



Escambia County 2023 Marine Turtle Nest Monitoring Report



Mark Nicholas, Marine Environmental Program Manager

ABSTRACT

In 2023, there were 13 loggerhead (*Caretta caretta*) nests, and 1 green (*Chelonia mydas*) nest on Pensacola Beach (PB). There were also 7 loggerhead and 2 green false crawls. There were 2 loggerhead nests recorded on Perdido Key (PK) along with 3 loggerhead false crawls. The mean hatch success for all nests on Pensacola Beach, was 56.9% while mean emergence success was 55.4%. Mean hatch success for all nests on Perdido Key, was 83.6%, and mean emergence success was 76.1%.

There were zero nests deposited below the Most Recent High Tide Line (MRHTL) on PB or PK, so 0 nests were relocated on PB, in compliance with FWC guidelines. However, one nest was relocated on PK with special permission from FWC. It was laid only 6 feet from the high tide water line. No tropical systems affected nests this season, but erosion did wash out three nests. Artificial lighting negatively affected 67% of applicable Pensacola Beach nests (n = 6 of 9); several nests were not applicable due to the absence of viable offspring (0% hatch success) or due to weather obscuring the tracks. PK had 0% of the nests disorient (n = 0 of 2). A total of 30 marine turtle strandings were documented throughout 2023 in Escambia County (19 loggerhead, 9 alive, 4 green, 1 leatherback, and 6 Kemp's ridley, 4 alive). There were 13 live turtle rescues either from the PB fishing pier or in the surf. Fishery related entanglements with turtles remain an issue at the PB fishing pier.

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INTRODUCTION

The Pensacola Beach area of Santa Rosa Island encompasses approximately 8.1 miles of Northwest Florida's gulf coast, providing nesting habitat suitable to marine turtles. For the 2023 season, Pensacola Beach was covered under FWC permit #032A. Historically, loggerhead (*Caretta caretta*; CC), green (*Chelonia mydas*; CM), leatherback (*Dermochelys coriacea*; DC) and Kemp's ridley (*Lepidochelys kempii*; LK) have nested on Pensacola Beach. Pensacola Beach has averaged 15.5 nests per season ($SD \pm 9.2$) since annual surveys began, with 2023 exhibiting a nest count of 14 (Fig. 1).

The Perdido Key area is 6 miles in length and is utilized by loggerhead turtles. Historically this area was patrolled by the FL State Park personnel, until the 2018 season. For the 2023 season, Escambia lands on Perdido Key were covered under FWC permit #202. Historically, loggerhead (*Caretta caretta*; CC) and Kemp's ridley (*Lepidochelys kempii*; LK) have nested on Perdido Key. Perdido Key has averaged 7.7 nests per season ($SD \pm 4.3$) since 2009, with 2023 exhibiting a nest count of 2. (Fig. 2).

In general, marine turtles nesting in Florida has been increasing for several years. (Fig 3 & 4).

Volunteers are used extensively in this documentation and monitoring effort. These volunteers are greatly appreciated, and the program could not complete its mission without the effort of this group of people.

METHODS

Survey Area

The Pensacola Beach turtle patrol is delineated on the west end by the Fort Pickens area of Gulf Islands National Seashore (GUIS) and on the east end by the Santa Rosa area of GUIS. The PB patrol utilized a UTV beginning between 0500 – 0600 hours, or first light, and lasting 2-3 hours.

The PB morning patrols began at boardwalk 22C located immediately east of White Sands condos, advanced to the designated eastern limit, and then progressed west to complete the survey at Park West.

Perdido Key is delineated on the west end by the Florida-Alabama state line. The east end is the boundary with the GUIS Perdido Key Area. The center 2-mile portion is Florida State Park land and nesting data is handled by the state park staff. Perdido Key utilized two UTV's this season, one going east and one going west. This was done to complete patrols earlier to allow beach vendors to begin set up chairs and umbrellas earlier.

Crawl Identification and Data Collection

Daily morning patrols were conducted between 01 May and 31 August 2023 on PB and PK. Patrols were completed by permitted staff and volunteers.

During a collaborative pre-season meeting, it was decided to continue asking chair and umbrella vendors to wait for group texts to arrive from the daily patrol after one pass cleared an area of beach. Texts were sent from the Hilton, Portofino and Park West. Texting was also utilized on Perdido Key.

Data was collected for each nesting and non-nesting emergence event (i.e. false crawl) on nest survey field sheets. This data was then entered into an excel database for storage and analysis. Nest numbers were denoted numerically following the sequence in which they were discovered, e.g. the first nest laid on Pensacola Beach was denoted as 'PB01' while the second nest encountered by patrol on Perdido Key was denoted as 'PK02', with a W for the western side and an E for the eastern side; PK02W and PK02E. Data collected for each emergence included species, incident type (nest or false crawl), distance of the body pit to both the water line and the vegetation lines, whether the nest was relocated, distances from the egg cavity to the nest sign and reference stakes, whether a predator screen was deployed and date if applicable, and location defined as 1) proximity to notable landmarks such as boardwalks and 2) GPS positioning of all nests at the clutch location. GPS positions were also taken for false crawls.

Crawls that contained loops, meandered parallel to the shoreline greater than 100 feet, and/or or traveled inland post-nesting were indicative of disorientation. Maps containing point data for each nest were generated using Google Earth. A diagram was also illustrated for each emergence event. Daily logs were filled out to document survey completion.

Nest Marking and Monitoring

After nests were located, nests were marked with a sign, a square enclosure, and two reference stakes. Nest relocation for conservation purposes did not occur on PB nor on PK during the 2022 season due to no opportunistic encounters of nests laid below the Most Recent High Water Line (MRHWL). Nests were monitored throughout the incubation period and checked daily by morning patrol for evidence of predation, over wash, erosion, and other disturbances. Additionally, nests were monitored for signs of hatching during morning surveys beginning day 50-55 of the incubation period to determine the precise duration of incubation, and to gather data on hatchling emergence, predation, and to document disorientation events. Visual emergence signs include a collapse or depression over the egg cavity and a cluster of small, approximately 2" wide tracks radiating from the nest site.

Nighttime nest monitoring (spot checking) was conducted for the 2023 season. This was completed on FWC permit # 272 for PB and # 273 for PK. This work is conducted to mitigate the effect of light pollution which confuses hatchlings upon emergence and causes them to go inland towards the brighter horizon.

Assessments

Nests were assessed 72 hours after the initial hatching event. Nests that were flooded and where emergence signs were not evident were assessed at day 80 of the incubation period. During assessment, nests were excavated and the number of hatched (defined as an intact shell greater than 50%), unhatched and pipped eggs was recorded, along with the number of live and dead hatchlings found in the nest at the time of excavation (Appendix B). Unhatched eggs were opened, and the presence or absence of development was noted. All contents were reburied in the nest chamber. Any hatchlings alive in the nest were released to crawl into the Gulf of Mexico (hereafter referred to as the Gulf) prior to 0900 if ≤ 10 hatchlings were present. In the event > 10 hatchlings were located in the nest during assessment they were either 1) held in a container with 1" of moist sand and kept in a cool, dark place until released that night, or 2) reburied with nest contents and allowed an additional 48 – 72 hours to emerge prior to assessment.

Analyses

Beach success, reproductive success and productivity were determined for the 2023 season. Beach success was defined as the proportion of nests to all emergences:

$$\text{Beach Success \%} = \text{Nests} / (\text{Nests} + \text{False Crawls})$$

Mean hatch and emergence success rates were calculated for assessed nests as follows:

$$\text{Mean Hatch Success \%} = \text{Total \# Hatched Eggs All Nests} / \text{Total \# Eggs Laid All Nests}$$
$$\text{Mean Emergence Success \%} = \text{Total \# Emerged Hatchlings All Nests} / \text{Total \# Eggs Laid All Nests}$$

RESULTS AND DISCUSSION

Crawl Activity and Beach Success

Nesting occurred between 20 May and 1 September on PB and between 2 June and 30 June for PK. The 2023 season witnessed 14 nests and 9 false crawls on Pensacola Beach (Fig. 5). This yielded a beach success of 61% compared to the 23-year average beach success of 65% (Fig. 7; Fig 9). One green turtle nested on PB. The remaining nests were loggerheads. Seven false crawls were identified as loggerheads and 2 were from green turtles.

The 2023 season witnessed 2 loggerhead nests and 3 loggerhead false crawls on Perdido Key (Fig. 6). This yielded a beach success of 40% (Fig. 8; Fig 10.) All nesting activity were loggerheads.

15 nests in Escambia County remained *in situ* upon initial location. One was relocated with permission granted by FWC. This nest was only 6 feet from the water when located on morning patrol.

Missed Nests

No unknown or “missed” nests, defined as a nest unidentified on patrol the morning after deposition but located some time during incubation or hatch, were documented this season.

Reproductive Success

In 2023, a total of 13 loggerhead nests and 1 green nest were laid on Pensacola Beach and monitored throughout incubation. The average length of incubation on PB was 65 days (n = 10), with the shortest incubation period observed at 56 days for PB10. The longest incubation length was for PB3 at 73 days.

Three nests were lost to erosion and assigned the “114” egg value that FWC recommends, resulting in an average clutch size of 120 eggs, ranging from 92- 151 (Table 1). Of the 14 monitored nests, 11 were assessed and nests PB1, PB13 and PB14 were completely lost to erosion.

In 2023, a total of 2 loggerhead nests occurred on PK. The average clutch size was 134 eggs, ranging from 121 to 147 (Table 2).

Mean hatch success for PB was 56.9% and PK was 83.6%. This was an increase over previous seasons that was well received (Fig. 11; Fig. 12). The total number of hatchlings witnessed entering the Gulf from PB was approximately 744. (Figure 13) PK had 223 hatchlings witnessed entering the Gulf. (Figure 14)

Hatching success can be related to the location of the nests on the beach. Nests laid lower on the beach, typically have lower success rates (Fig.15). Nests laid in positions that are prone to flooding, have been impacted by storms regularly for the last few seasons and have seen a significant decline in hatching success. Seasons that had lower tropical activity typically witnessed higher success rates of nests: such as 2000, 2002 and 2022. Other seasons that had high success rates, had a large percentage of nests relocated higher on the beach above lines of swash impacts from tropical storms, such as 2006, 2009, 2013 and 2016. (Fig.11).

Undeveloped Nests

Pensacola Beach nests 4 and 8 had high numbers of undeveloped eggs. These nests were not impacted by high water events from the Gulf. Nests that have 40 or more undeveloped eggs are included in this data set.

Nests readily fail due to flooding from storms and then typically have developed embryos inside the eggs upon the nest assessment. We have been monitoring for nests that showed no apparent development in the eggs. These eggs when opened, contained no blood or tissue. We realize that early development could have ceased with the tissue dissolving before the eggs were opened. However, we are now tracking nests that are either infertile, or fail in development at very early stages, and are thus eggs that appear undeveloped at assessment (Fig. 16).

Effects of Erosion, Inundation and Tropical Weather, General Beach Conditions

The direct impact of tides on several incubating nests this season may be due to a high number of low beach nests. Zero nests were located below the MRHTL, however one on PK was relocated with FWC permission.

Three of 14 nests on PB experienced tidal impacts to include erosion, repeated wash over and/or inundation. Of these 3 impacted nests, all experienced total loss of the eggs from erosion. (Table 1).

In total, 0 of 2 nests on PK experienced tidal impacts. (Table 2).

Sargassum washed in occurred once in early June and was considered to be light. Green slime algae, Cladophora sp. impacts were minimal in the summer of 2023 as well. In general, a significant bloom never occurred. Both algae were considered light amounts for the summer.

Predation

Complete or partial predation of marine turtle nests did not occur in 2023. While egg and hatchling predation by ghost crabs was only observed at nests, it is likely greater loss occurred that was not observed and can be attributed to ghost crabs. Burrows were noted in close proximity to a couple of the nest sites, however, sub-surface loss cannot be accurately confirmed. Data sheets include field notes regarding ghost crab activity. Missing eggs/hatchlings could be attributed to either unknown predation events or heavy rain that may have washed out tracks from daytime and nighttime rainfall emergences.

Nest Relocations

In 2023 the average distance of nests on PB to the water line was 50 feet (SD \pm 27.3 feet). For PK it was 31 feet (SD \pm 35.3 feet). Variance was high for both locations. No nests were relocated upon initial discovery on PB during 2023 due to guidelines outlined in the FWC Marine Turtle Handbook stating only nests deposited seaward of the MRHTL are candidates for relocation (FWC 2016). However, special permission was granted to move one nest on PK since it was only 6 feet from the water. In 2022, FWC did give permission to relocate any nest laid below 10 feet from the high tide line. However, FWC did not reinstate that rule in 2023.

Light Pollution and Disorientation

Hatchling disorientation was defined hatchlings from a given nest orienting $> 45^\circ$ from the most direct path to the Gulf post-emergence (FWC 2016). Artificial lighting negatively affected 66% of applicable Pensacola Beach nests (n = 6 of 9; Fig. 16). Five nests were not applicable due to the absence of viable offspring.

Artificial lighting negatively affected 0% of Perdido Key nests (n = 0 of 2).

Adult and hatchling disorientation reports are provided annually to FWC for evaluation. The most commonly noted sources of disorientation on reports provided to FWC during the 2023 season were interior and exterior lighting of various homes and condominiums and sky glow.

Obstructed Nesting Events

There was one obstructed nesting attempt on PB and zero on PK in 2023. One adult loggerhead was disoriented on PK and completed four 360 loops then returned to the Gulf.

Research

Escambia County participated in a research program with USGS researcher Dr. Meg Lamont. Two temperature transects were installed on Pensacola Beach to collect data from 3 different depths on the mid beach and high beach. Temperature probes successfully collected data through the summer and through October. This replicated the 2021-22 effort.

Escambia County participated in a research program with the University of West Florida, Dr. Phillip Schmutz. The study is titled, The Spatial Variability of Sea Turtle Nest Sites Related to Beach Morphology Characteristics on Pensacola Beach, FL.

Strandings

A total of 30 marine turtle strandings were documented throughout 2023 in Escambia County (19 loggerhead, 9 alive, 4 green, 1 leatherback, and 6 Kemp's ridley, 4 alive). There were 13 live turtle rescues either from the PB fishing pier or in the surf. Fishery related entanglements with turtles remain an issue at the PB fishing pier.

The Escambia County Ambassador Program initiated increased presence on the PB Fishing Pier. The objectives include increasing public education and pier signage, scheduling routine piling and on deck clean-ups, providing nets so operators can assist hooked or entangled turtles, and to provide proper training so reporting and transport of hooked turtles to rehabilitation facilities occurs.

CONCLUSIONS AND RECOMMENDATIONS

Nesting was at record high levels in 2023 for greens and loggerheads in Florida. However, Escambia County saw low nesting numbers in general. Some nests were lost to erosion with low hatching success. It is recommended by staff and volunteers that a more reasonable “relocation line” in the sand be permitted, to allow the very low nests to be relocated to higher ground. FWC granted a 10 foot line above mean high water in early August 2022, but did not allow that again in 2023. The current Most recent High tide Line is typically only feet from the Gulf. It is expected that if the Most Recent Storm Line were used, located typically somewhere around 25-35 feet up the beach, several nests per season could be relocated. Females that arrive to nest in the area, have to access and negotiate many anthropogenic impacts, before they emerge, as well as while crawling to their nests site. These include artificially designed/constructed beaches, sand shortages from the Army Corps of Engineers century long practice of dumping dredged sand from channels miles offshore, houses and condominiums constructed just above the vegetation line, that have lighting that alters the night sky, human physical presence on the beaches at all hours of the night with flashlights/cell phone lights on, that are readily observed for miles. It is impossible for a female turtle to experience natural conditions on our local beaches, and it is speculated they possibly nest lower than normal due to the myriad of human impacts.

Disorientation events were high again in 2023. Nests that hatch under new or less than half-moon conditions typically witness disorientation. Coastal lighting which contributes to point source and non-point source (sky glow) continues to be an issue.

Limiting Disruption

Human presence on nesting beaches during nighttime hours could disrupt nesting turtles and their hatchlings. Human presence on the beach after dark is frequent in places and include flashlight/cell phone light usage, that illuminates the beaches. The 2023 season witnessed excessive use of lighting by beach goers in the core areas. This can be a deterrent to females attempting to emerge and nest on these beaches.

The Escambia County’s Sea Turtle Ambassador program began to educate beach goers on this issue; however the problem presents unique challenges to changing visitor behavior, partly in due to the high number of short-term and day-use visitors on Pensacola Beach. Volunteers provided red flashlight and

cell phone filters to the beach visitor centers and participating hotels to help reduce the amount of white light being cast on the beaches at night by beach goers.

Volunteer Time

Volunteers collectively submitted approximately 1200 hours for conducting marine turtle nesting surveys and another 450 hours on monitoring activities. Key issues that require dissemination to the public include how to reduce disorientation caused by artificial lighting, strandings caused by fisherman on and off piers, and improper waste disposal. Continuing to utilize permitted volunteers for stranding response and transport will be a beneficial use of volunteer resources and increase chances of survival for sick and injured marine turtles.

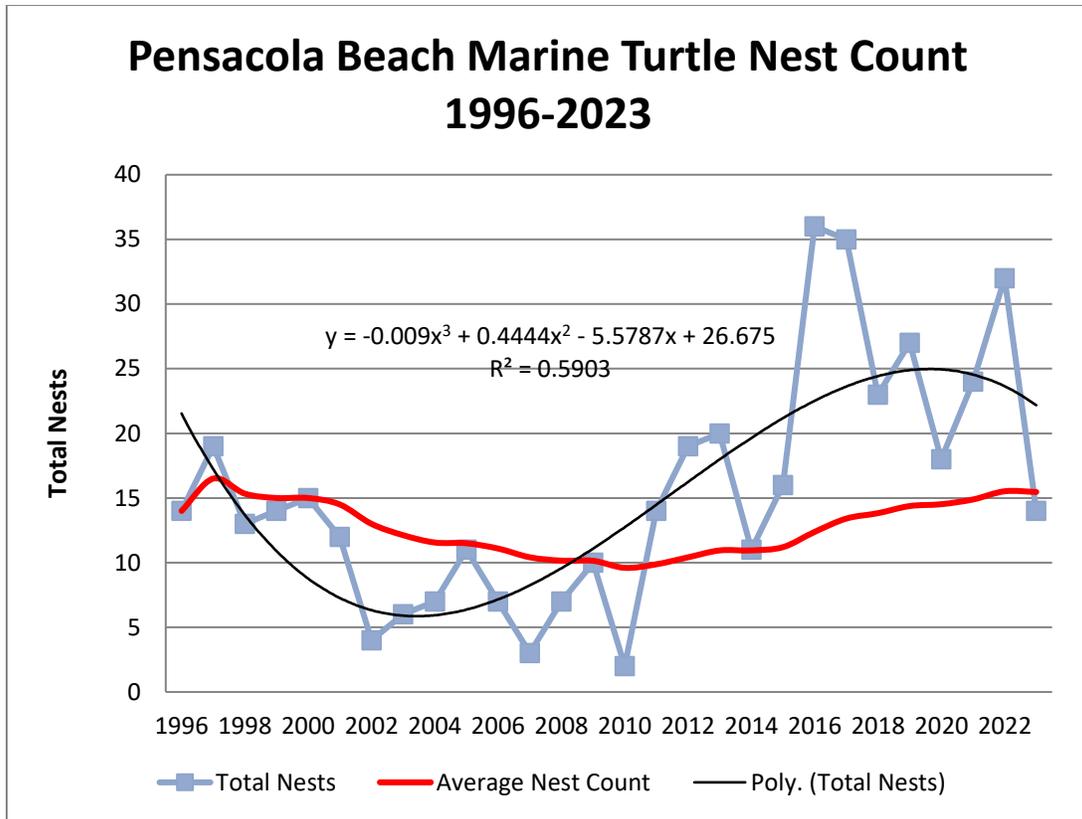


Figure 1: Pensacola Beach annual marine turtle nest count trend from the 1996 - 2023 seasons. Pensacola Beach has averaged 15.5 nests per season (SD ± 9.2) since annual surveys began. The best-fit trend line is displayed (polynomial; R² = 0.5903).

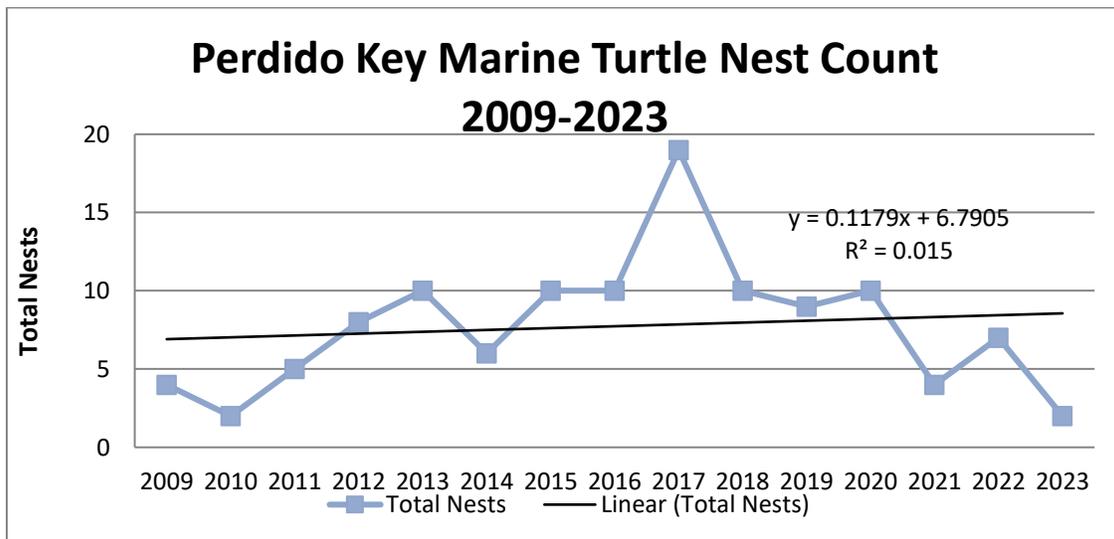


Figure 2: Perdido Key annual marine turtle nest count trend from the 2009 - 2023 seasons. Perdido Key has averaged 7.7 nests per season (SD ± 4.3) since 2009. The best-fit trend line is displayed (polynomial; R² = 0.015).

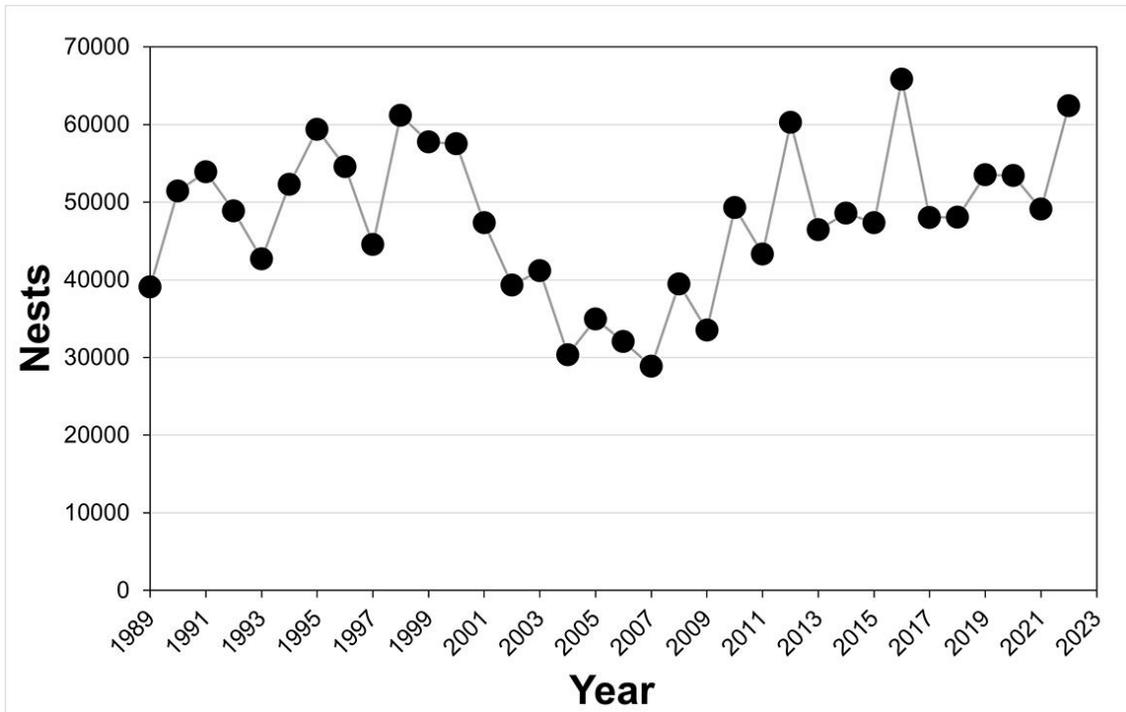


Figure 3: Number of loggerhead turtle nests counted on core index beaches in peninsular Florida, from 1989 through 2023. (FWC data)

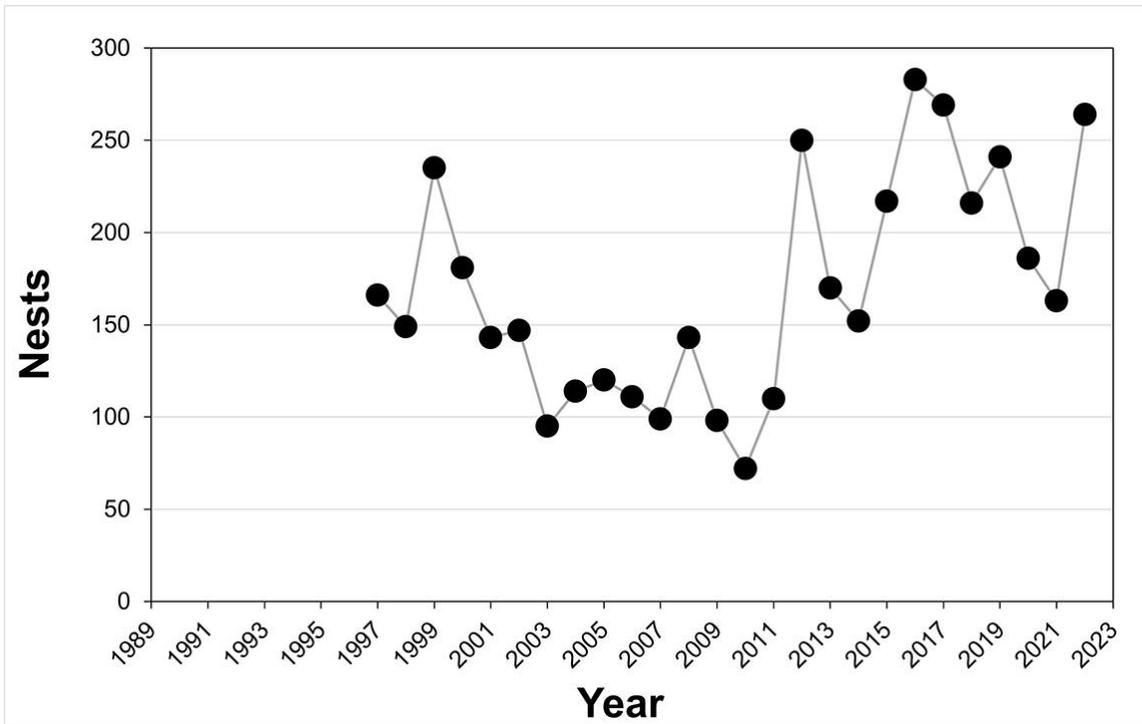
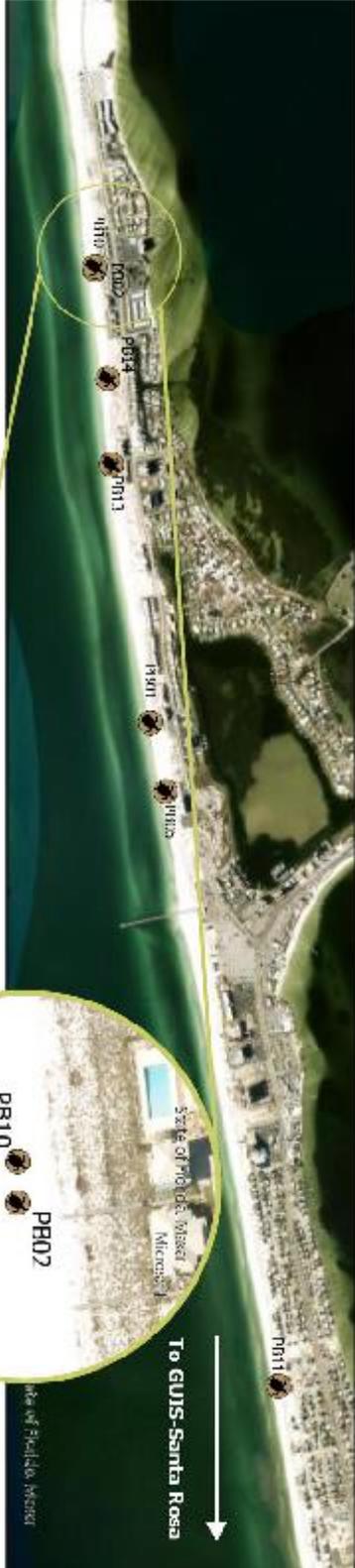


Figure 4: Number of loggerhead turtle nests counted on index beaches in the Florida Panhandle, from 1989 through 2023. (FWC data)

Escambia County 2023 Sea Turtle Nesting
Pensacola Beach



Pensacola Beach West



Pensacola Beach East



Legend

Pensacola Beach
2023 Sea Turtle
Nests

-  Species
-  Logjoints
-  Green

Figure 5: GIS map displaying Pensacola Beach marine turtle nest locations for the 2023 season.

Escambia County 2023 Sea Turtle Nesting Perdido Key



Perdido Key West



Perdido Key East



Legend

Perdido Key 2023
Sea Turtle Nests

Species

- Loggerhead

N



Figure 6: GIS map displaying Perdido Key marine turtle nest locations for the 2023 season.

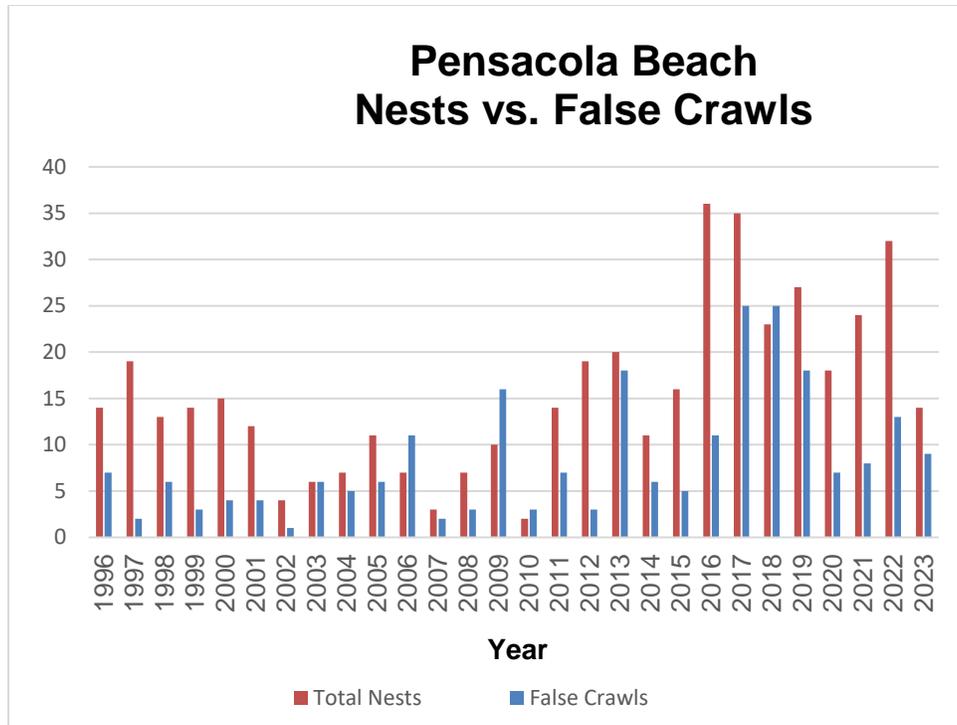


Figure 7: Marine turtle emergence data from Pensacola Beach including the number of nests compared to the number of non-nesting emergences (i.e. false crawls), 1996 - 2023.

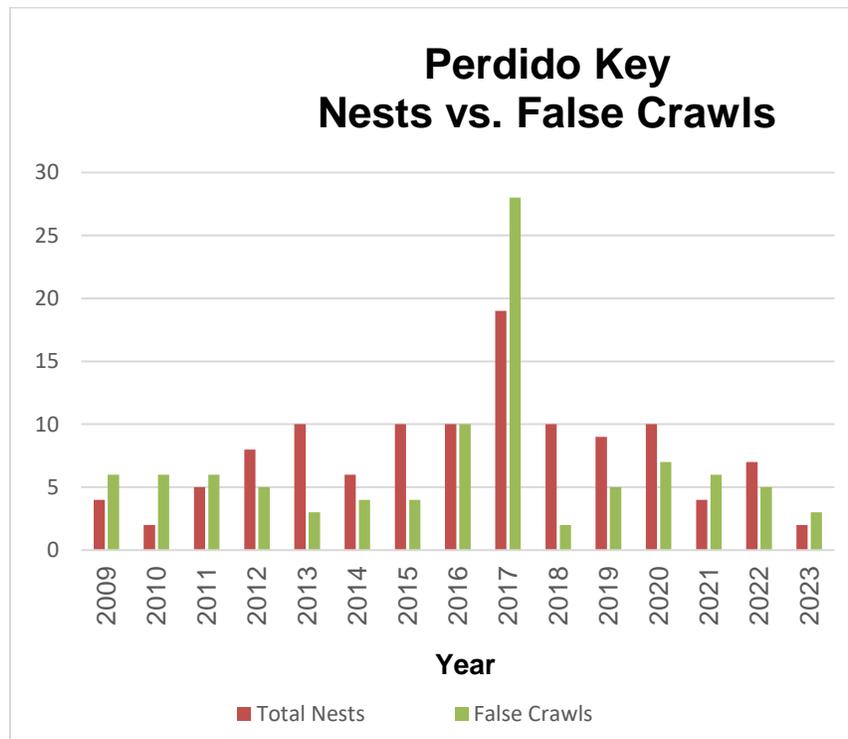
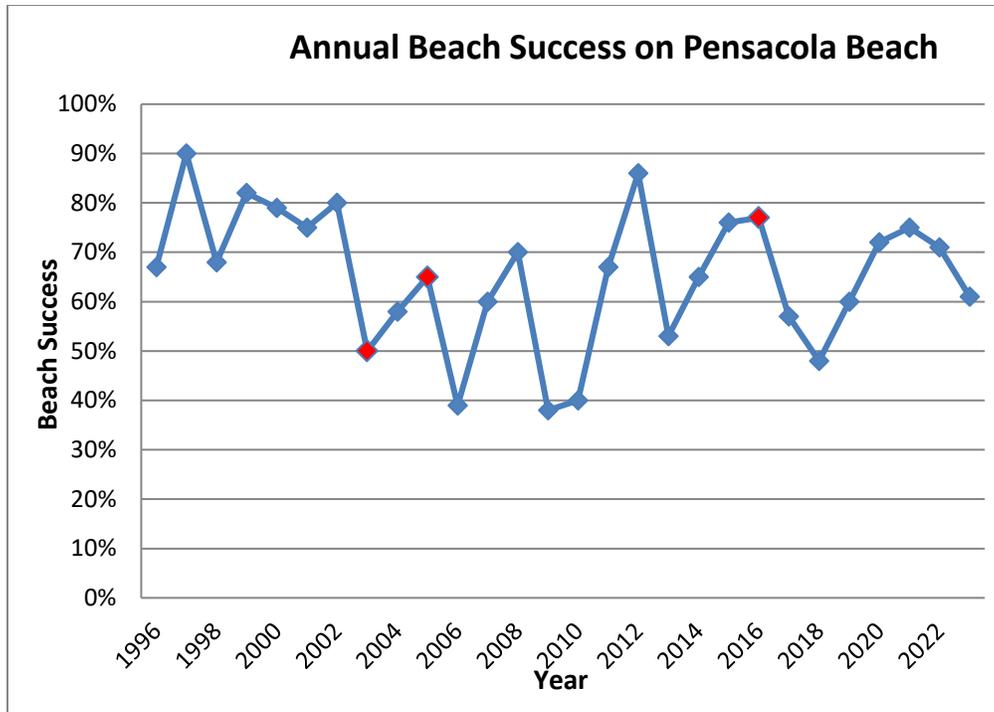
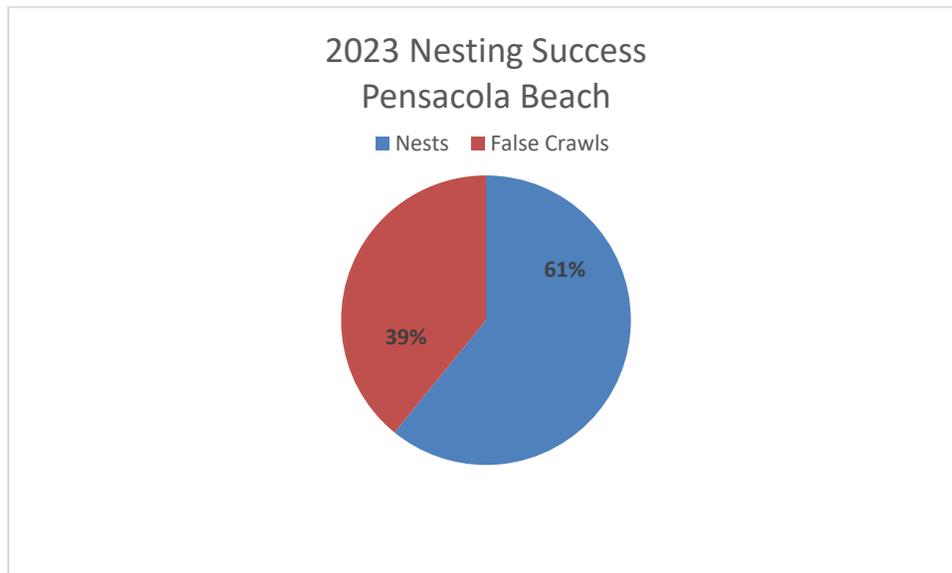


Figure 8: Marine turtle emergence data from Perdido Key including the number of nests compared to the number of non-nesting emergences (i.e. false crawls), 2009 - 2023.

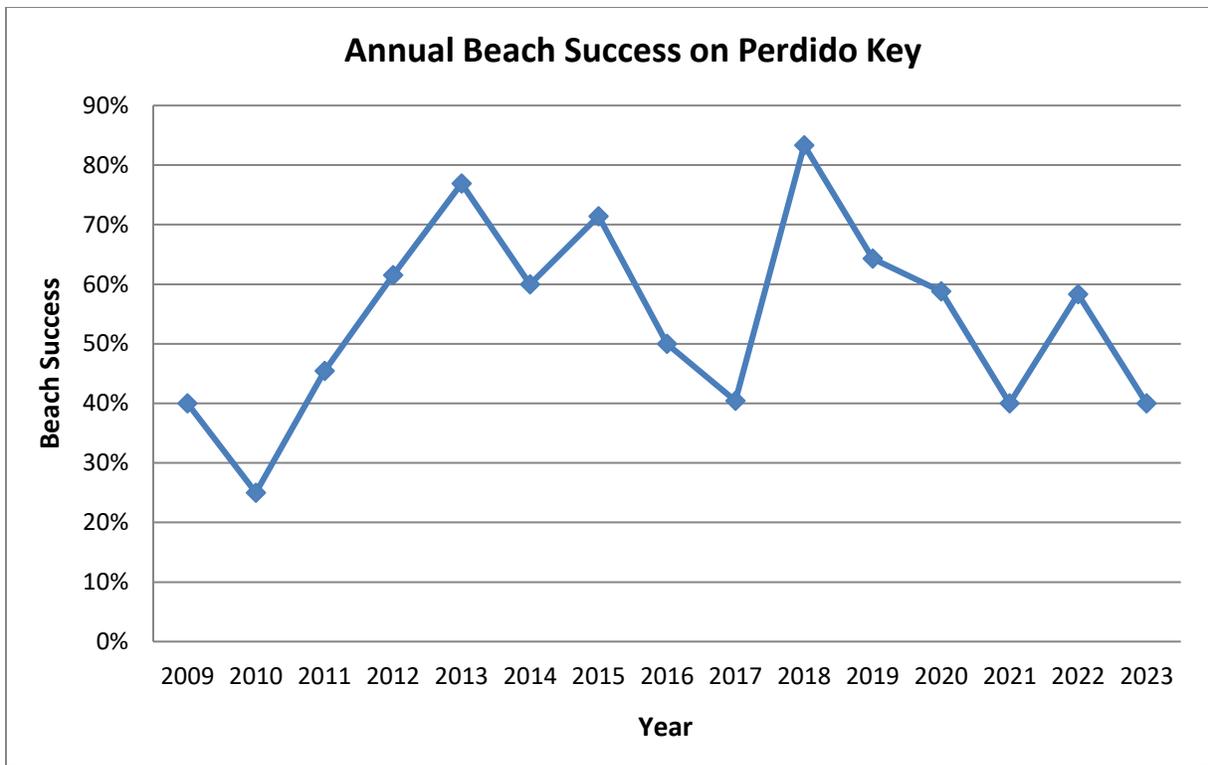


a.

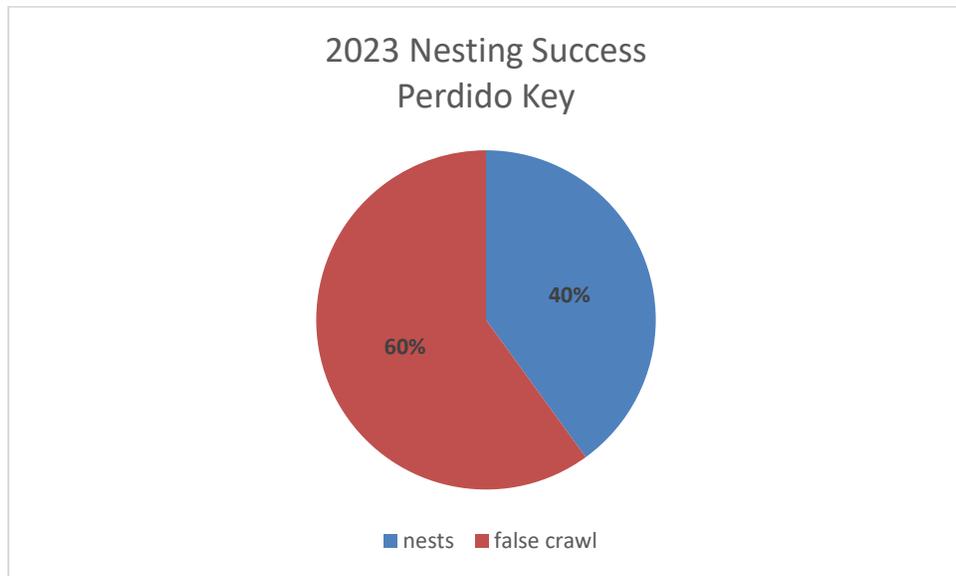


b.

Figure 9: Annual beach success data from Pensacola Beach, 1996-2023 (a). Beach success is defined as the proportion of nests laid to the total number of crawls. Beach nourishment project years are represented by red data points (2003, 2005, and 2016). Beach success for 2023 was 61%, compared to the 23 year average of 65%. (b). Proportion of nests to false crawls for 2022.



a.



b.

Figure 10: Annual beach success data from Perdido Key, 2009-2023 (a). Beach success is defined as the proportion of nests laid to the total number of crawls. Beach success for 2023 was 40%. Proportion of nests to false crawls for 2023 is also depicted (b).

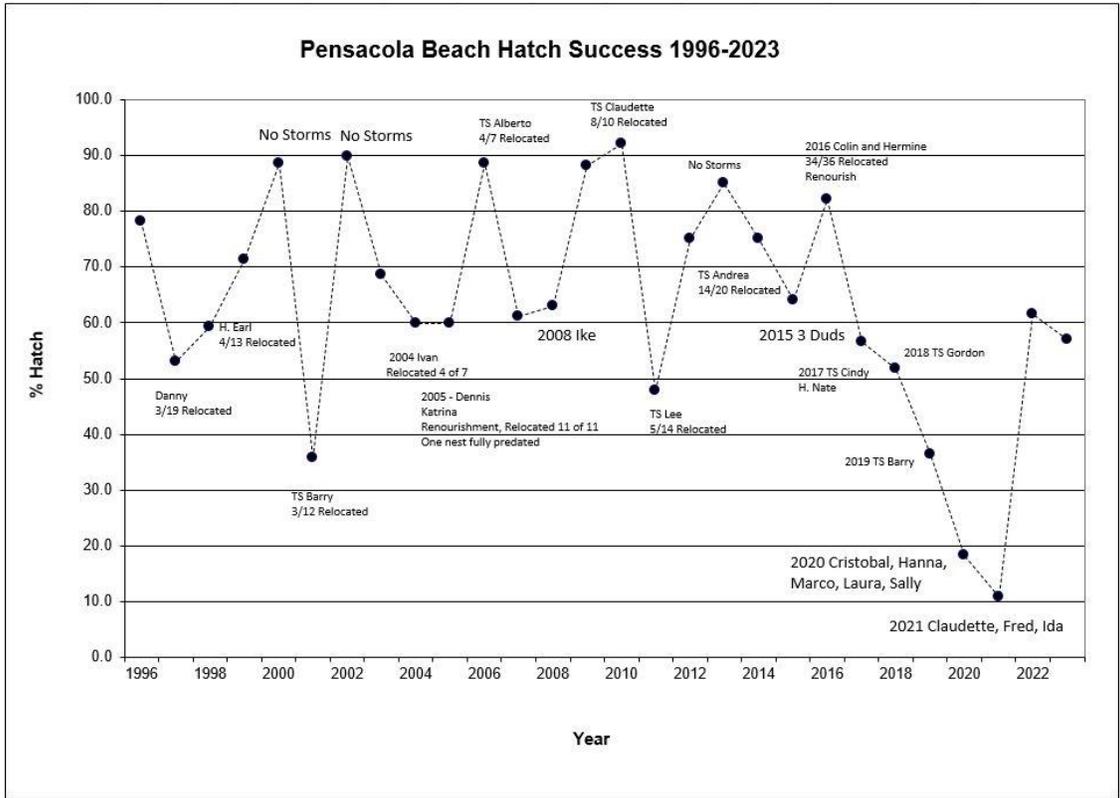


Figure 11: Annual mean hatch success (% hatch) from the 1996 - 2023 nesting seasons on Pensacola Beach. Mean hatch success for the 2023 season was 56.9 (SD ± 21%). Long-term monitoring efforts have established a 25 year mean hatch success of 63.5%.

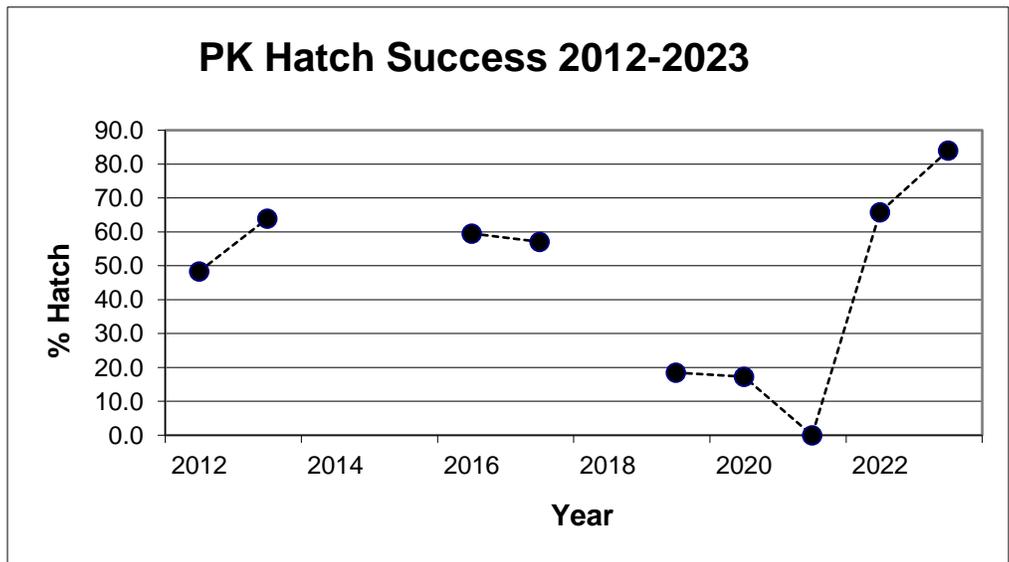


Figure 12: Annual mean hatch success (% hatch) from the 2012 - 2023 nesting seasons on Perdido Key. Data is missing or incomplete for some years. Mean hatch success for the 2023 season was 84%.

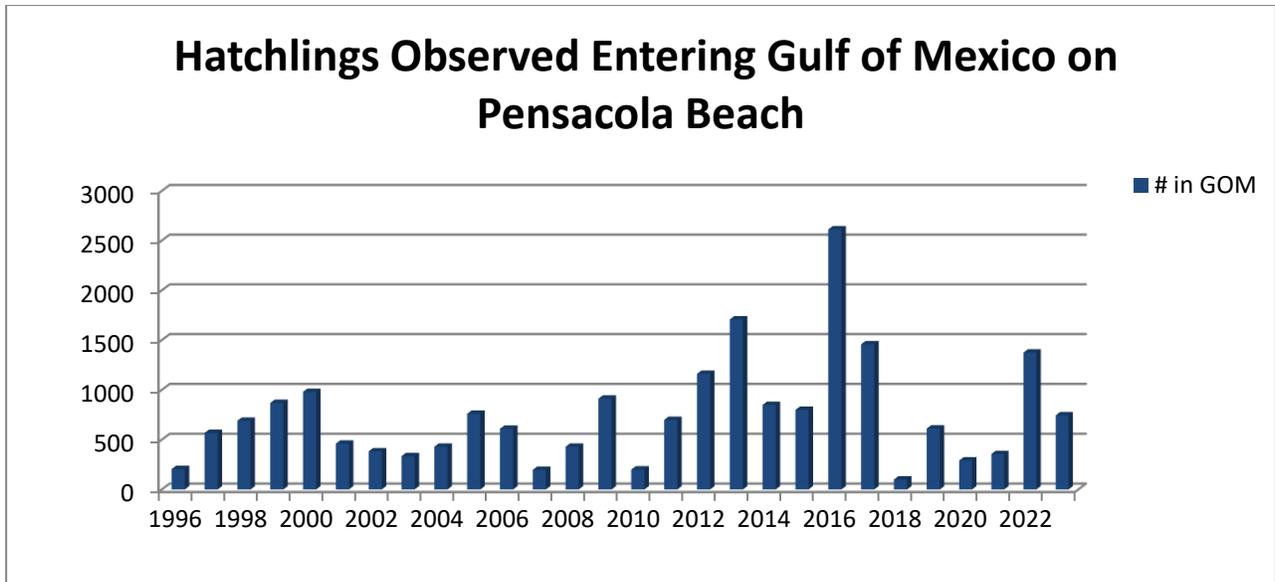


Figure 13: Number of hatchlings observed entering the Gulf of Mexico from the 1996 - 2023 nesting seasons on Pensacola Beach.

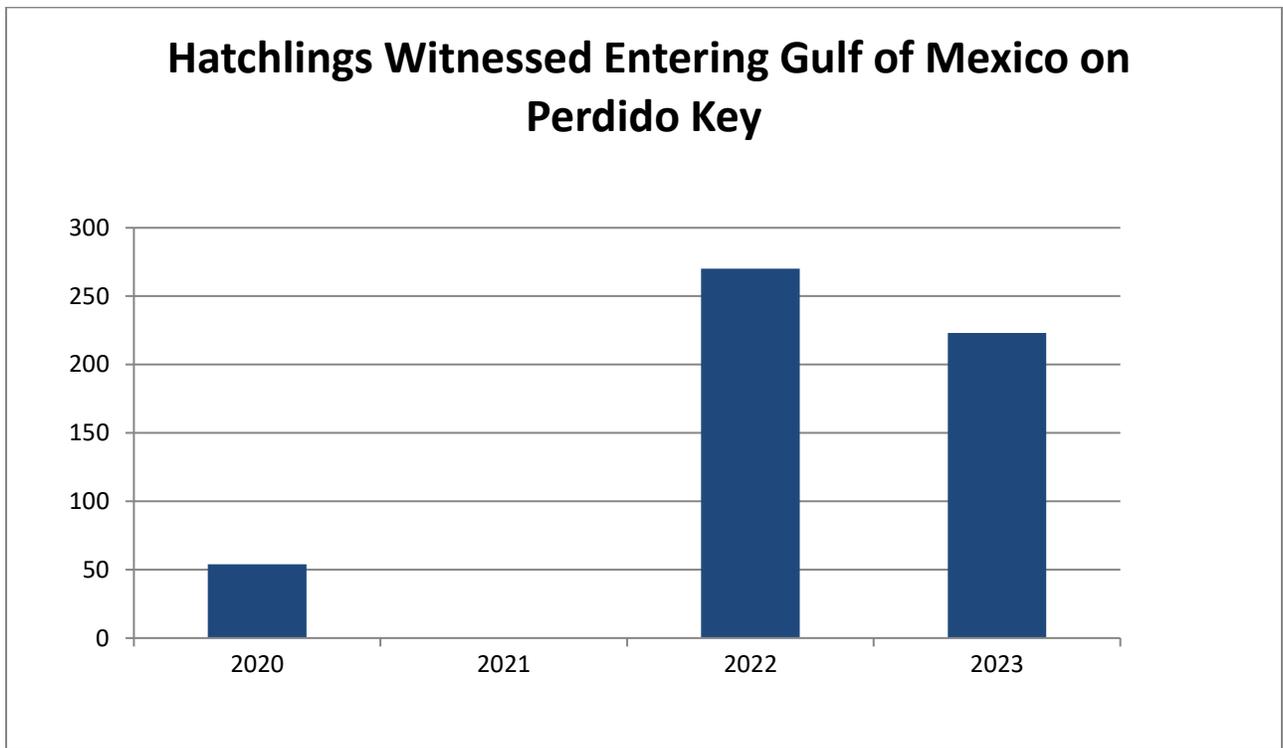


Figure 14: Number of hatchlings observed entering the Gulf of Mexico from the 2020 - 2023 nesting seasons on Perdido Key.

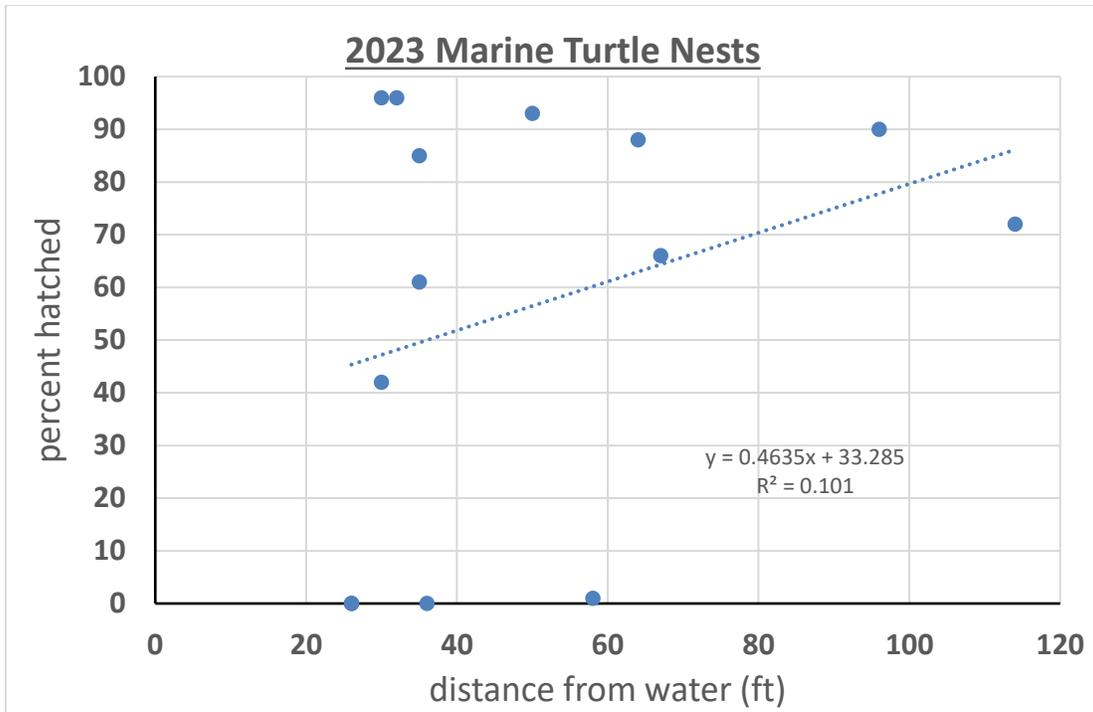


Figure 15: 2023 Pensacola Beach plotting nest hatching success versus distance nests are laid upland from the Gulf of Mexico.

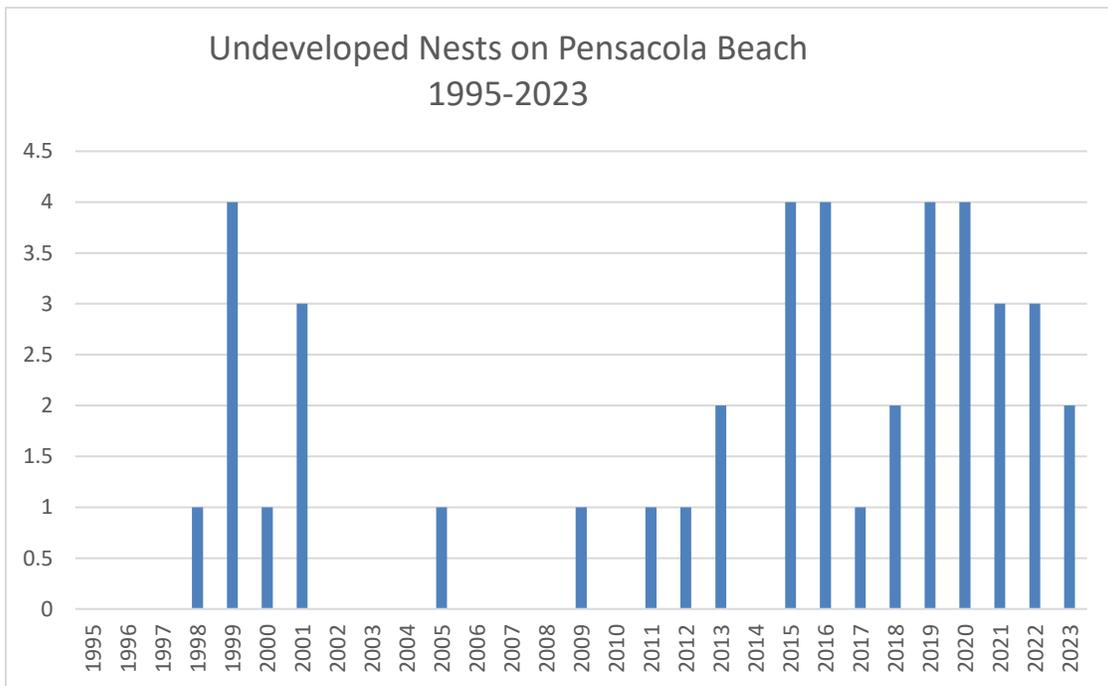


Figure 16: Pensacola Beach undeveloped nests from 1995-2023

Pensacola Beach Disoriented Nests 1996 - 2023

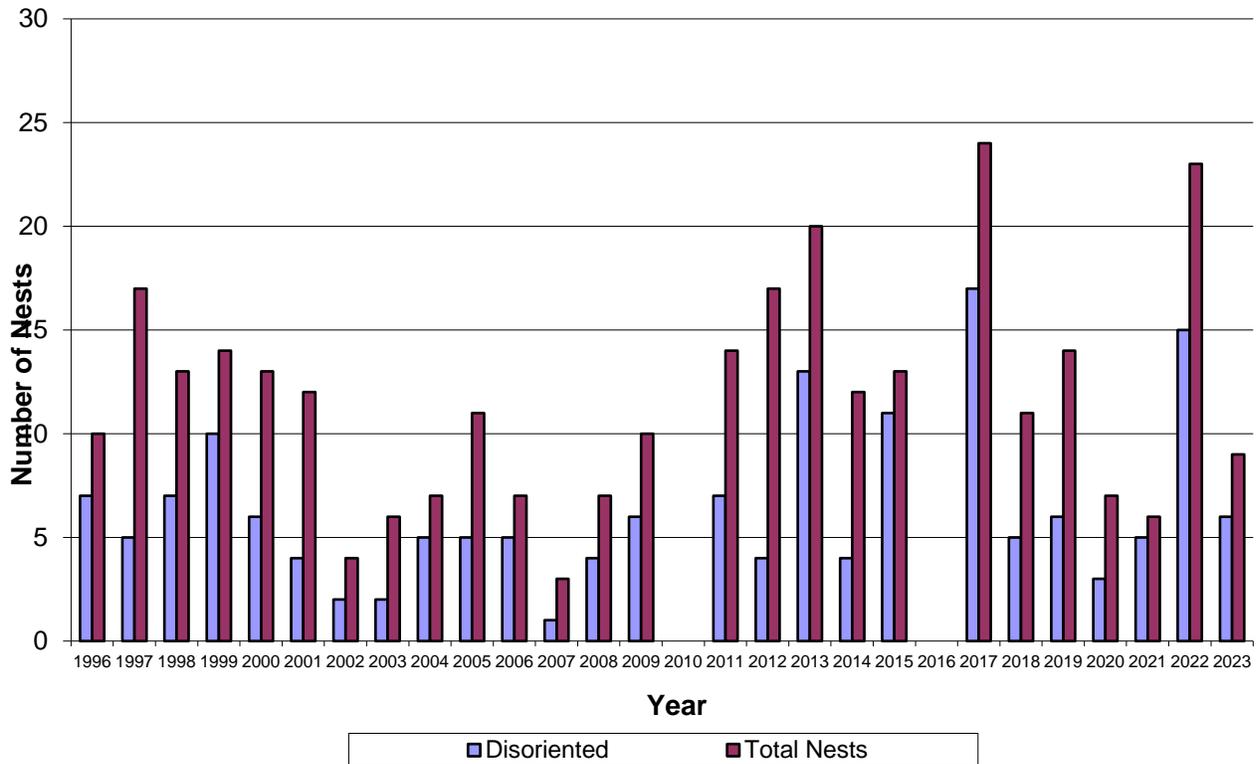


Figure 17: Comparison of marine turtle nests with hatchling disorientation to the total number of nests per season from 1996-2023 on Pensacola Beach. Disorientation data is not shown for the 2010 and 2016 seasons due to relocation of all incubating nests offsite during the 2010 Deepwater Horizon oil spill and 2016 nourishment project. Hatchling disorientation was defined as nests with ≥ 5 hatchlings crawling at $> 45^\circ$ angle from the direct path to the water. Hatchlings were required to crawl ≥ 10 feet to be classified as disoriented.



Figure 18: Nest PB01 was lost to erosion. Photograph was taken by the public after patrol had passed and prior to staff arriving to relocate the nest once eggs were exposed.



Figure 19: Nest PK01W located just above high tide line.



Figure 20: Volunteers relocating the clutch higher with permission from FWC. Nest hatched at 90%.



Figure 21: Nest PB04, loggerhead, located very close to the high tide line. This nest hatched at 42%.



Figure 22: Photograph illustrating light pollution issues near PB09.



Figure 23: Female loggerhead from PB11



Figure 24: Nest PB10 laid just NW of nest PB02.

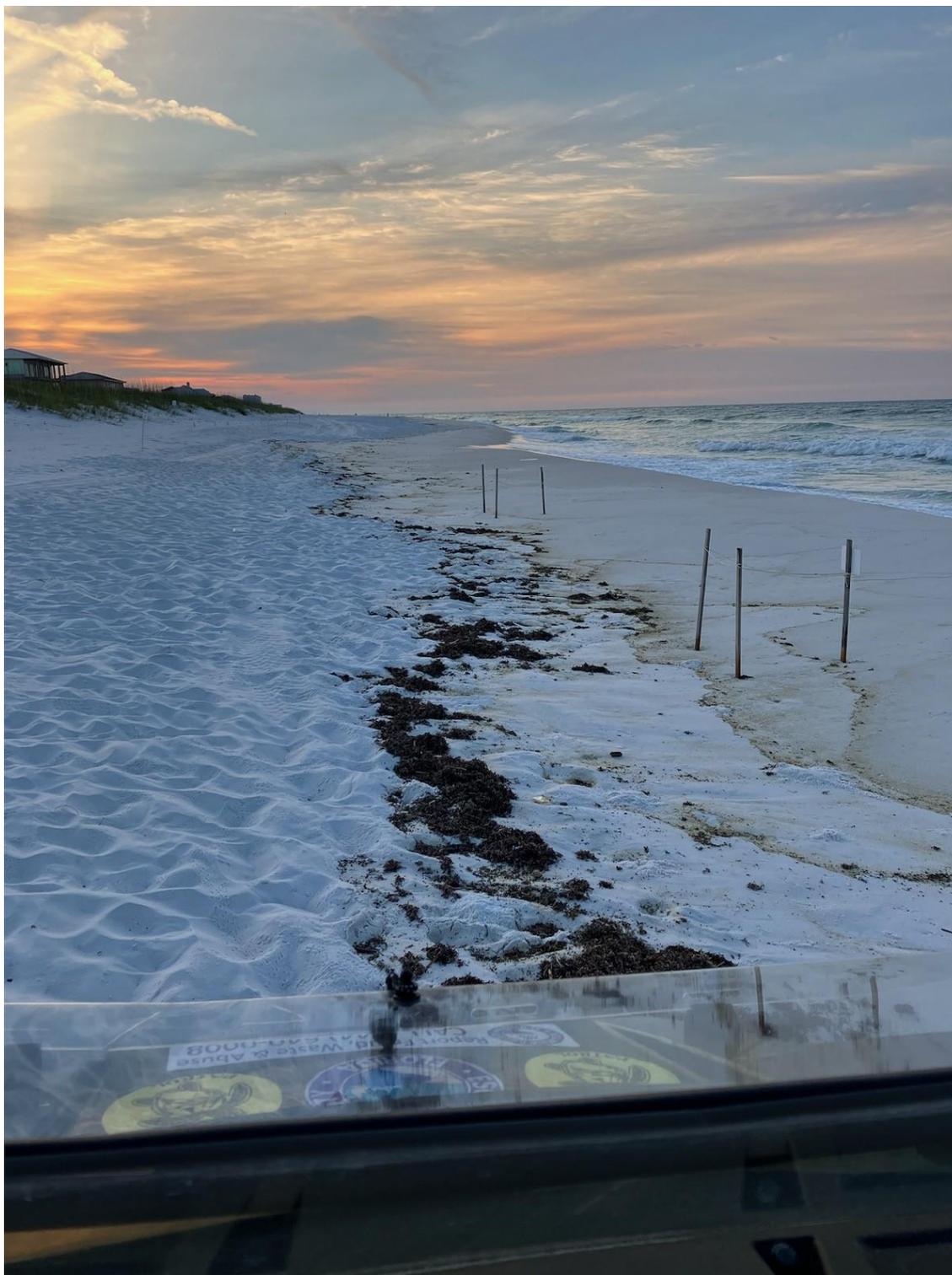


Figure 25: Sargassum line in early June at the temperature probe transect area. Sargassum never arrived in large mats as was forecasted earlier in the spring.



Figure 26: PK01E nest, with moon straight south of nests. Hatchlings are beginning to emerge.



Figure 27: Assessment of nest PB12. Public education occurs during these as beach goers come by and ask questions. Volunteers use these opportunities to educate them on marine turtle biology.



Figure 28: Civilian Clark Allen rescuing an entangled Kemp's ridley at dusk on the sandbar just off Pensacola Beach. The turtle was severely tangled in line and a home made anchor of some type. The turtle was successfully untangled and released. Drone footage provided by Steve Luppert.

Pensacola Beach 2023	Nest #	Date/Laid	Species	Hatch Date	Incub Days	# Eggs	# Eggs Prehatched	# without develop	# with develop	# Unhatched (including pipped)	# Hatched	# Emerged	% Hatch	% Emerge	Adult Dis. (Y/N)	Hatching Dis. (Y/N)	Tidal Impact (Y/N)	# in water Tracks witnessed	Approx. Tracks to GCN	Relocated (Y/N)	Crawl width (in)	Distance from High Tide Line (ft)	Distance from High Tide Line (ft)	218' scrap (Y/N)	Latitude	Longitude	
	1	5/20	Cc	NA	NA	114	0	NA	NA	NA	0	0	0%	0%	N	NA	Y	0	0	N	37	111	26	Y	30.328611	87.161111	
	2	5/24	Cc	8/1	69	111	0	4	0	0	107	104	96%	99%	N	N	N	105	0	N	30	33	30	N	30.328157	87.172047	
	3	5/27	Cc	8/8	73	114	0	21	12	6	75	73	66%	69%	N	Y	N	73	0	N	32	59	67	N	30.412836	87.216379	
	4	6/2	Cc	8/12	71	133	0	72	5	0	56	47	42%	35%	N	Y	N	56	0	N	36	43	30	N	30.344570	87.088356	
	5	6/5	Cc	8/13	69	126	0	33	16	0	77	72	61%	57%	N	Y	Y	77	0	N	34	65	35	N	30.327144	87.141725	
	6	6/5	Cc	8/12	68	92	0	7	6	1	78	78	85%	85%	N	Y	N	2	0	N	33	70	35	N	30.340020	87.091839	
	7	6/6	Cc	8/14	69	101	0	3	0	7	91	87	90%	89%	N	N	N	90	0	N	33	31	96	N	30.347695	87.062771	
	8	6/18	Cc	NA	NA	118	0	115	2	1	1	0	1%	0%	N	NA	N	0	0	N	29	53	58	N	30.346836	87.067088	
	9	6/21	Cc	8/21	61	141	0	6	3	1	131	131	93%	93%	N	Y	N	131	0	N	34	39	50	N	30.338844	87.107616	
	10	6/21	Cc	8/16	56	105	0	4	0	0	101	101	96%	96%	N	Y	N	101	0	N	38	20	32	N	30.326157	87.172047	
	11	6/23	Cc	8/20	58	147	0	11	6	0	130	130	88%	88%	N	Unk	N	1	1	N	36	10	64	N	30.334582	87.112045	
	12	7/3	Cm	8/31	59	151	0	39	2	1	109	108	72%	72%	N	N	N	108	1	N	41	10	114	N	30.348111	87.048056	
	13	7/30	Cc	NA	NA	114	0	NA	NA	NA	0	0	0%	0%	N	NA	Y	0	0	N	36	48	26	N	30.328913	87.163164	
	14	9/1	Cc	NA	NA	114	0	NA	NA	NA	0	0	0%	0%	N	NA	Y	0	0	N	32	10	36	N	30.326710	87.166960	
n=	14	14		10	14	14	14	14	14	14	14	14	14	14	14	9	14	14	14	14	14	14	14	14			
sum						1681	0	315	52	17	956	931						744	2		481	622	699				
mean						65	0	29	5	2	68	67	55.9%	55.4%	0	6	4	53	0	0	34	44	50	1			
StDev						17.4	0.0	35.6	5.2		49.1	49.0	0.4	0.4				50.4	0.4		3.2	29.8	27.3				
						114	egg # assigned by RUC for nest distribution																				

H:\Marine_Resources\Active\MRD\Projects\WVAV\MGMT\WV2009\Sea Turtles_TE Sp Standings\Dealthistorical Data by Year\2023 Data 20200908\2022PBeach20231106.xlsx\2023 Annual Data

Table 1: 2023 Pensacola Beach marine turtle nesting data summary.

APPENDIX A

MARINE TURTLE MONITORING REPORT

CIRCLE: PK PB

NEST NUMBER _____

REPORTED BY: _____
DATE: _____ TIME: _____ AM/PM
WEATHER _____

LOCATION: _____ YARDS/MILES EAST/WEST OF
MARKER: _____
DESCRIPTION: _____

SPECIES: (circle one)
Cc = Loggerhead
Cm = Green
Dc = Leatherback
Lk = Kemp's Ridley

INCIDENT TYPE:
NEST
FALSE CRAWL

**MOST RECENT
HIGH TIDE LINE:**
ABOVE
BELOW

**DISTANCE OF BODY PIT
FROM:** (feet/ meters)
WATER LINE: _____
VEGETATION LINE: _____

SIGNS/STAKES: from
center of body pit/egg cavity
(feet / meters)
Sign: _____
From the sign:
1st stake _____
2nd stake _____

CRAWL MEASUREMENTS:
ALTERNATING
SYMMETRICAL
WIDTH: _____ IN/CM

PREDATOR SCREENED: ___ YES ___ NO _____ DATE

RELOCATED: ___ YES ___ NO **If YES Proceed to back of form**

ADDITIONAL COMMENTS:

PLEASE DRAW A DIAGRAM BELOW

NEST'S INCUBATION INCIDENTS

APPENDIX B
Nest Assessment Data Sheet
SEA TURTLE NEST ASSESSMENT REPORT

v.09.13.2017

DATE:	TIME:	NEST NUMBER:
LOCATION:	REPORTED BY:	

RELOCATED: Y / N <12 HOURS / > 2 WEEKS

PREDATION:

NEST: _____

HATCHLING: _____

DISORIENTATION:

ADDITIONAL COMMENTS:

TOTAL EGGS FOUND	_____	LIVE IN NEST	_____
HATCHED EGGS	_____	DEAD IN NEST	_____
UNHATCHED W/ DEVELOPMENT	_____	% HATCH SUCCESS	_____
UNHATCHED W/O DEVELOPMENT	_____	DAYS INCUBATED	_____
PIPPED ALIVE	_____	WITNESSED ENTERING GULF	_____
PIPPED DEAD	_____	EMERGED	_____
		GHOST CRAB PREDATION	_____

- The # of hatched eggs + unhatched eggs + pipped alive & dead = # of eggs in nest
- Hatched eggs do not include "pipped" eggs

HATCHING (please initial all entries)

DATE	TIME in GOM	#HATCHLINGS	DISORIENTED	UNDER SCREEN	ROOTS	OBSERVER	COMMENTS

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