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COLLIER COUNTY
SEA TURTLE PROTECTION PLAN
ANNUAL REPORT – 2023

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Summary

Adult loggerhead emergences were recorded on Collier County beaches from April 19th through August 23rd, 2023. A total of 1273 nests and 2128 false crawls were identified on Barefoot, Vanderbilt, Park Shore, City of Naples, and City of Marco Island beaches. Nest hatching occurred from June 26th through October 26th. A total of 85,745 hatchlings are presumed to have entered the Gulf of Mexico. This includes 86,539 that emerged on their own and 509 that were found alive in the nest and released. A total of 212 nests disoriented with Vanderbilt beach having the most disorientations (71). Predator depredations affected 5.9% (76) of the nests. Most of these depredations occurred on Marco Island beach. Raccoon and coyote depredations were responsible for most of the egg loss accounting for 80.6% of the depredations that occurred. Tidal inundations caused by high tides, king tides, tropical storm Alex and hurricane Idalia washed over 79 nests and washed out 175 nests. A total of 51 sea turtle strandings were recorded during the year. Overall, the 2023 sea turtle season was very successful, with high emergence numbers and low storm damages.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
ATV	All-Terrain Vehicle
CCCL	State Coastal Construction Control Line
DNR	Florida Department of Natural Resources (now called FWC)
FWCC	Florida Fish and Wildlife Conservation Commission
GPS	Global Positioning System
HWL	High Water Line
NAD	North American Datum
NERR	National Estuarine Research Reserve
NMFS	National Marine Fisheries Service
NOV	Notice of Violation
USFWS	United States Fish and Wildlife Service

SECTION 1

INTRODUCTION

Collier County is responsible for surveying 22.5 miles (36.2 km) of beach for sea turtle activities. The Sea Turtle Protection Program within the Collier County Parks and Recreation Division (CCPRD) monitored the entire 22.5 miles (36.2 km) of shoreline on Barefoot, Vanderbilt, Park Shore, City of Naples, and Marco Island beaches. The surveyed beaches not included in this report are Delnor-Wiggins Pass State Park (monitored by State Park Staff), Keewaydin Island (monitored by the Conservancy of Southwest Florida), Cape Romano Complex (monitored by Rookery Bay NERR), Cannon and Sea Oat Islands (monitored by Rookery Bay NBNERR), and the Ten Thousand Islands (monitored by the US Fish and Wildlife Service and RBNERR).

Coastal development and natural erosion have significantly reduced the number of suitable nesting beaches. Developed beaches used by nesting sea turtles can become hazardous to emerging hatchlings. Human disturbances on nesting beaches include human activity, artificial lighting, erosion induced by shoreline hardening with seawalls, rock revetments, beach renourishment, vehicular traffic on or near the beach, beach raking, pollution, shading of beaches by large buildings and exotic vegetation, beach furniture and recreational accessories, large holes left on the beach, as well as egg and hatchling predation associated with human activities. Sea turtles have encountered some or all these problems on many of Florida's beaches, including Collier County.

The purpose of the Collier County Sea Turtle Protection Program is to protect nests and collect data on sea turtle nesting and hatching activities, to fulfill permit requirements for beach raking and beach renourishment. Protecting sea turtle nests also allows beachfront property

owners to obtain permits for certain activities seaward of the State Coastal Construction Control Line (CCCL).

This report details the methods established by the CCPRD with updates based on the Florida Fish and Wildlife Conservation Commission - Marine Turtle Conservation Handbook (Rule 68E-1.004, 2016). The report includes an analysis of sea turtle emergences, effects of beach renourishment, historical trends, nesting and hatching, depredation, beach lighting, and stranding and salvage efforts. For more information on the biology, ecology, distribution, habitat, history, educational resources, laws and regulations visit myfwc.com/wildlifehabitats/wildlife/sea-turtle.

SECTION 2

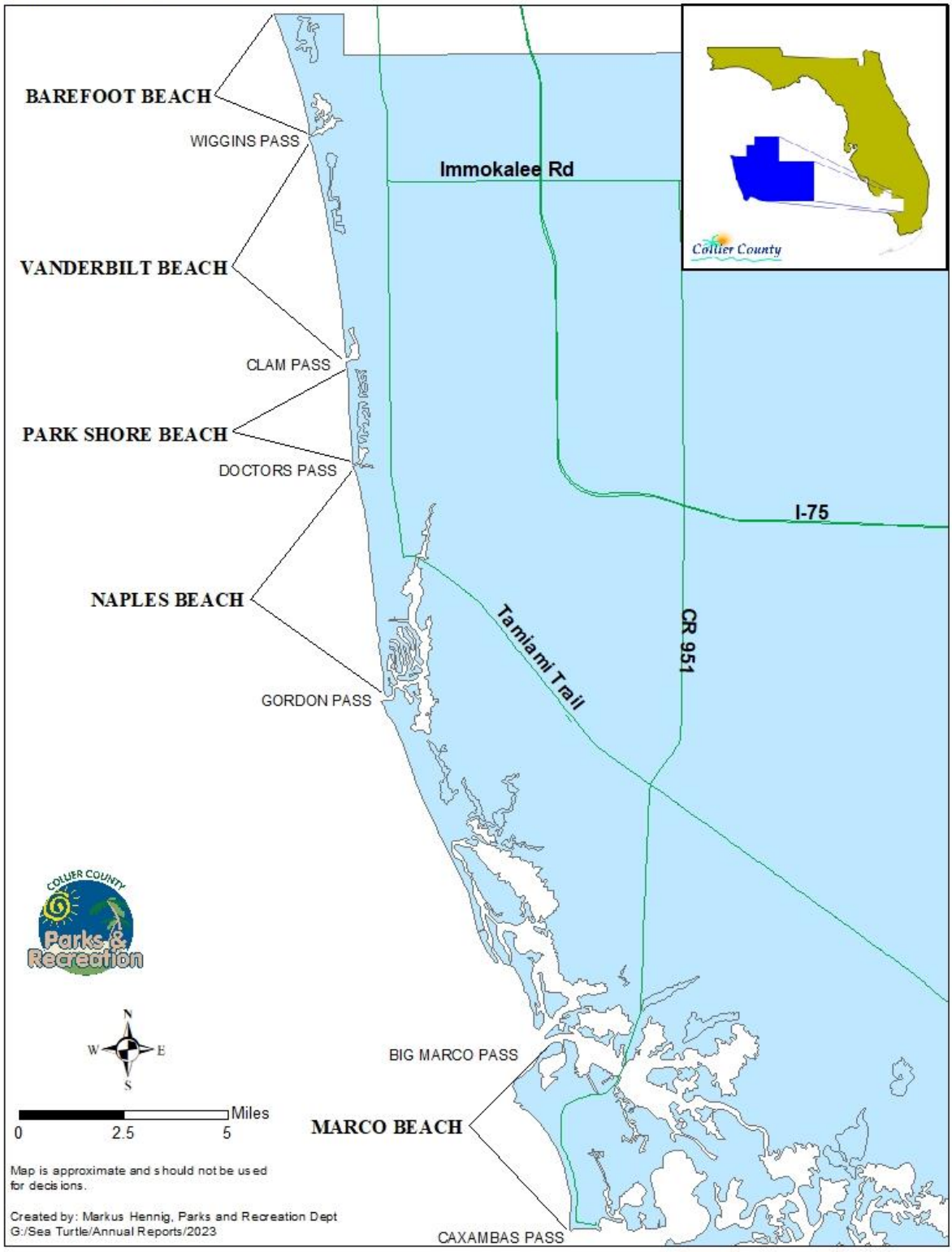
SEA TURTLE MONITORING PROGRAM

2.1. STUDY AREA

Collier County, Florida is the southern terminus of the southwest barrier island chain that begins at Anclote Key in Pasco County, 175 miles (282 km) to the north. The Collier barrier island coastline extends 37 miles (60 km) from the Lee/Collier County line, southward to Cape Romano. The beaches comprise a wide variety of physiographic types including a coastal headland, barrier beach ridge, barrier islands, migrating over-wash ridges, and a coastal cape. Ten major barrier beach units are recognized in the County, separated by nine tidal passes. Five of the ten barrier beach units are surveyed daily (May 01–October 31) for sea turtle activities including Barefoot, Vanderbilt (excluding Delnor-Wiggins Pass State Park), Park Shore, City of Naples, and City of Marco Island beaches (Figure 2.1.1.).

Since 1990, beach renourishment activities have occurred in Collier County. The following sections outline the renourishment areas which are reported to FWC and DEP as a permit requirement for beach renourishment. The reports include the last three years of data, DNR monument location, and sand source (hydraulic, mechanical, or upland) for each renourishment event. Hydraulic sand is transported by pipe from an offshore sand source or from a pass, with seawater as a transport medium. Mechanical sand is excavated from a pass, stockpiled, and spread onto the beach. Upland sand is trucked from an inland quarry source and spread onto the beach.

Figure 2.1.1. Collier County Beaches 2023



2.1.1. Barefoot Beach

Barefoot Beach is the northern-most beach unit in Collier County, which encompasses 3.1 miles (5.0 km) of barrier beach extending from the County line south to Wiggins Pass (DNR monument R-1 to R-16.5). The Barefoot Beach unit is surveyed for sea turtle activities in compliance with the Wiggins Pass Inlet Management Plan and to assist in the permitting process for the maintenance of Wiggins Pass. Table 2.1.1.1. summarizes the renourishment area currently reported on for Barefoot Beach.

Table 2.1.1.1. Barefoot Beach Renourishment.

Year	DNR Location	Sand Source	Linear Feet of Beach
2013	R-12 to R-14.5	Hydraulic	2,500
2023	R-1 to R-9	Upland	8,000

2.1.2. Vanderbilt Beach

The Vanderbilt Beach coastal barrier unit includes 4.7 miles (7.6 km) of beach from Wiggins Pass south to Clam Pass (DNR monument R-17 to R-41.5). The northern most mile of the Vanderbilt Beach unit, Delnor-Wiggins Pass State Park (R-17 to R-22.5), is surveyed for sea turtle activities by park staff. Vanderbilt Beach is surveyed for sea turtle activities to meet the permit requirements for beach restoration and beach raking. Table 2.1.2.1 summarizes the renourishment activity of Vanderbilt Beach currently being reported on.

Table 2.1.2.1. Vanderbilt Beach Renourishment.

Year	DNR Location	Sand Source	Linear Feet of Beach
2021	R-22+400’ to R-32+200’	Upland	9800
2022	R-34 to R36	Upland	2000
2022	R-40 to Clam Pass	Mechanical	1,500
2023	R-22+400’ to R36	Upland	13,600

2.1.3. Park Shore Beach

The Park Shore coastal barrier unit extends 3.2 miles (5.1 km) from Clam Pass south to Doctors Pass (DNR monument R-41.5 to R-57). Clam Pass County Park extends from Clam Pass southward approximately 2,000ft (640 m) to the Naples Cay development (R-42 to R-44.5). Park Shore Beach is monitored for sea turtle nesting activities to comply with beach renourishment and beach raking permit requirements. Table 2.1.3.1 summarizes the renourishment activity of Park Shore beach currently being reported on.

Table 2.1.3.1. Park Shore Beach Renourishment.

Year	DNR Monument	Sand Source	Linear Feet of Beach
2019	R-43 to R-54+400’	Upland	11,400
2022	R-41.5 to R-43	Mechanical	2,500
2023	R-42 to R-57	Upland	17,000

2.1.4. City of Naples Beach

The City of Naples beach unit encompasses approximately 5.6 miles (9.0 km) of shoreline from Doctors Pass south to Gordon Pass (DNR monument R-57 to R-89). To meet the beach renourishment program permit requirements, Collier County Parks and Recreation Division monitored the City of Naples beach for sea turtle activities for the 2023 season. Table 2.1.4.1. summarizes the renourishment history of the City of Naples beach.

Table 2.1.4.1. City of Naples Beach Renourishment.

Year	DNR Location	Sand Source	Linear Feet of Beach
2020	R57 to R61 +850	Upland	4,930
2021	R61 + 700 to R74 +400	Upland	12,700
2022	R60 to R61.5	Hydraulic	1,500
2023	R-57 to R-79.5	Upland	20,000

2.1.5. City of Marco Island Beach

The City of Marco Island coastal barrier unit encompasses 7.1 miles (11.4 km) of beach, from inside Big Marco Pass [Hideaway Beach (DNR monument H-16 to H-1)] south to Caxambas Pass (DNR monument R-131 to R-148). The City of Marco Island is a highly developed beach with high-rise condominiums and hotels. This beach has been monitored for sea turtle activities since 1990 to comply with the permit requirements for beach renourishment and raking. Table 2.1.5.1. summarizes the renourishment activity of the City of Marco Island currently being reported on.

Table 2.1.5.1. City of Marco Island Beach Renourishment History.

Year	DNR Monument	Sand Source	Linear Feet of Beach
2019	*H1 to H12 R135 to R141	Hydraulic Mechanical	11,000 6,000
2020	R146 to R 148 to Caxambas Pass	Hydraulic	2,000
2023	*H12 to H14.5	Hydraulic	1,250
2023	SDH3 to SD133	Hydraulic	8,000
2023	R146 to R148 + 730’	Upland	2,730

* Indicates an area within Hideaway Beach where the H-monuments are numbered consecutively from southwest to northeast.

2.2. METHODS AND MATERIALS

2.2.1. Reconnaissance Surveys and Beach Zoning

Pre-season reconnaissance surveys of the monitored beaches were conducted in April 2023. The objective of the surveys was to develop daily monitoring strategies, note the condition of the beaches, zone the beaches for management purposes, and conduct cone penetrometer readings to determine if the beaches required tilling pre-season.

Metal signs on 6’ metal posts were placed within the dune area in approximately 1,000 ft. increments from the Lee/Collier County line south to Marco Island at corresponding DNR survey markers. In addition, wooden stakes were installed 500 ft south of every DNR marker.

2.2.2. Daily Monitoring

Daily surveys for sea turtle emergence activity were performed along the high-water line (HWL) utilizing all-terrain vehicles (ATVs) equipped with low-pressure tires. Upon discovery of an emergence, staff visually determined if the emergence resulted in a nest or a false crawl (non-nesting emergence). A GPS reading was taken for each emergence location. Nests and false crawls were sequentially numbered and mapped on aerial photographs. Characteristics and measurements of the emergences were recorded on data sheets for evaluation.

All nests were marked with stakes, flagging tape, and a sign to provide protection and facilitate evaluations. Four 36-inch (91 cm) long wooden stakes were placed in the corners of each disturbed area. Yellow ribbon with the word "caution", was then placed around the stakes and a Sea Turtle Nest Sign (Figure 2.2.2.1.) was affixed to alert and direct beach rakers and the public away from nests. In addition, the stakes were marked with their direction (SW, NW, SE, NE) to facilitate clutch location if stakes were lost during storms.

Nests laid in areas known for high depredation, such as the undeveloped portions of Barefoot, Vanderbilt, Clam Pass Park area of Park Shore and Sand Dollar Island (Marco Island) beach were covered with a protective screen or cage. Screening involved securing a three-foot (0.9 m) square wire mesh screen over the clutch with metal tent stakes. The 2 by 4-inch screen openings (5.1 by 10.2 cm) were large enough to allow the natural escape of hatchlings but were small enough to prevent most mammalian depredation. Nest cages were deployed on Barefoot, Marco Island and Vanderbilt beaches providing additional protection to the nests, by preventing predators from digging under the screen. Although cages cannot protect nests from inundation by high tides or fire ant predation, the incorporation of caging efforts has proven to be the most effective nest protection. Screened and caged nests were observed daily for evidence of predation.

If a predator disturbed the sand under the screen, the sand was replaced, the area flattened out, and the event recorded. If fire ants were observed, they were gently swept off the nest.

2.2.3. Nest Monitoring and Evaluation

Daily monitoring for hatched nests began as the first nest approached the expected hatch date (approximately 60 days). All nests were observed for signs of hatching, such as an obvious depression in the sand or hatchling tracks around the nest. Each nest was excavated for evaluation approximately 72 hours (3 days) following signs of the first emergence. If the nest remains unhatched nests are excavated 70 days from deposition or 80 days if the nest was inundated from high surf, excessive rainfall, or shading.

Upon excavation, all contents of the egg cavity were removed by hand. The depth and width of the egg cavity was measured and recorded. Data from each nest evaluation was recorded on CCPRD Sea Turtle Nesting Forms. Empty eggshells accounted for live hatchlings that escaped from the nest and/or dead turtles, found within the nest. Unhatched eggs included undeveloped eggs, dead embryos, and eggs depredated prior to hatching. Pipped eggs refer to hatchlings (dead or alive) that puncture the eggshell but did not fully emerge from the shell. Unhatched eggs were opened and inspected to determine the presence of embryonic development at the time of death. If live hatchlings were found in the nest, they were either released immediately or transferred to a bucket of moist sand for night release, depending on the time of the day and the presence or absence of predatory birds in the area. Hatchling releases were conducted according to the Florida Fish and Wildlife Conservation Commission - Marine Turtle Conservation Handbook (Rule 68E-1.004, 2016).

Nests were also inspected for evidence of predation. If signs of predation were discovered, the information was recorded. The collection of predator data aids in quantifying and determining the extent of nest predation in Collier County. The data also helps to identify ways to mitigate predation. Washed out nests and inundations were also recorded after storm events and extreme high tides.

2.2.4. Data Analysis

Sea turtle emergence and hatchling data were compiled using the relational database Microsoft Access. Maps were produced using ArcGIS10.1 and Collier County Property Appraiser's aerial photographs taken in 2022 and 2023. Graphs and plots were created using Microsoft Excel. Data was analyzed with personal computers utilizing Microsoft Excel and Microsoft Access.

Data was analyzed at each study area for factors relating to both nest and hatching characteristics. Nesting factors included nests per emergences (nesting success), emergences per mile (e/mi.), and nest placement characteristics. Factors relating to hatching success included location, incubation duration, egg counts, inundation, and depredation. Linear regression analysis was used to search for any factors directly affecting hatching success. Plots were prepared showing comparisons between and within study areas.

2.3. RESULTS AND DISCUSSION

2.3.1. Emergences

Sea turtles emerged on Collier County beaches from April 19, 2023, through August 23, 2023. A total of 3,401 emergences (1,273 nests and 2,128 false crawls) occurred along the 22.5 miles (36.2 km) of the daily surveyed shoreline. A breakdown of emergence activity for each

beach is listed in Table 2.3.1.1. Aerial maps showing emergence location by beach are available as an additional appendix separate from this report. A comparison of nests and false crawls for each beach segment is given in Figure 2.3.1.1. A breakdown of emergences per mile on each beach is illustrated in Table 2.3.1.1. Barefoot Beach had the most sea turtle activity with an average of 239 emergences per mile. Marco Island beach received the least activity with an average of 78 emergences per mile.

Table 2.3.1.1. Emergences, 2023.

	Barefoot	Vanderbilt	Park Shore	Naples	Marco	Total
Total Nests	256	328	221	341	127	1273
Total False Crawls	487	429	391	392	429	2128
Total Emergences	743	757	612	733	556	3401
Nest / Emergence (%)	34.5	43.3	36.1	46.5	22.8	37.4
Beach Length (mi.)	3.1	3.5	3.2	5.6	7.1	22.5
Emergences / mi.	239	216	191	130	48	151
Nests / mi.	80	93	69	60	17	56
False Crawls / mi.	157	122	122	70	60	94

Figure 2.3.1.1. Sea Turtle Emergences in Collier County, 2023.

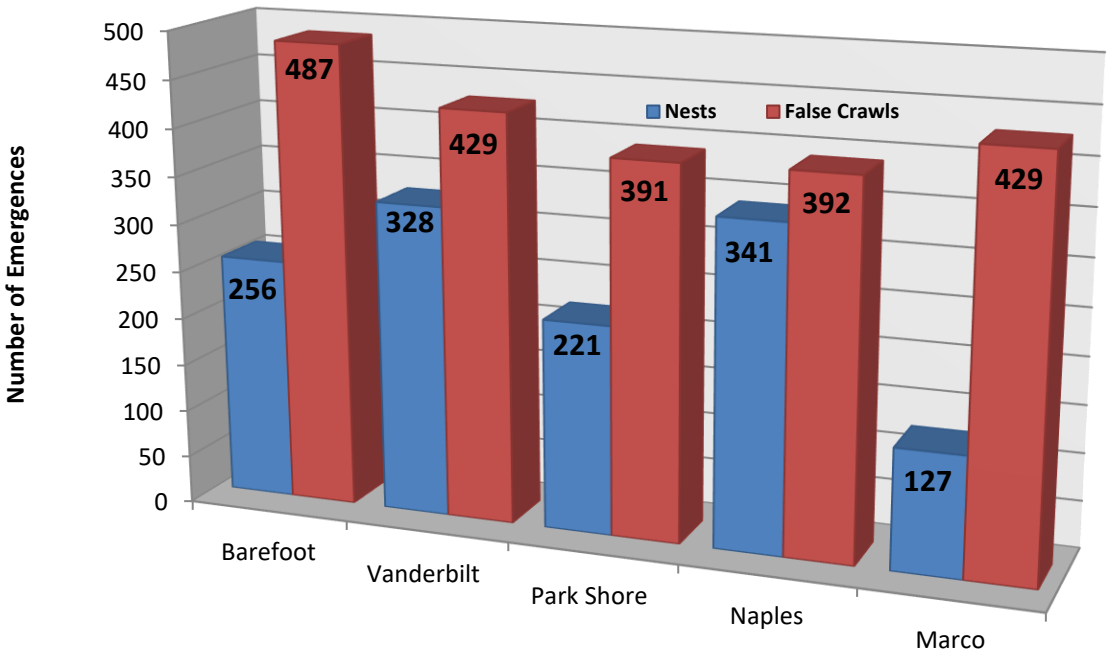


Figure 2.3.1.1. shows some variation in total nests and false crawls between beaches. This variation is difficult to explain since nest-site selection of the female turtle is still poorly understood. Some important factors include, but are not limited to beach compaction, artificial lighting, human activity, structures on the beach, and scarps.

Above normal beach compaction can impede nest excavation contributing to the rejection of a nesting site, thus increasing the number of false crawls and aborted egg cavities on renourished beaches (Raymond, 1984a; Nelson, 1991). Witherington (1991) found that the "presence" of lights in beach areas "sharply reduce" the number of sea turtles that emerge to nest. Human activities on the beach can also contribute to the disruption of nest site selection by adult sea turtles (LeBuff, 1990; Kraus, 1992). Obstacles in the paths of emerging turtles may contribute to the failure of a nesting attempt. These obstacles include, but are not limited to scarps, beach furniture, seawalls,

boardwalks, stairs, fences, pilings, groins, sandcastles, sand pits, standing water on the beach, dense roots, and boats stored on the beach.

Abandoned nesting attempts (false crawls) are a common occurrence for loggerheads and have been recorded at all nesting beaches (Dodd, 1988). Raymond (1984b) reported that on natural beaches, 38.6% to 61.9% of emergences resulted in false crawls. The 2,128 false crawls in Collier County, represents 62.5% of the total emergences.

It is possible that a limited number of false crawls occur from the female's instinctive preferences for a specific site. These are false crawls not provoked by human disturbance and interference; but by physical factors such as temperature, sand composition, and possibly other unknown characteristics.

2.3.2. Historical Trends

Marco Island beach was first surveyed for sea turtle activities in 1990, followed by Barefoot in 1991, and Clam Pass Park (from Clam Pass south to Seagate beach access) in 1992. In 1994, the "Collier County Sea Turtle Protection Program" was developed to survey mainland beaches in response to area-wide beach renourishment. Consecutive years of consistent data collection will assist biologists in detecting local population trends of sea turtles, and the local impacts of beach renourishment. Historical sea turtle emergences are presented in Table 2.3.2.1. and Figures 2.3.2.2. – 2.3.2.6. for all beaches.

Figure 2.3.2.1. Historical Trends of Sea Turtle Nests and False Crawls (FCs), 1994 – 2023.

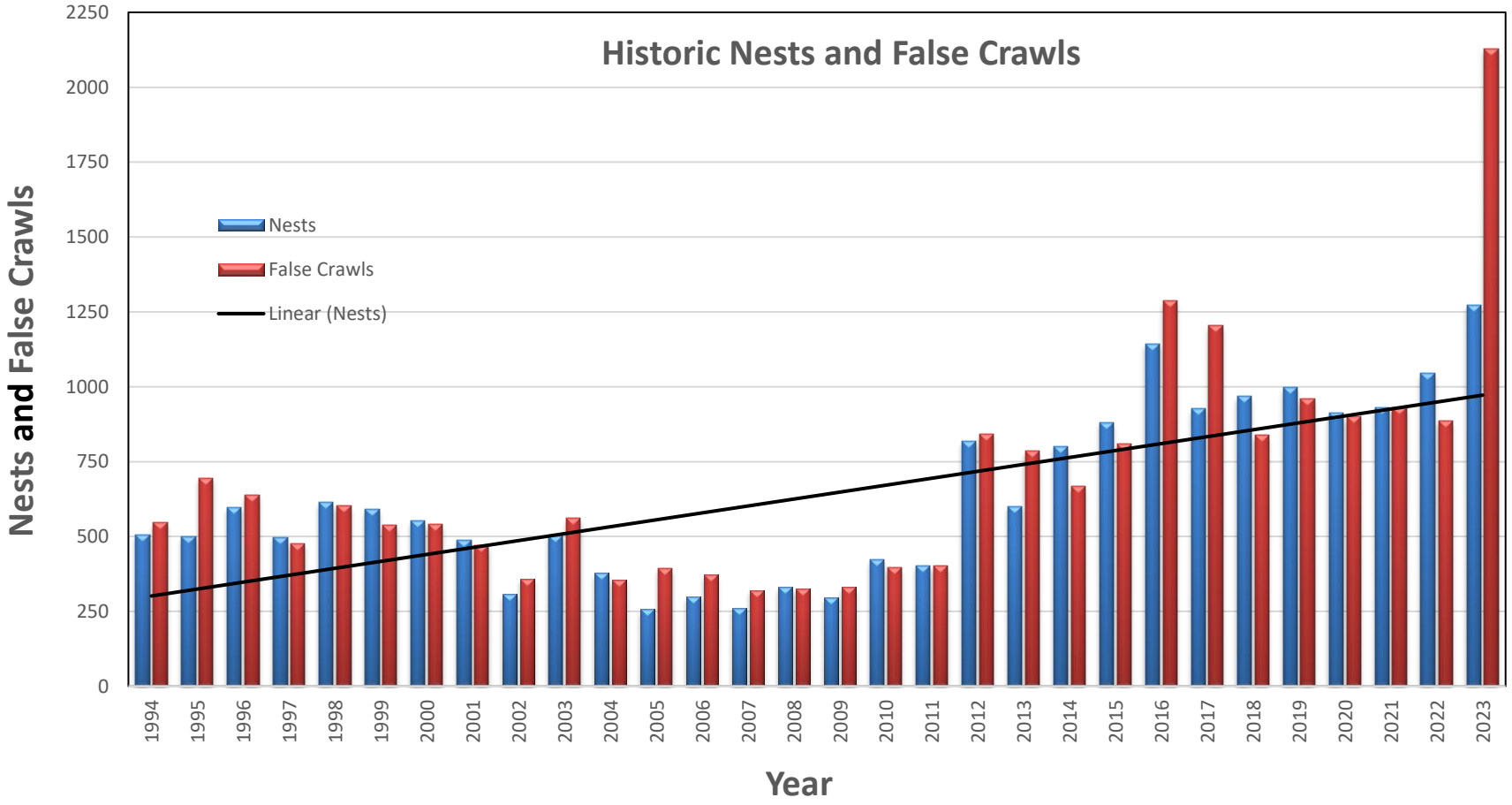


Figure 2.3.2.2. Barefoot Annual Emergences, 2014 – 2023.

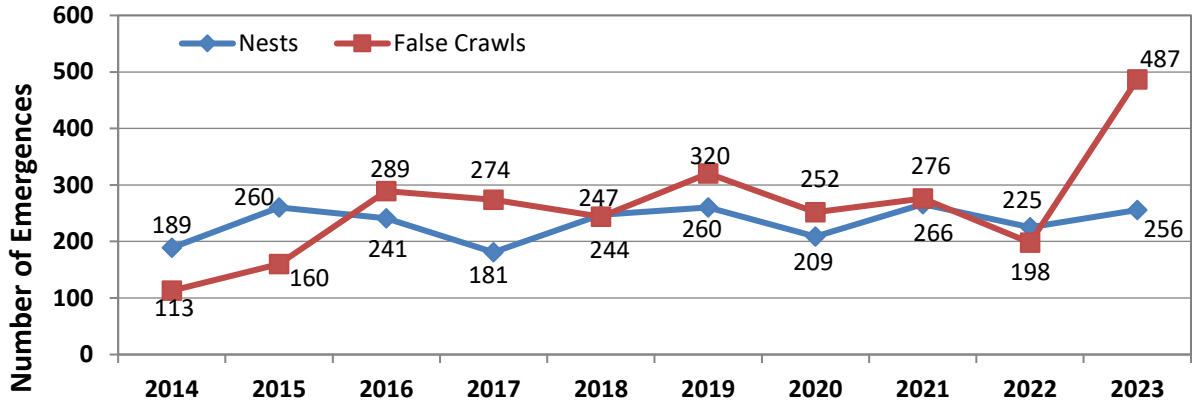


Figure 2.3.2.3. Vanderbilt Beach Annual Emergences, 2014 – 2023.

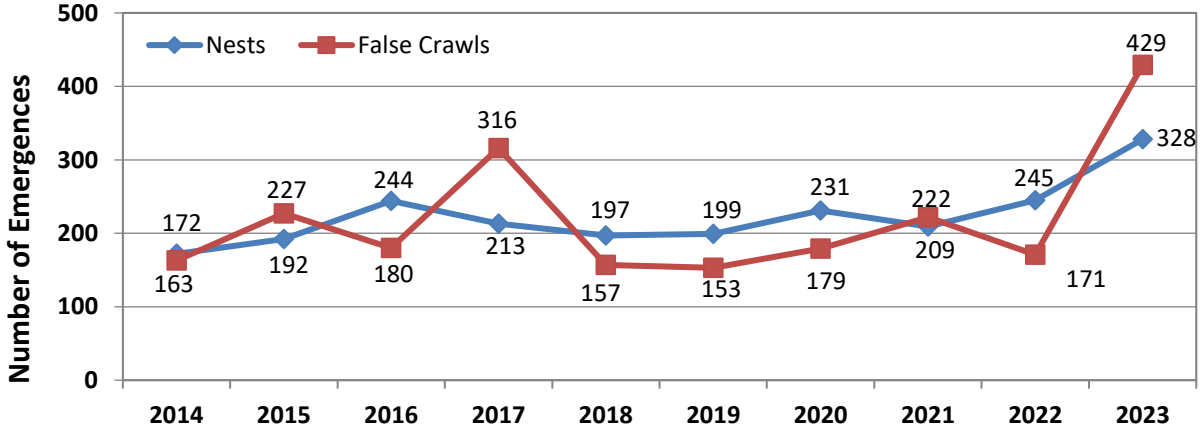


Figure 2.3.2.4. Park Shore Beach Annual Emergences, 2014 – 2023.

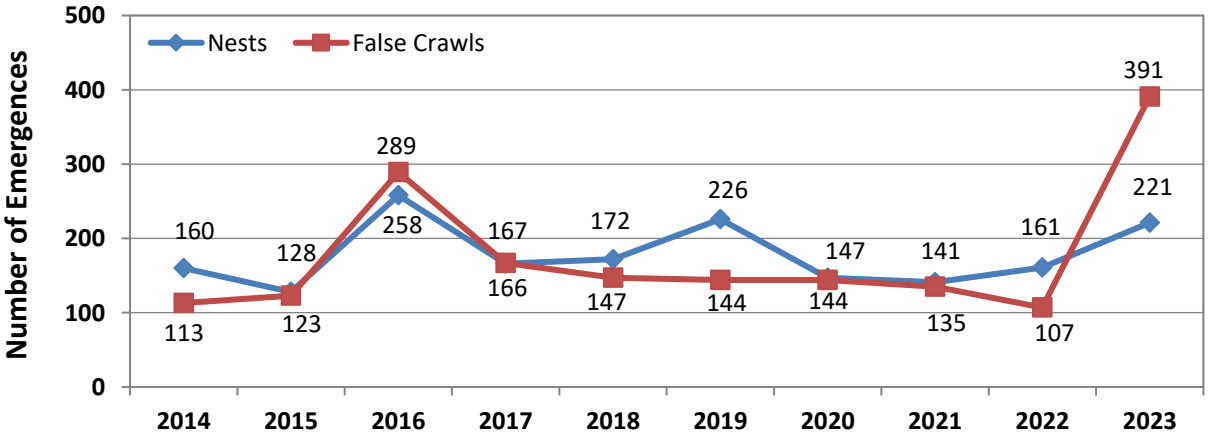


Figure 2.3.2.5. City of Naples Annual Emergences, 2014 – 2023.

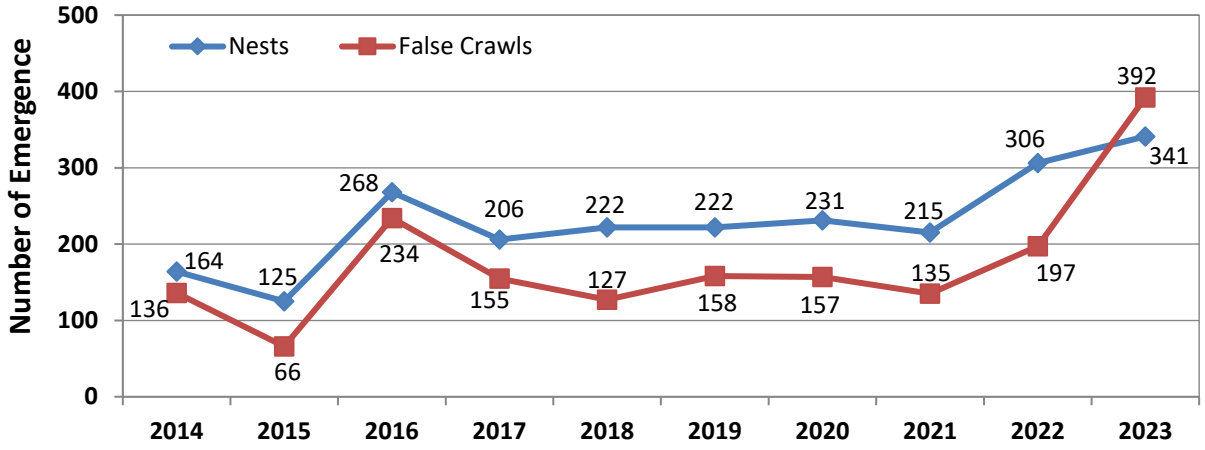
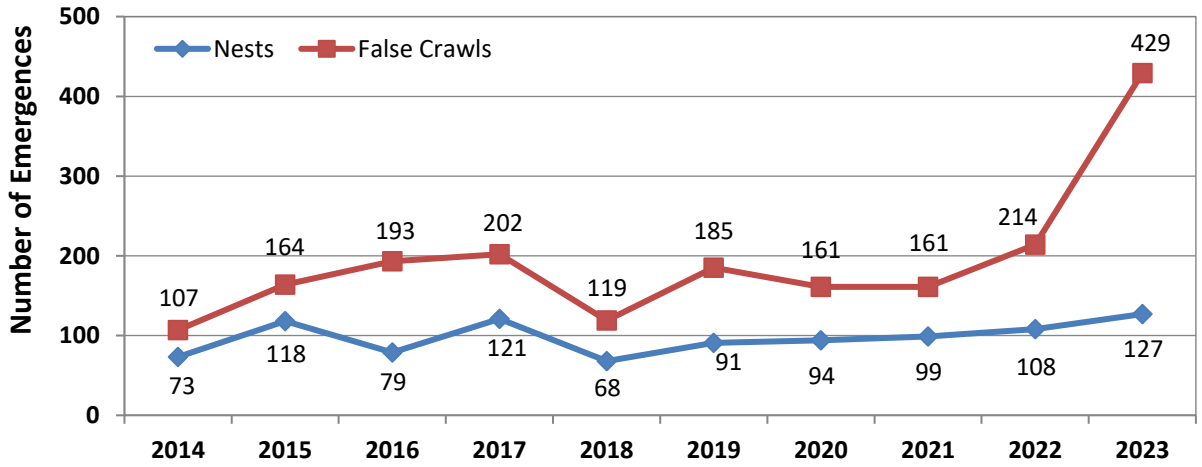


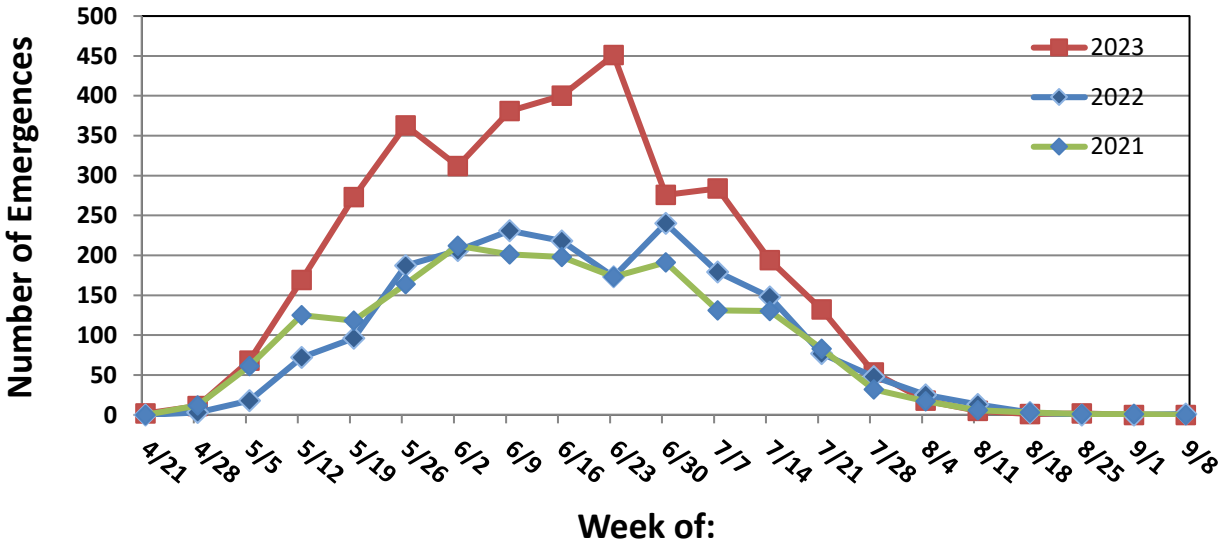
Figure 2.3.2.6. City of Marco Island Annual Emergences, 2014 – 2023.



2.3.3. Weekly Emergence Analysis

Sea turtle weekly emergence (nest and false crawls) trends are depicted in Figure 2.3.3.1. for 2021-2023. There are typically two peaks of sea turtle emergences for each season. This season's peaks occurred in the last week in May and the third week of June.

Figure 2.3.3.1. Collier County Emergences per Week, 2021– 2023



2.3.4. Hatching Evaluation

In 2023, 1273 nests were marked for evaluation. Of these nests, the CCPRD evaluated 995. One hundred-seventy-five (13.7%) were lost due to storms during the 2023 season. Tidal flooding inundated 79 (6.2%) nests. Tidal flooding and washed-out nests combined accounted for 254 (19.9%) of all nests compared to 11.9% in 2022.

The average number of eggs per nest (clutch size) was 103 (range = 1 –166). Loggerhead sea turtles average 110 to 120 eggs per nest throughout their range, but the clutch size is highly variable (Ernst *et al.*, 1994).

Table 2.3.4.1. Collier County Mean Clutch Size, 2023.

	Barefoot	Vanderbilt	Park Shore	Naples	Marco
Mean Egg Count per Nest	102	104	103	105	101

A total of 103,292 eggs were deposited into the evaluated nests and 85,745 hatchlings are presumed to have entered the Gulf of Mexico (Table 2.3.4.2.). The total number of hatchlings that entered the Gulf of Mexico includes 85,236 that emerged on their own and 509 that were found alive in the nest cavity.

Table 2.3.4.2. Nest / Hatchling Evaluations by Beach Unit, 2023.

	Barefoot	Vanderbilt	Park Shore	Naples	Marco	Total
Total Nests	256	328	221	341	127	1273
Lost Nests	19	31	21	70	18	175
Total Eggs	22,843	28,550	17,517	25,032	9.350	103.292
Emerged Hatchlings	18,251	24,1498	14,970	20,931	6,936	85,236
Hatchlings Alive in Nest	191	116	61	89	52	509
Hatchlings Dead in Nest	319	243	20	90	47	719
Undeveloped Eggs	2,696	3,003	1,601	2,505	1,135	10,940
Dead Embryos	664	636	485	1,246	453	3,484
Predated Eggs	575	183	323	0	742	1.823
Pipped Live Eggs	11	18	3	11	6	49
Pipped Dead Eggs	136	125	54	158	51	524
Total Hatch Success	82%	86%	86%	84%	75%	83.8%
Total Hatchling Emergence Success	80%	85%	85%	84%	74%	82.5%

Unhatched eggs (16,152) were opened to identify fertility and embryonic development. Dead embryos (3,484) comprised 21.5% of the unhatched eggs, depredated eggs (1.823) made up 11.2%, and the remaining 67.3% were labeled as undeveloped (10,940) due to lack of evidence of

embryological development. The undeveloped eggs may be a result of infertility or early embryological death.

Table 2.3.4.3. Hatching and Emergence Success in Natural and Renourished Sand, 2023.

Natural Sand or Renourishment Type	Natural	Renourished	Overall
Mean Hatching Success	81.8%	85.1%	83.9%
Mean Emergence Success	79.6%	84.2%	82.5%

Table 2.3.4.4. Summary of Natural Beaches vs Renourished Beach Areas, 2023

	Natural Beaches	Renourished Beaches	All Beaches
Beach Length (mile)	9.3	13.2	22.5
Nests	480	793	1273
Nests Per Mile (mean)	51.6	68.2	56.6
False Crawls	823	1,305	2,128
False Crawls Per Mile (mean)	88.3	112.2	94.6
Mean Incubation (days)	55	54	54

2.3.5. Nest Predation

Depredation by raccoons, ghost crabs, armadillos, coyotes, bobcats, and ghost crabs affected 4.5 % of all nests (n=57). Most depredations occurred on Marco Island Beach, where 30 nests (23.6%) were depredated. Of the 103,292 eggs deposited in 2023, 1,823 (1.7%) were lost to predators, which is the same as the overall percentage from 1,777 (1.7%) in 2022. Table 2.3.5.1 provides a breakdown of egg predation during 2023.

Table 2.3.5.1. Egg Depredation in Collier County, 2023.

Predator(s)	Number of Eggs Taken	Percentage By Predator
Raccoons	822	45.1
Coyote	548	30.1
Unknown	232	12.8
Human	200	11.0
Armadillo	8	0.4
Nesting turtle	8	0.4
Ghost crab	5	0.2
Total	1,823	100

SECTION 3

BEACH LIGHTING

Artificial lighting on nesting beaches, distant sources of illumination ("city glow") and other sources of light pollution can interfere with the normal nesting behavior of sea turtles and cause hatchling orientation problems. Light pollution has been proven to discourage sea turtles from emerging out of the water to nest (Witherington, 1996). The negative effects of artificial lights on hatchling sea turtles are well documented (Daniel and Smith, 1974; Dickerson and Nelson, 1989; Witherington, 1990). Artificial lighting interferes with a hatchling sea turtle's ability to correctly orient, causing them to crawl towards sources of the light pollution (disorientations). Disorientations affect sea turtles by leaving them vulnerable to dehydration, exhaustion, and predation (Witherington, 1999). Hatchling loggerhead turtles appear to be more susceptible to disorientation on wider beaches where nests are placed further from the vegetation, implying a protective benefit of the dune vegetation, by shading landward light sources.

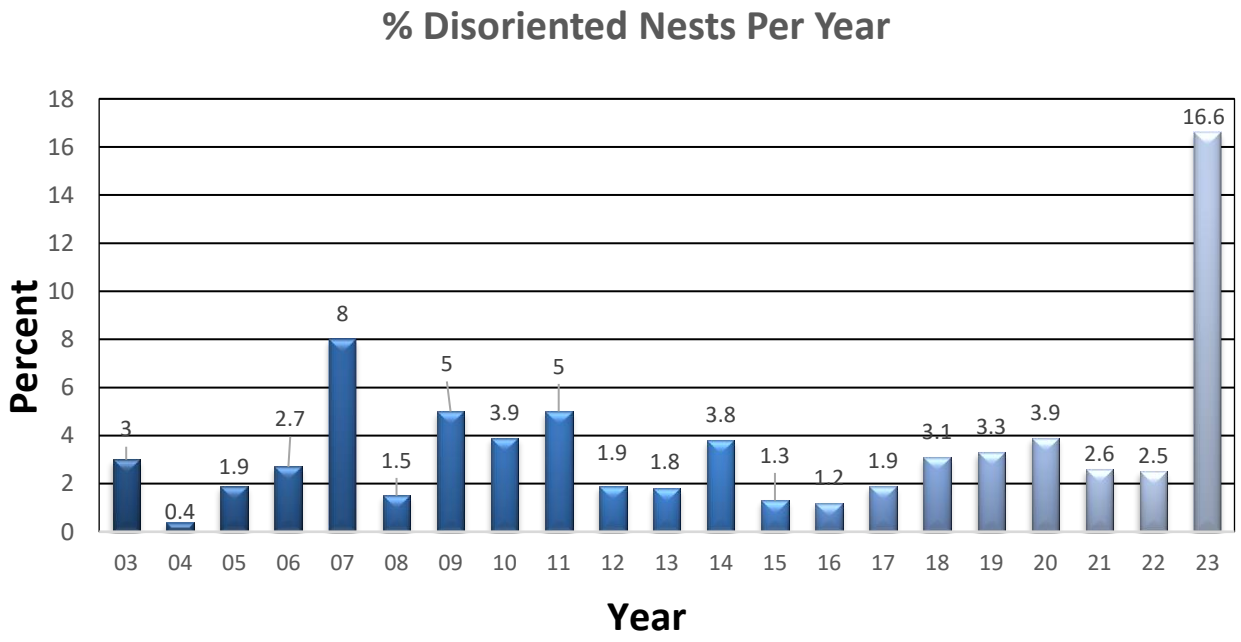
In accordance with the Collier County Land Development Code Sec. 3.04.00 "Protection of Endangered, Threatened or Listed Species", CCPRD manages a beach lighting compliance program developed to minimize the damages caused by light pollution. The program is composed of an annual mail-out prior to season, night lighting compliance inspections, violation notices, and code enforcement action. The City of Naples and Marco Island manage similar programs in accordance with Code of Ordinances Chapter 52 and Chapter 54 respectively.

Throughout sea turtle nesting season (May 01 – October 31), the CCPRD, Collier County Code Enforcement, City of Naples and Marco Island staff conduct monthly lighting compliance inspections. When a violation is identified, efforts are made to work with the property managers

and owners to correct the problem. Violations with no attempt to correct are sent to Collier County's Code Enforcement Department for formal action.

By working with property owners, managers, and renters, the beach lighting program decreased the amount of hatchling sea turtles affected by light pollution. In 1996, County staff documented 42 disorientations (7% of the nests), since that time the number of disorientations has decreased. In 2023, there were 212 disorientations (16.6 % of the nests). The extreme high percentage of disorientations can be attributed to the loss of light shielding vegetation along the beaches caused by hurricane Ian in 2022.

Figure 3.1. Disoriented Nests per Year by Percent in Collier County, 2003–2023.



In addition to documenting lighting violations, CCPRD staff also recorded objects left on the beach that could be an obstacle to nesting and hatchling sea turtles. The Collier County Land Development Code section 10.02.06 requires that any structure such as beach umbrellas and furniture not requiring a building permit, be removed nightly from the beach. Objects left on the beach over-night were documented and a NOV sticker adhered to the object to inform the owner of the need for furniture or equipment to be removed.

SECTION 4

SEA TURTLE STRANDING AND SALVAGE PROGRAM

Stranded sea turtles are those which wash ashore or are found floating, dead, or alive in a weakened condition. In 2023, 51 sea turtles were reported stranded along the Collier County coastline (Figure 4.2). Reported strandings occurred from February to December, 2023. (Figure 4.1).

Figure 4.1. Collier County Monthly Sea Turtle Strandings, 2023.

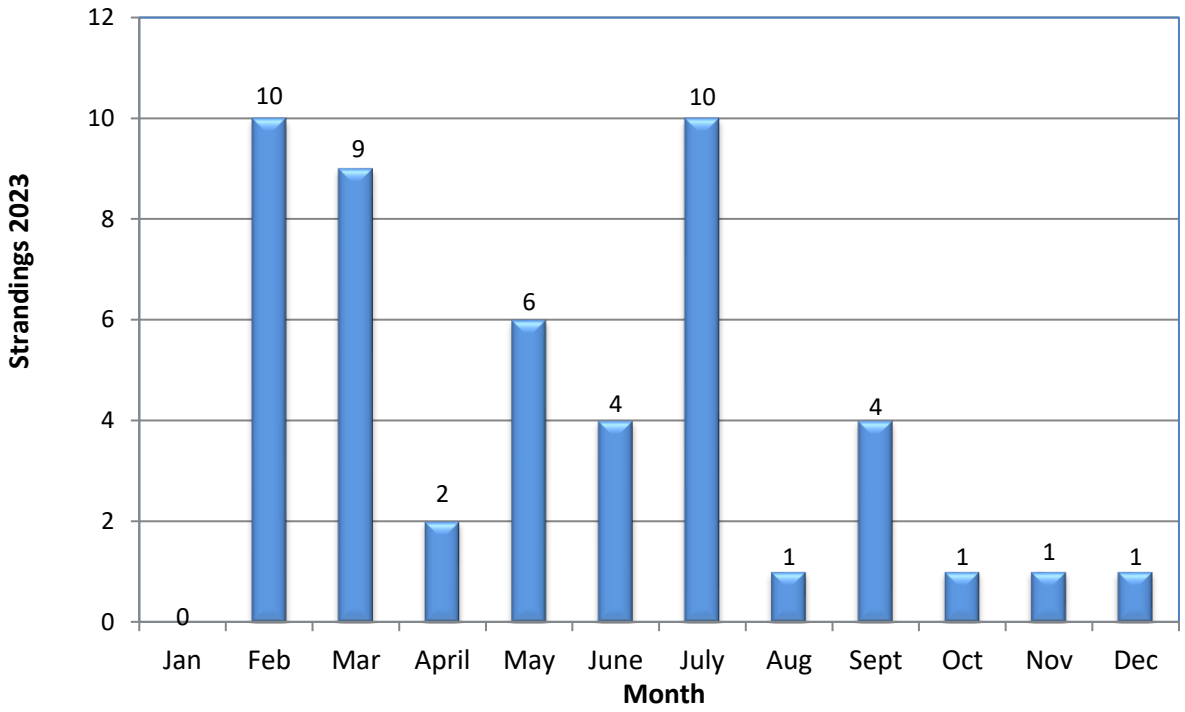
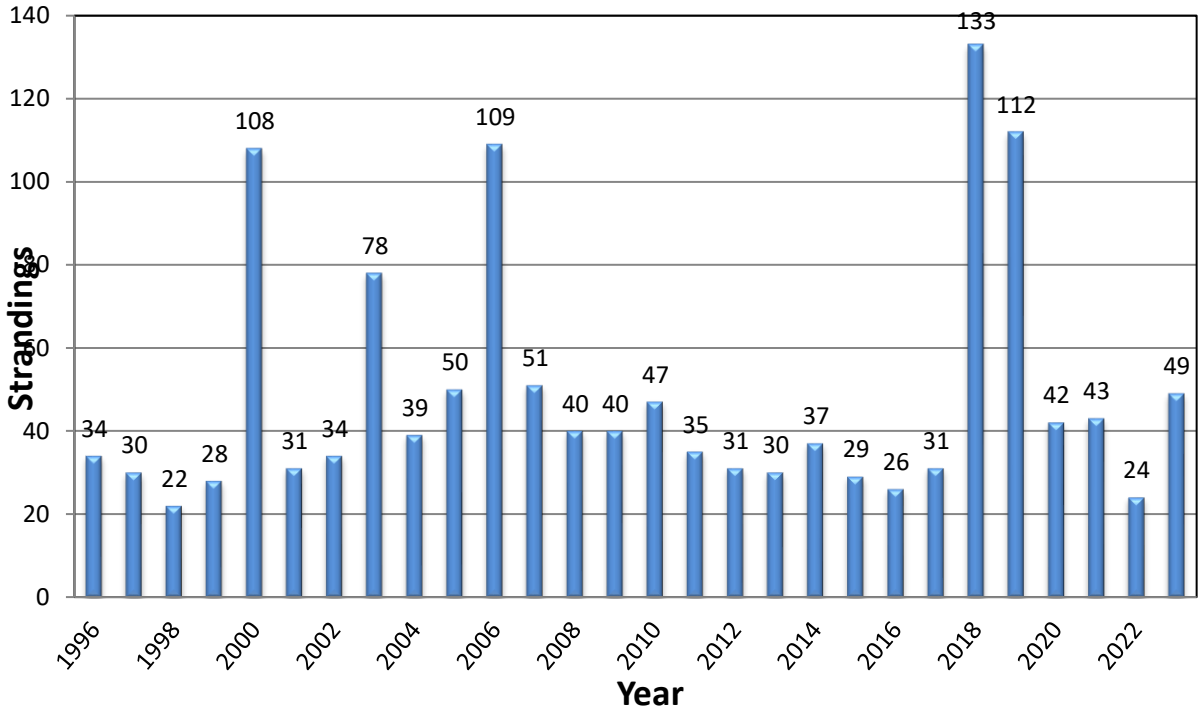


Figure 4.2. Collier County Sea Turtle Strandings, 1996-2023.



Strandings in 2023 included 40 loggerheads , 8 green sea turtles and one (1) Kemps ridley. Injuries and abnormalities of dead and live sea turtles ranged from boat and/or obvious propeller damage with visible markings or hull paint (11), shark bites (4), fishing line and cast net entanglement (2), red tide (15) and undetermined (17). Four sea turtles were alive at the time of rescue and taken to Mote Marine or Zoo Miami for treatment, most had to be euthanized due to the severity of injuries. The remaining turtle was released 47 days after intake, red tide was suspected to be involved.

Sea turtle strandings occurred throughout coastal Collier County on beaches including Barefoot (4) Vanderbilt Beach/ Delnor Wiggins (4), Park Shore (6) City of Naples (9), Marco

Island (9), and Keewaydin Island (6). Nine (9) were found, floating inshore, in bays or canals and one (1) floating offshore.

Increased public awareness of the reporting requirements may result in better coverage for the STSSN. Stranding and salvage personnel are not in the field daily outside of the nesting season and rely on the FWCC and the public for stranding locations. Stranded sea turtles outside the developed beaches may not be found or reported, some are lost at sea, and others buried by persons unfamiliar with the reporting procedures.

The Collier County Parks and Recreation Division responded to 38 of the 49 sea turtle strandings, Rookery Bay NERR responded to 2 strandings, Delnor Wiggins State Park responded to one (1) stranding, FWC responded to 3 strandings and 4 were taken directly to rehab facilities by FWC permitted facility volunteers.

SECTION 7

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