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# Sea Turtle Conservation Program, Broward County, FL 2006 Report

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Environmental Protection Department  
**2006 ANNUAL REPORT**

A photograph of a sea turtle resting on a coral reef. The turtle is the central focus, with its head and front flippers visible. The background shows a vibrant coral reef with various colors of coral and rocks.

# Sea Turtle Conservation Program In BROWARD COUNTY, FLORIDA:

**TECHNICAL REPORT EPD 07-01**

Submitted by:  
Curtis Burney, Principal Investigator and Stefanie Ouellette, Project Manager

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For the:  
**BROWARD COUNTY BOARD OF COUNTY COMMISSIONERS**

**TECHNICAL REPORT EPD 07-01**

**SEA TURTLE CONSERVATION PROGRAM  
BROWARD COUNTY, FLORIDA  
2006 REPORT**

Submitted by:

**Curtis Burney,  
Principal Investigator**

and

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awareness products including bumper stickers, activity books, table tents and door hangers. We also acknowledge the park employees of the Broward County Parks and Recreation Division at Hollywood North Beach Park who offered assistance whenever needed and the Rangers at John U. Lloyd Park who provided space for nest relocation when necessary. We would especially like to thank the following groups for their assistance and cooperation:

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The Florida Fish and Wildlife Conservation Commission, Florida Marine Research Institute

The Cities and Police Departments of Hallandale Beach Hollywood, Dania Beach, Fort Lauderdale, the Town of Lauderdale-By-The-Sea, Pompano Beach, Deerfield Beach, and the Town of Hillsboro Beach. Code Enforcement Departments in Deerfield Beach, Pompano Beach, Lauderdale-by-the-Sea, Fort Lauderdale and Hallandale Beach.

Fort Lauderdale Fire Department for assisting with disoriented hatchling recovery from storm drains.

Pompano Animal Control for assisting with sea turtle strandings and disoriented hatchlings.

## **INTRODUCTION**

Since 1978, the Broward County Environmental Protection Department (BCEPD) has provided for the conservation of endangered and threatened sea turtle species within its area of responsibility. 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 (especially necessary along heavily developed coasts) 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), Bureau of Protected Species Management, Tallahassee, Florida. This project was administered by the BCEPD and conducted by the Nova Southeastern University Oceanographic Center under Marine Turtle Permit #108, issued to the BCEPD by the FWCC.

The BCEPD is especially concerned with any environmental effects of intermittent beach nourishment projects on shorelines and the offshore reefs. As part of this concern, the BCEPD 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 2006 program.

In addition to fulfilling statutory requirements, the purposes of the project were:

- 1) to relocate eggs from nests deposited in sites threatened by natural processes or human activities and thus maximize hatchling survival,
- 2) to accurately survey sea turtle nesting patterns to document historical trends and assess natural and anthropogenic factors affecting nesting patterns and densities,
- 3) to assess the success of sea turtle recruitment and of hatchery operations in terms of nesting success, hatching success and total hatchlings released,
- 4) to 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) to 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.

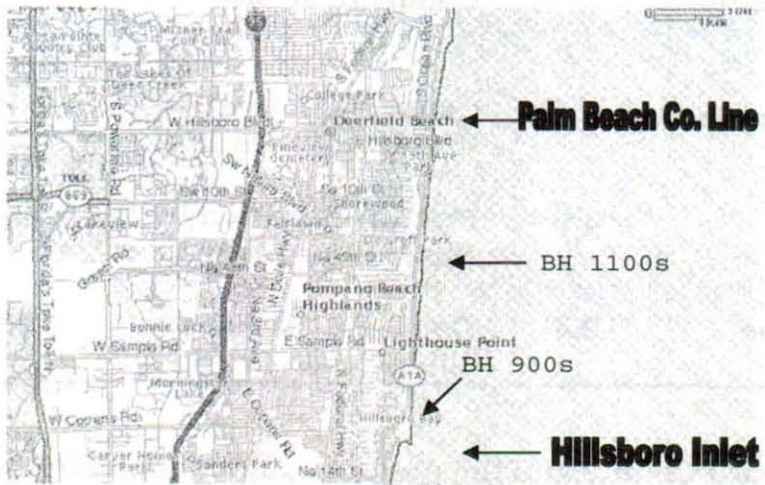
BEACH	BEACH LENGTH (km)	BOUNDARIES	DEP SURVEY MARKER #
Hillsboro-Deerfield Beach	7.0	Palm Beach Co. line to Hillsboro Inlet	R1-24
Pompano Beach Including Lauderdale-by-the-Sea	7.7	Hillsboro Inlet to Commercial Blvd.	R25-50
Fort Lauderdale	10.6	Commercial Blvd. to Port Everglades Inlet	R51-85
John U. Lloyd Park	3.9	Port Everglades Inlet to Dania Beach fence	R86-97
Hollywood-Hallandale Including Dania	9.4	Dania Beach fence to Miami Dade Co. line	R98-128

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

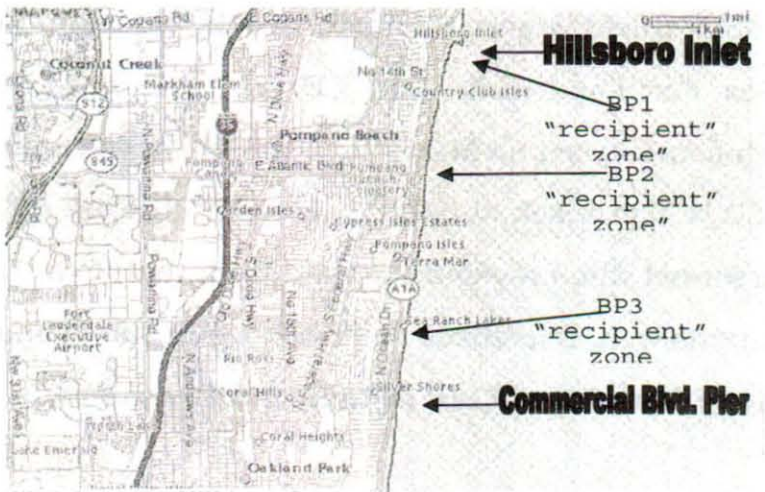
Daily surveys of Deerfield Beach, Hillsboro Beach, Pompano Beach, Lauderdale-by-the-Sea, Fort Lauderdale, Dania Beach, Hollywood Beach, and Hallandale Beach commenced on March 1, 2006. Surveys continued through September 30th. The beach at John U. Lloyd State Park (JUL) was patrolled by park personnel who provided the data from that area. Except in Lloyd Park, nest locations were referenced to FDEP beach survey monuments numbered consecutively from R1 to R128 (N to S). Marker numbers



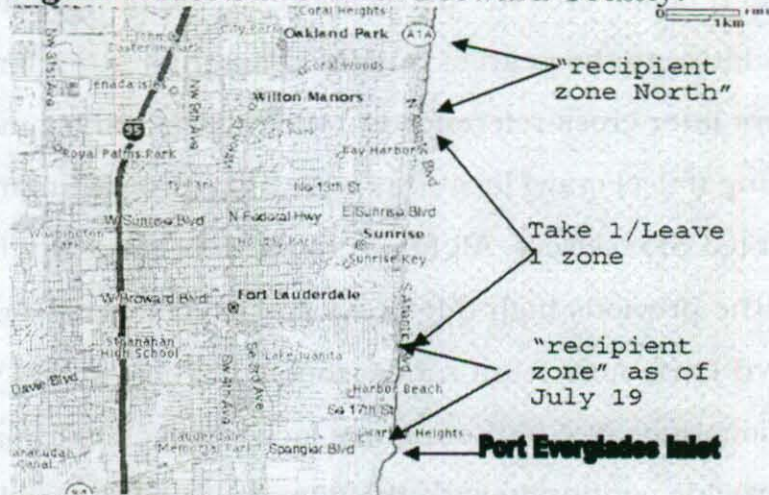
**Figure 1A:** The location of Broward County, FL



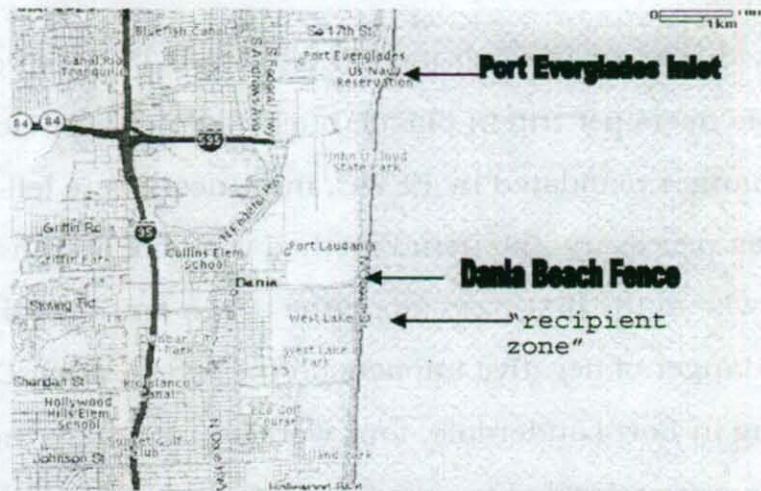
**Figure 1B:** Northern Broward County.



**Figure 1C: North Central Broward County.**



**Figure 1D: Central Broward County**



**Figure 1E: South Central Broward County**



**Figure 1F: Southern Broward County**

corresponding to each beach area are listed above. 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.

In John Lloyd Park, four 1-km zones (zone 1 farthest north) were used for recording nest locations due to the relative lack of beach landmarks. This was also done to provide continuity with the data collected in Lloyd Park during previous years.

Surveyors used four-wheeled all-terrain vehicles (ATVs) that could carry up to six turtle nests per trip in plastic buckets if needed. However, this year, due to changes mandated by FFWC, most nests were left *in situ*. 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. Due to early beach cleaning in Fort Lauderdale, four workers picked up the nests on the first pass. Nests were relocated to adjacent "safe zones" or "recipient sites" in a random manner by alternating zones and east-west location each day 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 within 10 feet of the previous evening wrack line or,
- 2) a nest located in a "donor zone", which was pre-determined by the FFWC 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 within 10 feet of the previous evening wrack line. Donor sites for these beaches

were designated by FWC and included zones R85-80, R57-50, R45-39, and R35-32 from March 1 through July 18. All other zones were designated recipient and *in situ* sites. As of July 19, zones R84-80 were added to the list of *in situ* and recipient sites. However, R85 remained a donor site throughout the season. In Pompano, Lauderdale-by-the-Sea, and Fort Lauderdale, recipient and *in situ* sites included zones R31-25 (referred to as BP1), R38-R36 (BP2), R49-46 (BP3), and R63-58. All nests that were relocated from zones R79-64 were moved to R63-58. Relocated nests from R85-80 were also relocated to these zones up until July 18. Beginning July 19, relocated nests from R85, R79 and R78 were moved into zones R84-80. Nests needing to be relocated from zones R57-R51 were relocated to R49-46 (BP3, Lauderdale-by-the-Sea). All relocated nests from zones R35-32, R45-39, and R50 were moved to BP1, BP2, or BP3 in an alternating fashion. Zones R79-64 were designated as a take 1/leave 1 zone. Here, half of all loggerhead nests deposited were left *in situ*, while half were relocated to zones R63-58. Donor zones and their associated recipient zones are summarized in Tables 2 and 3.

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 1200s on Highway A1A. These locations were designated BH900s, BH1000s, BH1100s and BH1200s, respectively. The locations of the most southerly and northerly limits of this area (BH900s and BH1200s, respectively) are shown in Figure 1B. All loggerhead nests deposited in zones R6-1 (Deerfield Beach) were relocated to zones R24-7.



**Table 2:** Destinations for Relocated Nests in Pompano, Lauderdale-by-the-Sea, and Fort Lauderdale. March 1-July 18, 2006

Donor Zones	Recipient Zones
R85-80	R63-58
R79-64	R63-58
R57-50	R49-46
R45-39	BP1, BP2 or BP3
R35-32	BP1, BP2, or BP3

**Table 3:** Destinations for Relocated Nests in Pompano, Lauderdale-by-the-Sea and Fort Lauderdale July 19-Sept 30, 2006

Donor Zones	Recipient Zones
R85, R79, R78	R84-80
R77-64	R63-58
R57-50	R49-46
R45-39	BP1, BP2 or BP3
R35-32	BP1, BP2, or BP3

Hollywood beach was also divided into donor and recipient/*in situ* sites. From March 1-July 18, donor sites included zones R128-107 and R101-97. Zones R106-102 were the recipient and *in situ* zones for nests relocated from R128-R107, while various areas in JUL served as recipient sites for nests laid between R101-97. Despite using self-releasing flat predator screens to protect these nests, they were heavily predated. As a result, beginning July 19, nests being relocated from zones R101-97 were

moved to R106-102 instead of JUL. As of July 19, zones R128-124 were added to the list of recipient/*in situ* sites, nests needing to be relocated from zones R114-R107 were moved to R106-102, and nests needing to be relocated from R123-115 were moved to R128-124. These donor and recipient zones are summarized in Tables 4 and 5.

**Table 4:** Destinations for Relocated Nests in Dania, Hollywood and Hallandale. March 1-July 18, 2006

Donor Zones	Recipient Zones
R128-107	R106-102
R101-97	JUL

**Table 5:** Destinations for Relocated Nests in Dania, Hollywood, and Hallandale. July 19-Sept 30, 2006

Donor Zones	Recipient Zones
R123-115	R128-124
R114-107	R106-102
R101-97	R106-102

All green turtle nests were left *in situ* except for those laid less than 10 feet from the high tide line. Only 5 green turtle nests were relocated, while 127 were left in place.

Nests to be relocated were carefully dug by hand, and 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, which were lined with sand from the natural nest. Care was taken to maintain the

natural orientation of each egg, to minimize possible injury to the embryos. These nests were marked off on the beach using 1 signed stake and 2 unsigned stakes forming a triangle around the egg chamber.

A total of 1122 nests that were not in danger of negative impacts or were located in recipient sites and were marked with stakes bearing yellow 5.5" X 8.8" sea turtle nest warning signs (Appendix 3), surrounded by 5 additional stakes and a 10 foot diameter circle of caution tape and left *in situ*. The only exception to this was along Fort Lauderdale strip (R79-64), where ½ of the loggerhead nests were intentionally left *in situ*, the egg chamber located and marked off with one signed stake and 3 additional stakes forming a diamond. When ½ of these nests reached 45 days of incubation, a restraining cage was placed over the egg chamber to avoid total loss.

After hatching, 501 *in situ* nests (45 percent) were excavated for post emergence examination. 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 pipped 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 pipped 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. Hatchling release success was defined as the number of released hatchlings divided by the total number of eggs.

#### Data analysis

The data were compiled, analyzed and plotted primarily with Quattro Pro, version 8 (Corel Corp. Ltd.) and Statistica, release 6 (StatSoft, Inc.). The countywide yearly nesting densities from 1981 to 2006 for the three species were plotted and trends were assessed by linear regression and correlation

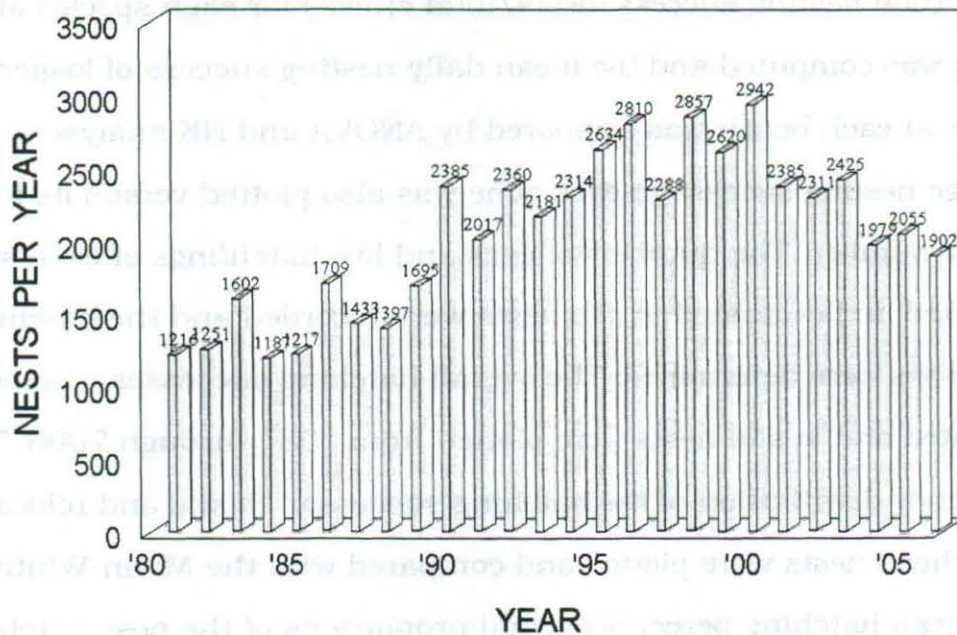
analyses. Seasonal nesting patterns and nesting densities were calculated for each beach (nests per km) and the beaches were compared using 1-way analysis of variance (ANOVA) and Newman-Keuls (NK) tests at the 0.05 significance level. The total number of nests deposited by each species in the beach segments corresponding to each FDEP survey marker was tabulated and plotted. GPS positions for most nests and false crawls 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 was compared by 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 hatching successes were determined. The overall hatching successes of all eggs from relocated and *in situ* nests were plotted from 1981 through 2006. The frequency distribution of the hatching success of *in situ* and relocated 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.

## RESULTS

Figure 2 shows the historical trend in the total number of sea turtle nests deposited in Broward County since 1981. A total of 1902 nests were found in 2006, which was 565 fewer than the previous 10-year average and the lowest number reported since 1989.

### SEA TURTLE NESTING HISTORY ALL SPECIES COMBINED

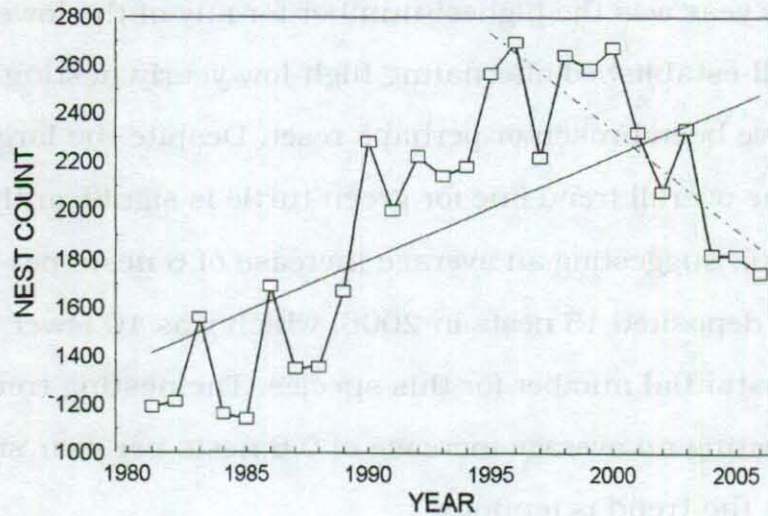


**Figure 2:** The pattern of total sea turtle nesting in Broward County since full surveys commenced in 1981.

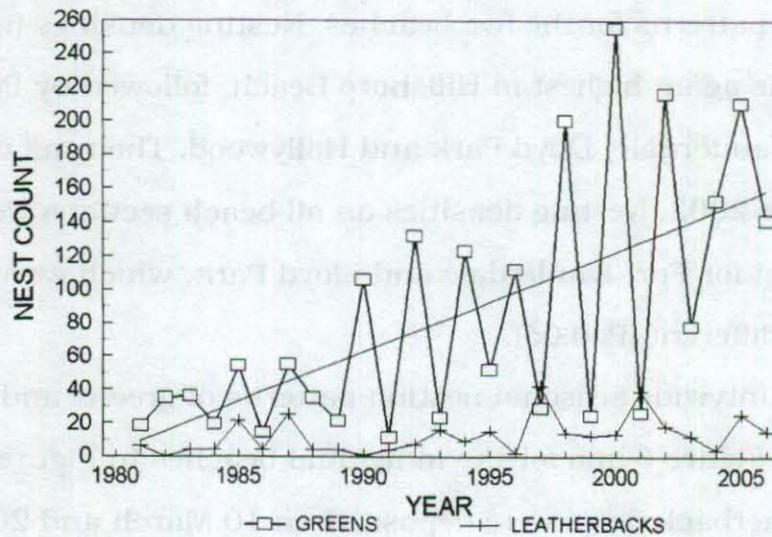
Figure 3 shows the yearly nesting trends of loggerhead, green and leatherback sea turtles. Loggerheads laid 1746 nests in 2006, which was the lowest number since 1989, but only 4 percent below the totals of the previous two years. While the overall loggerhead nesting trend remains positive, the trend since 1995 is negative ( $P = .0006$ ) and indicates an

### BROWARD LOGGERHEAD NESTS

Overall P=.0002; Since 1995 P=.0006



### GREENS AND LEATHERBACKS



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

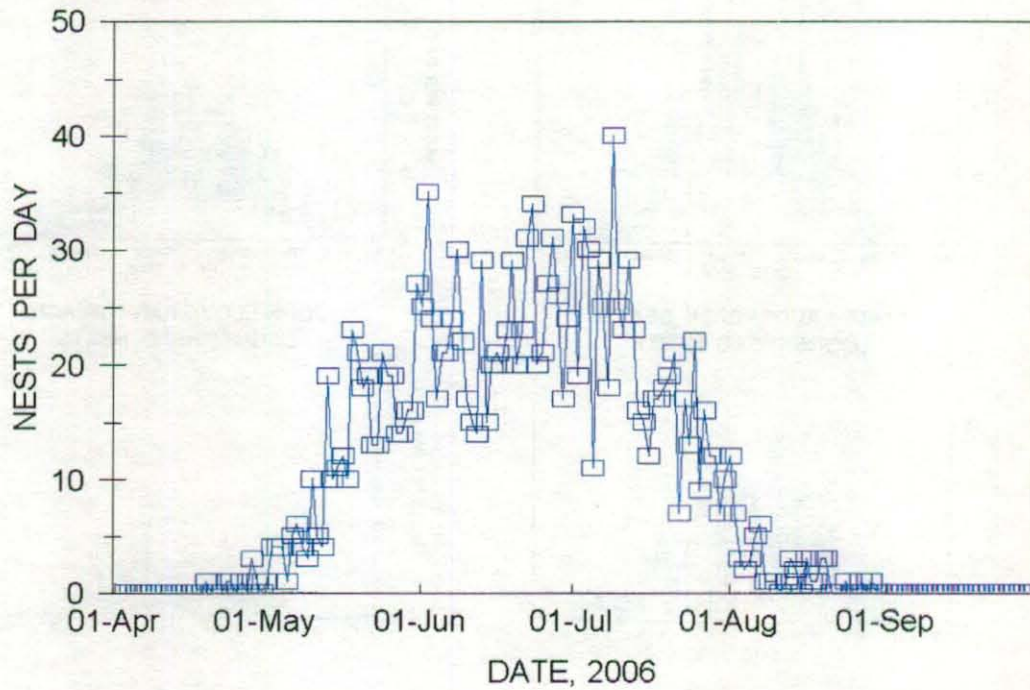
average decline of 81 nests per year. This year's loggerhead nest count was 573 (1.7 standard deviations) below the previous 10-year average.

Green turtle nesting (Fig. 3) was down 33 percent from last year but the nesting of this species has shown violent fluctuations since 1990 and the 141 nests this year was the highest number for any of the lower nesting years. The well-established alternating high-low yearly nesting pattern appears to have been broken or perhaps reset. Despite the large fluctuations, the slope of the overall trend line for green turtle is significantly greater than zero ( $P = .0025$ ), suggesting an average increase of 6 nests per year. Leatherbacks deposited 15 nests in 2006, which was 10 fewer than last year, but still a substantial number for this species. The nesting trend is still positive, indicating an average increase of 0.6 nests per year since project inception, but the trend is tenuous.

Figure 4 shows the seasonal loggerhead nesting pattern. The first and last nests were deposited on 19 April in Hollywood and on 29 August in Fort Lauderdale. Table 6 and Figure 5 give the total loggerhead nesting densities and seasonal patterns for the five beaches. Nesting densities (mean daily nests/km) was again highest in Hillsboro Beach, followed by Pompano Beach, Fort Lauderdale, Lloyd Park and Hollywood. The rank order has not changed since 2003. Nesting densities on all beach sections were statistically distinct except for Fort Lauderdale and Lloyd Park, which were not significantly different ( $P > 0.05$ ).

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 10 March and 26 May, in Hillsboro Beach. The first green turtle nests were deposited on 1 June in Hollywood and Pompano Beach and the last was on 28 September in Fort Lauderdale. Nesting densities for greens and leatherbacks are shown in Table 7 and Table 8, respectively. Nesting by greens again was significantly higher in Hillsboro Beach. Nesting on the other beaches was significantly

## LOGGERHEAD NESTS

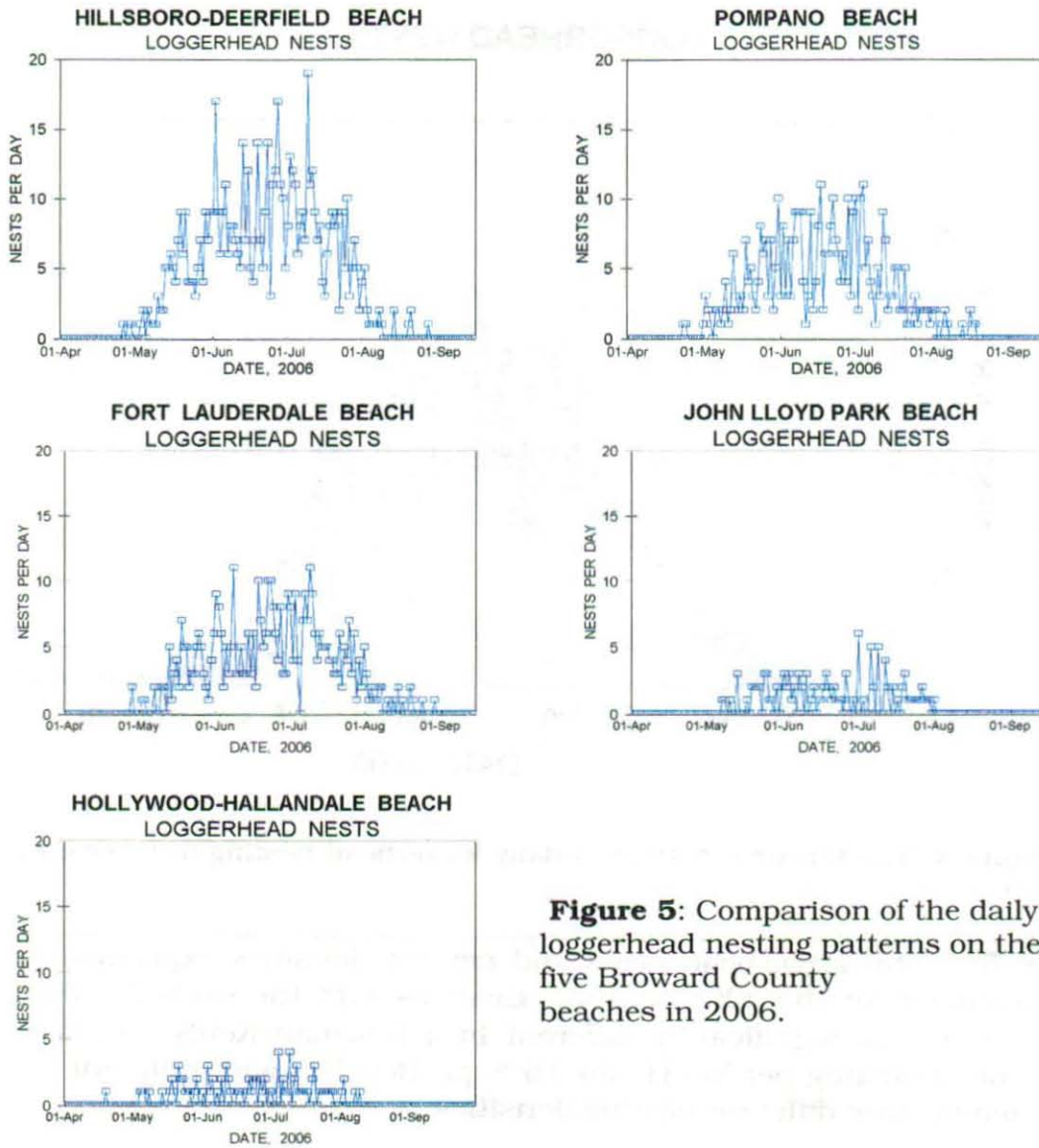


**Figure 4:** The seasonal pattern of daily loggerhead nesting in Broward County, 2006.

**Table 6:** Total loggerhead nests and nesting densities expressed as nests-per-kilometer for the 2006 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	659	7.0	94.1	.559 A
Pompano Beach	432	7.7	56.1	.330 B
Ft. Lauderdale	444	10.6	41.9	.244 C
Lloyd Park	114	3.9	29.2	.174 C
Hollywood	97	9.4	10.3	.061 D
OVERALL	1746	38.6	45.2	



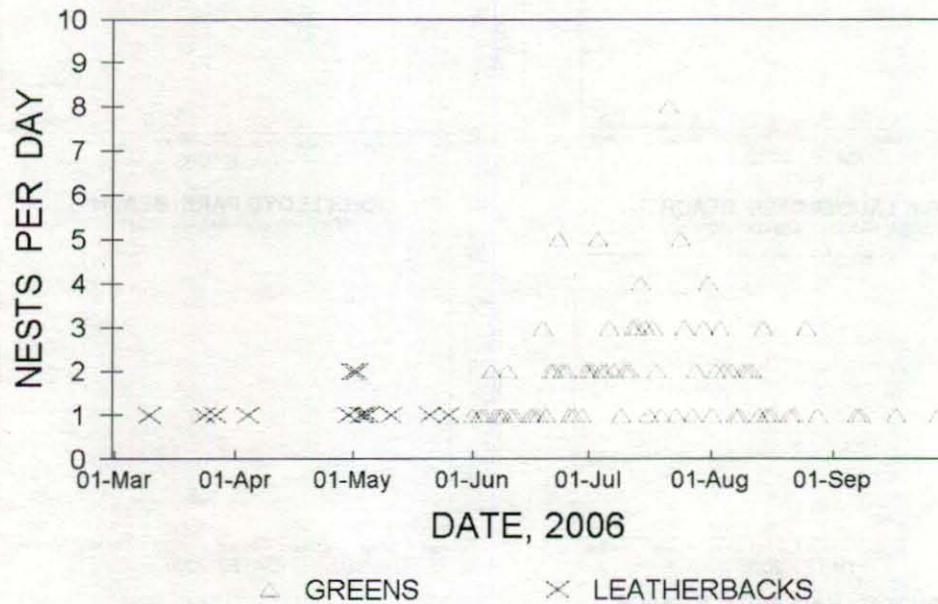


**Figure 5:** Comparison of the daily loggerhead nesting patterns on the five Broward County beaches in 2006.

lower and not statistically different. No green turtles nested in Hollywood in 2006, but there was one non-nesting crawl. Leatherback nesting was significantly heavier in Hillsboro Beach than in Pompano Beach and Fort Lauderdale. No leatherbacks nested in Lloyd Park or Hollywood, but there was one false crawl in Hollywood.

Figure 8 shows nest counts for each species in each 1000-foot zone of Broward County beach (1-km zones in Lloyd Park) during 2006. As in previous years, the low nesting zones R2, R24, R34 and R50 were near the

Deerfield Beach Pier, the Hillsboro Inlet, the Pompano Beach Pier and the Commercial Boulevard pier, respectively. The beach along the Fort



**Figure 6:** The seasonal pattern of daily green and leatherback nesting in Broward County, 2006.

Lauderdale strip (R61 to R78) and the entire beach south of R98 were also lightly nested. Loggerheads again nested most frequently in zone R21 in the residential section of Hillsboro Beach. This has been the most heavily nested zone since 2002. This year's nest distribution was remarkably similar to last years pattern except that nesting was unusually low in R7 (2 nests) and high in R8 (57 nests).

Figure 9 and Table 9 present the countywide distribution of nesting success for the three species. There was a significant downward north-to-south trend ( $P = .007$ ) in loggerhead nesting success calculated for each zone. This can also be seen in the overall nesting successes for each beach (Table 9). Nesting success was significantly higher in Hillsboro Beach, significantly lower in Lloyd Park and Hollywood, and intermediate

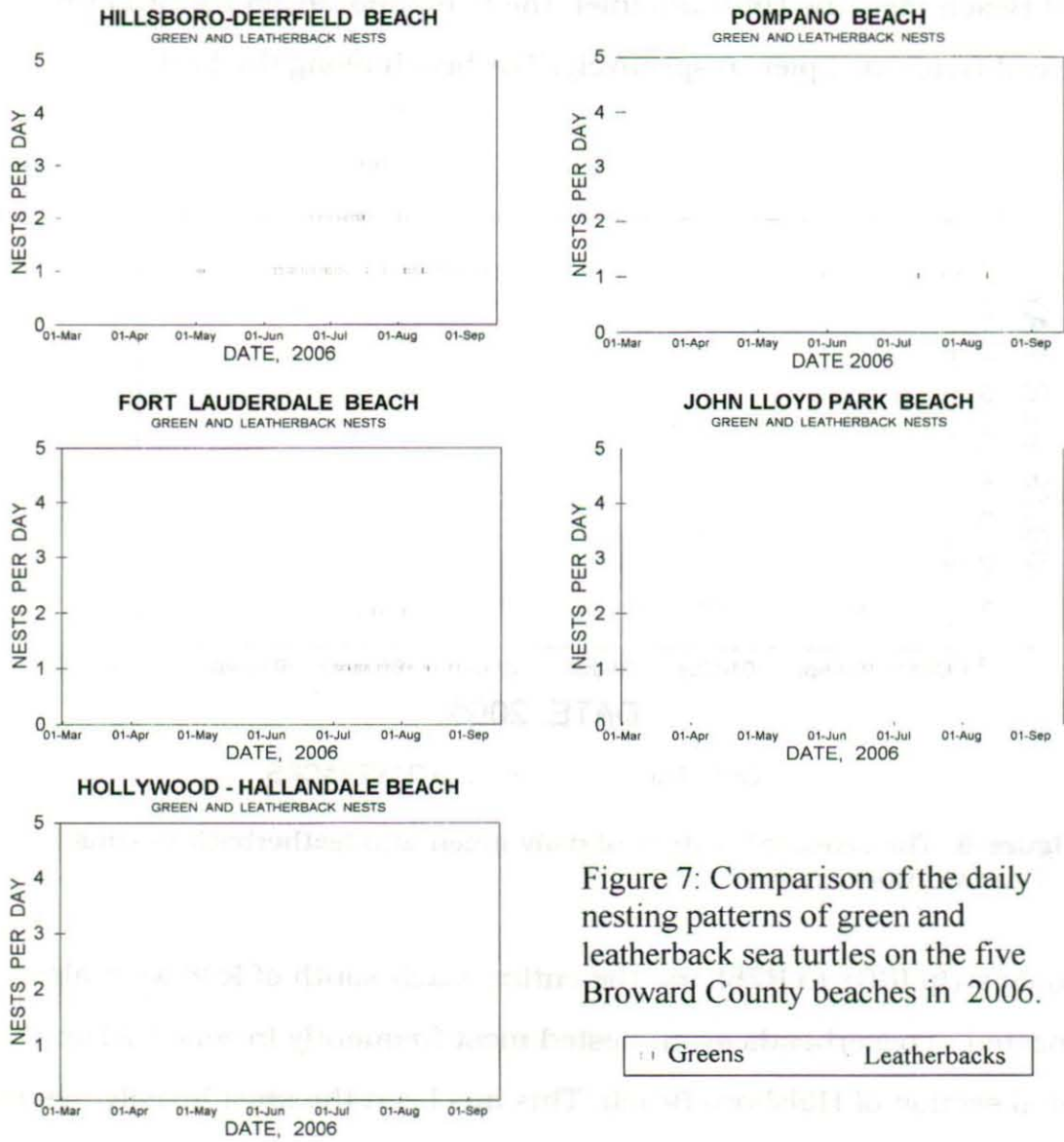


Figure 7: Comparison of the daily nesting patterns of green and leatherback sea turtles on the five Broward County beaches in 2006.

in Fort Lauderdale and Pompano Beach. There were no significant between-beach differences or countywide trends in green or leatherback nesting successes.

Table 10 gives the number of nests for each species that were relocated or left *in situ*. Because of the new procedures, 1122 nests were left *in situ* in 2006, compared to 675 in 2005. Table 11 lists the number of eggs and released hatchlings from evaluated *in situ* and relocated nests. The numbers

of predated nests and nests that were unevaluated due to stake removal or washout are also listed.

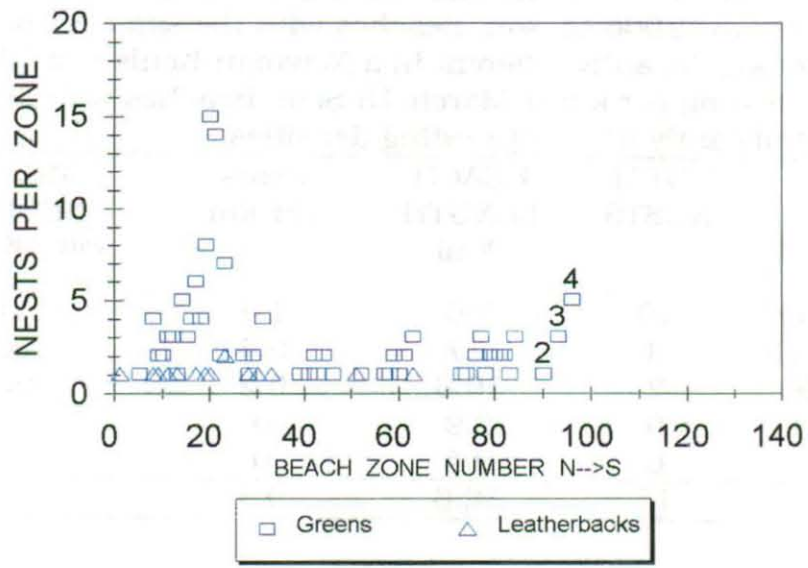
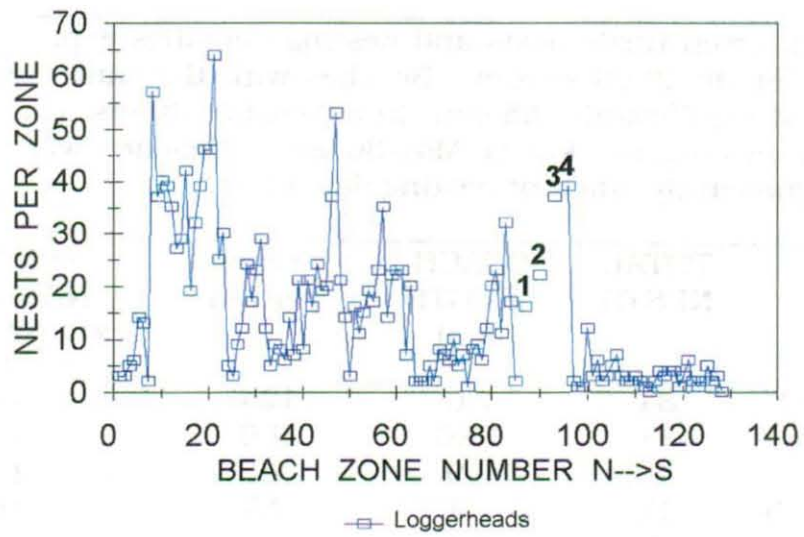
**Table 7:** Total green turtle nests and nesting densities expressed as nests-per-kilometer for the 2006 season. Beaches with the same NK designation letters were not significantly different in a Newman-Keuls test (alpha = .05) of mean daily nesting per km (1 May-30 Sep). Beaches with different NK letters 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	84	7.0	12.0	.078 A
Ft. Lauderdale	31	10.6	2.9	.019 B
Lloyd Park	9	3.9	2.3	.015 B
Pompano Beach	17	7.7	2.2	.014 B
Hollywood	0	9.4	0	0
OVERALL	141	38.6	3.7	

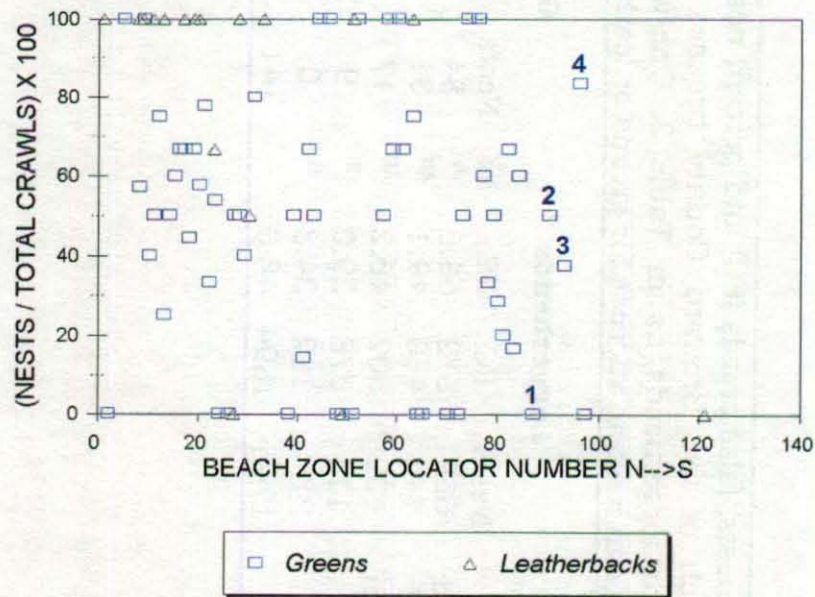
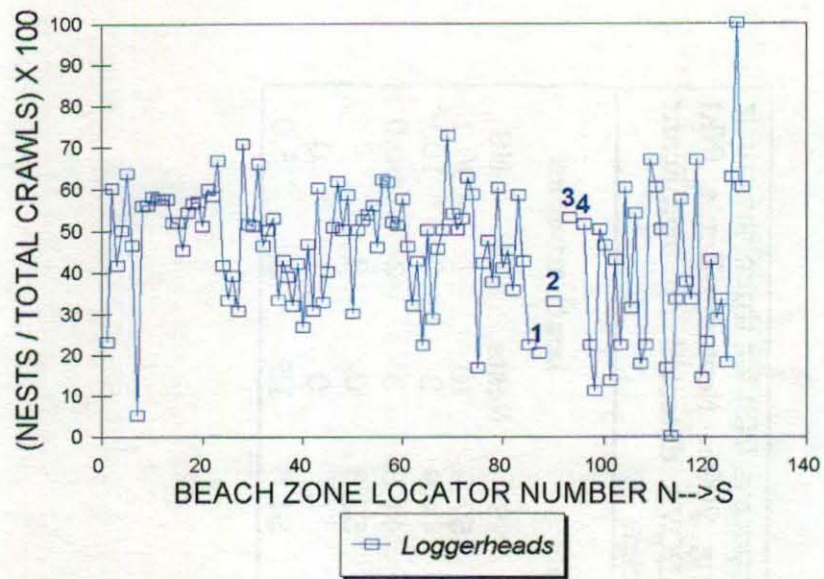
**Table 8:** Total leatherback nests and nesting densities expressed as nests-per-kilometer for the 2006 season. Beaches with the same NK designation letters were not significantly different in a Newman-Keuls test (alpha = .05) of mean daily nesting per km (1 March-15 Sep). Beaches with different NK 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	10	7.0	1.4	.0117 A
Pompano Beach	3	7.7	0.4	.0031 B
Ft. Lauderdale	2	10.6	0.2	.0016 B
Lloyd Park	0	3.9	0	0
Hollywood	0	9.4	0	0
OVERALL	15	38.6	0.4	

Compared to last year, the hatchling release success (live hatchlings released / total eggs) of relocated loggerhead nests increased dramatically from 53.3 percent to 76.8 percent this year. While this 23.5 percentage point increase can partially be attributed to the new procedures, the successes of *in situ* loggerhead, green and leatherback nests increased by 12.7, 6.4 and



**Figure 8:** Locations of loggerhead, green and leatherback nests in Broward County, 2006. Numbers 1-4 indicate the four beach zones of John Lloyd Park.



**Figure 9:** The distribution of the nesting success of loggerhead, green and leatherback turtles across Broward County, 2006. Numbers 1-4 indicate the four beach zones of John Lloyd Park.

**Table 9:** Total nests, false crawls (FC) and percent nesting success (NS) for three sea turtle species on each of five Broward County beaches during 2006. Newman-Keuls (NK) designations for loggerheads as in Table 2. One-way ANOVA detected no significant differences in mean nesting success for greens or leatherbacks.

BEACH	Loggerheads				Greens			Leatherbacks		
	Nests	FC	NS	NK	Nests	FC	NS	Nests	FC	NS
Hillsboro Beach	659	572	53.5	A	84	61	57.9	10	1	90.1
Ft. Lauderdale*	444	460	49.1	AB	31	38	44.9	2	0	100
Pompano Beach	432	502	46.2	AB	17	24	41.5	3	3	50.0
Lloyd Park	114	178	39.0	B	9	8	52.9	0	0	-
Hollywood	97	182	34.8	B	0	1	0	0	1	0
OVERALL	1746	1894	48.0		141	132	51.6	15	5	75.0

13.4 percentage points respectively, indicating that overall incubation conditions were much more favorable in 2006 than in 2005 which was unusually hot and was impacted by three hurricanes (Burney and Ouellette, 2005; Ouellette and Burney, 2005). Three relocated green turtle nests produced 82.7 percent live hatchlings, compared to a success rate of 38.9 percent for 6 nests in 2005. Figure 10 illustrates the historical patterns of yearly release success for all evaluated *in situ* and relocated sea turtle nests since 1981. This year, the success of relocated nests was the highest reported since 1988.

Figure 11 shows the seasonal patterns of the release success of *in situ* and relocated loggerhead nests. The success of relocated nests and *in situ* nests showed the usual significant seasonal declines ( $P < .001$ ) but unlike last year, the slopes of the trend lines were not significantly different ( $P = .071$ ). In fact, the success of *in situ* nests declined at a slightly faster rate than relocated nests.

Figure 11 also shows that most (94.6 percent) evaluated *in situ* nests were deposited on or before Julian day 185 (July 4), while only 68.8 percent of relocated nests were laid before this date. Because of the normal seasonal decline in hatchling release success, the disproportionate number of late season relocated nest evaluations must be considered when comparing the overall success of relocated and *in situ* nests (Table 11, Fig. 10).

Figure 12 shows the frequency distributions for hatching success in relocated and *in situ* nests. A Mann Whitney U test indicated a significant difference in the medians of these distributions ( $Z = 10.1$ ,  $P < .001$ ). Although the proportions of nests with successes above 90 percent were higher for *in situ* nests, the medians of the distributions were much closer



**Table 10:** Total Number of loggerheads, greens leatherback nests relocated or left *in situ* in 2006.

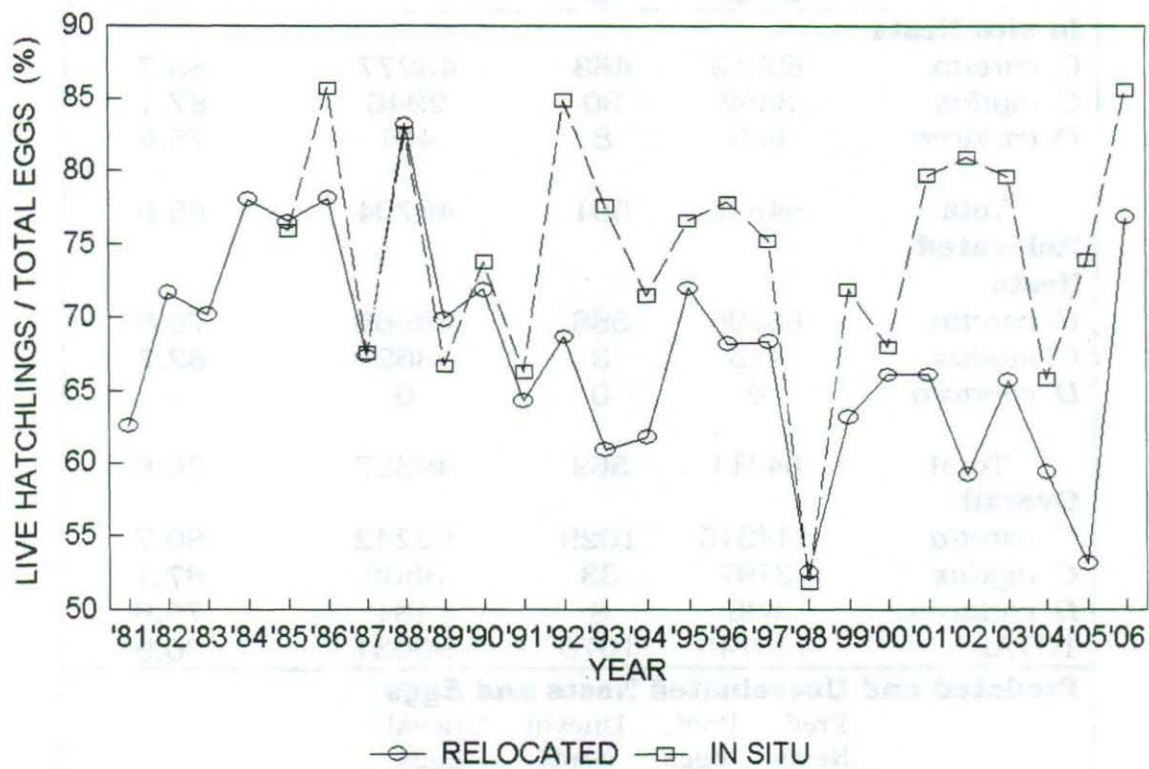
	Loggerheads	Greens	Leatherbacks	Totals
<b>RELOCATED</b>				
<u>Open Beach</u>				
Hillsboro Beach				
BH	1	0	0	1
BH900s	30	0	0	30
BH1000s	35	3	0	38
BH1100s	52	1	0	53
BH1200s	11	0	0	11
Pompano Beach				
BP	0	0	0	0
BP1	53	0	0	53
BP2	49	0	0	49
BP3P	95	0	0	95
Fort Lauderdale				
Strip	10	0	0	10
BFT	102	1	0	103
BP3F	139	0	0	139
Hollywood Beach				
BJL	15	0	0	15
TOTALS	652	5	0	657
<b>IN SITU</b>				
Hillsboro Beach	530	80	10	620
Pompano Beach	235	17	3	255
Ft. Lauderdale				
Strip	46	0	0	46
BFT	147	30	2	179
Hollywood Beach	22	0	0	22
TOTALS	980	127	15	1122
GRAND TOTALS	1632	132	15	1779

**Table 11:** Total egg counts, released hatchlings and overall release successes for *in situ* and relocated nests of loggerheads, greens and leatherbacks in 2006, with the numbers of nests and eggs predated, lost and unevaluated.

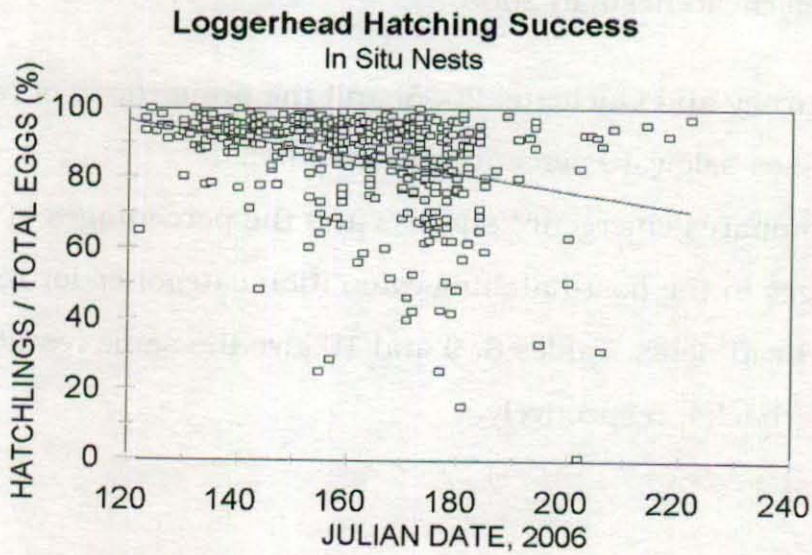
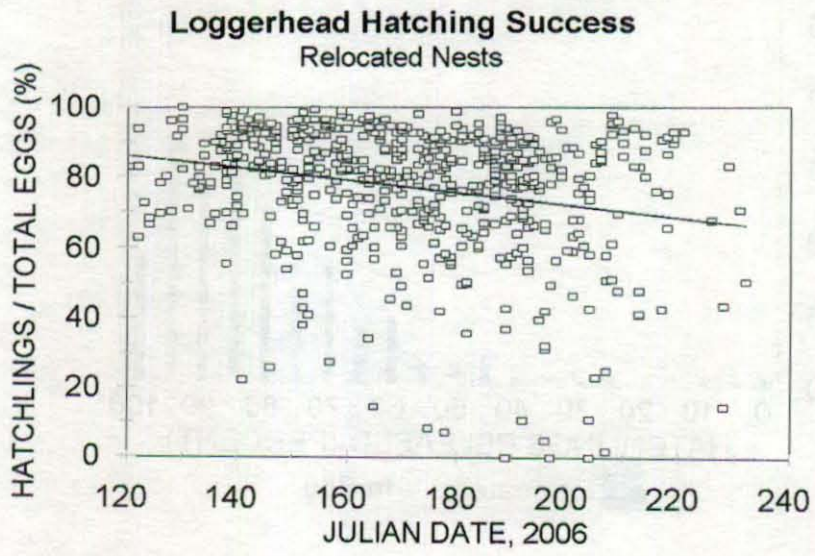
SPECIES	NUMBER OF EGGS	EVAL. NESTS	HATCHLINGS RELEASED	RELEASE SUCCESS (%)
<b>In situ Nests</b>				
<i>C. caretta</i>	50519	463	43277	85.7
<i>C. mydas</i>	3382	30	2946	87.1
<i>D. coriacea</i>	636	8	481	75.6
Total	54537	501	46704	85.6
<b>Relocated Nests</b>				
<i>C. caretta</i>	63796	566	48965	76.8
<i>C. mydas</i>	415	3	362	82.7
<i>D. coriacea</i>	0	0	0	-
Total	64211	569	49327	76.8
<b>Overall</b>				
<i>C. caretta</i>	114315	1029	92242	80.7
<i>C. mydas</i>	3797	33	3308	87.1
<i>D. coriacea</i>	636	8	481	75.6
TOTAL	118748	1070	96031	80.9
<b>Predated and Unevaluated Nests and Eggs</b>				
	Pred. Nests	Pred. Eggs	Uneval Nests	Uneval Eggs
<b>In Situ</b>				
<i>C. caretta</i>	94	-	423	-
<i>C. mydas</i>	8	-	89	-
<i>D. coriacea</i>	1	-	6	-
<b>Relocated</b>				
<i>C. caretta</i>	68	7911	18	2024
<i>C. mydas</i>	2	270	0	0
<i>D. coriacea</i>	0	0	0	0
<i>E. imbricata</i>	0	0	0	0

# HATCHING RELEASE SUCCESS

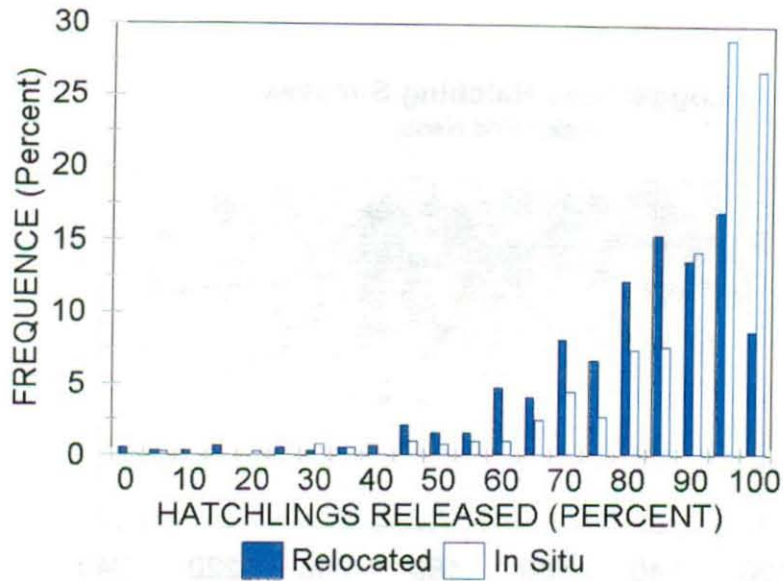
## HISTORICAL PATTERN



**Figure 10:** The historical patterns of yearly hatching release success for all evaluated *in situ* and relocated sea turtle nests, since 1981.



**Figure 11:** Comparison of seasonal hatching release success for relocated and *in situ* loggerhead nests during 2005.



**Figure 12:** Hatching release success frequencies for *in situ* and relocated loggerhead nests in 2005.

than last year (Burney and Ouellette, 2005) and the proportions of relocated nests with successes below 40 percent were minimal.

Table 12 compares emergence success and the percentages of hatchlings and eggs in the post-hatching evaluation categories for relocated and *in situ* loggerhead nests. Tables 8, 9 and 10 give the same results for greens and leatherbacks, respectively.

**Table 12:** Accounting of the status of all hatched and unhatched eggs in evaluated *in situ* and relocated loggerhead nests during 2006.

Location	Total Eggs	Emerged Hatchlings (%)	LIN (%)	DIN (%)	PIP Live (%)	PIP Dead (%)	VD (%)	NVD (%)
<b><i>In situ</i> Nests</b>								
Hillsboro Beach	19296	79.7	4.7	1.9	0.5	3.7	3.2	6.4
Pompano Beach	16593	83.9	3.0	1.9	0.3	3.6	3.2	4.1
Ft. Lauderdale								
Strip	4599	71.9	9.4	2.0	1.0	5.5	4.4	5.8
BFT	8446	81.6	3.4	1.5	0.7	3.8	3.4	5.6
Hollywood Beach								
BHo	1585	83.8	5.4	0.3	0.1	2.6	1.9	5.8
<b>Overall <i>In situ</i></b>	<b>50519</b>	<b>80.8</b>	<b>4.4</b>	<b>1.8</b>	<b>0.5</b>	<b>3.8</b>	<b>3.3</b>	<b>5.4</b>
<b>Relocated Nests</b>								
<u>Hillsboro Beach</u>								
BH	134	58.2	11.2	2.2	2.2	11.2	13.4	1.5
BH900s	2326	65.4	7.7	2.7	0.9	6.7	4.3	12.3
BH1000s	2072	67.7	5.1	2.4	1.0	6.8	6.0	11.1
BH1100s	3140	72.5	5.4	1.2	1.1	4.6	2.6	12.5
BH1200s	1101	74.4	3.2	1.6	0.1	1.8	8.1	10.7
Overall Hillsboro	8773	69.5	5.8	1.9	0.9	5.4	4.7	11.7
<u>Pompano Beach</u>								
BP1	5433	62.9	8.5	1.5	2.5	8.7	4.1	11.7
BP2	5318	60.1	10.3	1.8	2.4	11.5	6.3	7.5
BP3P	9837	63.6	12.8	1.0	3.2	9.1	3.4	6.8
Overall Pompano	20588	62.5	11.0	1.3	2.8	9.6	4.3	8.4
<u>Fort Lauderdale</u>								
BFT	1133	70.5	14.0	0.7	1.6	5.2	2.1	5.8
BFTN	11103	66.4	11.2	1.7	1.7	9.1	2.8	7.0
BP3F	15661	60.6	11.2	1.2	2.7	8.9	3.1	12.2
Overall Ft. Laud.	27897	63.3	11.3	1.3	2.3	8.8	2.9	10.0
<u>Hollywood Beach</u>								
BHo	6310	68.5	7.7	3.2	1.9	8.0	5.8	4.9
BJL	228	54.4	14.9	1.3	1.3	11.8	7.5	8.8
Overall Hollywood	6538	68.0	7.9	3.2	1.8	8.2	5.8	5.0
<b>Overall Relocated</b>	<b>63796</b>	<b>64.4</b>	<b>10.1</b>	<b>1.6</b>	<b>2.2</b>	<b>8.6</b>	<b>3.9</b>	<b>9.1</b>

**Table 13:** Accounting of the status of all hatched and unhatched eggs in investigated *in situ* and relocated green sea turtle nests during 2006.

Location	Total Eggs	Emerged Hatchlings (%)	LIN (%)	DIN (%)	PIP Live (%)	PIP Dead (%)	VD (%)	NVD (%)
<b><i>In situ</i> Nests</b>								
Hillsboro Beach	1475	75.5	6.1	2.6	0.6	3.2	3.6	8.4
Pompano Beach	700	87.9	2.3	0.3	0	1.0	4.7	3.6
Ft. Lauderdale	1207	86.6	4.5	1.2	0.2	0.5	1.7	5.3
<i>Overall In situ</i>	3382	82.0	4.7	1.6	0.4	1.8	3.1	6.4
<b><i>Relocated</i> Nests</b>								
<u>Hillsboro Beach</u>								
BH1000s	293	76.8	5.8	0.7	0.7	1.7	3.4	10.9
<u>Fort Lauderdale</u>								
BFTN	122	91.0	4.9	0	0.8	1.6	0.8	0.8
<i>Overall Relocated</i>	415	81.0	5.5	0.5	0.7	1.7	2.7	8.0

**Table 14:** Accounting of the status of all hatched and unhatched eggs in investigated *in situ* and relocated leatherback nests during 2006.

Location	Total Eggs	Emerged Hatchlings (%)	LIN (%)	DIN (%)	PIP Live (%)	PIP Dead (%)	VD (%)	NVD (%)
<b><i>In Situ</i> Nests</b>								
Hillsboro Beach	357	61.1	3.9	1.1	0.3	1.4	5.0	27.1
Pompano Beach	144	88.2	3.5	0	0	0	2.8	5.6
Ft. Lauderdale	135	54.8	31.1	2.2	0	3.7	2.2	5.9
<i>Overall In situ</i>	636	65.9	9.6	1.1	0.2	1.6	3.9	17.8
<b><i>Relocated</i> Nests</b>	none							

## **DISCUSSION**

### Yearly Nesting Trends

Loggerhead nesting in Broward County has been low and essentially constant for the last three years, with a general decline since 2000 (Fig. 3). This downtrend closely follows the overall decline on Florida Index Beaches (Fish and Wildlife Research Institute, 2006a, b). The duration and consistency of this trend strongly suggests that there has been a reduction in the number of nesting females rather than by decreases in the percentage of females nesting in a given year or to a decrease in the average number of clutches deposited per female. The nesting decline may be due to increased in-water mortality, which could occur locally, or in other ocean regions. Loggerhead strandings in Florida have increased significantly since 1989, with the highest incidences in 2003 and 2005 (Fish and Wildlife Research Institute, 2006a).

Green turtle nesting was lower than last year but still relatively high. The pattern of fluctuations in the Broward County nesting is identical to those in the Florida Index Beach totals since 1989 (Fish and Wildlife Research Institute, 2006b). If 2006 was a low-nesting year for greens, it was the highest such year recorded and the overall trend line (Fig. 3) is positive, despite the fluctuations. Green turtle nesting does not appear to have been impacted by the adverse factors affecting loggerheads.

Leatherbacks nested in northern and central Broward County, but not in Lloyd Park and Hollywood in 2006. This year's nest count was slightly below the 10-year average of 18.1, but it was the 7<sup>th</sup> highest number recorded since 1981 (Fig 3). Leatherbacks have not failed to nest in Broward County since 1982.



### Seasonal Nesting Patterns

The seasonal loggerhead nesting pattern (Fig. 4) was very similar to last year (Burney and Ouellette, 2005). The curve was quite symmetrical with the midpoint of the season in mid to late June. Day-to-day nest count fluctuations this season seemed smaller than in 2005. The largest daily nest count (40) was recorded on July 9.

Seasonal nesting at the individual beaches (Fig. 5) was similar to previous years, except for an unusual decline in the latter half of the season in Pompano Beach. Loggerhead nesting densities throughout Broward County again were highest in the north and declined significantly toward the south (Table 6). Compared to 2005, nesting densities increased by 25.4 percent in Hillsboro Beach and decreased by 23.4 percent in Fort Lauderdale. Nesting on Hollywood beach was essentially unchanged (down 4 percent) from 2005. This beach was renourished last year and all the 2006 nests were deposited on the new sand.

The seasonal pattern of green turtle nesting in 2006 (Fig. 6) was similar to other high nesting years (Burney and Ouellette, 2004, 2005). Nesting commenced on 1 June and ended on 28 September. A maximum of 8 nests were deposited throughout the county on 21 July. Leatherbacks again nested earlier in the season, from 10 March through 26 May. Eight nests were deposited in a 6-day period between 30 April and 5 May, indicating that at least 8 different females nested in 2006, because the minimum internesting interval for this species is 9 days (Eckert et. al, 1989; Miller, 1997). A similar analysis indicated that a minimum of 6 different leatherbacks nested in 2005 (Burney and Ouellette, 2005).

As in previous years, green turtles nested most densely in Hillsboro Beach (Table 7; Fig.7), possibly due to the reduced beachfront lighting and nocturnal human activity. Nesting in Pompano Beach, Fort Lauderdale and

Lloyd Park was not significantly different but it was significantly lower than Hillsboro. No green turtles nested in Hollywood, but there was one false crawl. Nesting in Lloyd Park in 2006 was one-third the 2005 level. Both Lloyd Park and Hollywood beaches were renourished in 2005. Leatherbacks nested most densely in northern Broward County and not at all in Lloyd Park and Hollywood, but there was one false crawl in Hollywood (Tables 8 & 9).

#### Countywide Nest Distribution

The distribution of loggerhead nests in the 128 survey zones (Fig. 8) continues to highlight 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 apparent preference for Hillsboro Beach, which has darker beaches with less public access (Fig. 8).

#### Nesting Success

Countywide loggerhead nesting success declined significantly from north to south (Fig. 9) but there was considerable statistical overlap among the individual beaches (Table 9). Only Hillsboro Beach was significantly higher than Lloyd Park and Hollywood. Figure 14 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. Loggerhead nesting success increased in 2006 on all beaches except Hollywood, however the increases in Hillsboro Beach and Fort Lauderdale, and the decrease in Hollywood were not statistically significant (proportions test;  $P > .05$ ). Pompano Beach and Fort Lauderdale have experienced only minor nesting success fluctuations in the

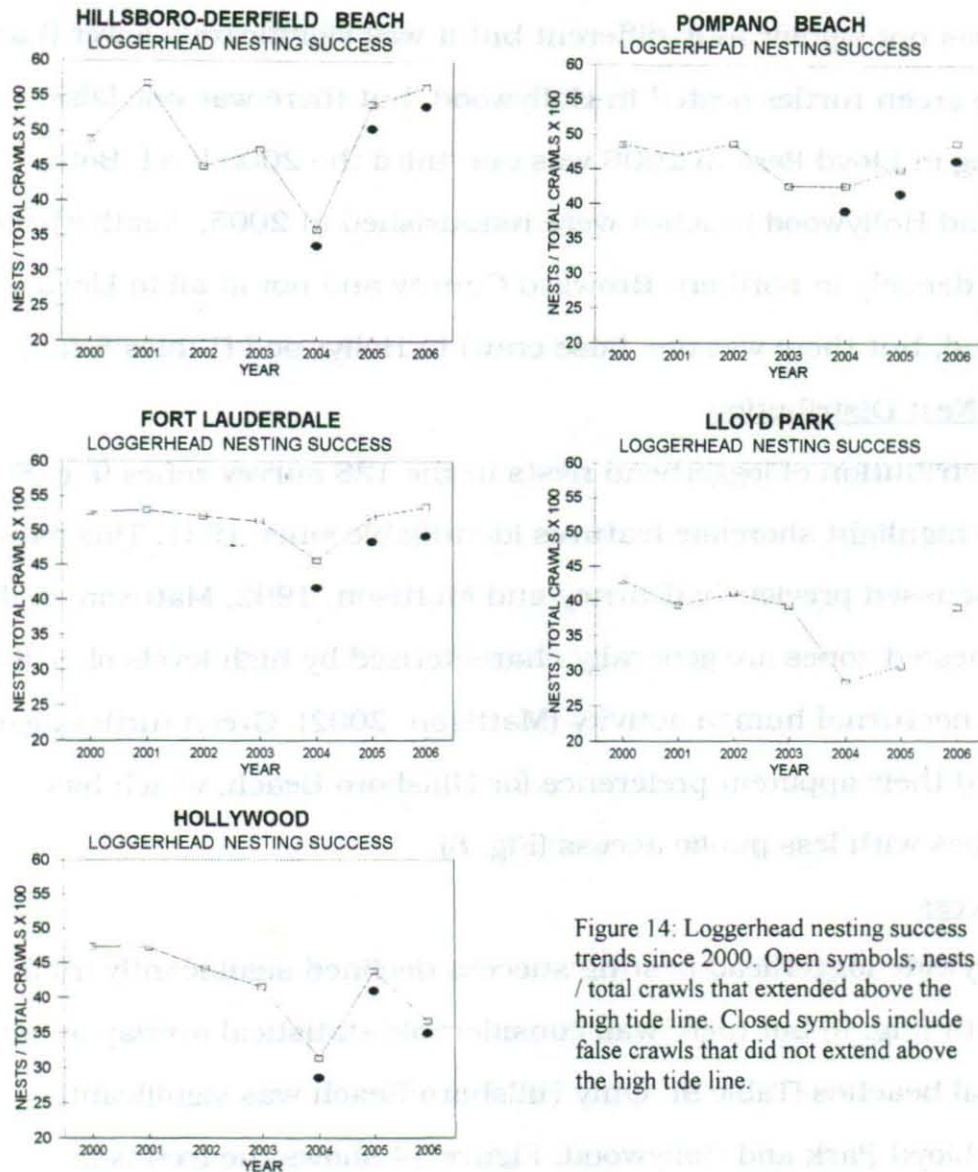


Figure 14: Loggerhead nesting success trends since 2000. Open symbols; nests / total crawls that extended above the high tide line. Closed symbols include false crawls that did not extend above the high tide line.

last six years. Nesting conditions remained most favorable in Hillsboro Beach after a significant sand accretion and the lack of significant storms this year. Nesting success increased significantly ( $p=.008$ ) in Lloyd Park where nesting declined 16 percent but false crawls dropped by 48 percent from last year. Figure 9 shows that loggerhead and green turtle nesting successes were lowest in the north end of Lloyd Park (zone 1) and increased toward the south (zone 4). This is the usual pattern, which has been attributed to greater beach erosion in zone 1, in spite of the 2005 renourishment. Overall,

the renourishment and the removal of Australian Pines have not reduced nesting success in Lloyd Park, although it is lower than in northern Broward County. Hollywood was also renourished in 2005 and nesting success was lower in 2006, but the drop was not statistically significant ( $P = .075$ ) due to the relatively lower sea turtle activity on this beach. Loggerhead nesting in Hollywood declined 4 percent from last year, but that was exactly proportional to the countywide decline since 2005. It appears that the nourishment project did not significantly impact loggerhead nesting or nesting success during the first season after construction.

#### Hatchling Release Success

Several factors might have contributed to the dramatic increase in the percentage of live hatchlings released from relocated sea turtle nests this year (Table 11, Fig. 10). There could have been an improvement in relocation technique, relocated nests could have experienced improved incubation conditions due to their more widely spaced distribution, or there could have been better overall incubation conditions this year, due to normal late-season temperatures and the lack of significant storms. No restraining or open beach hatcheries with nests placed in grid patterns were used this year. Relocated nests were randomly distributed to designated beach sections (recipient zones). Hatchery nests may experience adverse incubation conditions due to the close proximity of other nests. The abandonment of mass hatchery sites may well have contributed to the improved success of relocated nests but hatcheries are not inherently detrimental. For example, 58 loggerhead nests placed in the Pompano Beach restraining hatchery in 2005 produced 85.9 percent live hatchlings. As discussed previously (Burney and Ouellette, 2005) these were early-season nests, which are generally more successful than later-season nests (Fig. 11) but it indicates that properly operated hatcheries are not inherently destructive. It is clear from the 12.7

percentage point increase from last season in the success of *in situ* loggerhead nests that overall incubation conditions were much more favorable this year. There were 14 days in July and August 2005 with maximum air temperatures 4 or 5°F (2.2 or 2.7°C) above normal, and there were significant inverse correlations between hatchling release success and maximum daily temperature. Three hurricanes in 2005 also contributed to the very poor late season hatchling production rates in 2005 (Burney and Ouellette, 2005; Ouellette and Burney, 2006). The much more benign weather in 2006 certainly contributed to the much better release successes of both *in situ* and relocated nests. It should be noted that the improvement in live hatchling production in relocated nests from 2005 to 2006 was nearly twice that for *in situ* nests, so the latter improvement was due to a combination of the new procedures and better weather.

Although release success of relocated nests was still significantly lower than for *in situ* nests, the slopes of the seasonal trend lines (Fig. 11) were not significantly different, suggesting that relocation did not drastically impact hatchling production rates. As pointed out previously (Burney and Ouellette, 2005; 2004), some of the difference in the *in situ* and relocated values can be attributed to the larger proportion of late season relocated nests that were evaluated (see Results). Figure 12 shows that hatchling release successes less than 45 percent were very rare in relocated and *in situ* nests. The median for *in situ* nests (91.3) was still significantly higher ( $P \ll .001$ ) than for relocated nests (82.1), but both were much improved, compared to 2005 medians of 78.2 and 53.5 for *in situ* and relocated nests, respectively. The much better distributions this year can again be attributed to a combination of the new procedures and more favorable overall incubation conditions. The increased production of live hatchlings was partially offset by a large increase

in the number of hatchling disorientation events (see Management Issues below).

#### Post Emergence Nest Analysis

Comparison of the post emergence nest evaluation categories between locations for *in situ* loggerhead nests (Table 12) shows generally similar percentages across all categories, except for slightly lower emergence and higher LIN for nests left on the Fort Lauderdale strip. It is possible that these nests (some of which were caged) were evaluated sooner after hatching than other *in situ* nests, which might explain the greater proportion of LIN hatchlings.

For relocated loggerheads, Table 12 shows that the percentages of emerged hatchlings were slightly higher in Hillsboro Beach and Hollywood than in Pompano Beach and Fort Lauderdale. Recipient sites on the latter two beaches received most of the nests relocated from the adjacent donor areas and nests were placed fairly close together in some places due to restricted relocation space, although not as closely as in a hatchery. Emergence successes were nearly equal in Fort Lauderdale and Pompano Beach and although they were significantly lower than in Hillsboro Beach or Hollywood, the difference is more than offset by the higher LIN proportions in Pompano Beach and Fort Lauderdale.

Comparison of overall post hatching nest evaluation results for *in situ* and relocated nests (Table 12) shows lower emergence from relocated nests, which was partially offset by higher LIN and Live PIP rates, possibly due to earlier evaluation of relocated nests. Relocated nests also had significantly higher proportions of dead PIP and NVD than *in situ* nests. Increased percentages of dead pipped hatchlings may have been a consequence of relocation. This may have also contributed to the increase in eggs without

visible development but the percentage of unfertilized eggs cannot be determined.

For *in situ* greens (Table 13), the emergence rate was slightly lower and the NVD percentage was slightly higher in Hillsboro Beach than in the other locations. Although these differences are significant ( $P < .05$ ) the percentages are based on low numbers of evaluated eggs. Likewise, the very small number of evaluated relocated nests makes comparisons meaningless. Post hatching evaluation results for leatherbacks (Table 14) are presented for completeness, but between-location comparisons are not useful due to the low numbers of eggs.

### Management Issues

#### *Hatchling Disorientation*

Sea turtle management in Broward County has always been complicated by intense coastal lighting that causes hatchling disorientation and death. In the early 1980's, the Broward County Sea Turtle Conservation Project adopted nest relocation as a preventative measure and the mass hatchling kills of the past were greatly reduced, but relocation is a highly invasive procedure and hatching success is always somewhat lower than for undisturbed nests. According to the new procedures instituted this year by the FFWCC, many more nests were left *in situ*. While this increased the percentage of emerged hatchlings, many more of them were disoriented and did not reach the water. There were a total of 385 FWC Marine Turtle Hatchling Disorientation Incident Report Forms filed in 2006 compared to 126 in 2005, representing a three-fold increase. However, it is important to note that in 2005 Disorientation Forms were not filled out for individual nests located in the open beach hatcheries, but rather for the hatchery as a whole, thus decreasing the true amount of Disorientation Forms needed. In 2006, Disorientation Forms were filled out for each nest individually. Totals

from the Incident Report Forms indicated that between 16,532 and 19,255 hatchlings disoriented in 2006 compared to an estimated range of 7334 to 9400 in 2005. Estimates of disoriented hatchling deaths are summarized in Table 15. The minimum estimate of hatchling deaths were estimated by subtracting the minimum estimate of the number of disoriented hatchlings reaching water from the minimum number of disoriented hatchlings. The maximum estimates were determined in the same manner. Estimated hatchling deaths were more than double the estimates from 2005. The small

**Table 15:** Estimated hatchling disorientation deaths in 2006 compared to 2005. Numbers totaled from Disorientation Incident Report Forms

	<b>2005</b>	<b>2006</b>
<b>Disoriented Hatchlings</b>		
Minimum	7,334	16,532
Maximum	9,400	19,255
<b>Reached Water</b>		
Minimum	2,136	3,512
Maximum	3,018	4,808
<b>Hatchlings Missing</b>		
Minimum	5,198	<b>13,020</b>
Maximum	6,382	<b>14,447</b>
<b>2006 Additional Hatchlings MIA</b>		
Minimum		<b>7,822</b>
Maximum		<b>8,065</b>

numbers of disoriented hatchlings that were found alive and released are not included in the table because many of these were in poor condition when found.

Many disorientations occurred at some of the recipient sites where lighting was still unfavorable, despite the lighting ordinances. Of the 234 nests moved to recipient site BP3 in the municipality of Lauderdale-by-the-



Sea, 123 were disoriented (53 percent). An additional 37 nests left *in situ* in this area experienced disorientations. The numbers of disorientation events are probably underestimated because hatchling tracks are easily removed by rain and wind so some events are missed. The numbers of disoriented hatchlings are also estimates because of the difficulty of counting very faint crisscrossing hatchling tracks. It is difficult to tell if the values above are over or underestimates.

#### *Live Hatchling Production*

This year's new procedures contributed to the increase in the percentages of live hatchlings but also to an increase in hatchling loss due to disorientation. The following is an attempt to evaluate the new procedures by comparing the projected number of live hatchlings produced this year with what might have been produced if the old procedures had been employed. For the latter estimate, it was assumed that the proportions of relocated and *in situ* nests were the same as in 2005. In 2005, 35.8 percent of all nests were left *in situ* and 64.2 percent were relocated, so it was assumed that these would have been the percentages this year, if the old methods had been used. To estimate what the release success (live hatchlings produced / total eggs) might have been for relocated nests if the old methods had been used this year, we used the following assumptions. The release success of *in situ* nests (all species combined) increased from 73.9 percent in 2005 to 85.6 percent in 2006. We assume that this 11.7-point increase was caused by better overall incubation conditions due to more benign weather in 2006. The success of relocated nests increased from 53.1 to 76.8 percent from 2005 to 2006. We assume that this 23.7-point increase was due to a combination of better weather and the new procedures (wider nest spacing). If the better overall incubation conditions affected *in situ* and relocated nests equally (rather big assumption), then the new procedures might have contributed 12

percentage points to the increase in the success of relocated nests. If this is true, then the live hatchling production rate of relocated nests might have been closer to 64.8 percent this year, if the old methods had been used. This is probably an underestimate because the many other factors involved. Hatchling production estimates under the old and new procedures are shown in Table 16. For the projections, the total numbers of eggs in all *in situ* and relocated nests are estimated from the average numbers of eggs in evaluated nests. Predation is not considered in the table, but is discussed below.

<b>Table 16:</b> Comparison of projected live hatchling produced by New vs. Old procedures for 2006. See assumptions in text.	<b>Actual New Procedures</b>	<b>Projected Old Procedures</b>
<b>Total Nests</b>	1779	1779
Relocated	657	1142 (64.2%) <sup>1</sup>
<i>InSitu</i>	1122	637 (35.8%) <sup>1</sup>
<b>Average Eggs Per Nest</b>		
Relocated	112.8	112.8
<i>InSitu</i>	108.6	108.6
<b>Projected Total Eggs</b>		
Relocated	74,110	128,818
<i>InSitu</i>	121,849	69,178
<b>Release Success</b>		
Relocated	76.8%	64.8% <sup>2</sup>
<i>InSitu</i>	85.6%	85.6%
<b>Project Released Hatchlings</b>		
Relocated	56,916	83,474
<i>InSitu</i>	104,303	59,216
<b>Project Total Hatchlings</b>	161,219	142,690
<b>    "Extra" Hatchlings</b>	<b>18,529</b>	

<sup>1</sup> Percentages from 2005 ; <sup>2</sup> See text for assumptions

### Predation

We suspected more *in situ* nests might lead to greatly increased predation losses. In fact, 103 *in situ* and 70 relocated nests were predated in

2006. In 2005 there were 86 *in situ* and 115 relocated nests predated. In 2003, predators affected 211 *in situ* and 300 relocated nests. Our suspicion that predation would increase dramatically this year was not upheld.

#### *Hatchling Cost/Benefit*

It appears that the new management procedures this year contributed to an increase in the production of live hatchlings and an increase in disorientation losses. Based on the analyses above, the benefit in terms of live hatchlings ("Extra Hatchlings"; Table 16) may have slightly exceeded the hatchling loss estimates in 2006 (Table 15). Considering the hatchling disorientation counts are rough estimates and that our hatchling production projections are sensitive to small variations in assumptions, hatchling cost and benefit may have been approximately equal this year. However, hatchling disorientation losses also occurred in 2005 (Table 15). When accounting for this, it appears that the net increase in disorientation deaths may have been less than 10,000 in 2006, which compares more favorably with the estimate of "extra" live hatchlings produce this year.

Figure 10 shows that hatchling production for relocated nests this year was near it historical maximum and probably cannot be increased much more. However, hatchling disorientation losses can potentially be reduced by fine-tuning procedures and strict enforcement of lighting ordinances. While some reduction in beach illumination has been accomplished, constant vigilance on the part of sea turtle workers and local code and law enforcement officers will be necessary to reduce disorientations, because a beach can change from turtle-friendly to turtle-deadly at the flip of a switch.

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

SUBJECT	EMERGENCY LINE
LIVE STRANDINGS	10
DISORIENTATIONS	100
NEST LOCATIONS	60
POACHING	10
OTHER	>400
OVERALL	>550

**APPENDIX 2: Summary of Educational/Public Information Activities**

Flyers were distributed along the beach, primarily to people who approached workers with questions, and at the turtle talks, and at schools that were visited. Flyers were also available at all fenced hatcheries.

The 2006 Presentation Team conducted a total of 18 public education talks were conducted from July 5 to Sept. 1 at the Anne Kolb Nature Center. These PowerPoint presentations were followed by hatchling releases. A total of 984 people attended these events. Turtle talks were also given at the following locations.

- 1) Pioneer Middle School Environmental Awareness Day (March 17); 5 presentations
- 2) Oakland Park Elementary School (May 10); 6 presentations
- 3) Fort Lauderdale Junior Lifeguard Program (June 2)
- 4) Nova Middle School Summer Science Program (June 6); 3 presentations
- 5) Vacation Bible School (June 7 and 11); 4 presentations each
- 6) Lafayette Heart Park (July 25); 3 presentations
- 7) Sawgrass Nature Center (July 26)
- 8) Nova RA Orientation-with hatchling releases (August 15)
- 9) Indian Ridge Middle School (September 20); 5 presentations
- 10) Sawgrass Spring's Middle School's Critter Club (September 21)
- 11) Cooper City High School-with hatchling release (September 22)
- 12) Nova Southeastern University (October 4)
- 13) Pioneer Middle School Environmental Club (October 16)
- 14) Virginia Shuman Young Elementary School (November 20)
- 15) Blanche Ely High School (November 21); 2 presentations
- 16) American Heritage School Marine Biology Club (November 28)

Tables with specimens, informational handouts including brochures, flyers, bumper stickers, door hangers, table tents and activity books were hosted at the following events:

- 1) Hollywood Public Works Open House (May 19)
- 2) Museum Of Discovery and Science World Ocean Day (June 10)
- 3) Gumbo Limbo Sea Turtle Day-30 year Celebration (August 12)
- 4) Hollywood Clambake (Sept 29-30)

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

**DO NOT DISTURB  
SEA TURTLE  
NEST**



**VIOLATORS SUBJECT  
TO FINES AND  
IMPRISONMENT**

<b>FLORIDA LAW CHAPTER 379</b>	<b>U.S. ENDANGERED SPECIES ACT OF 1973</b>
No person may take, possess, disturb, mutilate, destroy, cause to be destroyed, sell, offer for sale, transfer, molest, or harass any marine turtle or its nest or eggs at any time.	No person may take, harass, harm, pursue, hunt, shoot, wound, kill, trap, or capture any marine turtle, turtle nest, and/or eggs, or attempt to engage in any such conduct.
Upon conviction, a person may be imprisoned for a period of up to 60 days or fined up to \$500, or both, plus an additional penalty of \$100 for each sea turtle egg destroyed or taken.	Any person who knowingly violates any provision of this act may be assessed a civil penalty up to \$25,000 or a criminal penalty up to \$100,000 and up to one year imprisonment.

**SHOULD YOU WITNESS A VIOLATION, OBSERVE AN INJURED OR STRANDED TURTLE, OR MISORIENTED HATCHLINGS, PLEASE CONTACT FWC AT**

**1-888-404-FWCC or \*FWD (MOBILE PHONE)**  
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
MARINE TURTLE PROTECTION PROGRAM



**Appendix 4:** Sea Turtle Summary Report Forms.



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING SURVEY QUESTIONNAIRE FOR 2006**  
(Fill in Blue shaded areas)

Submittal  
Deadline:  
Nov. 30,  
2006

**1. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>		Permit Number: <b>108</b>	
Organization:	<b>Broward Co. Dept. of Planning/Environmental Protection</b>		
Address:	<b>218 SW 1st. Ave.</b>		
	<b>Ft. Lauderdale, FL 33301</b>		
County: <b>Broward</b>	Email Address:	<b>lfisher@broward.org</b>	
Day Telephone (include area code):	<b>954-519-1255</b>	Night Telephone:	
Beach Name: <b>Deerfield/Hillsboro Beaches</b>			
Point of Contact:	<b>Louis Fisher</b>	Telephone & Email Address: (if different)	

**2. GENERAL SURVEY INFORMATION**

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

North Survey Boundary:	<b>Palm Beach/Broward Co Line</b>
South Survey Boundary:	<b>Hillsboro Inlet</b>

Beach Length (include KM or MI):	<b>7.0 km</b>	Is beach length estimated or measured?	<b>measured</b>
----------------------------------	---------------	--	-----------------

Was this the exact same survey area as your 2005 survey area? Yes / No	<b>Yes</b>
--	------------

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

Start Date of Survey (mm/dd):	<b>1-Mar-06</b>	End Date of Survey (mm/dd):	<b>30-Sep-06</b>
-------------------------------	-----------------	-----------------------------	------------------

Time of Day Surveyed: Start (include AM or PM)	<b>1/2 hr before sunrise</b>	Finish (include AM or PM)	<b>9:00 AM</b>
--	------------------------------	---------------------------	----------------

Number of Days Per Week Surveyed:	<b>seven (7)</b>
-----------------------------------	------------------

If you did **not** survey seven (7) days per week, describe how nests are counted on the day(s) surveys are resumed:

Was there any variation in the number of days surveyed per week or was the entire beach surveyed the same number of times every week of the nesting season? <b>SAME</b> or <b>VARIABLE</b>	<b>same</b>
--	-------------

If **VARIABLE**, please explain the specific variation and give the total number of days surveyed during the nesting season:

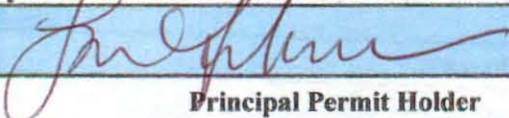
Were all non-nesting crawls (false crawls) counted during your survey? Yes or No	<b>Yes</b>
--	------------

How many people were involved in surveying the nesting beach during 2006?	<b>25</b>
---	-----------

**3. NESTING BEACH MANAGEMENT INFORMATION**

If nests were <b>RELOCATED</b> , were they relocated <b>Individually</b> (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a <b>Group</b> with other beach relocated nests?		<b>Individ.</b>
Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)		
Nest located within 20 feet of previous evenig wrack line or in an artificailly lighted area		
If a <b>HATCHERY</b> was used, please give reasons AND specific location:		
No hatchery was used		
If predator control methods other than screening/caging were employed, please describe below:		
How many <b>MARKED</b> nests were <b>negatively affected by predators</b> other than humans during the course of the season? <i>Note: this includes both partially and completely predated nests.</i>		<b>145</b>
List all non-human predators documented predated nests in 2006:		
fox, raccoon, ghost crab		
How many <b>MARKED</b> nests were <b>negatively affected by erosion, accretion, inundation, and storm-related events</b> ? <i>Note: this does not include stake removal/loss.</i>		<b>21</b>
Please give details:	18 C.c and 3 C.m. adversely impacted by Tropical Storm Ernesto	
How many <b>MARKED</b> nests were <b>taken or disturbed by humans</b> (Example: nest dug into, eggs removed, etc.)?		<b>0</b>
Please give details:		
Were hatchling disorientation events documented during 2006? Yes or No		<b>Yes</b>
If YES, have all <b>disorientation reports</b> been submitted to FWC? Yes or No		<b>Yes</b>

I certify the above information to be true and accurate to the best of my knowledge.

	<b>11/29/06</b>
<b>Principal Permit Holder</b>	<b>Date</b>

Email Forms to: [Beth.Brost@myfwc.com](mailto:Beth.Brost@myfwc.com)

**Please submit form by November 30, 2006**



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING DATA SUMMARY REPORT FOR 2006**

**Submittal  
Deadline: Nov.  
30, 2006**

**1. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>	Permit Number: <b>108</b>
Beach Name: <b>Deerfield/Hillsboro Beaches</b>	

**2. GENERAL NESTING DATA**

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)
<b>Total # of Nests</b>	<b>659</b>	<b>84</b>	<b>10</b>
Total # of Non-Nesting Emergences (False Crawls)	<b>572</b>	<b>61</b>	<b>1</b>
Date (mm/dd) of First Documented Nest	<b>4/26/06</b>	<b>6/4/06</b>	<b>3/10/06</b>
Date (mm/dd) of Last Documented Nest	<b>8/27/06</b>	<b>9/8/06</b>	<b>5/26/06</b>

**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)
<b>TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)</b>	<b>530</b>	<b>80</b>	<b>10</b>
(a) # of Nests left in Place without Additional Protection	<b>530</b>	<b>80</b>	<b>10</b>
(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)
<b>TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)</b>	<b>129</b>	<b>4</b>	<b>0</b>
(a) # of Relocated Nests without Additional Protection	<b>129</b>	<b>4</b>	
(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			

**Submit form by November 30, 2006  
Email to: Beth.Brost@myfwc.com**



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Caretta caretta* (Loggerhead)**

**Submission Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Deerfield/Hillsboro Beaches</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	530	530	183	19296	15379	902	370	93	710	1842	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection	129	129	81	8773	6100	505	171	80	477	1434	6
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

- Relocated:** Clutch was relocated from the original site of deposition.
- Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.
- Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.
- Hatchery:** A fenced or caged area where many nests are reburied.
- Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.
- Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.
- Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

- #of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.
- # of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)
- # of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Chelonia mydas* (Green Turtle)**

**Submittal Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Deerfield/Hillsboro Beaches</b>				Permit Holder: <b>Louis Fisher</b>						Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	80	80	15	1475	1114	90	38	9	47	177	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection	4	4	2	293	225	17	2	2	5	42	0
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

- Relocated:** Clutch was relocated from the original site of deposition.
- Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.
- Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.
- Hatchery:** A fenced or caged area where many nests are reburied.
- Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.
- Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.
- Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

- #of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.
- # of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)
- # of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Dermochelys coriacea* (Leatherback)**

**Submittal Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Deerfield/Hillsboro Beaches</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	10	10	4	357	218	14	4	1	5	115	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection											
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

**Relocated:** Clutch was relocated from the original site of deposition.  
**Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.  
**Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.  
**Hatchery:** A fenced or caged area where many nests are reburied.  
**Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.  
**Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.  
**Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

**# of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.  
**# of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)  
**# of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING SURVEY QUESTIONNAIRE FOR 2006**  
(Fill in Blue shaded areas)

Submittal  
Deadline:  
Nov. 30,  
2006

**I. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>		Permit Number: <b>108</b>	
Organization:	Broward Co. Dept. of Planning/Environmental Protection		
Address:	218 SW 1st. Ave.		
	Ft. Lauderdale, FL 33301		
County: <b>Broward</b>	Email Address:	<b>lfisher@broward.org</b>	
Day Telephone (include area code):	<b>954-519-1255</b>	Night Telephone:	
Beach Name: <b>Pompano/Lauderdale-by-the-Sea Beaches</b>			
Point of Contact:	<b>Louis Fisher</b>	Telephone & Email Address: (if different)	

**2. GENERAL SURVEY INFORMATION**

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

North Survey Boundary:	<b>Hillsboro Inlet</b>		
South Survey Boundary:	<b>Commercial Blvd. Pier</b>		
Beach Length (include KM or MI):	<b>7.7 km</b>	Is beach length estimated or measured?	<b>measured</b>
Was this the exact same survey area as your 2005 survey area? Yes / No			<b>Yes</b>
<b>IF NO, please explain the specific differences AND why the survey area changed:</b>			
Start Date of Survey (mm/dd):	<b>1-Mar-06</b>	End Date of Survey (mm/dd):	<b>30-Sep-06</b>
Time of Day Surveyed: Start (include AM or PM)	<b>1/2 hr before sunrise</b>	Finish (include AM or PM)	<b>9:00AM</b>
Number of Days Per Week Surveyed:	<b>seven (7)</b>		
If you did not survey seven (7) days per week, describe how nests are counted on the day(s) surveys are resumed:			
Was there any variation in the number of days surveyed per week or was the entire beach surveyed the same number of times every week of the nesting season? SAME or VARIABLE			<b>Same</b>
If VARIABLE, please explain the specific variation and give the total number of days surveyed during the nesting season:			
Were all non-nesting crawls (false crawls) counted during your survey? Yes or No			<b>Yes</b>
How many people were involved in surveying the nesting beach during 2006?			<b>25</b>

**3. NESTING BEACH MANAGEMENT INFORMATION**



If nests were <b>RELOCATED</b> , were they relocated <b>Individually</b> (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a <b>Group</b> with other beach relocated nests?		<b>Both</b>
Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)		
Nest located within 20 feet of previous evening wrack line or in an artificailly lighted area		
If a <b>HATCHERY</b> was used, please give reasons AND specific location:		
No hatchery was used		
If predator control methods other than screening/caging were employed, please describe below:		
How many <b>MARKED</b> nests were <b>negatively affected by predators</b> other than humans during the course of the season? <i>Note: this includes both partially and completely predated nests.</i>		<b>7</b>
List all non-human predators documented predated nests in 2006:		
raccoon, fox		
How many <b>MARKED</b> nests were <b>negatively affected by erosion, accretion, inundation, and storm-related events?</b> <i>Note: this does not include stake removal/loss.</i>		<b>3</b>
Please give details:	3 C.c adversely impacted by Tropical Storm Ernesto	
How many <b>MARKED</b> nests were <b>taken or disturbed by humans</b> (Example: nest dug into, eggs removed, etc.)?		<b>7</b>
Please give details:	7 C.c. nests disturbed by humans on hatching	
All events reported to FWC law enforcement.		
Were hatchling disorientation events documented during 2006? <b>Yes or No</b>		<b>Yes</b>
If <b>YES</b> , have all <b>disorientation reports</b> been submitted to FWC? <b>Yes or No</b>		<b>Yes</b>

I certify the above information to be true and accurate to the best of my knowledge.

	11/29/06
Principal Permit Holder	Date

Email Forms to: [Beth.Brost@myfwc.com](mailto:Beth.Brost@myfwc.com)

Please submit form by November 30, 2006



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING DATA SUMMARY REPORT FOR 2006**

**Submittal  
Deadline: Nov.  
30, 2006**

**1. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>	Permit Number: <b>108</b>
Beach Name: <b>Pompano/Lauderdale-by-the-Sea Beaches</b>	

**2. GENERAL NESTING DATA**

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)
<b>Total # of Nests</b>	<b>432</b>	<b>17</b>	<b>3</b>
<b>Total # of Non-Nesting Emergences (False Crawls)</b>	<b>502</b>	<b>24</b>	<b>3</b>
<b>Date (mm/dd) of First Documented Nest</b>	<b>4/23/06</b>	<b>6/1/06</b>	<b>4/4/06</b>
<b>Date (mm/dd) of Last Documented Nest</b>	<b>8/18/06</b>	<b>8/25/06</b>	<b>5/2/06</b>

**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.

<b>Record the number of nests by category and species.</b> 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)
<b>TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)</b>	<b>235</b>	<b>17</b>	<b>3</b>
(a) # of Nests left in Place without Additional Protection	<b>235</b>	<b>17</b>	<b>3</b>
(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).

<b>Record the number of nests by category and species.</b> 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)
<b>TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)</b>	<b>197</b>	<b>0</b>	<b>0</b>
(a) # of Relocated Nests without Additional Protection	<b>197</b>	<b>0</b>	<b>0</b>
(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			

**Submit form by November 30, 2006  
Email to: [Beth.Brost@myfwc.com](mailto:Beth.Brost@myfwc.com)**



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Caretta caretta* (Loggerhead)**

**Submission Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Pompano/Lauderdale-by-the-Sea Beaches</b>		Permit Holder: <b>Louis Fisher</b>								Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	235	235	147	16593	13914	500	314	55	599	1211	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection	197	197	184	20588	12871	2272	274	583	1983	2583	22
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

**Relocated:** Clutch was relocated from the original site of deposition.  
**Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.  
**Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.  
**Hatchery:** A fenced or caged area where many nests are reburied.  
**Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.  
**Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.  
**Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

**#of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.  
**# of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)  
**# of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Chelonia mydas* (Green Turtle)**

**Submittal Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name:		Pompano/Lauderdale-by-the-Sea Beaches			Permit Holder:		Louis Fisher			Permit #: 108	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	17	17	6	700	615	16	2	0	7	60	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection											
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

- Relocated:** Clutch was relocated from the original site of deposition.
- Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.
- Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.
- Hatchery:** A fenced or caged area where many nests are reburied.
- Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.
- Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.
- Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

- #of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.
- # of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)
- # of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Dermochelys coriacea* (Leatherback)**

**Submission Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Pompano/Lauderdale-by-the-Sea Beaches</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	3	3	2	144	127	5	0	0	0	12	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection											
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

**Relocated:** Clutch was relocated from the original site of deposition.

**Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.

**Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.

**Hatchery:** A fenced or caged area where many nests are reburied.

**Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.

**Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.

**Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

**#of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.

**# of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)

**# of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING SURVEY QUESTIONNAIRE FOR 2006  
(Fill in Blue shaded areas)**

Submittal  
Deadline:  
Nov. 30,  
2006

**1. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>		Permit Number: <b>108</b>	
Organization:	<b>Broward Co. Dept. of Planning/Environmental Protection</b>		
Address:	<b>218 SW 1st. Ave.</b>		
	<b>Ft. Lauderdale, FL 33301</b>		
County: <b>Broward</b>	Email Address:	<b>lfisher@broward.org</b>	
Day Telephone (include area code):	<b>954-519-1255</b>	Night Telephone:	
Beach Name: <b>Hollywood/Hallandale Beaches</b>			
Point of Contact:	<b>Louis Fisher</b>	Telephone & Email Address: (if different)	

**2. GENERAL SURVEY INFORMATION**

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

North Survey Boundary:	<b>3.9 km S of Port Everglades Inlet (S Bdry of JU Lloyd SP)</b>		
South Survey Boundary:	<b>Broward/Miami-Dade Co Line</b>		
Beach Length (include KM or MI):	<b>9.4 km</b>	Is beach length estimated or measured?	<b>measured</b>
Was this the <b>exact</b> same survey area as your 2005 survey area? <b>Yes / No</b>			<b>Yes</b>

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

Start Date of Survey (mm/dd):	<b>1-Mar-06</b>	End Date of Survey (mm/dd):	<b>30-Sep-06</b>
Time of Day Surveyed: Start (include AM or PM)	<b>1/2 hr before sunrise</b>	Finish (include AM or PM)	<b>9:00 AM</b>
Number of Days Per Week Surveyed:	<b>seven (7)</b>		

If you did **not** survey seven (7) days per week, describe how nests are counted on the day(s) surveys are resumed:

Was there any variation in the number of days surveyed per week or was the entire beach surveyed the same number of times every week of the nesting season? <b>SAME</b> or <b>VARIABLE</b>	<b>Same</b>
--	-------------

If **VARIABLE**, please explain the specific variation and give the total number of days surveyed during the nesting season:

Were all non-nesting crawls (false crawls) counted during your survey? <b>Yes</b> or <b>No</b>	<b>Yes</b>
--	------------


How many people were involved in surveying the nesting beach during 2006?	<b>25</b>
---	-----------

**3. NESTING BEACH MANAGEMENT INFORMATION**

If nests were <b>RELOCATED</b> , were they relocated <b>Individually</b> (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a <b>Group</b> with other beach relocated nests?	<b>Both</b>
---	-------------

Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)	
Nest located within 20 feet of previous evenig wrack line or in an artificailly lighted area	
If a HATCHERY was used, please give reasons AND specific location:	
No hatchery was used	
If predator control methods other than screening/caging were employed, please describe below:	
How many MARKED nests were <b>negatively affected by predators</b> other than humans during the course of the season? <i>Note: this includes both partially and completely predated nests.</i>	
	15
List all non-human predators documented predating nests in 2006:	
How many MARKED nests were <b>negatively affected by erosion, accretion, inundation, and storm-related events?</b> <i>Note: this does not include stake removal/loss.</i>	
	3
Please give details:	3 C.c adversely impacted by Tropical Storm Ernesto
How many MARKED nests were <b>taken or disturbed by humans</b> (Example: nest dug into, eggs removed, etc.)?	
	0
Please give details:	
Were hatchling disorientation events documented during 2006? Yes or No	Yes
If YES, have all <b>disorientation reports</b> been submitted to FWC? Yes or No	Yes

I certify the above information to be true and accurate to the best of my knowledge.

	11/29/06
Principal Permit Holder	Date

Email Forms to: [Beth.Brost@myfwc.com](mailto:Beth.Brost@myfwc.com)

Please submit form by November 30, 2006



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING DATA SUMMARY REPORT FOR 2006**

**Submittal  
Deadline: Nov.  
30, 2006**

**1. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>	Permit Number: <b>108</b>
Beach Name: <b>Hollywood/Hallandale Beaches</b>	

**2. GENERAL NESTING DATA**

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)
<b>Total # of Nests</b>	<b>97</b>	<b>0</b>	<b>0</b>
<b>Total # of Non-Nesting Emergences (False Crawls)</b>	<b>182</b>	<b>1</b>	<b>1</b>
<b>Date (mm/dd) of First Documented Nest</b>	<b>4/19/06</b>	<b>n/a</b>	<b>n/a</b>
<b>Date (mm/dd) of Last Documented Nest</b>	<b>8/9/06</b>	<b>n/a</b>	<b>n/a</b>

**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.

<b>Record the number of nests by category and species.</b> 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)
<b>TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)</b>	<b>22</b>	<b>0</b>	<b>0</b>
(a) # of Nests left in Place without Additional Protection	<b>22</b>	<b>0</b>	<b>0</b>
(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).

<b>Record the number of nests by category and species.</b> 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)
<b>TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)</b>	<b>75</b>	<b>0</b>	<b>0</b>
(a) # of Relocated Nests without Additional Protection	<b>75</b>	<b>0</b>	<b>0</b>
(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			

**Submit form by November 30, 2006  
Email to: [Beth.Brost@myfwc.com](mailto:Beth.Brost@myfwc.com)**





**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Caretta caretta* (Loggerhead)**

**Submission Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Hollywood/Hallandale Beaches</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	22	22	14	1585	1328	86	5	2	42	122	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection	75	75	59	6538	4448	519	206	120	533	707	5
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

- Relocated:** Clutch was relocated from the original site of deposition.
- Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.
- Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.
- Hatchery:** A fenced or caged area where many nests are reburied.
- Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.
- Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.
- Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

- # of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.
- # of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)
- # of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs





**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
 Species: *Chelonia mydas* (Green Turtle)

**Submittal Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Hollywood/Hallandale Beaches</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection											
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection											
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

- Relocated:** Clutch was relocated from the original site of deposition.
- Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.
- Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.
- Hatchery:** A fenced or caged area where many nests are reburied.
- Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.
- Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.
- Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

- #of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.
- # of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)
- # of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Dermochelys coriacea* (Leatherback)**

**Submittal Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Hollywood/Hallandale Beaches</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection											
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection											
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

**Relocated:** Clutch was relocated from the original site of deposition.  
**Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.  
**Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.  
**Hatchery:** A fenced or caged area where many nests are reburied.  
**Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.  
**Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.  
**Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

**# of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.  
**# of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)  
**# of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING SURVEY QUESTIONNAIRE FOR 2006**  
(Fill in Blue shaded areas)

Submittal  
Deadline:  
Nov. 30,  
2006

**1. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>		Permit Number: <b>108</b>	
Organization:	<b>Broward Co. Dept. of Planning/Environmental Protection</b>		
Address:	<b>218 SW 1st. Ave.</b>		
	<b>Ft. Lauderdale, FL 33301</b>		
County: <b>Broward</b>	Email Address:	<b>lfisher@broward.org</b>	
Day Telephone (include area code):	<b>954-519-1255</b>	Night Telephone:	
Beach Name: <b>Ft. Lauderdale Beach</b>			
Point of Contact:	<b>Louis Fisher</b>	Telephone & Email Address: (if different)	

**2. GENERAL SURVEY INFORMATION**

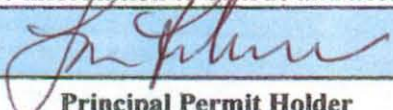
**Survey Boundary Information:** Please describe survey boundaries geographically. If boundaries have changed, please fill in the blue shaded area with new boundaries. Be specific and use known landmarks that can be found on a map (or include a marked map).

North Survey Boundary:	<b>Commercial Blvd. Pier</b>		
South Survey Boundary:	<b>Port Everglades Inlet</b>		
Beach Length (include KM or MI):	<b>10.6 km</b>	Is beach length estimated or measured?	<b>measured</b>
Was this the exact same survey area as your 2005 survey area? Yes / No			<b>Yes</b>
<b>IF NO, please explain the specific differences AND why the survey area changed:</b>			
Start Date of Survey (mm/dd):	<b>1-Mar-06</b>	End Date of Survey (mm/dd):	<b>30-Sep-06</b>
Time of Day Surveyed: Start (include AM or PM)	<b>1/2 hr before sunrise</b>	Finish (include AM or PM)	<b>9:00 AM</b>
Number of Days Per Week Surveyed:	<b>seven (7)</b>		
If you did not survey seven (7) days per week, describe how nests are counted on the day(s) surveys are resumed:			
Was there any variation in the number of days surveyed per week or was the entire beach surveyed the same number of times every week of the nesting season? SAME or VARIABLE			<b>Same</b>
If VARIABLE, please explain the specific variation and give the total number of days surveyed during the nesting season:			
Were all non-nesting crawls (false crawls) counted during your survey? Yes or No			<b>Yes</b>
How many people were involved in surveying the nesting beach during 2006?			<b>25</b>

**3. NESTING BEACH MANAGEMENT INFORMATION**

If nests were <b>RELOCATED</b> , were they relocated <b>Individually</b> (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a <b>Group</b> with other beach relocated nests?		<b>Both</b>
Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)		
Nest located within 20 feet of previous evening wrack line or in an artificailly lighted area		
If a <b>HATCHERY</b> was used, please give reasons AND specific location:		
No hatchery was used		
If predator control methods other than screening/caging were employed, please describe below:		
How many <b>MARKED</b> nests were <b>negatively affected by predators</b> other than humans during the course of the season? <i>Note: this includes both partially and completely predated nests.</i>		<b>6</b>
List all non-human predators documented predated nests in 2006:		
raccoon, fox, birds		
How many <b>MARKED</b> nests were <b>negatively affected by erosion, accretion, inundation, and storm-related events</b> ? <i>Note: this does not include stake removal/loss.</i>		<b>14</b>
<b>Please give details:</b>	14 C.c adversely impacted by Tropical Storm Ernesto	
How many <b>MARKED</b> nests were <b>taken or disturbed by humans</b> (Example: nest dug into, eggs removed, etc.)?		<b>2</b>
<b>Please give details:</b>	2 C.c. nests disturbed by humans on hatching	
All events reported to FWC law enforcement.		
Were hatchling disorientation events documented during 2006? <b>Yes or No</b>		<b>Yes</b>
If <b>YES</b> , have all <b>disorientation reports</b> been submitted to FWC? <b>Yes or No</b>		<b>Yes</b>

I certify the above information to be true and accurate to the best of my knowledge.

	<b>11/29/06</b>
<b>Principal Permit Holder</b>	<b>Date</b>

Email Forms to: [Beth.Brost@myfwc.com](mailto:Beth.Brost@myfwc.com)

Please submit form by **November 30, 2006**



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION  
FISH AND WILDLIFE RESEARCH INSTITUTE  
SEA TURTLE NESTING DATA SUMMARY REPORT FOR 2006**

**Submittal  
Deadline: Nov.  
30, 2006**

**1. PRINCIPAL PERMIT HOLDER INFORMATION**

Principal Permit Holder: <b>Louis Fisher</b>	Permit Number: <b>108</b>
Beach Name: <b>Ft. Lauderdale Beach</b>	

**2. GENERAL NESTING DATA**

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)
<b>Total # of Nests</b>	<b>444</b>	<b>31</b>	<b>2</b>
Total # of Non-Nesting Emergences (False Crawls)	<b>460</b>	<b>38</b>	<b>0</b>
Date (mm/dd) of First Documented Nest	<b>4/28/06</b>	<b>6/10/06</b>	<b>3/24/06</b>
Date (mm/dd) of Last Documented Nest	<b>8/29/06</b>	<b>9/28/06</b>	<b>5/1/06</b>

**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)
<b>TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)</b>	<b>193</b>	<b>30</b>	<b>2</b>
(a) # of Nests left in Place without Additional Protection	<b>171</b>	<b>30</b>	<b>2</b>
(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	<b>22</b>		

**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)
<b>TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)</b>	<b>251</b>	<b>1</b>	<b>0</b>
(a) # of Relocated Nests without Additional Protection	<b>251</b>	<b>1</b>	
(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			

**Submit form by November 30, 2006  
Email to: [Beth.Brost@myfwc.com](mailto:Beth.Brost@myfwc.com)**



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2006**  
**Species: *Caretta caretta* (Loggerhead)**

**Submission Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Ft. Lauderdale Beach</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	171	171	98	10727	8487	594	194	75	440	936	1
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage	22	22	21	2318	1709	122	30	31	132	294	0
Relocated/No Additional Protection	251	251	242	27897	17669	3160	376	638	2464	3558	32
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

**Relocated:** Clutch was relocated from the original site of deposition.  
**Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.  
**Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.  
**Hatchery:** A fenced or caged area where many nests are reburied.  
**Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.  
**Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.  
**Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

**#of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.  
**# of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)  
**# of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs  
**# of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs**



**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2005**  
**Species: *Chelonia mydas* (Green Turtle)**

**Submittal Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Ft. Lauderdale Beach</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	30	30	9	1207	1045	54	15	3	6	84	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection	1	1	1	122	111	6	0	1	2	2	0
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

- Relocated:** Clutch was relocated from the original site of deposition.
- Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.
- Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.
- Hatchery:** A fenced or caged area where many nests are reburied.
- Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.
- Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.
- Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

- #of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.
- # of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)
- # of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs





**Florida Fish and Wildlife Conservation Commission**  
**Fish and Wildlife Research Institute**  
**Sea Turtle Nest Success Reporting Form for 2005**  
**Species: *Dermochelys coriacea* (Leatherback)**

**Submission Deadline: Nov. 30, 2006**  
**Email to: Beth.Brost@myfwc.com**

Beach Name: <b>Ft. Lauderdale Beach</b>					Permit Holder: <b>Louis Fisher</b>					Permit #: <b>108</b>	
Category	Total # of Nests	# of Nests Marked to Evaluate	# of Nests Actually Evaluated	# of Eggs in Evaluated Nests	# of Hatchlings Emerged	# of Live Hatchlings in Nest	# of Dead Hatchlings in Nest	# of Pipped Live	# of Pipped Dead	# of Unhatched Eggs	
										# of Undamaged Eggs	# of Damaged Eggs
Left in Place/No Additional Protection	2	2	2	135	74	42	3	0	5	11	0
Left in Place/Self Releasing Screen											
Left in Place/Self Releasing Cage											
Left in Place/Restraining Cage											
Relocated/No Additional Protection											
Relocated/Self Releasing Screen											
Relocated/Self Releasing Cage											
Relocated/Restraining Cage											
Relocated/Self Releasing Hatchery											
Relocated/Restraining Hatchery											

**Definition of Terms**

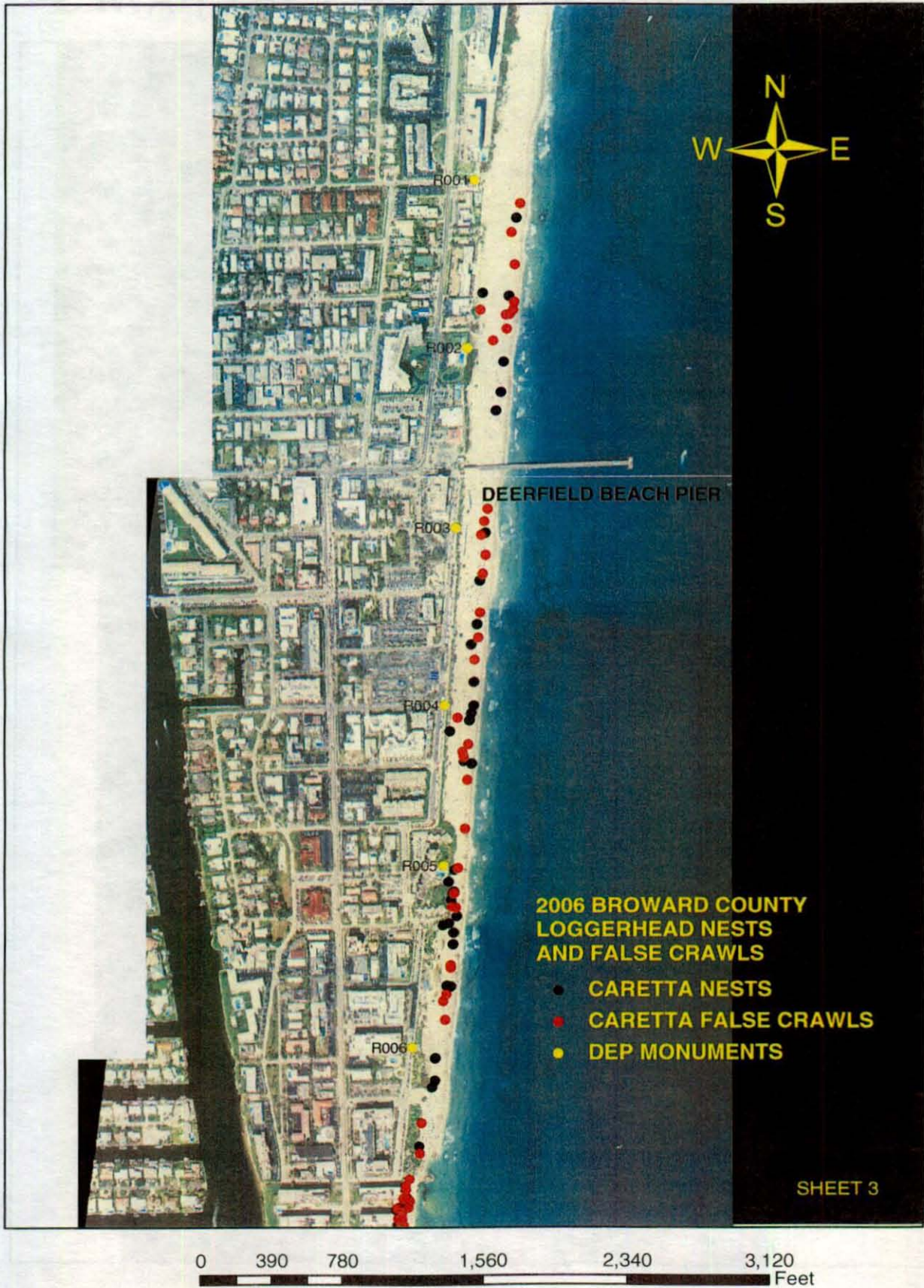
**Relocated:** Clutch was relocated from the original site of deposition.  
**Self-Releasing:** A screen, cage or hatchery through which hatchlings escape unaided.  
**Restraining:** A screen, cage, or hatchery that does not allow hatchlings to escape unaided.  
**Hatchery:** A fenced or caged area where many nests are reburied.  
**Pipped:** Hatchling broken through eggshell but not completely free of eggshell - not a hatched egg.  
**Damaged Eggs:** Eggs damaged by predators, roots, nesting females, or during relocation.  
**Important:** The # of Hatchlings Emerged + # of Live Hatchlings in Nest + # of Dead Hatchlings in Nest + # of Pipped Live + # of Pipped Dead + # of Unhatched Eggs = the # of Eggs in Evaluated Nests. **Please check to make sure this is the case.**

**Additional Information**

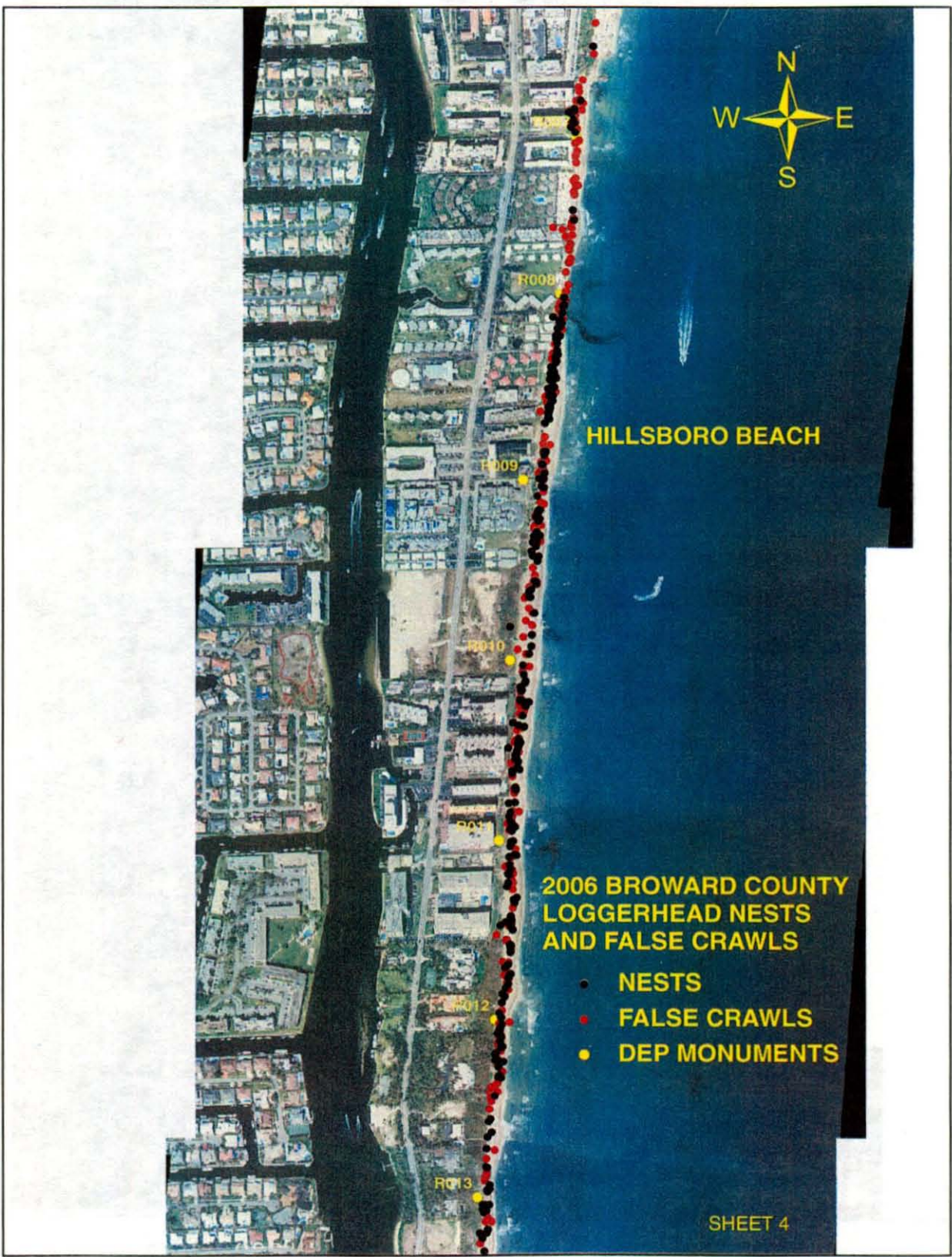
**#of Eggs in Evaluated Nests:** Direct count in *relocated* nests, count eggshells of nests left in place.  
**# of Hatchlings Emerged:** Count only those emerged unaided (prior to nest evaluation) #Empty Shells - (Live and Dead in Nest)  
**# of Unhatched Eggs:** (1) undamaged and unpipped eggs; and (2) damaged eggs

**Appendix 5:** Distribution of 2006 loggerhead nests and false crawls presented on 2006 costal aerial photographs.

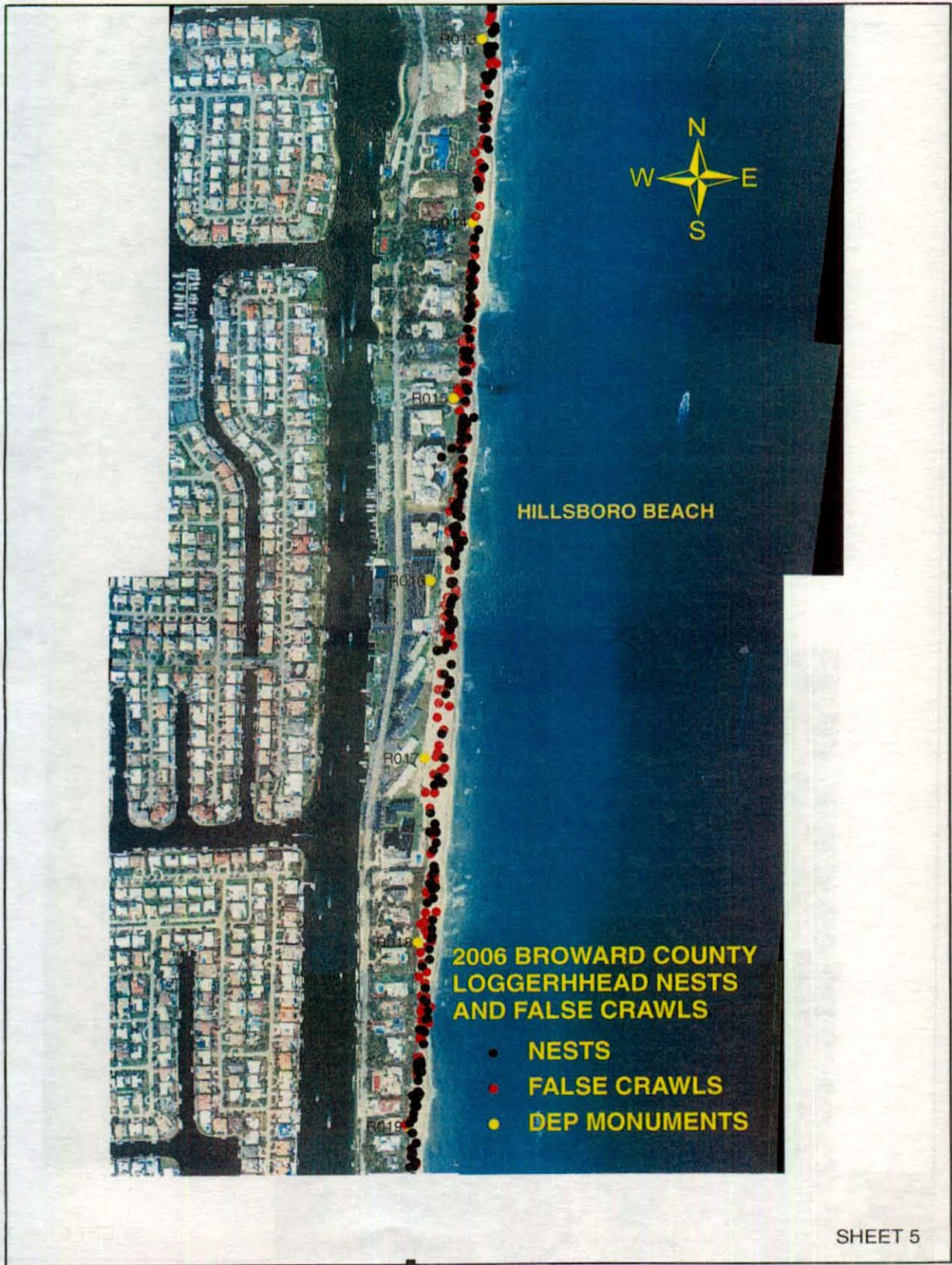
# 2006 LOGGERHEAD NESTS & FALSE CRAWLS



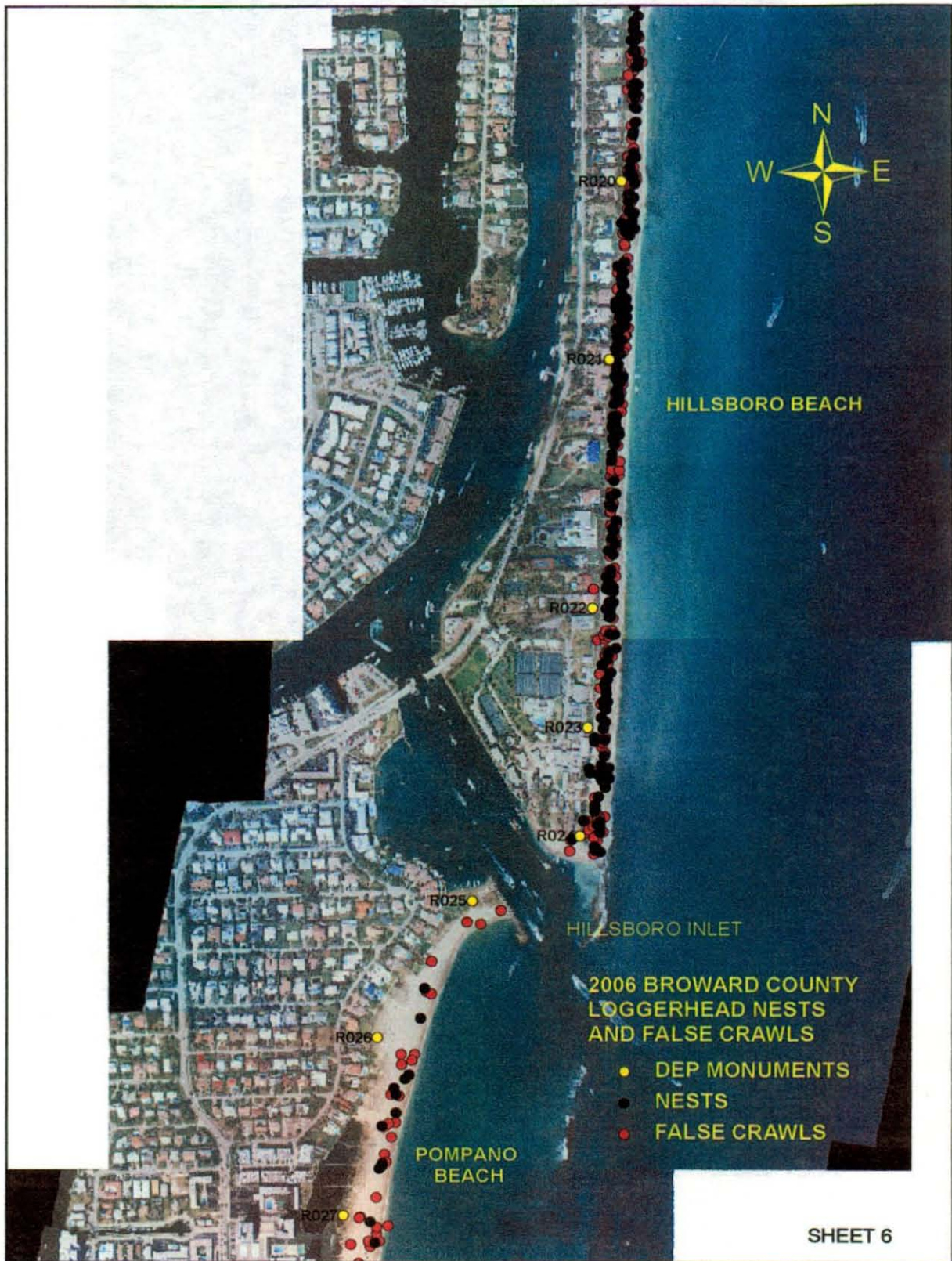
# LOGGERHEAD NESTS & FALSE CRAWLS



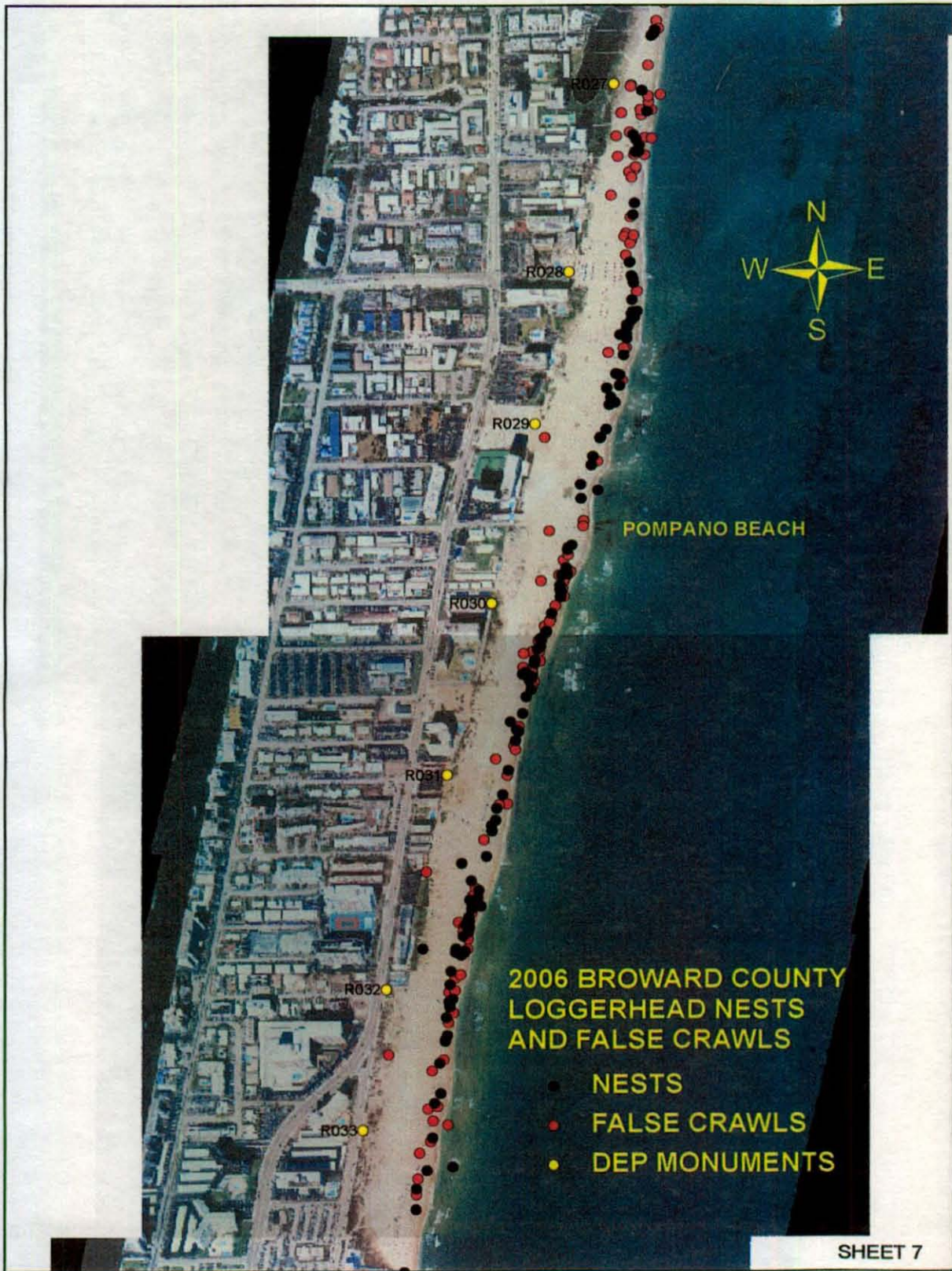
# LOGGERHEAD NESTS & FALSE CRAWLS



# LOGGERHEAD NESTS & FALSE CRAWLS

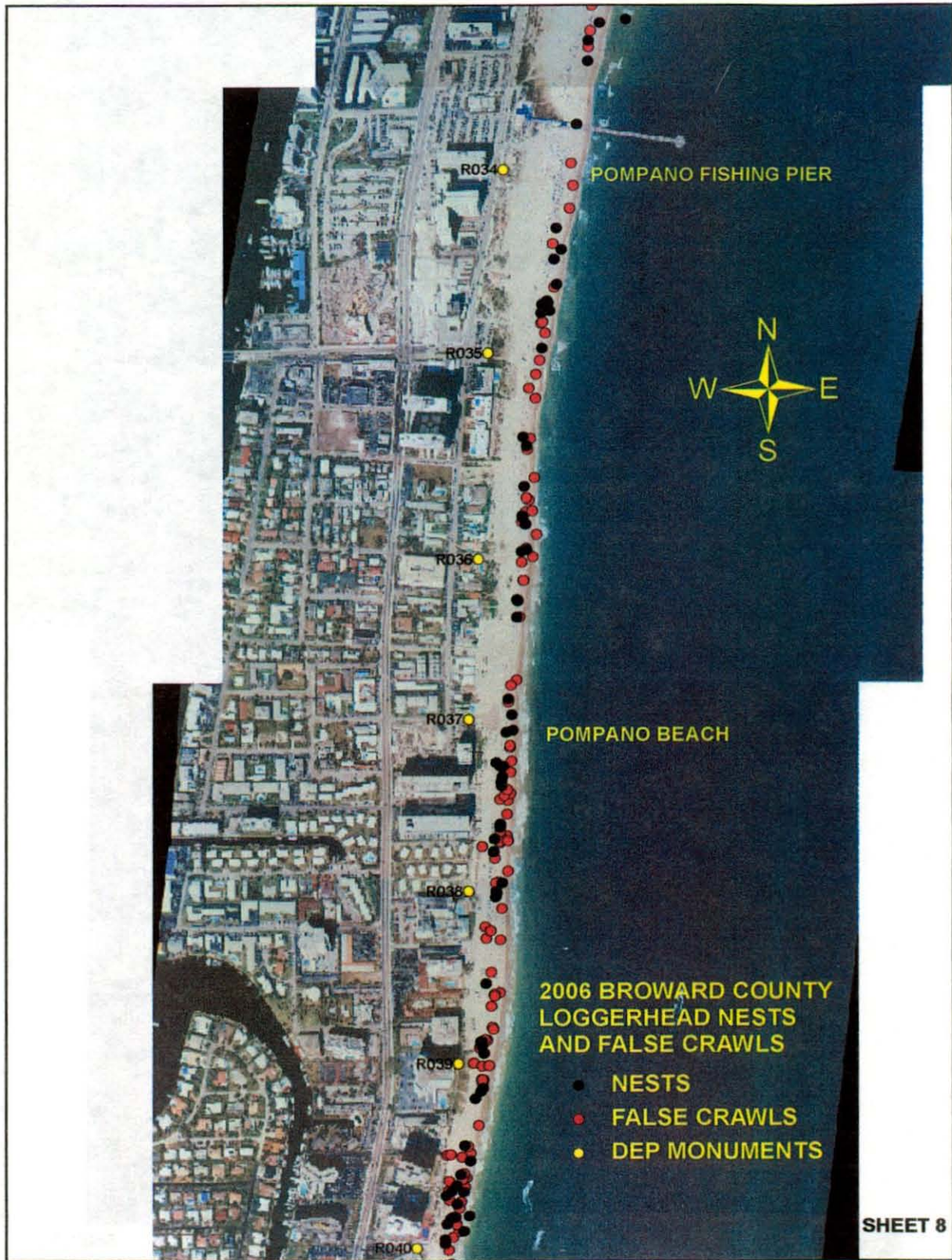


# LOGGERHEAD NESTS & FALSE CRAWLS



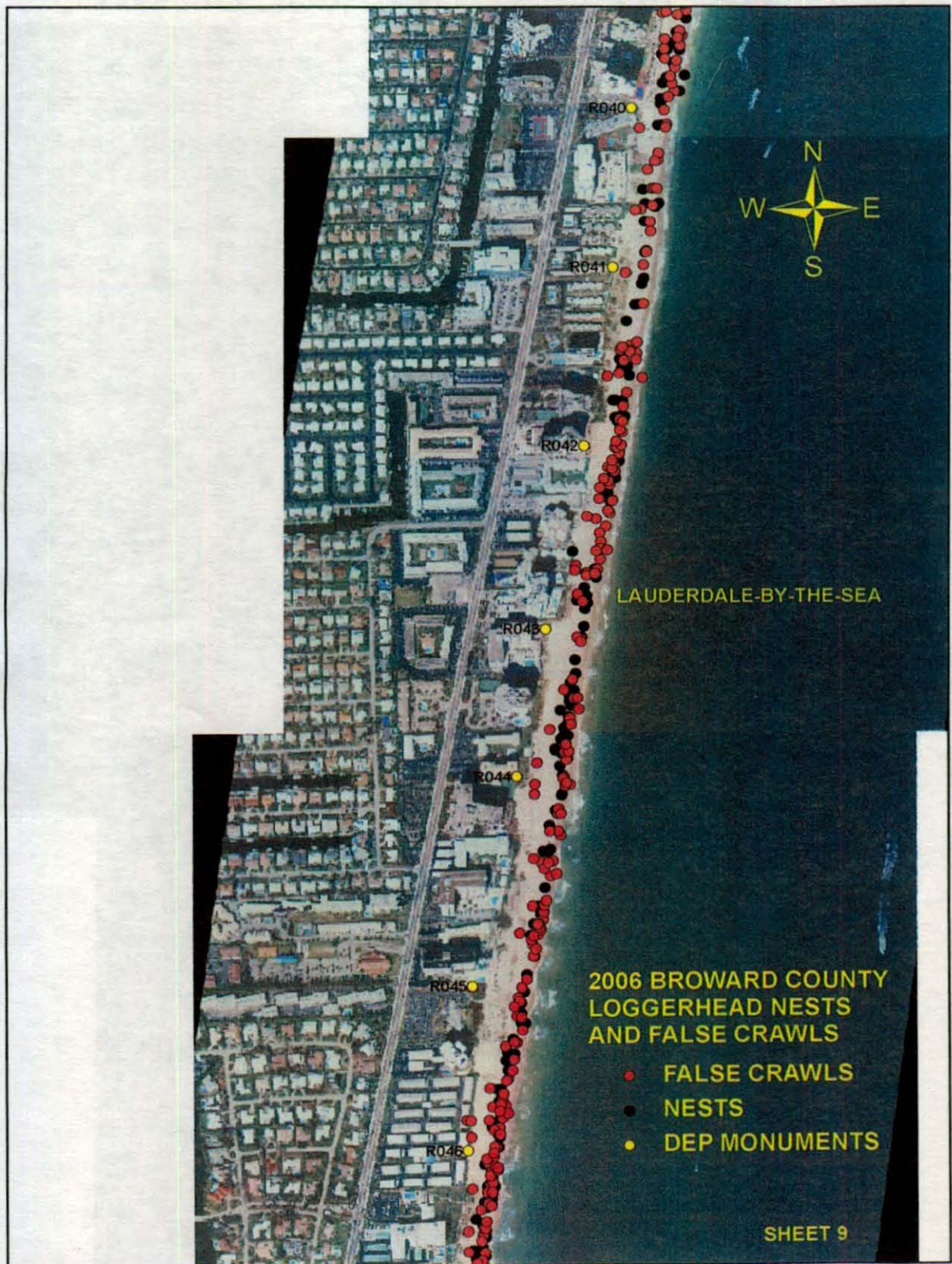
0 325 650 1,300 1,950 2,600 Feet

# LOGGERHEAD NESTS & FALSE CRAWLS



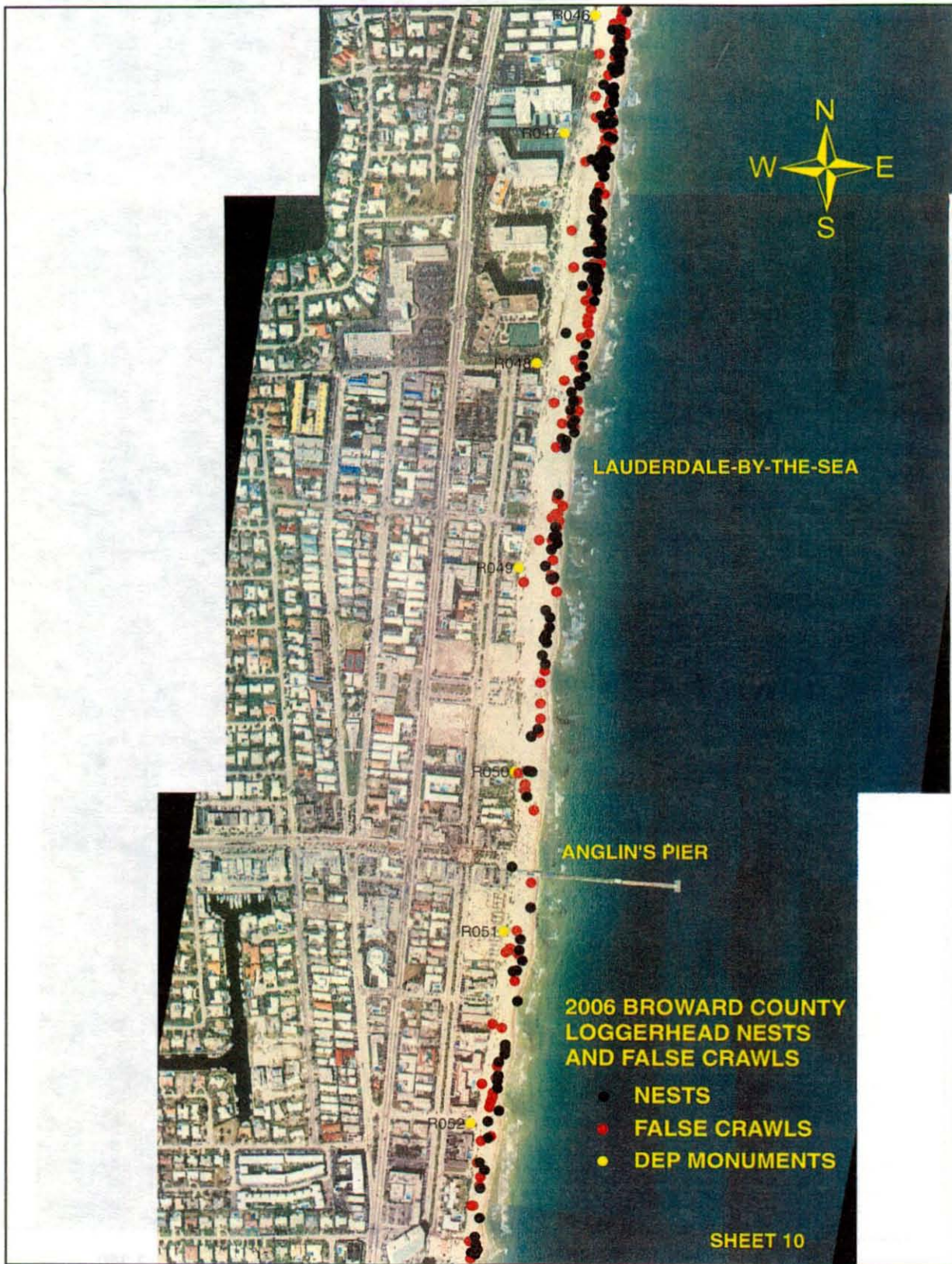


# LOGGERHEAD NESTS & FALSE CRAWLS



0 420 840 1,680 2,520 3,360 Feet

# LOGGERHEAD NESTS & FALSE CRAWLS

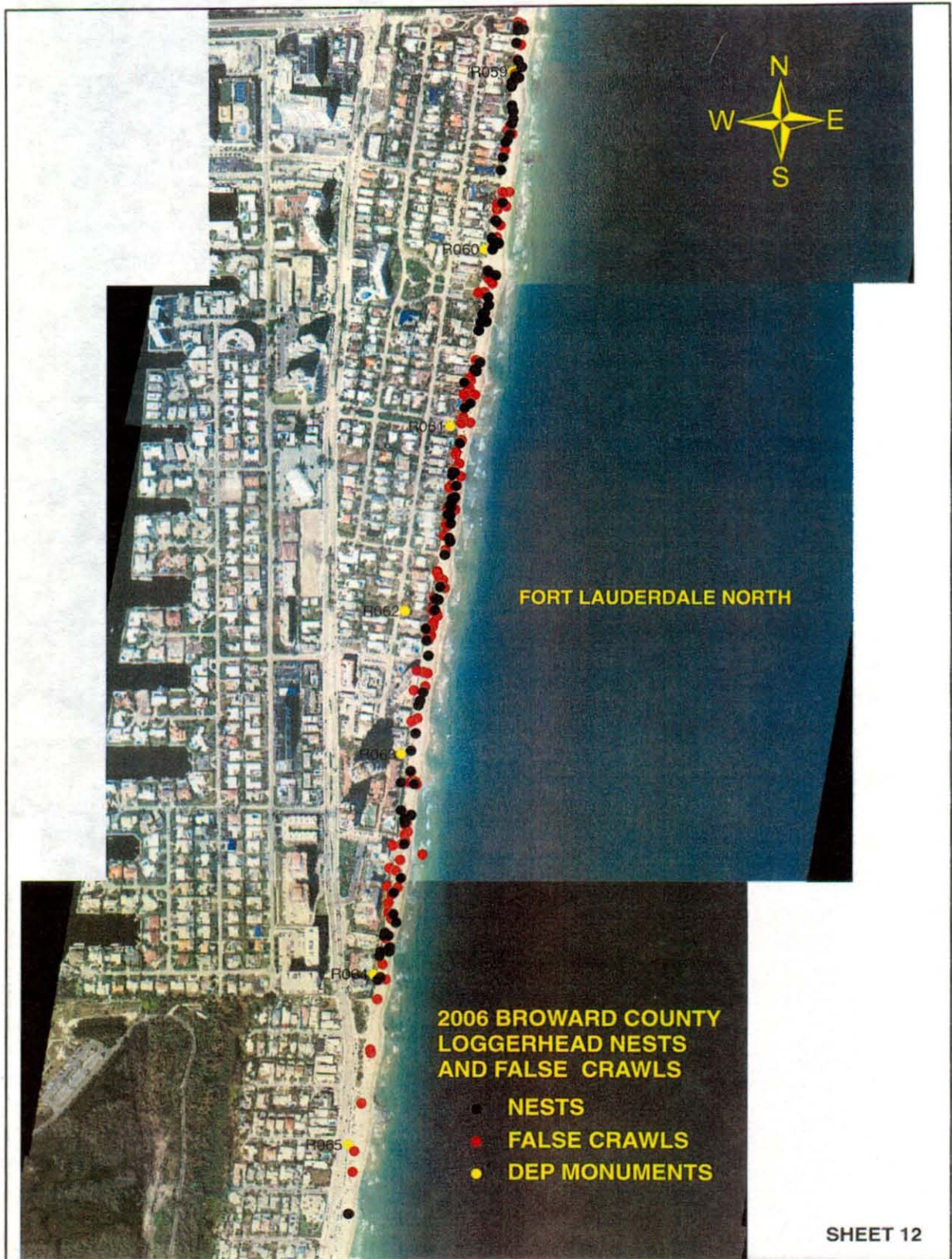


0 412.5 825 1,650 2,475 3,300 Feet

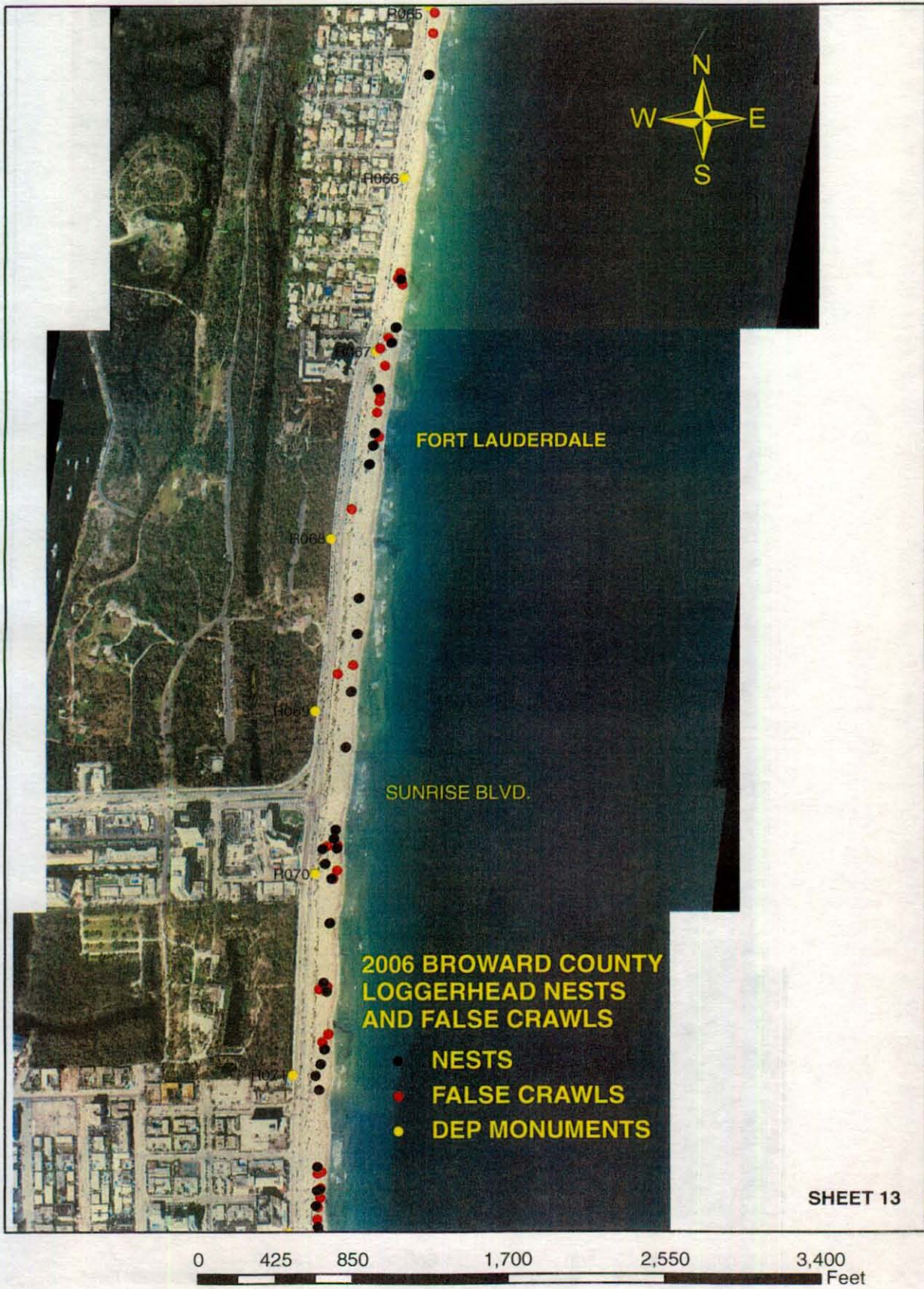
# LOGGERHEAD NESTS & FALSE CRAWLS



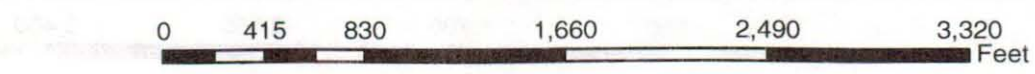
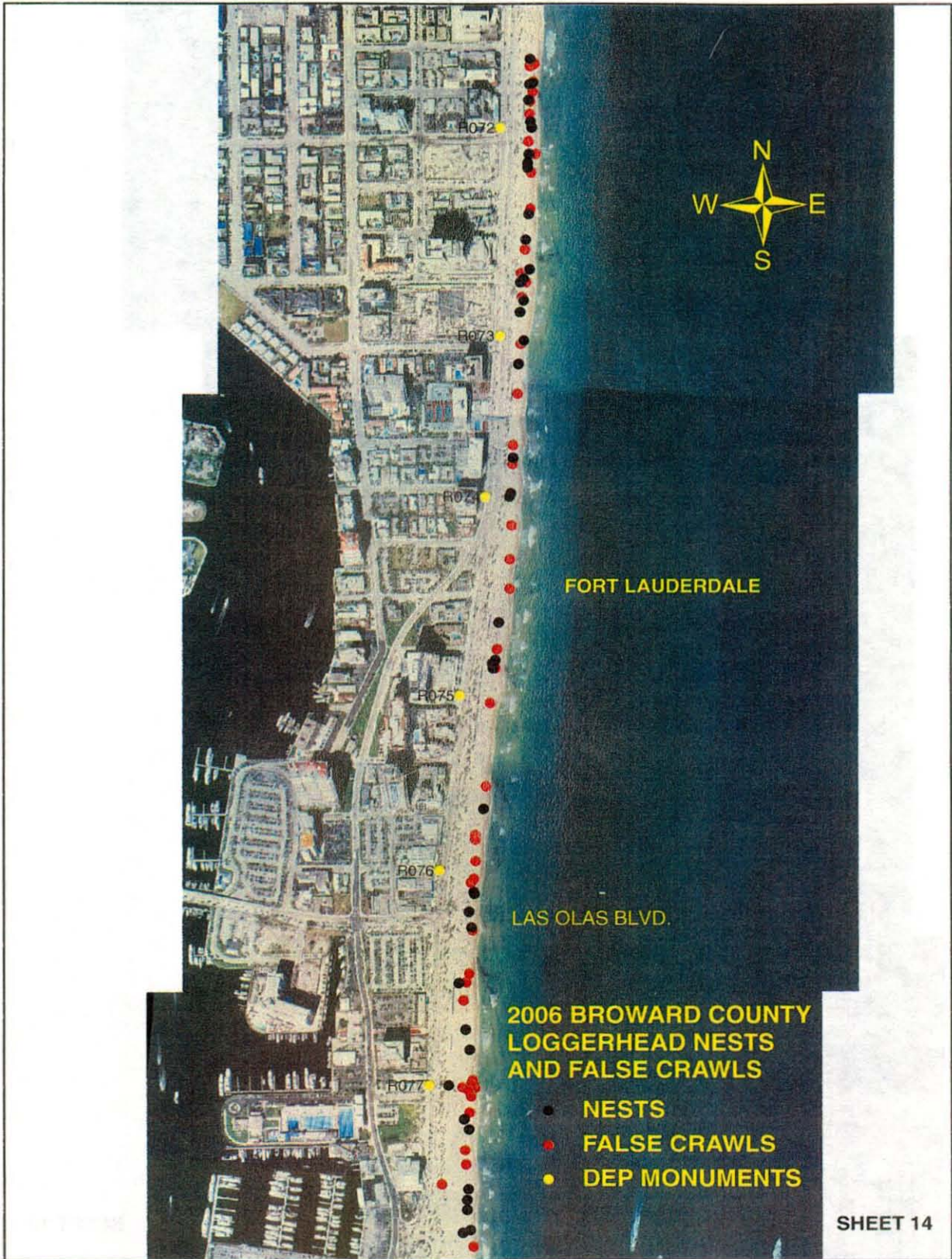
# LOGGERHEAD NESTS & FALSE CRAWLS



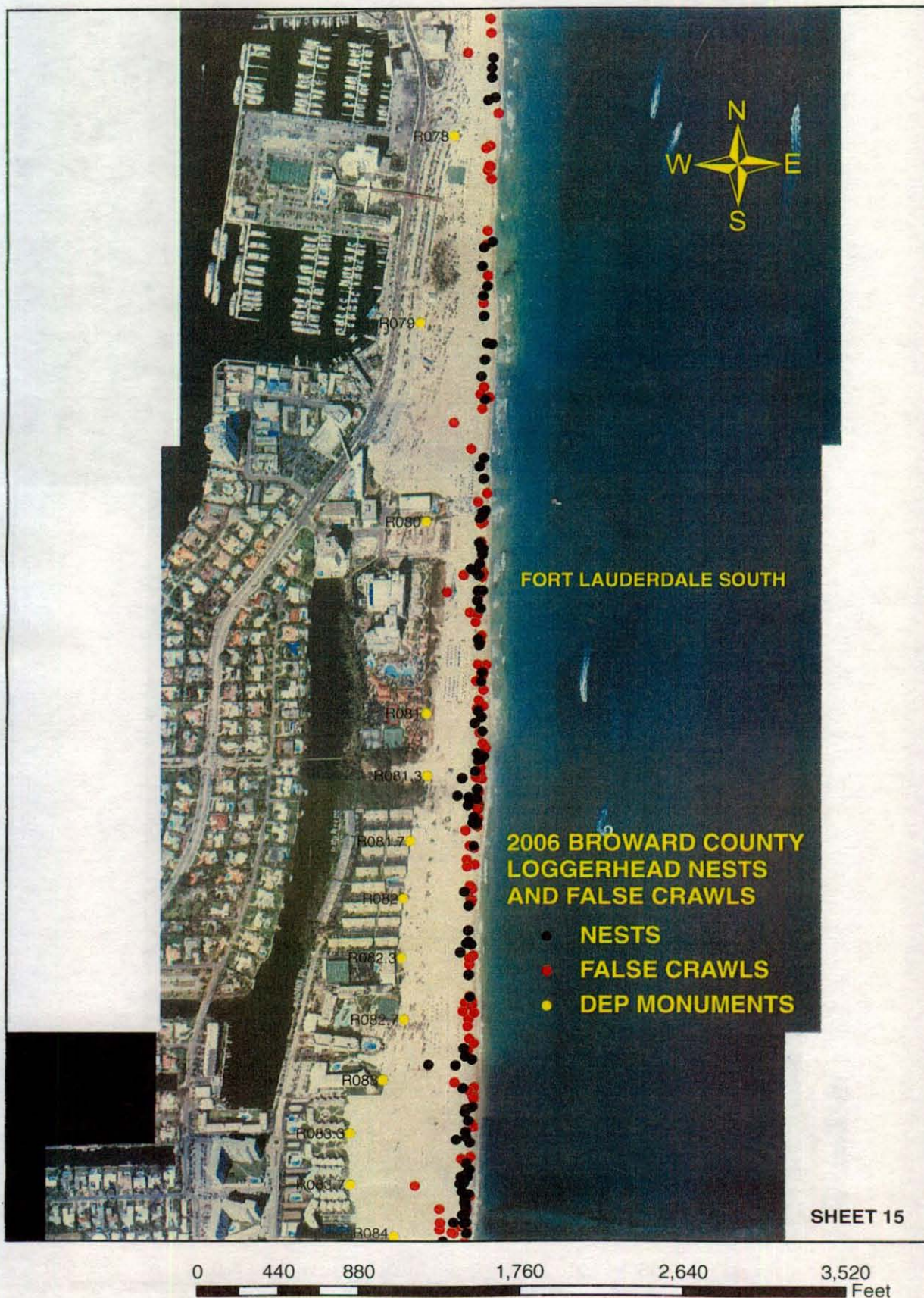
# LOGGERHEAD NESTS & FALSE CRAWLS



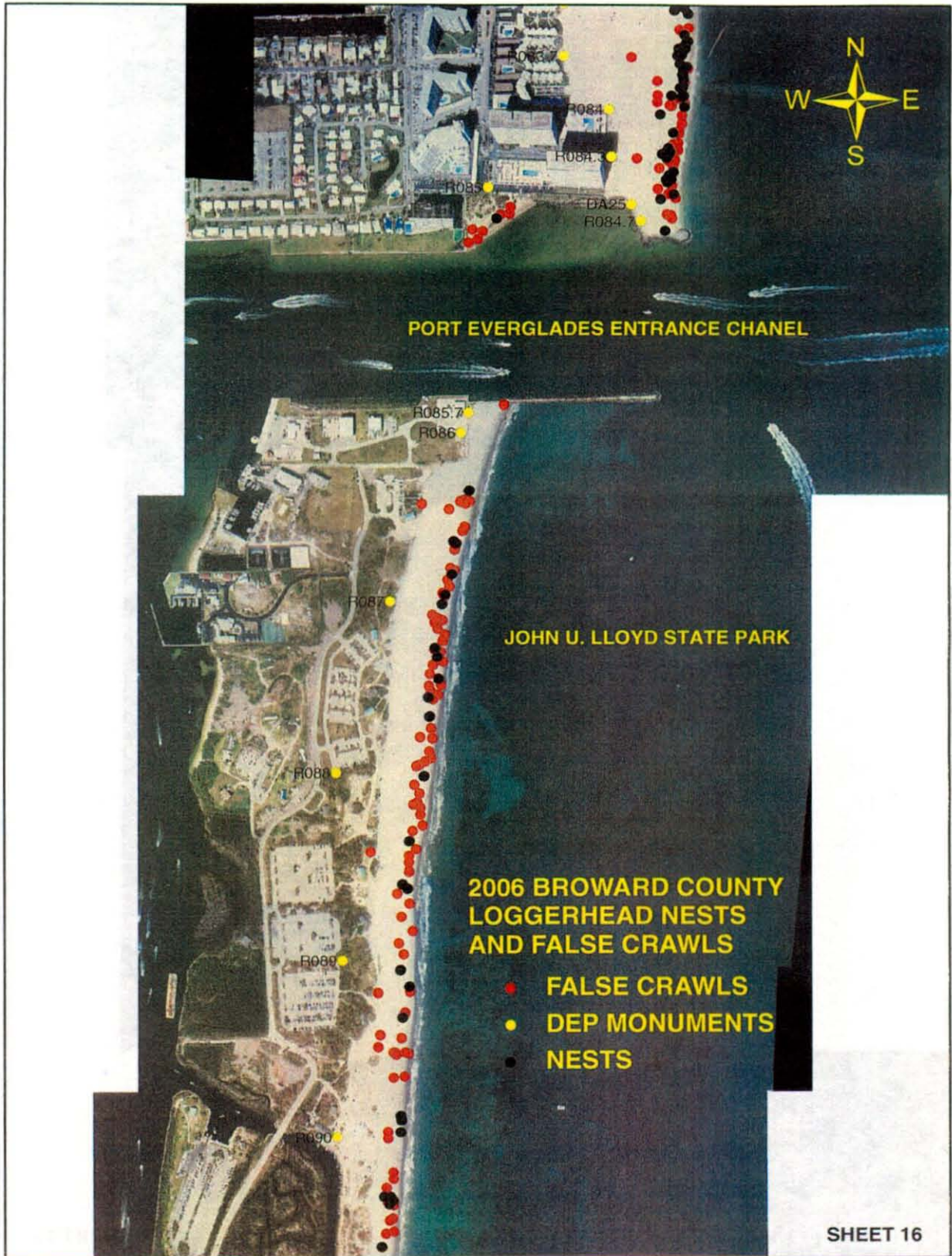
# LOGGERHEAD NESTS & FALSE CRAWLS



# LOGGERHEAD NESTS & FALSE CRAWLS



# LOGGERHEAD NESTS & FALSE CRAWLS



0 455 910 1,820 2,730 3,640 Feet



# LOGGERHEAD NESTS & FALSE CRAWLS



0 430 860 1,720 2,580 3,440 Feet

# LOGGERHEAD NESTS & FALSE CRAWLS

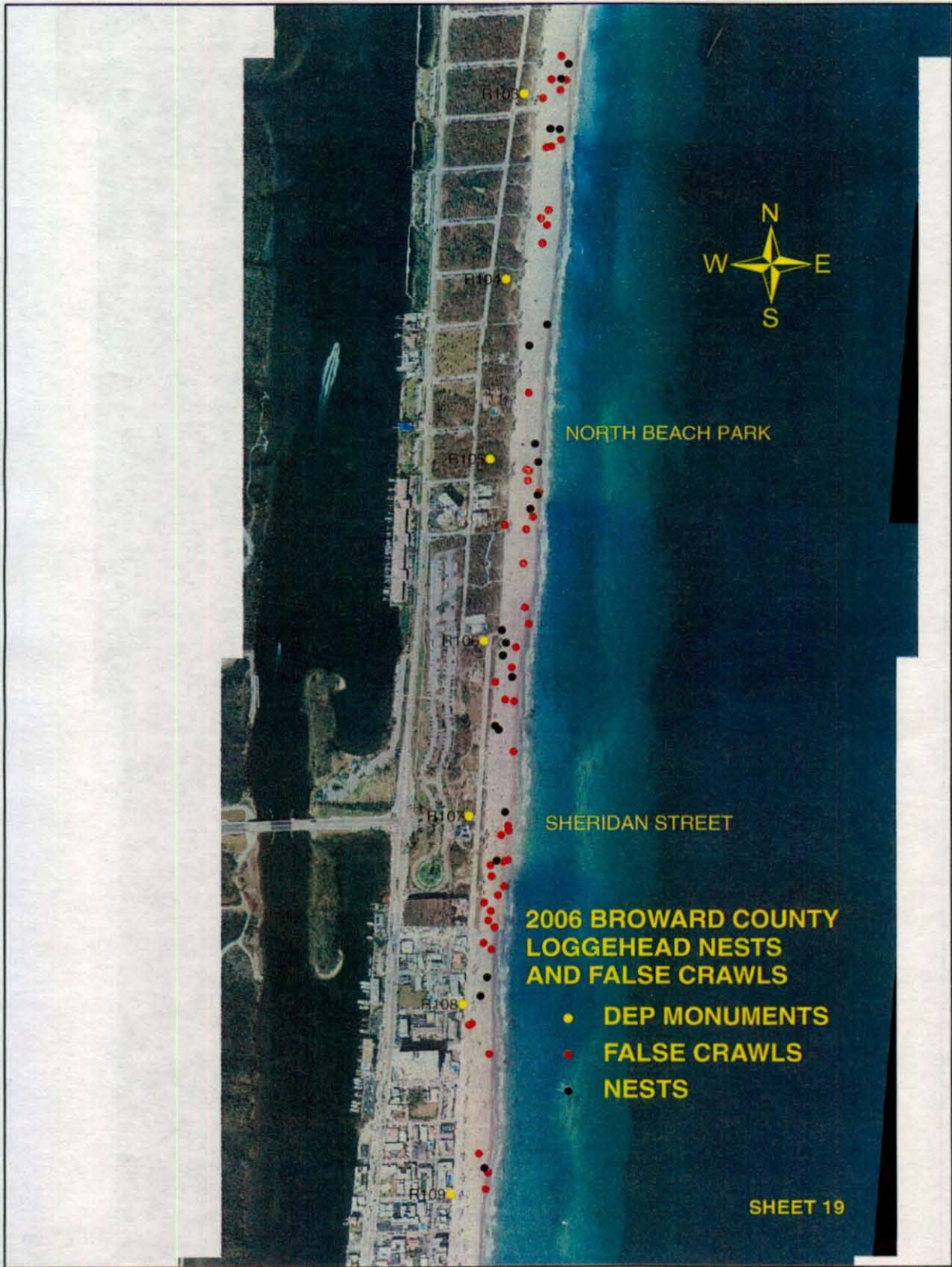


VT T 2914

SHEET 18

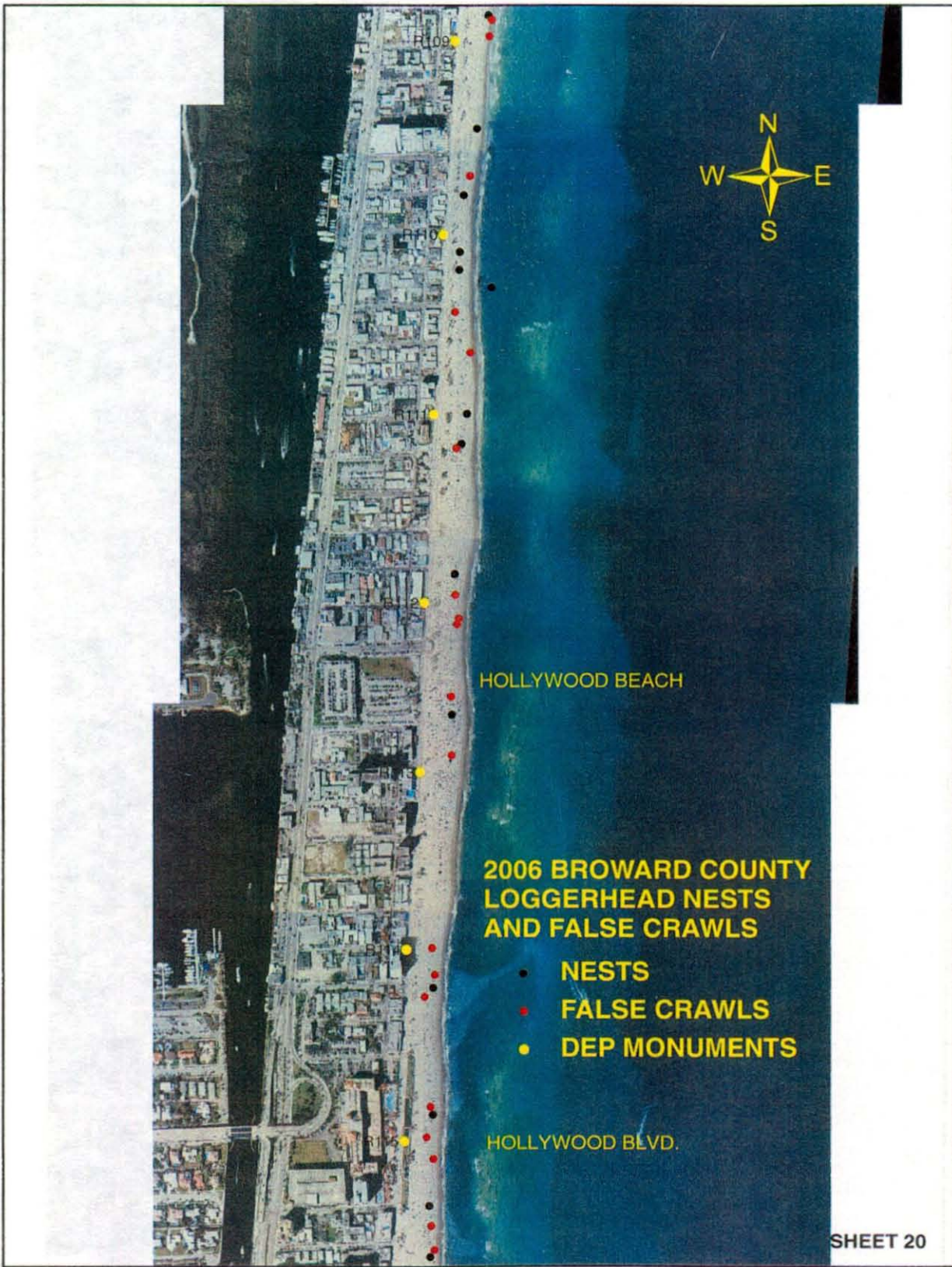
0 430 860 1,720 2,580 3,440  
Feet

# LOGGERHEAD NESTS & FALSE CRAWLS



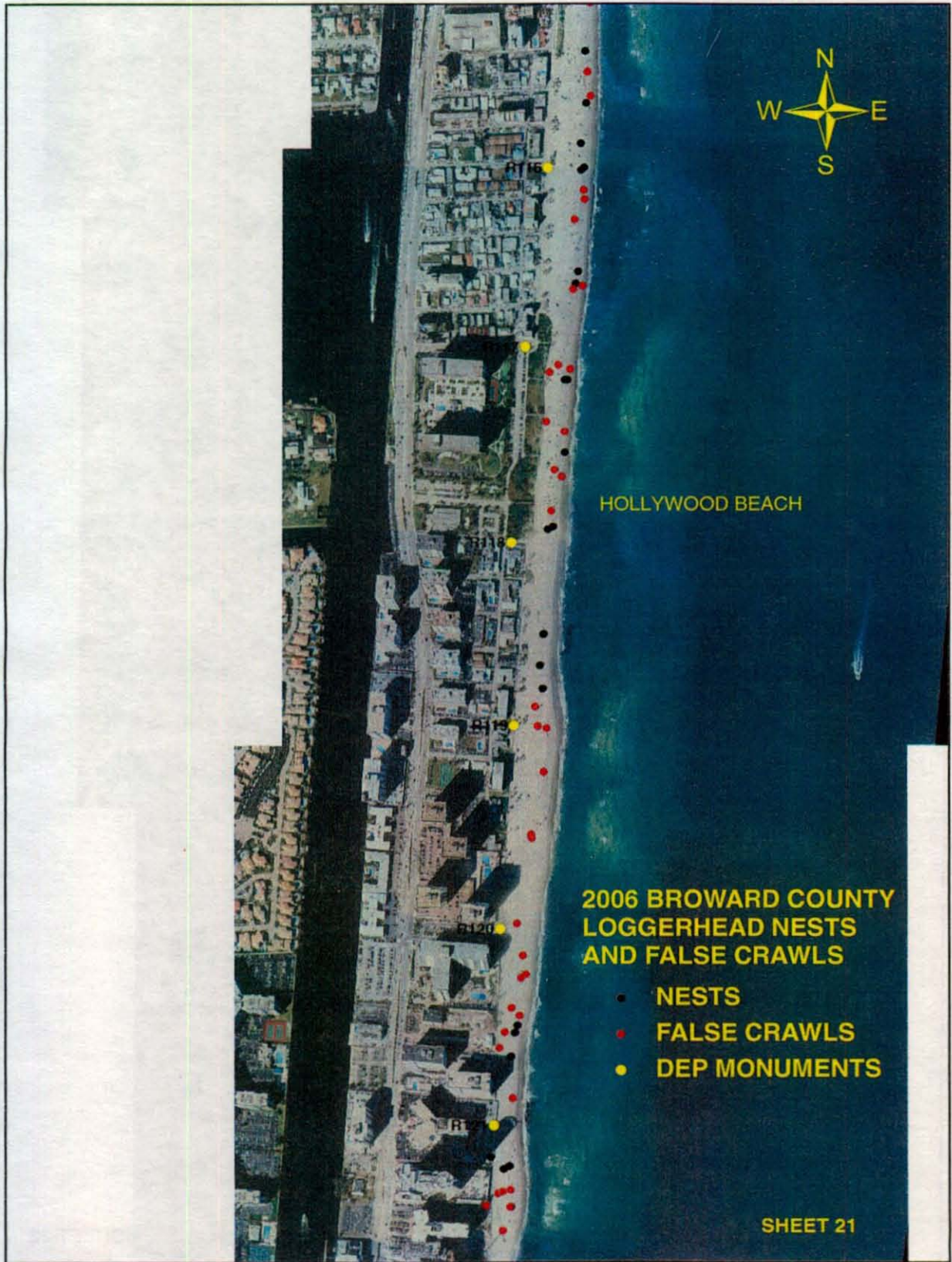
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# LOGGERHEAD NESTS & FALSE CRAWLS

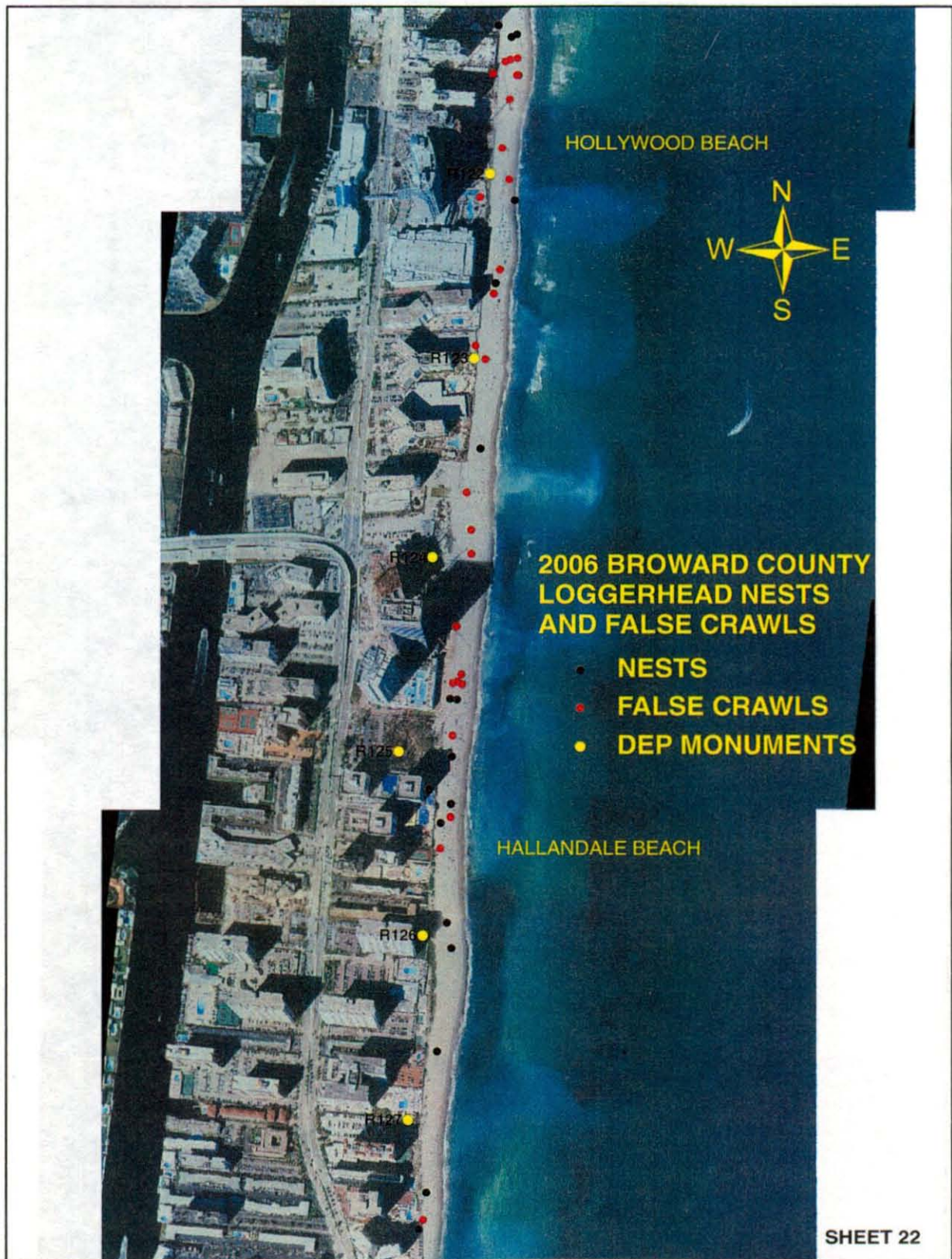


0 400 800 1,600 2,400 3,200 Feet

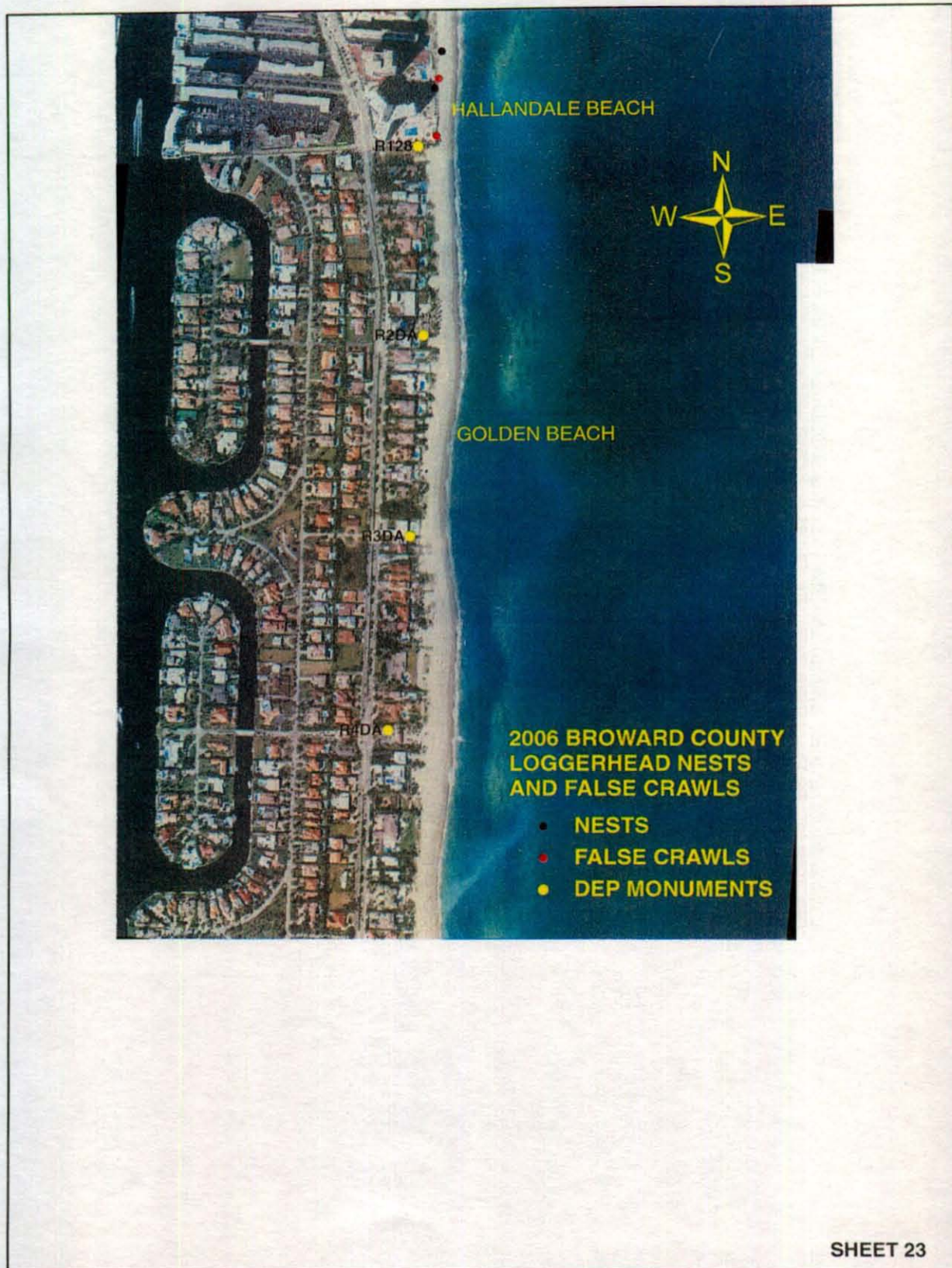
# LOGGERHEAD NESTS & FALSE CRAWLS



# LOGGERHEAD NESTS & FALSE CRAWLS



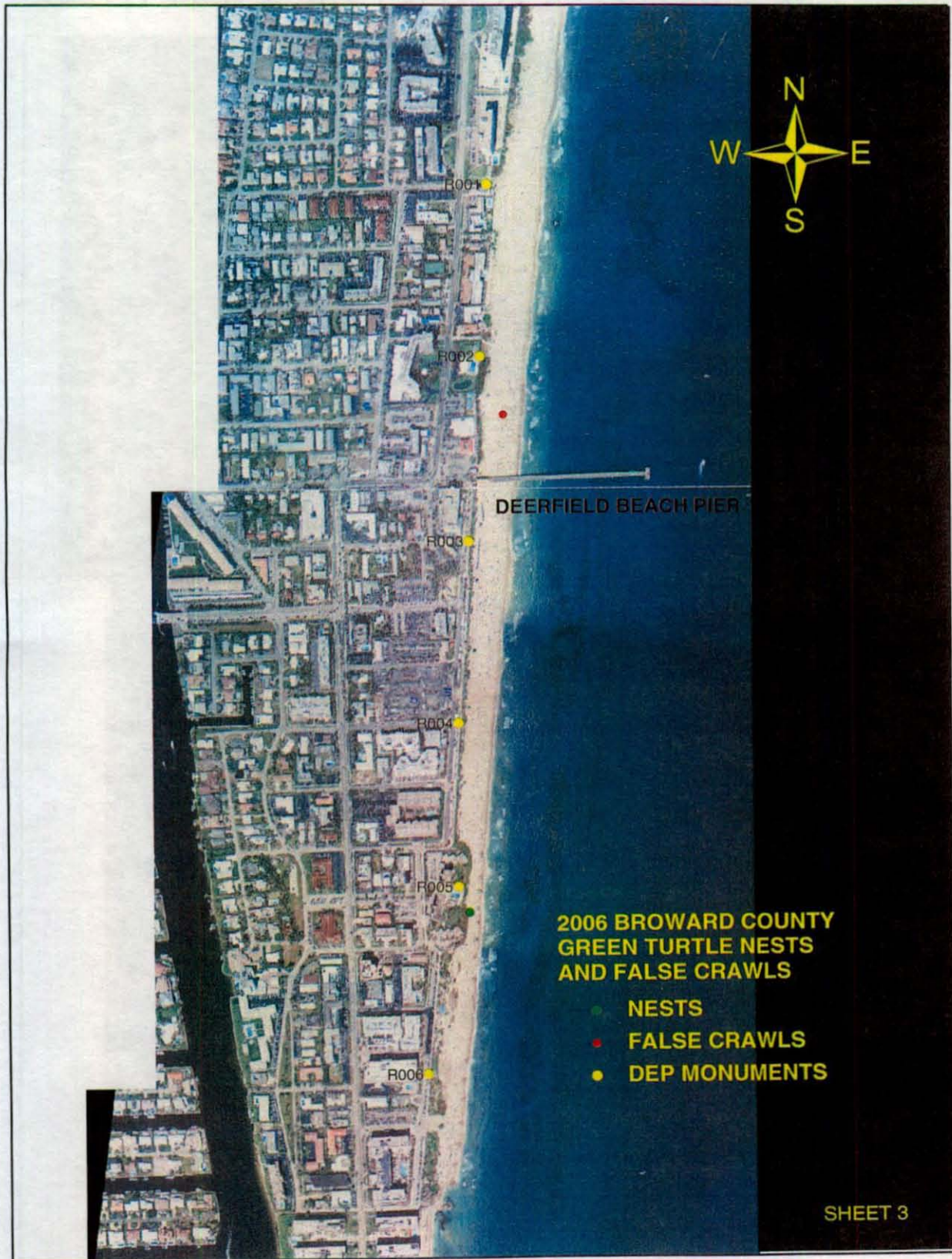
# LOGGERHEAD NESTS & FALSE CRAWLS



**Appendix 6:** Distribution of 2006 green sea turtle nests and false crawls presented on 2006 costal aerial photographs.

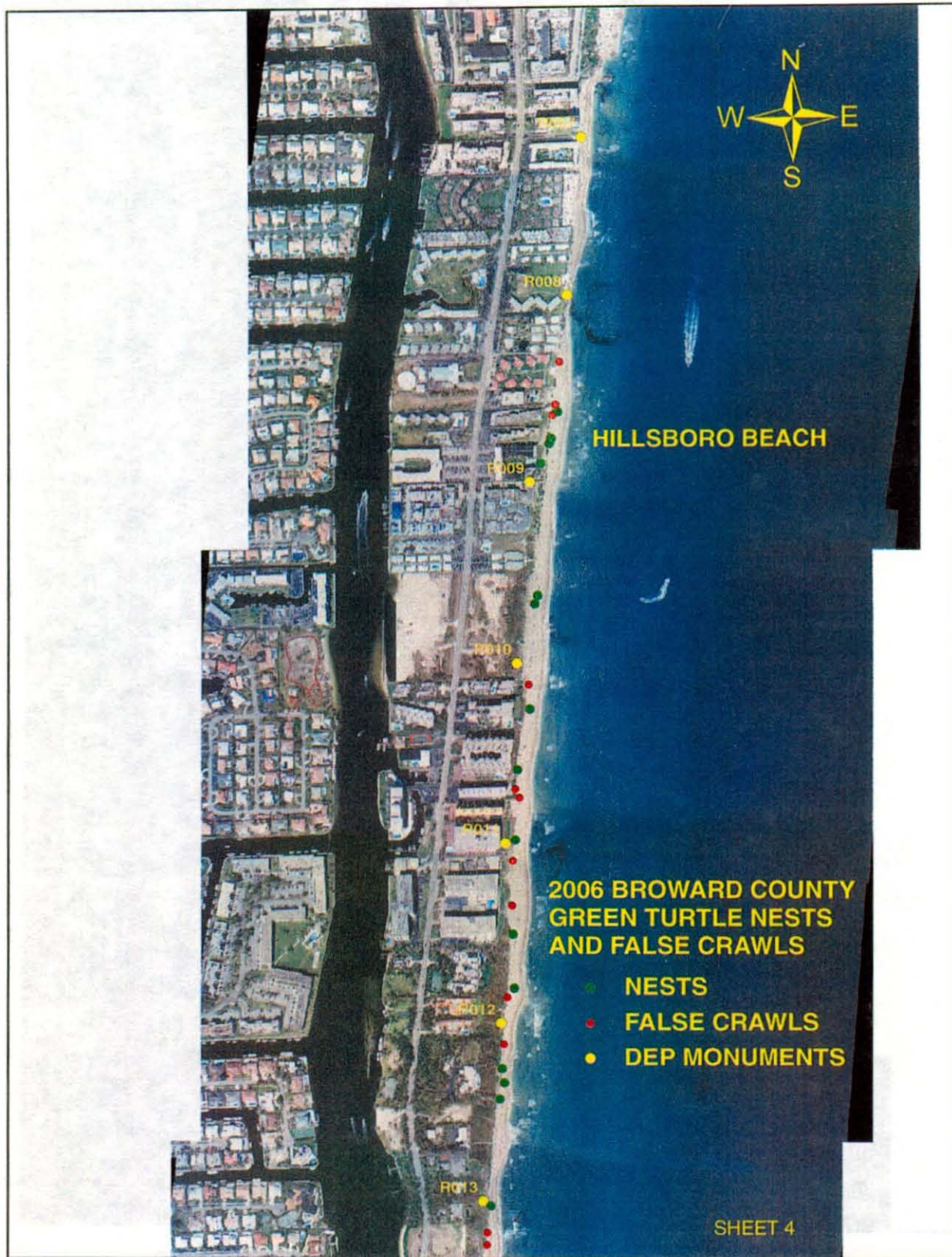


# 2006 GREEN TURTLE NESTS & FALSE CRAWLS



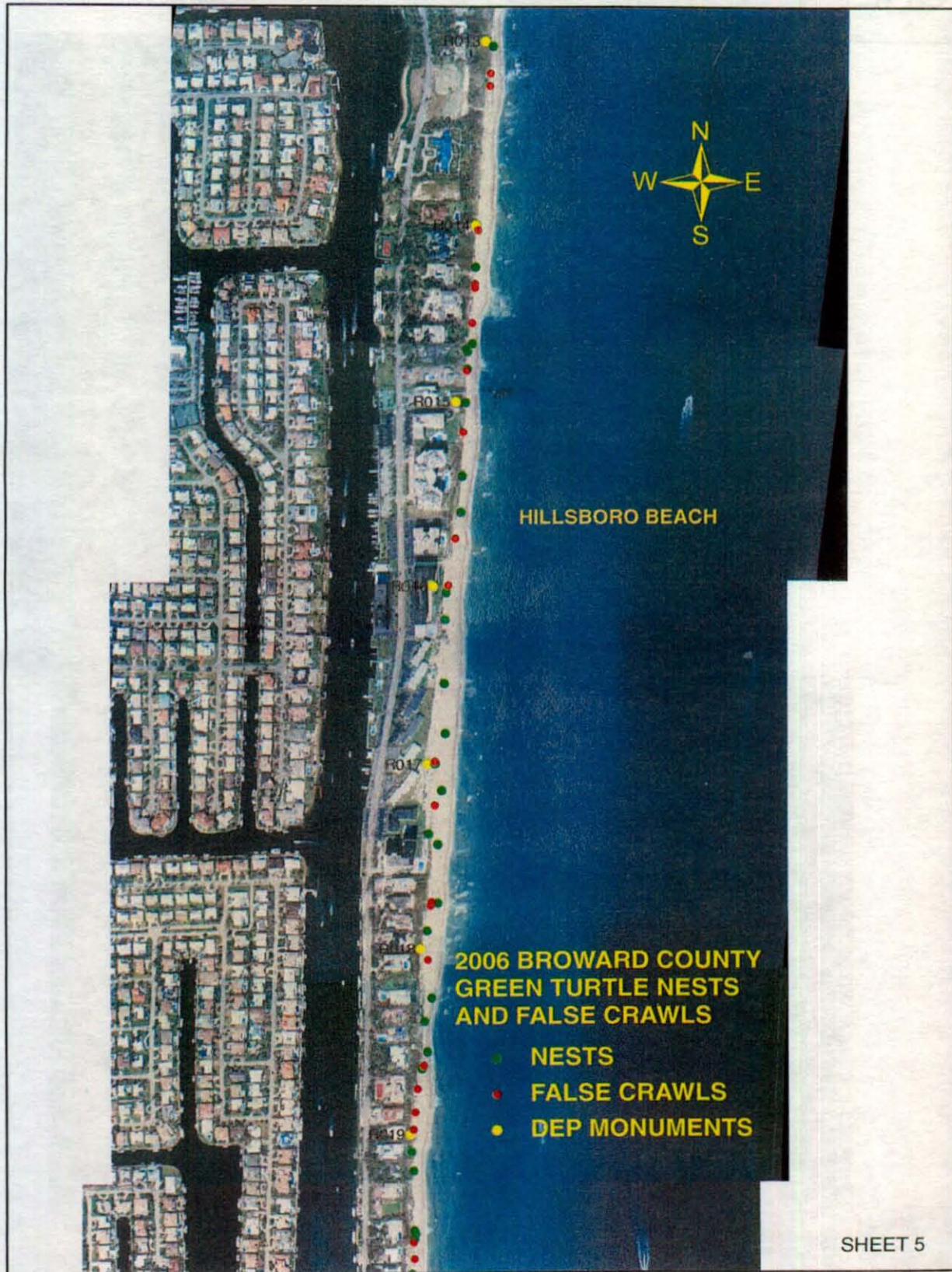
0 390 780 1,560 2,340 3,120  
Feet

# GREEN TURTLE NESTS & FALSE CRAWLS



0 430 860 1,720 2,580 3,440 Feet

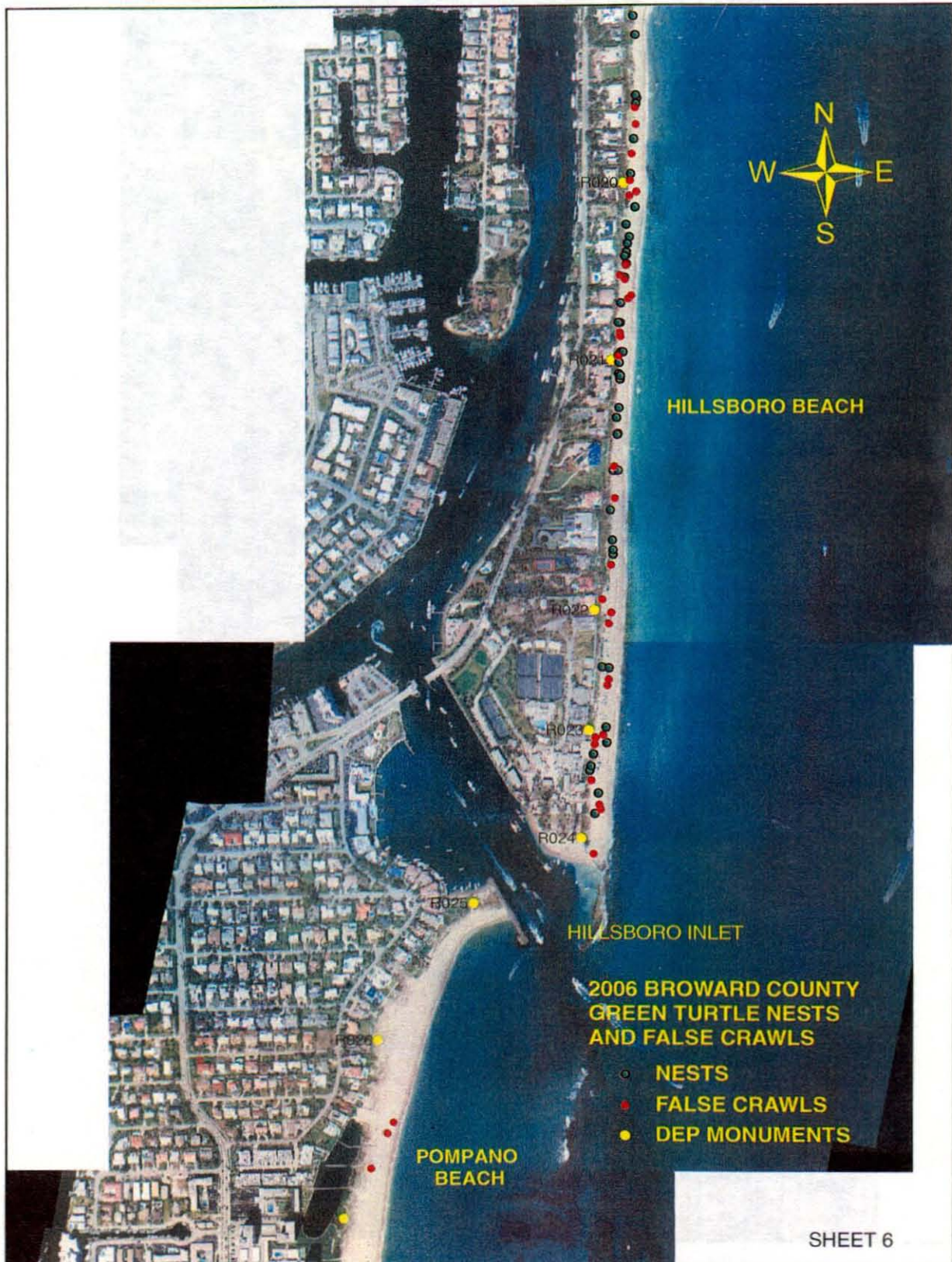
# GREEN TURTLE NESTS & FALSE CRAWLS



SHEET 5

0 430 860 1,720 2,580 3,440 Feet

# GREEN TURTLE NESTS & FALSE CRAWLS

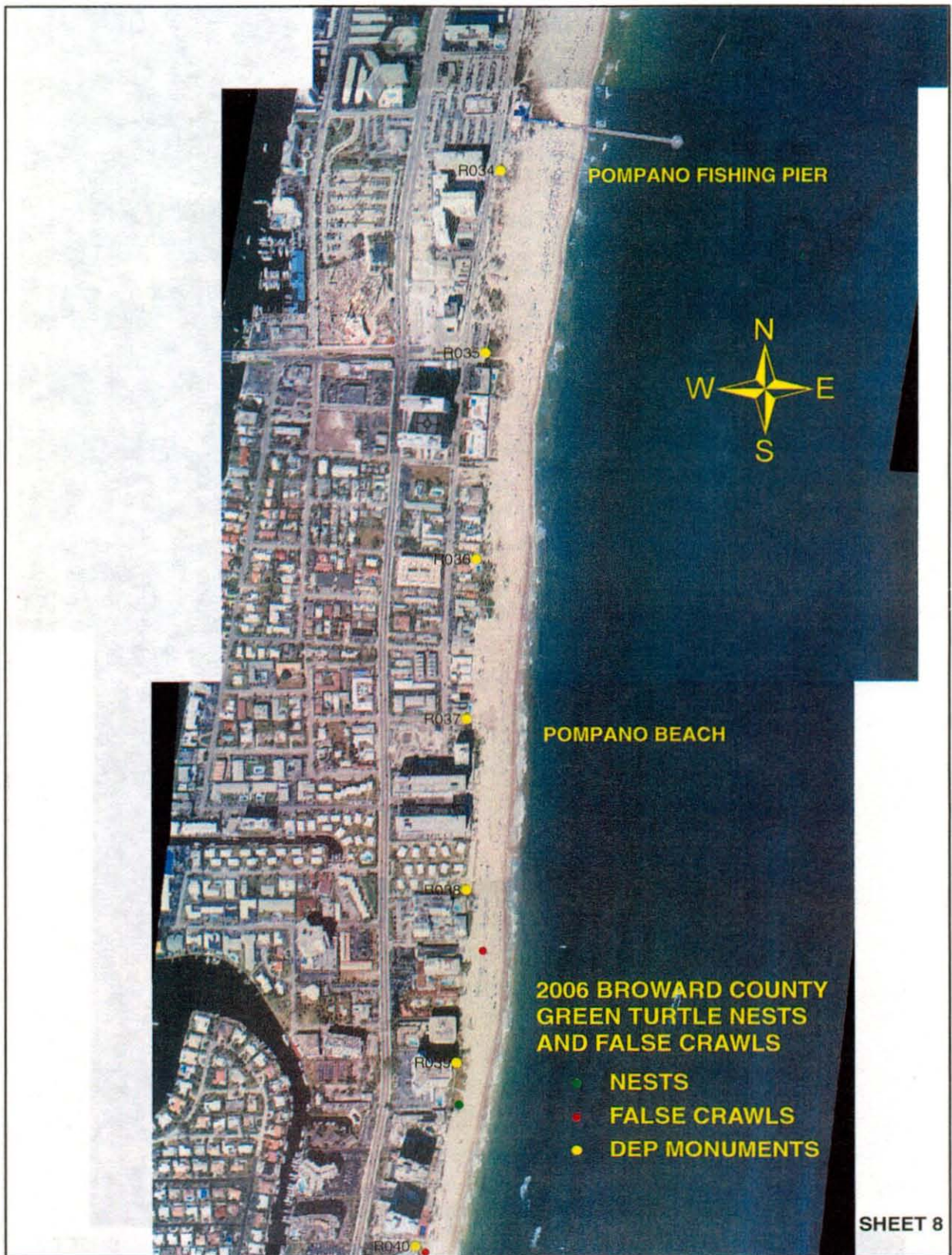


# GREEN TURTLE NESTS & FALSE CRAWLS



0 340 680 1,360 2,040 2,720 Feet

# GREEN TURTLE NESTS & FALSE CRAWLS



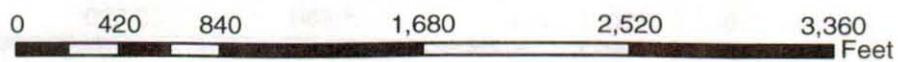
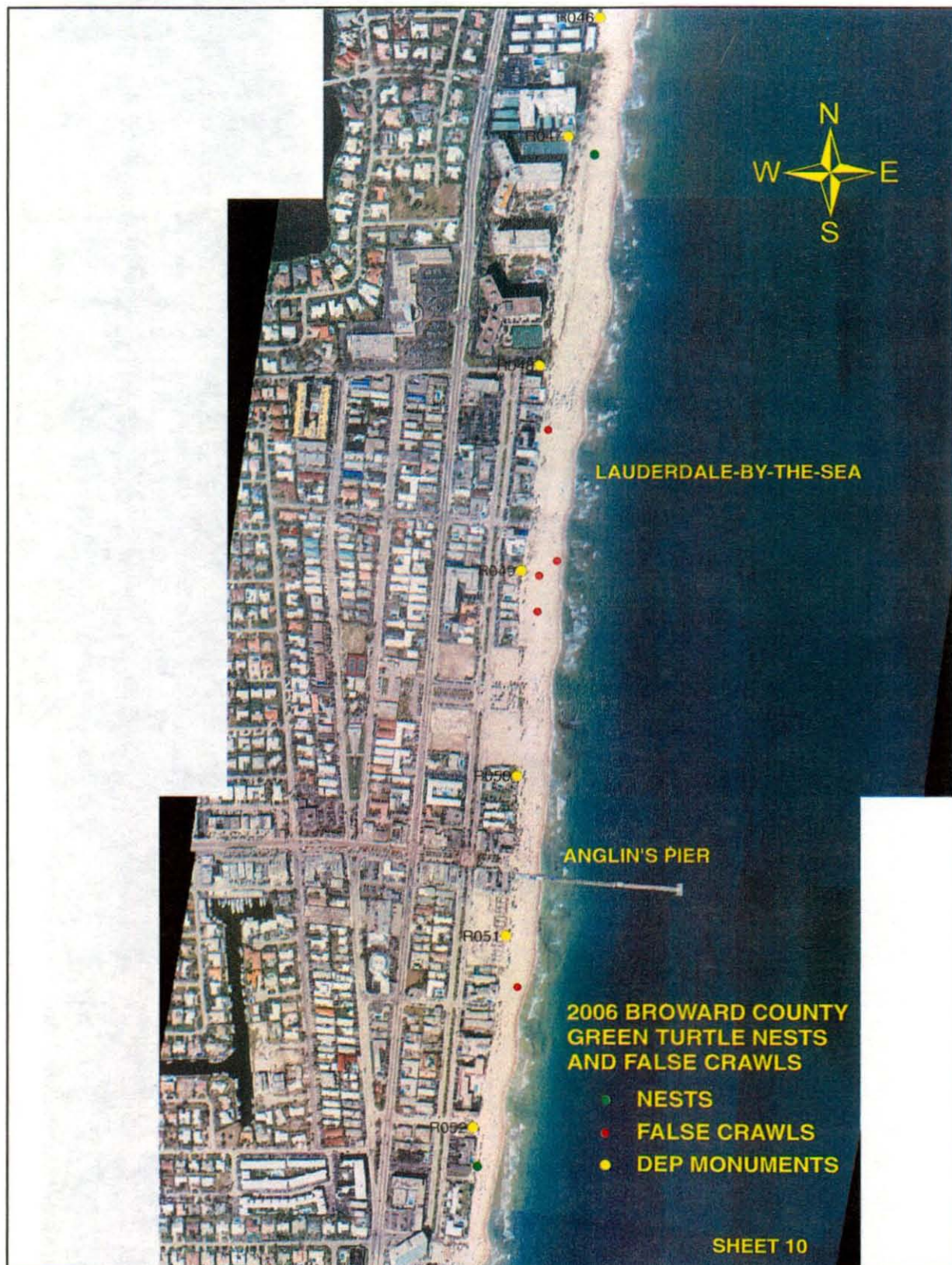
0 430 860 1,720 2,580 3,440 Feet

# GREEN TURTLE NESTS & FALSE CRAWLS



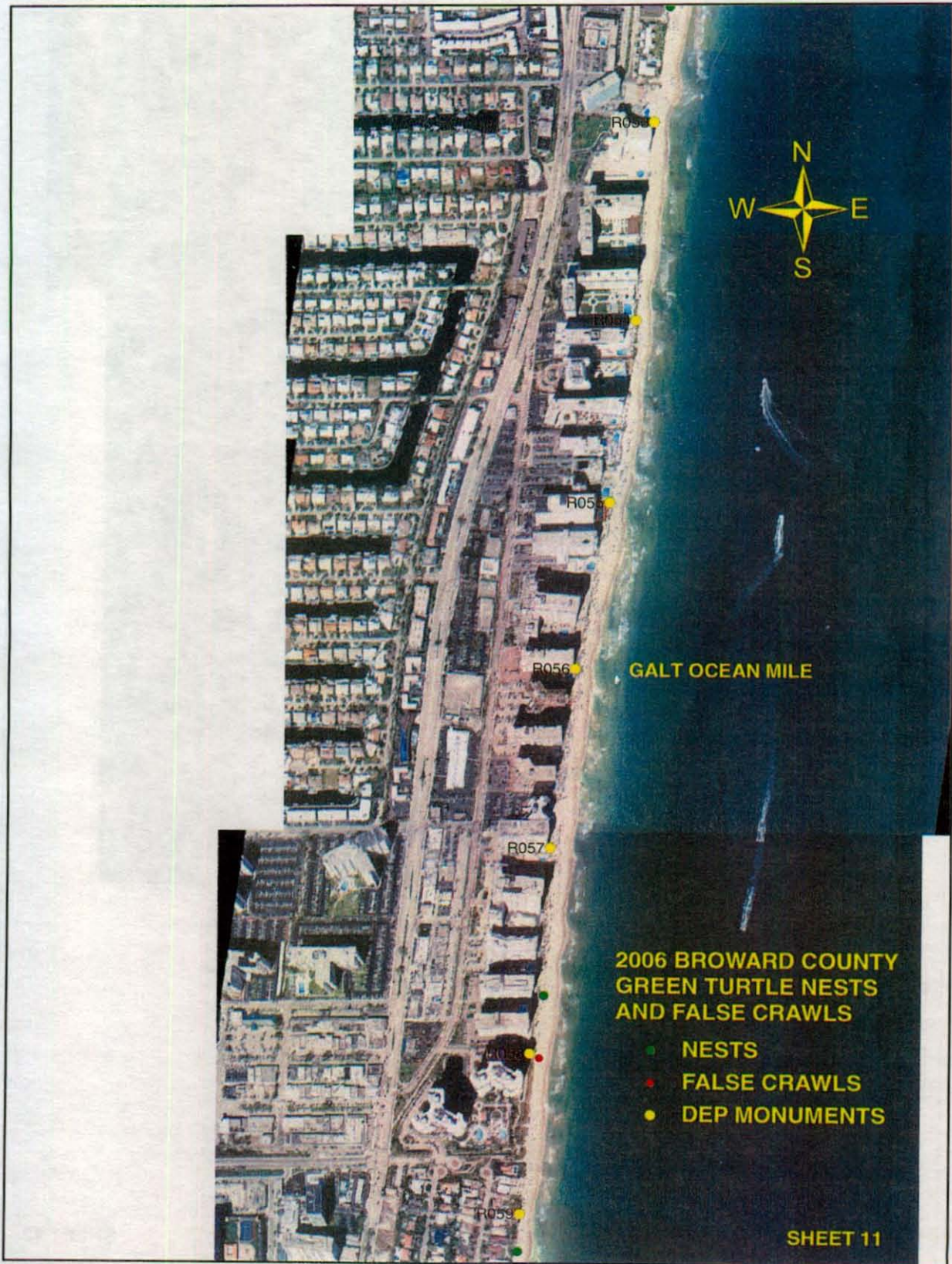
0 420 840 1,680 2,520 3,360 Feet

# GREEN TURTLE NESTS & FALSE CRAWLS

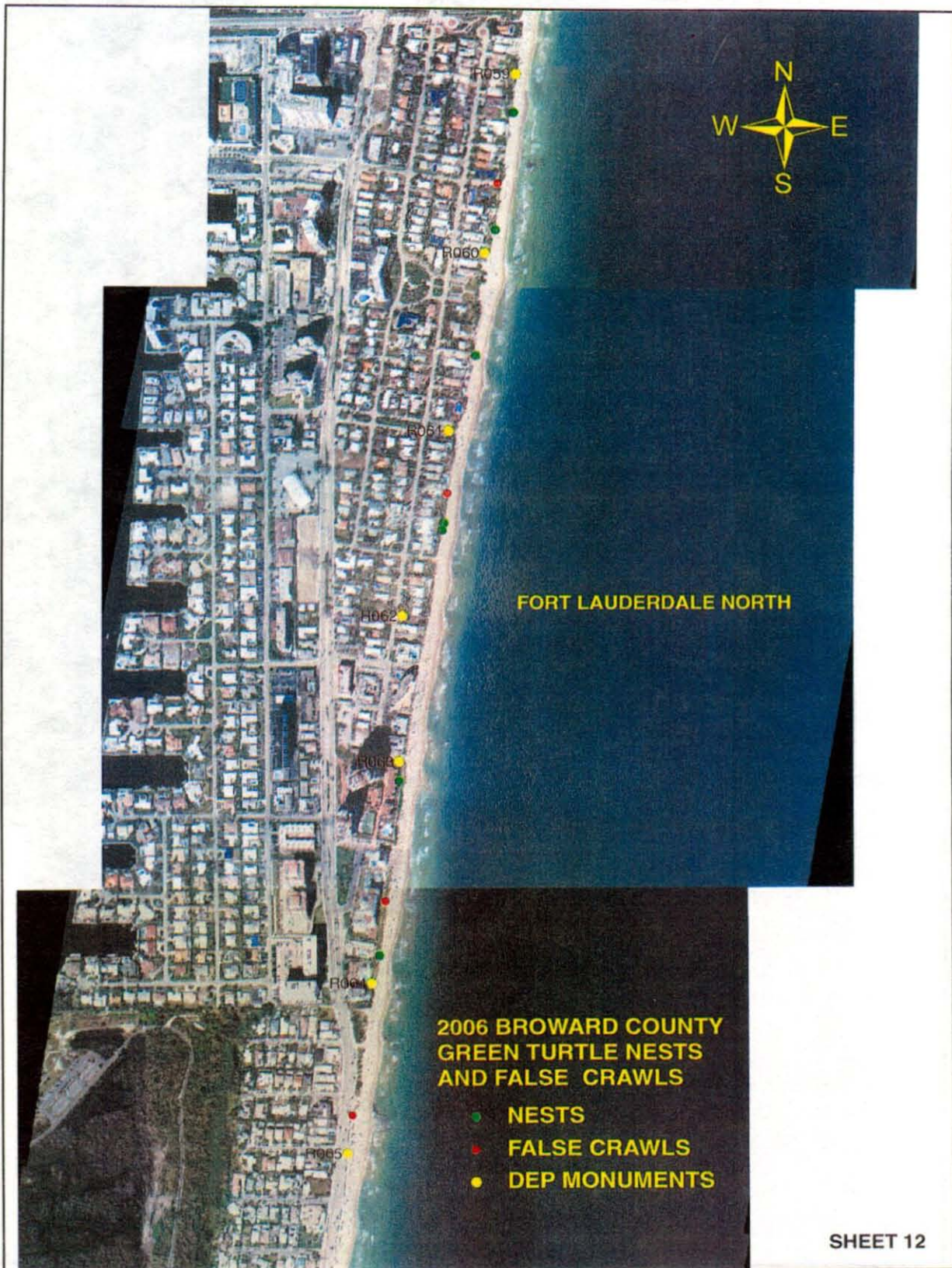




# GREEN TURTLE NESTS & FALSE CRAWLS



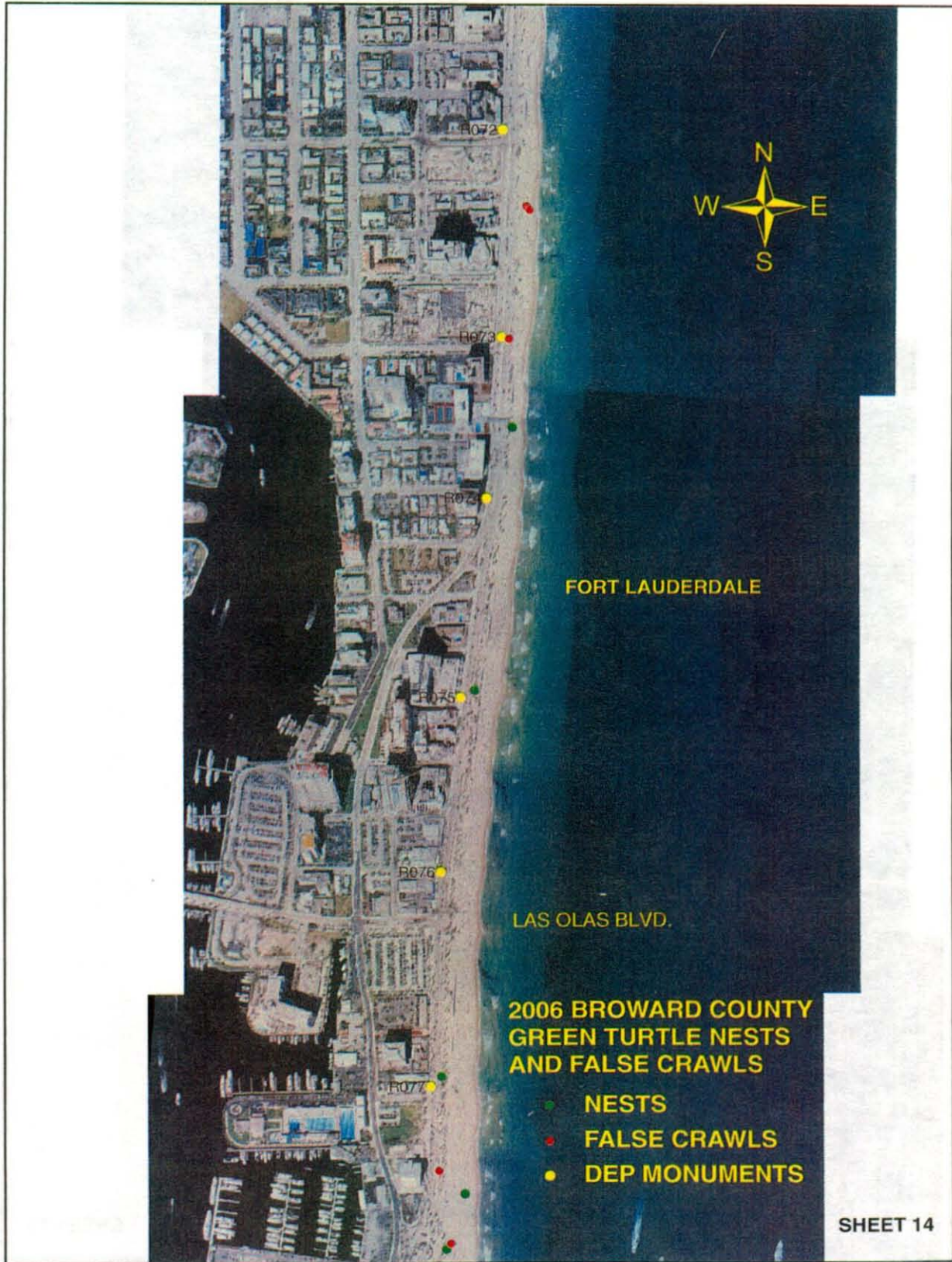
# GREEN TURTLE NESTS & FALSE CRAWLS



# GREEN TURTLE NESTS & FALSE CRAWLS

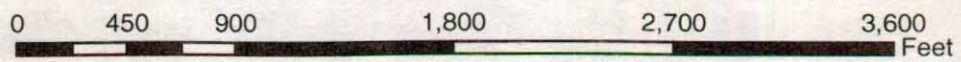
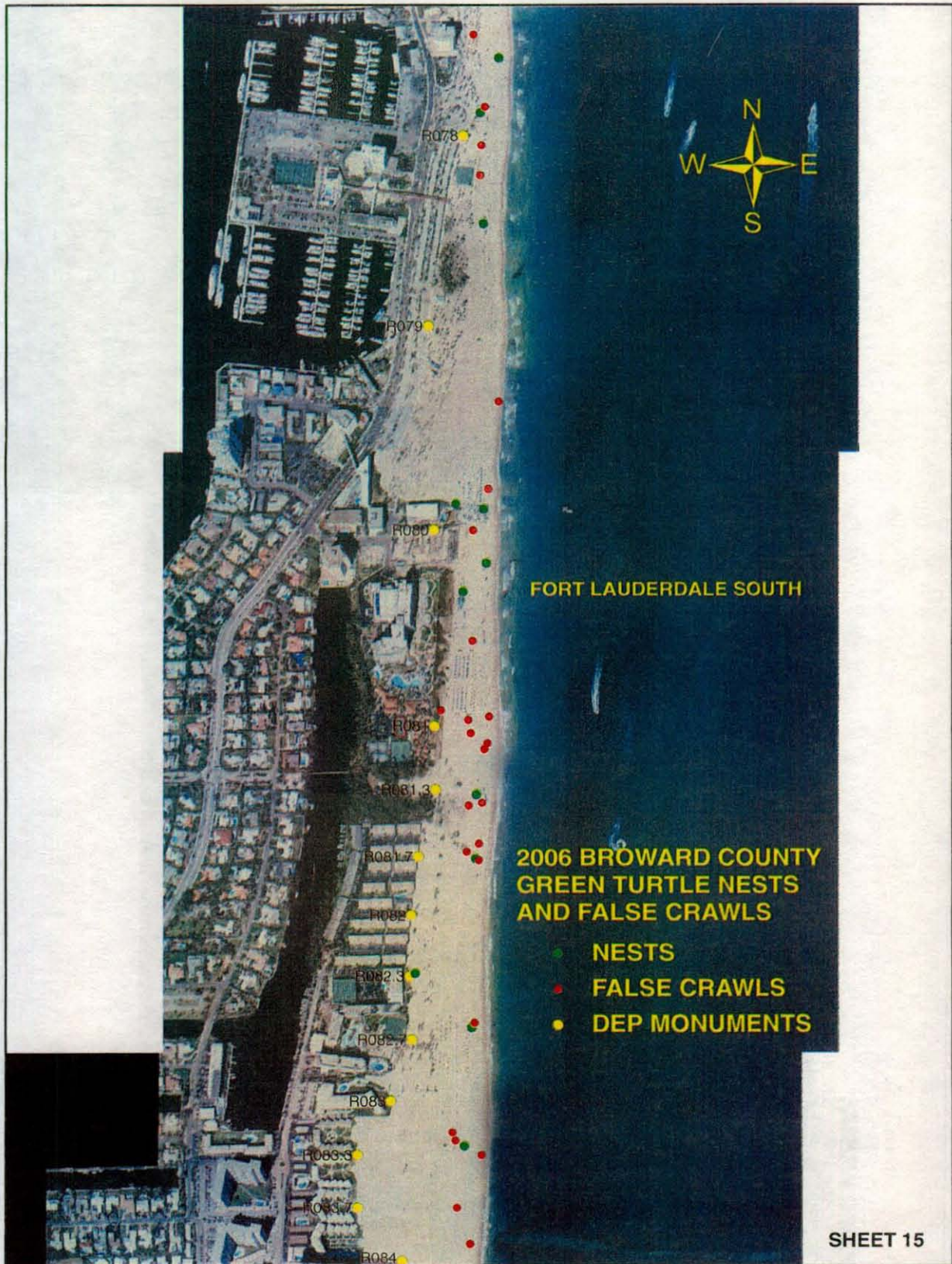


# GREEN TURTLE NESTS & FALSE CRAWLS

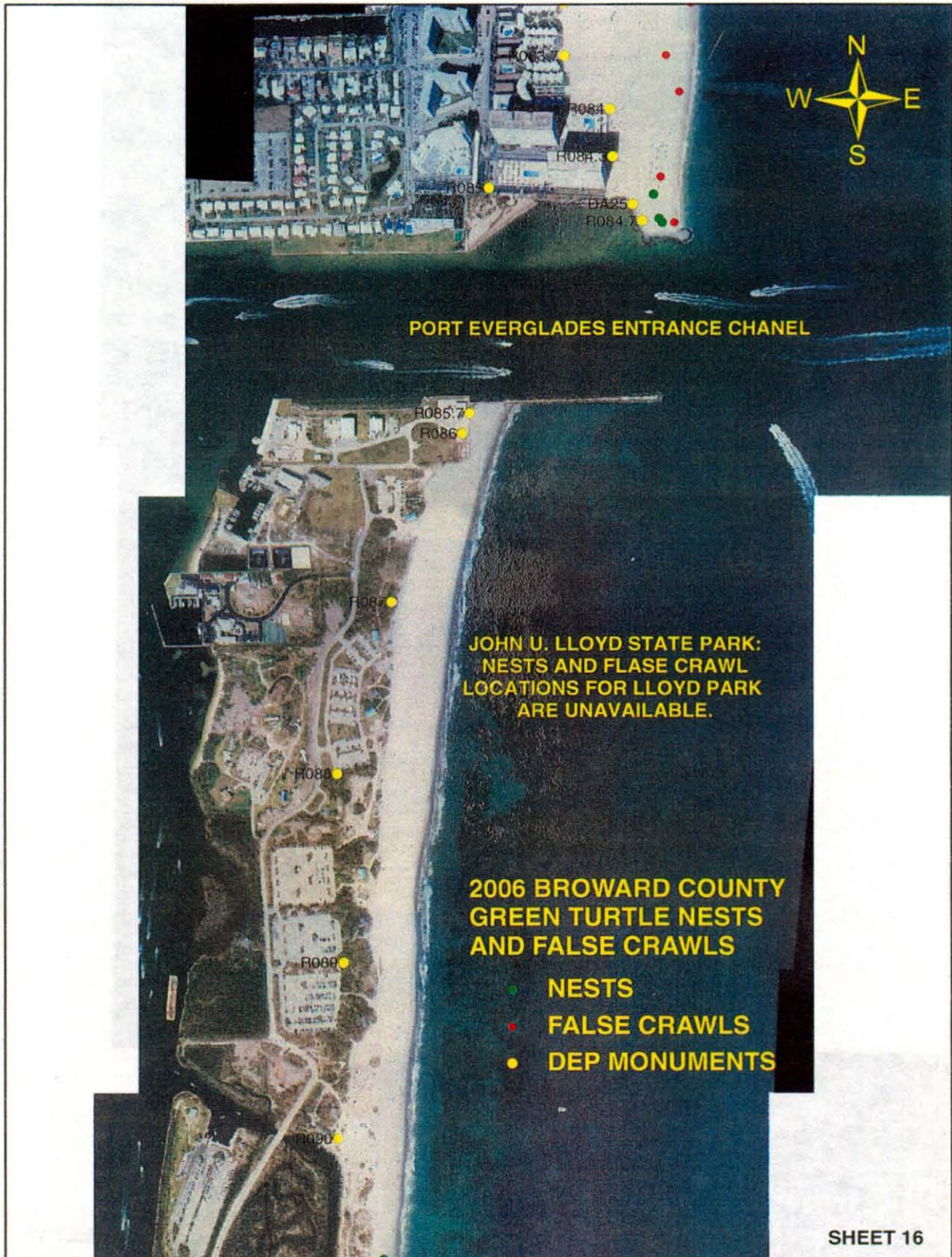


0 435 870 1,740 2,610 3,480 Feet

# GREEN TURTLE NESTS & FALSE CRAWLS

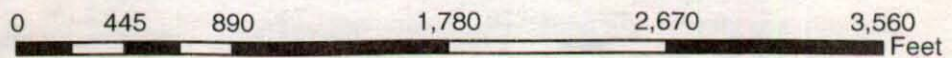
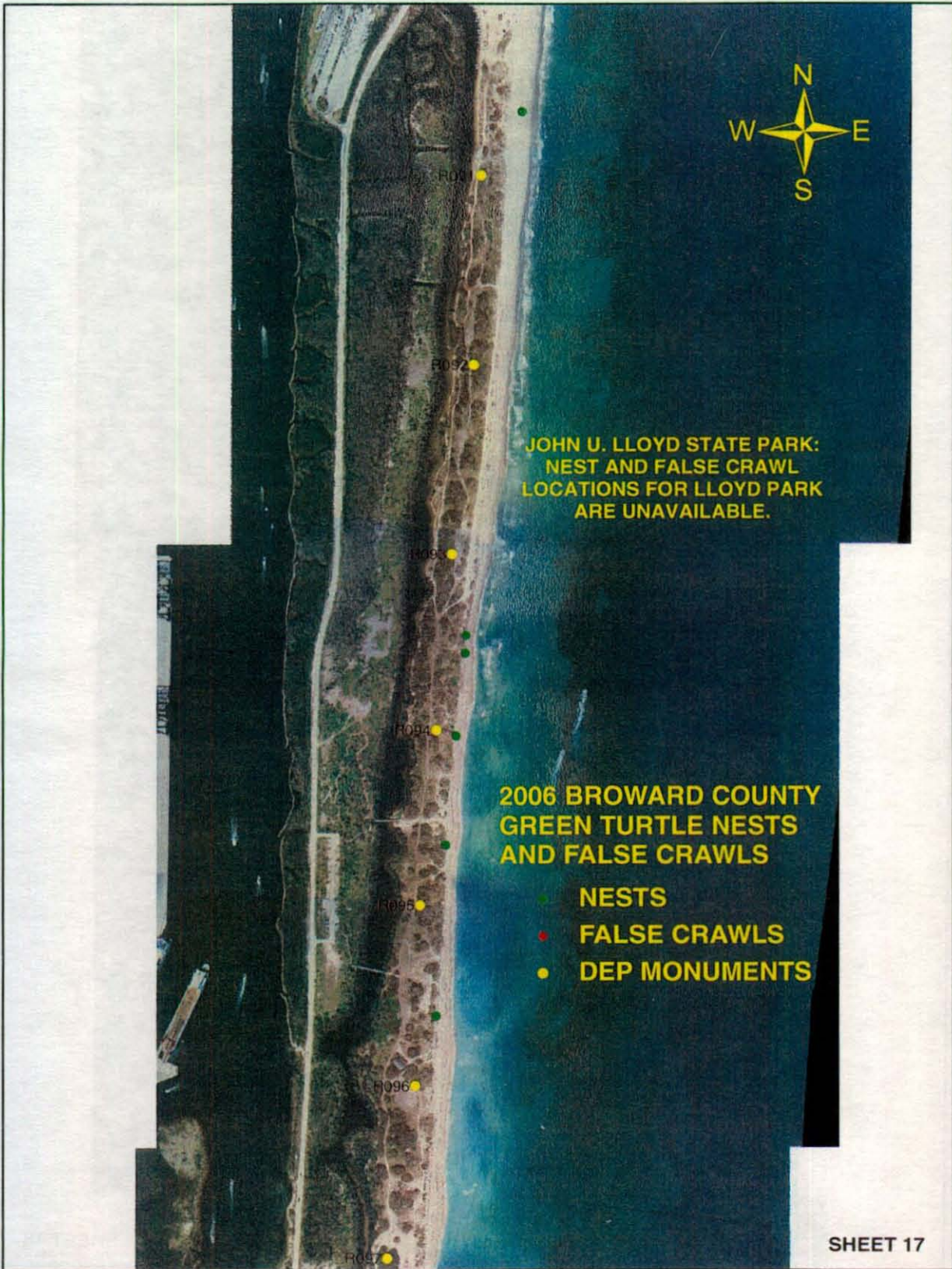


# GREEN TURTLE NESTS & FALSE CRAWLS

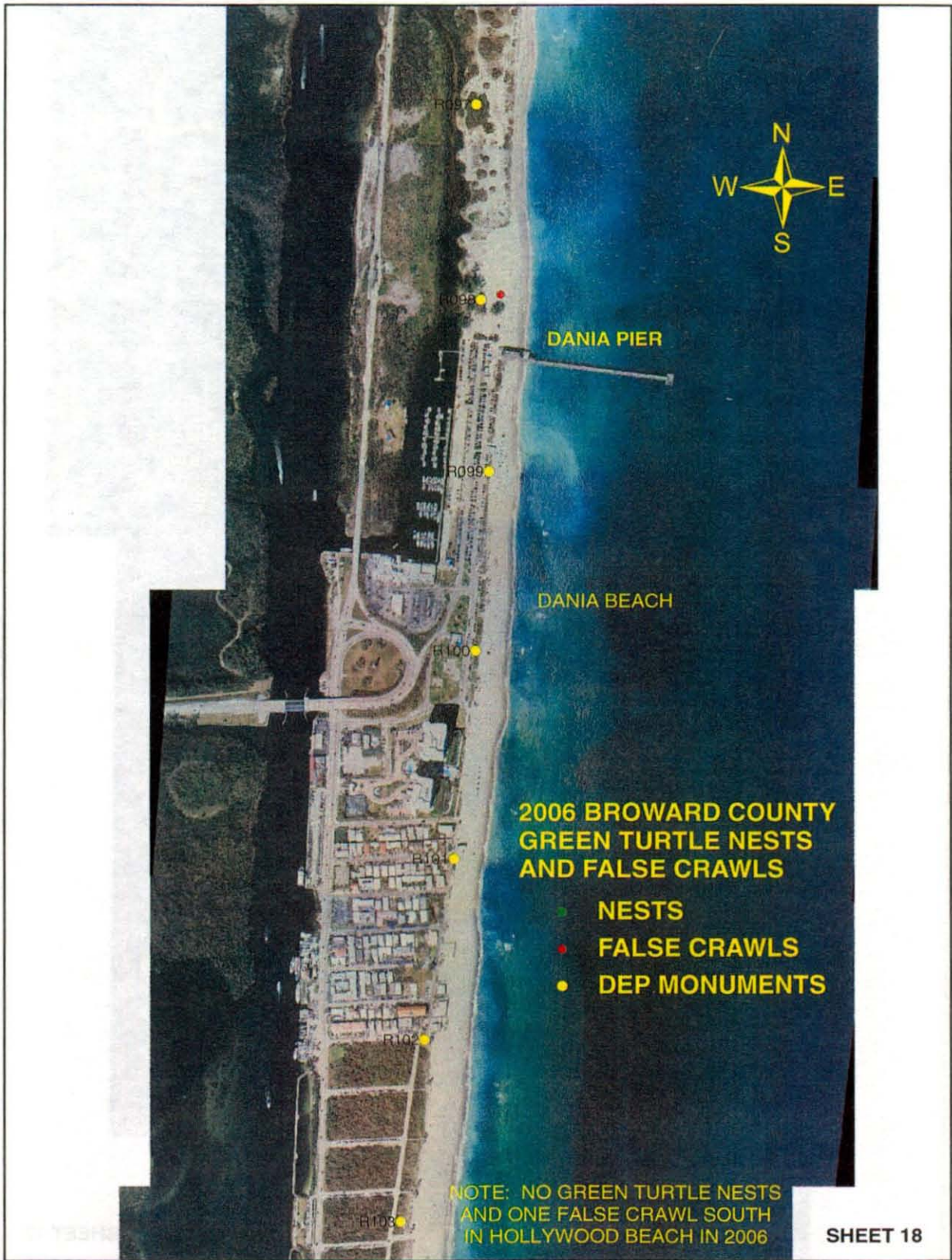


0 465 930 1,860 2,790 3,720 Feet

# GREEN TURTLE NESTS & FALSE CRAWLS



# GREEN TURTLE NESTS & FALSE CRAWLS



0 435 870 1,740 2,610 3,480  
Feet