



SAVE THE MANATEE TRUST FUND ANNUAL REPORT FISCAL YEAR 2020-21



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SUBMITTED BY
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
Fish and Wildlife Research Institute
and
Division of Habitat and Species Conservation



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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Cover photo Florida manatee rescue operations

Photographs Courtesy of FWC, unless otherwise noted

Research activities involving live manatees were conducted under Federal permit #MA773494-11



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EXECUTIVE SUMMARY

The Florida Fish and Wildlife Conservation Commission (FWC) is pleased to submit the annual report on the expenditures from the Save the Manatee Trust Fund (Trust Fund), per section 379.2431(4)(b), Florida Statutes. 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, annually. This report covers the period from July 1, 2020 through June 30, 2021.

Through the long-term public support of the Trust Fund, FWC actively implements science-based conservation programs and engages partnerships that are making a difference for manatees and habitat. FWC's guiding conservation goal for the Florida manatee is to effectively manage the wildlife resource in perpetuity throughout Florida. In order to accomplish this goal, the species must recover from a threatened status and be effectively managed so that manatees can endure future impacts that can affect their population including: large-scale die-offs from red tide and cold stress, human-related impacts and continued degradation and loss of important habitats.

Within the first 6-months of 2021 the statewide number of reported manatee deaths surpassed the previous annual high of 830 in 2013. The leading contributing factor to the high number of deaths was the unprecedented (in regional numbers and cause) manatee morbidity and mortality that was documented on the entire Atlantic coast region since December 2020. Based on available information, the probable cause of the Atlantic region mass mortality was malnutrition, driven by seasonal migration (for warmth) to areas where most seagrass has died off. Over the past decade, the Indian River Lagoon has experienced significant water quality degradation, leading to the repeated occurrence of harmful algal blooms and widespread loss of seagrass, the preferred food for manatees. Staff prepared an Unusual Mortality Event (UME) initiation request for review by a federally mandated panel of experts, referred to as the Working Group on Marine Mammal Unusual Mortality Events. The panel declared a UME, meaning that the event was unexpected, involves a significant die-off of a marine mammal population, and requires immediate response. Investigating these events is key to understanding the cause, understanding potential impacts on the population



as well as developing conservation measures that protect the species affected and the marine environment where the UME is taking place. The Atlantic region event is the 14th officially declared mortality event in Florida since 1996, roughly an event every other year over the past two decades.

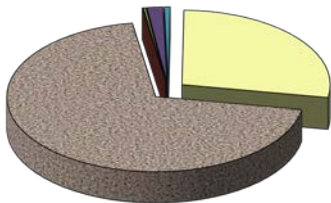
Regarding the current event, sufficient improvement in water quality conditions and forage are not anticipated in the immediate future and therefore staff expect manatee winter mortality to remain high in the region. FWC is therefore leading proactive efforts to plan for potential future events and implement habitat restoration projects benefitting manatees. The long-term impacts of such large-scale die-offs on the manatee population in Florida are not currently known; to help address this, FWC monitors multiple aspects of the manatee population including: prevalence of certain reasons for death, adult survival rates, and reproduction that, when taken in context of each other, improve our understanding of population dynamics. As with all species, future resiliency is associated with population size and distribution, growth rate, health, and habitat quality. Together these factors will impact the ability of manatees to cope with future changes and are the focus of conservation work.

These activities are possible because of the funding of the Trust Fund. The Trust Fund receives money from sales of manatee license plates and decals, boat registration fees, and voluntary donations. Revenues for FY 2020-21 totaled \$4,163,374. Appropriations from the Trust Fund for the same period were \$3,303,282, with \$286,678 provided for manatee research activities at Mote Marine Laboratory (Mote), and a service charge to General Revenue of \$333,302 that most trust funds are required by law to pay. In FY 2020-21, FWC's Division of Habitat and Species Conservation expended \$942,118 for conservation activities and the Fish and Wildlife Research Institute (FWRI) expended \$1,857,775 on research and monitoring. Details of revenues, appropriations, and expenditures are shown on page 6 of this report.



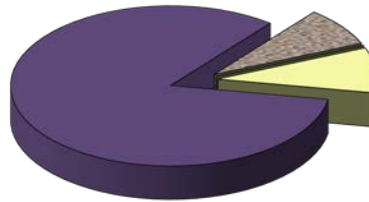
TRUST FUND FY 2020-21 REVENUES AND EXPENDITURES

REVENUES \$4,163,374



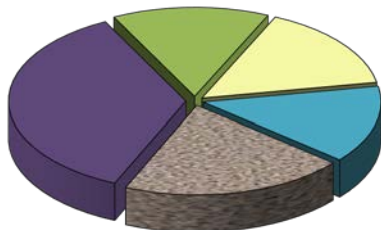
- Vessel Registrations (\$2,902,460)
- Sale of Surplus Property (\$3,604)
- Misc. Receipts (\$11,461)
- Save the Manatee Donations (\$71,626)
- Interest (\$26,373)
- Manatee License Plate Sales (\$1,147,850)

APPROPRIATIONS \$3,636,584



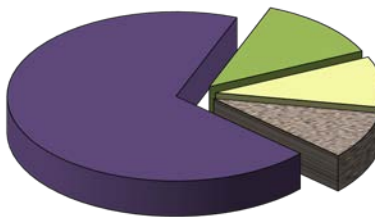
- FWC Manatee Program (\$3,016,603)
- Mote Marine Laboratory (\$286,679)
- Administrative Overhead (\$0)
- Service Charge to General Revenue (\$333,302)

FWC MANATEE PROGRAM CONSERVATION MANAGEMENT EXPENDITURES \$942,118



- Manatee Protection Zones (\$192,705)
- Plan and Permit Reviews (\$338,364)
- Habitat Protection (\$134,763)
- Data Distribution (\$144,938)
- Public Outreach (\$131,348)

FWC MANATEE PROGRAM RESEARCH EXPENDITURES \$1,857,775



- Behavioral Ecology (\$167,487)
- Mortality and Rescue (\$1,283,751)
- Photo Identification (Life History) (\$226,009)
- Population Assessment and Monitoring (\$180,528)



MANATEE BASICS

COMMON NAME	Florida manatee
SCIENTIFIC NAME	<i>Trichechus manatus latirostris</i> (Order: Sirenia)
STATUS	Threatened (Federal)
RANGE	Throughout Florida (summer months into southeastern states but reported as far north as Cape Cod and as far west as Texas)
MAXIMUM SYNOPTIC SURVEY COUNT	5,733 in 2019
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 (454 kilograms). The largest manatees may reach 14 feet (4.2 meters) in length and weigh over 3,500 pounds (1,588 kilograms). 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 meters) 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. Manatees 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 is also of concern, including future changes in artificial warm-water refuges and reductions in natural spring flows.



FLORIDA MANATEE MANAGEMENT PLAN

"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."

The Florida Manatee Management Plan (Plan), approved at the December 2007 FWC Commission meeting, guides key conservation work supported through the Trust Fund. The Plan 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



MORTALITY AND RESCUE

Research Activities

A network of researchers and law enforcement agencies was established in 1974 to recover manatee carcasses and assist injured manatees. The responsibility of manatee carcass salvage, necropsy, and field coordination of the rescue program was transferred to the State of Florida by the United States Fish and Wildlife Service (USFWS) in 1985.

Staff from FWC's Fish and Wildlife Research Institute (FWRI) are located in five coastal field stations and respond to all reported carcasses as well as public reports of manatees in distress. These stations are located around the State: Jacksonville, Melbourne Beach, Tequesta, Port Charlotte, and St. Petersburg. Carcasses are transported by field personnel from recovery locations to FWC's Marine Mammal Pathobiology Laboratory (MMPL) in St. Petersburg or are necropsied in the field. Staff perform consistent, high quality, post-mortem examinations to determine cause of death. Field staff also coordinate rescues, and when necessary, transport manatees to rehabilitation facilities. 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 and rescue information available on the FWC website (<https://myfwc.com/research/manatee/rescue-mortality-response/statistics/>).

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, Department of Environmental Protection - DEP, FWC), academic institutions (University of Florida - UF), non-governmental organizations (Save the Manatee Club), and private oceanaria (Cincinnati Zoo, Clearwater Marine Aquarium, Columbus Zoo, Pittsburgh Zoo, Dallas World Aquarium, Jacksonville Zoo and Gardens, Miami Seaquarium, Mote Marine Laboratory, SeaWorld Orlando, South Florida Museum, ZooTampa at Lowry Park, and Walt Disney World's The Seas).



FY 2020-21 HIGHLIGHTS

- Statewide, there were 1,118 manatee carcasses documented in Florida during FY 2020-21. Additionally, six carcasses were documented in Georgia, one in Alabama, two in Mississippi, one in North Carolina, three in South Carolina, one in Alabama, and three in Louisiana.
- 155 rescues were performed statewide during FY 2020-21. As of 16 August 2021, 66 of the manatees rescued statewide were released back into the wild, 37 died and the remaining 52 animals are still being rehabilitated.
- An Unusual Mortality Event (UME) associated with mass starvation was declared for the Atlantic Management Unit in the winter of FY 2020-21 and is ongoing. From the onset of the UME in early December 2020, 694 carcasses (from all causes of death) were reported and 67 manatees were rescued (all causes) within this region during FY 2020-21. The cause of the UME is centered in the Indian River Lagoon (IRL) where a decade of significant water quality degradation and repeated occurrence of harmful algal blooms led to widespread loss of seagrass. The IRL is central in manatee migration patterns on the Atlantic coast, and health effects of starvation were documented in all of the Atlantic management region. This event is unprecedented, both in numbers and cause, and operational restrictions due to COVID-19 added extra challenges to the event response. The investigation into the cause continued for the UME that began in the IRL in late July 2012 and was declared in April 2013, but was not specifically associated with significant mortality during FY 2020-21. The preliminary cause for the 2012 IRL UME is acute dysbiosis, unlike the chronic malnourishment observed in the ongoing 2020 Atlantic UME.
- Please visit <https://myfwc.com/research/manatee/rescue-mortality-response/ume/> for more information regarding the Atlantic coast manatee UME.
- FWRI researchers examined 10 years of Florida manatee necropsy reports to characterize and quantify watercraft-related scarring. The researchers found that one out of every four adult carcasses analyzed in their study bore evidence of 10 or more watercraft strikes. With only 4% of adult manatees devoid of watercraft-related scars, it appears exceedingly rare that manatees reach late adulthood without having been struck multiple times. This study shows that manatees are subjected to more sublethal watercraft strikes than any other studied marine mammal and underscore the need for long-term vigilance in conservation actions in the state. Read more here: <https://myfwc.com/research/manatee/rescue-mortality-response/publication/>



Manatee Rescues FY 2020-21 (preliminary numbers)

<i>Type of Rescue</i>	<i>Number of Rescues</i>
Calf—Alone	25
Calf—With Rescued Mother	4
Mother of Rescued Calf	2
Human—Entanglement	7
Human—Entrapment*	22
Human—Watercraft-Related	31
Human-Other	0
Natural—Includes Red Tide	60
Undetermined; Other	4
Total	155

Manatee Mortality FY 2020-21 (preliminary numbers)

<i>Cause of Death</i>	<i>Number of Deaths</i>
Human-Flood Gate or Canal Lock	14
Human - Other	16
Human-Watercraft Related	114
Natural - Cold Stress	27
Natural - Other	139
Perinatal	143
Undetermined	58
Verified, Not Recovered	607
Total	1118

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

POPULATION MONITORING AND ASSESSMENT

Research Activities

Long-term research and monitoring of the Florida manatee population by FWC and our key partners has provided a solid foundation of high-quality data from which we can make sound inferences about manatee population status and trends throughout Florida. 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 aerial surveys to determine regional abundance and distribution of manatees and estimating survival and reproductive rates through photo-identification and genetic identification. Assessments also include estimates of risk to the population, including projected and past population growth and probability of persistence into the future (i.e., risk of extinction).

In February, March and June of 2021, FWC conducted aerial surveys over the waters of Brevard County and southern Volusia County as part of the response to the unprecedented manatee Unusual Mortality Event (<https://myfwc.com/research/manatee/rescue-mortality-response/ume/> for more information regarding the Atlantic coast manatee UME) . These surveys were conducted in partnership with Mote Marine Laboratory and Save the Manatee Club to document manatee numbers and distribution during the declared UME. Preliminary data indicate that at least 1008 manatees were present there in March, 768 in April, and 755



in June. Most manatees were sighted in the northern portion of the survey area in Mosquito Lagoon.

Traditional synoptic surveys, flown after winter cold fronts, provide a minimum number of manatees known to be alive using warm water and winter habitats on a particular survey day. These surveys also provide information about manatee distribution among warm water sites throughout the state. Synoptic surveys are conducted annually, weather permitting, pursuant to s. 379.2431(4)(a), F.S. FWC did not conduct the annual statewide manatee synoptic survey in 2021 due to COVID-19.

A different survey approach called an abundance survey represents a significant improvement over the traditional synoptic survey by providing a sound estimate of the Florida manatee population. In December 2016, an abundance aerial survey was flown on the east coast of Florida, from the Georgia-Florida State line to Monroe County, to estimate the manatee population. These surveys were combined with the west coast survey conducted in 2015. An updated analysis using the more recent surveys produced the latest population abundance estimate to date. These results are available in Technical Report TR-23 at <https://f50006a.eos-intl.net/F50006A/OPAC/Details/Record.aspx?BibCode=1864664>.

Preparations for a subsequent abundance survey began in 2020-2021 with anticipation of conducting another survey on the Gulf coast in 2021 and Atlantic coast in 2022. Reliable estimates from the new abundance surveys can be used to track population changes over time and as part of population projection models. A published statewide abundance estimate (Martin et al 2015) was included in the latest update of the Core Biological Model (CBM). This model (Runge et al 2017) is designed to forecast Florida manatee population dynamics in what is referred to as a population viability analysis. The model provides a framework to assess the status of manatees, understand the relative influence of the threat's manatees face, and evaluate concerns around potentially emerging threats.

An integrated population model (IPM) for the Florida manatee was also recently developed to reconstruct population dynamics in the southwest region of the state over the past 20 years. In contrast to the CBM, the IPM is designed to reconstruct historical population dynamics and abundance, filling in gaps in observation data by integrating information from multiple sources (e.g., survival, abundance, mortality). The IPM also provides estimates of population abundance in years when abundance surveys were not flown. A manuscript describing the IPM and its results for the southwest region was published this year in *Scientific Reports*.



Results of manatee monitoring efforts in the Port of the Islands (POI), Collier County, FL were also published in *Scientific Reports* in June 2021. FWC developed an innovative mark-recapture method to estimate manatee abundance and detection from count data at aggregation sites using an Unmanned Aerial System (UAS). This information is being used as a baseline measurement for mapping distribution and abundance to help determine the impact of the Comprehensive Everglades Restoration Plan's Picayune Strand Restoration Project on manatee use of warm-water sites in the POI region.

Long-term data on survival of individuals and reproductive performance of mature females are included within these 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 are usually the result of encounters with boats, but they can also be caused by entanglement in fishing gear, cold-stress lesions, and injury caused by infections. This research is conducted through a partnership between FWC, USGS, and 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 and reproductive rates, and reproductive parameters such as calving intervals (time between births) and length of calf dependency.

Demographic parameters in need of refinement to better model manatee status and recovery include annual sex-specific movement between federal management units, sex-specific adult survival rates in the southwest region, and survival rates for calves and young adults. These parameters 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, particularly in the southwest region. Genetic analysis can help in the identification of calves and other individuals with no markings, as well as carcasses. Genetic markers can also be used to determine the gender of identified individuals. FWC implemented a genetic identification (ID) sampling program in 2008 to collect skin biopsy samples from wild manatees and have continued with this effort.



FY 2020-21 HIGHLIGHTS









-  An integrated population model (IPM) was developed for the southwest region as a phase one approach that will be expanded to other regions. The IPM manuscript was published in *Scientific Reports* (<https://doi.org/10.1038/s41598-021-81478-z>). The IPM is used to integrate information from multiple sources, including abundance surveys, mortality, and survival and reproductive rates. The model estimates abundance and growth rate in years between abundance surveys.
-  FWC conducted aerial surveys over the waters of Brevard County and southern Volusia County as part of the response to the ongoing manatee Unusual Mortality Event (UME).
-  FWRI staff members and interns spent 72 days conducting land and boat-based photo-ID research during 150+ visits to sites used by manatees. Other research partners and volunteers also provided additional photo-documentation of manatees. Manatee photo-ID data were processed and analyzed to support updated adult survival and reproductive rates—key input parameters in ongoing population modeling efforts. Data for the southwest region through April 30, 2020, were made available for analyses.
-  106 manatees meeting specific photo-ID criteria were added to the southwest portion of the MIPS catalog of uniquely identifiable animals. The statewide MIPS catalog currently includes 5,032 animals and more than 117,000 sighting records.
-  Transfer of responsibility for the longstanding Manatee Individual Photo-Identification System database, including data, responsibilities, and leadership, from USGS to FWC was initiated.
-  Genetic sampling surveys were conducted in southwest Florida. A total of 365 samples were collected from free swimming manatees during the 2021 winter: 14 samples at Port of the Islands (Collier County), 151 samples in the Orange River (Lee County), and 200 samples in the Tampa Bay area.
-  The manatee genetic-ID database currently includes 2,764 unique individuals identified by skin samples collected from live manatees in our southwest Florida study area through the 2020 winter.
-  A manuscript on age-specific survival from genetic mark-recapture data was published this year in *Ecology*.





Photo-ID cataloged manatee known as TB645 with calf at the TECO Big Bend Power Plant.



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 of time. In the field, biologists locate these study animals by homing in on the tag's unique radio signals to obtain data on behavior, group size, and habitat attributes. Processed data are mapped in a Geographic Information System (GIS) and are used in devising strategies for manatee conservation and recovery. For more information on FWC's manatee telemetry program—including photos, maps, and an animated movement track—please see: <http://myfwc.com/research/manatee/research/radiotelemetry-tracking/>.

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. Therefore, managers are taking proactive steps to restore spring systems and to mitigate for the expected loss of other warm-water habitats. One crucial site planned for restoration in southwest Florida is Warm Mineral Springs, which flows via Salt Creek into the lower Myakka River. Manatees are precluded from accessing the warm-water refuge at low tides because of sedimentation from past human activities. FWC biologists are monitoring water temperatures, water levels, and manatee use along the spring run during winter to establish a pre-restoration baseline. A passive thermal basin that has provided warm-water habitat for a large aggregation of manatees at Port of the Islands, Collier County, is expected to disappear once hydrologic restoration of sheet flow in the Picayune Strand is completed as part of the Comprehensive Everglades Restoration Plan. To mitigate this loss, the South Florida Water Management District and Army Corps of Engineers—in consultation with FWC, USFWS, and USGS—created deep pools that are designed to provide and hold warm, saline ground water. Researchers are monitoring manatee winter use of the newly-created habitat









and evaluating water temperature conditions there and at other aggregation sites in the region.



Two manatees socializing in the northern Indian River (Chip Deutsch, FWC).



FY 2020-21 HIGHLIGHTS

-  Manatee distribution and abundance in Salt Creek, which is the outflow from Warm Mineral Springs, was investigated in relation to ambient temperature during winter using ground surveys. Continuous monitoring of water temperatures and tidally-influenced water levels within the creek provide a baseline for future comparison to the system after restoration.
-  Monitoring of manatee use of manmade passive thermal basins near Port of the Islands, as well as at nearby warm-water sites, resumed during winter 2020-21. High-resolution video acquired with an unmanned aerial system was used to map manatee distribution and to estimate abundance during mid-winter cold periods at aggregation sites by accounting for imperfect detection with an innovative sight-resight method. This will provide insights into the effects of restoration and mitigation projects on manatee use of regional warm-water refugia. The findings from 2017 to 2019 were published in the peer-reviewed journal *Scientific Reports*.
-  FWC monitored water temperatures during the winter with temperature data recorders placed at many warm-water habitats and associated ambient sites throughout much of the manatees' winter range. Several passive thermal sites (e.g., dredged basins or canals) were investigated for their potential to provide sufficient warmth to sustain manatees through cold winter periods.
-  FWRI received a NOAA-funded actionable science grant for a project entitled, "Creating Secure Warm-water Habitat Networks for Manatees along Florida's Gulf Coast: Developing a Vision, Identifying Gaps, and Prioritizing Restoration Sites." The goal of this interagency project (to start in fall 2021) is for state and federal managers and researchers to jointly develop plans to identify and address the highest research priorities to meet management needs regarding the creation, enhancement, or protection of warm-water habitats for manatees.
-  A study that employed tetracycline marks to validate the annual deposition of growth rings in manatee earbones over timespans up to 37 years was published in the peer-reviewed journal *Wildlife Society Bulletin*. This information will help researchers assess the utility of age data in manatee population models.
-  As part of the Atlantic coast Unusual Mortality Event investigation (UME), FWC collaborated with U.S. Geological Survey and Clearwater Marine Aquarium Research Institute to track experienced rehabilitated manatees, using satellite-linked GPS tags, along the east coast after their release from facilities. Manatee movement data in relation to environmental information will provide insights into manatee behavioral response to seagrass loss.



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); however, portions of some staff salaries are provided by the Trust Fund [s. 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 response. Efforts to protect this species are outlined in the North Atlantic Right Whale Recovery Plan¹.

The North Atlantic right whale is one of the most endangered large whales in the world with fewer than 400 individuals in the population.² Entanglement in fishing gear and vessel collisions 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 United States (U.S.) is the primary calving area for the North Atlantic right whale. Since 1994, portions of Florida and Georgia coastal waters have been designated as critical habitat by NOAA Fisheries. 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 inception in 1993 and currently serves as Team Leader.

FWC has conducted aerial surveys to monitor seasonal presence of right whales, mitigate vessel-whale collisions, and assess population dynamics since 1987. An Early Warning System communication network, coordinated by NOAA Fisheries with assistance from FWC, is utilized 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. FWC is also one of a handful of major contributors to the North Atlantic Right Whale Identification Database—

¹ <https://www.fisheries.noaa.gov/resource/document/recovery-plan-north-atlantic-right-whale-eubalaena-glacialis>



² <https://www.fisheries.noaa.gov/species/north-atlantic-right-whale#overview>




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, as well as through genetic sampling. FWC has 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 (AIS). Commercial vessels are required by federal regulations to be equipped with an AIS 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 provides a framework for quantifying the risk of vessel strikes and informs and evaluates the effectiveness of proposed management plans.


FY 2020-2021 HIGHLIGHTS


-  In total, 79 individual right whales, including 17 mother-calf pairs, were documented in the southeastern U.S. during the calving season (November 15th - April 15th). One additional mother-calf pair was discovered in May off Briar Island, Nova Scotia.
-  From December 1st - March 31st, FWC collaborated with the Georgia Department of Natural Resources and the Clearwater Marine Aquarium Research Institute to survey between Canaveral National Seashore, Florida, and Tybee Island, Georgia, out to approximately 30 nautical miles offshore. Survey effort was also expanded to include the coasts of North Carolina and South Carolina. Those surveys were flown by the Clearwater Marine Aquarium Research Institute. FWC conducted 53 aerial surveys and detected 92 right whale sightings. Preliminary photo analysis indicates FWC documented 47 individual right whales (including 15 calves). Select photos from the calving season can be viewed here: <http://myfwc.com/research/wildlife/right-whales/images/>




- 
 Biopsy (genetic) sampling was conducted in collaboration with NOAA Fisheries Service and the Georgia Department of Natural Resources. During the calving season, 34 vessel trips were conducted, resulting in samples from sixteen right whale calves, one adult female right whale, one juvenile right whale, and two humpback whales. The skin samples will be used to determine individual identification, sex, and parentage. This information helps close demographic information gaps, improve population estimates, and identify carcasses.

- 
 Right whales are part of an ongoing Unusual Mortality Event³ (UME) declared in 2017 by NOAA Fisheries due to elevated mortality for this species. Deaths have been exceeding births in recent years, leading to further population decline. Vessel strikes and entanglement are the leading causes of death for the right whales examined.

- 
 Two chronically-entangled right whales were observed off Florida. On January 11-12, Catalog #1803, an adult male, was sighted off the St. Marys River Entrance with multiple wraps of rope around the peduncle and fluke and a blue trap/pot visible just aft of the flukes. On February 18, Catalog #3920, an adult male, was reported by the public near shore off Indialantic Beach with rope embedded in the rostrum and trailing from the mouth. Catalog #3920 had been entangled since at least October 2020 and was severely emaciated. Multi-agency response efforts were mounted for both cases but neither whale was disentangled. To date, there have been no subsequent sightings of Catalog #1803 and Catalog #3920 was found floating dead off South Carolina on February 27. Both cases are consistent with trap/pot gear fished in the NE U.S. or Canada.

- 
 On February 12, a 54-foot sportfishing vessel reported hitting a whale inside the entrance channel to St. Augustine Inlet. The vessel's Captain grounded the damaged boat to prevent it from sinking and no injuries to passengers or crew were reported. The following morning, a fresh dead right whale calf was found on a nearby beach and necropsied February 13-14. Cuts on the calf's back and head were indicative of being struck by a vessel's propellers and other injuries were consistent with impact trauma, including broken ribs and bruising. The calf's mother, Catalog #3230, was observed a few days later with a series of fresh propeller cuts on her left side. To date, there have been no subsequent sightings of the mother.

- 
 FWC researchers gather information from the public about reports of whales and collaborate with local volunteer sighting networks. These efforts are especially helpful in areas with little or no aerial survey coverage (including Central and Southeast Florida) and contribute to the overall understanding of right whale demographics, distribution, and habitat use in the southeastern U.S.

³ <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2018-north-atlantic-right-whale-unusual-mortality-event>





FWC biologists measuring a dead one-month old right whale calf on the beach at Anastasia State Park in St. Augustine, FL. The calf had injuries consistent with a vessel strike, including fresh propeller cuts on its back and head, broken ribs, and bruising.

Photo: Tucker Joenz/FWC, NOAA Fisheries permit #18786



RESEARCH PUBLICATIONS AND REPORTS

research activities

2020-21 PUBLICATIONS: (*FWC authors in bold type*)

Hostetler, J. A., J. Martin, M. Kosempa, H. H. Edwards, K. A. Rood, S. L. Barton, and M. C. Runge. 2021. Reconstructing population dynamics of a threatened marine mammal using multiple data sets. *Scientific Reports* 11: 2702.

Deutsch, C. J., M. de Wit, M. E. Barlas, W. Greer, A. R. Howell, A. Garrett, and L. I. Ward-Geiger. 2021. Unprecedented mortality of Florida manatees along the Atlantic coast. *Sirenews* 73: 24-26. <https://mission.cmaquarium.org/research-institute/manatee-research/sirenews/>

Edwards, H. H., J. A. Hostetler, B. M. Stith, and J. Martin. 2021. Monitoring abundance of aggregated animals (Florida manatees) using an unmanned aerial system (UAS). *Sci Rep* 11: 12920. <https://doi.org/10.1038/s41598-021-92437-z>

Lonati, G. L., A. R. Howell, P. Schueller, and C. J. Deutsch. 2021. Using tetracycline to evaluate age estimation in a long-lived aquatic mammal. *Wildlife Society Bulletin* 45(2): 340-350. <https://doi.org/10.1002/wsb.1192>

Bassett BL, Hostetler JA, Leone EH, Shea CP, Barbeau BD, Lonati GL, Panike AL, Honaker A, Ward-Geiger LI. 2020. Quantifying sublethal Florida manatee-watercraft interactions by examining scars on manatee carcasses. *Endang Species Res.* 43:395-408. <https://doi.org/10.3354/esr01075>

Gowan, T. A., M. D. Tringali, J. A. Hostetler, J. Martin, L. I. Ward-Geiger, and J. M. Johnson. 2021. A hidden Markov model for estimating age-specific survival when age and size are uncertain. *Ecology* 102(8): e03426. <https://doi.org/10.1002/ecy.3426>

Gowan, T. A., N. J. Crum, and J. J. Roberts. 2021. An open spatial capture-recapture model to estimate density, movement, and population dynamics from line-transect surveys. *Ecology and Evolution* 11: 7354-7365. <https://doi.org/10.1002/ece3.7566>

Crum, N. J., L. C. Neyman, and T. A. Gowan. 2021. Abundance estimation for line transect sampling: A comparison of distance sampling and spatial capture-recapture models. *PLoS ONE* 16(5): e0252231. <https://doi.org/10.1371/journal.pone.0252231>





Montes, N. L., R. Swett, and T. A. Gowan. 2020. Risk of encounters between North Atlantic right whales and recreational vessel traffic in the southeastern United States. *Ecology and Society* 25(4): 12. <https://doi.org/10.5751/ES-11923-250412>



MOTE MARINE LABORATORY MANATEE RESEARCH PROJECTS

Research Activities

The following projects were funded in FY 2020-21 (\$286,679.00):

-  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 FWC, USGS, and other partner organizations; 2) continue field effort for photo-identification and other data collection efforts in southwest Florida; and 3) contribute to genetic sampling of wild manatees.
-  Manatee Rescue and Verification—Mote researchers work under direction of FWC to verify and transport carcasses using a custom trailer provided by FWC and assist in responses to reports of injured or ill manatees within a defined response area.
-  Aerial Surveys of Manatees— Mote staff conducted one aerial survey of manatees within the Withlacoochee River area. The survey contributed to understanding of manatee habitat and distribution in this region.
-  Program Oversight— The program leader is responsible for periodic reports and coordination with State scientists and managers regarding contracted activities conducted by Mote.

MANATEE FORUM

Management Activities

In 2004, FWC and 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 2020-21, due to the COVID-19 pandemic, the Manatee Forum met remotely through video and teleconference, once in October 2020 and a second time in May 2021. Presentation topics in the October meeting focused on manatee telemetry and




tracking studies in the Northern Gulf of Mexico and along the Atlantic Coast north of Florida and changes in recreational boating in western Pinellas County associated with newly-posted Manatee Protection Zones. The May meeting included updates on the manatee Unusual Mortality Event in the greater Atlantic Region and the recently completed Warm Water Habitat Action Plan and Florida Power & Light workshop updates. Both meetings included updates and discussion on FWC and USFWS research and management activities. For both meetings this fiscal year, all participants viewed the presentations by Adobe Connect and listened to the presentations by phone. Pending the status of the pandemic, future plans are for the Manatee Forum to conduct one meeting each year in person and one using this technology. The new format will provide efficiencies and save resources for Forum members and participating agencies. 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.

MANATEE PROTECTION PLANNING 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 2020-21 HIGHLIGHTS

-  FWC reviewed and provided comments on 300 requests for manatee protection measures for actions being taken by the Florida Department of Environmental Protection (DEP), Water Management Districts (WMDs), State Clearinghouse, Florida Department of Transportation (DOT), U.S. Army Corps of Engineers (USACOE), and USFWS.




- Staff has continued conversations with the City of Oldsmar Engineering Division regarding the most recent entrapment event where three manatees entered a retention pond by swimming over a city-owned weir structure in summer 2020. Similar entrapment events have taken place in 2012, 2017, and 2018. FWC staff have provided suggestions for manatee barrier designs to prohibit future manatee entrapments at this site, and while no official action to retrofit the weir have been taken at this time, the City has indicated they are exploring funding options to complete this work during their FY 2021-22.
- Staff contacted the City of St. Augustine Public Works regarding access into a stormwater system after a manatee swam through a culvert and became entrapped on the other side in October 2020. Additionally, attempts to contact staff in Pinellas County were made after the second incident of manatee entrapment behind a small weir in McKay Creek. At the time of this report, neither municipality has requested technical assistance to modify the structures, but FWC staff will continue to communicate with the municipalities to assist where needed.
- Staff facilitated conversations and attended a site visit with the City of St. Petersburg Water Resources Department regarding the modification of a concrete spillway structure that allowed for manatee access and multiple entrapment cases in 2014 and 2020. At the time of this report, the weir has not been retrofitted, though City staff have allocated funding to the project and plan to initiate construction in late 2021.







Photo of weir at McKay Creek in Largo, Pinellas County (left). Photo of concrete spillway in St. Petersburg, Pinellas County (right).



Florida Port Activities

-  FWC staff provided recommendations on how to offset expected impacts to manatees for six port projects including Port Everglades, Port of Miami, Port of Tampa Bay, and Port Canaveral.

Manatee Protection Plans


-  **Brevard County MPP:** FWC and Brevard County staff met to discuss future revisions to the county plan including the need for countywide data collection.
-  **Broward County MPP:** FWC staff have continued correspondence with county staff regarding slip allocation and future revisions to their existing plan including minor revisions to slip fees.
-  **Miami Dade County MPP:** FWC staff have continued to meet regularly and provide technical assistance to the County in their efforts to revise their existing plan.
-  **Sarasota County MPP:** FWC and Sarasota County staff continued discussions on data collection efforts and needs that would aid in the review of their existing plan. Countywide vessel surveys are expected to begin August 2021.

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 Commission, as well as 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 2020-21 HIGHLIGHTS

-  **Monitoring Activities** – FWC staff coordinate some data collection activities that assist in the program’s monitoring of existing manatee habitat. This information includes manatee distribution data, vessel use patterns and speed zone compliance. These data aid in the review of existing or potential manatee protection areas in addition to manatee protection planning and agency permit reviews. FWC staff participated in several monitoring activities in FY 2020-21.




- Western Pinellas County – The first year of a recreational boating study in western Pinellas County was completed in August 2016. These data collection efforts represent “pre-manatee zone rule” surveys and were completed in advance of the posting of regulatory markers in western Pinellas County, which were adopted in December 2015. This study was repeated and data collection was completed in November 2019. The “post-manatee zone rule” surveys were evaluated in comparison to the “pre-manatee zone rule” surveys and a report was generated in November 2020 that evaluated how speed zone regulations change vessel distribution or travel patterns, including compliance with the zones.
- Eastern Panhandle Region – FWC staff also continued a two-year manatee distribution aerial survey in the eastern Florida panhandle covering portions of Franklin, Gulf, Jefferson, Taylor, and Wakulla counties. Partnering with The Nature Conservancy, who provided funding to FWC, to survey this area that has little information about seasonal manatee distribution in this region. Pending temporary delays due to safety concerns with the pandemic, the survey is expected to conclude in 2022 and will provide valuable information about manatee distribution and habitat. A funding extension has been granted.
- Withlacoochee River - Staff continued a vessel compliance study at the mouth of the Withlacoochee River in Levy County through FY 2020-21. The one-year study will aid in the review of an existing manatee protection zone that may no longer be serving the purpose of manatee protection as intended when the zone was adopted in 1985.



Local Ordinances – FWC staff coordinated with representatives from local governments on issues related to potential local manatee protection ordinances.

- In April 2020, staff from the Town of Ft. Myers Beach (Lee County) inquired about the potential for the Town to establish local manatee protection zones along the eastern shoreline of Estero Island and in a small lagoon north of Big Carlos Pass. FWC staff provided guidance on the local ordinance process, including the development of a draft ordinance to present to the Town Council. After evaluation of the proposed local zones and a best available data, FWC approved the ordinance language in October 2020.
- In May 2020, staff from the City of Sanibel (Lee County) inquired about the potential for the City to establish a local manatee protection zone along the eastern shoreline of southern Sanibel Island. FWC staff provided guidance on the local ordinance process, including evaluation of available data, and formally approved the ordinance in January 2021.



 **Permits** – Rule 68C-22.003, F.A.C., allows FWC to issue permits for activities that would otherwise be prohibited. Most of these permits are for residential access, commercial fishing and professional fishing guide activities occurring within some manatee protection zones. There are approximately 175 of these permits in effect at any given time. FWC staff worked on one additional request for other types of permits during FY 2020-21.

- In June 2021, FWC received a request from the Broward County Port Authority for exemption from the Florida Power & Light Port Everglades No Entry Zone to conduct bridge inspections for future repairs. A permit was issued in July 2021.

Variations or Waivers - The variance and waiver process is governed by s. 120.542, F.S., and Chapter 28-104, F.A.C. FWC did not receive any requests for a variance from manatee protection rules during FY 2020-21.

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 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 2020-21 HIGHLIGHTS

WARM-WATER HABITAT



- The Atlantic Coast Manatee Unusual Mortality Event (UME) has brought renewed attention to existing watershed and ecosystem issues in places like the Indian River Lagoon. In response more resources have become available for efforts to support manatee habitat. FWC staff and partners have worked together to identify projects and collaborative opportunities related to the restoration of aquatic habitats to benefit manatees. In FY 2021-22, projects will be selected for funding and activities to support implementation will commence.
- FWC staff continued to work with Florida Power & Light, Duke Energy, and the Tampa Electric Company to ensure the protection of manatees during the conversion of their existing facilities along Florida’s coastline from oil or coal burning turbines to the more efficient combined cycle natural gas units. Data collected during these conversions will assist FWC staff in monitoring the health of manatees in this area during the conversion process and provide information regarding how manatees respond to changes in warm water availability during winter seasons. The monitoring conducted through these efforts will be useful to FWC and agency partners in developing future warm-water habitat plans. During FY 2020-21, the Tampa Electric Company’s Big Bend Power Plant initiated the biological monitoring required as part of their efforts to repower an existing coal and gas fired unit with a combined-cycle natural gas unit.
- FWC staff, in coordination with the USFWS, completed the revision to *The Florida Manatee Warm Water Habitat Action Plan* in November of 2020. This document provides a long-term planning tool for manatee warm-water habitat. A workshop composed of representatives from partner agencies, nonprofit organizations, universities, and others will be hosted by the Florida Power & Light Company in Spring of 2022 to develop strategies for implementing the Action Plan.
- FWC staff are working with a variety of partners to develop and complete a project to restore and enhance Warm Mineral Springs’ downstream run (Sarasota County), considered the most important natural manatee warm-water refuge along Florida’s southwest coast. This project will improve warm-water access and habitat quality for manatees. Through funding and assistance from The Nature Conservancy, the Coastal and Heartland National Estuary Partnership, the U.S. Army Corps of Engineers and FWC’s Aquatic Habitat Conservation and Restoration Section, final design plans were completed and permits acquired in Fall 2020. Pending funding allocation, construction is expected to commence in Spring of 2022.
- FWC staff are also working collaboratively with DEP’s Division of Recreation and Parks and a variety of other partners to stabilize severely eroding banks along the Blue Spring Run (Volusia County), a high use recreational area and critical manatee warm-water refuge. Data collection and survey work began in April 2018 and



Phase I of project construction commenced in May 2021. Phase II is anticipated to begin in Spring of 2022.



Photo of shoreline stabilization project in Blue Spring Run, Volusia County.



MINIMUM FLOWS AND LEVELS

- Coordination continues with the WMDs in the development of Minimum Flows and Levels for river and spring systems that provide warm-water habitat for manatees.



WATER-CONTROL STRUCTURES

- FWC staff coordinate the Interagency Task Force for Water Control Structures, which is comprised of USFWS, Miami-Dade County, USACOE, the South Florida WMD, DEP, Southwest Florida WMD and St. Johns River WMD. This working group addresses central and south Florida water control structure-related manatee mortality issues. The Interagency Task Force met virtually in February 2020 to discuss issues and concerns that occurred during the previous year.
- During FY 2020-21, FWC staff reviewed 15 water-control structure manatee mortality events at Task Force structures. In coordination with research staff, Imperiled Species Management (ISM) Section mortality notification letters were



sent to four structure managers to request operational data and provide technical assistance to prevent future manatee mortality at these sites.

- This past FY, nine manatees died due to interactions with these water control structures. These deaths increased the overall total of water control structure-related deaths to 247 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 3.8 manatees per year (2001-2021).



Photo of Structure S-25B in Miami-Dade County



AQUATIC VEGETATION

- FWC staff continue 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 staff work 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 Kings Bay and Blue Spring Aquatic Plant Working Groups are two such interagency groups that work to implement invasive aquatic plant management plans and address warm and cold season treatment activities and other protection measures for manatees.



PUBLIC OUTREACH - FY 2020-21 HIGHLIGHTS

Management Activities

Public outreach regarding manatee conservation programs is important so that the public is well informed about manatees and understands the reasons for various 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 or entanglement in discarded monofilament line and why boaters must comply with posted speed zones to reduce manatee injury and death from boat collisions.



MANATEE AWARENESS ONLINE ENGAGEMENT

Press releases: 5

- July 9 - Show support for manatee and sea turtle conservation with new decals from FWC
- October 28 - Make a Difference for Manatees this November
- February 15 - Martin County to get improved waterway marker signs
- March 31 - Manatees on the move! Go slow, look out below
- June 30 - Celebrate Independence Day the Floridian way with these wildlife-friendly tips

Social media engagement and web site information:

- FWC staff reviewed both the manatee related MyFWC.com webpages to make sure that all areas where the Wildlife Alert information was posted had the current information for reporting dead, injured or distressed manatees. The Tip@MyFWC.com information was removed from these areas to prevent a delay in the reporting from this service, leaving the Wildlife Alert phone numbers. Wildlife Alert text was reworded so that when translated to Spanish through the Google Translator app embedded on the website, the translation was clearer.
- Facebook posts - 9
 - July - Show your Love for sea turtles and manatees! - 136 likes; 17 comments
 - Sept. - Wildlife Alert - rescue of stranded manatee - 1.4K likes; 54 comments
 - Oct. - Manatee Awareness Month - 553 likes; 59 comments
 - Nov. (3X) - Manatee Awareness Month: Show your support! License plate and decals - 916 likes and 19 comments; 918 likes and 19 comments; and 799 likes and 18 comments
 - Jan. - Manatee rescue - canal near Moore Haven - 272 likes; 20 comments
 - Jan. - Support for USFWS regarding manatee harassment (political) - 843 likes; 430 comments; 145 shares



- Mar. - Go slow, Look out below! - 1.1K likes; 140 comments
- Tweets - 28
 - Of the 28 tweets sent out, 11 tweets were sent in November - Manatee Awareness Month
 - Tweet topics: Manatee behavior or characteristics, manatee awareness when boating, manatee habitat, migration and the importance of warm water sites, use of polarized glasses to see manatees, support of manatee program through decal sales, notification of sign replacement (Martin County), watching wildlife ethics, manatee rescues, discourage manatee harassment, "Marvelous Manatee" video, Unusual Mortality Event, State marine mammal, research staff rescue manatees year-round, vessel collisions and accidents, mating herd awareness, Population model for manatee abundance in SW Florida
- Instagram posts - 2
 - Slow down, save manatees! 21,850 reach
 - November is Manatee Awareness Month! 21,676 reach
- Information requests:
 - During FY 2020-21, FWC staff responded to 191 AskFWC customer requests for information with 66 of those requests related to manatees. The remaining requests related to other ISM program species.
 - FWC staff responded to 30 FWC Tracker requests routed to FWC from the Governor's Office of Citizen Services.
 - FWC staff mailed out 90 public information requests for educational materials. Most of these requests originated from the agency's on-line Publication Request service.



MANATEE OUTREACH

Due to COVID-19 pandemic restrictions, in-person events between July 2020 and June 2021 were either cancelled or rescheduled to a later date. Some outreach occurred through online meetings, networking and through the creation of materials targeted to different groups.

- North Florida - ISM outreach staff continued to serve on the Community Classroom Consortium Board, which provides opportunities for FWC to be involved with the Big Bend community and to link up with outreach staff in other agencies or businesses that provide educational programs or events in the area. Most meetings or events planned this year were online or pre-recorded. Outreach staff participated with the WFSU Summer Challenge by providing an activity for the



- group's activity booklet and manatee and sea turtle decals for swag bags distributed through a drive-by/pick-up event. FWC Project WILD staff submitted a few educational videos used for online presentations throughout the year.
- Staff welcomed a new U.S. Coast Guard Auxiliary liaison and provided him with samples of the ISM manatee educational materials available to distribute to Florida auxiliaries. In turn, he reached out to the Auxiliary's public information officers around the state. Since the initial contact, 15 Auxiliaries have placed orders for materials to use with their boater education classes or for distribution at tabling events.
 - The Save the Manatee Club continues to advocate for manatee awareness in many ways. ISM staff worked with the Club to update the "Waterway Sign" card, which is a multi-lingual laminated card. FWC staff coordinated a review and update of the four languages on the card (English, French, German, and Spanish). Staff from other FWC offices who spoke Spanish and French assisted with these translations, which also created an In-Reach networking opportunity. A new graphic was added to the Slow Speed section and the Wildlife Alert logo was added to the card as well. The Club coordinated the printing of the card. FWC staff, along with various other groups around the state, purchased the cards through a bulk order process coordinated through the Club. FWC maintains the graphics and design for this publication. FWC's Law Enforcement/Regional Offices received cards to distribute.
 - Manatee decal sales increased during FY 2020-21 and several counties requested additional decals. FWC staff took advantage of an outreach opportunity and assisted with the demand and sent out decals and other educational materials to 126 Hillsborough County individuals who had paid for decals after the county ran out of decals.
 - At the end of the FY year, staff traveled to coastal businesses in the Big Bend area to distribute publications that could be given out to visitors at these sites: Edward Ball Wakulla Springs State Park, TnT Canoe and Kayak Rental, Rocky's Gas Station center (sells FWC fishing licenses), the Wakulla County Visitor Center in Panacea, the Holiday Campground (near Ochlocknee Bay), and the Gulf Specimen Marine Lab. The in-person visit at these locations allowed for some networking connections.



[Note: The FWC manatee mascot was not sent out for events this year.]

Educational materials about manatees were distributed to these groups to assist with their manatee awareness efforts in their communities:

- New Port Richey in Pasco County and a Charter School in Georgetown, SC received materials for their Manatee Awareness Day events
- Project WILD requested materials to distribute to teachers trained at their workshops
- Lake County Water Authority used materials to target 211 Third grade classrooms
- University of Tampa put materials in their Education Student Resource Center, which provides materials for future teachers to create lesson plans
- The Nature Center of the Great Outdoors in Titusville, FL
- Florida's Adventure Coast Visitor's Bureau
- Captain's Choice Boat Training in Deland, FL
- South Florida Wildlife Center in Ft. Lauderdale, FL
- Sarasota County Beaches and Water Access sites in Nokomis, FL
- All Florida visitor centers received the new manatee post card/rack card



MANATEE DECAL

- The manatee decal available at Florida tax collector offices this year was titled, "Observe with Care", and recognized the early efforts of legendary wildlife researcher Jacques-Yves Cousteau whose film documentary fifty years ago, "The Forgotten Mermaids", impacted many people and helped start the movement to protect Florida's manatees. Florida's tax collector offices distributed 4,685 decals through the annual vehicle/vessel registration period and helped raise approximately \$23,425 for the Save the Manatee Trust Fund. [Note: at the time of this report, five counties had not reported their decal sales, accounting for 198 decals.]
- In addition to the decal sales at the tax collector office, individuals may order manatee decals through the ISM Section office. Decal order forms are available to download from the manatee program's web page:



https://myfwc.com/media/20974/manateedecalorderform19_20.pdf. The manatee decals continue to bring in additional funds to the Save the Manatee Trust Fund. Decals from 1992 to the present fiscal year are available for purchase at \$5 each. During FY 2020-21, current year and surplus decal sales brought in an additional \$1,517.50 to the fund plus a separate donation of \$10,000 from a supporter from Newport Beach, CA, who expressed their support for manatee conservation.

- Surplus manatee decals from previous years are also distributed to groups to use at their education events or programs. A total of 3,877 decals were given away during the year.



MANATEE INFORMATION - UPDATES AND NEW RESOURCES

Two of the manatee signs listed on our manatee program web pages were updated. The sign vendors who produce the signs for permit-related marinas or local boat ramps were notified that changes to the signs were available.

<https://myfwc.com/wildlifehabitats/wildlife/manatee/education-for-marinas/>

FWC staff finalized updates and printed the brochure, "Guidelines for protecting Florida Manatees", which had been under review since the last fiscal year. After the brochure was printed, agency research staff assisted with translating the text to Spanish and an ADA version of the translated brochure was posted online. This timely translation allowed research staff in Mexico to use the information for educational purposes when it was discovered that a tagged manatee from Florida was swimming around and using the navigational channels in Cancun, Mexico. The translated information was shared with researchers monitoring the manatee, the protected area administrators, local NGOs, tourist guides and the navigation authority of the Port of Cancun.

New this year is a handout created for distribution through Florida's visitor centers—a post card/rack card that has a tear-away section, which allows someone to mail the post card portion and then keep a smaller segment of the card to use as a reference during their Florida visit. The post card message invites people to visit places where they can see manatees if/when they visit, and the tear-away portion provides guidelines about the best



ways to observe manatees during their Florida visit. An allotment of the cards were mailed out to all Florida visitor centers with another mail-out planned for Manatee Awareness Month (November 2021).

Post card/Rack card



Stay WILD!

Manatees are Florida's state marine mammal. These gentle giants are definitely a unique imperiled species that lives in Florida's waterways.

The Florida manatee is a subspecies of the West Indian manatee.



To:

Put a stamp here before mailing.

Manatee Coexistence Tips:

- The best way to enjoy seeing Florida's manatees is to wear polarized sunglasses and to quietly observe them from a distance.
- Properly dispose of used fishing line/gear and trash.
- Observe and follow all boating speed zone signs when recreating on Florida's waterways.
- Manatees are a protected marine species. It is illegal to feed, harm or harass them.



If you see a manatee in distress, call the FWC's Wildlife Alert Hotline: **888-404-FWCC (3922)** #FWC or *FWC on cellphones.



APPENDIX A ACRONYMS AND ABBREVIATIONS

°C — degrees Celsius
cm — centimeters
Commission, Commissioners — members of the FWC Commission
DEP—Florida Department of Environmental Protection
DTAG — Digital Acoustic Recording Tag
°F — degrees Fahrenheit
FAC — 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 Photo Identification 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
UF – University of Florida
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

ES = Spanish - Español
FR = French - Français
DE = German - Deutsch



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



ES: La velocidad más lenta necesaria para mantener gobierno y dirección (velocidad de ~2-3 mph o 3-5 km/h).

FR: Vitesse la plus basse tout en maintenant la gouverne et la direction. (Vitesse ~2-3 mph ou 3-5 km/h)

DE: Die niedrigste Geschwindigkeit, um das Boot auf Kurs zu halten.



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



ES: La embarcación debe estar asentada y nivelada en el agua, sin surcar mientras se mueve con una estela mínima (velocidad de ~5-7 mph o 8-11 km/h).

FR: Peu ou pas de sillage. L'embarcation doit être complètement positionnée dans l'eau. (Vitesse ~5-7 mph ou 8-11 km/h)

DE: Langsame Fahrtgeschwindigkeit, kein Kielwasser, Boot muss vollständig im Wasser sein.



Resume normal safe speed according to current water traffic conditions.



ES: Reanude la velocidad normal y opere de manera segura tomando en cuenta el tráfico en el agua.

FR: Reprendre une vitesse normale et prudente, selon les conditions de transport nautique en vigueur.

DE: Normale und an die Wasserbedingungen angepasste Fahrtgeschwindigkeit wieder aufnehmen.

***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**



FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

What can you do to protect Florida's manatees?

ES: ¿Qué puede hacer para proteger a los manatíes de la Florida?
FR: Que pouvez-vous faire pour protéger le lamantin de la Floride?
DE: Was können Sie tun, um Floridas Manatees zu schützen?

Wear polarized sunglasses while operating a boat.
Polarized lenses make it easier to see things under the surface.



ES: Use lentes de sol polarizados mientras opera una embarcación. La polarización facilita ver cosas debajo del agua.

FR: Portez des lunettes solaires polarisées quand vous opérez une embarcation. Les lentilles polarisées facilitent la vision des objets situés sous la surface de l'eau.

DE: Polarisierte Sonnenbrillen tragen, wenn Sie im Boot unterwegs sind. Mit polarisierten Brillengläsem kann man leichter etwas unter der Wasseroberfläche erkennen.

Slow down and observe all manatee speed zones and caution areas.



ES: Reduzca la velocidad en las zonas de manatíes y respete todas las áreas de velocidad restringida o de precaución.

FR: Ralentissez et respectez toutes les zones de vitesse et les zones de prudence concernant les lamantins.

DE: Langsam fahren und alle Geschwindigkeitsbeschränkungen und Warnungen für Manatees beachten.

While swimming or diving, do not approach or chase a manatee.



ES: Mientras nade o bucee no se acerque o persiga a los manatíes.

FR: Lorsque vous nagez ou plongez, n'approchez pas et ne pourchassez pas un lamantin.

DE: Beim Schwimmen oder Tauchen den Manatees nicht zu nahe kommen oder sie verfolgen.

Don't pollute. Pick up trash such as fishing line and plastic bags.



ES: ¡No contamine! Recoja la basura, tal como el hilo de pescar y las bolsas plásticas.

FR: Ne polluez pas! Ramassez les déchets tels que les lignes de pêche et les sacs de plastique.

DE: Die Umwelt nicht verschmutzen! Abfall, z.B. Angelleinen und Plastiktüten, aufheben.

Give a proper lookout for manatees when boating



A manatee's snout will break the water's surface when the animal comes up to breathe.



A manatee's back may break the surface before a dive.



A flat swirl on the water's surface, called a manatee "footprint," is created by a manatee's paddle-shaped tail. The edge of the tail may be visible.



Depending on the time of day, water clarity, and reflection of the sun, manatees may be hard to see. Use caution when boating in waters where manatees may be present.

02/21



Wildlife Alert Hotline:
1-888-404-3922



FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

APPENDIX C MANATEE LICENSE PLATE AND DECAL PROGRAM

Manatee License Plate

The manatee license plate was created in 1990 as per s. 320.08058(1)(c), F.S., and s. 379.2431(4)(d), F.S., to raise funds for manatee research and protection. In FY 2020-21, the manatee license plate generated \$1,147,850. 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, County 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 2020-21, 4,685 manatee decals were sold for manatee conservation. This year's decal was designed by FWC staff.



You can be the solution! Visit: MyFWC.com/StashtheTrash



A Legacy of Care

Fifty years ago, the legendary wildlife researcher Jacques-Yves Cousteau filmed a documentary called "The Forgotten Mermaids" for his TV series, *The Undersea World of Jacques Cousteau*. The film highlighted Cousteau's manatee research at Blue Spring on the St. Johns River and featured his team's work with a manatee that was rescued from a sewer pipe in Miami, rehabilitated at the Miami Seaquarium and who Cousteau's team successfully released.

At the time, little was known about manatees, but Cousteau noted the animals should be allowed to live without being harassed or harmed and wilderness areas should be valued and protected. The increased public interest after the show aired helped to start the movement to protect Florida's manatees, which led to manatees being designated as the state's marine mammal and Florida being designated as a manatee sanctuary.

In the decades since then, manatee awareness, research and conservation efforts have improved the plight of Florida's manatees. Today, manatees are classified as a threatened species and are still

protected. Thousands of people support manatee conservation through the purchase of the Save the Manatee license plate, vessel registration fees and these manatee decals. Through your support and by carefully observing manatees in the wild, you can continue to fulfill Cousteau's legacy of Florida manatee conservation.

Observe with Care:

- Use caution when boating
- Allow manatees to use their warm-water sites undisturbed
- Quietly enjoy watching manatees from a distance

Thank you for your donation to the Save the Manatee Trust Fund! The Trust Fund supports research, rescue, rehabilitation, management, conservation and education efforts to protect Florida's manatees.



Florida Fish and Wildlife Conservation Commission
620 S. Meridian Street, 6-A
Tallahassee, FL 32399-1600

MyFWC.com/Manatee

