*Responsible Conservation of Florida's Wildlife Heritage*

# SAVE THE MANATEE TRUST FUND
## ANNUAL REPORT
## FISCAL YEAR 2023-24

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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**

1-888-404-FWCC (3922)

to report fish and wildlife violations, as well as manatee injuries and mortalities.

**Roger Young, Executive Director**

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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 (s.) 379.2431(4)(b), Florida Statutes (F.S.). The Trust Fund is the primary source of funding for the State's manatee-related research and conservation activities. As required by Florida law, the report is provided to the President of the Florida Senate and the Speaker of the Florida House of Representatives by December 1, annually. This report covers the period from July 1, 2023, through June 30, 2024.

Through the long-term public support of the Trust Fund, the FWC actively implements science-based conservation programs and engages partnerships that are making a difference for manatees and habitat. The 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.

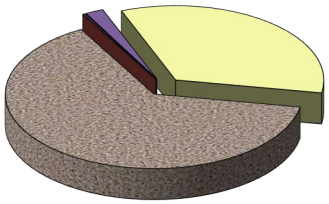
The long-term impacts of large-scale die-offs on the manatee population in Florida are not currently known. Investigating these events is key to understanding the cause, understanding potential impacts on the population as well as developing conservation measures that protect the species affected and the marine environment where the UME is taking place. To help address this, the 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 2023-2024 totaled $4,321,228. Appropriations from the Trust Fund for the same period were $4,174,344 with $313,310 provided for manatee research activities at Mote Marine Laboratory (Mote), and a service charge to General Revenue of $344,103 that most trust funds are required by law to pay. In FY 2023-2024, FWC's Division of Habitat and Species Conservation expended $1,078,981 for conservation activities and the Fish and Wildlife Research Institute expended $2,029,796 on research

and monitoring. Details of revenues, appropriations, and expenditures are shown on page 6 of this report.

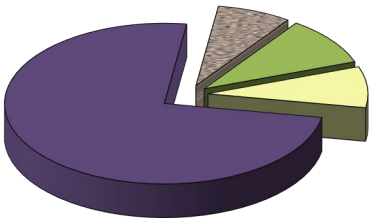
# TRUST FUND FY 2023-2024
# REVENUES AND EXPENDITURES

**REVENUES**
**$4,321,228**



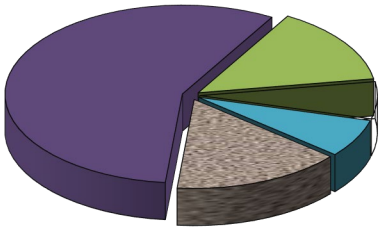
- Vessel Registrations ($2,767,773)
- Misc. Receipts ($834)
- Save the Manatee Donations ($10,050)
- Interest ($84,507)
- Manatee License Plate Sales ($1,456,218)

**APPROPRIATIONS**
**$4,174,344**



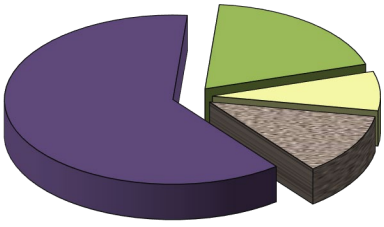
- FWC Manatee Program ($3,108,777)
- Mote Marine Laboratory ($313,310)
- Administrative Overhead ($408,154)
- Service Charge to General Revenue ($344,103)

**FWC MANATEE PROGRAM CONSERVATION MANAGEMENT EXPENDITURES**
**$1,078,981**



- Manatee Protection Zones ($166,415)
- Plan and Permit Reviews ($613,652)
- Habitat Protection ($151,804)
- Data Distribution ($72,763)
- Public Outreach ($74,347)

**FWC MANATEE PROGRAM RESEARCH EXPENDITURES**
**$2,029,796**



- Behavioral Ecology ($237,479)
- Mortality and Rescue ($1,256,140)
- Photo Identification (Life History) ($383,921)
- Population Assessment and Monitoring ($152,256)

# MANATEE BASICS

| | |
|---|---|
| **COMMON NAME** | Florida manatee |
| **SCIENTIFIC NAME** | *Trichechus manatus latirostris* (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** | 6,620 in 2017 |
| **HISTORY** | A native species found in Florida's fossil record and recorded by earliest |
| **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 and 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. Using objective-driven criteria, carcasses are selected for transport by field personnel from recovery locations to FWC's Marine Mammal Pathobiology Laboratory (MMPL) in St. Petersburg or are examined 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 Rescue and 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 (Aquarium Encounters, The Bishop Museum of Science and Nature, Brevard Zoo, Cincinnati Zoo, Clearwater Marine Aquarium, Columbus Zoo, Dallas World Aquarium, Georgia Aquarium, Gulfarium, Jacksonville Zoo and Gardens, Mote Marine Laboratory, SeaWorld Orlando, Texas State Aquarium, Zoo Miami, ZooTampa at Lowry Park, Walt Disney World's The Seas).

[1] Unusual Mortality Events are defined by the Marine Mammal Protection Act as "a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response." See https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-unusual-mortality-events for more information.

# FY 2023-24 HIGHLIGHTS

- Statewide, there were 573 manatee carcasses documented in Florida during FY 2023-24. Additionally, four carcasses were documented in Georgia, two in Alabama, one in Mississippi, one in North Carolina, one in South Carolina, and one in Texas.

- Statewide, 129 rescues were performed in Florida during FY 2023-24. As of 31 July 2024, of the 129 manatees rescued, 20 were released back into the wild *(37 were Assist & Release)*, 24 died and the remaining 48 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 the investigation is ongoing. Fortunately, recovery of seagrass in parts of the Indian River Lagoon in the summer of 2022 initiated a decline of the high mortality numbers. As in last FY, mortality of non-perinatal carcasses during FY 2023-24 was at baseline numbers and no starvation-related deaths were documented. The UME coordinators will apply for closure of the event and transition into the post-UME monitoring phase for longterm health effects and other manatee population concerns. The number of verified perinatal carcasses in the Indian River Lagoon increased significantly this FY (n=54) compared to the previous FY (n=1). This increase is attributed to a return to calving after several years of reproductive suppression by malnutrition and starvation, and was expected with improved health condition since perinatal mortality occurs in any reproducing manatee population.

  Please visit https://myfwc.com/research/manatee/rescue-mortality-response/ume/ and https://myfwc.com/research/manatee/rescue-mortality-response/statistics/mortality/ume-carcass/ for more information regarding the Atlantic coast manatee UME.

- Thirteen manatees died from entrapment and drowning in culverts. Nine cases were in Brevard County, three in Miami-Dade County, and one in Broward County. Of these, six manatee mortalities in Merritt Island and three manatee mortalities in Cocoa Beach were related to a single sewer opening. After these nine mortalities were documented, the culverts were closed off to prevent manatee access in the future. Discussions are ongoing to close off the remaining four openings.

- Ten manatees were rescued due to entrapment from high water levels due to Hurricane Idalia.

| Manatee Rescues FY 2023-24 (preliminary numbers) | |
|---|---|
| ***Type of Rescue*** | ***Number of Rescues*** |
| Calf—Alone | 15 |
| Calf—With Rescued Mother | 1 |
| Mother of Rescued Calf | 1 |
| Human—Entanglement | 15 |
| Human—Entrapment* | 23 |
| Human—Watercraft-Related | 22 |
| Human-Other | 0 |
| Natural—Includes Red Tide | 52 |
| Undetermined; Other | 0 |
| **Total** | **129** |

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

| Manatee Mortality FY 2023-24 (preliminary numbers) | |
|---|---|
| ***Cause of Death*** | ***Number of Deaths*** |
| Human-Flood Gate or Canal Lock | 11 |
| Human – Other | 19 |
| Human-Watercraft Related | 91 |
| Natural – Cold Stress | 13 |
| Natural – Other | 58 |
| Perinatal | 160 |
| Undetermined | 45 |
| Verified, Not Recovered | 176 |
| **Total** | **573** |


*Double manatee rescue in Bear Creek, St. Petersburg, FL*

# 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).

FWC conducted six aerial surveys from October 2023 to May 2024 in the Indian River Lagoon, from Ponce Inlet to Jupiter Inlet, of an ongoing investigation to better understand the unprecedented manatee Unusual Mortality Event that began in winter 2020-2021 on the Atlantic coast. (https://myfwc.com/research/manatee/rescue-mortality-response/ume/ for more information regarding the Atlantic coast manatee UME). These surveys were conducted to document manatee numbers and distribution during the declared UME. The region with the highest number of manatees counted in each survey was the northern portion of the survey area in Mosquito Lagoon.

Aerial distribution surveys have been on-going in upper Tampa Bay since September 2023. Surveys are conducted twice a month to document manatee numbers and distribution in Hillsborough and parts of Pinellas County. These surveys will be completed in September of 2024.

Abundance surveys employ the latest scientific methods to provide conservation managers and the public with a sound estimate of the Florida manatee population. The statewide survey is flown over two consecutive winters, one coast per season. Abundance estimates were updated using data collected in December 2021 and November and December 2022 and published in a technical report https://f50006a.eos-intl.net/F50006A/OPAC/Details/Record.aspx?BibCode=5857422. The estimates from abundance surveys can also be used as part of population projection models, like the Core Biological Model (CBM; Runge et al 2017), which are designed to forecast Florida manatee population dynamics, 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., vital rates, abundance estimates, verified carcasses). In the future, regional and eventually a statewide IPM framework will provide estimates of population abundance in years when the intensive abundance surveys were not flown.

Monitoring efforts in the Port of the Islands (POI), Collier County, FL continued in winter 2024. 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 manatee 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 fluke 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 skin conditions. Florida manatees are photographed throughout their range and the sightings are incorporated into a 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. Staff continued priority work to transfer the long-term oversight and support of the federal MIPS database to the FWC including updating the database and front-end application.

Demographic parameters, particularly survival rates for calves and young adults, can sometimes be difficult to estimate through photo-identification because of unfavorable photographic conditions, limited animal accessibility, and the lack of scars on young individuals. 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. 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 2023-24 HIGHLIGHTS

- FWC conducted 6 aerial surveys in the Indian River Lagoon as part of the investigation to the manatee Unusual Mortality Event (UME) within the Atlantic coast region.
- The results from a manatee abundance aerial survey conducted in December 2021 and November and December 2022 were published in a FWC technical report https://f50006a.eos-intl.net/F50006A/OPAC/Details/Record.aspx?BibCode=5857422
- FWRI staff members and interns spent 300+ days conducting land and boat-based photo-ID research during 640+ 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 will be analyzed to support updated adult survival and reproductive rates—key input parameters in ongoing population modeling efforts.
- The statewide MIPS catalog currently includes 5,146 animals and more than 126,800 sighting records. In addition, this year 148 carcasses were matched to animals known through photo-identification.
- Transfer of responsibility for the longstanding Manatee Individual Photo-Identification System database, including data, responsibilities, and leadership, from USGS to FWC continued, with FWC now in the lead leadership role. Implementation of data management processes to more effectively manage the transferred continued. In addition, for the MIPS SQL database that was transferred from USGS and updated by FWC, the development of an associated front-end application continued.
- Genetic sampling surveys were conducted in southwest Florida and on the Atlantic Coast. A total of 611 samples were collected from free swimming manatees during the 2024 winter: 17 samples at Port of the Islands (Collier County), 201 samples in the Orange River (Lee County), 200 samples at the TECO Big Bend Power Plant (Hillsborough County), and 193 samples at the Cape Canaveral Energy Center (Brevard County).
- The manatee genetic-ID database 3,488 unique individuals identified by skin samples collected from live manatees through the 2024 winter.

*Aerial Survey of Manatees in Tampa Bay*

# 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: https://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 target of restoration this year is Warm Mineral Springs, which flows via Salt Creek into the lower Myakka River in Sarasota County (see Habitat Management highlights). Manatees have been precluded from accessing the warm-water refuge at low tides because of sedimentation from past human activities; dredging was completed in fall 2023 to restore the natural depth in much of the creek. FWC biologists are monitoring water temperatures, water levels, and manatee use along the spring run during winter to compare the situation after restoration to 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 other aggregation sites in the region.

Another serious habitat-related threat to manatees is the large-scale loss of seagrass in the Indian River Lagoon and along much of Florida's east coast. Although manatees feed on a variety of aquatic vegetation, they rely primarily on seagrass and macroalgae in estuarine environments. The unprecedented loss of forage in this crucial region led to widespread malnutrition and starvation of manatees in recent years. FWC's investigation into this manatee unusual mortality event includes research into manatee health, ecology, behavior, and population impacts (https://myfwc.com/research/manatee/rescue-mortality-response/ume/).

*Manatee foraging on shoreline grass at edge of waterway.*

# FY 2023-24 HIGHLIGHTS

- As part of the Atlantic coast Unusual Mortality Event investigation, FWC again collaborated with the U.S. Geological Survey (USGS) to tag and track manatees with satellite-linked GPS tags, and to evaluate submerged aquatic vegetation used by tagged manatees in the northern Indian River Lagoon. A team of scientists and veterinarians from FWC, USGS, University of Florida, and other partners assessed the health and body condition of each animal to further understand the health of the wild population.

- FWC continued its collaboration with USGS and Clearwater Marine Aquarium Research Institute to help track experienced rehabilitated manatees with GPS tags along the east coast after their release from facilities. Manatee movement data in relation to environmental information is providing insights into manatee behavioral response to seagrass loss and partial recovery.

- FWC made considerable progress on 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." State and federal managers and researchers on the team jointly drafted study plans to address the highest research priorities to meet management needs regarding the restoration, enhancement, creation, or protection of warm-water habitats for manatees.

- Manatee distribution and abundance in Salt Creek, which is the outflow from Warm Mineral Springs, was investigated in relation to ambient temperature during winter 2023-24 using ground surveys. Continuous monitoring of water temperatures and tidally-influenced water levels within the creek provide a first look at changes in the system since restoration of the creek bed, which was completed in fall 2023.

- Monitoring of manatee use of manmade passive thermal basins near Port of the Islands, as well as at nearby warm-water sites, continued during winter 2023-24. 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. These baseline data will help to evaluate manatee response to the creation of a new warm-water refuge and to the eventual loss of a traditionally used site due to hydrologic restoration.

- 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.

*Researcher recovering a manatee GPS tag in the northern Indian River*

*Tagged manatee drinking freshwater from the surface with other manatees*

# 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 and develop rigorous analytical products. Efforts to protect this species are outlined in the North Atlantic Right Whale Recovery Plan[1] and NOAA Fisheries 2021-2025 Priority Action Plan[2].

The North Atlantic right whale is one of the most endangered large whales in the world with approximately 360 individuals[3]. The population has been in decline since 2010 and an Unusual Mortality Event (UME)[4] has been in effect since 2017. Entanglement in fishing gear and vessel collisions are the leading known causes of death in this species and 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). FWC has been a member of the SEIT since its inception in 1993 and currently serves as Team Leader for this federal recovery team.

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

[1] https://www.fisheries.noaa.gov/resource/document/recovery-plan-north-atlantic-right-whale-eubalaena-glacialis
[2] https://www.fisheries.noaa.gov/resource/document/species-spotlight-priority-actions-2021-2025-north-atlantic-right-whale
[3] https://www.fisheries.noaa.gov/species/north-atlantic-right-whale#overview
[4] https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2024-north-atlantic-right-whale-unusual-mortality-event

and where right whales have been sighted. FWC is a major contributor to the North Atlantic Right Whale Consortium—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 2023-2024 HIGHLIGHTS

- During the North Atlantic right whale calving season (November 15th – April 15th), four research teams conducted aerial surveys in coastal Atlantic waters from North Carolina to Florida. In total, 81 unique right whales, including 19 mother-calf pairs[5], were documented. FWC collaborated with the Georgia Department of Natural Resources (GDNR) and the Clearwater Marine Aquarium Research Institute (CMARI) to survey the area between Canaveral National Seashore, Florida, and Tybee Island, Georgia, out to approximately 30 nautical miles offshore. FWC conducted 59 aerial surveys and detected 80 right whale sightings between November 20th and March 31st. Preliminary photo analysis indicates FWC documented 52 unique right whales, including 17 calves. Select photos from the calving season can be viewed here: http://myfwc.com/research/wildlife/right-whales/images/

- Genetic sampling was conducted in collaboration with NOAA Fisheries Service and the Georgia Department of Natural Resources with assistance from other partners. During the calving season, 53 vessel trips were conducted, resulting in samples from 15 right whale calves, 18 adult females, one adult male, and two juvenile right whales. The skin samples will be used to determine individual

[5] A 20th calf was documented in June off Virginia by researchers from HDR Inc. https://www.fisheries.noaa.gov/national/endangered-species-conservation/north-atlantic-right-whale-calving-season-2024

identification, sex, and parentage. This genetic data helps identify carcasses, improve population estimates, and close demographic information gaps. Additional samples were collected from adult females this season as part of a health assessment initiative that will include analyses such as hormones, microbiome, and epigenetics.

- FWC researchers gather information from the public and government agencies about reports of whales and collaborate with local partners to document sightings and mitigate human interaction with whales. These efforts are especially helpful in areas with limited or no aerial survey coverage and contribute to the overall understanding of right whale demographics, distribution, and habitat use in the southeastern U.S.

- In early January, recreational boaters off Edisto, South Carolina reported sighting right whales, identified by FWC researchers as Catalog #1612 and calf. Video collected by the boaters showed significant, but not fresh, vessel strike wounds on the calf's head. The last sighting of the pair prior to the injury, was by the FWC aerial survey team off Florida, nearly a month earlier. Research teams re-sighted the injured calf on January 11th off Amelia Island, FL, and were able to collect thorough documentation: deep, crisscrossed propellor wounds spanned from the blowholes to the tip of the rostrum and involved the left lip. Over the next two months, there was a multi-agency effort to monitor and document the injuries and health of the calf. The pair was sighted numerous times between Sapelo Island, GA and Daytona Beach, FL. On March 2, #1612 was sighted alone off St. Augustine, FL, and the carcass of the calf washed ashore on Cumberland Island, GA the following day.[6]

- Three dead right whales were detected in the SEUS and mid-Atlantic this winter, and four additional dependent calves are presumed dead.[7] FWC was actively involved in all the cases, including species confirmation, individual identification, documentation, reporting, and wound analysis as well as carcass relocation, recovery, necropsy, and disposal.
    - 2023 calf of Catalog #4340, a one-year-old female, was found floating dead off Savannah, GA on February 13th. Necropsy found fractures of the skull consistent with blunt force trauma from a vessel strike. The young whale was last seen alive 10 days earlier off Melbourne, FL.
    - 2024 calf of Catalog #1612, a dependent calf, survived for over two months before succumbing to injuries from a vessel strike to the head. The calf's carcass washed ashore on Cumberland Island, GA on March 3rd. Necropsy found that the propeller lacerations had penetrated deep into soft tissue and bone, leading to multiple sites of necrosis and infection. Preliminary estimates show the vessel involved was less than 57ft. Wound analysis is on-going.
    - Catalog #1950, an adult female, was sighted floating dead off Virginia on March 30th. Necropsy found catastrophic injuries to the vertebrae consistent with blunt force trauma from a vessel strike. This strike occurred while #1950 and her calf were migrating north from the SEUS calving grounds to feeding habitats in New England and Canada.
    - 2024 calf of Catalog #1950, a dependent calf, is unable to survive on its own following the death of its mother in March. The calf's carcass wasn't located.

[6] https://www.fisheries.noaa.gov/national/endangered-species-conservation/north-atlantic-right-whale-updates#2024-calf-of-juno-right-whale-1612
[7] https://www.fisheries.noaa.gov/national/endangered-species-conservation/north-atlantic-right-whale-updates

- 2024 calf of Catalog #3780, a days-old dependent calf, disappeared on the calving grounds between December 31st and January 5th.
- 2024 calf of Catalog #1301 became emaciated and disappeared between January 11th and 14th. Catalog #1301 has lost at least 6 calves.
- 2024 calf of Catalog #3260, a late-season calf, looked a little thin on March 12th and disappeared before March 21st.

*Injured calf of right whale Catalog #1612 on January 11, 2024, off Amelia Island, FL. The calf sustained a vessel strike to the head sometime between December 9, 2023, and January 3, 2024 and eventually died, washing ashore on Cumberland Island, GA in early March 2024.*
*Photo: FWC, NOAA Fisheries permit #24359*

*Weeks-old calf of right whale Catalog #1612 surfaces to breath as its mother swims beneath. This image was taken on December 9, 2023, approximately 19 nautical miles off Amelia Island, FL before the calf was fatally wounded by a vessel strike.*
*Photo: FWC, NOAA Fisheries permit #26919*

# RESEARCH PUBLICATIONS & REPORTS

## *Research Activities*

**2023-24 PUBLICATIONS:** (*FWC authors in bold type*)

Cagle LA, Stacy NI, Harvey JW, **de Wit M**, Adler L, Walsh M, Bonde R and Stokol T. 2023. Cytochemical staining of leukocytes and platelets in the Florida manatee (*Trichechus manatus latirostris*): identification of a bilobed monocyte similar to other members of the Paenungulata. Front. Vet. Sci. 10:1149000. doi: 10.3389/fvets.2023.1149000.

**Crum, NJ, Gowan, TA,** Ramachandran, KM. 2023. Forecasting wildlife movement with spatial capture–recapture. Methods in Ecology and Evolution 14: 2844–2855.

Ewing RY, Sutton MN, Herring HM, **Schubert MR, Boyd DM,** Richardson JL, Rotstein DS. 2023. Standardizing gross descriptions of skin lesions in common bottlenose dolphins (*Tursiops truncatus*) stranded in Southwest Florida, 2015–2019. Front Mar Sci. 10:1269075.

**Gowan TA, Edwards HH, Krzystan AM,** Martin J, Hostetler JA. 2023. 2021-2022 statewide abundance estimates for the Florida manatee. St. Petersburg (FL): Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute. Technical Report No. 27.

**Neyman, LN, Crum, NJ,** Adams, JD, Patterson, EM, Good, CP. 2023. Mariner cooperation with recommended lanes in two critical habitats of the North Atlantic right whale, *Eubalaena glacialis*. Fish and Wildlife Research Institute Technical Report TR–24.

Roberts JJ, Yack TM, Fujioka E, Halpin PN and others (2024) North Atlantic right whale density surface model for the US Atlantic evaluated with passive acoustic monitoring. Mar Ecol Prog Ser 732:167-192. doi.org/10.3354/meps14547

Annie Page, Clara Hay, Wendy Marks, Baylin Bennett, Matthew O. Gribble, Wendy Noke Durden, Megan Stolen, Teresa Jablonski, **Nadia Gordon**, Trip Kolkmeyer, Mingshun Jiang, Nicole Pegg, Hunter Brown, Steve Burton. 2024. Trace element bioaccumulation, tissue distribution, and elimination in odontocetes stranded in Florida and Georgia, USA over a 15-year period (2007–2021), Heliyon, Volume 10, Issue 3, e25552, ISSN 2405-8440

Rose Borkowski, **Allison C. Perna, Nadia J. Gordon**, Alvin C. Camus, John M. Gliatto, Connie Merigo, and Lauren A. Polimeno. 2023. Notable Stingray Spine-Associated Strandings Involving Two Female Bottlenose Dolphins in Florida and Massachusetts, USA, in the Context of Literature and Database Reviews, aquaticmammalsjournal.org Vol. 49, Iss. 6, pages 569-584. https://doi.org/10.1578/AM.49.6.2023.569

# MOTE MARINE LABORATORY MANATEE RESEARCH PROJECTS

## research activities

The following projects were funded in FY 2023-24 ($313,310):

- Photo-Identification and Genetic Sampling Studies of Manatees in Southwest Florida —The objectives of this project were to: 1) ensure that an updated photographic catalog and data are thoroughly checked for quality and completeness and are provided to the FWC; 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 the FWC to verify and transport carcasses using a custom trailer provided by the FWC and assist in responses to reports of injured or ill manatees within a defined response area.

- Aerial Surveys of Manatees— Mote staff conducted aerial survey of manatees. The survey's contributed to understanding of manatee abundance, habitat, and distribution.

- 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 staff 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 2023-24, the Manatee Forum met in November 2023 and remotely through teleconference in May 2024. Presentation topics in both meetings were focused on manatee habitat restoration, with updates on agency efforts to implement the Warm-water Habitat Action Plan, submerged aquatic vegetation in the Indian River and Mosquito lagoons, and restoration activities in the St. Johns River. Other presentation topics included a review of the quality of thermal refuges based on a recent publication by the US Geological Survey, FWC Division of Law Enforcement updates and coordination efforts, and a summary of the results from the 2021-22 Abundance Estimate recently published by FWRI. The Forum also reviewed governance updates to encourage continued participation and attendance. The 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 valuable to all parties.

# MANATEE PROTECTION PLANNING AND PERMIT REVIEWS

## *Management Activities*

FWC staff review proposed development projects and provide biological opinions to state regulatory agencies for Environmental Resource Permits, Joint Coastal Permits, Special Event Permits, Sovereign Submerged Land leases, State Clearinghouse projects, Comprehensive Everglades Restoration Plan projects, and Developments of Regional Impact. The FWC is also heavily involved in the development and implementation of sixteen individual county-specific Manatee Protection Plans (MPPs). FWC staff work closely with federal and county representatives regarding revisions to existing MPPs and provide 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 2023-24 HIGHLIGHTS

- The FWC reviewed and provided comments on 366 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 (FDOT), U.S. Army Corps of Engineers (USACOE), and USFWS.

- In response to a manatee entrapment in a stormwater culvert under a Florida Department of Transportation (FDPT) roadway in Port Richey, staff contacted the FDOT to discuss opportunities to retrofit the culvert. FDOT sought technical assistance from FWC staff and installed a grating system on the exposed culvert in January 2024. The manatee was successfully rescued, rehabilitated, and released.

- Staff continue to coordinate and provide technical assistance to the City of St. Petersburg regarding a large spillway adjacent to Clam Bayou. Multiple manatee entrapment scenarios have been documented since 2014 with a recent entrapment in April 2024. City engineers have proposed design plans for excluding manatees and work is expected to begin in FY 2024-25.

*Photo of culvert at Miller's Bayou in Port Richey, Pasco County (left). Photo of spillway near Clam Bayou, St. Petersburg (right).*

## *Florida Port Activities*

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

## Manatee Protection Plans

- **Volusia County MPP:** FWC staff corresponded with Volusia County and USFWS to review an Addendum to the Volusia County MPP to provide updated clarification and relevance for the MPP's implementation. A Letter of Concurrence regarding this Addendum was issued in July 2023.

- **Interagency MPP Meeting:** In March 2024, FWC Staff led an in-person Interagency Manatee Protection Plan Meeting at the Stetson Aquatic Center in Deland. This was the first of these meetings hosted since 2017 and there was attendance from representatives across 16 counties, 14 of which have existing MPPs and attendance from a further two counties that contain important manatee habitat. This opportunity enabled all parties to provide updates, discuss common themes and issues, and explore ways to continue best promoting waterway interests while conserving manatees in the State of Florida.

- **Brevard County MPP:** FWC staff worked with Brevard County and USFWS to provide updated guidance for data-driven criteria assessments of the MPP. There was also guidance discussed regarding data collection efforts required for a future Plan revision.

- **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.

- **Duval County MPP:** County staff have initiated correspondence with FWC staff regarding slip allocation tracking and future revisions to their existing plan.

- **Indian River County:** FWC staff have ongoing collaboration with County Staff about the data requirements required to revise their existing Plan.

# MANATEE PROTECTION ZONES

## Management Activities

The FWC establishes manatee protection rules, including boat speed zones and restricted access areas, and administers activities related to these rules. Staff evaluates data and develops proposed rules for consideration by the FWC Commission, 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 2023-24 HIGHLIGHTS

**Rule Development** – In the fiscal year 2023-24, sign posting of the newly established temporary No Entry Zone in Brevard County was completed. Staff coordinated with Levy County staff and FWC Division of Law Enforcement to initiate rulemaking activities to amend a portion of the existing zones at the mouth of the Withlacoochee River. Staff formally notified Levy County of the rulemaking activities in June 2023.

**Monitoring Activities** — FWC staff coordinate 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 the following monitoring activities in FY 2023-24.

- Hillsborough County — In FY 2023-24, FWC staff completed a 12-month vessel distribution aerial survey effort to document and record recreational and commercial vessel traffic in Hillsborough County waters. This information will aid staff in future evaluations of Manatee Protection Zone and potential Manatee Protection Plan revisions and updates. FWC staff also conducted a manatee distribution aerial survey in Hillsborough County. The resulting data will provide valuable information about manatee distribution and habitat. Lastly, FWC staff began the process of conducting an inventory survey of water accessible facilities in Hillsborough County. The survey will provide insight on the facilities that have access to manatee accessible waterways, potentially aiding in the making of a future Manatee Protection Plan in Hillsborough County and other management efforts.

- Coastal Volusia County – In FY 2023-24, FWC staff conducted a manatee distribution aerial survey in Coastal Volusia County. The resulting data will provide valuable information about manatee distribution and habitat.

- Upper St Johns River - FWC staff began discussion on prioritization of protection zone evaluations at warm-water sites in the Upper St Johns River.

**Local Ordinances** — In FY 2023-24, FWC staff continued coordination with representatives from Citrus County government on issues related to a potential local manatee protection ordinance in Crystal River. Additionally, FWC began and continue to have coordination with representatives from Hernando County regarding the establishment of a local manatee protection ordinance in the Mud River.

**Permits** — Rule 68C-22.003, F.A.C., allows the 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 two additional requests for other types of permits during FY 2023-24.

- In March 2024, the FWC issued LEE Construction Group, Inc an exemption permit from the Year-round No Entry zone in the discharge canal of the Florida Power & Light ("FPL") Port Everglades Energy Center (Broward County) to continue structural repairs and maintenance work of the bridge that connects SE 19th Avenue and Eller Drive.

- In November 2023, the FWC issued Collier County an exemption permit from the Year-round No Entry zone in the waters of the basin & canal drainage easement at the eastern extent of Henderson Creek (Collier County) to remove storm generated debris and repair damages.

- In August 2023, the FWC issued LEE Construction Group, Inc an exemption permit from the No Entry zone adjacent to the Florida Power & Light (FPL) Port Everglades Next Generation Clean Energy Center to repair Eller Drive Bridge, a vehicular bridge which has deteriorated and required structural repairs and maintenance work on both the top and underside of the bridge.

**Variances or Waivers** – The variance and waiver process is governed by s. 120.542, F.S., and Chapter 28-104, F.A.C. In FY 2023-24, FWC received three new requests for variances from manatee protection rules.

- In December 2023, FWC received a request from Ski-A-Rees for temporary variance from portions of a Slow Speed Manatee Protection Zone rule in Sarasota County to conduct ski tournament practices in the month of June 2024. A temporary (1st-21st June 2024) variance, with conditions, was granted to allow for tournament practice ahead of the regional annual tournament held in Winter Haven, FL.

# 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 ensuring habitat health and stability is a primary focus of habitat protection programs (See Chapter 7, "Management Actions," p. 55 Florida Manatee Management Plan).

# FY 2023-24 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, eight projects were identified in collaboration with stakeholders and partners around the State for funds authorized by the legislature (SB 2500). In FY 2023-24, construction was ongoing for these projects except for Warm Mineral Springs which was completed in September of 2023. These projects include restoration of manatee access to critical warm-water habitat in natural springs and habitat restoration in manatee concentrated areas including seagrass habitat enhancement and nursery infrastructure throughout Atlantic coastal estuaries where seagrass declines have occurred. Additional information and updates related to these projects can be found on our webpage at: https://myfwc.com/wildlifehabitats/habitat/ahcr/manatee-projects/

- 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 those areas 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 the FWC and agency partners in developing future warm-water habitat plans.

- FWC staff, in coordination with the USFWS and Florida Power & Light began planning efforts to establish two Regional Partnership Teams (RPTs) along the Atlantic coast. These two teams are the first of five planned RPTs that are aligned with the regional focus of the Florida manatee Management Units. Individuals were identified representing a wide range of relevant stakeholder groups who will provide resources and/or regional expertise. The goal of these RPTs is to provide practical recommendations to the Steering Committee on warm-water restoration, enhancement, and creation projects. RPTs will also provide support in formulating necessary regional collaborative partnerships and funding opportunities.

- FWC staff completed a project to restore and enhance Warm Mineral Springs' downstream outflow (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. Funding and assistance were provided from multiple partners, including The Nature Conservancy, the Coastal and Heartland National Estuary Partnership, the U.S. Army Corps of Engineers and with FWC's Aquatic Habitat Conservation and Restoration Section's state allocated funding. Construction, funded through Senate Bill 2500, was completed in September of 2023. Significant impacts caused by Hurricane Ian in the fall of 2022 delayed anticipated completion of this project, and additional funding was needed to correct sediment augmentation caused by the storm. Additionally, outreach activities within the local community were led by the National Wildlife Federation through a grant from the Gulf Coast Community Foundation and included informational signage and brochures, community events and messaging.

- 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. Phases I and II of project construction are complete, and Phase III is underway and expected to be completed in September, 2024. FWC staff continue to monitor this project and implement adaptive management strategies.

*Photos of Blue Springs State Park restoration project, 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 Working Group for Water Control Structures, which is comprised of numerous agencies statewide, including the USFWS, Miami-Dade County, USACOE, FDEP, the South Florida WMD, Southwest Florida WMD and St. Johns River WMD. This Working Group addresses central and south Florida navigational lock and water control structure-related manatee mortality issues. The Interagency Working Group met at FWC's South Regional Office in West Palm in June 2024 to discuss issues and concerns that occurred during the previous year.

- During FY 2023-24, FWC staff reviewed eleven structure manatee mortality events and one pump station entrapment mortality. Mortality notification letters were sent to five structure managers to request operational data and provide technical assistance to prevent future manatee mortality at these sites.

- This past FY, eleven manatees died due to interactions with the above-mentioned structures. These deaths increased the overall total of navigational lock and water control structure-related deaths to 295 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 5.3 manatees per year (2001-2023).

- FWC staff coordinated with St Johns River Water Management District Staff to utilize FCO funds from the legislative session to implement the installation of Manatee Protection Systems. Manatee barriers and/or manatee detection systems were installed at three navigational locks to prevent manatee entrapments and construction during FY 23-24.

- FWC Staff are conducting ongoing coordination with South Broward Drainage District Staff to prevent further mortality and entrapments at their pump structures and culvert network This has included site visits and review of Manatee Exclusion Device designs.

*Photo taken during a site visit and agency coordination at Canaveral Lock, one of the structures with a water control structure mortality during the FY 2023-24.*

### 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. In FY 2023-24, FWC staff collaborated with partners to implement eelgrass restoration at several locations within tributaries of the Indian River Lagoon and began construction of several seagrass aquaculture facilities to enhance capacity for future restoration efforts.

- 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 in 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 2023-24 HIGHLIGHTS

## *Management Activities*

Public outreach regarding manatee conservation programs is important so 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.

During FY 23-24, the Imperiled Species Management Section continued their Internship Program which included manatee management related projects. In the fall and spring semesters, students from Florida universities earned course credit while completing various projects, such as distributing outreach materials to communities living alongside manatees and updating a guide for retrofitting water control structures to prevent manatee entrapment.

## MANATEE AWARENESS ONLINE ENGAGEMENT

- Press releases: 3

- July 10, 2023 – Help ensure Florida's manatees and sea turtles have access to clean and healthy habitats with new decals from the FWC
- January 4, 2024 – FWC completes habitat restoration at Warm Mineral Springs
- March 21, 2024 – Go slow, look out below for manatees this spring

- Webpages – FWC staff made updates to the Unusual Mortality Event webpage including an update on available foraging resources for manatees in Mosquito Lagoon in March of 2024.

- Social Media – Staff continued regular and frequent social media engagement through platforms such as Facebook, Instagram, and Twitter. Important messaging included awareness about moving manatees during seasonal migration and a reminder prior to National Safe Boating Week to "Go Slow, Look Out Below!" aimed at protecting manatees from waterway vessels.

## MANATEE OUTREACH

In FY 2023-24, FWC staff participated in several in-person outreach events, with audience members ranging from elementary school students to adults. ISM staff participated and presented on manatee conservation at the following events:

- Manatee Festival – Manatee Research and Management (in-person table display; Crystal River, FL)
- Florida Sierra Club – Manatee Biology, Research, and Management (in-person presentation; Tallahassee, FL)
- Estuary Day Celebration – Manatee Management (in-person table display; Apalachicola, FL)
- Florida State University Coastal & Marine Lab Open House – Manatees (in-person table display; St. Teresa, FL)
- Wild Amelia Nature Festival – Manatee Management (in-person table display; Fernandina Beach, FL)
- Right Whale Festival – Manatees (in-person table display; Fernandina Beach, FL)
- Tallahassee Science Festival (in-person table display; Tallahassee, FL)
- St. Marks Wildlife Heritage and Outdoors Festival – Manatees and Sea Turtles (in-person table display; St. Marks, FL)
- Wiregrass STEAM Night – Manatees (in-person table display; Wesley Chapel, FL)

## MANATEE DECAL

- The manatee decal available at Florida tax collector offices this year was titled, "Healthy Manatees and Healthy Habitats" and was an awareness reminder that manatees depend on healthy habitats which provide sea grass and other aquatic vegetation for them to forage on. Boaters and residents can do their part to support healthy habitats for manatees by avoiding navigating through shallow grass beds, eliminating the use of lawn chemicals which degrade water quality, and participating in local habitat restoration projects. Florida's tax collector offices distributed 3,801 decals through the annual vehicle/vessel registration period and helped raise approximately $19,005 for the Save the Manatee Trust Fund. [Note: at the time of this report, two counties had not reported their decal sales, accounting for 1000 decals.]
- In addition to the decal sales at the tax collector office, individuals may order manatee decals through the Manatee Management Program office. Decal order forms are available to download from the manatee program's web page: Manatee Decals | FWC (myfwc.com). 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 donation at $5 each.
- Surplus manatee decals from previous years are also distributed to groups to use at their education events or programs. A total of 12,352 older decals were given away during the year.

## MANATEE INFORMATION – UPDATES AND NEW RESOURCES

An educational outreach campaign addressing the feeding of manatees in two communities was completed. Approximately 200 addresses within these communities were mailed a letter, the "Respect Florida Manatees" flyer, and a manatee sticker.


*Photo of "Respect Florida Manatees" Educational Signage*

Staff maintain a webpage for residents and boat facilities to obtain access to signage and educational material. All manatee educational signage is available for download here: https://myfwc.com/wildlifehabitats/wildlife/manatee/education-for-marinas/

New this year is a sticker that can be handed out at outreach events or by law enforcement when interacting with the public. It can also be requested on the FWC Publications request service page for mail-out to members of the public. The sticker, "Please help protect manatees", will aid water users in detecting manatees which may be in the vicinity of their vessel and remind them of conservation guidelines for manatees.


*Photo of "Please help protect manatees" Sticker*

# 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 steerage 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 complétement 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**

# 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 Brillengläsern 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.

Save the Manatee. savethemanatee.org

**Wildlife Alert Hotline: 1-888-404-3922**

WILDLIFE ALERT

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## 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.

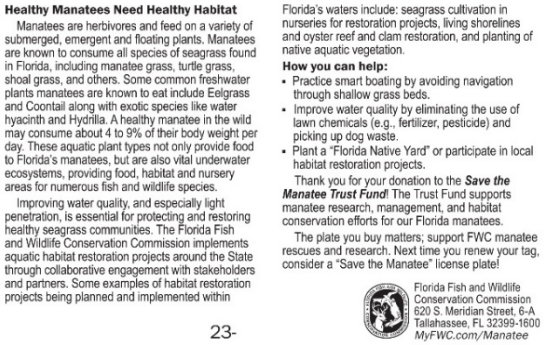
# APPENDIX C
# MANATEE LICENSE PLATE AND DECAL PROGRAM

## *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 2023-24, the manatee license plate generated $1,382,970. These revenues are deposited in full into the Save the Manatee Trust Fund.


## *Manatee Decal*

Section 328.72, Florida Statutes, 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 2023-24, 3,871 manatee decals were sold for manatee conservation. This year's decal was designed by FWC staff and focuses on supporting healthy habitats with sea grasses and aquatic vegetation for manatees.

**Healthy Manatees Need Healthy Habitat**

Manatees are herbivores and feed on a variety of submerged, emergent and floating plants. Manatees are known to consume all species of seagrass found in Florida, including manatee grass, turtle grass, shoal grass, and others. Some common freshwater plants manatees are known to eat include Eelgrass and Coontail along with exotic species like water hyacinth and Hydrilla. A healthy manatee in the wild may consume about 4 to 9% of their body weight per day. These aquatic plant types not only provide food to Florida's manatees, but are also vital underwater ecosystems, providing food, habitat and nursery areas for numerous fish and wildlife species.

Improving water quality, and especially light penetration, is essential for protecting and restoring healthy seagrass communities. The Florida Fish and Wildlife Conservation Commission implements aquatic habitat restoration projects around the State through collaborative engagement with stakeholders and partners. Some examples of habitat restoration projects being planned and implemented within

23-

Florida's waters include: seagrass cultivation in nurseries for restoration projects, living shorelines and oyster reef and clam restoration, and planting of native aquatic vegetation.

**How you can help:**

- Practice smart boating by avoiding navigation through shallow grass beds.
- Improve water quality by eliminating the use of lawn chemicals (e.g., fertilizer, pesticide) and picking up dog waste.
- Plant a "Florida Native Yard" or participate in local habitat restoration projects.

Thank you for your donation to the ***Save the Manatee Trust Fund***! The Trust Fund supports manatee research, management, and habitat conservation efforts for our Florida manatees.

The plate you buy matters; support FWC manatee rescues and research. Next time you renew your tag, consider a "Save the Manatee" license plate!

Florida Fish and Wildlife Conservation Commission
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Tallahassee, FL 32399-1600
*MyFWC.com/Manatee*