



VOLUSIA COUNTY

MANATEE PROTECTION PLAN

ANNUAL REPORT
2025



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Background

Florida has been a home to the Florida manatee (*Trichechus manatus latirostris*) for thousands of years. The abundant number of freshwater, brackish, and marine ecosystems throughout the state have historically provided good habitat for the manatee to thrive and reproduce. However, in recent years the increase in the human population of Florida has become more of a threat to manatees. This increased threat led to several important federal protection measures, including the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973, both of which prohibit harassment and harm to the species. In 1978, the Florida Manatee Sanctuary Act declared the entire state as a manatee refuge, and later in 1989, 13 counties, including Volusia County, were listed as key to manatee survival.

Under the 1989 mandate each of the 13 key counties were required to develop a Manatee Protection Plan (MPP). Volusia County completed an MPP that included a marina siting element, as well as educational and outreach components. A Boating Activity Study, which was completed in 1996 and updated in 2000, is the underpinning for many of the policies outlined within the MPP.

The Volusia County MPP strives to balance manatee protection and resource preservation with recreational and economic demands. The plan is divided into two phases to fully address all the components. The goal of both Phase I and Phase II is to achieve and maintain an optimal sustainable manatee population within Volusia County.

Phase I focuses on manatee conservation efforts through education, outreach, habitat enhancement, scientific research, and interagency coordination. The Florida Fish and Wildlife Conservation Commission (FWC) approved Phase I in February 2001. Phase II of the MPP includes the boat facility siting plan, which outlines methods for boat facility placement to minimize watercraft related injuries to manatees. The boat facility siting element creates policies that address protection of the manatee population, as well as preservation of manatee habitat. Phase II was approved by the FWC in October of 2005. An addendum to Phase II was approved in 2023.

Phase I

Phase I of the Volusia County Manatee Protection Plan (MPP) addresses issues such as habitat inventory, law enforcement, habitat protection, education and awareness, scientific research, and governmental coordination. The objective of Phase I is to evaluate current impacts to manatees, and implement strategies to increase public awareness, facilitate interagency coordination, and promote scientific research. Volusia County has designed and developed several projects to increase manatee conservation and habitat protection to meet the objectives of Phase I.

MONOFILAMENT RECOVERY/RECYCLING AND MARINE DEBRIS PROGRAMS

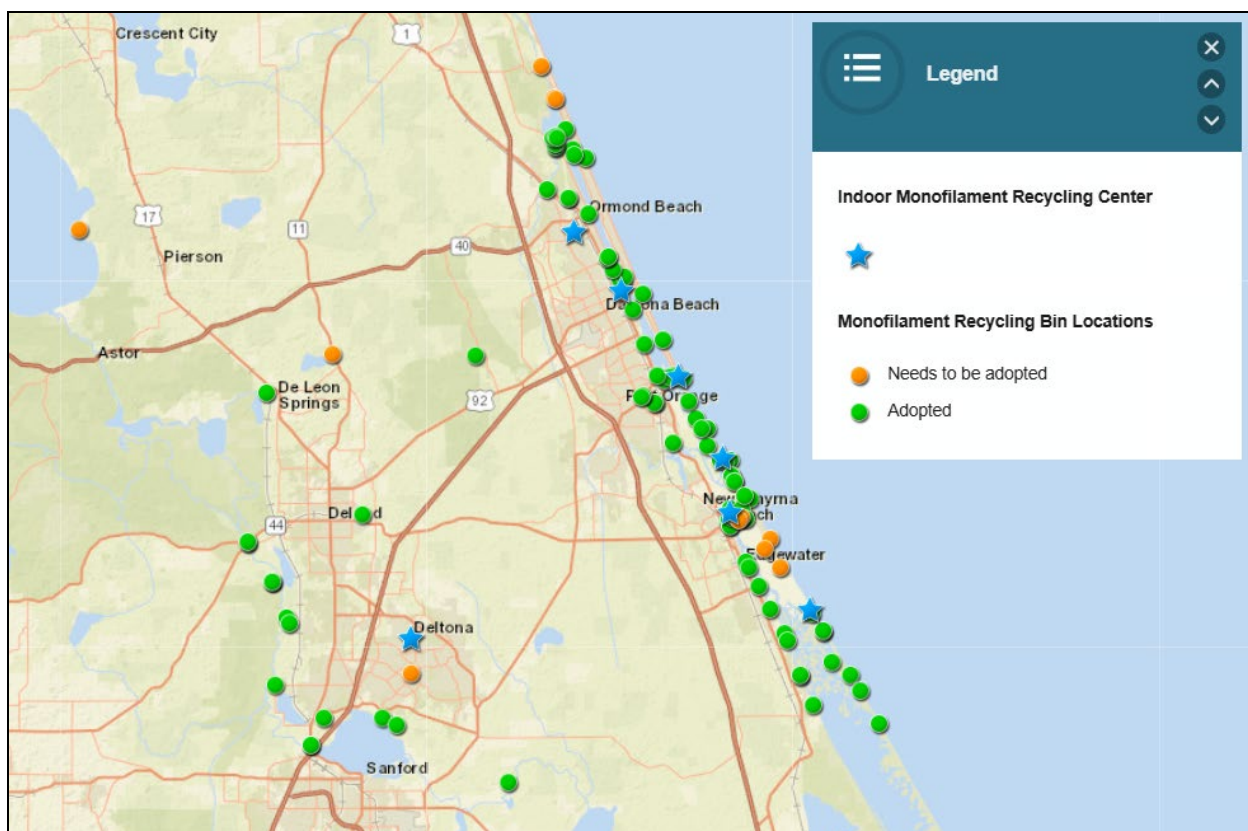
Monofilament Line Recycling Bins: The objective of the Volusia County Monofilament Line Recovery and Recycling Program (MRRP) is to minimize the negative impacts of improperly discarded fishing line by decreasing the amount of fishing line entering the environment, increasing the amount of fishing line being recycled, and by fostering awareness of the potentially harmful effects of improperly discarded line. Monofilament fishing line causes numerous threats to the environment, wildlife, and humans. The program's goal is to place the bins in areas where there is an abundance of fishing activity, including at all county boat ramps.

Individuals, school groups, civic organizations, and business groups volunteer to maintain the bins. Bin maintenance by volunteers includes emptying the bin to remove the recyclable line, sinkers, bobbers, hooks, lures, garbage, and then properly disposing of all items. Volunteers complete data forms each time they empty each bin, which is often on a quarterly basis. A web-based data entry form makes the reporting process much easier for volunteers by allowing them to complete the form and submit it in one easy process, which eliminates the need for scanning, copying, or mailing in data sheets. The website and online form can be found at www.volusiafishinglinerecycling.org. The data collected allows program staff to determine how much line is being recycled and which bins are most often used. The data also shows how full the bins become, what types of fishing gear are collected, and how much time volunteers are contributing to the program.

In 2025, volunteers recovered a cumulative total of approximately 23 bins full of used line. This equates to approximately 92 pounds of line that did not enter the environment. There are 107 bins in total in Volusia County. There are currently 91 bins adopted by 37 different volunteers. This number changes throughout the year due to unforeseen circumstances such as volunteer turnover. Staff recruited two new volunteers who adopted a total of 3 bins in 2025. There are currently 16 bins in need of adoption. The unadopted bins were checked and cleaned by County staff as time permitted. Once the bins are emptied, the volunteers then take the clean monofilament line to a line collection center which can be found at participating fishing tackle shops, environmental learning centers and other partner locations. Each location has a recycling box (with pre-paid postage). Once full of fishing line, the box is then sent to The Berkley Conservation Institute where the line is recycled. The line is melted down to make plastic pellets, which are then used to create artificial fish habitats and tackle boxes. Berkley returns an empty recycling container back to the line collection center for continued use. As an incentive for fishers and boaters to participate in the program, this recycling process is convenient, easy, and free.

In 2025, monofilament line recycling volunteers spent approximately 46 hours collecting and recycling line, which is equivalent to approximately \$1,600.34 in volunteer time. The online interactive monofilament bin map developed in 2019 also continues to be used to help recruit new volunteers by letting users zoom into the map in the area that they are interested in adopting a bin. Once focused on their area of interest, they can

see which bins are available for adoption and its exact location. A link to this interactive map can be found at www.volusiafishinglinerecycling.org.



Screenshot of December 2025, interactive monofilament bin map

Monofilament line recycling program staff maintains communication with volunteers through newsletter updates sent by e-mail on a quarterly basis. Each update highlights a current event, or a dedicated volunteer. This is a way to acknowledge the diversity and accomplishments of the program and participants. The update also provides facts, hints and reminders concerning fishing line recycling.

Underwater Cleanups: In addition to the bin collection program, an effort to remove monofilament line and other debris that has already entered the environment is also coordinated by the monofilament recycling program. Each month during the summer, County staff and other qualified participants conduct underwater cleanup events along the north jetty fishing pier at Ponce Inlet. Teams of divers, spotters and boat captains work together to remove rope, nets, anchors, lures, fishing poles, fishing line and other debris from this important coastal habitat. During these cleanup events, divers have also freed animals entangled in fishing gear including fish, seahorses, sea urchins, crabs, and other species.

“Underwater Cleanup Ambassadors” are an important element to the jetty cleanups. Ambassadors are volunteers who help by educating curious onlookers watching divers

from the nearby fishing pier and jetty. The ambassadors walk along the jetty during the dives, informing people about what the divers are doing and answering any questions they have. They also share ethical angling suggestions on how to fish while minimizing gear loss. They also clean debris and line from the exposed jetty rocks. Unfortunately, due to hurricane damages the previous year, the boardwalk and fishing pier were closed, and the team could not utilize ambassadors in the 2025 season.

In 2025, eight underwater cleanup dives were conducted at the north jetty of the Ponce de Leon Inlet. Two additional planned dives were canceled due to inclement weather. Despite the limited effort, divers removed a combined total weight of 920 pounds of monofilament fishing line, gear, and other debris from the inlet. This was an increase of 240 pounds from the 2024 efforts.

In past years, a GoPro underwater camera was used to make a video record to show the extent of the impact created by fishing line and other marine debris in the north jetty cleanup area. Education videos were created from the GoPro footage. The 2013 video of our underwater cleanup efforts, produced by Trey Hannah (Formerly of Volusia County Environmental Management) can be viewed at:

<https://www.volusia.org/services/growth-and-resource-management/environmental-management/natural-resources/florida-manatee/monofilament-recycling-program/>.

In May 2018, the "Underwater Cleanup" video created by Gary Daniels for the Volusia Magazine, won a Bronze Award in the National Telly Awards in the Nature/Wildlife category. Other winners included national shows such as Sea Rescue, Ocean Treks and Jack Hanna's Wild Countdown. To watch this video, follow the link on the following webpage. <https://www.volusia.org/services/growth-and-resource-management/environmental-management/get-involved/waterway-cleanups/>

During the cleanups, divers also remove non-native species, such as Green Mussels, *Perna vindex* and Titan Acorn Barnacles, *Megabalanus coccopoma* when found. Though they are not always captured or removed, several invasive species are documented as well, such as the Lionfish (*Pterois volitans*). These observations are shared with other biologists and researchers whenever possible so that the location can be included in other research and removal efforts.



Photo: Exotic Green Mussel (*Perna vindex*) removed during an underwater cleanup

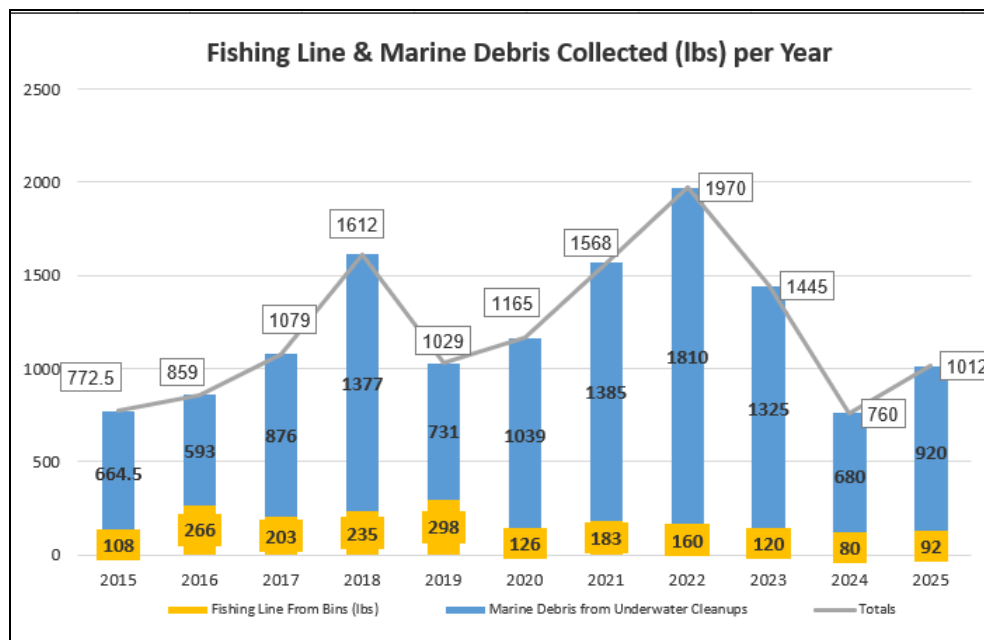


Figure 1. Chart depiction of the total amount of fishing line debris recovered from bin collection and underwater cleanups combined for the past eleven years.

Figure 1 chart

Year	Fishing Line from Bins (lbs.)	Marine Debris from Underwater Cleanups	Totals
2015	108	664.5	772.5
2016	266	593	859
2017	203	876	1079
2018	235	1377	1612
2019	298	731	1029
2020	126	1039	1165
2021	183	1385	1568
2022	160	1810	1970
2023	120	1325	1445
2024	80	680	760
2025	92	920	1012
Totals	1871	11400.5	13272

Thanks to the efforts of dedicated volunteers and staff members of the Monofilament Recovery and Recycling Program, the total amount of monofilament and marine debris collected from bins and underwater cleanups from 2002 through 2025 reached 18,614 pounds, of which 1,012 lbs. were retrieved in 2025 (Figure 1).

MARINE DEBRIS

NOAA Project: In December of 2017, Volusia County became the first partner in the state of Florida to participate in the NOAA Marine Debris Monitoring and Assessment Program (MDMAP). Manatee Protection Program staff identified a site at Rose Bay, Port Orange to conduct monthly marine debris surveys. In 2021 NOAA updated their collection protocols. Due to the changes, a new survey location was selected to collect data accurately and efficiently. Therefore, in June 2021 Volusia County changed their survey location from Rose Bay, Port Orange to Lighthouse Point Park, Ponce Inlet.

In 2025, MPP staff surveyed the designated area of shoreline in Ponce Inlet each month of the year except for December. The 100m long site is divided into four random 5m transects for each survey. All debris data collected is uploaded to the NOAA Marine Debris and Monitoring database, which is used to inform and assess debris prevention and mitigation. A description of the NOAA project, with maps and data denoting survey sites is located at: <https://marinedebris.noaa.gov/monitoring-toolbox> On the NOAA website the chart is interactive, allowing users to hover the cursor over each section of the chart to show the percentage amount of the type of debris that was collected. Below is a figure created by the MDMAP website which summarizes the collection effort in Ponce Inlet over the past three years. As shown, over 81% of items collected in these surveys were plastic.

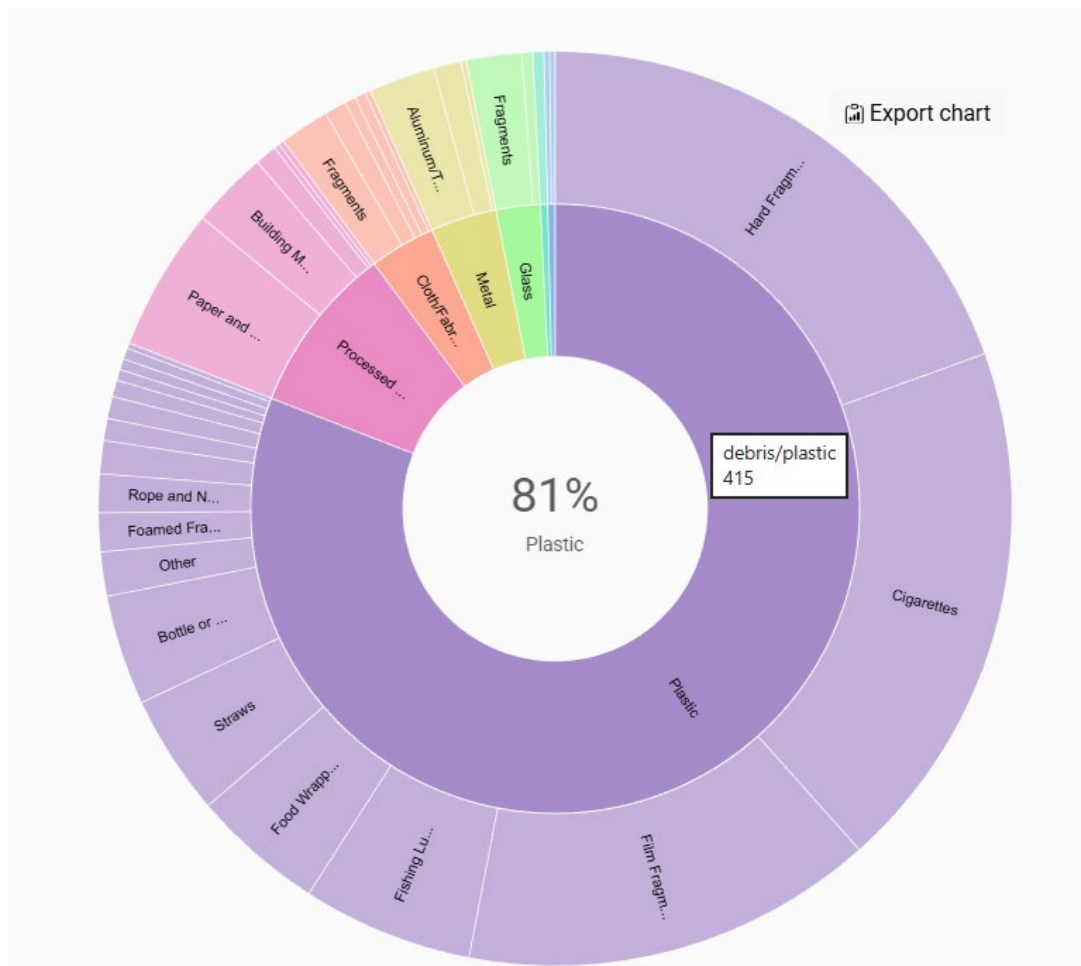


Figure 2. NOAA MDMAP Debris breakdown Piechart [Visualize | Lighthouse Point Park II \(noaa.gov\)](#)

In addition to this monthly effort, which is closely monitored by and reported to NOAA, data is also submitted through their smart phone application (app) called the Marine Debris Tracker, which can be downloaded at: [Home | Marine Debris Tracker](#). This app allows the public to participate in an important large scale citizen scientist project, by tracking marine debris in their own neighborhoods. MPP staff encourage people to use the app during educational outreach efforts.

Derelict Crab Trap Removal: Lost and abandoned crab traps have been identified as a problem because they often continue to trap organisms after they are lost. Organisms can remain trapped until they expire or the trap can be left in the environment until it degrades to the extent that it rots apart and no longer traps marine life. Decomposition can take a very long time, and the derelict trap may “ghost fish” (trap organisms) for years. These derelict traps also become a hazard to other marine life and boaters and are a source of pollution.

Tampering with traps that do not belong to you, even if they are derelict is a third-degree felony and can carry fines of up to \$5,000 and the permanent revocation of your

fishing privileges. However, the Florida Fish and Wildlife Conservation Commission (FWC) has a Derelict Trap and Trap Debris Removal Program. Through this program volunteer groups may obtain authorization to collect derelict traps and trap debris during open or closed seasons. These cleanup events must adhere to guidelines established in [Rule 68B-55, Florida Administrative Code](#) (FAC). ([Derelict Trap Retrieval and Debris Removal Programs | FWC \(myfwc.com\)](#))

On June 10, 2025, MPP staff along with Environmental Management Water Quality staff conducted a Derelict Crab Trap Cleanup Day. The location of the cleanup encompassed approximately 125 feet of the Halifax River eastern shoreline in Ormond Beach, Volusia County.

The event was coordinated with the Florida Fish and Wildlife Conservation Commission's (FWC) Marine Fisheries Management Office in Tallahassee, Florida. A preliminary survey was conducted by boat prior to the event, and it was determined a cleanup in the area was warranted due to an abundance of abandoned traps located along the edge of the vegetated shoreline, approximately 1 mile south of the Highbridge Boat Ramp in Ormond Beach.

The cleanup team moored the boat in sections of shoreline where a cluster of traps could be collected at one time. In total, six sections were cleared of traps. The smallest section contained three traps while the largest contained twenty-two. Traps and trap debris were scattered from the shallow waters, half buried in the substrate, up the shore and into the vegetation.

A total of 56 traps/trap debris were collected. Photos were taken throughout the event and data on each trap was collected and compiled on the provided data sheets. All the traps contained a large amount of oyster shells, one contained a few live oysters, one contained a small fish, and almost all traps contained small juvenile crabs. All live bycatches were released. Participants removed most of the loose oyster shells from the traps before they were removed from the location. Participants also noted that occasionally they would find that two or more traps were connected to each other with a thin, flat metal cable tie. In most cases, the traps were compromised, damaged and/or were missing sides. None of the traps contained a buoy, buoy line or identification.

The event concluded early in the day due to inclement weather and without incident. Several more traps were observed and left for another attempt at removal. Unfortunately, the team later learned that the derelict traps were left behind by another organization's experimental shoreline restoration project. MPP staff extended an offer to assist in removing the remaining debris when the organization is ready to proceed with removal.

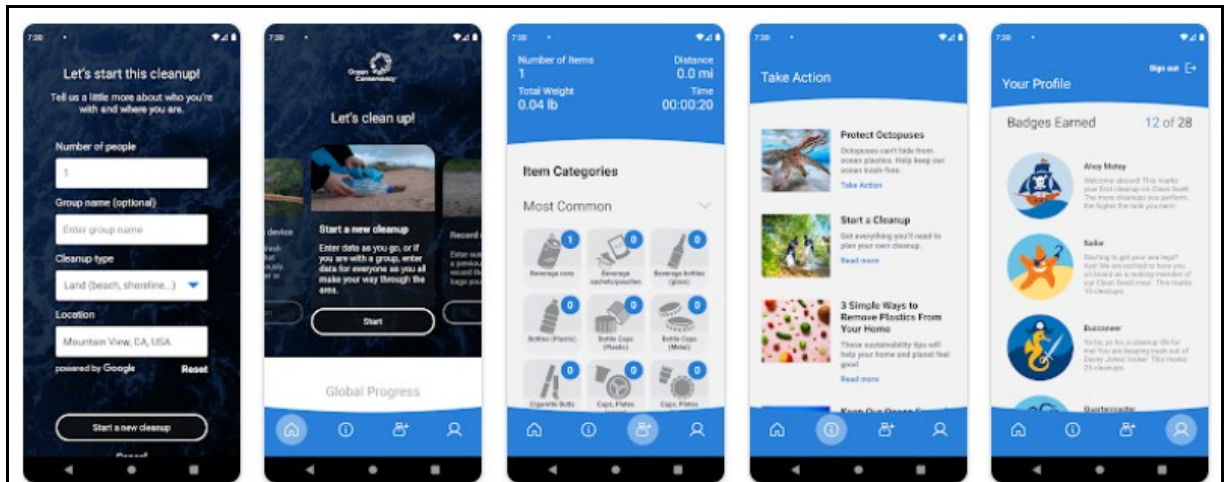


Photo: Derelict crab traps removed during the 2025 cleanup.

Other Waterway Cleanups: MPP staff partnered with the Volusia County Habitat Conservation Plan (HCP) staff to coordinate the International Coastal Cleanup (ICC) in Volusia County. The ICC is an international event sponsored by The Ocean Conservancy and is generally held on the 3rd Saturday in September each year. The 2025 ICC event was conducted on September 20th, 2025, at 34 waterway sites in eastern Volusia County. Participants were encouraged to use the Ocean Conservancy's data collection app called Clean Swell in place of paper data cards which have been the predominate method of data collection until recent years. Due to the Clean Swell app malfunction that volunteers experienced the previous year because an overload of volunteers using the app across the world, at the same time slowed the app and made it difficult to use, measures were taken during the 2025 ICC event to prepare to collect data if the app failed again. Extra paper data cards were given to each site captain to ensure they had a backup system for their participants to use. Fortunately, in 2025 the app seemed to work efficiently and that data cards were largely unused. Despite the app supporting the significant number of users, a few people and sites submitted data more than once and created duplicate records, skewing the

collection data. To prevent this from occurring in the future, more training will be given to the site captains in 2026.

MPP staff also promote using the Clean Swell app for individual cleanup efforts and recruit participants to help with the Waterway cleanups during outreach events throughout the year.



Screen Shot of Clean Swell application used during International Coastal cleanup events.

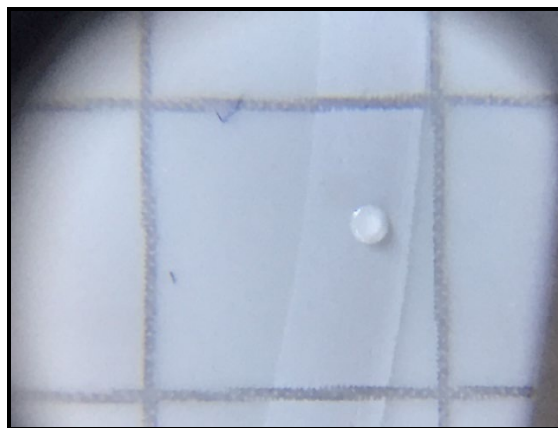
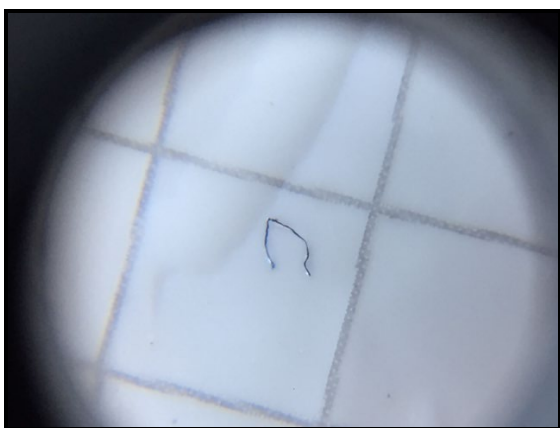


Photo: ICC participants & the trash collected at Smyrna Yacht Club

FLORIDA MICROPLASTICS AWARENESS PROJECT

MPP staff incorporates education about microplastics and water sample collection into education programs with the Volusia County Schools Field STEM Program, the Marine Science Center, and Explore Volusia programs.

Microplastics are less than 5mm long plastic particles. These particles can take several forms, including microplastic fragments derived from larger pieces of plastic, “Nurdles” pre-production plastic pellets, microbeads, film, and fibers. Researchers have continued to see large increases in these particles in our oceans over the past 10-15 years. Due to a growing concern about the potential impact of microplastics in the marine environment, staff decided to take a closer look at the problem.



Photos: Microfiber (left) & microbead and fiber (right) – Found in a sample of bottled water at a Project IBIS presentation

The program has been very successful in bringing awareness, to both students and adults, about a growing problem that most people did not know existed until recently. Scientists are still assessing the possible transfer of microplastics through our food web, and the extent of the harm microplastic pollution is causing to the marine environment, and to human health.

MANATEE EDUCATION AND OUTREACH

Manatee conservation education continues to be an important program objective. Volusia County Manatee Protection Program education and outreach include the development and distribution of original lesson plans, manatee activities, participation in community festivals, other educational events, and transmitting information to the public via the education program website and other opportunities such as radio and tv interviews.

Online Resources: Educational activities and lesson plans focusing on manatee genetics, taxonomy, and protection to promote conservation of the endangered Florida

manatee are available online at: <https://www.volusia.org/services/growth-and-resource-management/environmental-management/natural-resources/florida-manatee/education/>. The educational curriculum correlates with skill sets outlined in the Next Generation Sunshine State Standards or Common Core, with the goal of providing a complete educational package in a “ready-to-use” format. Teachers can correlate a particular manatee educational lesson to the learning skill they are focusing on at the time. Teachers have access to the manatee curriculum through the manatee education webpage (link above). There are also other educational activities and links to related resources on the web page.

Volusia County Schools Field STEM Program (formerly known as Project IBIS):

Project IBIS (Investigating Biomes in Science) was created to increase student engagement and achievement in the natural environment. In 2024 the name of this program was changed to Volusia County Schools Field STEM (Science Technology, Engineering, Mathematics) Program, when it merged with the STEM education program. In 2021 Volusia County Schools produced a U-Tube video that gives a small explanation about the educational opportunities at Spruce Creek Park IBIS/STEM Program: <https://www.youtube.com/watch?v=Yquv5rgu4aM>. The Field STEM program is primarily for high school students; however, elementary age students are the focus audience at Lyonia and the Marine Science Center educational facilities. Manatee presentations at each location are designed to be appropriate to the students’ grade levels and as an enhancement to their classroom learning experiences. All activities complement the curriculum maps for each part of the school year, address specific Next Generation Sunshine State Standards, and address topics found on the End of Course exams.

Manatee protection staff provided various types of education and activities for project Field STEM. The activity, “How Long Will It Take to Decompose?” based on facts from the workbook, “Talking Trash and Taking Action”, by the Ocean Conservancy and NOAA Marine Debris, are used with high school students attending the program. Students are given a type of marine debris commonly found during beach, shoreline, and underwater cleanups, and asked to guess how long it would take their item to decompose in the marine environment. During the lesson, the students are also asked other questions, for example, what is marine debris? How does each marine debris item affect the marine environment? What can we do to prevent this item from getting into the marine environment? And why does their item decompose at a different rate than another? One of the items used in this exercise is fishing line. When discussed, it provides an opportunity to educate the classes about the Volusia County Monofilament Recovery and Recycling Program. Students are amazed to learn about the 600-year decomposition rate of monofilament, as well as the efforts that are taking place around the county to help prevent the problem and to restore our waterways. The discussion often leads to concerns about marine debris in general and then into microplastic pollution. At the end of each lesson, the activity includes a hands-on marine debris cleanup of Rose Bay. During the cleanups, students are educated about the different types of mangroves commonly found on the East coast of Florida and the importance of the estuary they are helping to preserve. The students typically remove 10-12 bags of

marine debris and several hundred pounds of chemically treated wood during each cleanup.

Through native plant educational walks and talks, the Field STEM students learn about the value of estuaries as habitat and as natural buffers to storms. They also learn why estuaries are one of the most productive ecosystems in the world. The walks/talks teach students to identify local species of mangroves, and other estuarine plants, and demonstrate how these plants have developed the necessary individual adaptations that allow them to live in such a harsh, saline environment.

In 2025, staff continued to give presentations on microplastics to students. An Activity Lesson is followed in conjunction with the program. The lesson outlines how to conduct a microplastic experiment for high school students within a 30–45-minute timeframe. The lesson also describes the equipment needed, water sample collection protocol, and process for filtering for microplastics utilizing the Microplastic Awareness Project guidelines.

Water quality presentations were also conducted. During these, students collected water samples using a Nanson Bottle. They tested their samples for Nitrates, Sulfates, Ph, temperature, salinity, and clarity. Following the test sample, there was a question-and-answer session to explain their results and discuss possible reasons for how their results could be affected by air temperature, pollution in the waterways, and other variable influences.

In 2025 MPP staff made educational presentations to a total of 82 students plus their teachers and chaperones.

Other Presentations: Manatee Protection Program staff provides in person education on manatees, manatee habitat, marine mammals, monofilament line recycling, marine debris, microplastic pollution, and the estuarine environment at the Marine Science Center (MSC) in Ponce Inlet & Lyonia Environmental Center (LEC) in Deltona. Staff educated 43 children and chaperones during class trips and summer camps at the MSC & LEC. They also participated in education programs for SIMS (Seniors in Motion), Florida Master Naturalist Program, the Port Orange Library, Port Orange Civic Leadership Series, the Sunshine State Co-Op, New Smyrna Beach Leadership, Embry Ridell Environmental stewards' group, Explore Volusia and the. These programs allowed MPP staff to educate 197 additional participants, which are mostly adult members of the community.

Community events and activities also provided numerous opportunities for education and outreach by MPP staff. Additional events and programs MPP staff participated in were Volusia County Envirothon & Volusia County Elementary Expo.

Festivals: One of the largest annual outreach events that MPP staff attend each January is the Manatee Festival, which is held jointly at Valentine Park and Blue Springs State Park in DeLand, FL. In 2025 over 12,200 guests attended the festival

where staff were onsite providing education material and a booth that many attendees visited. Please visit www.themanateefestival.com for more information about this event. MPP staff educated thousands more at other festivals such as Turtle Day and the Wildlife Festival held at the Marine Science Center, the Lyonia Environmental Center Wildlife Festival, and the Florida Virtual Schools Career Fair.

MANATEE WATCH

In 2005, the Manatee Watch program was established as a volunteer network to assist MPP staff in gaining a better understanding of how manatees are utilizing Volusia County's waterways. Now in its 20th year, the program continues to play an important part in understanding manatee movement and activities within Volusia County.

In 2025, MPP staff offered virtual training throughout 2025. The online training option with pre-recorded sessions included a question-and-answer section to ensure the completion of each section. The training introduces the Manatee Watch program to potential volunteers, and provides education on manatee biology and physiology, manatee identification and scar pattern recognition, and an overview of manatee regulatory laws. Fourteen new members were trained in 2025.

The volunteers report valuable information and send photos that can be very helpful in identifying locations of known manatees, reporting animals in distress, and cataloging new animals.

Manatee Watch volunteers are not trained or authorized for manatee rescues, or any sort of intervention. However, once trained, they can recognize the difference between an animal in distress and natural behavior. If they observe something wrong, they are instructed to report distressed animals to the Florida Fish and Wildlife Conservation Commission and MPP staff immediately. This allows for rescue teams to respond as quickly as possible.

Since 2006, MPP staff has also been collaborating with the U. S. Geologic Survey (USGS) and FWC on the Sirenia Project which maintains the Manatee Individual Photo Identification System (MIPS) database. This is a statewide photo identification database that many entities work on collaboratively to maintain. Whenever good photographic documentation is received, MPP staff send manatee sighting reports and photos, from volunteers to the MIPS program via e-mail so that it can be reviewed and possibly added to the database.

MPP staff maintain contact with valued volunteers through periodic Manatee Watch Newsletters which help to keep them current with sightings, upcoming training events, manatee facts, and tips (see photos below). Feedback from the volunteers has been positive and there has been increased participation since implementing the updates.

Another way volunteers are encouraged to participate is by rewarding each volunteer that sends in three manatee sightings with a unique Manatee Watch t-shirt!

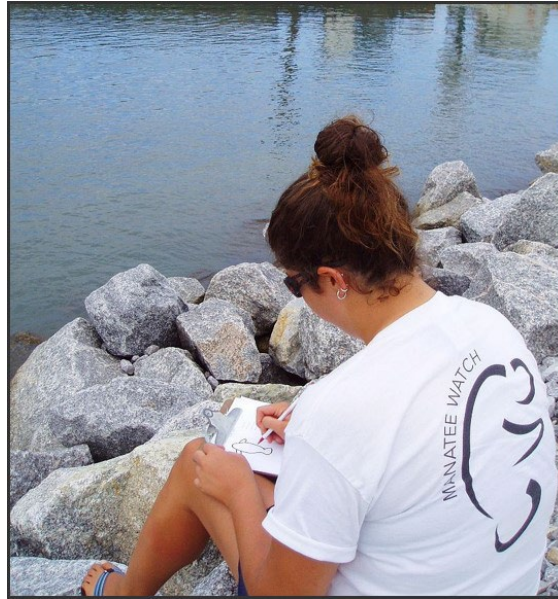


Photo: Manatee Watch Volunteer wearing the Manatee Watch logo tee-shirt

With the addition of 14 new volunteers in 2025, the number of trained Manatee Watchers throughout the years reached 505 (298 of which are active members).

Watch Volunteers submitted 23 sighting reports in 2025, some of which consisted of two or more animals per sighting and multiple behaviors. A total of 151 manatees were documented. There was one deceased animal reported and no cases of injured animals reported. Three satellite tagged animals were reported to FWC. Sighting reports were submitted by 9 different volunteers, in which manatees were documented in several different bodies of water, including one observed in Brevard County. Volunteers reported spending 5.3 hours conducting manatee observation, which is valued at \$184.39.

Volunteers submit their data from their computers or smart phones through the webpage at www.volusiamanatees.org. See figures 3-5 for a breakdown of data collected from the volunteers.

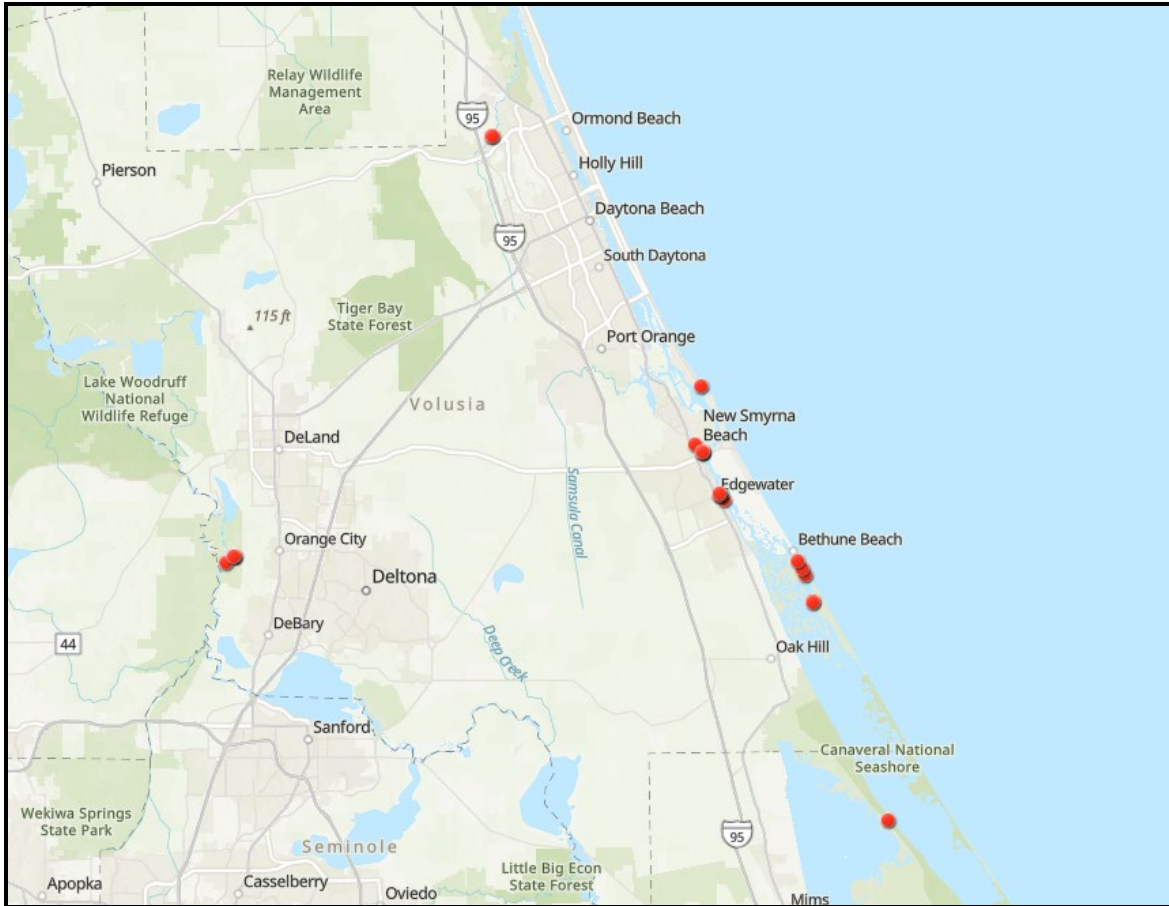


Figure 3: Screenshot of 2025 Map of manatee sighting locations submitted through the GIS online data report.

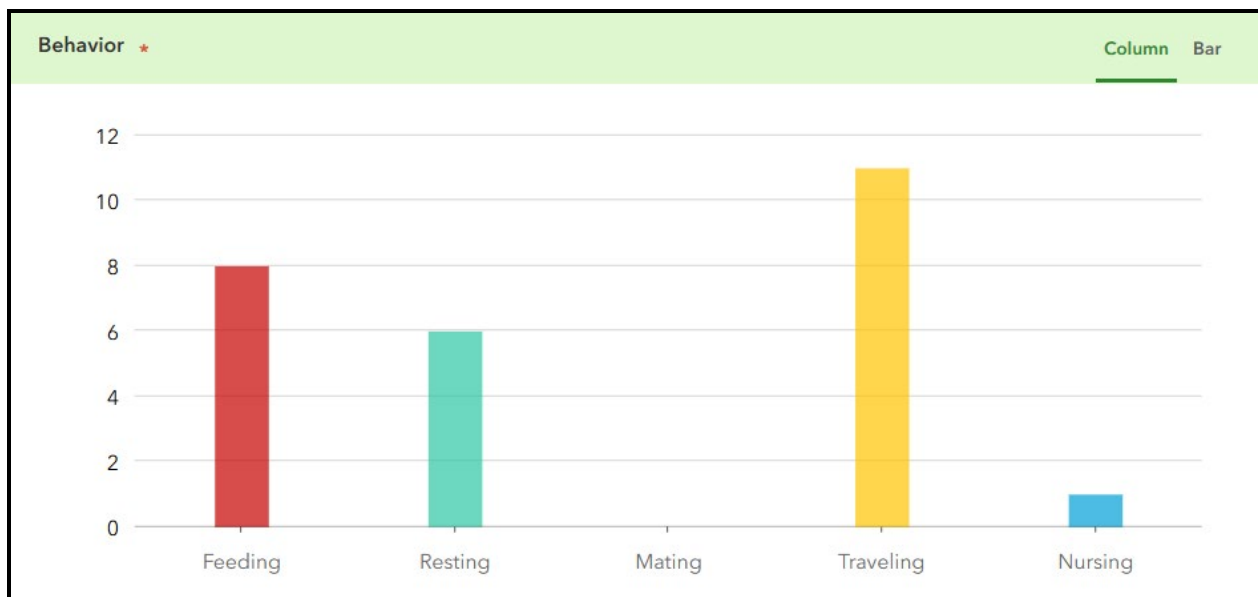


Figure 4. Chart of Manatee behaviors documented. 8 feeding, 6 resting, 0 mating, 11 traveling and 1 nursing.

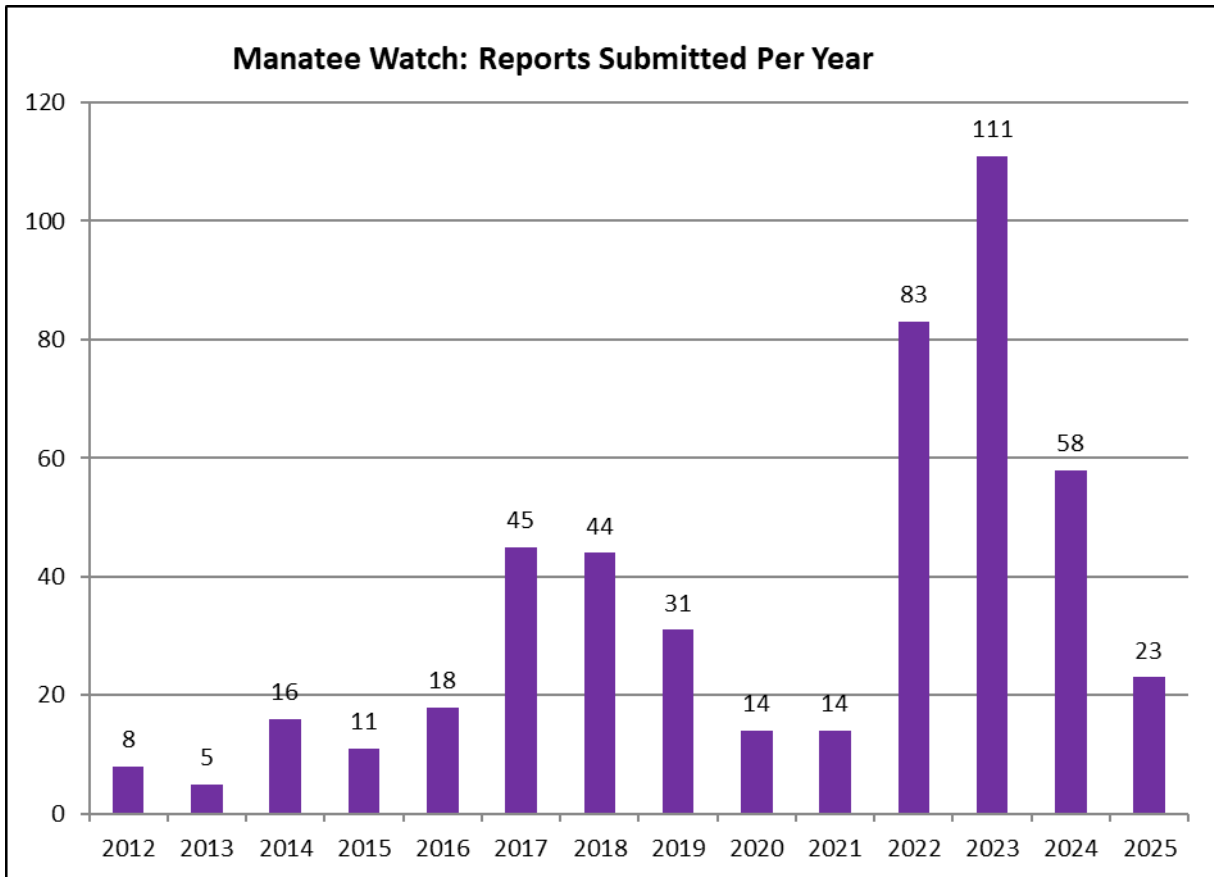


Figure 5. Chart showing volunteer reports submitted from 2012 – 2025.

Figure 5 chart

Year	Number of reports
2012	8
2013	5
2014	16
2015	11
2016	18
2017	45
2018	44
2019	31
2020	14
2021	14
2022	83
2023	111
2024	58
2025	23

The Manatee Watch Program is fortunate to have a dynamic group of volunteers with varied experience and knowledge working to collect manatee sighting information throughout the county. A well-trained group of volunteers can gather more information and cover more territory than staff members alone would be able to do, and they provide a valuable service to the county's Manatee Protection Program. From this data, we gain a better understanding of how manatees use Volusia County waterways and information such as behavior, size, associations, movement, and even individual identification, which all proves to be extremely valuable in making management decisions. Manatee Watchers have also proven themselves to be invaluable by alerting staff when they observe a manatee that is injured or in distress. This is a great asset for our Marine Mammal Stranding Team's ability to respond quickly to potentially compromised manatees in our waterways.

The Manatee Watch program continues to grow and adapt in response to incoming volunteers, new data, and participation in beneficial collaborative efforts.



Photo: Tagged manatee traveling near Haulover Canal Bridge, reported by MW volunteer Kelly Waller

BLUE SPRING STATE PARK INTERAGENCY MANATEE OBSERVER PROGRAM

In 2014, MPP staff held the first Manatee Observer training, which is a more advanced level of Manatee Watch and only available to trained volunteers at Blue Spring State Park. The program is a cooperative effort between Park volunteers, park staff, and volunteers from Save the Manatee Club (SMC), Clearwater Marine Aquarium Research

Institute (CMARI) and Volusia County Manatee Watch. The goal of the Blue Spring Manatee Observer (MO) program is to provide trained volunteers to assist Blue Spring Park rangers with education and to reduce human interactions with manatees during the summer months (March – October). This is when the manatees are often sharing the swim area of the spring run with people and constant observation and education is essential. Ideally, there is a volunteer in a kayak and one on the boardwalk or on the swim/diver entry dock to provide park visitors with information and answer questions about the manatees. The presence of the MO volunteers also helps to prevent manatee harassment by swimmers and divers, which is especially important when mothers enter the spring with their new calves or they are in need of a safe environment for giving birth.

MO volunteers interested in observing by kayak, are required by the Florida Park Service, managed by the Department of Environmental Protection (DEP) to attend an additional mandatory kayaking skills and safety course, conducted by an American Canoe Association (ACA) certified level two kayak instructor. They also must complete the US Boater Safety course online.

In 2025, three in-person new member Manatee Observer training sessions were conducted at Blue Spring State Park by MPP, BSSP, SMC & CMARI staff members. The program now has 63 active observers, most of which are approved to use kayaks while observing. In 2025 manatee observers contributed approximately 2,000 hours of volunteer time at the park to ensure manatees and park guests could enjoy the water safely.



Photo: Trained Boardwalk Manatee Observer



Photo: Manatee Observer in official Manatee Observer Kayak



Photo: Manatee "Annie" and her 2025 calf.

In 1971, there were 11 manatees recorded at Blue Spring, which included one calf. In 1981 there were 36 total animals. In 2025, there was one record high count for the year, when there were 735 manatees reported at Blue Spring State Park in a single day during Save the Manatee Club's (SMC) daily manatee identification counts. The total manatees documented for the season reached 888 individuals (88 of which were calves).

Park rangers also conduct a daily count of the manatees from the boardwalk. This count is sometimes different from SMC's count as they have a different view than that of the researchers in their canoe. The park's highest count in a single day in 2025 was 932 manatees, the highest count the park has ever had. These figures clearly demonstrate the effectiveness of the manatee protections that have been put into place on the St. Johns River and at Blue Spring State Park. The number of manatees utilizing the spring as a warm water habitat also shows how important it is to maintain healthy habitat conditions in Volusia County waterways.

LIVING DOCKS PROGRAM

In 2022 MPP staff partnered with EMD Water Quality staff to begin a Living Docks (LD) Program in Volusia County. Living docks are made up of oyster mats that are attached to pilings on boat docks and/or fishing piers.

habitat for filter-feeding organisms to settle on. In return, these communities improve water clarity as well as attract larger organisms such as fish, crabs, and shrimp, creating a diverse ecosystem. (<https://www.floridaocean.org/living-docks>)

The LD team developed a pilot project modeled after a similar program in Martin County, Florida. The goal of the Volusia County LD program is to improve the water quality of the Indian River Lagoon (IRL). The purpose of the pilot project is to test the materials in various locations for productivity and get a baseline of water quality in those locations. The pilot project lasted one year starting with the deployment of mats in January 2024 and ended with a winter data collection in January 2025.

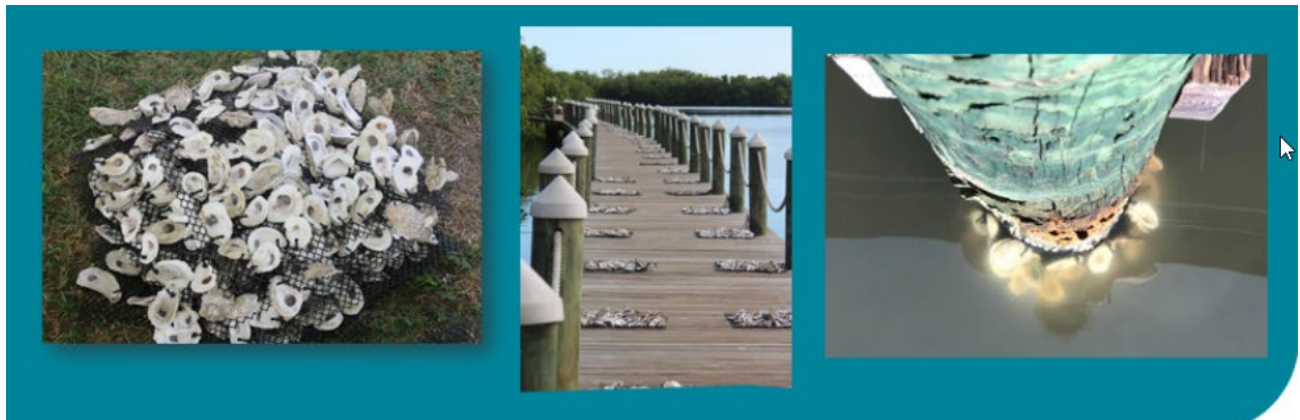


Photo: Florida Oceanographic Society Living Docks Photos

Data from the mats deployed during the pilot project revealed a significant increase in oyster and other organism growth. While oyster growth steadily increased from Spring 2024 through Winter in 2025 some of the other organism's growth varied by location and season. See Figures 6-9 for growth analysis. Note: all organisms were counted by percent coverage except for oysters which were individually counted.

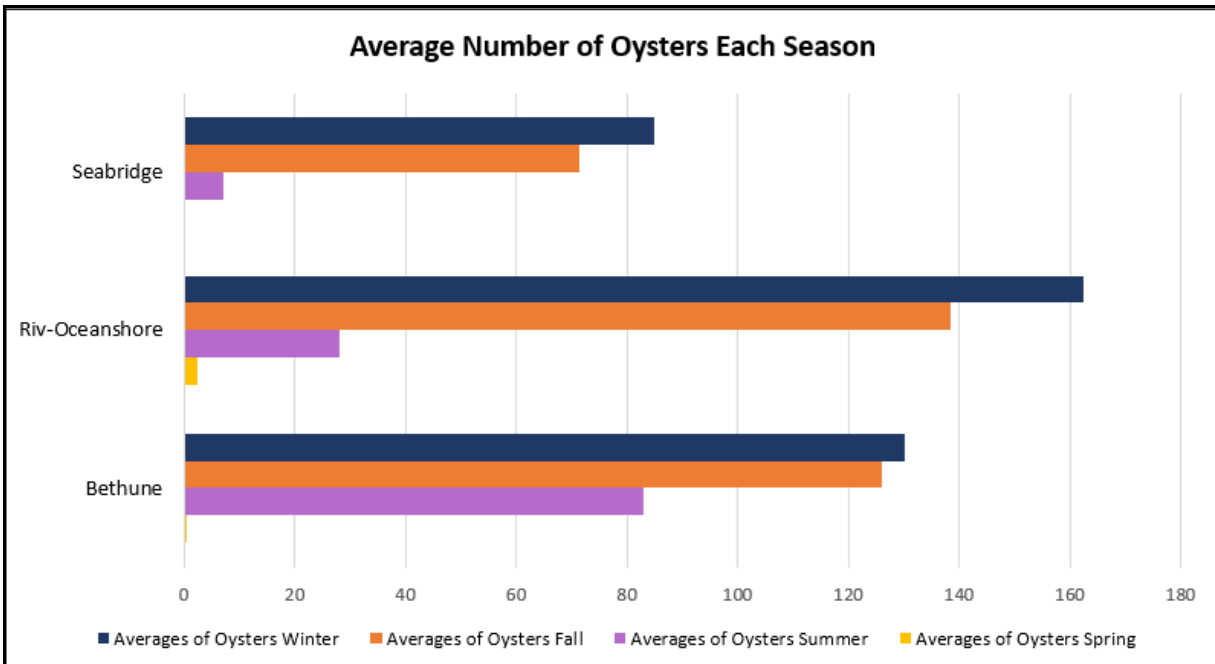


Figure 6: Average number of oysters at each location

Figure 6 chart

Locations	Spring	Summer	Fall	Winter
Bethune	0.5	83	126	130
Riv-Oceanshore	2.5	28	138.5	162.5
Seabridge	0	7	71.5	85

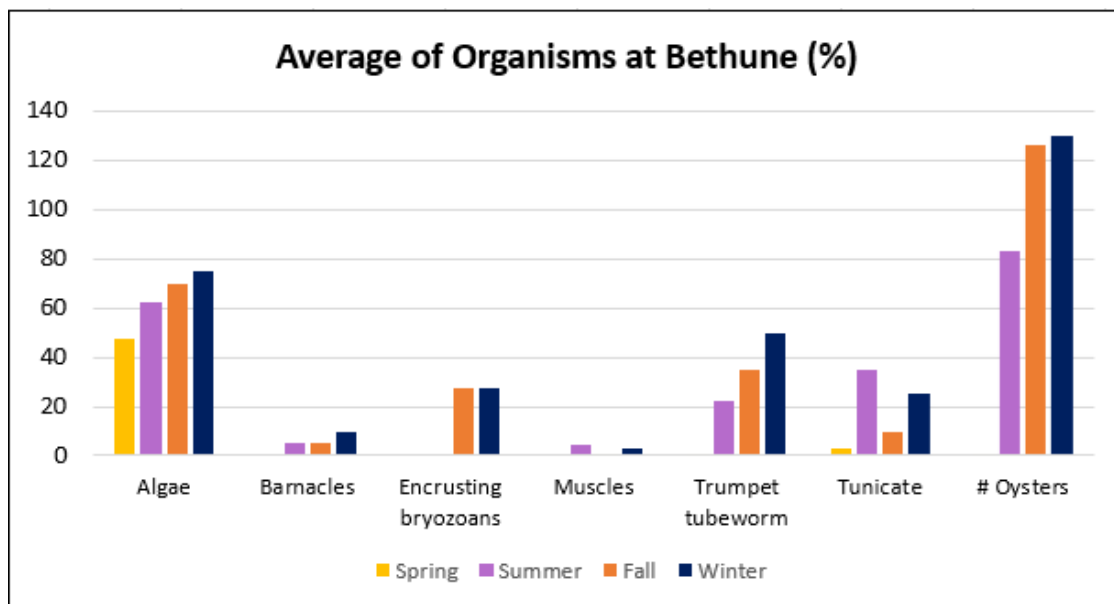


Figure 7: Average of all organisms at the Bethune location throughout the seasons.

Figure 7 chart

Organism	Spring	Summer	Fall	Winter
Algae	47.5	62.5	70	75
Barnacles	0	5	5	10
Encrusting bryozoans	0	0	27.5	27.5
Muscles	0	4.5	1	3
Trumpet tubeworm	1	22.5	35	50
Tunicate	3	35	10	25
# Oysters	0.5	83	126	130

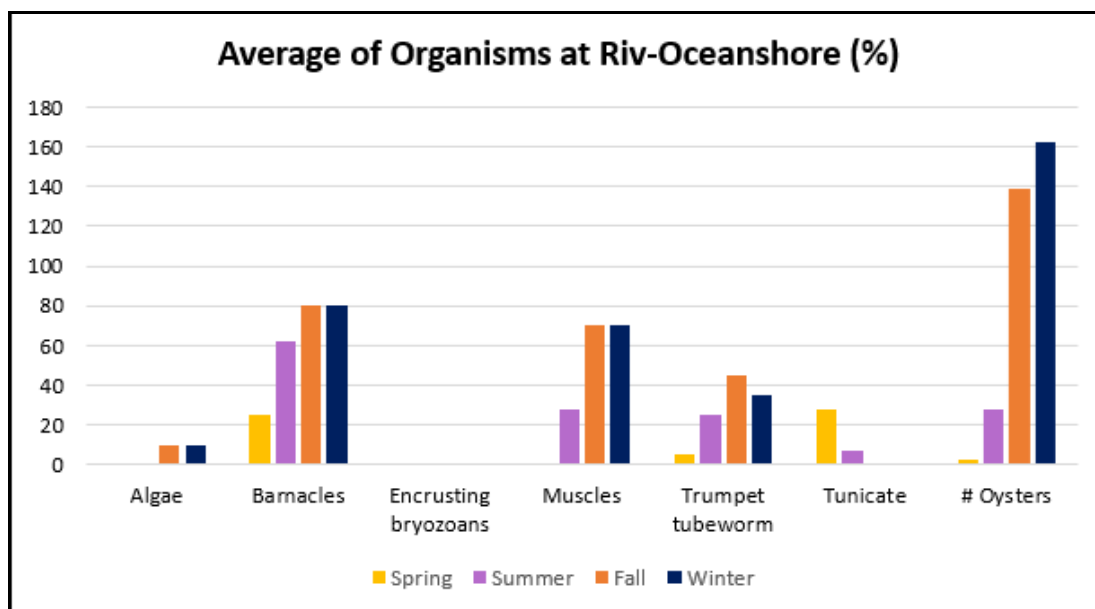


Figure 8: Average of all organisms at the Riv-Oceanshore location throughout the seasons

Figure 8 chart

Organism	Spring	Summer	Fall	Winter
Algae	0	0.875	10	10
Barnacles	25	62.5	80	80
Encrusting bryozoans	0	0	0	0
Muscles	0.5	27.5	70	70
Trumpet tubeworm	5	25	45	35
Tunicate	27.5	7.5	0	0
# Oysters	2.5	28	138.5	162.5

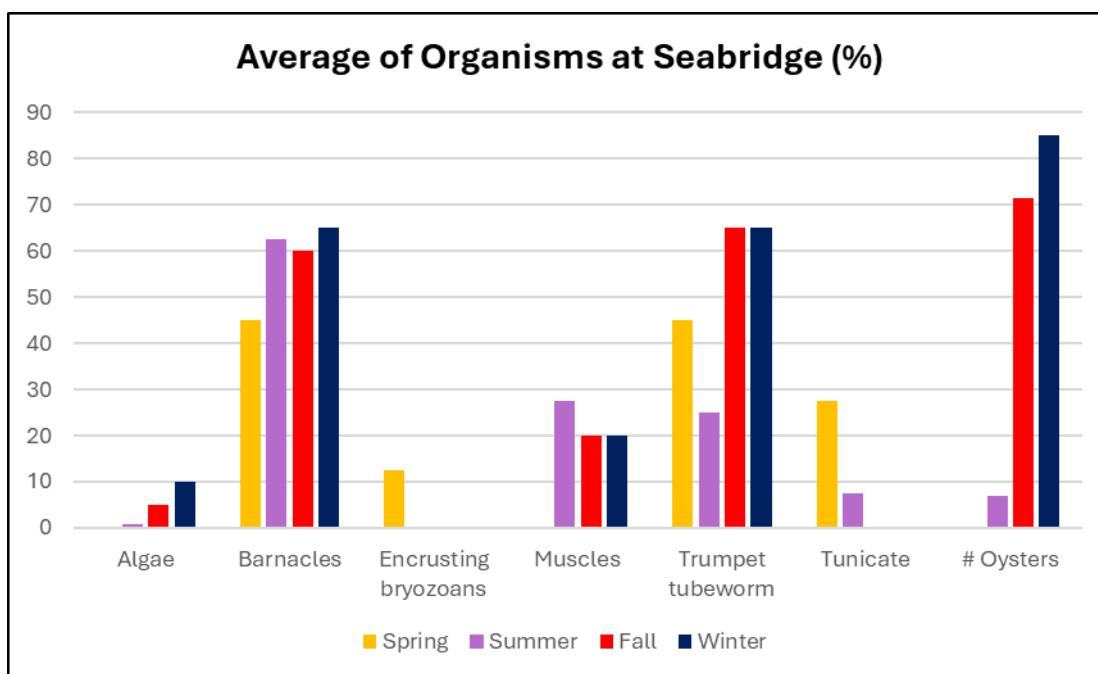
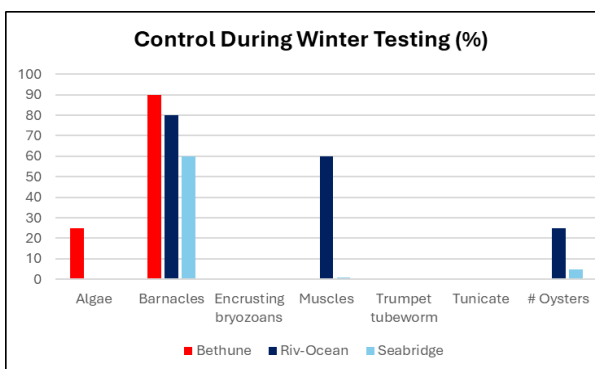
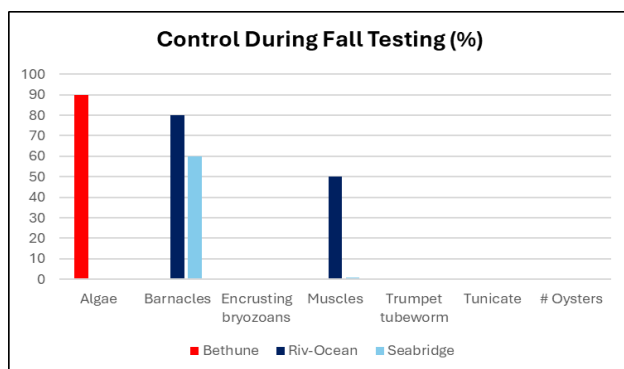
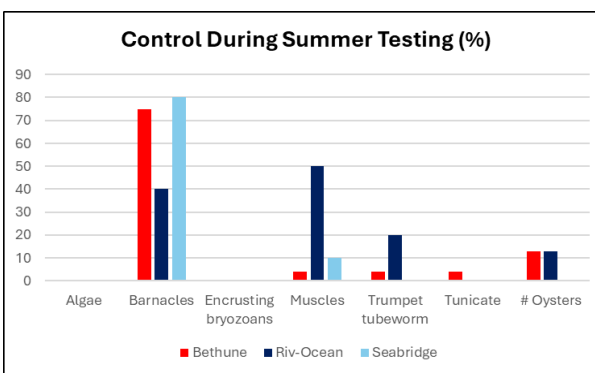
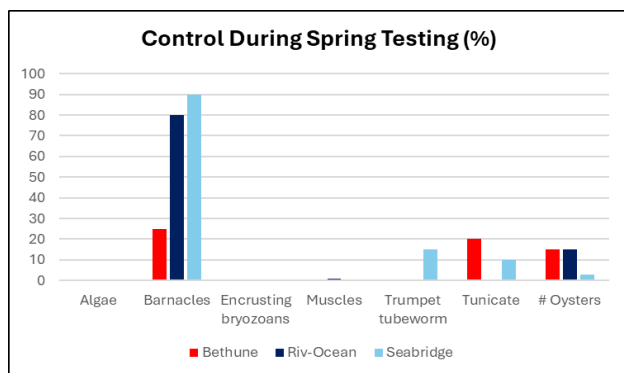


Figure 9: Average of all organisms at the Seabridge location throughout the seasons

Figure 9 chart

Organism	Spring	Summer	Fall	Winter
Algae	0	0.875	5	10
Barnacles	45	62.5	60	65
Encrusting bryozoans	12.5	0	0	0
Muscles	0	27.5	20	20
Trumpet tubeworm	45	25	65	65
Tunicate	27.5	7.5	0	0
# Oysters	0	7	71.5	85

When comparing these results to the control piling (a piling that did not receive a mat) results, there is a significant difference in growth at each of the locations. While barnacles, muscles and algae were the dominant inhabitants of the control piling throughout the study, oysters did not seem to be as successful on the control pilings as they were with the oyster mats. (Figures 10-13)



Figures 10-13: Results of growth of each organism, on the control piling, at each location from Spring to Winter.

Figures 10-13 Charts

Spring Organisms	Bethune	Riv-Ocean	Seabridge
Algae	0	0	0
Barnacles	25	80	90
Encrusting bryozoans	0	0	0
Muscles	0	1	0
Trumpet tubeworm	0	0	15
Tunicate	20	0	10
# Oysters	15	15	3

Summer Organisms	Bethune	Riv-Ocean	Seabridge
Algae	0	0	0
Barnacles	75	40	80
Encrusting bryozoans	0	0	0
Muscles	4	50	10
Trumpet tubeworm	4	20	0
Tunicate	4	0	0
# Oysters	13	13	0

Fall Organisms	Bethune	Riv- Ocean	Seabridge
Algae	90	0	0
Barnacles	0	80	60
Encrusting bryozoans	0	0	0
Muscles	0	50	1
Trumpet tubeworm	0	0	0
Tunicate	0	0	0
# Oysters	0	0	0

Winter Organisms	Bethune	Riv- Ocean	Seabridge
Algae	25	0	0
Barnacles	90	80	60
Encrusting bryozoans	0	0	0
Muscles	0	60	1
Trumpet tubeworm	0	0	0
Tunicate	0	0	0
# Oysters	0	25	5

One setback the team encountered was visibility conditions which made it difficult to definitively count and identify the organisms that grew on the control pilings. Also, when the mats were initially deployed data was collected from each of the pilings that were to be used in the study. All the organisms were calculated using percent coverage. However, during the spring testing for the purpose of this study, the team felt it would be better to gather an exact count of oysters. The initial deployment data was not included in these results to avoid confusion.

Overall, the results from this study show that, over the 1-year period, oyster mats on pilings were an effective method in recruiting a diversity of organisms and providing habitat for oysters.

Future studies will consider a non-plastic alternative to the mats that were used during this project so that it can expand into a potential volunteer-based program where citizens and/or business owners can use oyster mats on their docks to improve our water quality and marine habitat.



Photo: Members of the LD team deploying one of the mats.



Photo: Growth on randomly selected piling during Spring testing 2024.



Photo: Growth on randomly selected mat during summer monitoring 2024



Photo: Growth on randomly selected mat during fall monitoring 2024.



Photo: Growth on randomly selected mat during winter monitoring 2025

PARTNERSHIPS AND COLLABORATIVE EFFORTS

The Manatee Protection Program staff continues to participate in working groups and interagency task forces at the state and federal levels to enhance their knowledge of issues relating to scientific research, public interest, available grants, and education and outreach efforts. This also creates opportunities for collaboration with other government agencies and helps to inform staff of new initiatives. Additionally, participation allows the county to have direct input at both the state and federal level.

The Manatee Protection Program Manager is a member of the Blue Spring Interagency group which holds an annual meeting, which focusses on exotic aquatic vegetation control plans in the St. Johns River and the potential impact this activity may have on manatees. At these meetings, partners review maps and an annual herbicide spray schedule. Plans are adjusted as deemed necessary to avoid over spraying areas and to ensure enough food sources are available for manatees using the nearby habitat. Attending agency staff also give updates on their respective programs.

The Program manager is also a member of the Northeast Estuary Restoration Team (NERT), and the Florida Sea Grant Advisory Committee. Both of these organizations also meet at least annually and discuss topics relevant to manatee habitat improvement projects and research occurring within Volusia County waterways.

In 2025, the MPP manager attended the Interagency Manatee Protection Plan meeting where other County MPP managers and state and federal officials throughout Florida gathered to provide updates, discuss their programs and provide a professional network to assist with program management skills.

LAW ENFORCEMENT

Good coordination and communication with the law enforcement agencies responsible for enforcing manatee speed zones within the county is an essential element of manatee protection.

Staff continue to maintain contact with the different agencies to coordinate with each other to maximize their presence and effectiveness. Staff also contact the Sheriff's Marine Unit concerning manatee-related enforcement issues that arise from citizen calls, which precipitate a timely on-the-water response. For state related issues staff contact the Florida Fish and Wildlife Conservation Commission Law Enforcement.

Manatee Protection Program staff continued to provide information to the public regarding manatee speed zones in an effort to decrease the number of manatee injuries and mortalities caused by boat strikes. While enjoying Florida's waterways, boaters often pass through manatee speed zones. Especially for the many people visiting or new to Florida, it can be hard to know what areas of waterbodies have manatee protection zones. In 2018, the County developed an interactive map that provides users with digital access to manatee speed zones. While enjoying Florida's waterways, boaters can use the interactive map to zoom in to the area they are interested in or enter a nearby address or landmark in the search box, to advance to the location. A link to the interactive map can be found on the Volusia County Manatee Speed Zone webpage, <https://www.volusia.org/services/growth-and-resource-management/environmental-management/natural-resources/florida-manatee/manatee-speed-zones.stml>. Staff continue to promote a QR code at festivals. Visitors can quickly scan the code with their smart phones and save the link for easy access while on the water.

Future efforts to improve ease of use for users will be to create a smartphone app for this purpose.

Know your Manatee Speed Zones

Scan the QR Code or visit www.volusia.org/manatees for our interactive Manatee Speed Zones Map

Screen Shot: Sign created to display at festivals for access to speed zone app.

MARINE MAMMAL STRANDING TEAM

The purpose of the Volusia County Marine Mammal Stranding Team (VCMMST) is to provide a quick and organized local marine mammal stranding response which is vital to the survival of live stranded marine mammals by offering them the best chance at successful rescue and rehabilitation. It also allows for the timely collection of data and disposal of dead animals. Collection of data from dead stranded marine mammals provides an opportunity to learn about the life history, ecology and health of species that are inherently difficult to study in the wild. These animals also serve as indicator species and serve to gauge the health of our marine ecosystems.

Marine Mammal Stranding Team members are county employees, which provides for continuity in team membership and facilitates increasing the level of training and expertise of the Team as a whole. The Stranding Team works closely with the County's Water Quality Program, the Sea Turtle Program, Beach Safety, the Marine Science Center, and the Marine Discovery Center of New Smyrna Beach. The Stranding Team is an effective catalyst for gathering stranding data efficiently and then removing stranded animals from the beach or waterways as quickly as possible. This in turn elicits an interest in marine mammals from visitors and provides a method for distributing information about marine mammal strandings to the public.

The Volusia County Stranding Team is authorized through the Hubbs-SeaWorld Research Institute's (HSWRI) Stranding Agreement with the National Oceanic and Atmospheric Administration (NOAA) Marine Fisheries Service when responding to cetacean (dolphins and whales) calls. Team members work extensively on increasing their level of knowledge and experience, and because of this hard work and dedication, the Stranding Team maintains a "Designee" status under the HSWRI Stranding Agreement.

When responding to manatee calls, the Stranding Team takes directions from the Florida Fish and Wildlife Conservation Commission (FWC). In 2008 the Stranding Team applied for and received a Letter of Authorization from the U. S. Fish and Wildlife Service (FWS) for the designation of manatee "Verifier", which allows team members to be first responders to manatees under the direction of FWC staff. The Team continued to work extensively with FWC staff; both with the Jacksonville Field Station (FWC-NEFL), and with the FWC Melbourne Station (FWC-ECFL). In 2021, in addition to "Verifier" staff applied for and were granted a "Rescuer" status. With this new status, the team is authorized to respond to reports of injured and/or distressed manatees and can initiate hands-on rescue as needed, after consultation and direct authorization from FWC.

MMST TRAINING:

The Team welcomed eleven (11) new members in 2025. New members are required to attend training presentations including information on Stranding Team protocols and basic marine mammal biology. New members are included in a monthly on-call calendar as members in training. Typically, two Team members respond to each stranding event, however, members in training accompany an experienced Team member until they have reached a certain level of competence so sometimes; there are more than two responders. In addition, when a stranding requires a higher level of Team member response, more than two members may be necessary to handle the event. At those times, other Team members, Hubbs SeaWorld (HSWRI) volunteers and FWC volunteers may also respond.

The Stranding Team regularly works with Hubbs SeaWorld and FWC trained volunteers to provide the highest level of trained responders possible. In 2023 a new level to the team structure was added. A level I team member is required to attend the New Member Training. A level II member has completed the training, finished all required reading materials, participated in three open water net set captures, three cetacean necropsies, shown proficiency in collecting scientific data and genetic sampling, and has been on the stranding team for at least 1 year. Finally, a level III member has completed all level II requirements and participated in a total of five necropsies. At the end of 2025 the team had 15 level I members, 4 level II and 5 level III members which includes the MMP Program Manager and Associate.

In addition to New Member Training, all team members are required to attend Habitat Conservation Plan (HCP) training from Sea Turtle Program staff to ensure that they understand the proper regulations and safety precautions for driving on beaches when conducting a standing response during the sea turtle nesting season and in accordance with the HCP.

The Team has four stranding kits located throughout the county. The kits are in strategic places so that when a stranding occurs, the responding team members can access equipment quickly and are fully equipped for any situation. The VCMMST coordinator regularly takes inventory and restocks all the kits to ensure that they are fully stocked with all necessary stranding event supplies.

HEALTH ASSESSMENTS:

For several years, the United States Geological Survey (USGS) research staff led manatee captures and health assessments at Crystal River in conjunction with FWC, University of Florida veterinary and marine programs students, researchers, and stranding teams. These assessments consisted of shoreline net sets, morphometric work ups, ultrasonography for skin and blubber thickness, photography for individual identification, pit-tagging, blood collection for health assessment and various studies, respiratory and heart rate monitoring, etc.

Manatee health assessments provide a significant learning experience for VCMMST members because they acquire invaluable knowledge about, and experience with live animal handling and capture techniques. During the assessments, members have the opportunity to help with the capture net, transference of animals from the capture location to the medical tents, as well as the release of the animals. Some may also have the chance to help with respirations, giving oxygen, monitoring carbon dioxide, taking blood samples and inserting pit tags.

Unfortunately, health assessments were not held in Volusia County or neighboring counties in 2025. However, assessments did continue in other areas of Florida as well as other states.

Every year VCMMST members are also provided with an opportunity for an open water net set training. FWC staff from the East Central Florida Field Station hold a classroom session covering capture methods via a PowerPoint presentation and then conduct a hands-on field training class in a boat. To date, almost all VCMMST members are net-set trained. In 2025 eight members of the team attended this training in Jacksonville, FL.

The VCMMST Associate continued to assist with HSWRI's dolphin photo identification surveys in 2025. Assistance included captaining the research boat and recording habitat and behavioral data while HSWRI staff photographed the animals. MPP staff continues to practice photographing, to further assist during these routine surveys.

Every year Volusia County staff conducts a Marine Mammal First Responder training for new and returning Volusia County Beach Safety (VCBS) emergency medical technicians (EMT's) and lifeguards. Since they patrol the beach daily, they are often the first on scene when a stranding occurs. During the First Responder training, MPP staff gives a brief background on the VCMMST and its partners (HSWRI & FWC). They go over common cetacean identification and teach basic stranded marine mammal response procedures for manatee and cetacean strandings. In 2025, four training classes were conducted reaching over 40 VCBS staff members.

EDUCATION:

MPP staff and volunteers participated in several other educational opportunities in 2025 including:

Human Interaction (HI) Virtual Training course. Topics during this presentation included what HI evaluations are, what the importance of collecting HI data is from a management perspective, gear analysis, and a thorough look into the types of HI and HI lesions.

The FWC Spring 2025 Manatee (2 -day) Forum. Topics included river water control structures, Florida Manatee interactions with fisheries gear and marine debris, seagrass habitat monitoring, springs protection zones and water control structure manatee protection systems.

The National Marine Mammal Stranding Network meeting which focused on a vast number of marine mammal protection efforts and studies, stranding event techniques and improvements, animal health studies and more.

STRANDING RESPONSES:

In 2025, the VCMMST responded to 52 stranding calls. There were 10 cetacean calls (8 Bottlenose dolphins, one Striped dolphin and one Short-finned Pilot whale), 39 sirenian (manatee) calls, two calls where team members were sent to retrieve a satellite tag that had fallen off a manatee and one call that was reported as an entangled dolphin but turned out to be a lifeguard marker flag. (Figure 14).

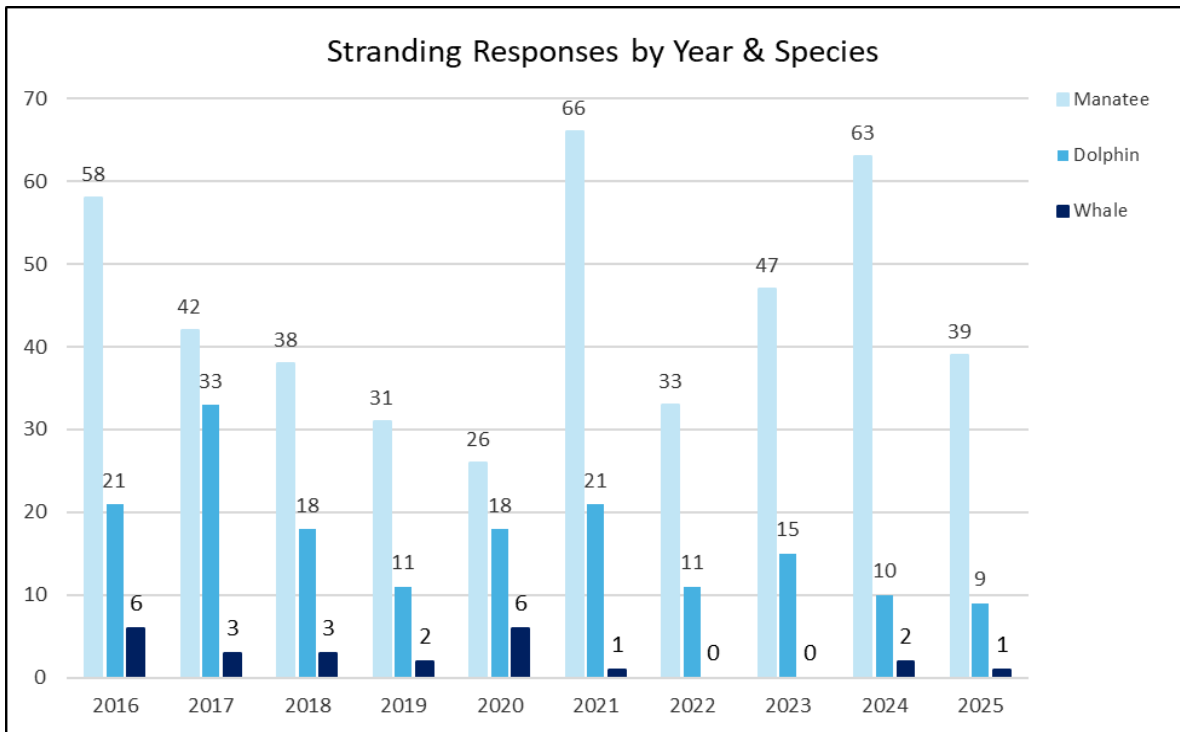


Figure 14. Chart showing the Volusia County stranding responses by year, 2016 - 2025.

Figure 14 Chart

Year	Manatee	Dolphin	Whale
2016	58	21	6
2017	42	33	3
2018	38	18	3
2019	31	11	2
2020	26	18	6
2021	66	21	1
2022	33	11	0
2023	47	15	0
2024	63	10	2
2025	39	9	1

Of the 10 response attempts for cetaceans, there were two (2) live cetacean stranding rescues, three (3) responses where staff could not find (CNF) the animal. One (1) case where the animal was found alive and in need of additional monitoring due to an entanglement in monofilament line. Two (2) calls for deceased animals that required either partial or full necropsies, and two (2) more cases where the carcass was retrieved for HSWRI pickup and transferred to their lab for a necropsy. (Figure 15).

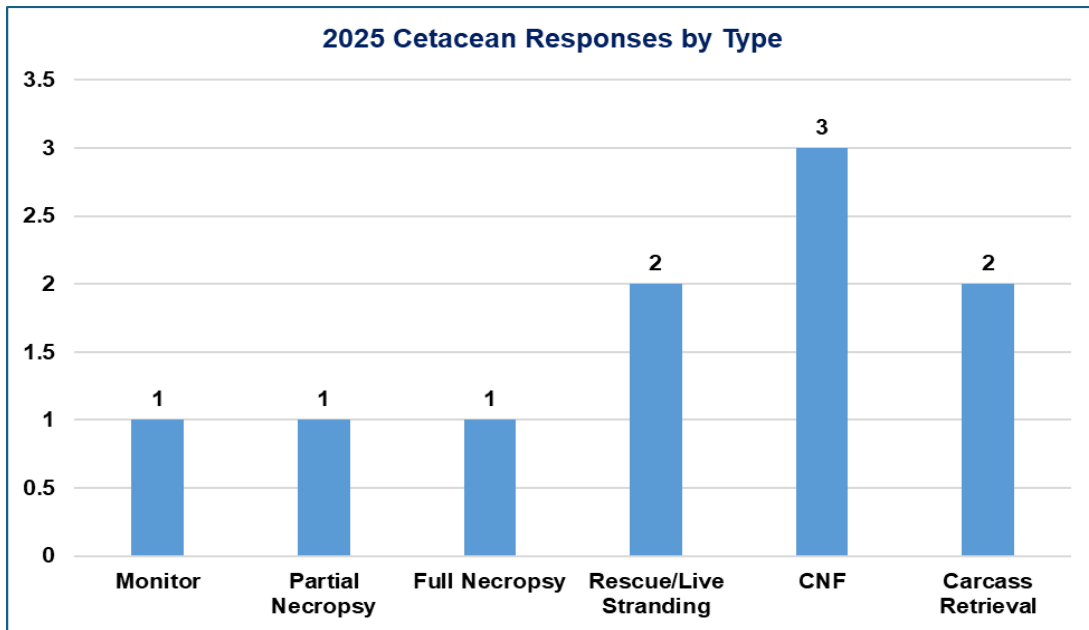


Figure 15. VCMMSST Cetacean responses by type

Figure 15 chart

Cetacean Responses	2025
Monitor	1
Partial Necropsy	1
Full Necropsy	1
Rescue/Live Stranding	2
CNF	3
Carcass Retrieval	2

In 2025, the Volusia County Marine Mammal Stranding Team responded to 39 manatee response calls (Figure 16).

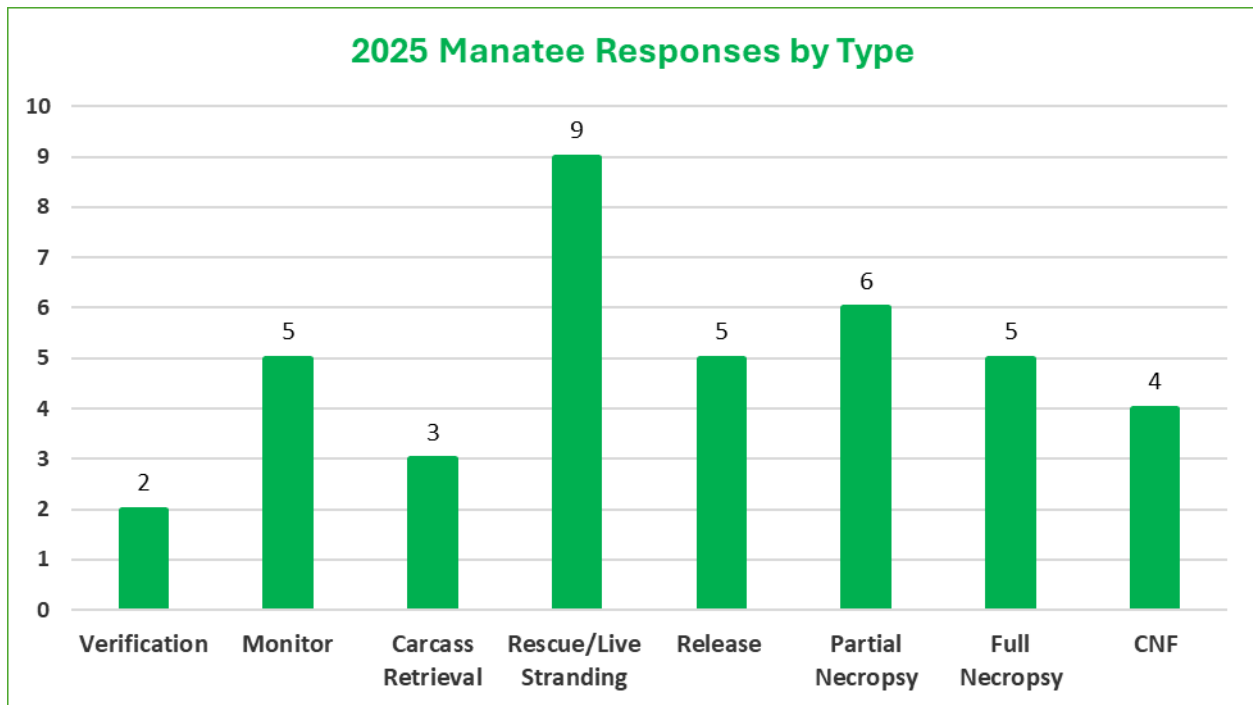


Figure 16. VCM MST Manatee responses by type

Figure 16 chart

Manatee Responses	2025
Verification	2
Monitor	5
Carcass Retrieval	3
Rescue/Live Stranding	9
Release	5
Partial Necropsy	6
Full Necropsy	5
CNF	4

Nine (9) of the calls were for live responses and rescues. Six (6) calls were in response to calls by concerned citizens, in which the staff could not find (CNF), or the manatee was located but appeared to be showing normal behavior. During five (5) of the responses, the animal needed additional monitoring to determine if a rescue attempt should be coordinated. Three (3) calls were for carcass retrieval which involved team members locating the carcass, towing it by boat to the nearest boat ramp or dock, and securing it for FWC retrieval. There were six (6) partial necropsies and five (5) full necropsies. During full field necropsies, VCM MST members transferred the carcasses to a remote location, took before photos, measurements, conducted an internal and external exam, and collected genetics and other samples. During partial necropsies, a less in-depth internal exam was required. Team members also assisted other agencies with five (5) rehabilitated manatees which were released back into the wild.

The following charts show the totals of strandings for each species, including Bottlenose dolphins (*Tursiops truncatus*), manatees (*Trichechus manatus latirostris*), one Stripped dolphin (*Stenella coeruleoalba*) and one Short-finned Pilot whale (*Globicephala macrorhynchus*) (Figure 17), their stranding locations within Volusia County (Figure 18) and the breakdown of strandings per city (Figure 19).

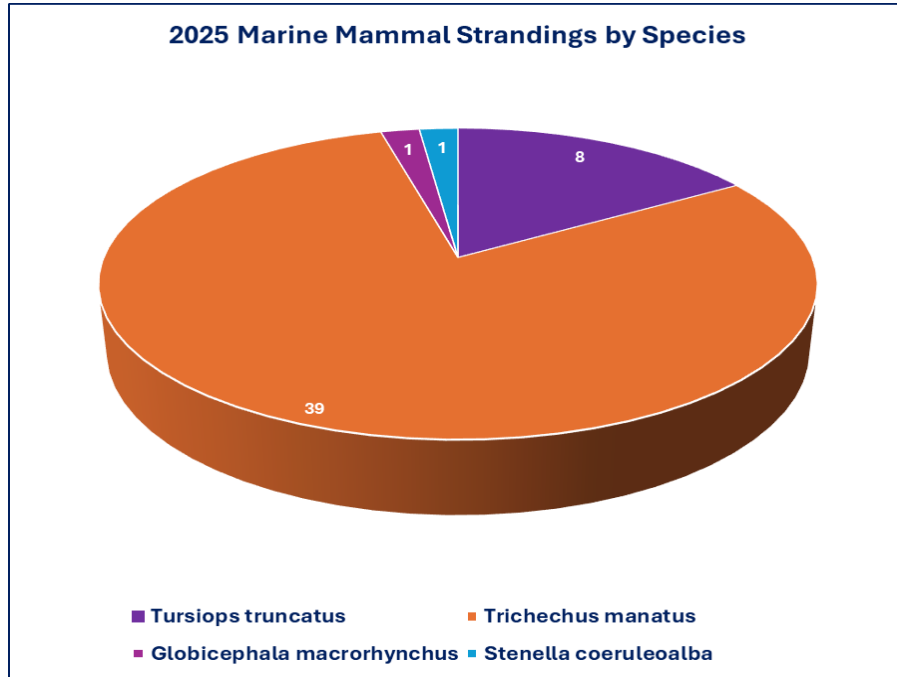


Figure 17. Species strandings percentage for 2024 (14% Bottlenose Dolphins, 84% Florida Manatees and 1% for each of the Whales).

Figure 17 chart

Marine Mammal Species	2025
<i>Tursiops truncatus</i>	8
<i>Trichechus manatus</i>	39
<i>Globicephala macrorhynchus</i>	1
<i>Stenella coeruleoalba</i>	1

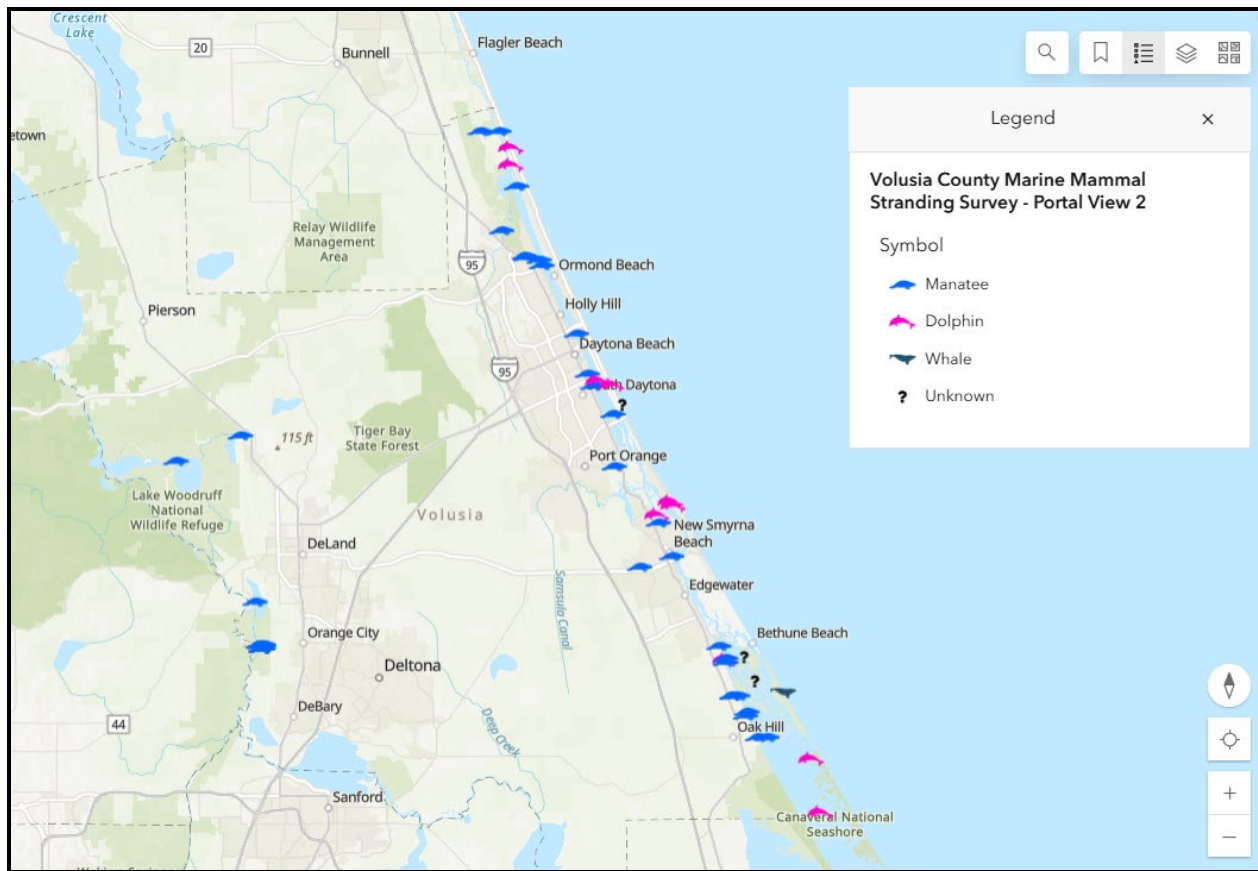


Figure 18: Screen shot of interactive online database showing 2025 stranding locations within Volusia County and nearby counties.

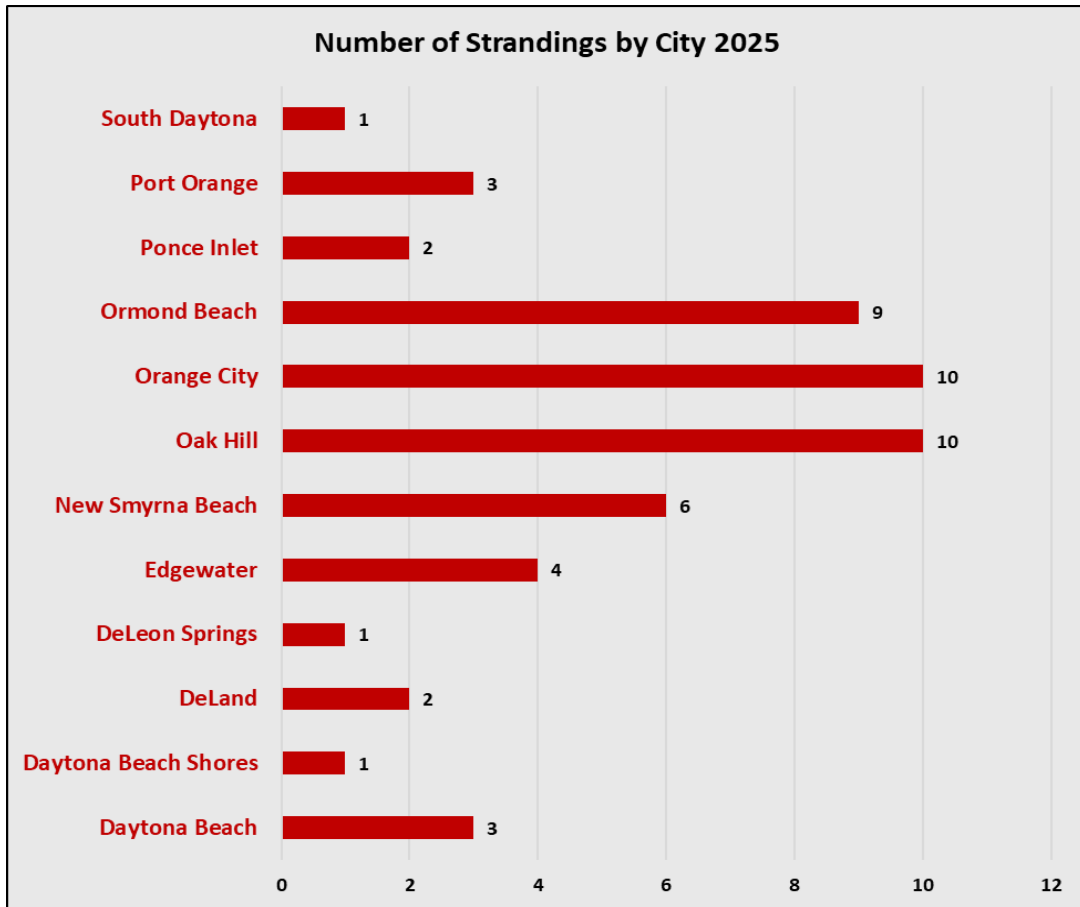


Figure 19. Number of stranding calls by city

Figure 19 chart

City	2025
South Daytona	1
Port Orange	3
Ponce Inlet	2
Ormond Beach	9
Orange City	10
Oak Hill	10
New Smyrna Beach	6
Edgewater	4
DeLeon Springs	1
DeLand	2
Daytona Beach Shores	1
Daytona Beach	3

Seasonal patterns of stranding calls often occur in marine mammal species. For example, in the winter in Florida, there is often a rise in response calls due to cold stressed manatees. During the spring months, when more anglers are out on the water many calls come in for mating herds, orphaned or deceased manatee and dolphin calves, or entangled animals. In Volusia County, these patterns are seen but vary throughout the years depending on how cold our winters are, along with other various factors that may affect mating seasons, calving seasons, etc. See figure 20 for the fluctuations throughout the seasons for the past five years.

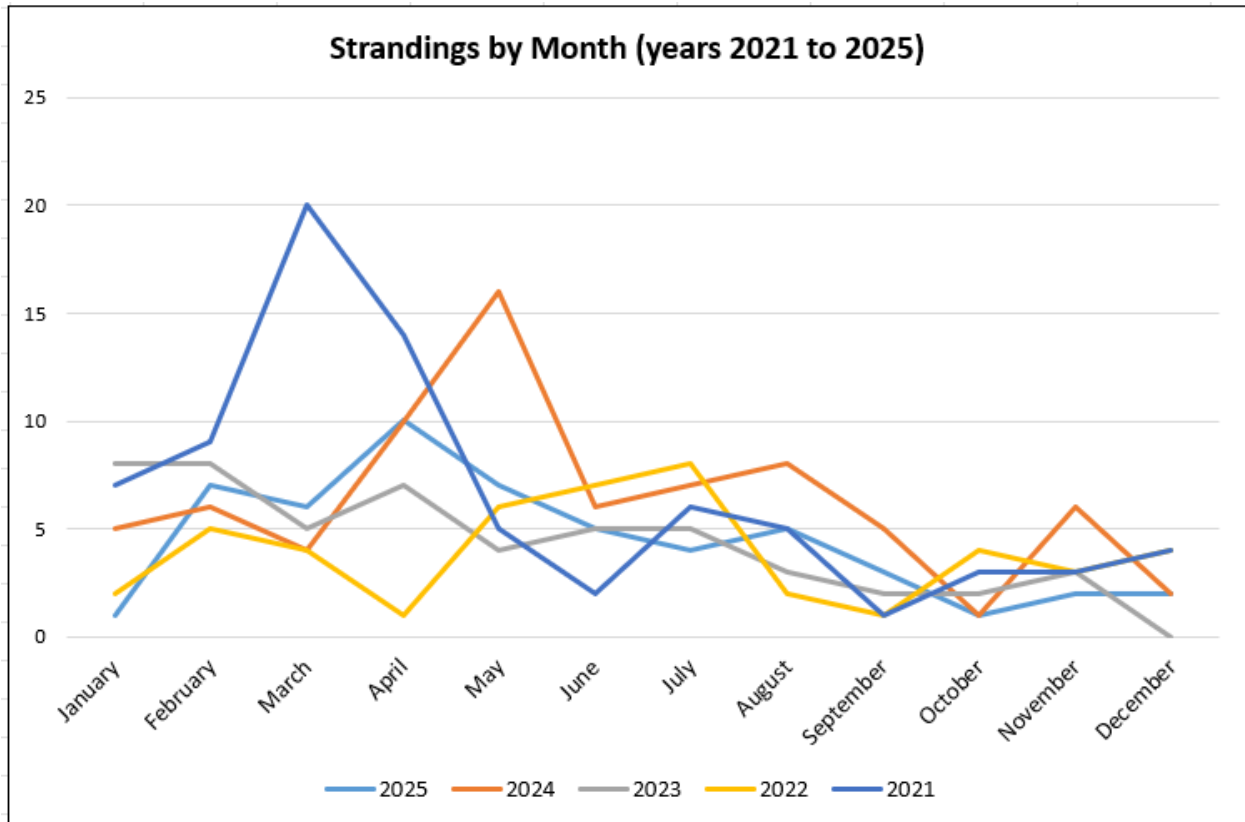


Figure 20: Seasonal stranding call fluctuations

Figure 20 chart

Month	2025	2024	2023	2022	2021
January	1	5	8	2	7
February	7	6	8	5	9
March	6	4	5	4	20
April	10	10	7	1	14
May	7	16	4	6	5
June	5	6	5	7	2
July	4	7	5	8	6
August	5	8	3	2	5
September	3	5	2	1	1
October	1	1	2	4	3
November	2	6	3	3	3
December	2	2	0	4	4

The following are photos from marine mammal responses that VCMMST members assisted with.



Photo: Stripped dolphin stranded, deceased in Daytona Beach



Photo: Emaciated, positively buoyant, manatee rescue at DeLeon Springs (VCMMST members in red)

MANATEE MORTALITY

The Florida Wildlife Research Institute (FWRI), which is the research branch of the Florida Fish and Wildlife Conservation Commission (FWC), maintains an on-line manatee mortality database. This database indicates that in 2025 there were a total of 632 manatee mortalities throughout the state of Florida, of which 38 were in Volusia County. This is a decrease in 20 from the 2024 reports (58). This total includes all categories of mortality, including human interaction (HI) related deaths, as well as deaths from natural causes. Of the 38 manatee mortalities counted in Volusia County in 2025, nine (9) were due to watercraft strikes, which includes both propeller related injuries and blunt force trauma resulting from the impact with an engine, prop, boat hull, or other structural part of a boat (Figure 21).

There were nine (9) more mortalities listed as perinatal deaths in 2025. The term perinatal refers to the size of the animal rather than a cause of death and is an animal less than 150 cm (5 ft.) in total length, which was not determined to have died due to human-related causes.

Other mortality causes included two (2) that died of natural causes, such as heart conditions or age, four (4) undetermined cause of death, and twelve (12) animals that were not recovered and could not be necropsied to determine cause of death. There were two (2) mortalities caused by cold stress and zero (0) non-boat-related human interaction (HI) caused deaths, e.g., starvation from plastics or fishing line ingestion.

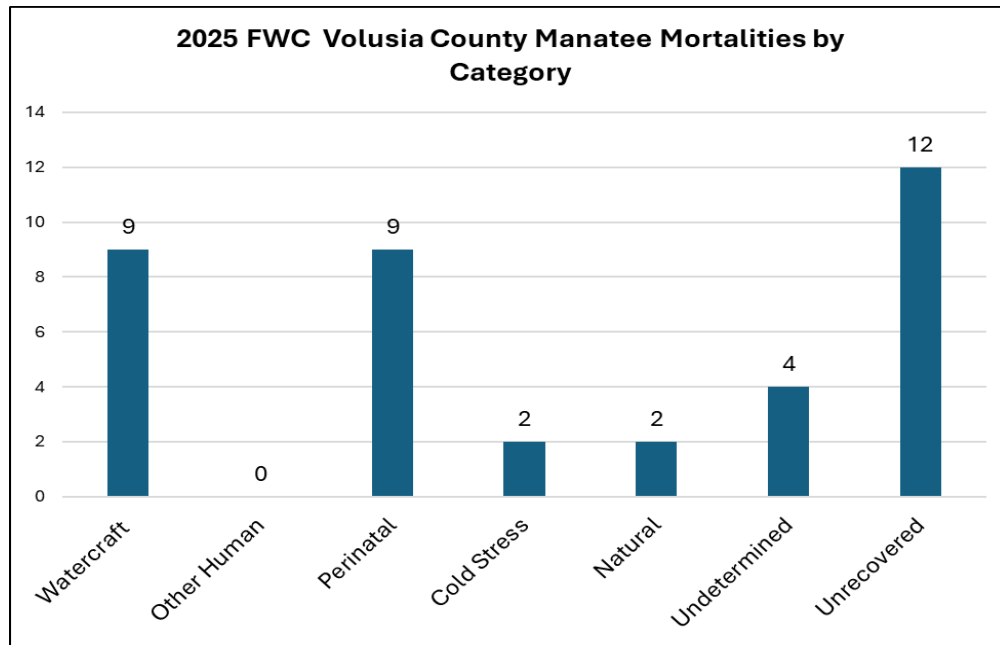


Figure 21. FWC Volusia County manatee mortality by category

Figure 21 chart

Category	2025
Watercraft	9
Other Human	0
Perinatal	9
Cold Stress	2
Natural	2
Undetermined	4
Unrecovered	12

The total number of manatee mortalities in Volusia County in all categories have fluctuated over the years. However, the largest mortality cause of death to manatees are typically caused by watercraft injuries.

Statewide, the total number of manatee deaths and the number of manatee mortalities caused by watercraft decreased in 2025. However, throughout the years we continue to see these numbers fluctuate (Figure 22).

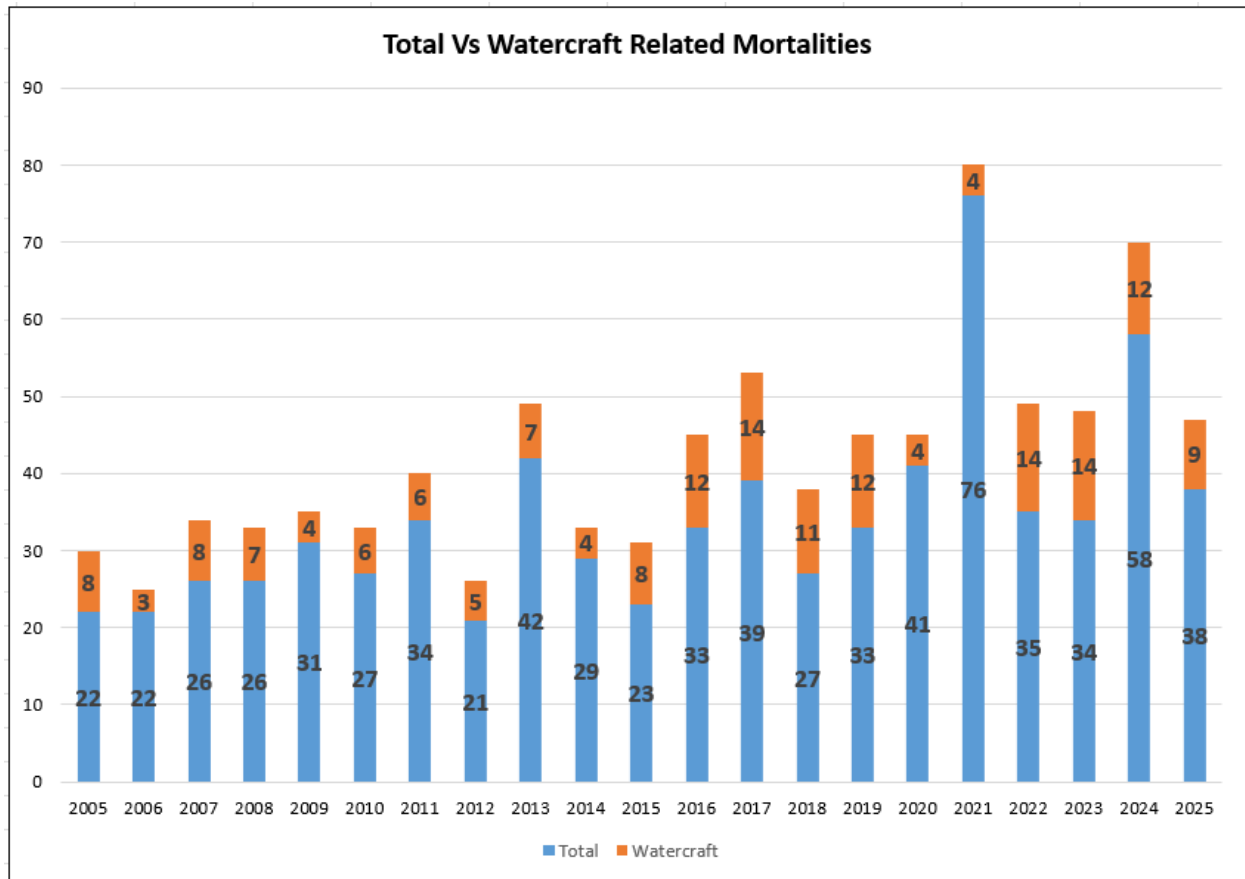


Figure 22. Volusia County total manatee mortalities vs watercraft manatee mortalities through the years 2005-2025.

Figure 22 chart

Year	Total	Watercraft
2005	22	8
2006	22	3
2007	26	8
2008	26	7
2009	31	4
2010	27	6
2011	34	6
2012	21	5
2013	42	7
2014	29	4
2015	23	8
2016	33	12
2017	39	14
2018	27	11
2019	33	12
2020	41	4
2021	76	4
2022	35	14
2023	34	14
2024	58	12
2025	38	9

A red tide, or harmful algal bloom, is a higher-than-normal concentration of a microscopic algae. In Florida and The Gulf of Mexico, the species that causes most red tides is *Karenia brevis*. The last reported red tide UME for manatees in Florida was in 2018. In 2025, there were 9 cases of confirmed manatee mortalities due to red tide effects and 41 suspected or possible cases, where the tissue samples are still undergoing testing for confirmation. No red tide mortality cases occurred in Volusia County. For more information on Red Tides visit, <https://myfwc.com/research/redtide/faq/> (Figure 23).

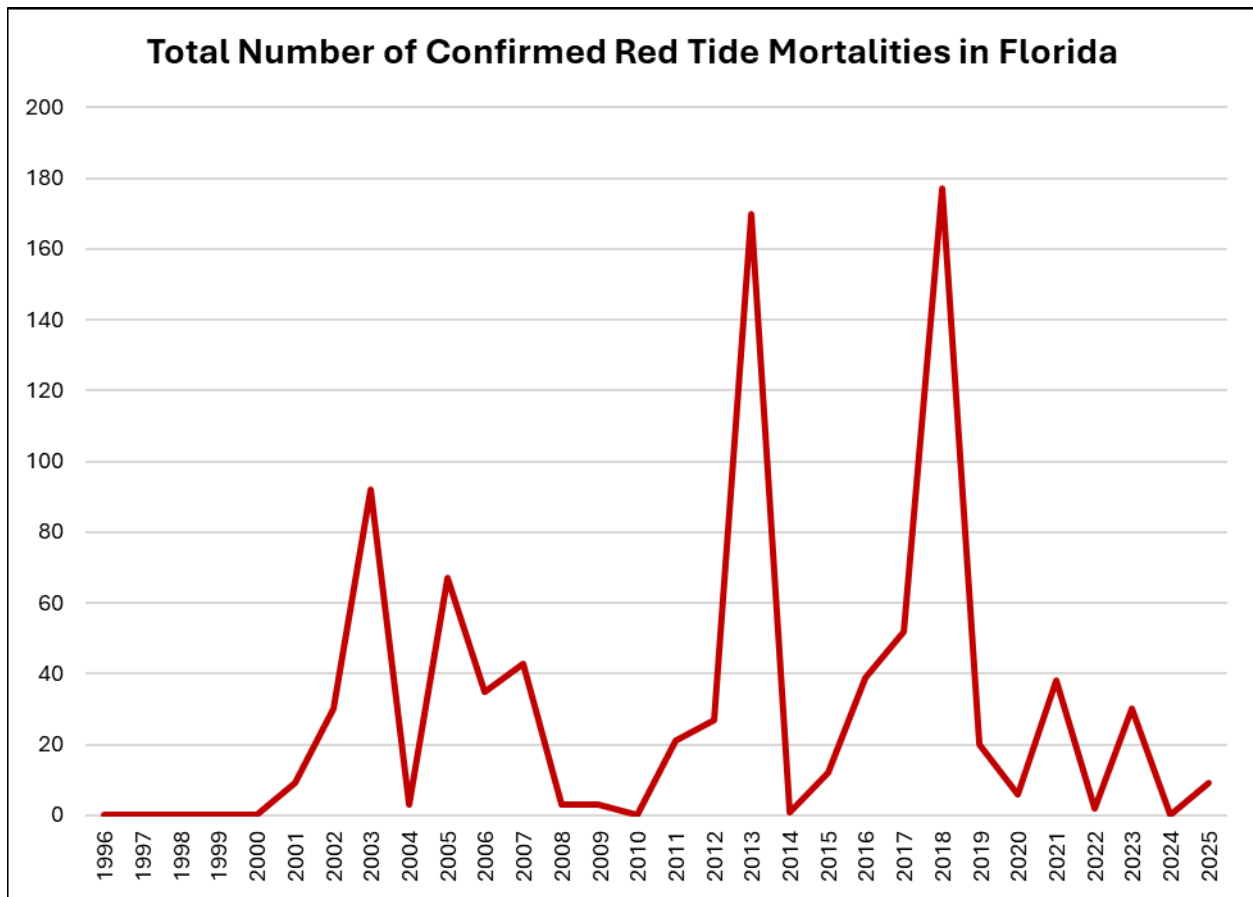


Figure 23. Total number of confirmed manatee deaths from Red Tide blooms from 1996-2025

Figure 23 Chart

Year	Confirmed Mortalities
1996	0
1997	0
1998	0
1999	0
2000	0
2001	9
2002	30
2003	92
2004	3
2005	67
2006	35
2007	43
2008	3
2009	3
2010	0
2011	21
2012	27
2013	170
2014	1
2015	12
2016	39
2017	52
2018	177
2019	20
2020	6
2021	38
2022	2
2023	30
2024	0
2025	9

For more information regarding manatee statistics visit:

<https://myfwc.com/research/manatee/rescue-mortality-response/statistics/mortality>

For more information regarding the ongoing manatee UME visit:

[Manatee Mortality Event Along The East Coast: 2020-2022 | FWC \(myfwc.com\)](#)

Phase II

BACKGROUND

Phase II of the Manatee Protection Plan for Volusia County (MPP) is the Boat Facility Siting Plan. The goal of Phase II is to provide directions to those wishing to expand or construct new marine facilities, to decrease the potential direct impact on manatees through watercraft collisions, and to minimize potential indirect impacts to manatees and their habitat.

The primary method for determining boat facility placement is the use of area specific slip-to-shoreline ratios established by a criteria-based evaluation of the manatee data and manatee habitat, by state and federal agencies. Another essential part of Phase II is the funding mechanism incorporated within the plan, which provides for increased on-the-water enforcement of manatee speed zones. The boat facility siting plan also includes site-specific criteria such as water depth, water quality, presence of submerged aquatic vegetation, zoning and land use policies, etc. Guidelines for best management practices are also included as recommendations for facility structure and management. These provisions utilized together result in a dock density that is appropriate for Volusia County.

CITY PARTICIPATION

Volusia County is essentially surrounded by water, with the Atlantic Ocean and the Intracoastal Waterway on the east side of the county, and the St. Johns River on the west side. These waterbodies, and all lakes, and tributaries connected to these primary waterways, which are traversable by manatees, are included in the Manatee Protection Plan (MPP) and covered by the provisions of the plan. On the coastal side of the county, there are ten existing municipalities with shoreline affected by the provisions of the plan, and on the west side, there are two such municipalities.

Coastal Volusia

- City of Ormond Beach
- City of Holly Hill
- City of Daytona Beach
- City of Daytona Beach Shores
- City of South Daytona
- City of Port Orange
- Town of Ponce Inlet
- City of New Smyrna Beach
- City of Edgewater
- City of Oak Hill

West Volusia

- City of DeBary
- City of Deltona

Under the MPP Phase II provisions, cities and municipalities bordering waterways along the coastal side of the County have three options that relate to boat facility siting. Those cities may:

- 1) Adopt Phase II provisions as written, referred to as the “as is” option,
- 2) Adopt a city specific refinement to Phase II’s provisions referred to as the “slip aggregation” option, or
- 3) Take no action.

Unincorporated county lands, and cities bordering the St. Johns River have two options:

- 1) Adopt Phase II provisions as written, referred to as the “as is” option, or
- 2) Take no action.

The option for slip aggregation does not apply to the west side municipalities, or to unincorporated county lands.

Since the MPP is a county specific document, and applies to unincorporated Volusia County, adoption by the cities of either the “as is” option or the “slip aggregation” option is necessary to include that city under the MPP and allow permitting to be regulated by the Phase II provisions. A decision by an affected city to take no action could result in impediments in the boat facility permitting process within that city.

Currently only one coastal city, Ormond Beach, has decided to adopt the “as is” option as outlined in Phase II of the MPP. All the other coastal cities have opted for the “slip aggregation” method, and all have endorsed the MPP and adopted resolutions to that effect. The unincorporated county, and cities with lands bordering the St. Johns River, are required by the MPP, to utilize the “as is” method if they decide to endorse the MPP provisions. Both DeBary and Deltona, the only two cities bordering the St. Johns River, have endorsed the MPP and adopted the “as is” method through resolutions of support.

Another MPP requirement of Phase II is the execution of a Memorandum of Understanding (MOU) with each participating city to outline the responsibilities of both the county and the city, and to detail the process for the permitting of boat facilities. All the affected cities have executed MOUs with the county.

SLIP ALLOCATIONS

All the cities that opted for the “slip aggregation” method have slip pools that were agreed upon by both the cities and the FWC. The slip pools are derived from a formula that started with the measurement of shoreline within each city jurisdiction, and the calculation of the possible number of slips for each city, as per the MPP. Then all existing wet slips, dry slips, and boat trailer spaces are deducted, and all single-family residential parcels are deducted. The remaining number of slips are then placed in a “slip pool” from which the respective cities can allocate slips to marine facilities.

In accordance with the Manatee Protection Plan, all single-family residences are allowed no more than two slips per parcel. These slips are not deducted from the city's slip pools.

All commercial docks, multifamily developments or marina projects must submit plans and an application to Volusia County Environmental Management for review and to obtain a letter of exemption or compliance with the Manatee Protection Plan for their projects including all new slips, remodels and repairs.

In 2025, two multi-family/commercial facilities increased their number of slips (one in Port Orange and one in New Smyrna Beach) and another project in Astor, where a large resort has proposed to increase their slips, is still under review by Volusia County Environmental Management. Twelve other commercial properties throughout the county were issued a Letter of Exemption for repairs and/or modifications to existing slips.

As of December 31, 2025, the current slips available in each of the slip pools, from the "aggregation" option cities are as follows:

Holly Hill -274
Daytona Beach -2,464
South Daytona -622
Daytona Beach Shores -81
Port Orange – 1073
Ponce Inlet -443
New Smyrna Beach (N of N CSWY & S of S CSWY) -1288
Edgewater -76 (358 slips have been put on hold by the city until 12/23/2028)

Manatee project reviews were conducted on 64 single-family residences throughout the county. See figure 24 for a comparison of MPP project reviews completed for each city and unincorporated county.

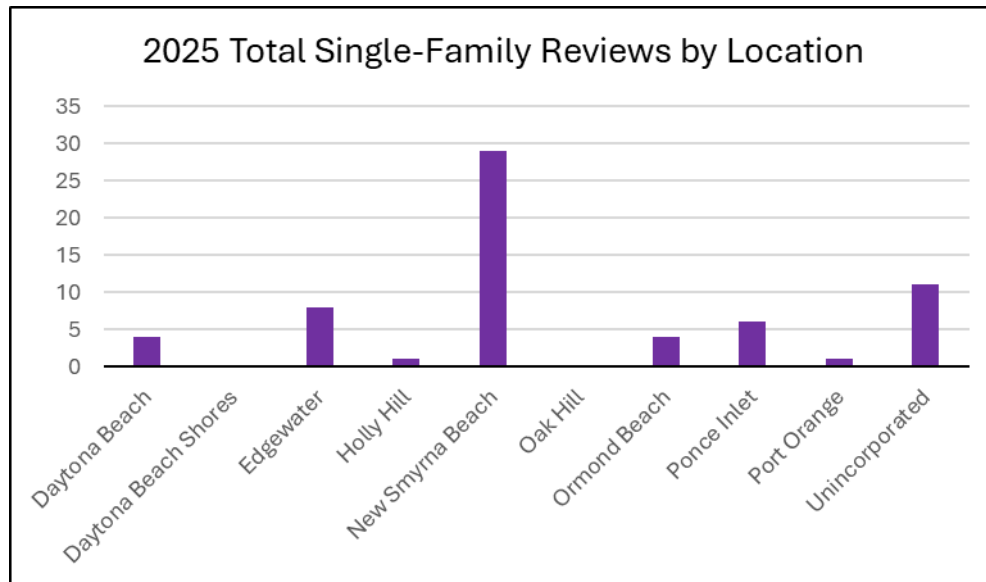


Figure 24: 2025 Number of MPP Single-Family Project Reviews by City

Figure 24 chart

City	2025
Daytona Beach	4
Daytona Beach Shores	0
Edgewater	8
Holly Hill	1
New Smyrna Beach	29
Oak Hill	0
Ormond Beach	4
Ponce Inlet	6
Port Orange	1
Unincorporated	11

There was a steady increase in project reviews between 2017 to 2021. Then, during 2021 and 2023, there was a significant drop in applications possibly due to hurricanes Ian and Nicole that passed though the east coast of Florida in late 2022 which may have altered or delayed the construction process of new docks. In 2025 the number of project reviews was 17 fewer than the previous year and includes post 2024 Hurricane Milton storm repairs. (Figure 25).

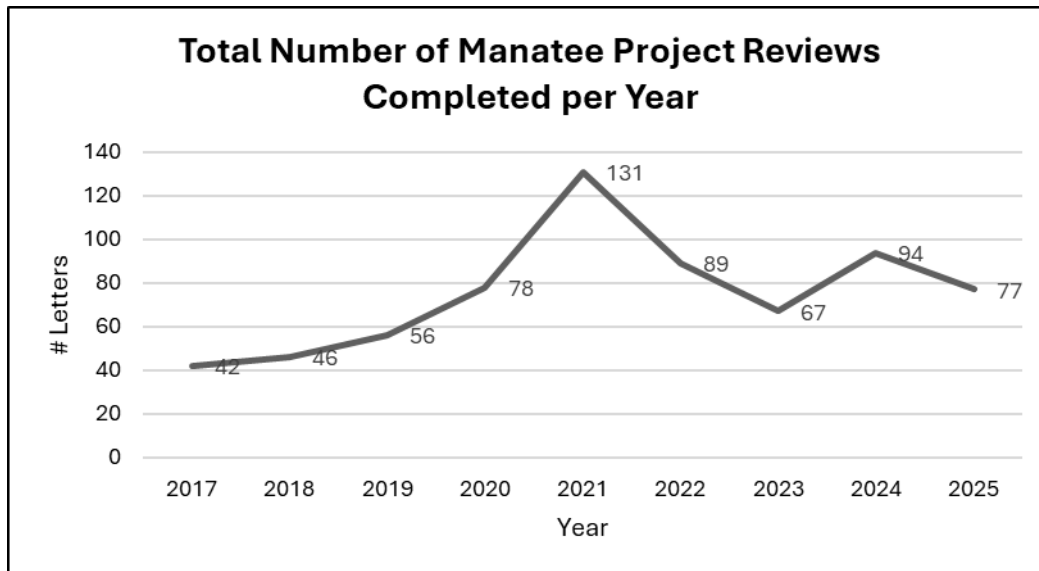


Figure 25. The total number of manatee project reviews completed for each year from 2017-2025

Figure 25 chart

Year	# Permits
2017	42
2018	46
2019	56
2020	78
2021	131
2022	89
2023	67
2024	94
2025	77

In 2023, the MPP manager implemented a final inspection process for single-family, city jurisdiction and all commercial slip projects. In 2025 three (3) commercial and eleven (11) single-family dock (within city jurisdictions) final reviews were completed by MPP staff. Ten (10) unincorporated single-family final reviews were also completed by county permitting staff (Figure 26). In 2025 the total number of final inspections slightly decreased from the prior year.

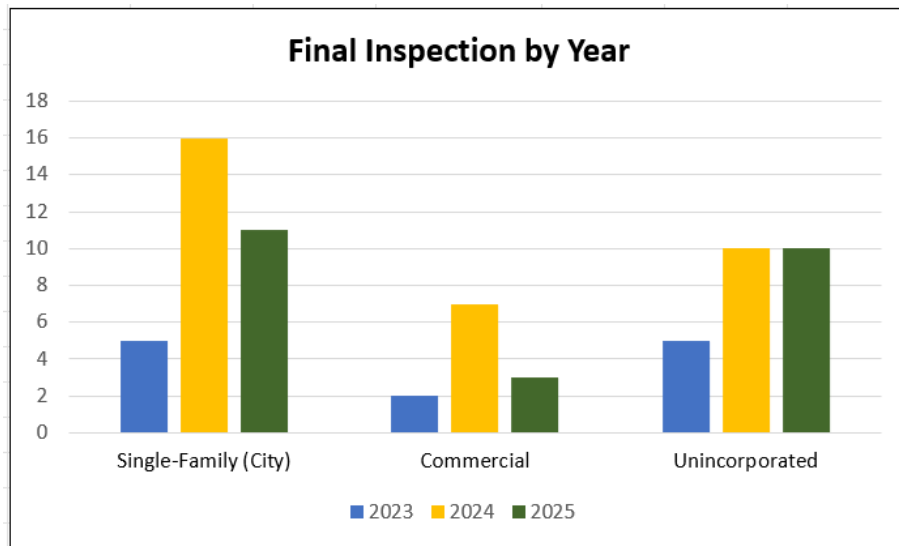


Figure 26: Final inspections completed by type and year.

Figure 26 chart

City	2023	2024	2025
Single-family (City)	5	16	11
Commercial	2	7	3
Unincorporated	5	10	10

LAW ENFORCEMENT

An important premise of the MPP is that to sustain a healthy, viable manatee population within the context of a growing county, additional on-the-water enforcement is necessary. The boat facility siting component of the MPP provides a mechanism for funding this additional enforcement through the collection of a manatee mitigation fee. All applicants with new or expanding boat facilities must pay a one-time mitigation fee for each new: boat slip, ramp parking space, and/or dry storage space. The fees are deposited into a dedicated, interest-bearing account named the Manatee Conservation Fund (MCF).

In 2025, all new or expanded boat facilities paid a one-time manatee mitigation fee, which ranged from \$388.42 for single family residential boat docks, to \$1,553.68 per wet slip, dry storage space, or ramp parking space for all other types of facilities. While various factors may necessitate changes in mitigation fees, under the MPP, the Volusia County Council reserves the right to raise fees as it sees fit. However, for the first five years of the plan the mitigation fees and planning zone descriptions remained fixed. Since the last MPP update, the fees are now raised annually in accordance with all other similar permit fees.

The Volusia County Manatee Protection Program administers the MCF, with the majority of the funds being disbursed as grants to local on- water law enforcement units. The MCF was designed so that the first \$500,000 collected could be used in its entirety for enforcement and manatee conservation and education purposes. Once the \$500,000 dollar threshold was reached, thereafter the County of Volusia could only utilize/disburse the interest accrued on the fund account each year. In 2011, the MCF reached and exceeded the \$500,000 threshold, and from then until 2023, only interest was used for grant disbursement.

In 2024 an addendum to the Manatee Protection Plan was approved by FWC, USFWS and County Council. One of the updates was to change the way the funds are being distributed. Instead of only dispersing the interest off the MCF each year, it was changed to distribute \$50,000 annually. The funds continue to be divided according to the same guidelines as previously, but the annual amounts available to fund recipients became significantly higher due to the change.

Seventy-five percent of the funding is reserved for law enforcement and is awarded through grants to the County Sheriff's Marine Unit as well as participating cities. MCF grant funding to the Sheriff's Marine Unit and the participating cities is determined by percentage, based on the amount linear river miles within each agency's jurisdiction. The funding is used for increased enforcement of manatee speed zones by marine law enforcement units, additional equipment for on-the-water law enforcement efforts, and enforcement related education programs.

Twenty-five (25) percent of the MCF is reserved for manatee conservation efforts, and education and awareness programs, administered by the County Manatee Protection Program. In 2025 MPP staff applied for a U.S. Fish and Wildlife Service Prescott Marine Mammal Rescue and Response Grant in order to purchase a new Marine Mammal Stranding Team response boat, motor and trailer. A reliable boat is needed for the team to respond to stranding events including but not limited to sick, injured, orphaned or entangled marine mammals, carcass recoveries, in-field necropsies, monitoring sick or injured animals pre rescues, assistance during rescues and post rescue monitoring, as well as the response to deceased animals for collection of samples for scientific research. The MCF funds available for the MPP programs 25-26 budget cycle will be used as the required 25% cost match of the funds received. The grant approval notification was made to the County on March 31, 2026.

The Volusia County Sheriff's Marine Unit has participated in the Manatee Conservation Fund grant program since its inception, actively patrolling the county's waterways. The Volusia County Sheriff's Office Marine Unit is very involved in efforts to conserve and protect manatees and has assisted in numerous manatee carcass recoveries and rescues. They also educate the boating public about manatee awareness and assist with underwater marine debris collection in Ponce de Leon Inlet. The Sheriff's Marine Unit has also been instrumental in conducting directed patrols in areas where human and manatee interactions have occurred.

The Sheriff's Marine unit applied for and received their MCF grant in the 2024/25 fiscal year. The money they received was used for a total of 278 hours of overtime for officers patrolling the Volusia County waterways. This included approximately 100 miles of freshwater waterways and 50 miles of intracoastal waterways. These patrols concentrated within the busiest manatee zones, which are designated as slow speed zones. Marked patrol boats enforced the laws in these areas and distributed manatee education and safe boating practices materials to those they had to stop. In total the VCSO Marine Unit issued 95 boating citations and 201 boating warnings. Their presence on VC Waterways is invaluable to the safety of the animals, environment and people utilizing our areas.

For more information on the Volusia County Manatee Protection Plan, visit <https://www.volusia.org/services/growth-and-resource-management/environmental-management/natural-resources/florida-manatee/manatee-protection-plan/>