

TECHNICAL REPORT EPD 11-03

**SEA TURTLE CONSERVATION PROGRAM
BROWARD COUNTY, FLORIDA
2011 REPORT**

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For the:



**BROWARD COUNTY
BOARD OF COUNTY COMMISSIONERS**

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INTRODUCTION

Since 1978, the Broward County Natural Resources Planning and Management Division (BCNRPMD) has provided for the conservation of endangered and threatened sea turtle species within Broward County. Broward County is within the normal nesting areas of three species of sea turtles: the loggerhead sea turtle (*Caretta caretta*), the green sea turtle (*Chelonia mydas*) and the leatherback sea turtle (*Dermochelys coriacea*). The loggerhead is listed as a threatened species, while the green and leatherback are listed as endangered under the U.S. Endangered Species Act, 1973, and Chapter 370, F.S.

Since these statutes strictly forbid any disturbance of sea turtles and their nests, conservation activities involving the relocation of nests from hazardous locations require permitting by the U.S. Fish and Wildlife Service (USFWS). In Florida, this permit is issued to the Florida Fish and Wildlife Conservation Commission (FFWCC), Imperiled Species Management Section, Tallahassee, Florida. This project was administered by the BCNRPMD and conducted by the Nova Southeastern University Oceanographic Center under Marine Turtle Permit #108 issued to the BCNRPMD by the FFWCC. Volunteers assisting with night nest monitoring worked under Marine Turtle Permit #174, also issued to the BCNRPMD.

The BCNRPMD is especially concerned with any environmental effects of intermittent beach nourishment projects on shorelines and the offshore reefs. As a result, the BCNRPMD has maintained the sea turtle conservation program in non-nourishment years to provide a continuous database and for monitoring of completed nourishment projects. Nova Southeastern University received the contract to conduct the 2011 program.

In addition to fulfilling the requirements of the U.S. Endangered Species Act and Chapter 370. F.S., the purposes of the project were:

- 1) relocate eggs from nests deposited in sites threatened by natural processes or human activities and thus maximize hatchling survival,
- 2) accurately survey sea turtle nesting patterns to document historical trends and assess natural and anthropogenic factors affecting nesting patterns and densities,
- 3) assess the success of sea turtle recruitment in terms of nesting success, hatching success and total live hatchling production,
- 4) dispose of turtle carcasses, respond to strandings and other emergencies and maintain a 24-hour emergency cell phone for reporting of turtle incidents, and
- 5) inform and educate the public about sea turtles and their conservation.

MATERIALS AND METHODS

Beach Survey

Daily beach surveys commenced one half hour before sunrise. For survey purposes the County was divided as follows:

Table 1: Broward County Survey Areas.

BEACH	BEACH LENGTH (km)	BOUNDARIES	FDEP SURVEY MARKER #
Hillsboro-Deerfield Beach	7.0	Palm Beach Co. line to Hillsboro Inlet	R1-24
Pompano Beach Including Lauderdale-by-the-Sea	7.7	Hillsboro Inlet to Commercial Blvd.	R25-50
Fort Lauderdale	10.6	Commercial Blvd. to Port Everglades Inlet	R51-85
John U. Lloyd Park	3.9	Port Everglades Inlet to Dania Beach fence	R86-96
Hollywood-Hallandale Including Dania	9.4	Dania Beach fence to Miami Dade Co. line	R97-128

The location of Broward County and the positions of the boundary lines above are shown in Figure 1 A-F.

Daily surveys of Deerfield Beach, Hillsboro Beach, Pompano Beach, Lauderdale-by-the-Sea, Fort Lauderdale, Dania Beach, Hollywood Beach, and Hallandale Beach commenced on March 1, 2011. Surveys continued through September 30th. The beach at John U. Lloyd State Park (JUL) was patrolled by park personnel who provided the data from that area. Except in Lloyd Park, nest locations were referenced to Florida Department of Environmental Protection (FDEP) beach survey monuments numbered consecutively from R1 to R128 (N to S). Marker numbers corresponding to

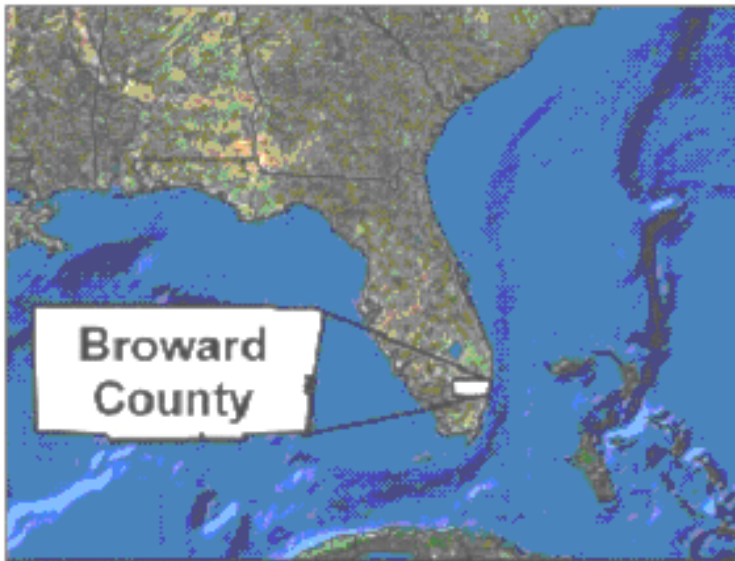


Figure 1A: The location of Broward County, FL



Figure 1B: Northern Broward County

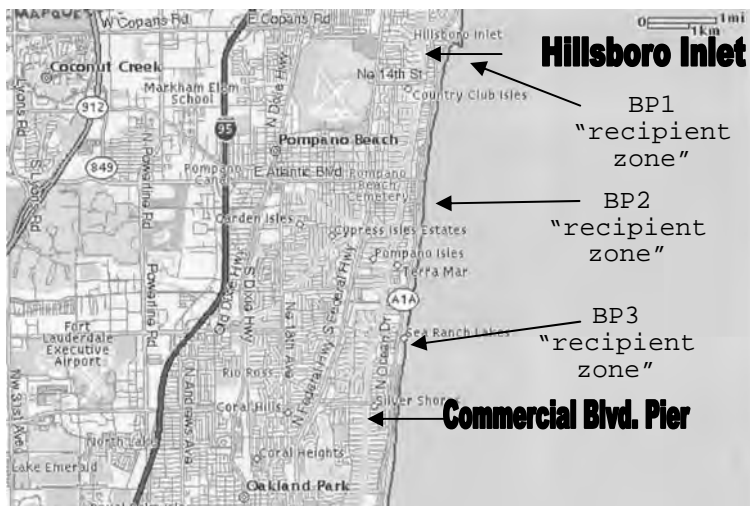


Figure 1C: North Central Broward County

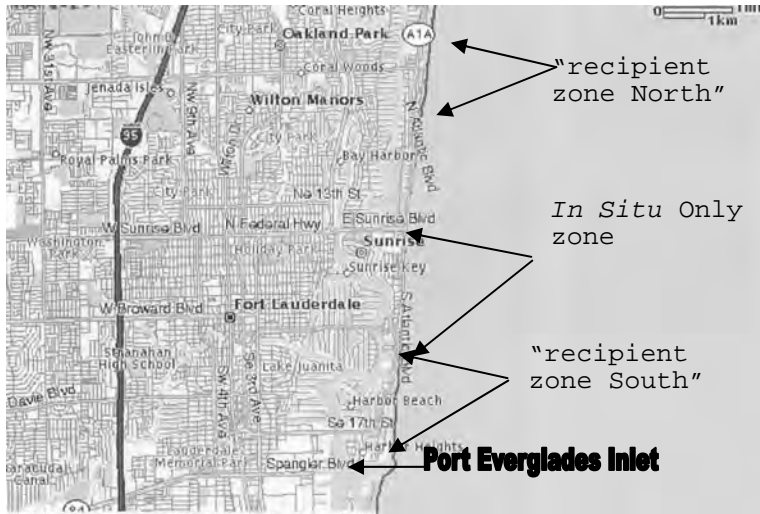


Figure 1D: Central Broward County

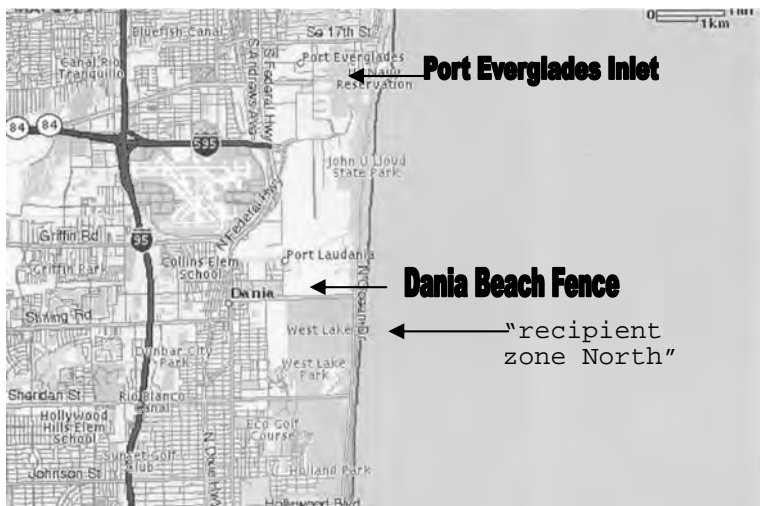


Figure 1E: South Central Broward County



Figure 1F: Southern Broward County

each beach section are listed in Table 1. Each nest location was initially recorded relative to the nearest building, street, or other landmark. These locations were later cross-referenced to the nearest survey marker. Nest and non-nesting (false) crawl locations were also recorded using Global Positioning System (GPS) receivers. All false crawls were recorded, but those that did not reach the previous high tide line were listed separately.

Surveyors used four-wheeled all-terrain vehicles (ATVs) that could carry up to six turtle egg clutches per trip in plastic buckets if needed. However, only loggerhead nests in designated donor zones were relocated, as mandated by FFWCC. When relocation was necessary, the usual method was to mark and record nests and false crawls on the first pass along the beach and then dig and transport nests in danger of negative impacts on the return pass. Nests were relocated to adjacent “safe zones” or “recipient sites” in a random manner to avoid clustering nests within the recipient zones. After recording all pertinent information, the crawl marks were obliterated to avoid duplication.

Nests in danger of negative impacts were defined as follows:

- 1) a nest located at or below the previous evening’s high tide line or,
- 2) a nest located in a “donor zone”, which was pre-determined by the FFWCC and located in a highly illuminated area.

Nests located in Fort Lauderdale, Lauderdale-by-the-Sea, and Pompano were relocated if they were deposited in a donor site or were deposited at or below the previous evening’s high tide line. Donor sites for these beaches were designated by FFWCC and included zones R122 – R107, R101-R98, R85, R54-53, R50, R35-32, and 2300 Bay Dr north to the Hillsboro Inlet (R25-R24). All other zones were designated recipient and *in situ* sites or *in-situ* only.

In Fort Lauderdale, Lauderdale-by-the-Sea, and Pompano recipient and *in situ* sites included zones R31-25 (referred to as BP1), R41-36 (BP2), R49-42 (BP3), R84-55, and R52-51. All nests that were relocated from zones R54-53 were alternately moved to zones R52-51 and R63-58. Nests that were relocated from R85 were moved to R83-80. Nests needing to be relocated from zones R50 were relocated to R49-42 (BP3, Lauderdale-by-the-Sea). All relocated nests from zones R35-33 were moved to R41-39 and R37-36 (BP2) and R32 were moved to R31-25 (BP1). Zones R79-69 were designated as *in situ* only with caging encouraged. This protocol was mandated by FFWCC. Here, egg chambers of only loggerhead nests were located within 12 hours post deposition and select nests then received a restraining cage at 45 days of incubation. Donor zones and their associated recipient zones are summarized in Table 2.

Nests in danger of negative impacts at Hillsboro Beach were individually relocated to safer nearby locations (designated BH) or they were moved to open beach locations adjacent to homes with house numbers in the 900s through the 1100s on Highway A1A. These locations were designated BH900s, BH1000s, and BH1100s and DB (in Deerfield Beach) respectively. The locations of the most southerly and northerly limits of this area (BH900s through BH1100s) are shown in Figure 1B.

Hollywood Beach was divided into donor and recipient/*in situ* sites. Donor sites included zones R122-107 and R101-97. Nests relocated from zones R101-97 were moved to R106-102. Nests relocated from zones R114-107 were moved to R106-102, and nests from R122-115 were moved to R128-124. These donor and recipient zones are summarized in Table 3. All green turtle nests were left *in situ* except for those deposited at or below the

previous night's high tide line. Only 5 green turtle nests were relocated, while 249 were left in place. All leatherback nests were left *in situ*.

Table 2: Destinations for Relocated Nests in Pompano, Lauderdale-by-the-Sea, and Fort Lauderdale. March 1-Sept 30

Donor Zones	Recipient Zones
R85	R83-80
R54-53	R52-51 & R63-58, alternately
R50	R49-42
R35-33	R41-39 & R37-36
R32	R31-25

Table 3: Destinations for Relocated Nests in Dania, Hollywood, and Hallandale. March 1-Sept 30

Donor Zones	Recipient Zones
R122-115	R128-124
R114-107	R106-102
R101-97	R106-102

Nests to be relocated were carefully dug by hand, and the eggs were transported in buckets containing sand from the natural nest chamber. The depths of the natural egg chambers were measured and recorded. The eggs were then transferred to hand-dug artificial egg chambers of similar dimensions and lined with sand incorporated from the natural nest. Care was taken to maintain the natural orientation of each egg, to minimize

possible injury to the embryos. These relocated nests were marked off on the beach using 1 stake with a nest sign attached and 2 unsigned stakes forming a triangle around the egg chamber. A total of 196 loggerhead nests were relocated and 177 (90%) were post-hatch evaluated. The 19 unevaluated nests were either completely predated or washed out.

A total of 2008 nests that were located in FFWCC designated recipient sites were marked with stakes bearing yellow 5.5" X 8.8" sea turtle nest warning signs (Appendix 3), surrounded by a minimum of 4 additional stakes and a minimum 10 foot diameter circle of caution tape and left *in situ*.

At least 72 hours after first emergence, 1176 *in situ* nests (59%) were excavated for post emergence evaluation. The number of hatchlings released from each nest was determined as the total number of eggs minus the number of hatchlings found dead in the nest (DIN), dead piped eggs with partially emerged hatchlings (DPIP), and unhatched eggs showing visible (VD) or no visible development (NVD). The number of hatchlings alive in the nest (LIN) and live piped eggs (LPIP) were included in the number of hatchlings released but were subtracted from this number to determine the number which naturally emerged from each nest. Live hatchling production success was defined as the number of released hatchlings divided by the total number of eggs.

Workers also located, assessed and recorded hatchling disorientation events and sent a Marine Turtle Hatchling Disorientation Incident Report Form for each event to FFWCC. As in the past four years, Marine Turtle Permit 174 was utilized for additional support for the management of disorientation events. A volunteer training session was held on May 23 to educate the volunteers about the Broward County Sea Turtle Program and the effects of artificial lighting on the behavior of nesting and hatchling sea

turtles. Volunteers were trained and permitted to rescue disoriented hatchlings and record information for the preparation of disorientation reports. Their efforts helped to ensure safe passage of hatchlings to the ocean and provided valuable information about disorientation events throughout the County. The volunteers monitored nests from June 20 to October 30.

Data Analysis

The data were compiled, analyzed and plotted with Quattro Pro, version 8 (Corel Corp. Ltd.) and Statistica, release 6 (StatSoft, Inc.). The countywide yearly nesting densities from 1981 to 2011 for the three species were plotted and trends were assessed by linear regression and correlation analyses. Seasonal nesting patterns and nesting densities were calculated for each beach (nests per km) and the beaches were compared using 1-way analysis of variance (ANOVA) and Newman-Keuls (NK) tests at the 0.05 significance level. The total number of nests deposited by each species in the beach segments corresponding to each FDEP survey marker, was tabulated and plotted. GPS positions for nests were also plotted on the Broward County Coastline Aerial Shore Line Map using the ArcView Geographic Information System (GIS).

Total nesting success (nests/total crawls) for each species at each beach was computed and the mean daily nesting success of loggerheads and greens at each beach were compared using ANOVA and NK analyses. The average nesting success in each zone was also plotted versus its FDEP survey number. The numbers of eggs and live hatchlings of each species in relocated and evaluated *in situ* nests were recorded and the hatchling release successes were determined. The overall hatchling release successes of all eggs from relocated and *in situ* nests were plotted from 1981 through 2011.

The frequency distribution of the hatching success of relocated and *in situ* loggerhead nests were plotted and compared with the Mann-Whitney U-test. The mean hatching percentages and proportions of the post-hatching egg categories (LIN, LPIP, DIN, DPIP, VD and NVD) were tabulated by species from nests deposited or relocated at each of the individual beaches or relocation sites.

The number of hatchling disorientation incidents in 2011, and the estimated number of disoriented hatchlings involved were tabulated and compared to data from 2006-2010.

RESULTS

Figure 2 shows the historical trend in the total number of sea turtle nests deposited in Broward County since 1981. A total of 2392 nests were recorded in 2011, which were 173 (6.7%) fewer than in 2010. Although down slightly, this year's count still exceeded the average of the previous 10 years by 229 nests. Figure 3 shows the yearly nesting trends of loggerhead, green and leatherback sea turtles. Loggerheads deposited 2126 nests in 2011, which was 157 less than in 2010 but was still 152 nests above the previous 10-year average. The overall loggerhead nesting trend is positive ($P < 0.003$), with a slope of 25.6 nests per year. While the trend since 1995 is still negative ($P < 0.001$) the up trend since 2007 is now significantly positive ($P = 0.040$) indicating a gain of 141 nests per year. Green turtles deposited 261 nests in the County this year (Fig. 3), which was only 7 fewer than the record number in 2010 and represents the third highest number since project inception. The slope of the overall trend line for green turtles is significantly greater than zero ($P < 0.001$), indicating an average increase of 7.1 nests per year. Leatherbacks made only 5 nests this year, which were 18

SEA TURTLE NESTING HISTORY ALL SPECIES COMBINED

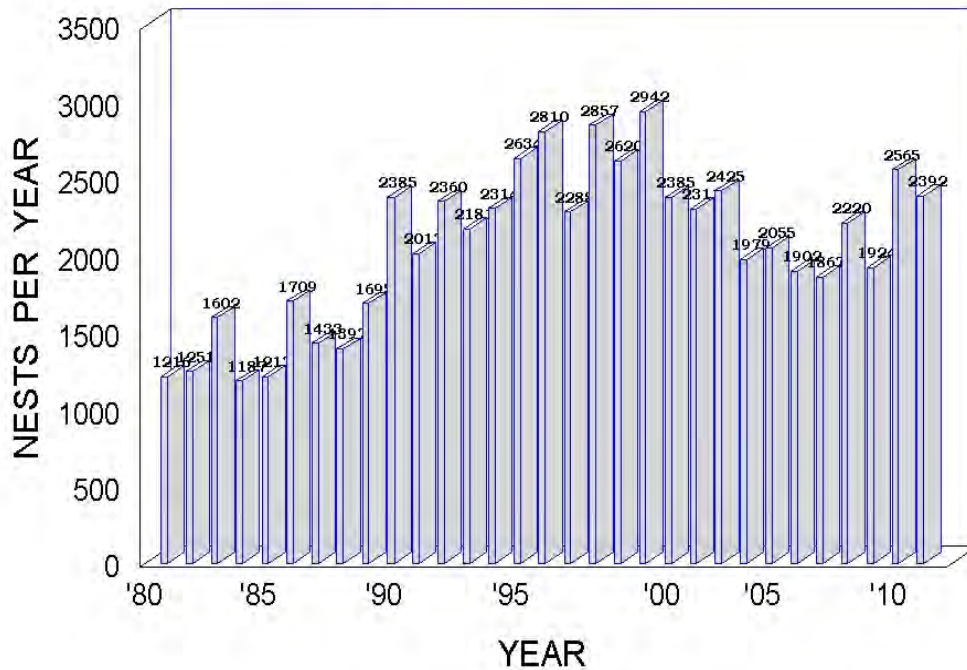


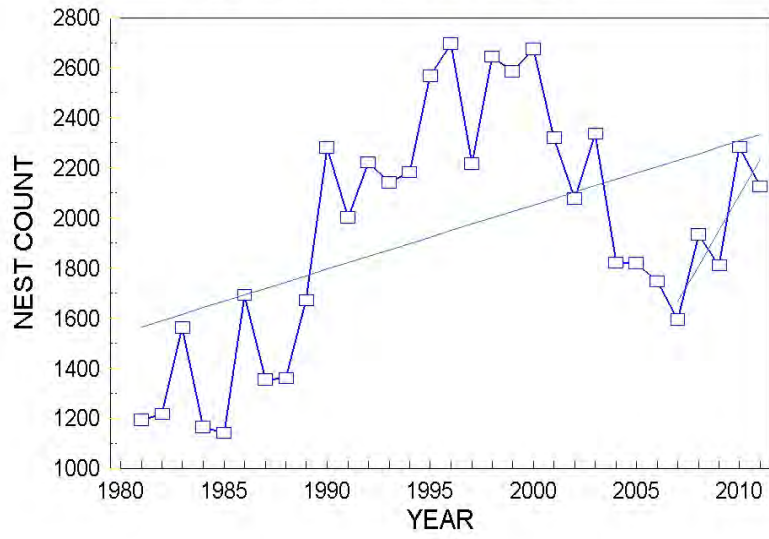
Figure 2: The pattern of total sea turtle nesting in Broward County since full surveys commenced in 1981.

below the previous 10-year average, but the overall trend is still significantly positive ($P = 0.006$) with a slope of 0.6 nests per year. Leatherbacks have still not failed to nest in Broward County since 1982.

Figure 4 shows the countywide loggerhead seasonal nesting pattern. The first and last nests were deposited on April 24 in Hillsboro Beach and on September 12 in Pompano Beach, respectively. Table 4 and Figure 5 give the total loggerhead nesting densities and seasonal patterns for the five beaches. Nesting densities (mean daily nests/km) were by far the highest in Hillsboro Beach, followed by Fort Lauderdale, Pompano Beach, Lloyd Park and Hollywood. This year, Pompano Beach relinquished its usual number two status to Fort Lauderdale, which had a significantly higher nesting density.

BROWARD LOGGERHEAD NESTS

Overall $P < .003$; Since 2007 $P = .040$



GREENS AND LEATHERBACKS

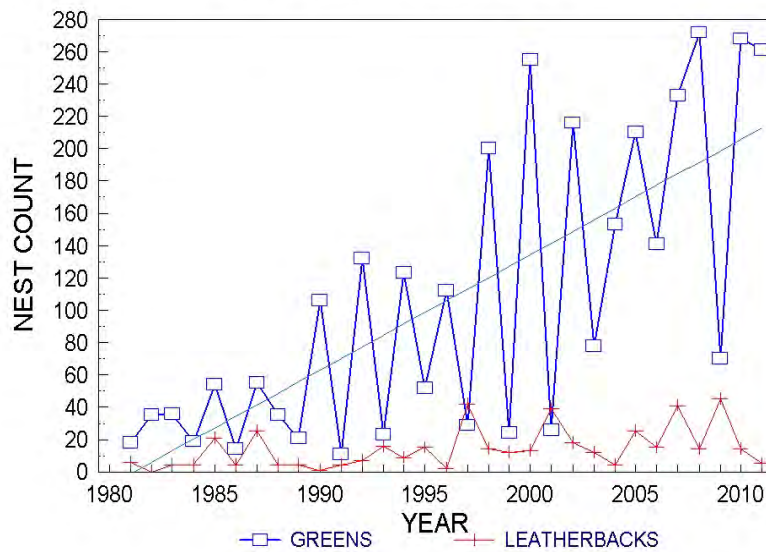


Figure 3: Historical nesting patterns of loggerhead, green and leatherback sea turtles in Broward County since 1981.

Pompano Beach was not statistically different than Lloyd Park, but both were significantly higher than Hollywood.

The countywide seasonal nesting patterns of greens and leatherbacks are shown in Figure 6 and for the individual beaches in Figure 7. The first and last leatherback nests were deposited on May 13 and June 3, both in Fort Lauderdale. The first green turtle nest was laid on May 27 in Pompano Beach and the last was on September 27 in Fort Lauderdale.

Nesting densities for greens and leatherbacks are shown in Tables 5 and 6, respectively. The Newman-Keuls test showed that the nesting density of green turtles per kilometer was significantly highest in Hillsboro Beach, while the other beaches were lower and not significantly different from each other.

Green turtle nesting was more than 6 times denser in Hillsboro Beach than in any other area. Leatherbacks also nested most densely in Hillsboro Beach but nesting throughout the county was low and Hillsboro Beach was not significantly different from Fort Lauderdale (Table 6). There were no leatherback nests in Lloyd Park, Pompano Beach and Hollywood.

Figure 8 shows nest counts for each species in each 1000-foot beach zone (3280 ft zones in Lloyd Park) during 2011. As in previous years, there was lower nesting in zones R1-4, R24, R34 and R50, near the Deerfield Beach Pier, the Hillsboro Inlet, the Pompano Beach Pier and the Commercial Boulevard pier, respectively. The beach along the Fort Lauderdale strip (R65 to R79) and the entire beach south of R100 were also lightly nested. Loggerheads again nested heavily in zones R10-23 in Hillsboro Beach, R29-30 in Pompano Beach, R55-62 on the Galt Ocean Mile and R80-83 in southern Fort Lauderdale. These high and low areas were almost identical in 2010 (Burney & Wright 2010).

Figure 9 and Table 7 show the countywide nesting successes of the three species. As found in 2010, there was no significant between-beach

LOGGERHEAD NESTS

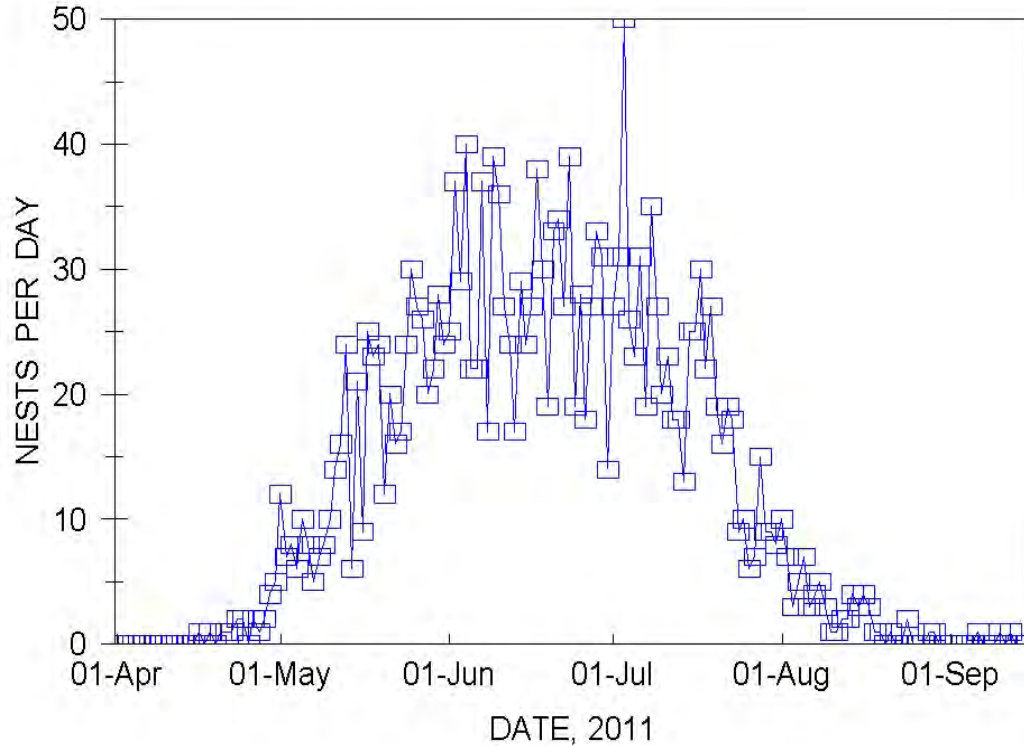


Figure 4: The seasonal pattern of daily loggerhead nesting in 2011.

Table 4: Total loggerhead nests and nesting densities expressed as nests-per-kilometer for the 2011 season. Beaches with the same NK designation letters were not significantly different in a Newman-Keuls test ($\alpha = .05$) of mean daily nesting per km (1 Apr-15 Sep). Beaches with different NK letters had significantly different nesting densities.

Beach	Total Nests	Beach Length (km)	Nests per km	Mean Daily Nests per km with NK Designation Letter
Hillsboro Beach	670	7.0	95.7	.558 A
Ft. Lauderdale	763	10.6	72.0	.419 B
Pompano Beach	415	7.7	53.9	.318 C
Lloyd Park	176	3.9	45.1	.269 C
Hollywood	102	9.4	10.9	.061 D
OVERALL	2126	38.6	55.1	

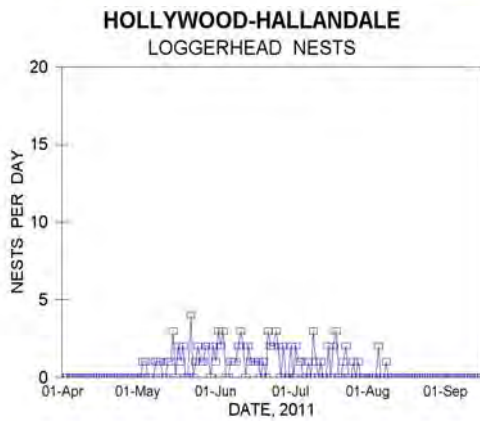
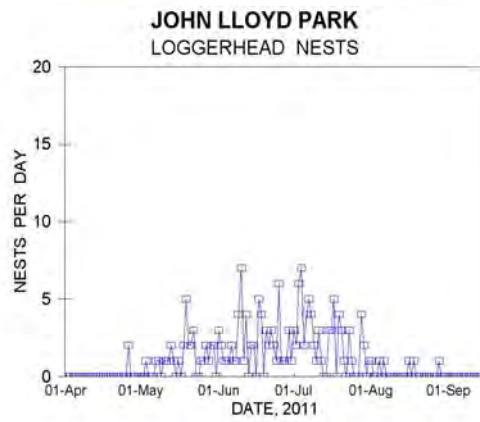
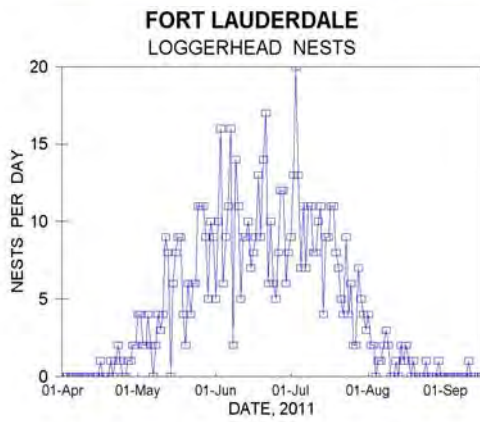
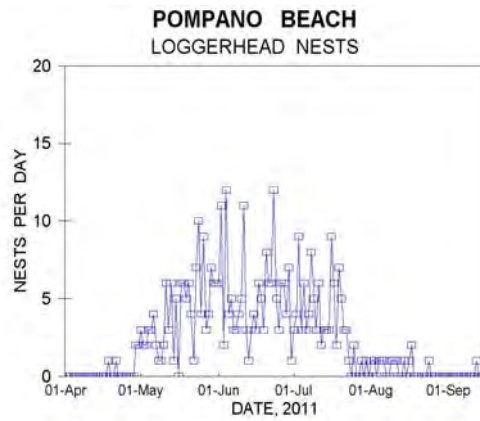
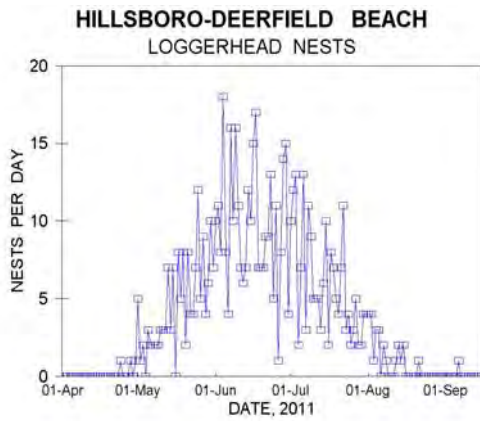


Figure 5: Comparison of the daily loggerhead nesting patterns on the five Broward County beaches in 2011.

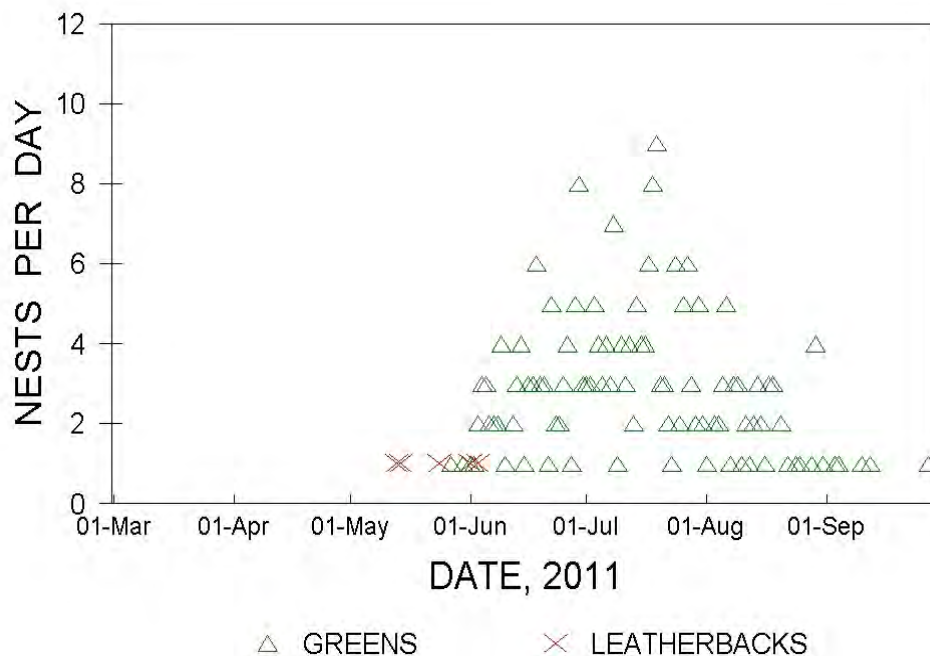


Figure 6: The seasonal pattern of daily green and leatherback nesting in Broward County in 2011.

differences in the nesting successes of any of the species (Table 7). The higher variability in loggerhead nesting successes south of R100 was due to the relatively lower number of nests and false crawls in this area. Lower nesting successes occurred near the Deerfield Beach pier, extreme northern Hillsboro Beach and the Hillsboro Inlet. There was no significant overall north-to-south trend ($P = 0.31$) in loggerhead nesting success in zones R1-96 (Fig. 9). Zones farther south were excluded from this analysis because of the high variability due to low nesting. However, there was a strongly significant ($P < 0.001$) correlation between nests per zone and zonal nesting success north of R97. The R^2 value of this relationship was 0.25, suggesting that beach characteristics experienced by the females after they begin crawling accounted for 25 percent of the variance in the zonal nesting distribution.

Figure 10 shows the trends in loggerhead nesting success for the 5 beaches since 2000. Prior to 2004, false crawls were counted only if they extended above the previous high tide line. Since then, false crawls that did not reach the previous high tide line were also counted, but were listed separately. The closed symbols give the nesting success with these crawls included.

Table 8 gives the number of nests for each species that were relocated or left *in situ*. Overall, 196 loggerhead nests were relocated and 1754 were left *in situ*. Because of the FFWCC directive to leave all green and leatherback nests *in situ* unless they faced certain destruction, only 5 greens and no leatherback nests were relocated.

Table 9 lists the number of eggs and released hatchlings from evaluated *in situ* and relocated nests. The hatchling release success (live hatchlings / total eggs) of relocated loggerhead nests this year was 77.1 percent, compared to 58.5 percent last year. The success of *in situ* loggerhead nests increased from 57.1 percent in 2010 to 78.6 percent this year. The sub-optimal incubation conditions of 2010 were not present this year.

The live hatchling production rates for *in situ* and relocated green nests of 81.8 and 80.4 percent, respectively, were up slightly from last year's respective values of 74.4 and 72.0 percent. The three evaluated *in situ* leatherback nests also had a respectable live hatchling production rate of 78.5 percent.

Figure 11 illustrates the historical patterns of yearly release success for all evaluated *in situ* and relocated sea turtle nests since 1981. This year's incubation conditions were clearly superior to 2010.

Figure 12 shows the live hatchling production percentages of *in situ*

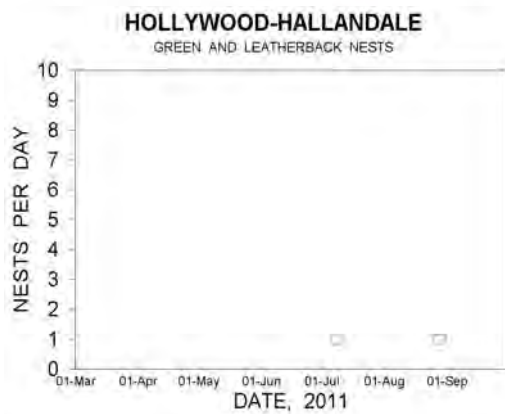
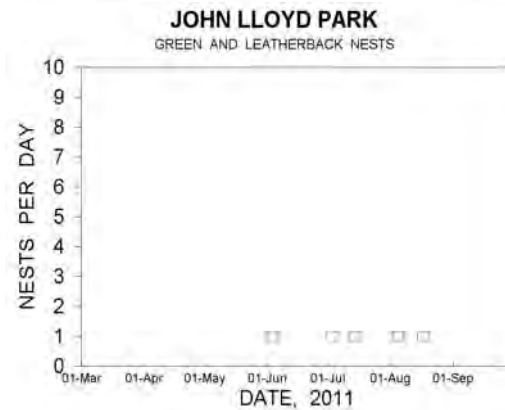
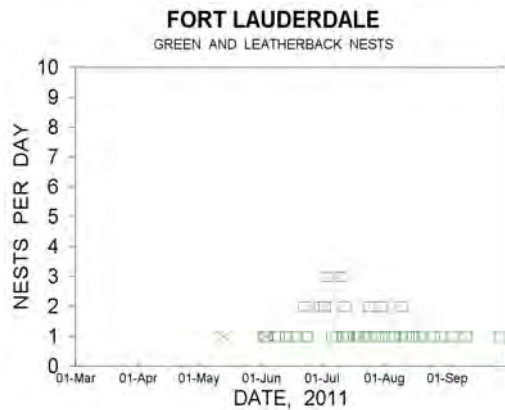
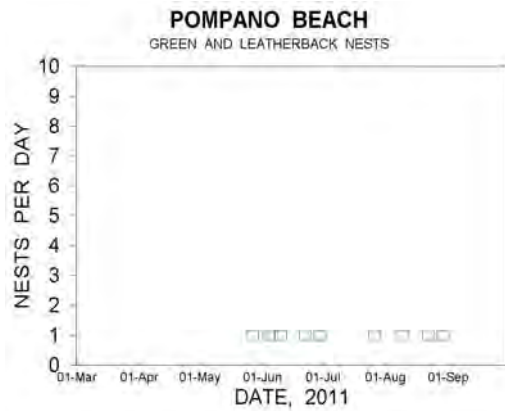
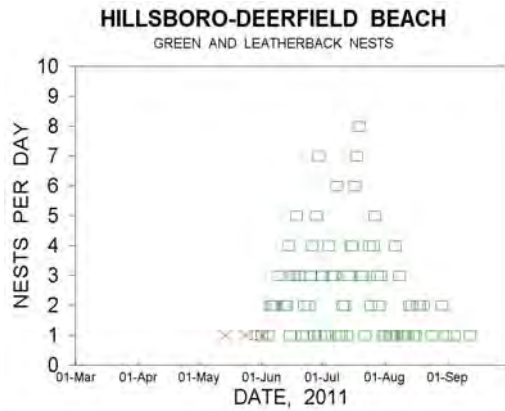


Figure 7: Comparison of the daily nesting patterns of green and leatherback sea turtles on the five Broward County beaches in 2011.

□ Greens × Leatherbacks

Table 5: Total green turtle nests and nesting densities expressed as nests-per-kilometer for the 2011 season. Beaches with the same NK designation letters were not significantly different in a Newman-Keuls test (alpha = .05) of mean daily nesting per km (1 May-30 Sep). Beaches with different NK letters had significantly different nesting densities.

Beach	Total Nests	Beach Length (km)	Nests per km	Mean Daily Nests per km with NK Designation Letter
Hillsboro Beach	194	7.0	27.7	.181 A
Ft. Lauderdale	48	10.6	4.5	.030 B
Lloyd Park	7	3.9	1.8	.012 B
Pompano Beach	10	7.7	1.3	.008 B
Hollywood	2	9.4	0.2	.001 B
OVERALL	261	38.6	6.8	

Table 6: Total leatherback nests and nesting densities expressed as nests-per-kilometer for the 2011 season. Beaches with the same NK designation letters were not significantly different in a Newman-Keuls test (alpha = .05) of mean daily nesting per km (1 March-15 Sep). Numbers were too few to analyze statistically.

Beach	Total Nests	Beach Length (km)	Nests per km	Mean Daily Nests per km
Hillsboro Beach	3	7.0	0.4	.002
Ft. Lauderdale	2	10.6	0.2	.001
Lloyd Park	0	3.9	0	0
Pompano Beach	0	7.7	0	0
Hollywood	0	9.4	0	0
OVERALL	5	38.6	0.1	

and relocated loggerhead nests plotted versus Julian date of deposition in 2011 compared with 2010. All plots show declining seasonal trends, but it is clear that there was a much lower proportions of low-success nests in 2011 compared to 2010, especially early in the season. Figure 13 shows the

frequencies (percentages) of relocated and *in situ* nests that produced from 0 to 100 percent live released hatchlings in 2011 compared to 2010. Medians this year were 82.7 and 84.7 percent, for relocated and *in situ* nests, respectively, compared to values of 63.8 and 61.5 last year.

Table 10 compares emergence success and the percentages of hatchlings and eggs in the post-hatching evaluation categories for relocated and *in situ* loggerhead nests. No post-hatching data were obtained for Lloyd Park. The park staff reports these data separately. Tables 11 and 12 give the same results for greens and leatherbacks, respectively. In Tables 10-12, emergence success is the percentage of hatchlings that emerged from the nests on their own, and should not be confused with live hatchling production success in Table 9 and Figures 11-13.

Hatchling Disorientation Events

Table 13 summarizes the number of hatchling disorientation events and the minimum and maximum estimates of the numbers of disoriented hatchlings in 2011 estimated by the morning patrols working under MTP# 108 and night patrols working under MTP# 174, compared to estimates from 2006-2010. Numbers of disoriented nests and hatchlings in 2011 were not very different from 2010, in spite of the much larger percentage of nests left *in situ* this year. However, another group known as Sea Turtle Oversight Protection (STOP) also monitored nests at night and rescued disoriented hatchlings. They reported a total of 8844 additional disoriented hatchlings from 348 nests. Adding these numbers indicates that there were from 12713 to 13478 disoriented hatchlings from 458 nests.

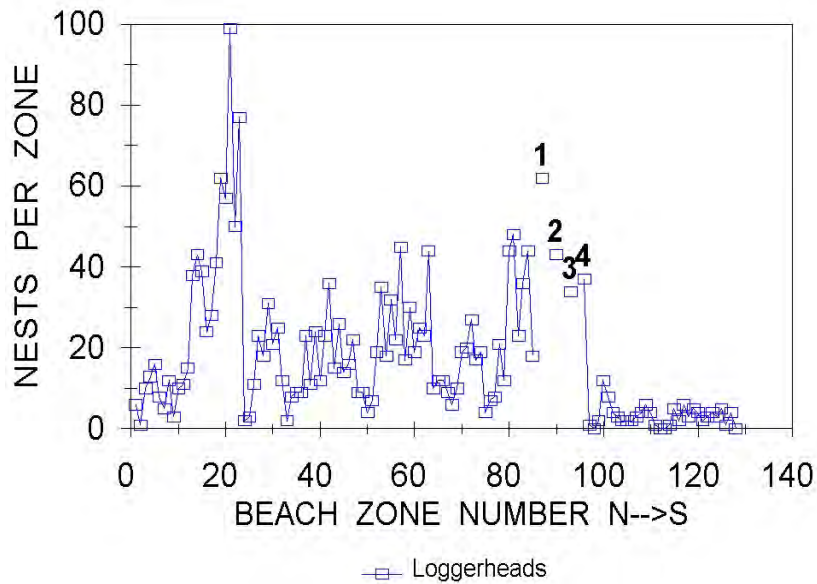


Figure 8a: Locations of loggerhead nests in Broward County in 2011. Numbers 1-4 indicate the four beach zones of John Lloyd Park.

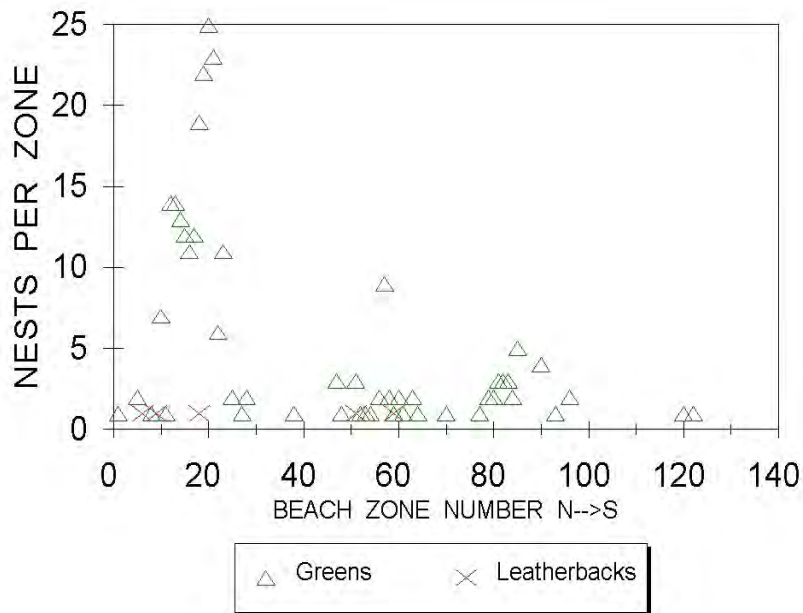


Figure 8b: Locations of green and leatherback nests in Broward County in 2011

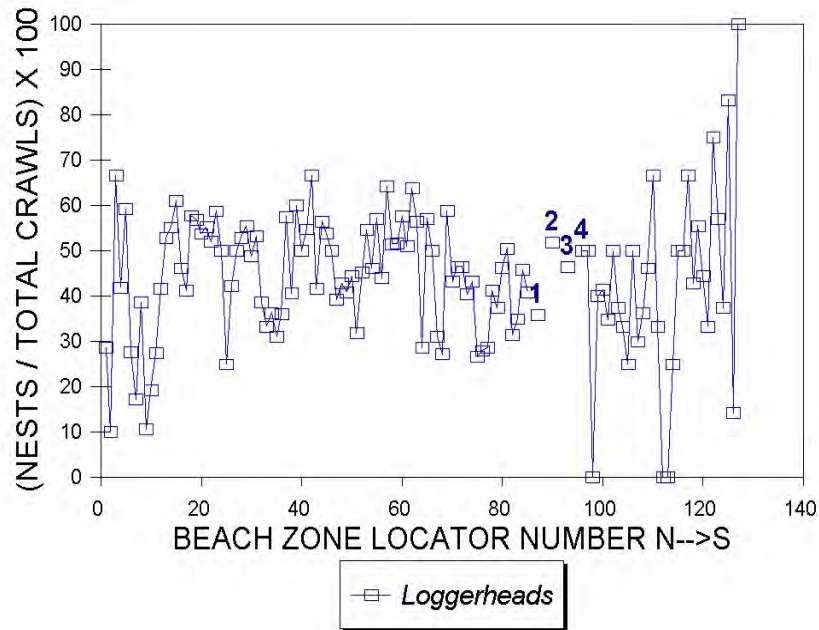


Figure 9a: Loggerhead nesting success across Broward County in 2011. Numbers 1-4 indicate the four beach zones of John Lloyd Park.

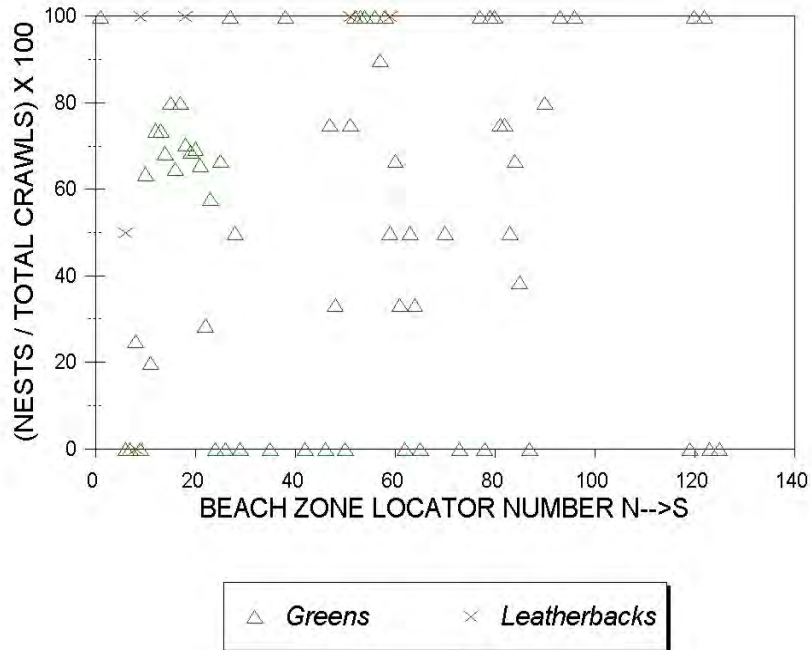


Figure 9b: Green and leatherback nesting success across Broward County in 2011.

Table 7: Total nests, false crawls (FC) and percent nesting success (NS) for three sea turtle species on each of five Broward County beaches during 2011. NK tests detected no significant differences in mean nesting successes of loggerheads, greens or leatherbacks throughout the County.

BEACH	Loggerheads			Greens			Leatherbacks		
	Nests	FC	NS	Nests	FC	NS	Nests	FC	NS
Pompano Beach	415	433	48.9	10	14	41.7	0	0	-
Hillsboro Beach	670	709	48.6	194	115	62.8	3	2	60.0
Ft. Lauderdale	763	907	45.7	48	29	62.3	2	0	100
Lloyd Park	176	227	43.7	7	4	63.6	0	0	-
Hollywood	102	139	42.3	2	4	33.3	0	0	-
OVERALL	2126	2415	46.8	261	166	61.1	5	2	71.4

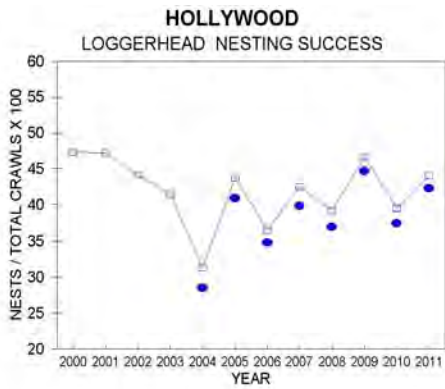
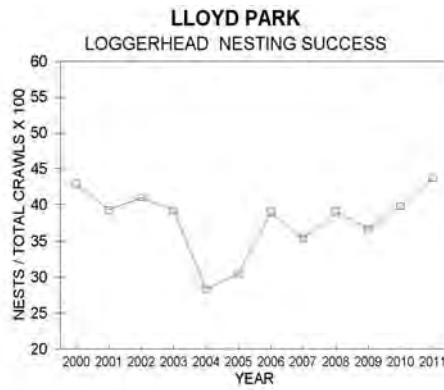
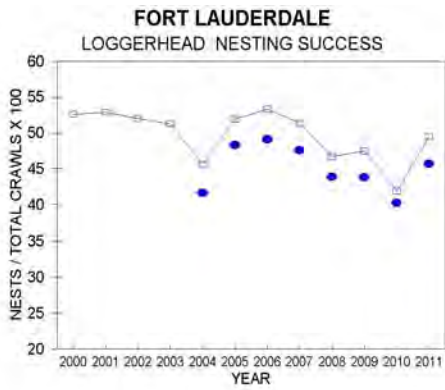
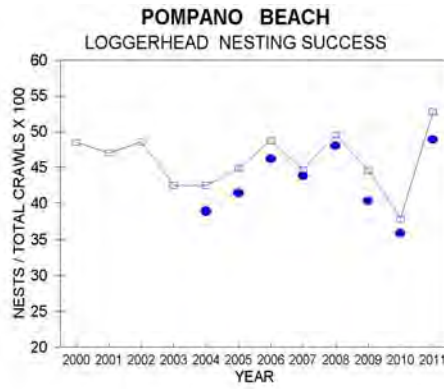
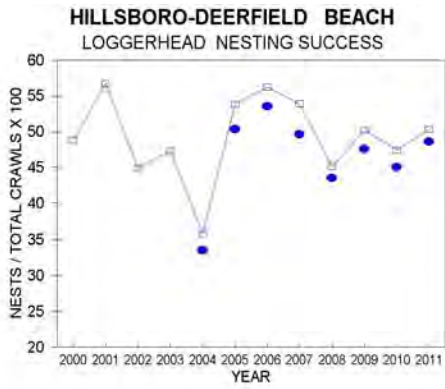


Figure 10: Loggerhead nesting success trends since 2000. Open symbols; nests / total crawls that extended above the high tide line. Closed symbols include false crawls that did not extend above the high tide line.

Table 8: Total Number of loggerheads, greens, and leatherback nests relocated or left *in situ* in 2011. Individually relocated nests in Deerfield Beach, Hillsboro Beach, Pompano Beach, Fort Lauderdale and Hollywood are listed as DB, BH, BP, BFT and BHo, respectively.

	Loggerheads	Greens	Leatherbacks	Totals
RELOCATED				
Open Beach				
Hillsboro Beach				
DB	2	0	0	2
BH	0	0	0	0
BH900s	8	1	0	9
BH1000s	3	1	0	4
BH1100s	0	0	0	0
Pompano Beach				
BP	0	0	0	0
BP1	26	0	0	26
BP2	19	0	0	19
BP3	9	0	0	9
BP3P	0	0	0	0
Fort Lauderdale				
Strip	5	0	0	5
BFT	1	0	0	1
BFTN	46	1	0	47
BFTS	10	2	0	12
BP3Ft	0	0	0	0
Hollywood Beach				
BHo	0	0	0	0
BHoN	36	0	0	36
BHoS	31	0	0	31
TOTALS	196	5	0	201
IN SITU				
Hillsboro Beach	657	192	3	852
Pompano Beach	362	10	0	372
Ft. Lauderdale				
Strip	534	0	0	534
BFT	166	45	2	213
Hollywood Beach	35	2	0	37
TOTALS	1754	249	5	2008
GRAND TOTALS	1950	254	5	2209

Table 9: Total egg counts, released hatchlings and overall release successes for *in situ* and relocated nests of loggerheads, greens and leatherbacks in 2011, with the numbers of nests predated and unevaluated.

Species	Number of Eggs	Eval. Nests	Hatchlings Released	Release Success Percent	Pred. Nests	Uneval. Nests
<i>In situ</i>						
Loggerhead	114068	1063	89647	78.6	25	666
Green	12764	110	10441	81.8	9	130
Leatherback	289	3	227	78.5	0	2
Total	127121	1176	100315	78.9	34	798
Relocated						
Loggerhead	20090	177	15499	77.1	1	18
Green	510	4	410	80.4	0	1
Leatherback	0	0	0	-	0	0
Total	20600	181	15909	77.2	1	19
Overall						
Loggerhead	134158	1240	105146	78.4	26	684
Green	13274	114	10851	81.7	9	131
Leatherback	289	3	227	78.5	0	2
TOTAL	147721	1357	116224	78.6	35	817

HATCHING RELEASE SUCCESS HISTORICAL PATTERN

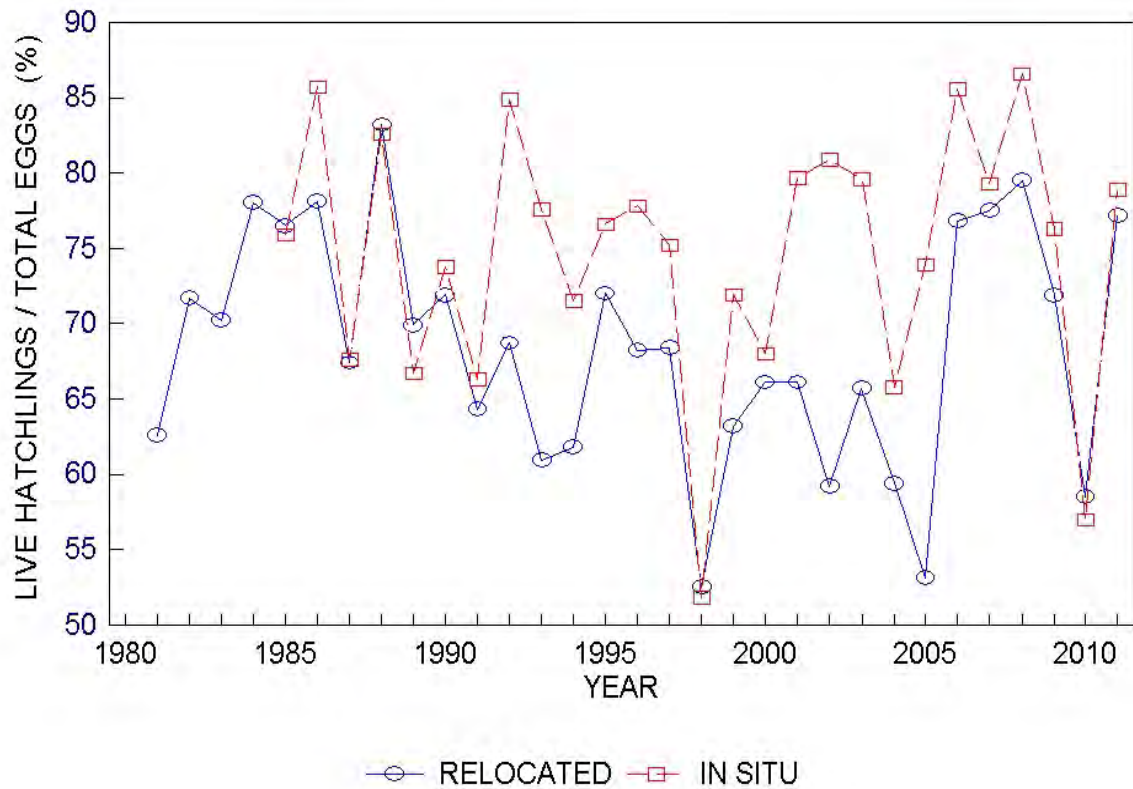


Figure 11: The historical patterns of yearly hatching release success for all evaluated *in situ* and relocated sea turtle nests, since 1981.

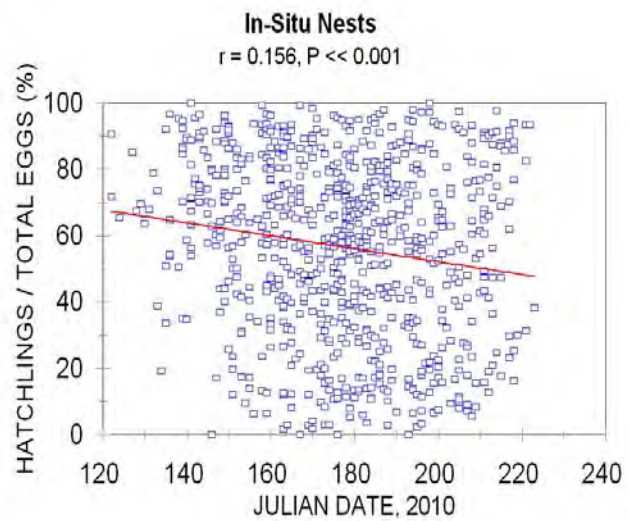
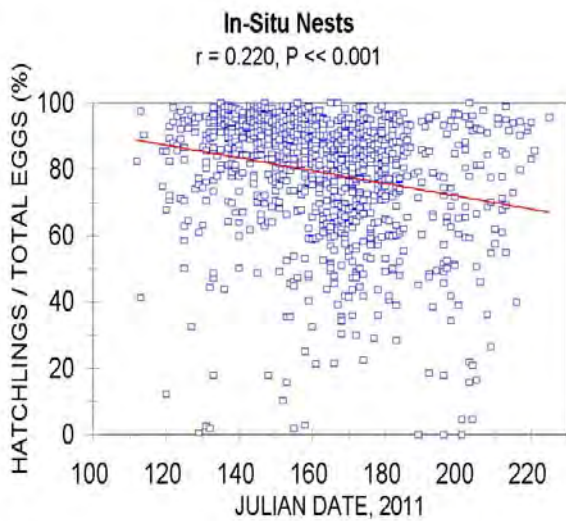
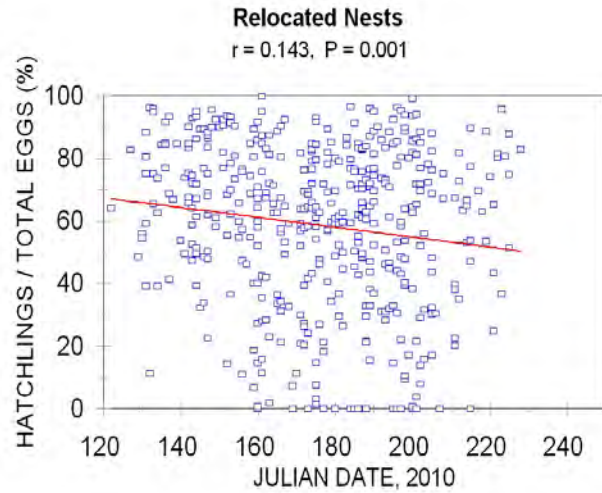
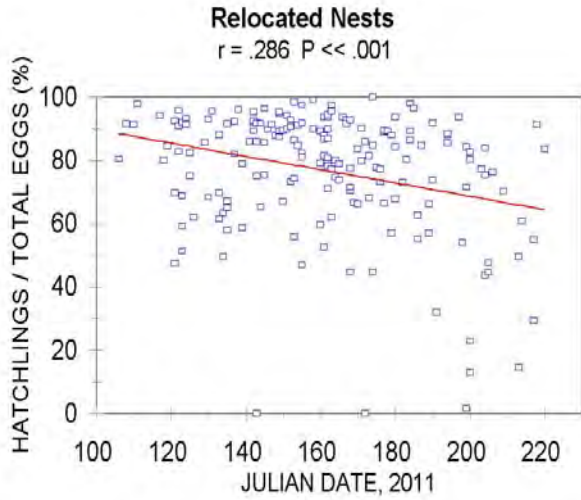


Figure 12: Comparison of seasonal hatching release success for relocated and *in situ* loggerhead nests during 2011 (left) and 2010 (right).

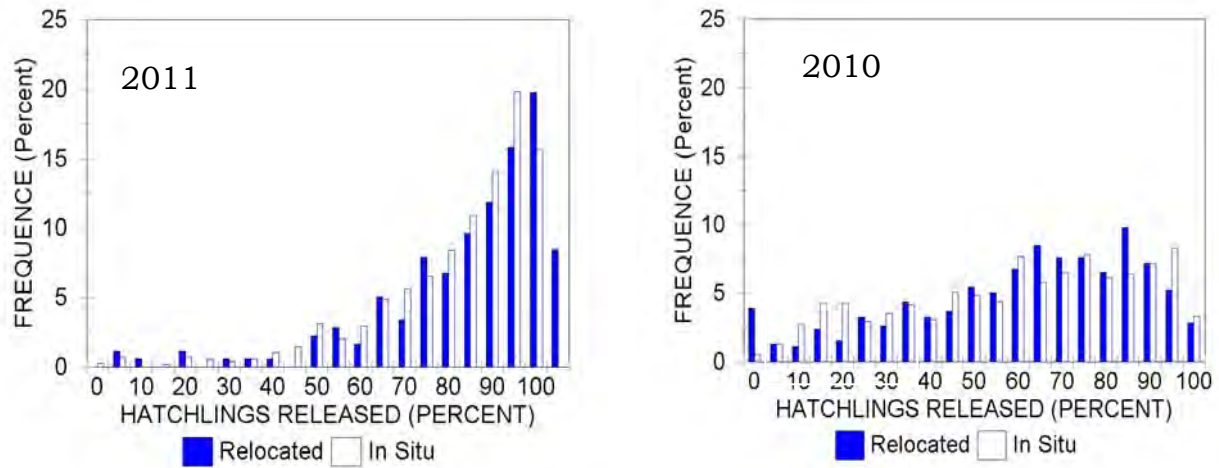


Figure 13: The frequencies of nests producing from 0 to 100 percent live released hatchlings for *in situ* and relocated loggerhead nests in 2010 & 2011.

Table 10: Accounting of the status of all hatched and unhatched eggs in evaluated *in situ* and relocated loggerhead nests during 2011.

Location	Total Eggs	Total Nests	Emerged (%)	LIN (%)	DIN (%)	PIP Live (%)	PIP Dead (%)	VD (%)	NVD (%)
<i>In situ</i> Nests									
Hillsboro Beach	37421	370	73.4	2.1	1.7	0.2	6.1	6.9	9.6
Pompano Beach	22233	202	79.3	2.3	1.8	0.2	4.6	4.5	7.3
Ft. Lauderdale									
Strip Caged	405	4	49.1	3.2	1.0	0.2	9.1	7.9	29.4
Strip Uncaged	11965	113	76.5	2.0	1.9	0.4	4.9	7.0	7.4
BFT	39407	349	77.4	2.0	2.2	0.2	3.7	6.1	8.4
BFTN	411	4	75.7	2.4	0.2	0.0	1.0	7.1	13.4
Hollywood Beach									
BHo	2226	21	79.1	3.6	2.4	0.1	4.8	3.8	6.3
Overall <i>In situ</i>	114068	1063	76.3	2.1	1.9	0.2	4.8	6.1	8.5
Relocated Nests									
<u>Hillsboro Beach</u>									
DB	250	2	30.4	10.0	2.0	2.8	13.2	17.6	24.0
BH900s	711	7	76.5	3.8	1.7	0.1	10.4	2.0	5.5
BH1000s	127	1	70.9	2.4	1.6	0.0	7.1	3.1	15.0
Overall Hillsboro	1088	10	65.2	5.1	1.8	0.7	10.7	5.7	10.9
<u>Pompano Beach</u>									
BP1	2613	23	69.5	6.5	1.5	1.2	8.2	2.9	10.0
BP2	1760	15	72.6	4.7	1.2	0.5	4.8	1.4	14.9
BP3	963	9	84.6	2.5	1.0	0.7	5.5	0.9	4.7
Overall Pompano	5336	47	73.2	5.2	1.3	0.9	6.6	2.0	10.7
<u>Fort Lauderdale</u>									
BFT	89	1	88.8	3.4	1.1	0.0	0.0	3.4	3.4
BFT Strip	563	5	65.9	4.1	1.2	0.9	1.6	1.6	24.7
BFTN	4426	40	72.2	5.7	1.7	1.7	5.2	2.6	11.0
BFTS	1129	10	74.6	1.3	0.5	0.7	3.7	3.8	15.4
Overall Ft. Laud.	6207	56	72.3	4.7	1.4	1.4	4.5	2.7	12.9
<u>Hollywood Beach</u>									
BHoN	3713	33	76.7	4.0	0.7	0.9	5.4	2.6	9.6
BHoS	3746	31	63.8	4.4	1.7	1.1	8.7	4.4	16.0
Overall Hollywood	7459	64	70.2	4.2	1.2	1.0	7.1	3.5	12.8
Overall	20090	177	71.4	4.7	1.3	1.1	6.4	3.0	12.2

Table 11: Accounting of the status of all hatched and unhatched eggs in investigated *in situ* and relocated green sea turtle nests during 2011.

Location	Total Eggs	Total Nests	Emerged (%)	LIN (%)	DIN (%)	PIP Live (%)	PIP Dead (%)	VD (%)	NVD (%)
<i>In situ</i> Nests									
Hillsboro Beach	9711	85	77.8	2.5	0.9	0.5	4.0	9.3	5.1
Pompano Beach	648	5	77.8	1.4	2.3	0.0	2.6	9.0	6.9
Ft. Lauderdale									
BFT	2405	20	84.8	1.6	1.0	0.3	2.2	6.1	4.1
Overall <i>In situ</i>	12764	110	79.1	2.3	1.0	0.4	3.6	8.7	5.0
<i>Relocated</i> Nests									
Hillsboro Beach									
BH900s	115	1	76.5	5.2	3.5	0.0	12.2	0.9	1.8
Fort Lauderdale									
BFTN	150	1	70.0	16.7	1.3	0.7	2.0	0.7	8.7
BFTS	245	2	57.1	15.9	4.5	2.4	17.1	1.2	1.6
Overall <i>Reloc.</i>	510	4	65.2	13.4	3.5	1.4	12.1	1.0	3.4

Table 12: Accounting of the status of all hatched and unhatched eggs in investigated *in situ* and relocated leatherback nests during 2011.

Location	Total Eggs	Total Nests	Emerged (%)	LIN (%)	DIN (%)	PIP Live (%)	PIP Dead (%)	VD (%)	NVD (%)
<i>In situ</i> Nests									
Hillsboro Beach	88	1	87.5	0.0	1.1	0.0	0.0	0.0	11.4
Ft. Lauderdale	201	2	70.6	4.0	12.4	0.0	5.0	3.0	5.0
Overall <i>In situ</i>	289	3	76.2	2.7	8.6	0.0	3.3	2.0	7.1
<i>Relocated</i> Nests									
None									

Table 13: Comparison of the number of disorientation incidents (nests) and the minimum and maximum estimates of the numbers of disoriented hatchlings in Broward County municipalities from 2006 to 2011.

Municipality		2006	2007	2008	2009	2010	2011
Hillsboro + Deerfield Beach	Min.	657	639	190	183	105	409
	Max.	739	699	190	218	115	499
	Nests	16	16	3	7	5	13
Pompano Beach	Min.	4769	5052	1885	1689	1510	893
	Max.	5277	5826	2030	1844	1600	1063
	Nests	102	101	42	38	35	25
Lauderdale By The Sea	Min.	6153	5287	2984	3986	776	745
	Max.	7566	6254	3124	4036	851	905
	Nests	167	122	53	104	27	20
Fort Lauderdale	Min.	3979	4221	3372	3143	1461	1575
	Max.	4559	4970	3777	3647	1767	1900
	Nests	78	94	64	79	55	45
Hollywood + Dania + Hallandale	Min.	974	1031	251	267	235	247
	Max.	1114	1171	281	292	265	267
	Nests	22	23	8	5	15	7
Totals	Min.	16532	16230	8682	9268	4087	3869*
	Max.	19255	18920	9402	10037	4598	4634*
	Nests	385	356	170	233	138	110*

* Totals above do not include an additional 8844 disoriented hatchlings from 348 nests, reported by Sea Turtle Oversight Protection.

DISCUSSION

Yearly Nesting Trends

The loggerhead nest count (Fig. 3) declined slightly from last year but not enough to negate the general up trend since 2007. A similar slight decline was seen in the total nest counts for loggerheads on the Florida Index

Beaches (Fish and Wildlife Research Institute, 2011a). Although loggerhead nesting remains below its level in 2000, the significant ($P = 0.04$) positive trend since 2007 suggests that at least a partial recovery may be in underway.

Green turtle nesting (Fig. 3) decreased very slightly in 2011 but still represented the third highest nest count on record in the county. Clearly the alternate year, high-low nesting pattern that existed throughout 1990 to 2003 has broken. Starting in 2007, there have been two high-nesting years followed by one low and two more high years. Even with the large fluctuations, green nesting has been increasing dramatically over the last two decades in Broward County. A similar strong upward trend is seen in the green nest counts on the Florida core index beaches (Fish and Wildlife Research Institute, 2011b) but the exact year-to-year pattern is slightly different. This year saw a record number of green nests on the index beaches.

Unfortunately, leatherback nesting (Fig. 3) in Broward County has not followed the strongly increasing state-wide trend on the index beaches (Fish and Wildlife Research Institute, 2011b). County nest counts have declined from the record number in 2009 and remain well below the previous 10-year average, but leatherback nesting has always been highly variable and the species has not failed to nest in the County since 1982.

Seasonal Nesting Patterns

The seasonal loggerhead-nesting pattern (Fig. 4) was very similar in shape and duration to 2010 (Burney and Wright, 2010). The curve again was quite symmetrical in 2011 with the midpoint of the season in late June. The highest daily nest count (50) was recorded on July 3, just after mid season. There was nothing unusual about the seasonal nesting at the individual

beaches (Fig. 5). Loggerhead nesting densities throughout Broward County again were highest in the north and generally declined toward the south (Table 4), except that densities in Pompano Beach were lower than in Fort Lauderdale.

The seasonal pattern of green turtle nesting in 2011 (Fig. 6) was very similar to 2010, starting in early June and extending through September. However, leatherback nesting began two months later in 2011 than in 2010. In 2010, leatherback nesting season ended on the day that it began in 2011.

Green turtles have always favored Hillsboro Beach over the more southerly beaches (Fig 7, Table 5) but this was even more apparent this year. Last year, Hillsboro Beach received 54 percent of all green nests but that value increased to 74 percent in 2011. Green nesting in 2011 was down by 79, 31 and 50 percent in Lloyd Park, Fort Lauderdale and Pompano Beach, respectively, but was up by 37 percent in Hillsboro Beach, when compared to last year. Greens possibly favor Hillsboro Beach because of its reduced beachfront lighting but there were no obvious lighting changes this year to account for the above nesting changes.

Countywide Nest Distribution

The distribution of loggerhead nests in the 128 survey zones (Fig. 8) was extremely similar to last year's pattern (Burney and Wright, 2011) and continues to correlate with shoreline features identifiable since 1981. This pattern has been discussed previously (Burney and Mattison, 1992; Mattison et al., 1993). Low nested zones are generally characterized by high levels of artificial lighting and nocturnal human activity (Mattison, 2002). Green turtles again demonstrated their preference for nesting at Hillsboro Beach, which has darker beaches and less public access (Fig. 8).

Nesting Success

As in 2010, there was no significant countywide north-south trend in loggerhead nesting success per zone (Fig. 9) and no statistical differences between the 5 beach survey areas in 2011 (Table 7). There was a significant direct relationship between nest counts and average nesting success per zone ($R^2 = 0.0.25$, $P \ll 0.001$) for zones R1-96. Since a turtle's decision to nest or to return to the water without nesting (nesting success) is determined after she emerges from the sea, the R^2 value above suggests that on-beach factors account for only about 25 percent of the variance in the nest distribution pattern. It appears that pre-emergence cues about where to and where not to nest are more important than post-emergence factors.

Figure 10 shows that the yearly trends in loggerhead nesting success in all areas except Pompano Beach showed relatively slight change from 2010 levels. Pompano Beach showed a substantial one-year increase to 48.9 percent (Table 7) while the other beaches had smaller increases. The lower overall nest count in Pompano Beach this year was not due to a reduction in nesting success.

Hatchling Productivity

The production rate of live loggerhead hatchlings experienced a dramatic increase from last year's low value and is now back above a respectable 75 percent (Fig. 11, Table 9). Although loggerhead nesting this year was down slightly from 2010, there were 38624 (76%) more live hatchling produced in 2011 than last year. As previously discussed (Burney and Wright 2010) the poor success of last year's nests could have been unusually high temperatures in May, June and July. Temperatures were lower this year and this may account for the increase in the live-hatchling

production rates. Kawana (in prep) found a significant inverse relationship between average daily air temperature at Fort Lauderdale beach and the overall yearly loggerhead hatching success rates in Broward County. Air temperatures are strongly correlated with sand temperatures (Godley et al, 2001). The correlation of *in situ* hatchling release success rates from 1999 through 2011 (Figure 11) with average daily July air temperatures (National Climate Data Center) gave a similar highly significant inverse relation ($R^2 = 0.567$, $P < 0.002$). This year's improved release success corresponded to a drop of only 0.6 C in the average daily July air temperature.

Post Emergence Nest Analysis

The overall loggerhead hatchling emergence rate (on their own) for *in situ* nests was a respectable 76.3 percent (Table 10), with most of the remainder accounted for by unhatched eggs with visible (VD) or no visible development (NVD). Percentages of unemerged hatchlings and pipped eggs totaled only 9 percent. For relocated nests, Table 10 shows that the overall natural emergence rate was 71.4 percent and unhatched eggs accounted for most of the remainder. There were slightly higher percentages of live in nest (LIN) and live pipped (LPIP) in relocated nests when compared to *in situ* nests.

Table 11 shows that 79.1 percent of *in situ* green hatchlings emerged on their own in 2011. Most of the remainder were unhatched VD or NVD eggs. The emergence rate was 65.2 percent for the 4 relocated nests. Relocated nests had elevated LIN and dead pipped (DPIP) percentages. This year's loggerhead emergence rates from *in situ* and relocated nests increased dramatically from last year's values of 68.3 and 42.9 percent, respectively (Burney and Wright, 2010). Likewise, the emergence rates of the 3 evaluated *in situ* leatherback nests was 76.2 percent, compared to only 26.9 percent in

2010. Clearly, incubation conditions for all species were much improved in 2011 compared to 2010.

Hatchling Disorientation

Table 13 suggests that the number of disoriented nests and hatchlings were not much different than in 2010. However, it must be stressed that these are estimates from morning patrols working under MTP#108 and night patrols under MTP#174. The STOP group working under MTP# 192-193 & MTP#195-196 were also very active this year. Their *modus operandi* was to monitor individual nests that were about to hatch, in order to rescue any disoriented hatchlings. According to their web page (seaturtleop.org) they monitored 646 nests of which 348 experienced disorientation, involving 8844 hatchlings. When added to our estimates in Table 13, this indicates a total of 458 disoriented nests and from 12713 to 13208 disoriented hatchlings. The numbers are much higher than last year, but it should be noted that the 2010 numbers in Table 13 do not include an unknown number of nests and hatchlings rescued by the STOP group, which was active at a lower level than this year. However, the range of disoriented hatchlings in 2011, including the STOP numbers, was still 20 to 31 percent lower than in 2006, which was the first year that FFWCC disallowed usage of mass beach hatcheries and mandated that many more nests be left *in situ*. The total of 458 disoriented nests this year was only 19 percent higher than in 2006. This is especially interesting because there were 2008 nests left *in situ* in 2011 compared to only 1122 in 2006 (Burney and Ouellette, 2007). Given the fact that there were about 79 percent more nests left *in situ* (and potentially more susceptible to disorientation) in 2011, it appears that the disorientation problem has actually diminished since 2006. Regardless, the disorientation

problem is still unacceptable and will continue to require vigilance and greater effort to bring it under control.

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APPENDIX 1: Summary of sea turtle emergency cell phone calls.

SUBJECT	EMERGENCY LINE
LIVE STRANDINGS	11
TOTAL STRANDINGS	63
DISORIENTATIONS	30
NEST LOCATIONS	140
POACHING	5
OTHER	>500
OVERALL	>800

APPENDIX 2: Summary of Educational/Public Information Activities

Flyers were distributed along the beach, primarily to people who approached workers with questions, at the turtle talks, and at school visitations.

The 2011 Presentation Team conducted a total of 38 public education talks from June 25 to Sep. 10 at Anne Kolb Nature Center, Hillsboro Club (75+), Pompano Beach, Opal Towers, Broward Shell Club, Boy Scout Pack 172, Girl Scouts of America, The Renaissance, Ebb Tide Resort, Naturescape Habitat Steward Training, University School Green Team, and John U Lloyd State Park. These PowerPoint presentations were followed by hatchling releases.

Turtle talks were also given at the following locations:

- 1) Pembroke Pines Charter H.S. A.P. Environmental Science Classes (January 28)
- 2) Pioneer M.S. Environmental Awareness Day (April 21)
- 3) Oakland Park Elementary Career Day (May 19)
- 4) Lighthouse Point Library Summer Camp (June 15)
- 5) Hollywood Green Team (June 23)
- 6) National Energy & Utility Affordability Conference (June 27)
- 7) IGFA Fishing Hall of Fame Museum (July 12)
- 8) Sawgrass Nature Center Camp Wild (July 20)
- 9) North Broward Preparatory Marine Biology Class (Sept 7)
- 10) Driftwood M.S. (Sept 21)
- 11) Sawgrass Springs M.S. (Sept 28)

Tables with specimens, informational handouts, brochures, door hangers, table tents and activity books were provided at the following events.

- 1) Anne Kolb Nature Center Anniversary Celebration (February 12)
- 2) City of Plantation 2011 Green Day (February 26)
- 3) Gumbo Limbo Sea Turtle Day (March 12)

Appendix 3: Sea turtle nest warning sign. Black lettering on yellow background. Actual size is 5.5" X 8.5".



Appendix 4: Sea Turtle Summary Report Forms.



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder:		Lou Fisher	Permit Number:	108
Organization:	Broward Co. Natural Resources Planning & Mgmt. Div.			
Address:	1 North University Drive, Suite 301			
	Plantation, FL 33324			
County:	Broward	Email Address:	lfisher@broward.org	
Day Telephone (include area code):	(954) 519-1255	Night Telephone:		
Beach Name:	Deerfield/Hillsboro Beaches			
Point of Contact & Phone #		Email Address for Point of Contact: (if different from above)		

2. GENERAL SURVEY INFORMATION

Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. Be specific and use known landmarks that can be found on a map (or include a marked map).

Beginning Survey Boundary:	Palm Bch/Broward Co Line (26.32100, -80.07447)		
Ending Survey Boundary:	Hillsboro Inlet (26.25817, -80.08043)		
Beach Length (include KM or MI):	7.0 KM	Is beach length estimated or measured?	measured
Was this the exact same survey area as last year?	Yes / No		Yes

IF NO, please explain the specific differences AND why the survey area changed:

n/a			
-----	--	--	--

Start Date of Survey (mm/dd/yy):	03/01/11	End Date of Survey (mm/dd/yy):	09/30/11
Time of Day Surveyed: Start (include AM or PM)	1/2 hr before sunrise	Finish (include AM or PM)	9:00 AM
Number of Days Per Week Surveyed:	seven		
Total # of Days Surveyed in 2011 (this is the total # of days between start and end dates MINUS any missed days):	214		

If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). It is recommended to adhere to a fixed schedule if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.

n/a			
-----	--	--	--

If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day? It is recommended that only tracks from the previous night be counted when the survey resumes.

n/a			
-----	--	--	--

Were all non-nesting crawls (false crawls) counted during your survey? Yes or No	Yes
If no, please explain why?	

How many people were involved in surveying your nesting beach this season?	25
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3. NESTING BEACH MANAGEMENT INFORMATION

If nests were RELOCATED, were they relocated **Individually** (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a **Group** with other relocated nests (i.e., self-releasing and/or restraining hatchery)? **Individ.**

Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)

Nests found at or below the high tide line or in designated donor areas

If **ALL** relocated nests were not inventoried, please give reason.

washed out or totally predated

If **ALL** caged nests were not inventoried, please give reason.

No caged nests

If a **HATCHERY** was used, please give reasons AND specific location:

None

If predator control methods other than screening/caging were employed, please describe below:

None

4. FATE OF NEST INFORMATION

How many marked nests were **negatively affected by predators** other than humans during the course of the season? **124**
 Note: this includes both partially and completely predated nests

List all non-human predators that were documented predated nests this season:

fox, raccoon

How many marked nests were **negatively affected by the nesting female or another nesting sea turtle**? **20**

How many marked nests were **negatively affected by roots** (i.e., damaged eggs, impeded hatchling emergence)? **0**

How many marked nests were **negatively affected by erosion, accretion, inundation, and storm-related events**? **327**
 Note: this does not include stake loss.

Please give details: **CC 148 wash over; 129 washout (116 Irene); CM 13 wash over; 37 washout(36 Irene)**

How many marked nests were **taken or disturbed by humans** (Example: nest dug into, eggs removed, etc.)? **6**
 Note: this does not include stake removal.

Please give details: **3 humans in nest areas; 1 dug into; 1 run over by beach raker; 1 furniture in nest area**

Unmarked Nests: If known, please entered any comments regarding fate of unmarked nests on your beach.
 (Example: 14 unmarked nests were predated by raccoons, etc.)

No nests were intentionally left unmarked.

How many disorientation events occurred on this survey area in 2011? **13**

If disorientation events occurred, have all **disorientation reports** been submitted to FWC? **Yes** or **No** **Yes**

I certify the above information to be true and accurate to the best of my knowledge. **(type in name & date)**

Date:



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder: **Lou Fisher** Permit Number: **108**

Beach Name: **Deerfield/Hillsboro Beaches**

2. GENERAL NESTING DATA

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	670	194	3	0	0
Total # of Non-Nesting Emergences (False Crawls)	709	115	2	0	0
Date (mm/dd/yy) of First Documented Nest	04/24/11	05/30/11	05/14/11		
Date (mm/dd/yy) of Last Documented Nest	09/06/11	09/12/11	06/01/11		

Total # of Nests Prior to 15 May:	41	0	1	-	-
Total # of Nests After 31 Aug:	1	2	0	-	-

Comments:

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	657	192	3		
(a) # of Nests left in Place without Additional Protection	657	192	3		
(b) # of Nests left in Place with Self-Releasing Flat Screen					
(c) # of Nests left in Place with Self-Releasing Cage					
(d) # of Nests left in Place with Restraining Cage					

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	13	2	0		
(a) # of Relocated Nests without Additional Protection	13	2			
(b) # of Relocated Nests with Self-Releasing Flat Screen					
(c) # of Relocated Nests with Self-Releasing Cage					
(d) # of Relocated Nests with Restraining Cage					
(e) # of Relocated Nests to Self-Releasing Hatchery					
(f) # of Relocated Nests to Restraining Hatchery					



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder:		Lou Fisher	Permit Number:	108
Organization:	Broward Co. Natural Resources Planning & Mgmt. Div.			
Address:	1 North University Drive, Suite 301			
	Plantation, FL 33324			
County:	Broward	Email Address:	lfisher@broward.org	
Day Telephone (include area code):	(954) 519-1255	Night Telephone:		
Beach Name:	Pompano/Lauderdale-by-the-Sea			
Point of Contact & Phone #		Email Address for Point of Contact: (if different from above)		

2. GENERAL SURVEY INFORMATION

Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. Be specific and use known landmarks that can be found on a map (or include a marked map).

Beginning Survey Boundary:	Hillsboro Inlet (26.25801, -80.08185)		
Ending Survey Boundary:	Commerical Blvd. Pier (26.18948, -80.09466)		
Beach Length (include KM or MI):	7.7 KM	Is beach length estimated or measured?	Yes
Was this the exact same survey area as last year?	Yes / No		Yes

IF NO, please explain the specific differences AND why the survey area changed:

n/a			
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Start Date of Survey (mm/dd/yy):	03/01/11	End Date of Survey (mm/dd/yy):	09/30/11
Time of Day Surveyed: Start (include AM or PM)	1/2 hr before sunrise	Finish (include AM or PM)	9:00 AM
Number of Days Per Week Surveyed:	seven		
Total # of Days Surveyed in 2011 (this is the total # of days between start and end dates MINUS any missed days):	214		

If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). It is recommended to adhere to a fixed schedule if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.

n/a			
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If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day? It is recommended that only tracks from the previous night be counted when the survey resumes.

n/a			
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Were all non-nesting crawls (false crawls) counted during your survey? Yes or No	Yes
If no, please explain why?	

How many people were involved in surveying your nesting beach this season?	25n
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3. NESTING BEACH MANAGEMENT INFORMATION

If nests were RELOCATED, were they relocated **Individually** (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a **Group** with other relocated nests (i.e., self-releasing and/or restraining hatchery)?

Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)

nests found at or below the high tide line FWC designated "donor" areas

If **ALL relocated nests** were not inventoried, please give reason.

washout

If **ALL caged nests** were not inventoried, please give reason.

no nests were caged

If a **HATCHERY** was used, please give reasons AND specific location:

None

If predator control methods other than screening/caging were employed, please describe below:

None

4. FATE OF NEST INFORMATION

How many marked nests were **negatively affected by predators** other than humans during the course of the season?
Note: this includes both partially and completely predated nests

1

List all non-human predators that were documented predated nests this season:

fox

How many marked nests were **negatively affected by the nesting female or another nesting sea turtle**?

4

How many marked nests were **negatively affected by roots** (i.e., damaged eggs, impeded hatchling emergence)?

0

How many marked nests were **negatively affected by erosion, accretion, inundation, and storm-related events**?
Note: this does not include stake loss.

232

Please give details: **CC: 126 wash overs; 103 washouts (100 Irene) CM: 2 wash overs; 1 washout (1 Irene)**

How many marked nests were **taken or disturbed by humans** (Example: nest dug into, eggs removed, etc.)?

6

Note: this does not include stake removal.

Please give details: **3 potential poach; 1 walkover; 1 raked over; 1 run over by ATV**

Unmarked Nests: If known, please entered any comments regarding fate of unmarked nests on your beach.
(Example: 14 unmarked nests were predated by raccoons, etc.)

No nests were intentionally left unmarked.

How many disorientation events occurred on this survey area in 2011?

47

If disorientation events occurred, have all **disorientation reports** been submitted to FWC? **Yes** or **No**

Yes

I certify the above information to be true and accurate to the best of my knowledge. (type in name & date)

Date:



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder: Lou Fisher	Permit Number: 108
Beach Name: Pompano/Lauderdale-by-the-Sea	

2. GENERAL NESTING DATA

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	415	10	0	0	0
Total # of Non-Nesting Emergences (False Crawls)	433	14	0	0	0
Date (mm/dd/yy) of First Documented Nest	04/18/11	05/27/11			
Date (mm/dd/yy) of Last Documented Nest	09/12/11	08/29/11			

Total # of Nests Prior to 15 May:	45	0			
Total # of Nests After 31 Aug:	1	0			

Comments:

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	362	10	0	0	0
(a) # of Nests left in Place without Additional Protection	362	10			
(b) # of Nests left in Place with Self-Releasing Flat Screen					
(c) # of Nests left in Place with Self-Releasing Cage					
(d) # of Nests left in Place with Restraining Cage					

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	53	0	0	0	0
(a) # of Relocated Nests without Additional Protection	53				
(b) # of Relocated Nests with Self-Releasing Flat Screen					
(c) # of Relocated Nests with Self-Releasing Cage					
(d) # of Relocated Nests with Restraining Cage					
(e) # of Relocated Nests to Self-Releasing Hatchery					
(f) # of Relocated Nests to Restraining Hatchery					



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder:		Lou Fisher	Permit Number:	108
Organization:	Broward Co. Natural Resources Planning & Mgmt. Div.			
Address:	1 North University Drive, Suite 301			
	Plantation, FL 33324			
County:	Broward	Email Address:	lfisher@broward.org	
Day Telephone (include area code):	(954) 519-1255	Night Telephone:		
Beach Name:	Ft Lauderdale Beach			
Point of Contact & Phone #		Email Address for Point of Contact: (if different from above)		

2. GENERAL SURVEY INFORMATION

Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. Be specific and use known landmarks that can be found on a map (or include a marked map).

Beginning Survey Boundary:	Commerical Blvd. Pier (26.18948, -80.09466)		
Ending Survey Boundary:	Port Everglades Inlet (26.09508, -80.10500)		
Beach Length (include KM or MI):	10.6 KM	Is beach length estimated or measured?	measured
Was this the exact same survey area as last year?	Yes / No		Yes

IF NO, please explain the specific differences AND why the survey area changed:

n/a			
------------	--	--	--

Start Date of Survey (mm/dd/yy):	03/01/11	End Date of Survey (mm/dd/yy):	09/30/11
Time of Day Surveyed: Start (include AM or PM)	1/2 hr before sunrise	Finish (include AM or PM)	9:00 AM
Number of Days Per Week Surveyed:	seven		
Total # of Days Surveyed in 2011 (this is the total # of days between start and end dates MINUS any missed days):	214		

If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). It is recommended to adhere to a fixed schedule if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.

n/a			
------------	--	--	--

If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day? It is recommended that only tracks from the previous night be counted when the survey resumes.

n/a			
------------	--	--	--

Were all non-nesting crawls (false crawls) counted during your survey? Yes or No	Yes
If no, please explain why?	

How many people were involved in surveying your nesting beach this season?	25
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3. NESTING BEACH MANAGEMENT INFORMATION

If nests were RELOCATED, were they relocated **Individually** (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a **Group** with other relocated nests (i.e., self-releasing and/or restraining hatchery)? **individ.**

Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)

nests found at or below the high tide line or in FWC designated "donor" areas

If **ALL** relocated nests were not inventoried, please give reason.

washouts

If **ALL** caged nests were not inventoried, please give reason.

washout

If a **HATCHERY** was used, please give reasons AND specific location:

None

If predator control methods other than screening/caging were employed, please describe below:

None

4. FATE OF NEST INFORMATION

How many marked nests were **negatively affected by predators** other than humans during the course of the season? **2**
 Note: this includes both partially and completely predated nests

List all non-human predators that were documented predated nests this season:

fox

How many marked nests were **negatively affected by the nesting female or another nesting sea turtle**? **12**

How many marked nests were **negatively affected by roots** (i.e., damaged eggs, impeded hatchling emergence)? **1**

How many marked nests were **negatively affected by erosion, accretion, inundation, and storm-related events**? **280**
 Note: this does not include stake loss.

Please give details: **CC 185 wash overs; 87 washout (77 due to Irene) CM 8 washouts due to Irene**

How many marked nests were **taken or disturbed by humans** (Example: nest dug into, eggs removed, etc.)? **6**
 Note: this does not include stake removal.

Please give details: **4 poached or vandalized; 1 dug into; 1 mound covered with hand & foot prints**

Unmarked Nests: If known, please entered any comments regarding fate of unmarked nests on your beach. (Example: 14 unmarked nests were predated by raccoons, etc.)

No nests were intentionally left unmarked.

How many disorientation events occurred on this survey area in 2011? **45**

If disorientation events occurred, have all **disorientation reports** been submitted to FWC? **Yes** or **No** **Yes**

I certify the above information to be true and accurate to the best of my knowledge. (type in name & date)

Date:



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder:	Lou Fisher	Permit Number:	108
Beach Name: Ft Lauderdale Beach			

2. GENERAL NESTING DATA

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	763	48	2	0	0
Total # of Non-Nesting Emergences (False Crawls)	907	29	0	0	0
Date (mm/dd/yy) of First Documented Nest	04/16/11	06/02/11	05/13/11		
Date (mm/dd/yy) of Last Documented Nest	09/10/11	09/27/11	06/03/11		

Total # of Nests Prior to 15 May:	60	0	1		
Total # of Nests After 31 Aug:	1	3	0		

Comments:

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	700	45	2	0	0
(a) # of Nests left in Place without Additional Protection	700	45	2		
(b) # of Nests left in Place with Self-Releasing Flat Screen					
(c) # of Nests left in Place with Self-Releasing Cage					
(d) # of Nests left in Place with Restraining Cage					

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	63	3	0	0	0
(a) # of Relocated Nests without Additional Protection	63	3			
(b) # of Relocated Nests with Self-Releasing Flat Screen					
(c) # of Relocated Nests with Self-Releasing Cage					
(d) # of Relocated Nests with Restraining Cage					
(e) # of Relocated Nests to Self-Releasing Hatchery					
(f) # of Relocated Nests to Restraining Hatchery					



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder:		Lou Fisher	Permit Number:	108
Organization:	Broward Co. Natural Resources Planning & Mgmt. Div.			
Address:	1 North University Drive, Suite 301			
	Plantation, FL 33324			
County:	Broward	Email Address:	lfisher@broward.org	
Day Telephone (include area code):	(954) 519-1255	Night Telephone:		
Beach Name:	Hollywood/Hallandale Beach			
Point of Contact & Phone #		Email Address for Point of Contact: (if different from above)		

2. GENERAL SURVEY INFORMATION

Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. Be specific and use known landmarks that can be found on a map (or include a marked map).

Beginning Survey Boundary:	3.9 km S of Port Everglades Inlet (26.06043, -80.11138)		
Ending Survey Boundary:	Broward/Miami-Dade Co Line (25.97518, -80.11828)		
Beach Length (include KM or MI):	9.4 KM	Is beach length estimated or measured?	measured
Was this the exact same survey area as last year?	Yes / No		Yes

IF NO, please explain the specific differences AND why the survey area changed:

n/a			
Start Date of Survey (mm/dd/yy):	03/01/11	End Date of Survey (mm/dd/yy):	09/30/11
Time of Day Surveyed: Start (include AM or PM)		Finish (include AM or PM)	
Number of Days Per Week Surveyed:	seven		
Total # of Days Surveyed in 2011 (this is the total # of days between start and end dates MINUS any missed days):	214		

If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). It is recommended to adhere to a fixed schedule if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.

n/a			
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If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day? It is recommended that only tracks from the previous night be counted when the survey resumes.

n/a			
-----	--	--	--

Were all non-nesting crawls (false crawls) counted during your survey? Yes or No	Yes
If no, please explain why?	

How many people were involved in surveying your nesting beach this season?	25
--	-----------

3. NESTING BEACH MANAGEMENT INFORMATION

If nests were RELOCATED, were they relocated **Individually** (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a **Group** with other relocated nests (i.e., self-releasing and/or restraining hatchery)? **individ.**

Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)

nests found at or below the high tide line or in FWC designated "donor" areas

If **ALL relocated nests** were not inventoried, please give reason.

washout

If **ALL caged nests** were not inventoried, please give reason.

n/a

If a **HATCHERY** was used, please give reasons AND specific location:

None

If predator control methods other than screening/caging were employed, please describe below:

None

4. FATE OF NEST INFORMATION

How many marked nests were **negatively affected by predators** other than humans during the course of the season? **0**
 Note: this includes both partially and completely predated nests

List all non-human predators that were documented predated nests this season:
n/a

How many marked nests were **negatively affected by the nesting female or another nesting sea turtle**? **0**

How many marked nests were **negatively affected by roots** (i.e., damaged eggs, impeded hatchling emergence)? **0**

How many marked nests were **negatively affected by erosion, accretion, inundation, and storm-related events**? **16**
 Note: this does not include stake loss.

Please give details: **CC 10 washed over; 5 washed out due to Irene CM 1 washover**

How many marked nests were **taken or disturbed by humans** (Example: nest dug into, eggs removed, etc.)? **0**
 Note: this does not include stake removal.

Please give details: **n/a**

Unmarked Nests: If known, please entered any comments regarding fate of unmarked nests on your beach. (Example: 14 unmarked nests were predated by raccoons, etc.)

No nests were intentionally left unmarked.

How many disorientation events occurred on this survey area in 2011? **5**

If disorientation events occurred, have all **disorientation reports** been submitted to FWC? **Yes or No** **Yes**

I certify the above information to be true and accurate to the best of my knowledge. (type in name & date)

Date:



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
SEA TURTLE NESTING REPORT FOR 2011**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder: Lou Fisher	Permit Number: 108
Beach Name: Hollywood/Hallandale Beach	

2. GENERAL NESTING DATA

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	102	2	0	0	0
Total # of Non-Nesting Emergences (False Crawls)	139	4	0	0	0
Date (mm/dd/yy) of First Documented Nest	04/26/11	06/03/11			
Date (mm/dd/yy) of Last Documented Nest	08/28/11	08/17/11			

Total # of Nests Prior to 15 May:	7	0			
Total # of Nests After 31 Aug:	0	0			

Comments:

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	35	2			
(a) # of Nests left in Place without Additional Protection	35	2			
(b) # of Nests left in Place with Self-Releasing Flat Screen					
(c) # of Nests left in Place with Self-Releasing Cage					
(d) # of Nests left in Place with Restraining Cage					

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	67	0	0	0	0
(a) # of Relocated Nests without Additional Protection	67				
(b) # of Relocated Nests with Self-Releasing Flat Screen					
(c) # of Relocated Nests with Self-Releasing Cage					
(d) # of Relocated Nests with Restraining Cage					
(e) # of Relocated Nests to Self-Releasing Hatchery					
(f) # of Relocated Nests to Restraining Hatchery					

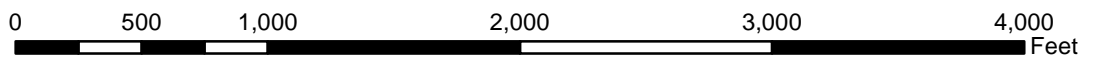
**Appendix 5: Distribution of Loggerhead, Green, and Leatherback Nests
Presented on December 2010 / January 2011
Coastal Aerial Photographs.**

2011 SEA TURTLE NESTS

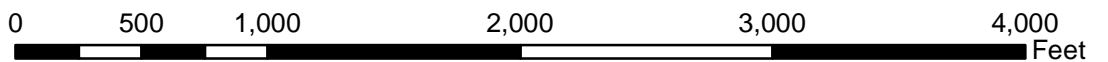


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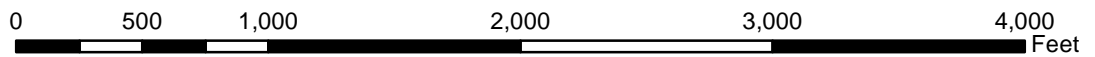
2011 SEA TURTLE NESTS



2011 SEA TURTLE NESTS



2011 SEA TURTLE NESTS



2011 SEA TURTLE NESTS



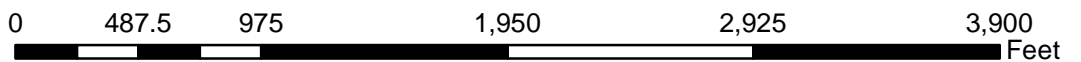
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2011 SEA TURTLE NESTS

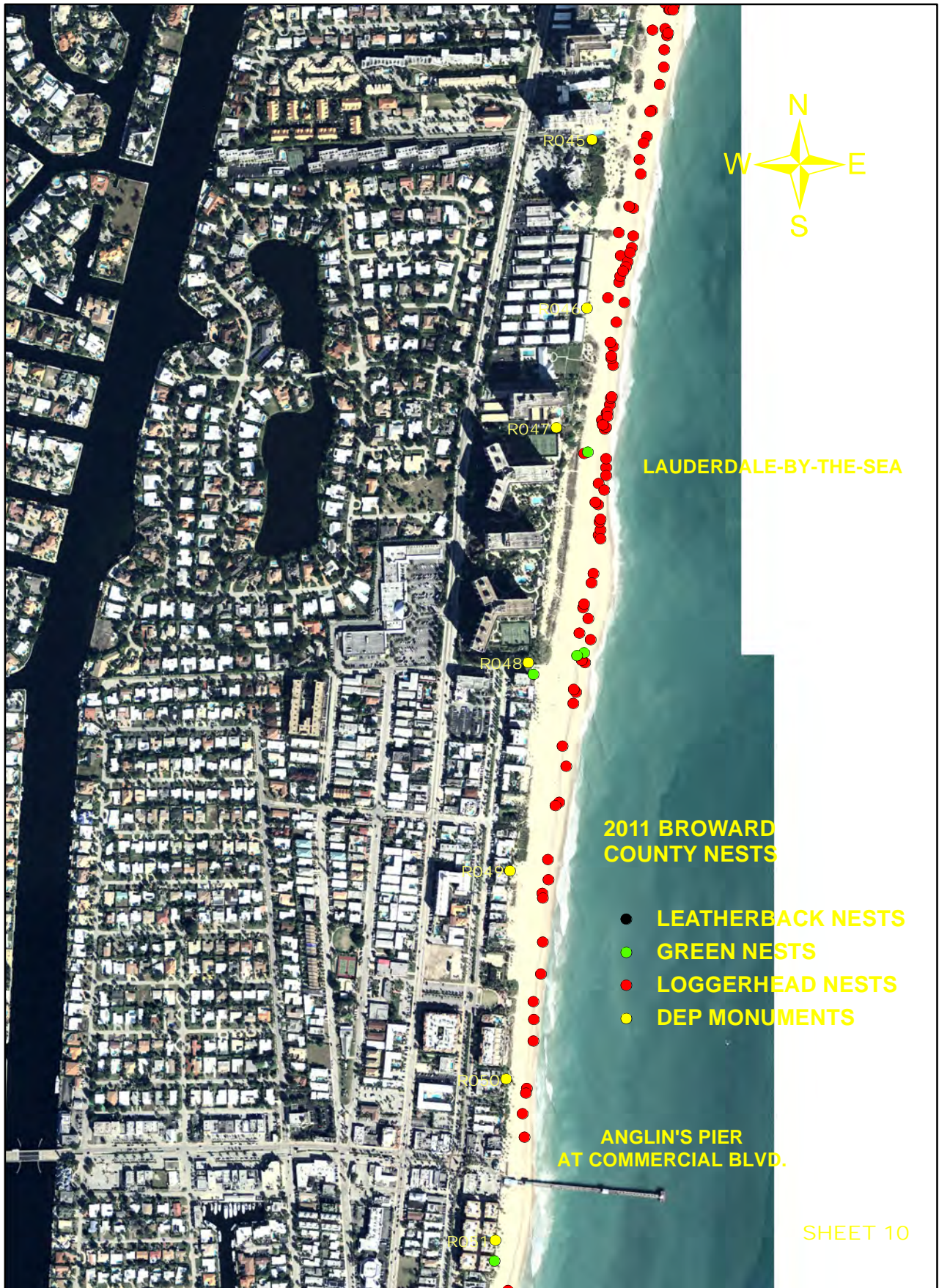


0 500 1,000 2,000 3,000 4,000 Feet

2011 SEA TURTLE NESTS

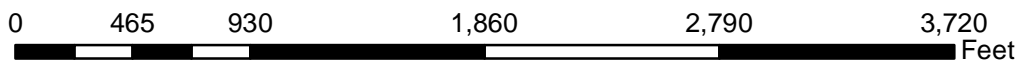


2011 SEA TURTLE NESTS



0 500 1,000 2,000 3,000 4,000 Feet

2011 SEA TURTLE NESTS

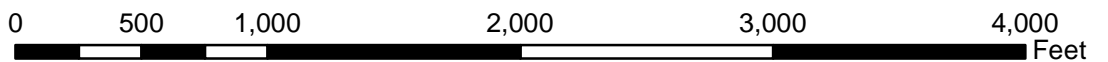
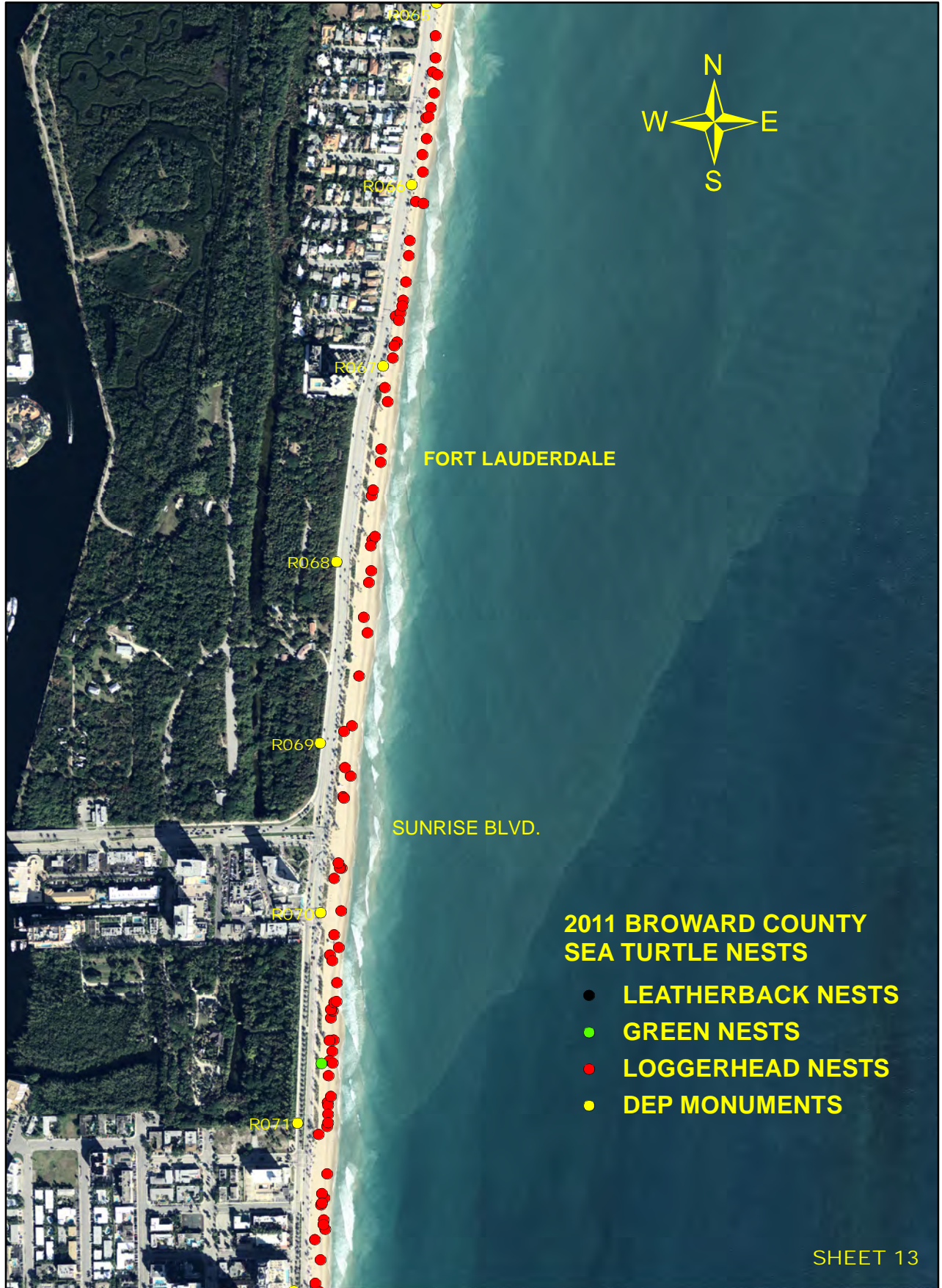


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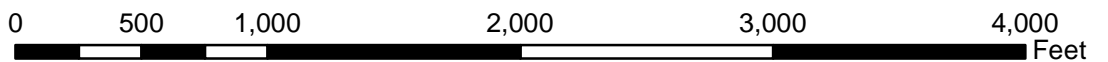


0 500 1,000 2,000 3,000 4,000 Feet

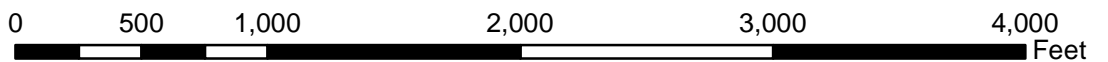
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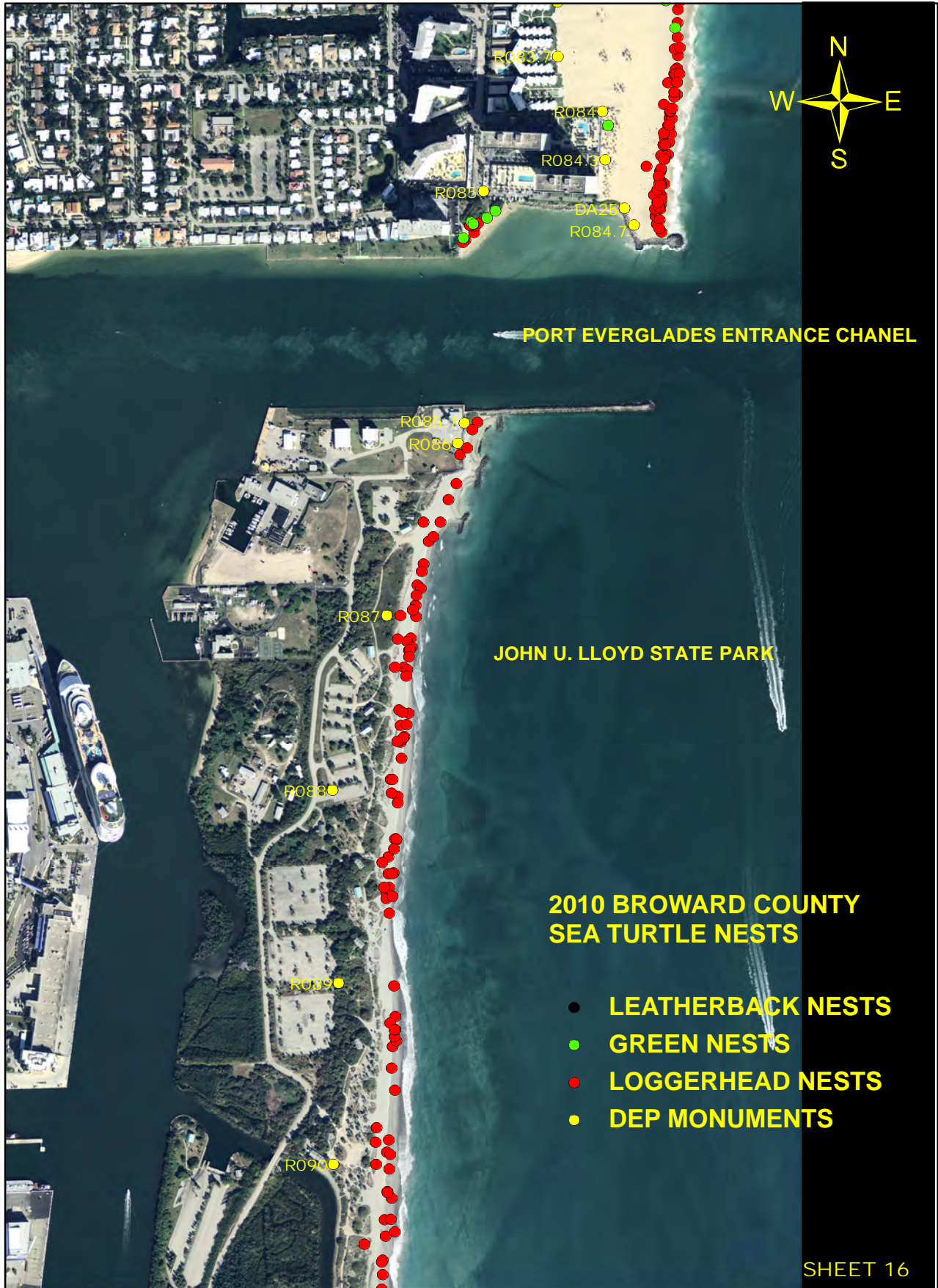
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2011 SEA TURTLE NESTS

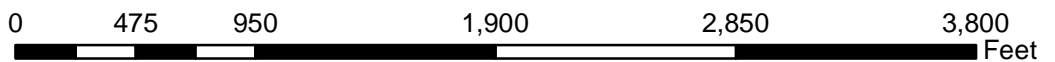


2011 SEA TURTLE NESTS

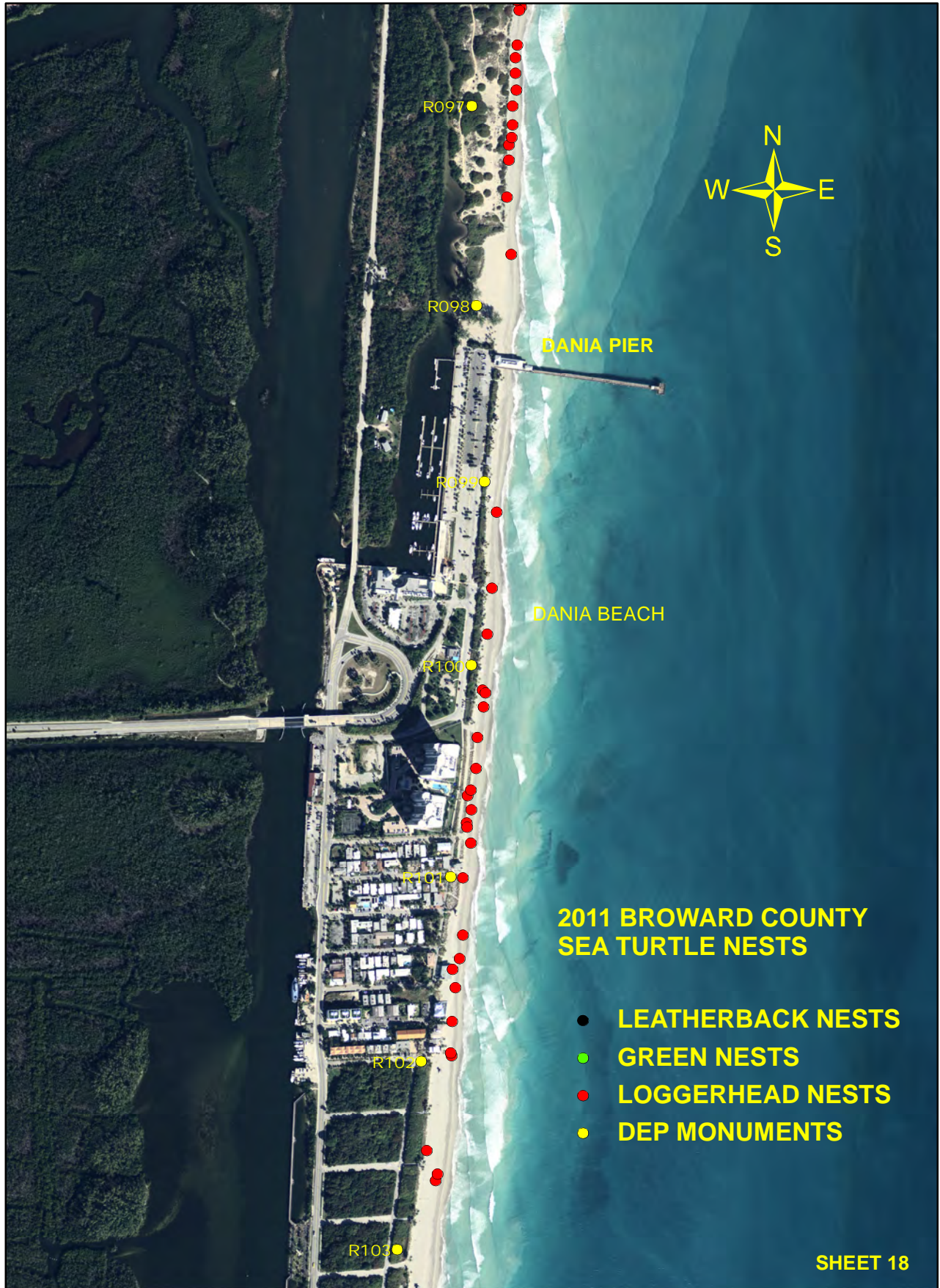


0 500 1,000 2,000 3,000 4,000 Feet

2011 SEA TURTLE NESTS

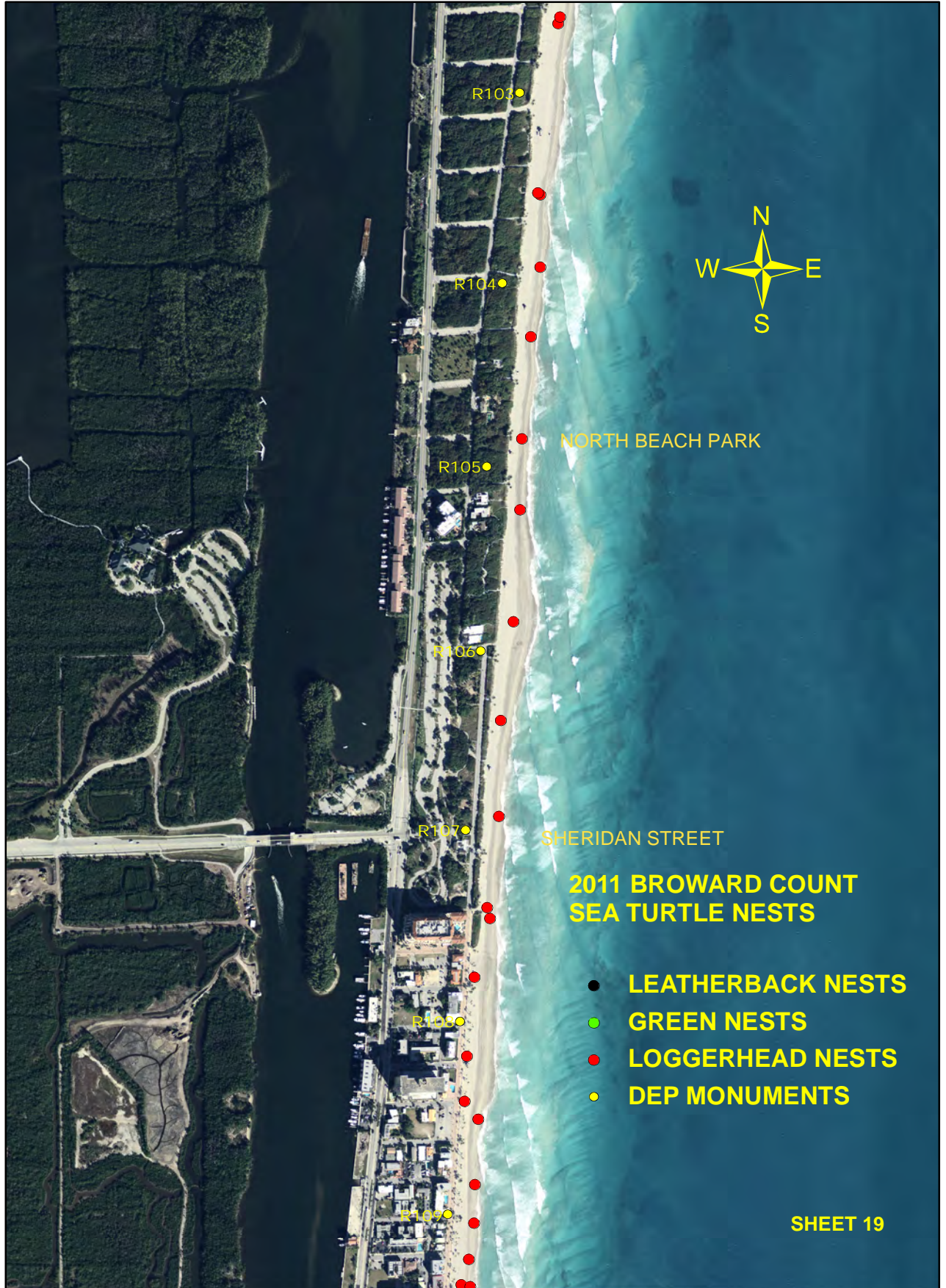


2011 SEA TURTLE NESTS



0 460 920 1,840 2,760 3,680 Feet

2011 SEA TURTLE NESTS



0 480 960 1,920 2,880 3,840 Feet

2011 SEA TURTLE NESTS



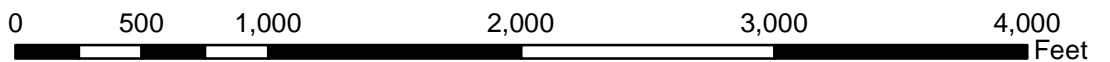
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2011 SEA TURTLE NESTS



0 495 990 1,980 2,970 3,960 Feet

2011 SEA TURTLE NESTS



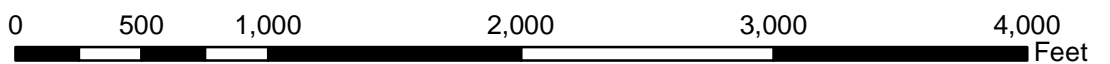
2011 SEA TURTLE NESTS



2011 BROWARD COUNTY SEA TURTLE NESTS

- **LOGGERHEAD NESTS**
- **LEATHERBACK NESTS**
- **GREEN NESTS**
- **DEP MONUMENTS**

SHEET 23



**Appendix 6: History of Sea Turtle Strandings in Broward County by
Calendar Year 2007 through 2011**

RECENT HISTORY OF STRANDINGS IN BROWARD COUNTY				
CAL. YEAR	SPECIES	DEAD	ALIVE	TOTAL
2007	LOGGERHEAD	14	5	19
	GREEN	21	4	25
	LEATHERBACK	0	0	0
	HAWKSBILL	1	0	1
	TOTAL	36	9	45
2008	LOGGERHEAD	13	1	14
	GREEN	37	4	41
	LEATHERBACK	0	0	0
	HAWKSBILL	2	0	2
	UNKNOWN	1	0	1
	TOTAL	53	5	58
2009	LOGGERHEAD	6	3	9
	GREEN	55	1	56
	LEATHERBACK	0	1	1
	HAWKSBILL	4	1	5
	UNKNOWN	2	0	2
	TOTAL	67	6	73
2010	LOGGERHEAD	16	4	20
	GREEN	34	6	40
	LEATHERBACK	2	0	2
	KEMPS RIDLEY	1	2	3
	HAWKSBILL	0	1	1
	UNKNOWN	1	0	1
	TOTAL	54	13	67
2011 thru DEC	LOGGERHEAD	11	4	15
	GREEN	39	7	46
	LEATHERBACK	1	0	1
	KEMPS RIDLEY	0	2	2
	HAWKSBILL	2	0	2
	UNKNOWN	1	0	1
	TOTAL	54	13	67