- FWC provided manatee information to the Water Management Districts to assist in the development of Minimum Flows and Levels (MFLs) for Homosassa and Chassahowitzka spring systems. Both of these springs provide warm-water habitat for manatees.

2012 – Due to warmer than average weather, FWC did not conduct the annual synoptic survey in 2012.

- In January 2012, the Fanning Springs restoration project (Levy County) was completed. The project removed sediment from the spring run in order to improve access for manatees seeking warm-water habitat.
- In February 2012, Fanning Springs State Park staff recorded an all-time high count of 21 manatees in the spring run.
- A prolonged algal bloom in the Indian River Lagoon, Mosquito Lagoon, and Banana River systems, reduced the available seagrass forage for manatees in the affected systems. FWC and other agencies collected information and monitored the areas where the bloom occurred to help determine what actions can be taken to improve the situation.
- The Moore Haven Lock (Glades County) was retrofitted with a manatee protection device to reduce structure-caused mortality at this site. This lock was the last water control structure to be retrofitted.
- Ten manatees died in 2012 due to an interaction with a water control structure. One structure was responsible for 6 of these deaths. As a result, an independent root cause analysis of the manatee protection system was conducted and found that multiple issues were involved including high water conditions and excessive debris accumulation, operator error, conflicting operating procedures, and damaged manatee protection equipment. Protocols were modified and the equipment was repaired.
- In May 2012, FWC approved Flagler County's new manatee protection zone rule.
- FWC continued its work with the FPL to ensure that the interim warm-water refuges used during the conversions of the Cape Canaveral and Riviera Beach power plants provide the necessary refuge for manatees. This is the second winter of a three winter conversion process at the Cape Canaveral site and the first of three winters at the Riviera Beach site.

- FWC revitalized the Blue Spring Aquatic Plant Working Group. The group worked together to formalize the invasive aquatic plant management plan, which addressed warm and cold season treatment activities and other related protection measures for manatees.
- The manatee genetic-ID database currently includes 963 unique individual manatees identified by skin samples collected from live manatees in southwest Florida.
- Individual manatee-boat encounters were visualized in relation to underwater features (depth, seagrass) using a dynamic 3-D animation application that simultaneously plays the recorded sounds of passing motorboats and ambient noise. The acoustic and behavioral records were then analyzed to assess manatee response in relation to characteristics of approaching boats and sound levels experienced by the manatee.
- In July 2012, four manatees became trapped inside of a storm water management lake on Pine Island/Merritt Island in Brevard County. A newly installed weir would periodically allow several inches of water to flow over it, allowing the manatees to climb over the weir into the lake. As a result of this manatee activity, a fence was installed (in 2013) and no more entrapment incidents were documented at this site.



- A brochure called, *A Boater's Guide to Living with Florida's Manatees*, specifically designed for boaters, was developed and is available for marina educational plans.
- Manatee Protection Zone sign posting in Flagler County was completed this year.

- The conversion of the FPL Cape Canaveral power plant was completed. The plant is generating electricity again and the warm-water refuge has returned to its original location.
- The FPL Port Everglades power plant started its first full winter with an interim heating system as it starts its conversion process to a new and more efficient electrical power generating units.
- In the local, statewide, national and world-wide news, two harassment incidents of people riding or jumping on Florida manatees helped call attention to manatee conservation efforts and the penalties involved for impacting an endangered species.
- The 2012-2013 manatee decal was designed by FWC graphic artist, AnnMarie Tavares. Information on the back of the decal highlights manatee use of Florida springs.



- Statewide, there were 865 manatee carcasses documented in Florida during Fiscal year 2012-2013 (July through June)

2013 – On February 23, a Manatee Brevetoxicosis (Red tide) Repeat Event was declared for southwest Florida. Between January and May, 276 confirmed and suspected red tide-related deaths were reported and 18 red tide-related rescues were conducted. Agency actions during the red tide event included reconnaissance missions conducted via aircraft and boat to find manatees in distress and conduct rescue operations.

- On April 11, a manatee Unusual Mortality Event (UME) was declared for the Indian and Banana rivers in Brevard County. One hundred-eleven manatee deaths were documented in this event. (See 2012 for more information about this area)

- Manatees got trapped in two separate culverts or pipes this year—one in Citrus County and one in Lee County. Grating/fencing was installed to prohibit future manatee access in these locations.
- [County specific maps](#) that combine FWC manatee protection zones, boating safety zones and USFWS manatee protection zones were completed for Martin and Miami-Dade counties and the upper St. Johns River within Volusia County and the adjacent counties of Lake and Seminole.
- FWC and Mote Marine Laboratory completed a final report on the assessment of manatee warm-water habitat at [Lithia Spring in Hillsborough County](#).
- Four manatees died as a result of interactions with a water control structure.
- Manatee decal caption for 2013-2014: [Living with Florida manatees](#). This decal celebrates the 500th anniversary of Juan Ponce de Leon's arrival on Florida's east coast. To date, this is the only decal that also includes manatee information in Spanish text on both the front and back of the decal.

2014 – FWC conducted a statewide synoptic survey over two days in January with a team of 20 observers from nine organizations. A total of 4,824 manatees were counted—the third highest recorded count since 1991 when the statewide synoptic surveys first began.

- FWC and Florida State University (FSU) 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.
- Ulele Springs, which is found near the banks of Hillsborough River in Tampa, was restored to provide an additional warm-water habitat for manatees. Ecosphere Restoration Institute, along with FWC and many other partners assisted with this restoration project. Freshwater flows of 672,000 gallons per day now flow from the spring to the Hillsborough River. At 75 degrees year round, the spring site provides manatees and a variety of aquatic species an oasis in an otherwise urban environment. During the construction phase, the project provided an opportunity for education and public outreach, which it will continue to do so into the future. Local schools participated with planting native wetland vegetation at the site and will continue to use the site for environmental education purposes. The rebirth of Ulele Springs as a unique natural feature now draws visitors to the area—a benefit to the economic and recreational opportunities to the City. Ulele Spring is a focal piece of the City of Tampa's new Water Works Park along the Riverwalk.



- [County specific maps](#) that combine FWC manatee protection zones, boating safety zones and USFWS manatee protection zones were completed for Brevard and Duval counties.
- Monitoring manatee use of the Cape Canaveral power plant's discharge in the warm-water refuge was completed during winter 2014-2015. The data collected during the conversion of this plant and two others (Riviera and Port Everglades) will provide information regarding how manatees responded to the changes in warm water availability along the east coast of Florida during the winter season.
- FWC reviewed the Minimum Flow Levels (MFL) for the lower Santa Fe River and Ichetucknee Springs 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.
- Springs restoration projects were developed to stabilize banks or improve access to natural warm-water habitat at the following locations: Salt Creek, Warm Mineral Springs Creek and Three Sisters Springs.
- Manatee decal caption for 2014-2015: [Protecting Florida Manatees](#).

2015 – FWC accomplished a key goal of the Manatee Management Plan (MMP) with the publication of the results from the first statewide abundance estimate of the Florida manatee in the journal, *Biological Conservation*. The findings represent a significant improvement over the traditional survey, commonly called the "synoptic survey." The new methods not only provide an estimate of the Florida manatee population, but also a level of confidence associated with that estimate.

- Nineteen manatees were rescued from a culvert in Satellite Beach (Brevard County). This unusual entrapment event highlighted manatee awareness on an international level with almost 6 million social media Twitter accounts and 40,000 individual Facebook accounts reached.

Staff worked through the permitting process to ensure that barriers were installed to prohibit future manatee entrapment in this culvert.

- A manatee UME declared for Indian River Lagoon in FY 2012-2013 (see 2012 entry) continued during FY 2014-2015. Fourteen manatee deaths were documented.
- The manatee genetic-ID database currently includes 1,262 unique individuals identified by skin samples collected from live manatees in our southwest Florida pilot study area.
- The final revised Duval County Manatee Protection Plan was accepted and approved by the County, the U.S. Fish and Wildlife Service and FWC.
- Three manatees died as a result of interactions with a water control structure.
- [Paddle-sport activities](#) were the target for public outreach development during FY 2014-2015. A list of guidelines were developed that were then introduced on the manatee program web pages and in updates to various publications.
- The existing FWC manatee brochure, "The Florida manatee—A Florida treasure" was updated and renamed, "Guidelines for protecting native wildlife—Florida manatees." Paddle-sport information was added to the brochure.
- The 2015-2016 manatee decal caption reads, "[Give them space](#)," and is focused on paddle-sport/manatee awareness.
- Charlotte Harbor Environmental Education Center assisted with outreach to marinas in the nearby community when several manatees were killed in the Charlotte Harbor in a short amount of time. This service and partnership is valuable to the state's manatee conservation efforts.
- The Southwest Florida Water Management District completed its [2015-2019 Springs Management Plan](#)

For more manatee time line information please exit this .pdf document by hitting your browsers' back button and select another time period or the annual reports for recent information.