

RICHARD: HERE IS THE REPORT FROM LAST SUMMER.
I'D BE HAPPY TO DESCRIBE IN DETAIL ANY
OF THE METHODS WE USED.

- KATE

SEA TURTLE MONITORING REPORT
1994

THE CONSERVANCY, INC.
1450 Merrihue Drive
Naples, Florida 33942

Prepared by
Katherine A. Sullivan
and

David S. Addison

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ABSTRACT

The 1994 Sea Turtle Rescue Project recorded 168 nests and 206 false crawls on southern Key Island; 58 nests and 87 false crawls on northern Key Island; and 59 nests and 120 false crawls on Naples Beach. The greatest amount of nesting activity occurred during the month of June. The mean clutch size of these nests was 102 eggs, while the mean incubation period was 67.1 days. Predation rates and damage by flooding was minimal this year, resulting in a mean hatching percentage of 75.7% and the introduction of 18,280 hatchlings into the Gulf of Mexico. A total of 66 individual nesting loggerhead turtles (*Caretta caretta*) were documented on southern Key Island. Thirty of these turtles laid multiple nests on the island, and 22 of them had nested there during previous years. Two green turtle (*Chelonia mydas*) nests were identified this season, one located on southern Key Island and the other on Naples Beach.

INTRODUCTION

The Conservancy is a non-profit environmental organization based in Naples, Florida which has conducted the "Sea Turtle Rescue Project" for the past thirteen years. This program monitors sea turtle nesting activity on Key Island and a segment of Naples Beach, while at the same time, protecting Key Island's nests from predation. This report summarizes the methodology and results of the 1994 project.

The techniques used to monitor the nesting activity and guard against predation have been revised over the years. For example, this was the first season where Naples Beach was patrolled daily. Nests on Naples Beach and North Key Island were also monitored through the hatching season for the first time. Despite such modifications, The Conservancy has compiled comparable data from the past nine years on the number, frequency, and location of nests and false crawls, as well as information regarding clutch sizes, hatching success, and the frequency of individual turtle nesting, as documented by tagging data.

As in previous years, The Conservancy has worked cooperatively with the Florida Department of Environmental Protection (FDEP), participating in their Index Nesting Beach

Survey. The number of nests and false crawls from all three patrolled beaches was also reported to the Collier County Department of Natural Resources (DNR). Lastly, The Conservancy provided the National Marine Fisheries Service (NMFS) with a complete list of turtles which had been tagged during the season.

STUDY AREA

Key Island is a coastal barrier island located just south of Naples and is bounded by the Gulf of Mexico and the Intracoastal Waterway (Fig. 1). Historically, this island has been the location of some of the most intensive loggerhead sea turtle (*Caretta caretta*) nesting activity along the southern west coast of Florida (Charles LeBuff, Caretta Research Inc.; personal communication). It is approximately 7.5 mi. in length and varies from <100 ft. to nearly 1/2 mi. in width.

The Conservancy's field station is situated in the middle of the southern half of the island. The nightly patrols conducted during the 1994 season covered ranged between the 20,200 ft. distance marker and the southern tip of the island (approx. 39,500 ft.). The presence of fallen Australian pines (*Casuarina sequisetifolia*) between 29,700 and 31,500 ft. has reduced the total patrollable area, but most patches of beach suitable for nesting were at least visible.

Daily patrols were also conducted on the northern part of the Key Island. These patrols covered the area from the northern tip of the island to either the 10,500 ft. or 14,500 ft. distance marker, depending upon the tides. The area between 14,500 ft. and 20,200 ft. was not accessible by ATV's due to the fallen Australian pines. This area was so severely obstructed that it was considered to be inaccessible to nesting sea turtles in all but a few

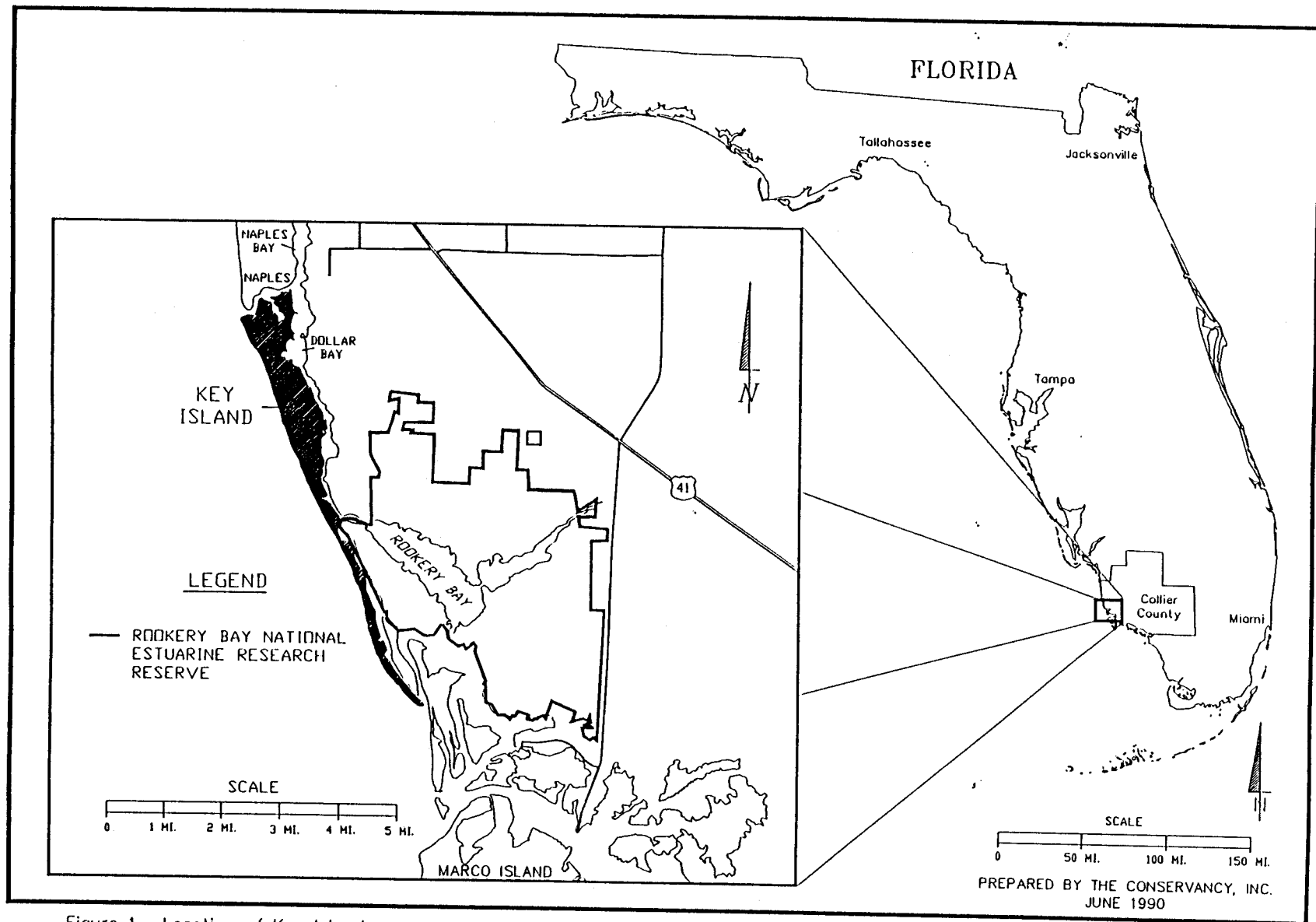


Figure 1. Location of Key Island

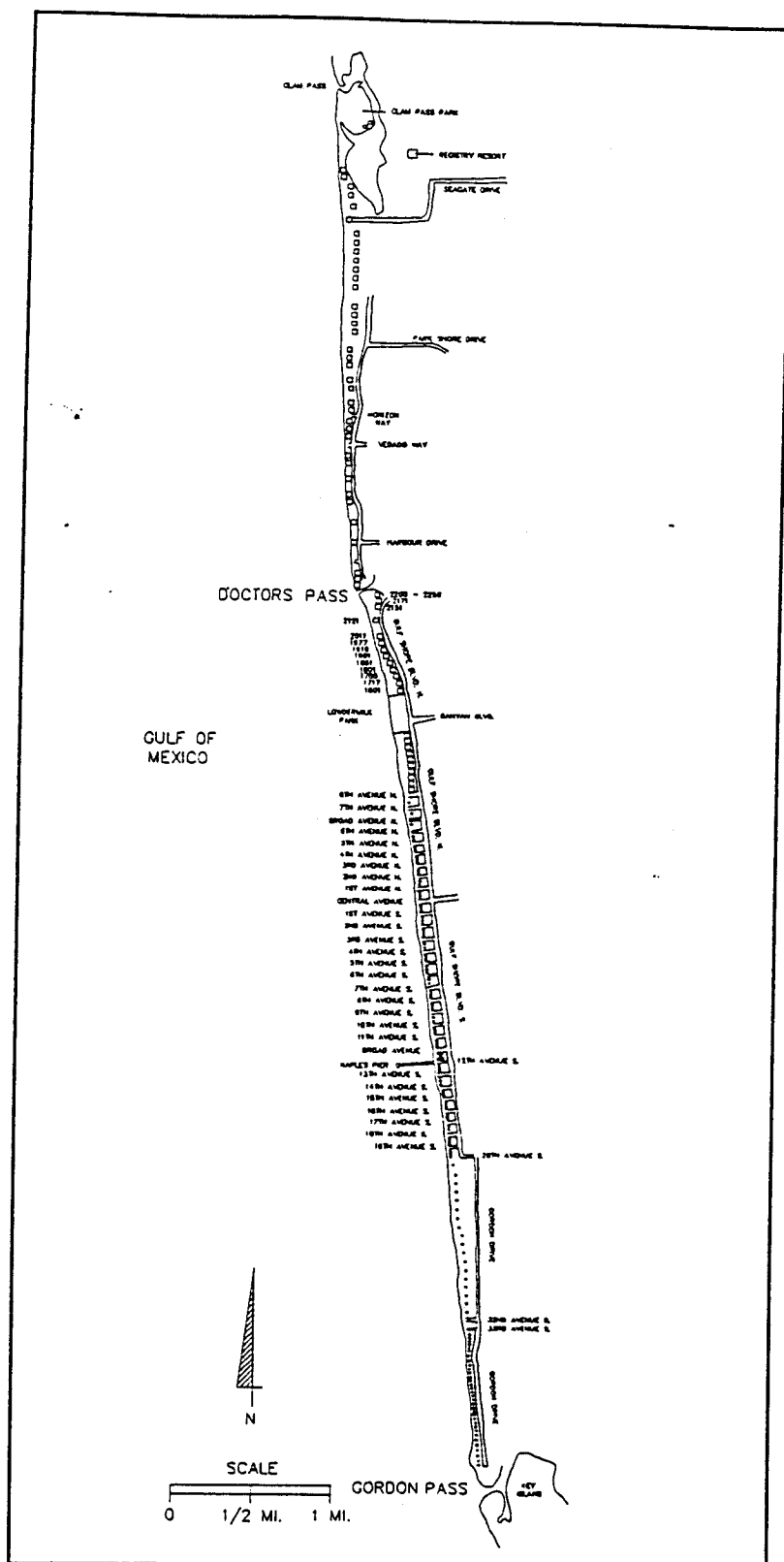
isolated areas. It is therefore likely that only a small percentage of the island's nests were overlooked.

Australian pines are the most readily apparent component of Key Island's floral community. This exotic species has out-competed much of the native vegetation such as sea grapes (*Coccoloba uvifera*) and sea oats (*Uniola paniculata*). The southern most portion of the island is accreting and contains an abundance of native plants; however, Australian pines are rapidly colonizing the northern portion of this accretional area.

A five mile portion of Naples Beach was also patrolled daily. This area extended from Doctors Pass to Gordon Pass (Fig. 2). Approximately half of this beach is bordered by seawalls, while the remainder is enclosed by natural vegetation and residential lawns. Unfortunately, a 1,650 ft. area between 8th Ave. N. and 6th Ave. N. was impassable due to seawalls and rocks. The beach in this area was quite narrow and unsuitable for nesting turtles. It was highly unlikely that any nests were laid in this section.

The suitability of beach habitat for turtle nesting sites depends upon several factors. In addition to vegetative debris and seawalls, sand scarps can also pose a problem for nesting turtles. Scarps were periodically present on both Key Island and Naples Beach throughout the nesting season. These scarps posed a relatively minor role as impediments to nesting compared to fallen Australian pines and seawalls.

Both the Key Island and Naples Beach are composed of quartz sand and shell debris. The sand near the vegetation line is frequently infiltrated with numerous roots. Although the sand containing shell debris and roots is more difficult to dig through, it is uncertain whether substrate composition causes non-nesting emergences on these beaches.



METHODS

The Sea Turtle Rescue Project was conducted by four Conservancy interns and a supervisor. Nightly patrols on southern Key Island required two individuals, while daily patrols of northern Key Island and Naples Beach were completed by one intern. Interns worked on a rotating schedule of two weeks on southern Key Island and one week in Naples. After 15 Aug., monitoring of the beaches for nest hatchings was accomplished by one intern and a supervisor.

Beach Indexing

Prior to the nesting season, the Key Island and Naples beaches were measured using a surveyor's wheel. Based on data from previous years, the northern-most corner post of the old hatchery was used as a distance reference point (28,200 ft.) on the southern half of Key Island. PVC pipe markers were placed at 500 ft. increments, beginning at 20,200 ft. and continuing to 39,200 ft. (Fig. 3). The same procedure was used on the north end of the island. Measurements began at the northern tip of the island (0 ft.), and markers were placed every 500 ft., up to 14,500 ft. (Fig. 3). PVC pipe markers were not used on Naples Beach. Instead, landmarks such as piers and houses were used as markers. Measurements began at Doctors Pass (0 ft.) and commenced at Gordon Pass (28,881 ft.). Landmarks and their respective distances were recorded on a reference sheet (Appendix A).

The beaches were also visually indexed into five sections ranging from the intertidal zone to the dune vegetation. This system was used to reference the type of beach habitat where nests and false crawls occurred. The indices were divided as follows: Index 1 referred to the intertidal zone; Index 2 extended from the intertidal zone to the mean high

THE CONSERVANCY'S SEA TURTLE RESCUE PROJECT

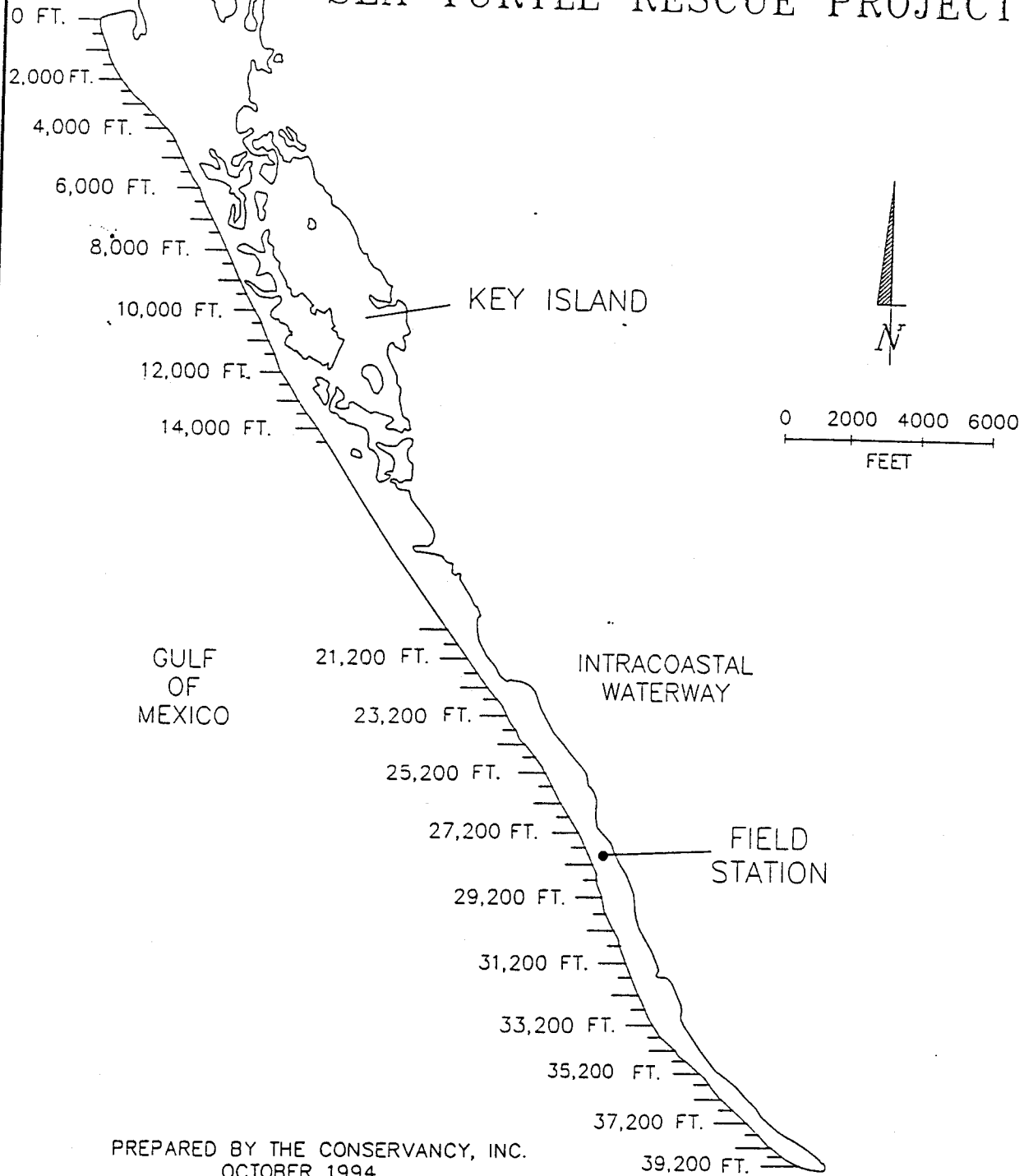


Figure 3. Reference points for nest site locations on Key Island.

tide line; Index 3 described the middle of the beach; Index 4 spanned the area approximately 10 ft. in front of the dune vegetation; and Index 5 referred to the area within the dune vegetation.

The final indexing system used was that of the FDEP's Index Nesting Beach Survey (INBS). The southern half of Key Island was the only beach included in the INBS. The beach was divided into nine 1/2 mi. sections (Fig. 4). Because of fallen Australian pines, index N-1 is no longer accessible. Nests and false crawls above the mean high tide line were recorded on FDEP data forms (Appendix B) and forwarded weekly. In order to adhere to the protocol of this survey, all nests laid before midnight were assigned a nest date of the following day. The survey was conducted between 15 May and 31 Aug. The survey's primary objective is to collect data using a standardized methodology in order to evaluate the status of each species of nesting sea turtle in Florida.

Beach Patrols and Data Collection

Nightly patrols of southern Key Island began on the evening of 14 May and continued until 12 Aug. Patrols began at 9 p.m. and lasted until approximately 5 a.m. the consecutive morning. Occasional "breaks" were necessary because of thunderstorms. Patrols were conducted using Honda four wheel ATV's. Normally, one intern would make a "run" while the other remained at the field station. A "run" consisted of patrolling the beach to the north, and then to the south of the field station. Interns usually repeated this before returning to the field station and alternating patrol shifts.

If an emerged turtle or tracks were discovered during a run, the ATV headlights and engine were immediately turned off. Turtles were not approached unless they were nesting or

THE CONSERVANCY'S SEA TURTLE RESCUE PROJECT

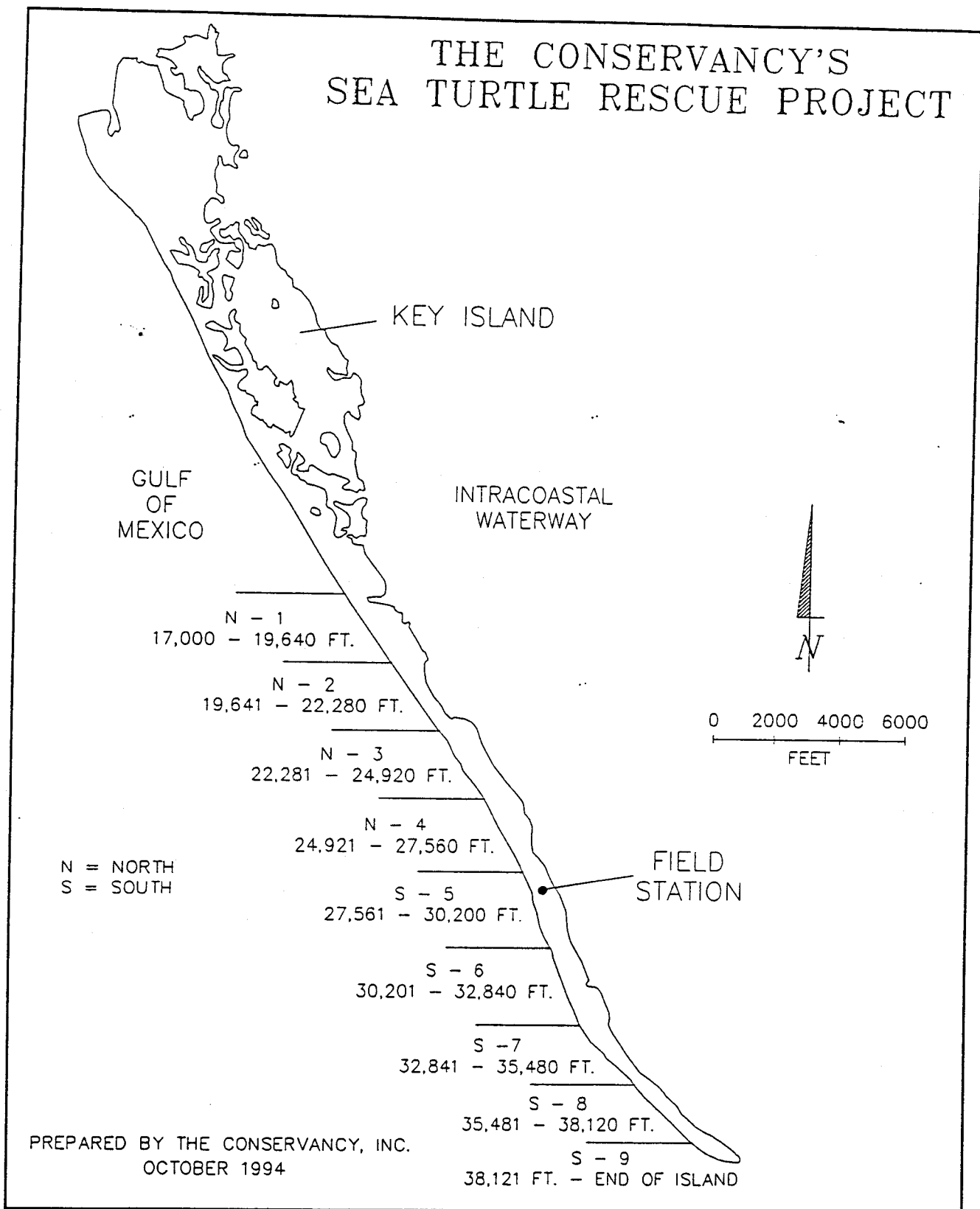


Figure 4. The Florida Department of Environmental Protection's Index Nesting Beach Survey on Key Island.

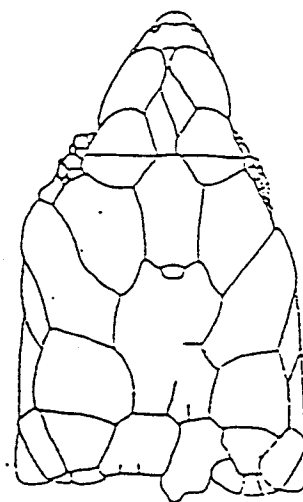
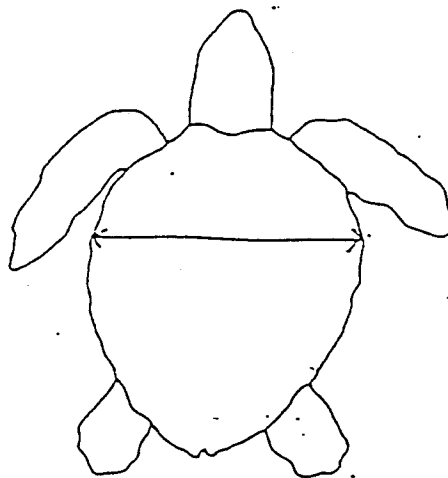
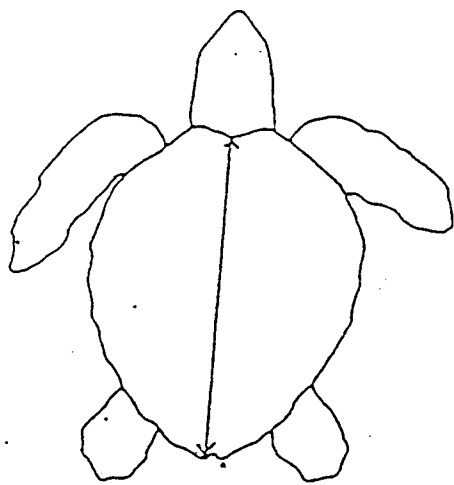
returning to the Gulf. If the tracks indicated a false crawl, or one was witnessed, the data was recorded and the intern continued the patrol. If a nesting turtle was discovered, the intern called the field station (using a cellular telephone) and informed their co-worker of the situation so that that person begin patrolling the beach.

Nesting turtles were approached cautiously and no attempt at data collection was made until egg deposition began. Once the turtle started laying, she was checked for tags and tag scars. If tags were present, the numbers were recorded. If no tags were found, one NMFS inconel tag was applied to each front flipper. Straight carapace lengths and widths were measured using aluminum tree calipers, while curved carapace lengths and widths were recorded using a measuring tape. Measurements were recorded to the nearest 0.5 cm. Both straight and curved lengths were measured from the nuchal scute to the longest posterior marginal scute (Fig. 5). The widths of the carapace were measured across the widest point perpendicular to the longitudinal body axis (Fig. 5). Orbital widths were also recorded, measuring between the outer edges of the pre-frontal scutes (Fig. 5).

Interns paced the distance from the nest to the nearest 500 ft. index marker to estimate its location on the island. The number of paces was converted to feet using the intern's personal pace-to-foot ratio, determined at the beginning of the season by pacing a 100 ft. tape measure three times and averaging the number of paces.

False crawl data was collected in a similar manner; however, turtles were usually not observed. The location was recorded as the point where the turtle stopped and turned back towards the Gulf. An attempt was also made at determining the cause of the false crawl.

Once a nesting turtle returned to the water, the eggs from the nest were located with the aid of a string marker which was placed in the egg chamber as the turtle was depositing



A. Carapace Length Straight Line.
Taken with caliper from the center of the nuchal (precentral) scute to the distal point of the longest posterior marginal (postcentral) scute.

B. Carapace Width Straight Line.
Taken with a caliper at the widest point and perpendicular to the longitudinal body axis.

C. Orbital Width.
Taken with tape measure between outer edges of the prefrontal scutes.

Figure 5. Carapace and orbital measurements

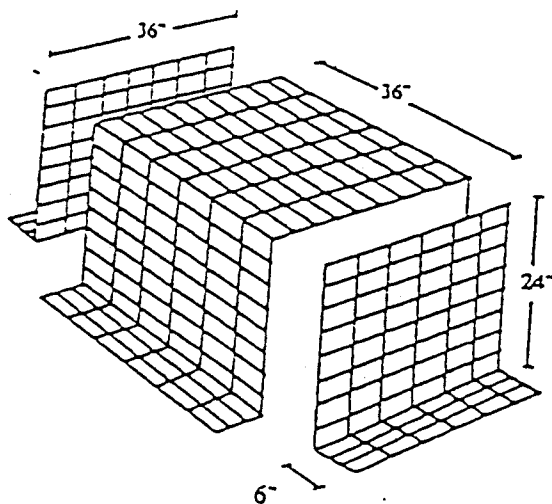


Figure 6. Diagram of cage used to protect nests from predation

her clutch. The eggs were carefully reburied and the center of the egg chamber was marked with either a handprint or a small stick placed in the sand. The nests were then caged *in situ*. These cages had been designed and tested in the latter half of the 1992 season. This was the second season they were used exclusively. The cages were fabricated from 12 or 14 gauge, 2 in. x 4 in. x 36 in. galvanized wire fencing which was assembled into a 36 in. x 36 in. x 24 in. box with 6 in. horizontal flaps around the bottom (Fig. 6). The cages were centered over the egg chamber and buried approximately 12 in. deep. The placement of the cage was critical in preventing persistent raccoons from reaching the eggs from the sides. The 2 in. x 4 in. mesh size also allows newly emerged hatchlings an easy exit. The cages have proven to be effective, self-releasing, anti-predation devices.

FDEP sea turtle nest signs (Appendix C) were used to identify the nests. These cardboard signs were placed in protective plastic baggies and either attached directly to the cage, or attached to a 3 ft. length of PVC pipe and driven into the sand in the corner of a cage. The identification number of the nest, beginning with "N" if the nest was located north of the field station, and "S" if it was to the south, and followed by a chronologically assigned number was recorded on the sign and the PVC pipe. A numbered strip of red surveyor's tape was also tied to the cage and buried in the sand to insure the nest could be identified at a later date.

Occasionally nests had to be relocated because they were either too close to the high tide line or an obstacle prevented cage installation. Eggs were carefully removed from their original nest and placed in a hand-dug egg chamber, where they were reburied and caged. Nests were either relocated to an appropriate location further up on the beach, in line with the original nest site, or moved slightly to the north or south, to a more open area of beach.

The original and relocated nest locations were recorded, as well as the number of eggs which were moved.

All the information regarding the turtles, nests and false crawls was recorded on a standardized data sheet (Appendix D). This data was later computerized using the software LOTUS 1-2-3, 3.1.

Patrols of the northern half of Key Island began the morning of 15 May and were performed daily until 15 Aug. Transportation to the island was provided by the Keewaydin Club ferry. The intern in town for the week was responsible for patrolling this beach as well as Naples Beach. This patrol was normally conducted between 10 a.m. and 12 p.m.; however, later patrols were sometimes necessary. This was the first year an ATV was utilized for these patrols. A Honda four wheel ATV was stored at the Keewaydin Club and used to patrol the beach from the northern tip of the island to either the 10,500 ft. or 14,500 ft. marker, depending upon the tide.

Patrols were conducted to locate nests and false crawls which occurred the previous night. This was evident by the turtle tracks still visible in the sand. If the tracks indicated the presence of a nest, digging was initiated in an attempt to locate the eggs. If the eggs were found, the nest was caged using the aforementioned procedures. Nests were also numbered chronologically and relevant information was recorded on a standardized data sheet (Appendix E) and later computerized.

Most false crawls were obvious, but occasionally a crawl which resembled a nest was discovered, yet after extensive digging, no eggs were found. When this occurred, the area was marked off so it could be monitored for possible predation or hatching. If neither of these occurred it was then confirmed to be a false crawl.

This was also the first year daily ATV patrols of Naples Beach were conducted. The intern responsible for patrolling the northern half of Key Island also patrolled Naples Beach. Patrols began on 15 May and continued until 31 Aug. They were conducted between 7 a.m. and 10 a.m. using a Honda four wheel ATV. As with northern Key Island, these patrols identified false crawls and nests from the previous evening. Unlike Key Island, predation was not a problem on Naples Beach, therefore, cages were not necessary. Nests were marked using four wooden stakes and yellow "caution" tape. Eggs were located and centered within the staked off area. NMFS turtle nest signs were affixed to one of the stakes and the nests were chronologically numbered. As on northern Key Island, suspicious looking false crawls were marked off so the presence or absence of eggs could be confirmed. Data was recorded on forms identical to those used for northern Key Island with the exception of the heading reading "Naples Beach". This data was also computerized.

Nest Hatching

Nests were also monitored for hatching activity. The procedure involved was similar for all three beaches. Every nest was assigned a "check date" - 55 days after the nest date - and was inspected daily after that date was reached (occasionally a day was missed). Nests were monitored for "depressions". A depression resembled a bowl-sized hole in the sand. This usually indicated that most or all of the turtles had hatched and emerged from the nest. If turtle tracks originating from the depression were apparent, the nest was excavated 0 to 3 days following the initial depression. If no tracks were visible, the nest was excavated 0 to 5 days after the depression occurred. If a nest exhibited no depression, it was excavated 75 days after it was laid.

Occasionally fire ants invaded nests and killed some hatchlings. If fire ants were seen in the vicinity of a nest, grits were sprinkled in a circle around the nest in an attempt to deter the ants from invading the nest.

Excavation of a nest entailed removing and dismantling the cage or pulling the stakes surrounding the nest; locating the egg chamber; removing and recording its contents; and reburying the nest. Hatching data was recorded on standardized forms (Appendix F) and included the depression and excavation dates; the number of live and dead hatchlings found; any predation which occurred during or after the hatching; any nest flooding which occurred; the degree of nest shading; the percentage of eggs which hatched; and the number of hatchlings which made it to the Gulf.

When live hatchlings were discovered, they were placed in a bucket under moist sand and covered with a towel. They were kept in a quiet area until that night when they were released into the Gulf. Every attempt was made to release hatchlings on the beach in which they had incubated. Release methodology was in accordance with FDEP marine turtle permit guidelines.

Incubation time was considered to be the number of days between egg deposition and nest depression (i.e. hatchling emergence). The number of hatched eggs was determined by combining the number of live pipped hatchlings with the number of hatched egg shells. The number of unhatched eggs was calculated by adding the number of dead pipped hatchlings to the number of dead or unfertilized eggs. The number of turtles which emerged from the nest was obtained by subtracting the number of live and dead hatchlings found within the nest from the number of hatched egg shells. The number of hatchlings assumed to have entered the Gulf was calculated by subtracting the number of dead hatchlings from the number of

hatched eggs. Hatching percentages were calculated for all nests which were not fully predated. The percentage of eggs which hatched was determined by dividing the number of hatched eggs by the total number of eggs laid. Because of the difficulty involved in counting egg shell fragments, these numbers were not 100% accurate. They were; however, within a 0%-5% error range, as demonstrated by the excavation of relocated nests where the actual number of eggs was known and also on several occasions when all of the hatchlings were found within the nest cavity.

Environmental Factors

Water levels were recorded for five nests on southern Key Island. This was accomplished by using a 4 ft. section of 1.5 in. diameter PVC pipe. The pipe was fitted with caps at both ends and mesh covered a cut-out strip on one side of the pipe, enabling water to flow into the pipe for measurement. A meter stick was inserted within the pipe, and the device was buried approximately 3 ft. Ground cork was placed inside of the pipe, so that the water levels could be read with ease. The water levels were checked daily, from the day of installation to the day each nest was excavated. The depth of the nests, the depth of the water markers, and the daily readings were combined to determine whether the nests had been inundated by water at any time during the season. This information was then compared to the hatching success of these nests.

Daily rainfall levels were also recorded on southern Key Island. These were compared to hatching rates to determine what effect, if any, rainfall had on the hatching success of nests.

RESULTS

Nest and False Crawl Data

Two hundred and eighty-five sea turtle nests and 413 false crawls were recorded as a result of the 1994 Sea Turtle Rescue Project. The breakdown per beach is listed in Table 1.

Table 1. The number of nests and false crawls recorded on southern Key Island, northern Key Island and Naples Beach during the 1994 sea turtle nesting season.

BEACH	TOTAL NUMBER OF NESTS	TOTAL NUMBER OF FALSE CRAWLS
SOUTHERN KEY ISLAND	168	206
NORTHERN KEY ISLAND	58	87
NAPLES BEACH	59	120

Fig. 7 compares this year's totals on southern Key Island with those of the previous nine years. The 1994 season concluded with the second highest number of recorded nests since the beginning of the Sea Turtle Rescue Project. The number of false crawls on southern Key Island fell within the range of the past nine years.

Table 2 compares the 1994 totals on northern Key Island with those from last year, the first year of patrolling this beach. The area patrolled increased by approximately 4,000 ft. in 1994, which to some extent, explains the increase in recorded nesting activity over 1993.

YEARLY NEST AND FALSE CRAWL TOTALS

SOUTHERN KEY ISLAND, 1985-1994

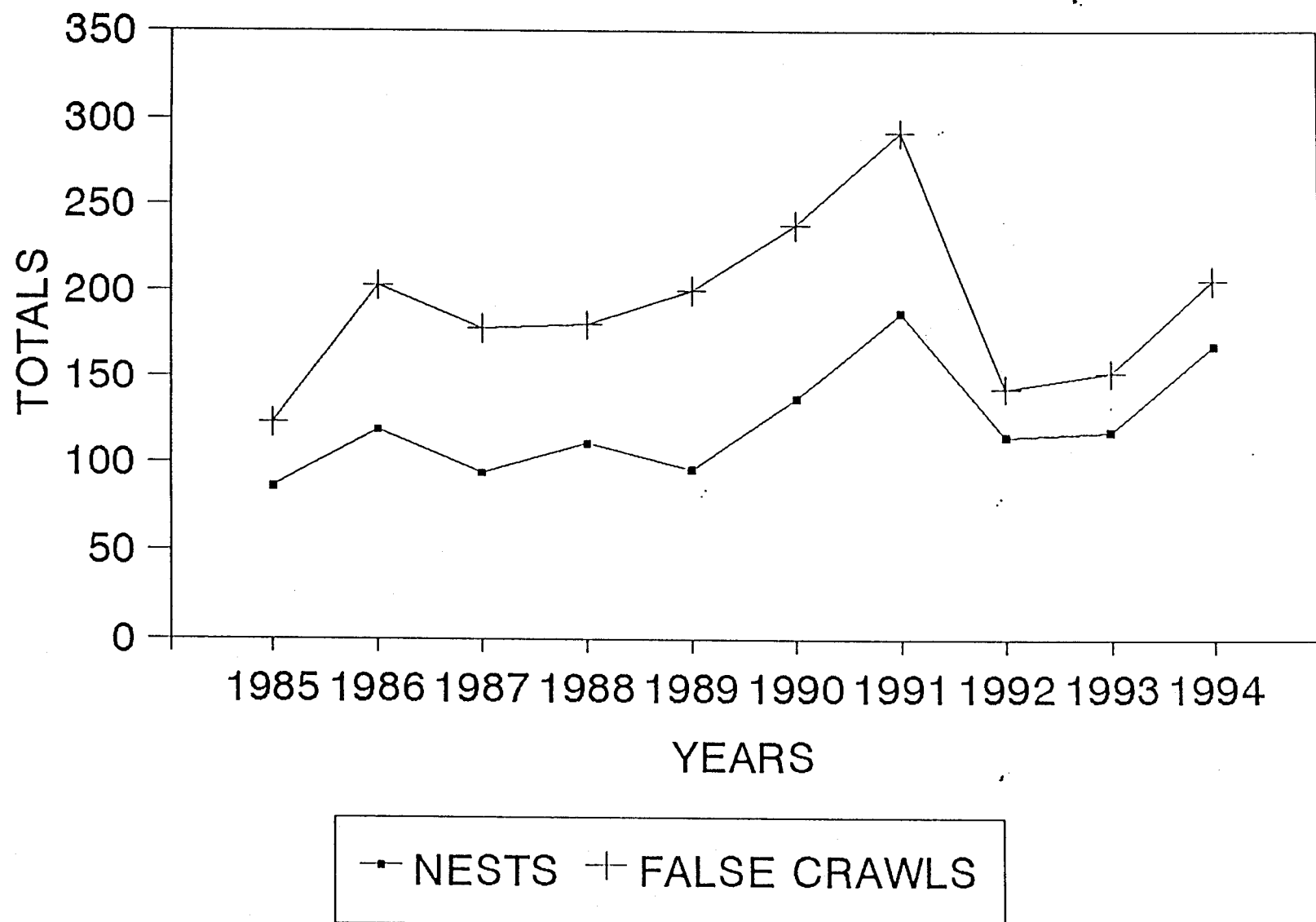


FIGURE 7

Table 2. The number of nests and false crawls recorded on northern Key Island during the 1993 and 1994 sea turtle nesting seasons.

YEAR	TOTAL NUMBER OF NESTS	TOTAL NUMBER OF FALSE CRAWLS	NUMBER OF UNIDENTIFIED CRAWLS
1993	37	43	2
1994	58	87	0

Table 3 lists the nesting activity totals from Naples Beach for the past five years. The data from 1990 to 1993 was obtained via the "Turtle Hotline", while the totals from 1994 were the product of daily beach patrols. This year's high numbers were partially the result of the change in methods, rather than a reliable indication of increased turtle activity on this beach.

Table 3. The number of nests and false crawls recorded on Naples Beach (Doctors Pass to Gordon Pass) from 1990 to 1994.

YEAR	TOTAL NUMBER OF NESTS	TOTAL NUMBER OF FALSE CRAWLS	NUMBER OF UNIDENTIFIED CRAWLS
1990	22	8	1
1991	19	23	1
1992	15	13	8
1993	17	22	9
1994	59	120	0

The overall nest-to-false crawl ratio for the 1994 season was 0.68:1. The ratios for southern Key Island, northern Key Island, and Naples Beach were 0.79:1, 0.67:1, and 0.49:1, respectively. Fig. 8 compares the nest-to-false crawl ratios of southern Key Island

YEARLY NEST TO FALSE CRAWL RATIOS

SOUTHERN KEY ISLAND, 1985-1994

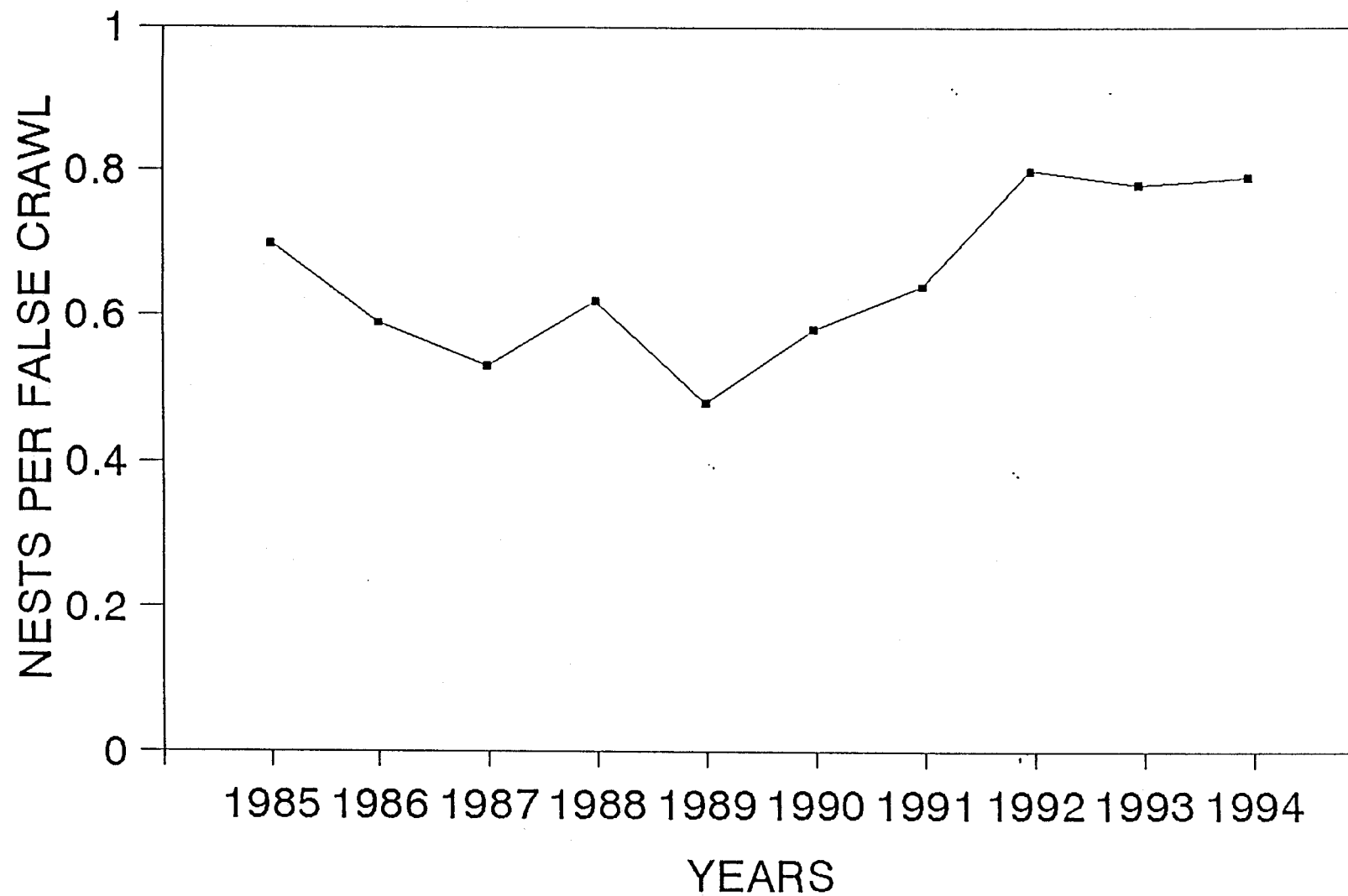


FIGURE 8

from 1985 through 1994. This year's ratio is similar to those from 1992 and 1993, and slightly higher than those from the previous seven years.

Fig. 9 represents the total number of nests and false crawls which occurred during the months of May through Aug. Nesting activity peaked in the month of June, followed closely by July. False crawls were the most frequent in June also, but by a greater margin. The breakdown of monthly nesting activity for each beach is included in Table 4.

Table 4. The number of nests and false crawls recorded on southern Key Island, northern Key Island, and Naples Beach during the months of May through August.

		BEACHES		
		SOUTHERN KEY ISLAND	NORTHERN KEY ISLAND	NAPLES BEACH
MAY	# OF NESTS	29	6	13
	# OF F.C.	45	15	29
JUNE	# OF NESTS	72	27	25
	# OF F.C.	105	48	50
JULY	# OF NESTS	56	23	20
	# OF F.C.	55	23	40
AUGUST	# OF NESTS	6	2	1
	# OF F.C.	1	1	1

Fig. 10 illustrates the geographical distribution of nests and false crawls located on southern Key Island. Nests were distributed somewhat evenly, peaking in the 25,000 ft. and 35,000 ft. areas, and decreasing at the extreme southern end of the island and between 29,000 and 31,000 ft., an area containing considerable numbers of fallen Australian pines. False crawl activity was more irregular, occurring at high rates in areas characterized by fallen Australian pines (29,000 ft.) and narrow beach spans (27,000 ft.), as well as open and

1994 MONTHLY NESTING ACTIVITY

COMBINED TOTALS FROM S.KEY ISLAND, N.KEY ISLAND, AND NAPLES BEACH

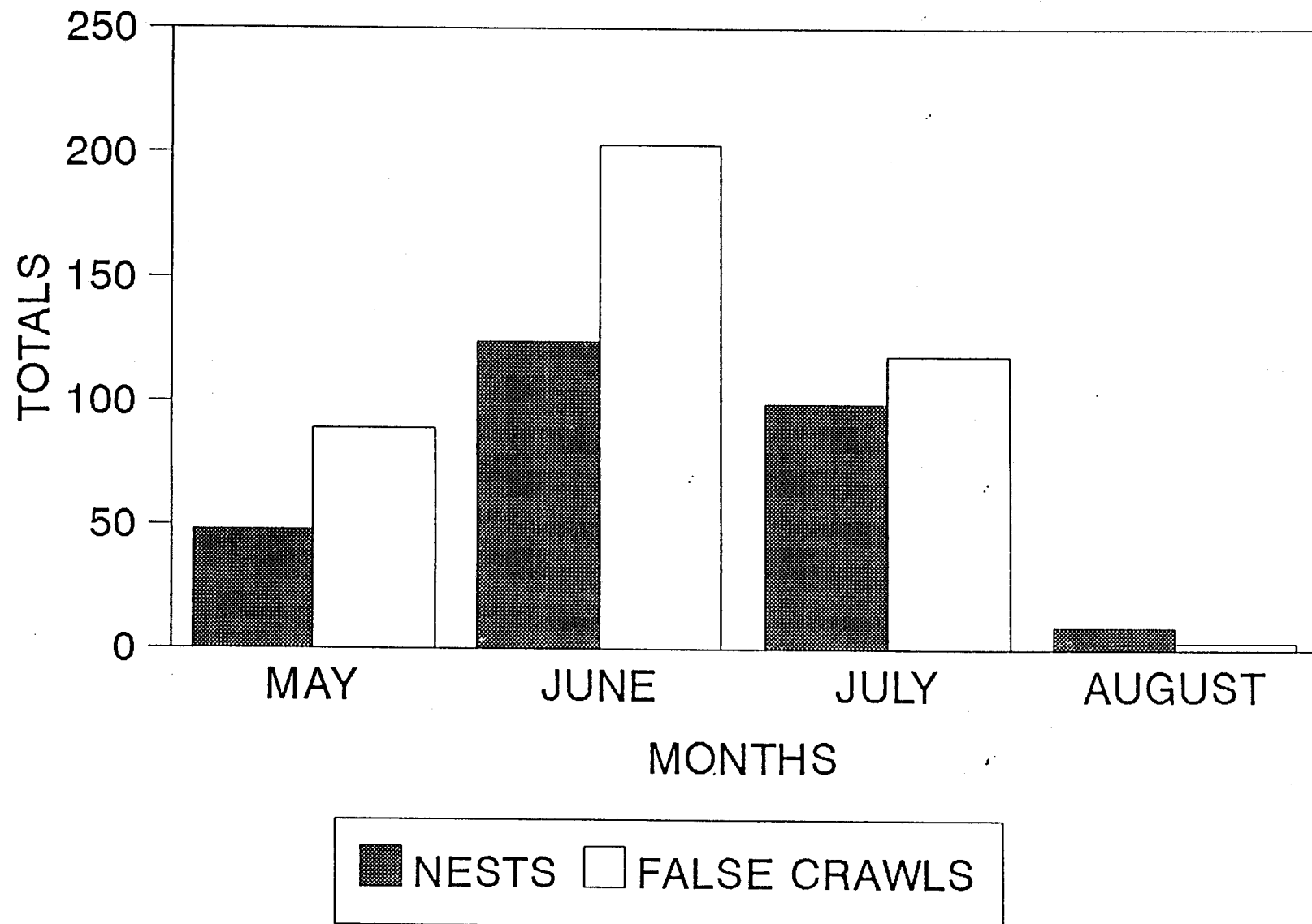


FIGURE 9

NEST AND FALSE CRAWL GEOGRAPHICAL DISTRIBUTION

SOUTHERN KEY ISLAND, 1994

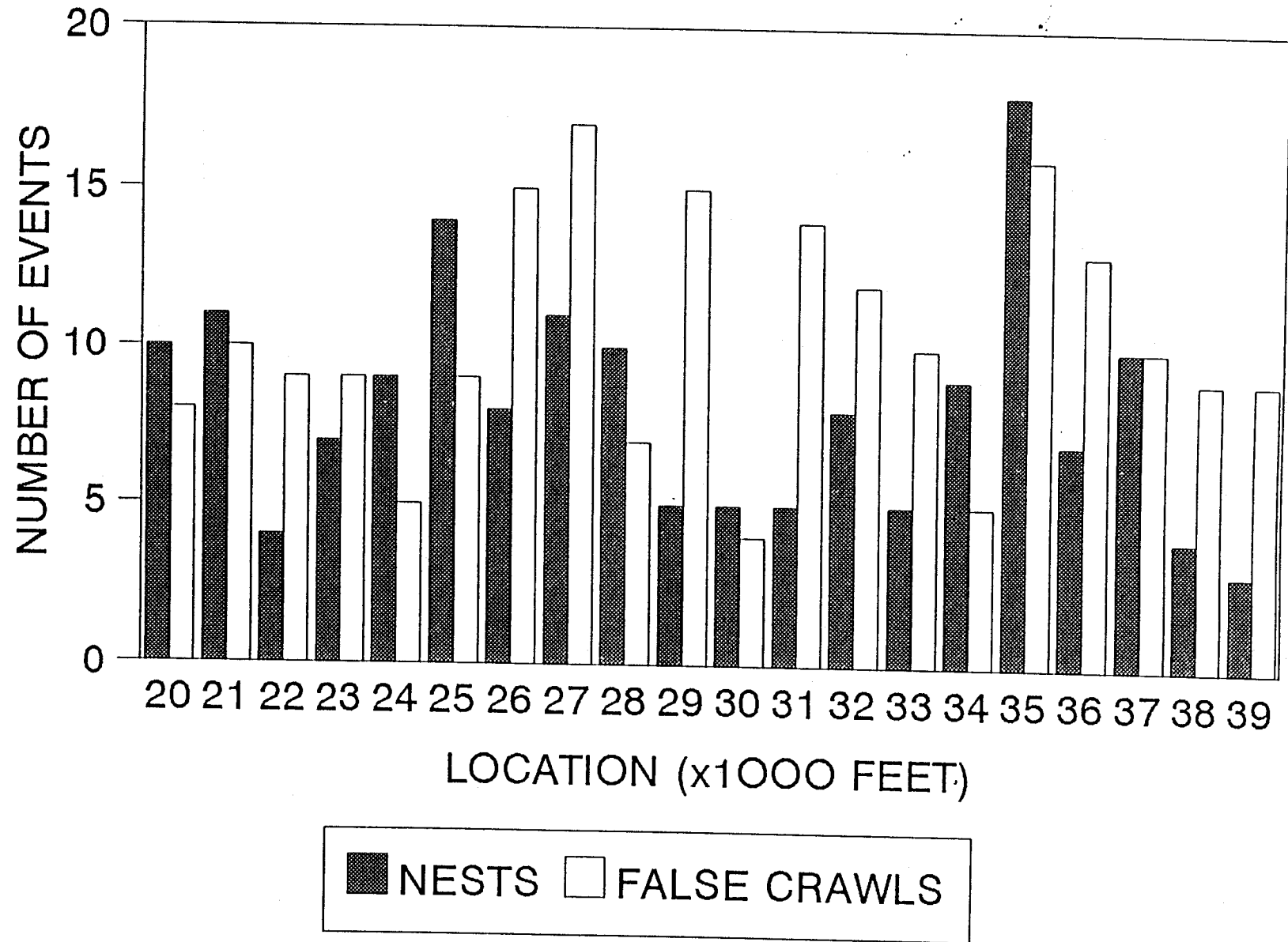


FIGURE 10

expansive beach areas (35,000 ft.).

Figs. 11 and 12 present the equivalent information regarding northern Key Island and Naples Beach. Nests on northern Key Island were also fairly evenly distributed. Their numbers peaked between 4,000 and 7,000 ft., and dwindled around 9,000 ft. and 15,000 ft., areas littered with fallen Australian pines. False crawls were most frequent near the 1,000 ft. and 9,000 ft. areas, due to the presence of a high scarp and fallen Australian pines, respectively. On Naples Beach, nests were almost non-existent between 5,000 and 15,000 ft., an area of narrow beaches and seawalls. Conversely, false crawls occurred at the highest rate within this same area. Nests and false crawls were not apparent between 6,000 and 8,000 ft. because the majority of this area was not patrolled due to almost daily inundation by tides. No activity was recorded in the 21,000 ft. area due to a misinterpretation of the distance reference sheet. This error was not discovered until after the nesting season had concluded. Of the 376 total emergences (168 nests + 206 false crawls) on southern Key Island, 55.1% were observed ($n=207$). One hundred and thirty-nine (82.7%) of the nesting emergences were observed, while only 68 (33.0%) of the false crawls were sighted. These percentages were similar to those reported from past years.

Fig. 13 reveals the hourly distribution of sightings on southern Key Island. This data represents the time at which an emerged turtle or the resulting tracks were observed. Nesting activity was rather consistent through the night, being lower before 2200 hours and after 0400 hours. False crawls occurred at the greatest frequency between 0 and 0300 hours.

Appendices G, H, and I contain the nesting data collected from southern Key Island, northern Key Island, and Naples Beach, respectively. Appendices J, K, and L present the equivalent data regarding false crawls occurring on the three beaches, respectively.

NEST AND FALSE CRAWL GEOGRAPHICAL DISTRIBUTION

NORTHERN KEY ISLAND, 1994

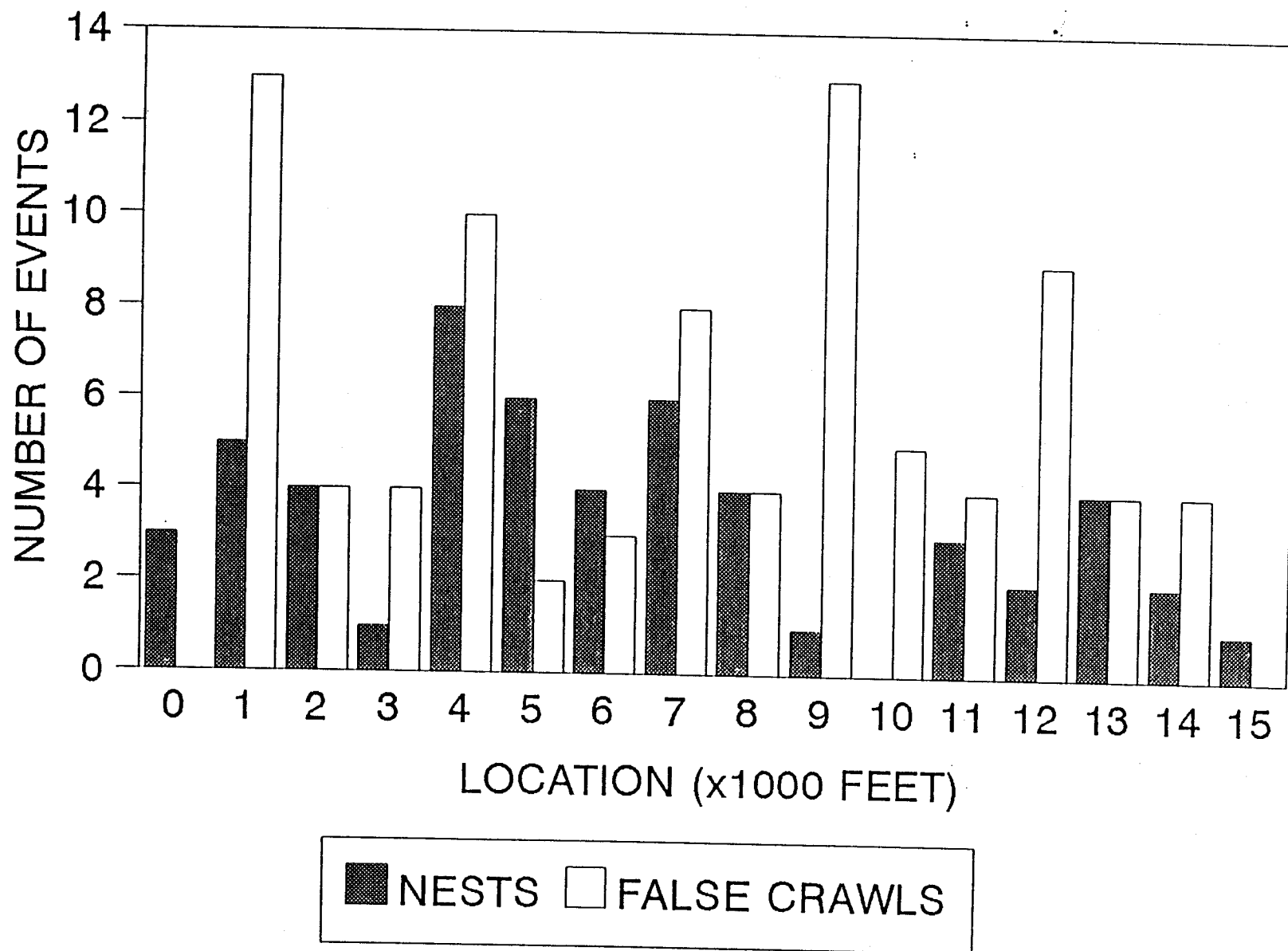


FIGURE 11

NEST AND FALSE CRAWL GEOGRAPHICAL DISTRIBUTION

NAPLES BEACH, 1994

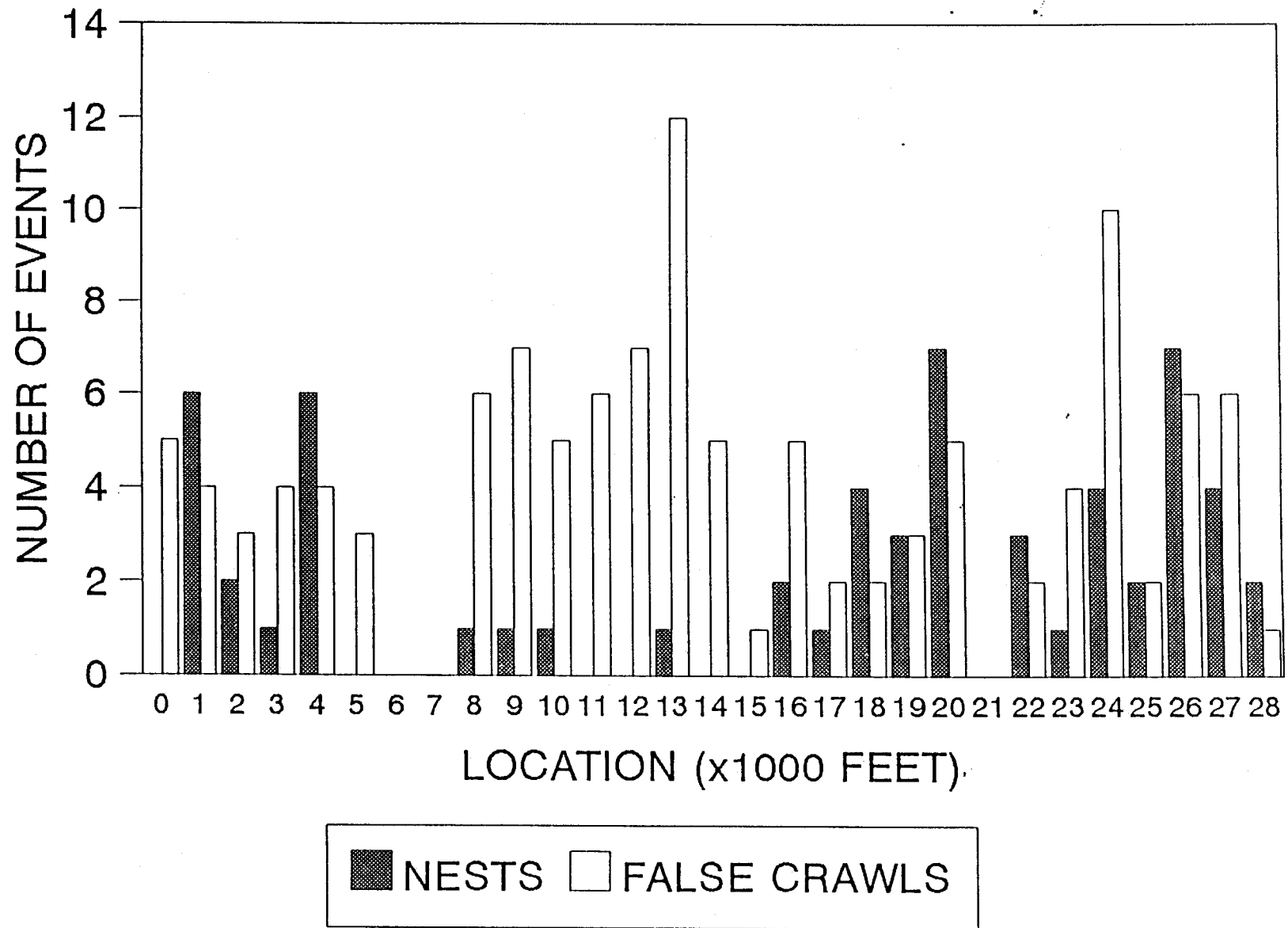


FIGURE 12

NEST AND FALSE CRAWL HOURLY DISTRIBUTION

SOUTHERN KEY ISLAND, 1994

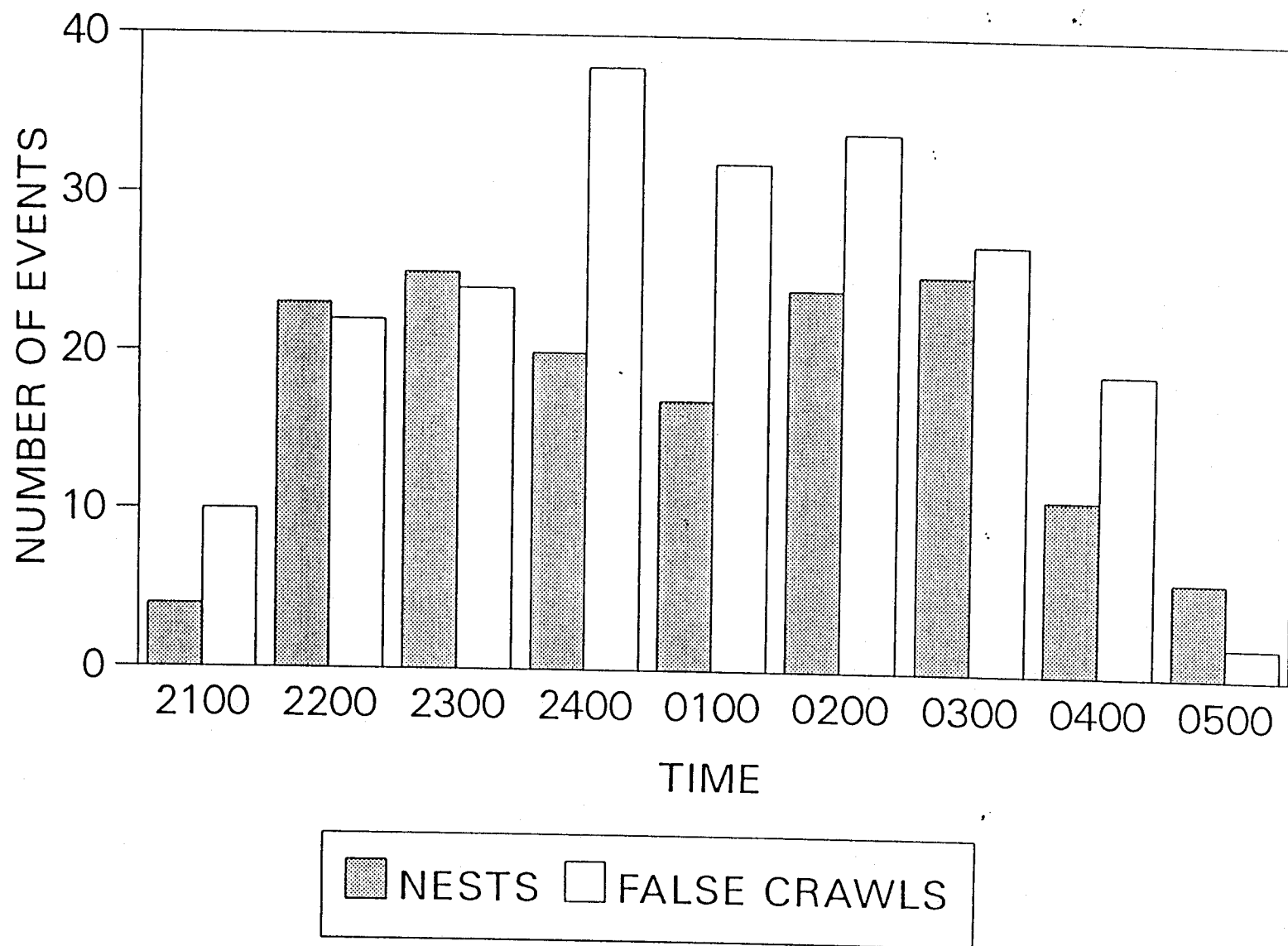


FIGURE 13

Turtle Data

For the first time since the onset of the Sea Turtle Rescue Project, green turtle (*Chelonia mydas*) nests were identified. A nesting green turtle was observed on southern Key Island, and a green turtle nest on Naples Beach was confirmed upon hatching. These nests were laid within three days of each other. Since the mean inter-nesting period of green turtles is approximately 12-14 days, it was assumed that these nests were the products of two separate turtles. Data regarding these nests is included among the nesting data of Appendices G and I. All the other nests were identified as loggerhead turtle nests.

Tagging data revealed that 66 different loggerhead turtles were observed during the 1994 season. Of these turtles, 30 were multiple-nesters, while 36 were observed only nesting once. The mean inter-nesting period for multiple-nesters was 14.5 days (range = 9-39 days). The typical inter-nesting period was 10 to 12 days, however. Multiple-nesters with an inter-nesting period greater than 18 days most likely either nested on Key Island again, without being observed, or nested on a different beach between their visits to the island. The mean number of nests laid by these multiple-nesters was 3.3 (range = 2-6 nests). A total of 22 turtles were identified as nesters from previous years on southern Key Island. Seventeen of these returnees were multiple-nesters in 1994. Twenty-seven nesting turtles were either not observed or unidentified. As previously mentioned, it is possible that some of these turtles were tagged multiple-nesters. It is also feasible that each of these turtles may have been a new nester on southern Key Island, resulting in a total of 93 nesting females. The actual number, however, is most likely somewhere between 66 and 93 turtles. Appendix M summarizes the nesting data compiled on these tagged turtles.

Turtle Data

For the first time since the onset of the Sea Turtle Rescue Project, green turtle (*Chelonia mydas*) nests were identified. A nesting green turtle was observed on southern Key Island, and a green turtle nest on Naples Beach was confirmed upon hatching. These nests were laid within three days of each other. Since the mean inter-nesting period of green turtles is approximately 12-14 days, it was assumed that these nests were the products of two separate turtles. Data regarding these nests is included among the nesting data of Appendices G and I. All the other nests were identified as loggerhead turtle nests.

Tagging data revealed that 66 different loggerhead turtles were observed during the 1994 season. Of these turtles, 30 were multiple-nesters, while 36 were observed only nesting once. The mean inter-nesting period for multiple-nesters was 14.5 days (range = 9-39 days). The typical inter-nesting period was 10 to 12 days, however. Multiple-nesters with an inter-nesting period greater than 18 days most likely either nested on Key Island again, without being observed, or nested on a different beach between their visits to the island. The mean number of nests laid by these multiple-nesters was 3.3 (range = 2-6 nests). A total of 22 turtles were identified as nesters from previous years on southern Key Island. Seventeen of these returnees were multiple-nesters in 1994. Twenty-seven nesting turtles were either not observed or unidentified. As previously mentioned, it is possible that some of these turtles were tagged multiple-nesters. It is also feasible that each of these turtles may have been a new nester on southern Key Island, resulting in a total of 93 nesting females. The actual number, however, is most likely somewhere between 66 and 93 turtles. Appendix M summarizes the nesting data compiled on these tagged turtles.

Hatching Data

The overall mean hatching rate for the 1994 season was 75.7%. The individual mean hatching percentages were 81.2% on southern Key Island, 51.9% on northern Key Island, and 75.5% on Naples Beach. The two green turtle nests produced hatching rates of 98.5% and 86.9%. Fig. 14 compares this year's mean hatching rate on southern Key Island to those from 1990 through 1993, the years in which nests were not relocated to a hatchery. The 1994 season produced the highest mean hatching rate of these five years. This was the first year hatching data was compiled for northern Key Island and Naples Beach; therefore, no comparisons could be made.

Several factors dictate the success of sea turtle nests. The three most detrimental factors appear to be nest flooding, predation, and root invasion. When nests affected by these factors ($n = 72$) were excluded, the overall mean hatching percentage rose to 86.2%, and the percentages for the three beaches rose to 88.0%, 81.0%, and 83.8%, respectively. Table 5 lists the number of nests on each beach which were affected by predation, flooding, and root inundation, along with their coordinating mean hatching percentages.

YEARLY MEAN HATCHING PERCENTAGES

SOUTHERN KEY ISLAND, 1990-1994

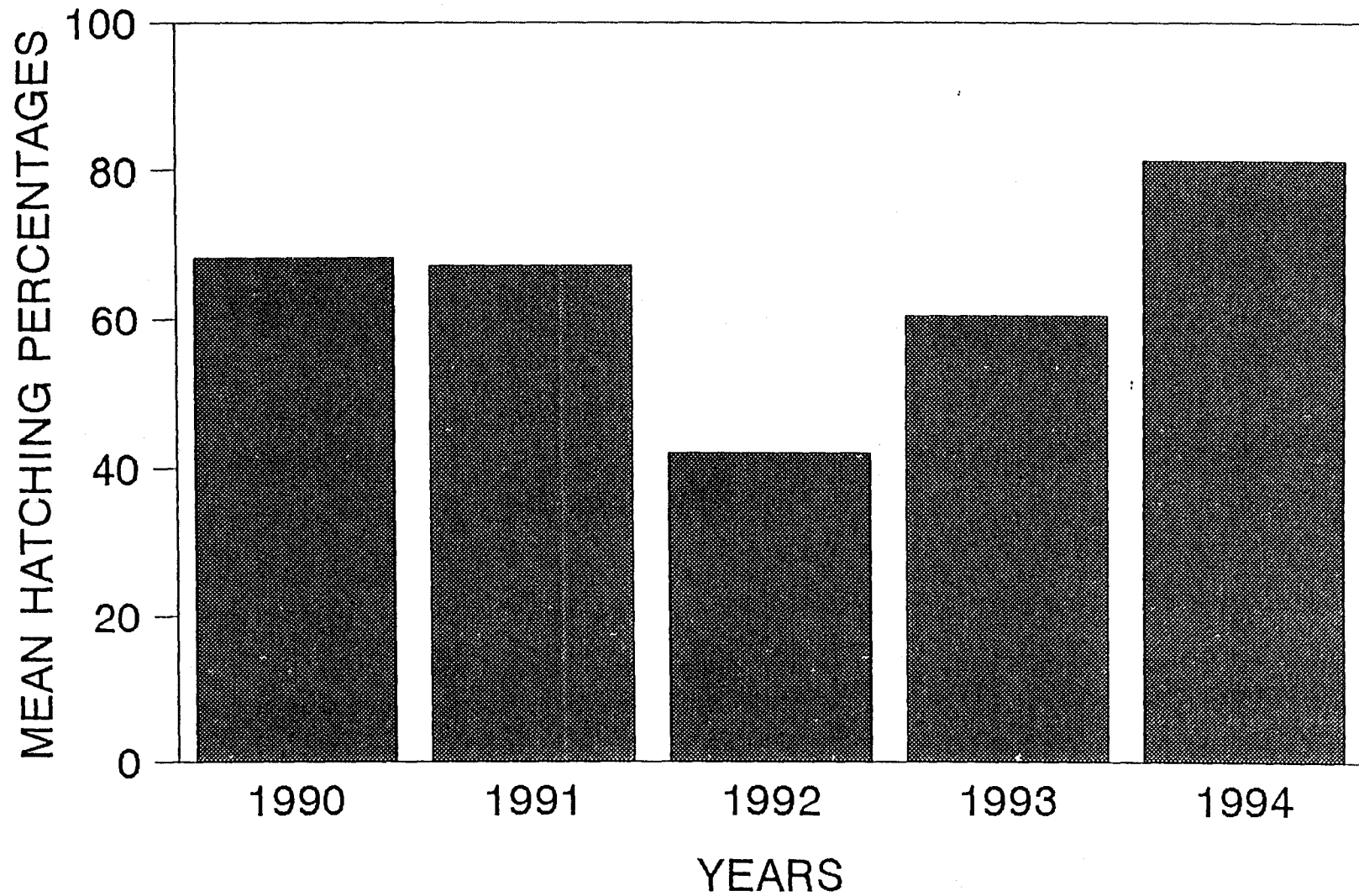


FIGURE 14

Table 5. The number of nests on southern Key Island, northern Key Island, and Naples Beach which were affected by predation, flooding, and root inundation, with their coordinating mean hatching percentages.

BEACH	FACTOR	NUMBER OF NESTS	MEAN HATCHING PERCENTAGE
S. KEY ISLAND	PREDATION	22	40.1% N=12*
	FLOODING	34	60.4%
	ROOTS	1	87.5%**
N. KEY ISLAND	PREDATION	30	13.9% N=1*
	FLOODING	6	38.8%
	ROOTS	2	5.1%
NAPLES BEACH	PREDATION	3	78.9% N=2*
	FLOODING	13	43.3%
	ROOTS	0	N/A

* Hatching percentages were calculated from partially predated nests only. "N" denotes the number of partially predated nests.

** Although this hatching percentage is high, forty-two of the hatchlings were trapped inside the nest by roots, sixteen of these died.

A storm which occurred late in the hatching season (1-3 Oct.) resulted in the flooding of several nests. One nest on southern Key Island was completely destroyed, while seven experienced major flooding damage, resulting in the death of many hatchlings. Two nests on northern Key Island and four nests on Naples Beach were also affected by this front. Nest predation by raccoons is a problem of particular concern on Key Island. As a result anti-predation methods have been utilized since the onset of this program. Previously, all nests were relocated to a protected hatchery area. Since 1990 all nests have been left in their original location and covered with mesh fencing. For the last part of the 1992 season and the past two years, wire cages have replaced the mesh fencing technique. When properly

installed, this method appears to successfully deter the raccoons.

Unfortunately, every nest on southern Key Island was not immune to predation. Thirteen percent of all the nests experienced at least minor predation by raccoons. Ten nests were fully predated and five were partially predated before cage installation occurred. This resulted from the nests being laid at a date or time when beach patrols were not in progress. Omitting these nests, the predation rate for caged nests on southern Key Island was 4.6% ($n=7$). Fig. 15 compares the predation rates of caged nests located on southern Key Island for the 1992, 1993, and 1994 seasons. This year's predation rates were similar to those from 1992, the year of the pilot study. The predation rates in 1993 were much higher, apparently due to human error in caging techniques.

Nests on northern Key Island were caged for the first time this year. Because of the beach patrolling schedule, nests were not caged until the morning after they were laid. This resulted in a high percentage of predation by raccoons (55.2%). Nineteen nests were fully predated and eleven were partially predated before cages were installed. Only two of the nests were predated following cage installation, and in both cases, this was due to human error. The high rate of partially predated nests on northern Key Island probably contributed to the lower hatching rates on this beach.

Predation was not a significant problem on Naples Beach. Nests were protected by four stakes and yellow "caution" tape, and yet only two nests were partially predated and one nest fully predated.

The mean estimated clutch size of loggerhead nests was 102 for the 1994 season. The mean clutch sizes for southern Key Island, northern Key Island, and Naples Beach were 99, 104, and 106 respectively. The two green turtle nests contained 132 and 122 eggs.

YEARLY PREDATION RATES OF CAGED NESTS

SOUTHERN KEY ISLAND, 1992-1993

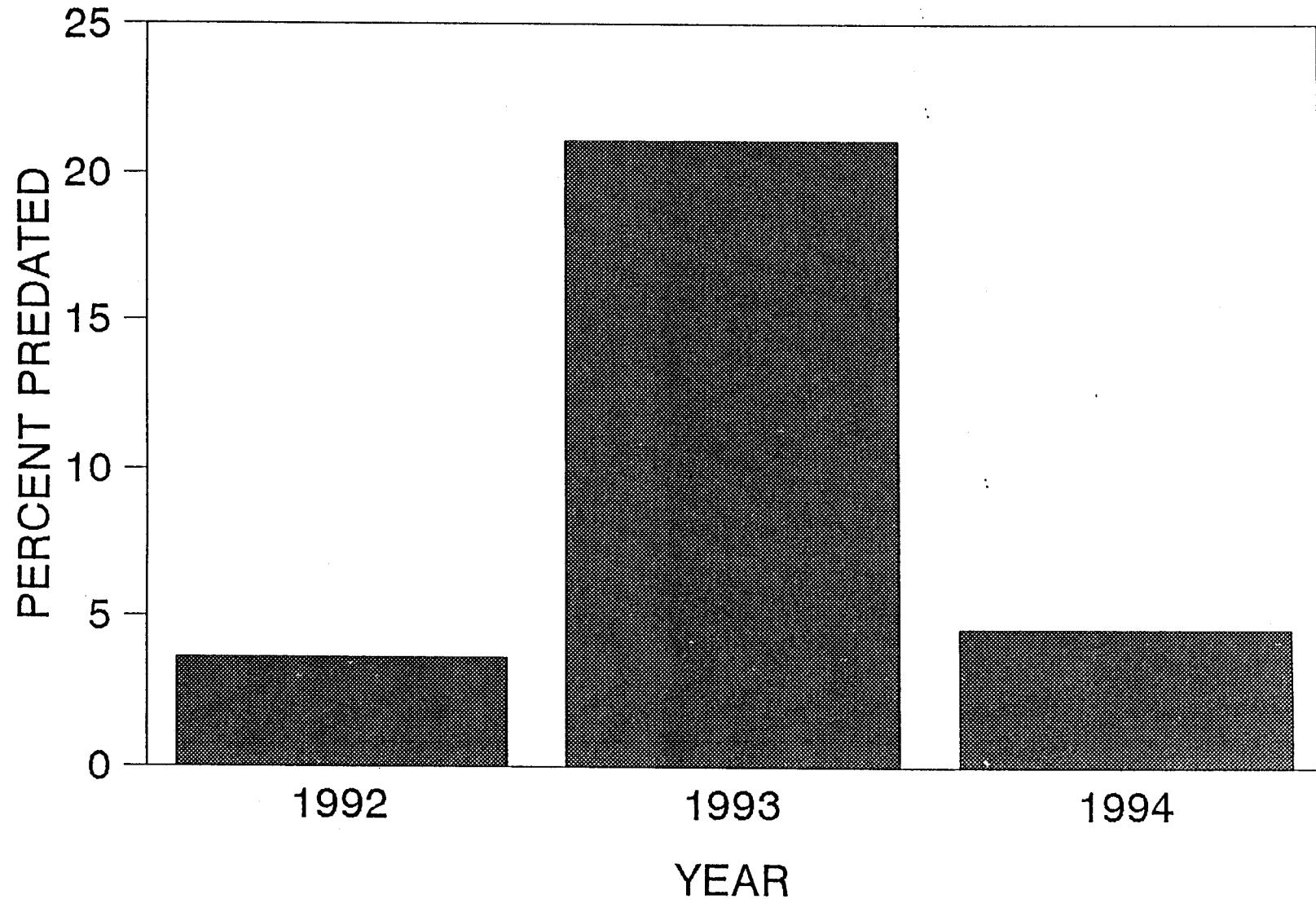


FIGURE 15

These clutch sizes are within the range of reported averages.

The mean incubation period for loggerhead nests was 67.1 days. The mean incubation periods for southern Key Island, northern Key Island, and Naples Beach were 66.6 days, 67.3 days, and 68.4 days, respectively. These means are slightly higher than the reported averages, indicating that temperatures within nests must have been slightly lower this year. The incubation periods for the two green turtle nests were 63 and 66 days, well within the reported range.

From the 285 nests during the 1994 season, a total of 18,280 hatchlings were assumed to have entered the Gulf. This includes the 17,530 hatchlings assumed to have emerged from their nests, as well as the 750 hatchlings found inside nests during excavation and later released. This also includes the 236 green turtle hatchlings which entered the Gulf. The number of these hatchlings originating from southern Key Island nests was 12,185; the number from northern Key Island was 1,960; and the number from Naples Beach was 4,135. Three of the nests on northern Key Island were not caged and severely predated after the hatchlings emerged and entered the Gulf, making it difficult to count the egg shells. An estimate of this number was; therefore, calculated based on the mean number of the emerged hatchlings from other northern Key Island nests.

Table 6 lists the number of hatchlings from southern Key Island which have entered the Gulf during the past five years of this project. The 1994 season concluded with the largest number of hatchlings from southern Key Island entering the Gulf since the start of the Sea Turtle Rescue Project. This was the first year that hatchling data was recorded for northern Key Island and Naples Beach nests. Appendices N, O, and P present the hatching data for the three beaches of this study.

Table 6. The number of hatchlings from southern Key Island assumed to have entered the Gulf of Mexico from 1990-1994.

YEAR	NUMBER OF HATCHLINGS ASSUMED TO HAVE ENTERED THE GULF
1990	8,546
1991	10,888
1992	4,770
1993	6,567
1994	12,185

Environmental Data

Water level readings are listed in Appendix Q. Using these readings, the depth of the four water meters and the depth of the five adjacent nests, it was determined that water levels were high enough to have reached some of the nests on a few occasions. Nests S60 and S63 were apparently flooded once, and nest S51 was flooded twice. These floodings had little to no detrimental effect on the success of these nests, however. The hatching percentages achieved by these nests were 86.6%, 97.7%, and 93.4%, respectively, well above the mean.

Rain gauge readings on southern Key Island are listed in Appendix R. Although the hatching failure of some nests can be indirectly linked to heavy rains - i.e. nests located in front of drainage pipes, heavy rainshowers on southern Key Island could not be directly linked to the failure of any nests. There were also no cases in which it could be documented that heavy rain resulted in the drowning of hatchlings within the nest.

DISCUSSION

In comparison to previous years, the 1994 Sea Turtle Rescue Project proved to be a

remarkably successful season. Green turtles were recorded nesting on Key Island and Naples Beach for the first time in the history of this project. Southern Key Island also produced the largest number of loggerhead hatchlings to enter the Gulf since the first year of data collection in 1985. This can be attributed to a combination of the high number of nests deposited on the island and the high hatching success of these nests. The high hatching percentages obtained this year were the result of low predation rates and the occurrence of only one storm late in the hatching season. Proper installation of the cages used to protect the nests most likely accounted for the sharp decrease in predation rates this year.

The daily ATV patrols of northern Key Island resulted in the documentation of more nests than in 1993, when foot patrols covering a lesser distance were performed. The density of nests on northern Key Island also increased over last year, equaling this year's density of nests on southern Key Island. Although predation on northern Key Island nests was significant, caging the nests enabled at least some to hatch successfully. Collecting data on hatching rates this year will also allow for comparisons to be made in future years.

This year's daily patrols of Naples Beach proved to be a much more effective method for documenting accurate numbers of turtle nests than the "Turtle Hotline". The information received through the hotline, although important, favored more populated areas of the beach due to its dependence upon public "call ins". This year's data from Naples Beach confirmed that the nesting activity on this beach is not as dense as that on Key Island, but it is nonetheless a significant amount of activity. As with northern Key Island, the hatching data obtained this year will be useful for comparisons in years to come.

Tagging data from this and past years continues to demonstrate that many of the nesting loggerheads not only return to Key Island to nest within the same season, but also

return to nest after an absence of several years. The data obtained from southern Key Island most likely understates the return numbers due to tag loss and the occurrence of turtles nesting without being observed. Over time, it will be useful to analyze all the tagging data from this project so the nesting history of each returning turtle could be determined. Another possibility to consider in the future would be attaching radio transmitters to some of the turtles in an attempt to better understand their activity during and between nesting seasons.

Data obtained from water markers and nests flooded by spring tides revealed that loggerhead nests can experience some levels of water inundation and still hatch successfully. One nest on southern Key Island which was flooded by spring tides hatched with all of its eggs surviving. Others which were flooded more regularly produced no hatchlings at all. The four nest that were monitored for water levels this years were all relatively high on the beach. In the future nests which are closer to the high tide line, but do not need to be relocated, will be monitored to try and gain some insight into how ground water inundation frequency and depth influences hatching success rates.

Although the Sea Turtle Rescue Project has improved its methods greatly over the years, there are still ways to increase the success of this program. Patrols on southern Key Island and Naples Beach have been modified to enhance data collection and protect as many turtle nests as possible. Although the methods used to patrol northern Key Island were improved drastically this year, predation of nests is still a problem. The only real way to solve this would be to begin night patrols of this beach. In concept, this is reasonable, but in reality it is not logistically possible at this time. Ideally, if the fallen Australian pines between 15,000 and 20,000 ft. were removed, the island could be patrolled nightly in its

entirety. The removal of these trees would be a time consuming and costly project.

CONCLUSION

The 1994 Sea Turtle Rescue Project began on 14 Aug. and continued until 18 Oct., the day of the last nest excavation. This was a season of changes and records. Naples Beach was patrolled daily and nest sites were marked for the first time. Northern Key Island was patrolled daily using ATV's and the nests were caged this year. The nests on both beaches were also monitored through the hatching season for the first time. This year represents the only time in the history of the project when green turtle nests were identified. The 1994 season was also a record year in terms of numbers of hatchlings which successfully reached the Gulf of Mexico.

ACKNOWLEDGEMENTS

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The Conservancy's Environmental Protection Department - Chris Ramsey, Ruth DiDonato, Jim Gore, Susan Nichols-Lucy, and Kristen Baum - for their overall assistance in the field and in the office;

And a special thanks is extended to all The Conservancy's members and individuals who donated to the Sea Turtle Rescue Project, making all this possible.

APPENDIX A

Measurements from Doctor's Pass moving south to Donahue's Jetty on Naples beach. All measurements in feet.

Note: Unless otherwise indicated, all "#" represent addresses and are located on a seawall. Streets measured from signs located on beach steps.

<u>LANDMARK</u>	<u>MEASUREMENT</u>
Doctor's Pass	0 ft
#2171	457 ft
#2151	742
#2121	931
Stone Dolphin	1113
#2011	1674
#1977	1828
#1919 (northern #)	1912
#1851	2425
#1801	2642
#1785 (on post/steps)	2814
#1717	2992
#1601 (northern #)	3212
#1601 (southern #)	3440
North entrance, Lowdermilk	3570
Center ramp/Concession	4004
#1285 (northern #)	4501
#1275	4803
#1255	4939
#1221	5072
#1121	5234
#1065	5452
Northern drainage pipe	5707
8th Ave N	5992
7th Ave N	6881
North Lake Ave	7292
6th Ave N	7666
4th Ave N	8467
3rd Ave N	8825
Survey Mark NBH40	9101
2nd Ave N	9221
1st Ave N	9582
Central Ave	9956
1st Ave S	10323
2nd Ave S	10703
3rd Ave S	11058
4th Ave S	11438
5th Ave S	11860
6th Ave S	12244
7th Ave S	12675
8th Ave S	13007

APPENDIX A (cont.)

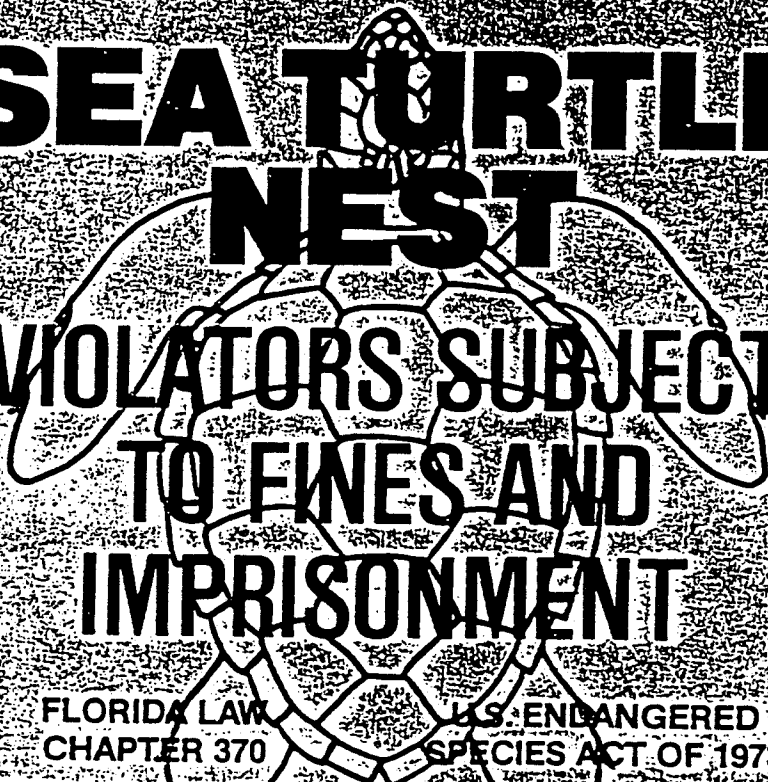
9th Ave S	13442 ft
10th Ave S	13850
11th Ave S	14265
Broad Ave	14668
12th Ave S (middle piling)	15049
13th Ave S	15467
14th Ave S	15874
15th Ave S	16279
16th Ave S	16657
17th Ave S	17037
18th Ave S	17467
19th Ave S	17846
20th Ave S	18515
21st Ave S (middle piling)	19539
North corner-house with widow's walk	20263
Middle piling (with board in middle of pilings)	20911
Middle piling near house with blue roof	22526
32nd Ave S	23081
33rd Ave S	23431
#3430	23920
Corner of seawall-south side after break	24373
3600 Gordon Dr	24597
Rust/olive house with flag pole-south corner	25001
#3860	25481
Steps-south end of green seawall	25986
Private beach club steps	26417
Chain link fence-south end	26950
#4348	27252
South end-seawall with asphalt (near house with roman columns)	27883
Corner of seawall before beach enlarges	28193
Survey marker NBH33	28410
Donahue's Jetty	28881

DATE May 29
OBSERVER L. Toffe / H. Grimes
TIME START May 28 AM ☒ PM

TIME END May 29 (AM) PM

COMMENTS: _____

DO NOT REMOVE SEA TURTLE NEST



VIOLATORS SUBJECT TO FINES AND IMPRISONMENT

FLORIDA LAW CHAPTER 370

No person may take, possess, disturb, mutilate, destroy, cause to be destroyed, sell, offer for sale, transfer, molest, or harass any marine turtle nest or eggs at any time.

Upon first conviction, imprisonment for a period up to 60 days or by a fine up to \$500, or both, plus an additional penalty of \$100 for each sea turtle egg destroyed or taken.

U.S. ENDANGERED SPECIES ACT OF 1973

No person may take, harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or attempt to engage in any such conduct to marine turtles, turtle nests, and/or eggs.

Any person who knowingly violates any provision of this act may be assessed a civil penalty up to \$10,000 or a criminal penalty up to \$20,000 and up to one year imprisonment.

**SHOULD YOU WITNESS A VIOLATION, PLEASE CONTACT
FLORIDA DEPARTMENT OF NATURAL RESOURCES
RESOURCE ALERT 1-800-342-1821**

1994 DATA SHEET FOR NESTING SEA TURTLES

COLLECTOR'S NAME _____ NEST #: _____

DATE: _____ TIME: _____

TURTLE OBSERVED: YES NO

TAG DATA:

LEFT: NEW TAG: _____ RETURN TAG: _____ SCAR: _____

RIGHT: NEW TAG: _____ RETURN TAG: _____ SCAR: _____

PHYSICAL DIMENSIONS (cm):

SHELL -STRAIGHT LENGTH: _____ WIDTH: _____

SHELL -CURVED LENGTH: _____ WIDTH: _____

ORBITAL WIDTH: _____

NEST DATA:

PREDATION: YES NO # EGGS PREDATED (if known) _____

RELOCATED: YES NO # RELOCATED EGGS: _____

REASON: (PREDATION) (BELOW TIDE LINE) OTHER: _____

SURROUNDINGS (w/in 10' radius): (Nat. Veg.) / (Casurina) / (Open Beach)

FALSE CRAWL: YES NO

CAUSE OF FALSE CRAWL: (ATC) / (Casurina) / (Scarp) / (Undetermined)
Other: _____LOCATION DATA:

ORIGINAL NEST / FALSE CRAWL: _____ RELOCATED NEST: _____

CRAWL INDEX: 1 2 3 4 5 FL. DNR INDEX: _____

WEATHER:

TIDE: HIGH / FALLING / LOW / RISING SPRING / NEAP

MOON: FULL / NEW HALF / HALF / HALF WAXING-WANING

COMMENTS/OBSERVATIONS: _____

APPENDIX E
1994 DATA SHEET FOR NESTING SEA TURTLES
NORTH KEY ISLAND

COLLECTOR'S NAME _____ NEST #: _____

DATE: _____ TIME: _____

NEST DATA:

PREDATION: YES NO # EGGS PREDATED (if known) _____

RELOCATED: YES NO # RELOCATED EGGS: _____

REASON: (PREDATION) (BELOW TIDE LINE) OTHER: _____

SURROUNDINGS (w/in 10' radius): (Nat. Veg.) / (Casurina) / (Open Beach)

FALSE CRAWL: YES NO

CAUSE OF FALSE CRAWL: (ATC) / (Casurina) / (Scarp) / (Undetermined)
Other: _____

LOCATION DATA:

ORIGINAL NEST / FALSE CRAWL: _____ RELOCATED NEST: _____

CRAWL INDEX: 1 2 3 4 5 FL. DNR INDEX: _____

WEATHER:

TIDE: HIGH / FALLING / LOW / RISING SPRING / NEAP

COMMENTS/OBSERVATIONS:

1994 NEST HATCHING DATA

COLLECTOR'S NAME _____

NEST #: _____ LOCATION: _____

TAG #: _____ INDEX: _____

NEST DATE: _____ CHECK DATE: _____

DEPRESSION: _____ EXCAVATION: _____

NEST COVER: (FULL SUN) / (PARTIAL SHADE) / (FULL SHADE)

RELOCATED: YES NO

ORIGINAL EGGS: _____

RELOCATED EGGS: _____

PREDATED: YES NO SPECIFY DATE AND QUANTITY, IF KNOWN _____

HATCHLING FATALITIES:

INSIDE NEST (fully hatched): _____

PIPPED INSIDE NEST: _____

OUTSIDE NEST: _____

LIVE HATCHLINGS:

PIPPED IN NEST: _____

HATCHED IN NEST _____

EMERGED FROM NEST: _____
(INCLUDE DEAD OUTSIDE NEST)

PREDATED: YES NO

TOTAL: _____

EGGS:

HATCHED EGGS: _____

UNHATCHED: _____

HATCHING %: _____

TOTAL HATCHLINGS FROM NEST ASSUMED TO HAVE ENTERED THE GULF: _____
(INCLUDE THOSE FOUND LIVE IN NEST AND RELEASED)COMMENTS AND
OBSERVATIONS _____

APPENDIX G

NEST LAYING DATA 1994 - SOUTH KEY ISLAND

			TAG DATA			PHYSICAL DIMENSIONS (cm)						NEST DATA			LOCATION DATA				WEATHER DATA	
NEST#	DATE	TIME	TURT LEFT	RIGHT	RETURN	STRAIG	CURVEI	ORB	PREDATION	RELOCATION	SURROUND	ORIGINAL	RELOCATED	CRAWL	FL DNR	TIDE	MOON			
			OBS? NEW	RETURN SCAR NEW	RETURN	SCAR	LNTH	WIDTH	LNTH	WIDTH	WIDTH (Y/N)	#EGGS(Y/N)	#EGGS	NEST	NEST	INDEX	INDEX			
1 S1A	03/05/94		N								Y	?	N	OB	35832		3 S8			
2 S1	15/05/94	0200	Y	QQR911			81	64	87.5	83.8	N		N	NV	35738		4 S8			
3 N2	15/05/94	2210	Y		QQR917		97	74	102	91	21 N		Y	130 CAS	20712	20716	4 N2			
4 N3	15/05/94	2230	Y	QQR913			96	80.5	102	95	22 N		N	CAS	23254		4 N3			
5 S4	16/05/94	2250	Y	QQR910		QQR912	94	68	99	85	11 Y(5/18)	40 N	N	NV/CAS	29278		4 S5			
6 N5	17/05/94	0240	Y	QQR9240		QQR925	96	73	98	93	12 N		N	OB	24419.8		3 N3			
7 N6	17/05/94	2308	Y	QQR924			85	64	91	88	9.5 N		N	OB	21899.5		4 N2			
8 S7	18/05/94	0347	Y								Y		10 N	OB	36652	2-3	5 S8			
9 N8	20/05/94	2253	Y	QQR903		QQR918	96	72	104	91	15 N		N	NV/OB	25955		4 N4			
10 S9	21/05/94	0326	Y	QQR914	Y	QQR968	78	61	96	83	12 N		N	NV	33458		4 S8			
11 S10	21/05/94	2205	Y	QQR983		QQR982	84	63	91	82	15 N		N	CAS	27870		4 S5			
12 S11	22/05/94	0305	Y	QQR934		QQR926	86	66	93	88	14 N		N	OB	35786		4 S8			
13 S12	22/05/94	2320	Y	QQR908		QQR920	88	68	96	88	12 N		N	NV	34680		5 S7			
14 S13	23/05/94	2250	Y	QQR927		QQR935	78	61	87	80	12 Y	10-15 N	N	CAS	28034		4 S5			
15 S14	23/05/94	2310	Y				98	81	104	97	11 N		N	NV	33300		5 S7			
16 S15	25/05/94	0105	Y	QQR905			96.5	70	107	96	15 N		N	NV	34662		5 S7			
17 N16	25/05/94	0135	N								Y	ALL		OB	26678		2 N4			
18 S17	25/05/94	2205	Y	QQR998		QQR947	95	72.5	101.5	88	14 N		N	OB	32043		3 S6			
19 S18	26/05/94	0425	Y	QQR907		QQR989	91	72	100	97	12 N		N	NV	35356		5 S7			
20 S19	26/05/94	2334	Y	QQR944		QQR948	88	73	99	91.4	11 N		Y	113 CAS	32576	32546	3 S6			
21 S20	27/05/94	0105	Y	QQR993		QQR949	90	72	97	92	13 N		N	NV	35207		4 S7			
22 S21	27/05/94	0435	Y	QQR913		QQR942	97.5	79	106	95	23 N		N	NV	34748		5 S7			
23 N22	27/05/94	2156	Y	CR963							N		N	OB	21678		3 N2			
24 N23	28/05/94	0105	Y	QQR997		QQR946	89	67.5	96	92	11 N		N	OB	26430		4 N4			
25 N24	28/05/94	2201	Y	QQR983		QQR940	84	68	92	87	14 N		N	OB	25890		3 N4			
26 N25	28/05/94	2321	Y			QQR999	98	70	106	92	19 N		N	OB	23478		3 N3			
27 S26	29/05/94	0056	Y	QQR942		QQR904	82	64	90	82	12 N		N	CAS/OB	28530		4 S5			
28 S27	29/05/94	0245	Y	QQR947		QQR904	80	61	89	83	10 N		N	OB	39200		3 S9			
29 S28	30/05/94	0410	Y	QQR990		QQR950	94	69	98	91.5	15 N		N	NV	34681		5 S7			
30 S29	01/06/94	0120	Y	QQR990		QQR950	85.5	72.5	95	93	12 N		N	CAS	32531		4 S6			
31 N30	01/06/94	2315	Y	PPV946		QQR945	83	65	90	80	13 N		N	NV	27170		5 N4			
32 S31	02/06/94	0023	Y	QQR903		QQR995	95	70	106	92	13 N		N	NV/OB	36829		5 S8			
33 N32	03/06/94	0236	Y	QQR983		QQR982	83.9	64.6	89.1	80.7	N		N	OB	25545		3 N4			
34 S33	03/06/94	0420	Y	QQR980	Y	PPV968	81.5	61.5	88	81	12 N		N	NV	36183		5 S8			
35 S34	03/06/94	2350	Y	QQR974		QQR966	84	62	93	84	11 N		N	OB	38750		4 S9			
36 S35	04/06/94	0105	Y	QQR908		QQR988	85	65	92.5	89	13 N		N	OB/ANQTH	39200		3 S9			
37 S36	04/06/94	0505	Y	QQR908		QQR920	79	62	87.5	82.5	11 N		N	CAS	32538		4 S6			
38 N37	05/06/94	0002	Y	QQR973		QQR932	98	78	105	94	18 N		N	CAS/OB	21331		4 N2			
39 S38	05/06/94	2322	Y	QQR964		QQR982	98	79.5	106	91	15 N		N	NV/OB	31319		4 S6			
40 N39	06/06/94	0312	Y	QQR941		QQR963	89	67	95	89	19 N		N	CAS/OB	22825		3 N3			
41 S40	07/06/94	0304	Y	QQR913		QQR976	96	77	104	98	14 N		N	NV	27796		5 S5			
42 N41	07/06/94	0510	Y	QQR998		QQR978	89	68	95	88	12 N		N	OB	26228		3 N4			
43 S42	07/06/94	2150	Y	QQR930	Y	QQR923	83.5	60.5	91	81	11 N		N	OB/LOG	37075		2 S8			
44 N43	07/06/94	2300	Y	QQR985		QQR970	94	70	102	91	22 N		N	NV	26622		5 N4			
45 S44	07/06/94	2355	Y	QQR975	Y	QQR947	94	71	103	90	13 Y	30-35 N		OB	34700		3 S7			
46 N45	07/06/94	2352	Y	QQR972		QQR947	84	68	93	87	17 Y	40-45 N		OB	25242		3 N4			
47 S46	08/06/94	0433	Y	QQR972		QQR986	84.5	67	93	88	13 N		N	NV	37680		5 S8			
48 N47	08/06/94	2140	Y	QQR944		QQR986	92	78	99	91	16 N		N	OB	21966		3 N2			
49 S48	09/06/94	0350	Y	QQR969		QQR922	91	69	97	89	13.5 N		N	NV	35832		5 S8			
50 S49	09/06/94	2207	Y	QQR922	Y	QQR979	96	75	103	93.5	13 N		N	NV	35240		5 S7			
51 S50	09/06/94	2031	Y	QQR965		QQR904	80	64.5	87	80	17 N		N	NV	33392		4 S8			
52 S51	09/06/94	2333	Y	QQR965		QQR904	90	67	101	93	14 N		N	NV/SCARP	28743		4 S5			
53 N52	10/06/94	0052	Y	PPJ796		QQR991	94.5	72.4	101.1	93.8	NA	Y	11 Y	72 CAS	29700	27184	5 N4			
54 S53	11/06/94	0015	Y	QQR990		QQR950	98	75	106	96	14 N		N	CAS	27695		4 S5			
55 N54	11/06/94	0506	Y	QQR990		QQR918	88	75	93	93	16 N		N	OB	24156		3 N3			
56 S55	12/06/94	0345	Y	QQR943	Y		95	71	103	93	13 N		N	NV	32250		5 S6			

NEST LAYING DATA 1994 - SOUTH KEY ISLAND

			TAG DATA			PHYSICAL DIMENSIONS (cm)				NEST DATA			LOCATION DATA			WEATHER DATA			
NEST#	DATE	TIME	TURT LEFT	RIGHT	RETURN	SCAR	LNTH	WIDTH	CURVEI	ORB	PREDATION	RELOCATION	SURROUND	ORIGINAL	RELOCATED	CRAWL	FL DNR	TIDE	MOON
			OBS? NEW	SCAR NEW	RETURN									NEST	NEST	INDEX	INDEX		
57 N56	12/06/94	2345	Y		PPV946	QQR945	81	62	90	84	10 N	N	NV	25278		5 N4	RIS/NP	WAN	
58 S57	13/06/94	0250	Y		QQR980	PPV968	81	62	92	82.5	12 N	N	NV	37920		5 S8	RIS/NP	HLF/WAX	
59 S58	14/06/94	2218	Y		QQR988	QQR988	85	63	93	86.5	11.5 N	N	NV	35054		5 S7	RIS/LOW/NP	WAX	
60 S59	16/06/94	0135	Y		PPJ765	QQR959	96	73	102	93	15 N	N	OB	37484		3 S8	RIS/NP	WAX	
61 P1	16/06/94	0200	N								Y	ALL	N	OB	20188		4 N2	LOW/NP	WAX
62 S60	16/06/94	0300	Y	QQR956		QQR970	86.5	67	95	84	12 N	N	OB	31768		3 S6	RIS/NP	WAX	
63 S61	16/06/94	2314	Y	QQR974		QQR966	82	68	93	84	13 N	N	CAS	28872		4 S5	FALL/NP	WAX	
64 N62	17/06/94	0035	Y	QQR952	QQR951		66.5	69.5	94.5	89	Y(6/18)	6 N	CAS	22568		5 N3	FALL/LW/NP	WAX	
65 S63	17/06/94	0300	Y	QQR955		QQR955	87	67.9	94.5	88.7	12.5 N	N	CAS	28619		4 S5	LOW/RIS/NP	HLF/WAX	
66 N64	17/06/94	0307	Y		QQR955	QQR955	94	63.5	103	92	13 N	N	OB	23708		3 N3	RIS/NP	WAX	
67 S65	17/06/94	0420	Y	QQR971			97	74			N	N	NV/CAS	30616		4 S6	RIS/NP	WAX	
68 N66	17/06/94	0414	Y		QQR913	QQR913	97	76	103	84	14 N	Y	118 CAS	25758	25758	5 N4	RIS/NP	WAX	
69 N67	17/06/94	2007	Y	QQR911		QQR967	80	66	91	84	11 N	N	OB	20654		4 N2	FALL/NP	NEW HALF	
70 S68	17/06/94	2310	N								N	N	NV/OB	37649		4 S8	FALL/NP	NEW HALF	
71 S69	17/06/94	2315	N								N	N	NV	38232		4 S9	FALL/NP	NEW HALF	
72 S70	18/06/94	0135	Y	QQR000		QQR983	88	72	100	87	14 N	Y	101 CAS	29726	29768	4 S5	FALL/NP	NEW HALF	
73 S71	18/06/94	0225	Y	QQR939		QQR958	89	69	93	85.5	15 N	N	OB	35240		3 S7	RIS	NEW HALF	
74 N72	19/06/94	0022	Y		QQR975		84	67	93	86.5	13 N	N	OB	27105		3 N4	FALL/NP	HLF/WAX	
75 S73	19/06/94	0217	Y		QQR972		85	67	92.5	88	13 N	N	NV	36233		4 S8	FALL/NP	HLF/WAX	
76 S74	19/06/94	2236	Y		QQR985		93	73	100.5	85	14.5 N	N	NV/OB	38043		4 S8	RIS/NP	HLF/WAX	
77 N75	19/06/94	2310	N								N	N	OB	23828		4 N3	HGH/RIS/NP	WAX	
78 S76	20/06/94	0215	Y	QQR984		QQR984	88.5	72.5	96	87	12 N	N	OB	36189		3 S8	FALL/NP	HLF/WAX	
79 S77	20/06/94	0254	Y			QQR904	82	64	87	72	11 N	N	OB	28872		3 S5	FALL/NP	HLF/WAX	
80 N78	20/06/94	0342	Y	QQR981		QQR919	90	65	97	81	11 N	N	CAS/OB	21690		4 N2	FALL/NP	WAX	
81 N79	20/06/94	2203	Y				75	56	64	80.5	N	N	OB	24295		4 N3	RIS/NP	HLF/WAX	
82 N80	21/06/94	2313	Y		QQR965		87	63	101	91.5	11.5 N	N	NV	25644		4 N4	RIS/SPR	WAX	
83 S81	22/06/94	0105	Y		CR963		84	61	90.5	86	11 N	N	NV	35544		4 S8	FALL/SPR	WAX	
84 P2	23/06/94	0006	N								Y	ALL	N	CAS/OB	32827		4 S6	RIS/SPR	HLF/WAX
85 P3	23/06/94	0230	N								Y	ALL	N	CAS	32500		4 S6	FALL/SPR	HLF/WAX
86 N82	23/06/94	2235	Y		PPV946		81	61	93.5	80.5	11.5 N	Y	77 NV	25592	25592	5 N4	RIS/SPR	FULL	
87 N83	23/06/94	2339	N								N	N	NV/CAS	20838		4 N2	RIS/SPR	FULL	
88 N84	24/06/94	2200	Y		QQR983		83	63	90	80	11 N	N	OB	25593		3 N4	SPR	WAN	
89 N85	24/06/94	2225	Y		QQR985		84	63	92	87.5	12 N	N	NV/OB	27020		4 N4	RIS/SPR	WAN	
90 S86	26/06/94	2352	N								N	N	NV	28728		4 S5	RIS/SPR	WAN	
91 S87	27/06/94	0100	Y		QQR985	SSK272	94.5	65	105	96	16 N	N	NV/CAS	27702		4 S5	RIS/SPR	WAN	
92 N88	27/06/94	0410	Y	SSK257	Y	QQR988	84	65	93	88	12 N	N	NV/CAS	20988		5 N2	HGH/RIS/SPR	WAN	
93 N89	27/06/94	2158	N								N	N	NV/OB	25710		4 N4	RIS/SPR	WAN	
94 S90	28/06/94	0003	Y		QQR913	QQR968	99	76	104	96	14 N	N	CAS	30822		4 S6	RIS/SPR	WAN	
95 N91	28/06/94	0205	Y		QQR911	QQR967	81	66	88	85	11 N	N	OB	21178		3 N2	RIS/SPR	WAN	
96 S92	28/06/94	0209	Y		QQR944	QQR986	91	64	102	92	13 N	N	NV	31948		5 S6	RIS/SPR	WAN	
97 S93	29/06/94	0054	Y		QQR944	QQR944	94	64	97	110	15 N	N	NV	23015		4 S5	RIS/NP	WAN	
98 N94	29/06/94	0328	Y		QQR975	QQR975	82	66	94	85	12 N	Y	95 OB	26200	26200	3 N4	RIS/NP	WAN	
99 S95	29/06/94	2335	Y		QQR922	QQR979	97	74	103	95	14 N	N	NV	27799.3		4 S5	FALL/NP	FULL/WAN	
100 N96	30/06/94	0039	Y	SSK292		SSK271	88	67	94	87	14 N	N	OB	24317.2		3 N3	LW/RIS/NP	FULL/WAN	
101 S97	30/06/94	0236	N								N	N	OB	39153		3 S9	RIS/NP	WAN	
102 S98	01/07/94	0054	Y	QQR937		QQR940	88	65	94.5	85.5	11 N	N	OB	35222		3 S7	LOW/NP	HLF/WAN	
103 S99	01/07/94	2226	Y		QQR937	SSK298	93	68	99	89	14 N	N	NV	30906		5 S6	FALL/NP	HLF/WAN	
104 S100	02/07/94	0005	Y		QQR937	SSK260	88	67	96	87	12 N	N	NV	30815		3 S6	FALL/NP	HLF/WAN	
105 N101	02/07/94	0050	Y		PPJ796		91	75.5	98.5	89	14 N	N	NV/TREES	20572		5 N2	FALL/NP	HLF/WAN	
106 N102	02/07/94	0155	Y	SSK259		QQR988	92.5	71	102	90.5	14 N	N	OB	20728		3 N2	LOW/NP	HLF/WAN	
107 S103	02/07/94	2250	Y		QQR980	PPV968	80	59	89	79	12 N	N	NV	34235		5 S7	HGH	HLF/WAN	
108 N104	03/07/94	0050	N								Y	1 N	OB	20704		3 N4	FALL/SPR	HLF/WAN	
109 S105	03/07/94	0156	Y		QQR965		90	70.5	98	93	14 N	N	NV/OB	36207		4 S6	FALL/SPR	HLF/WAN	
110 N106	03/07/94	0310	Y		CR963	QQR963	86	62	89.5	83	12 N	N	NV	24788		4 N3	LW/RIS/SPR	HLF/WAN	
111 S107	03/07/94	2230	Y		QQR943	QQR918	95	70	101.5	92.5	14 N	N	NV	37560		4 S8	HGH/SPR	HLF/WAN	
112 N108	04/07/94	0026	Y	QQR987		SSK223	81	66	86.5	87.5	13 N	N	OB	26380		3 N4	RIS/SPR	HLF/WAN	
113 N109	04/07/94	0220	Y		PPV946	QQR945&QQR940	82	57	89	79	13 N	N	CAS	20760		4 N2	RIS/SPR	HLF/WAN	
114 N110	04/07/94	0457	Y	SSK231		SSK249	97.5	67.5	98	83	14 N	N	OB	25693		4 N4	FALL/SPR	HLF/WAN	
115 S111	05/07/94	0141	Y		QQR952	SSK205	86	65	92	86	13.5 N	N	NV/OB	28078		4 S5	FALL/SPR	HLF/WAN	
116 S112	05/07/94	0510	Y		QQR983		82	62	88	79	12.5 N	N	NV	35115		4 S7	LW/RIS/SPR	HLF/WAN	
117 N113	05/07/94	2300	Y	SSK232		SSK299	89	69.5	98	87	14 N	N	CAS	20685		4 N2	RIS/SPR	HLF/WAN	
118 S114	06/07/94	0020	Y		SSK210	SSK242	96	74	105	95	12 N	N	NV	37700		5 S8	RIS/SPR	WAN	
119 N115	07/07/94	0410	Y		QQR982	QQR994	88.9	68.8	92.9	87.1	12.9 N	N	CAS/OB	22404		4 N3	FALL/SPR	WAX	
120 N116	08/07/94	0012	Y	SSK917		SSK273	83	64	96.5	87	11 N	N	OB	26818		4 N4	RIS/SPR	WAX	

APPENDIX G (cont.)

NEST LAYING DATA 1994 - SOUTH KEY ISLAND

			TAG DATA			PHYSICAL DIMENSIONS (cm)				NEST DATA			LOCATION DATA				WEATHER DATA	
NEST #	DATE	TIME	TURT LEFT	RIGHT	RETURN	SCAR	STRAIG	CURVE	ORB	PREDATION	RELOCATION	SURROUND	ORIGINAL	RELOCATED	CRAWL	FL DNR	TIDE	MOON
			OBS? NEW	NEW	SCAR	NEW	LNTH	WIDTH	LNTH	WIDTH	WIDTH (Y/N)	#EGGS (Y/N)	#EGGS	NEST	NEST	INDEX	INDEX	
121 N117	08/07/94	0150	Y		QQR944			92	75	98.5	91	13 N	N	OB	21960		3 N2	RIS/SPR
122 S118	08/07/94	0207	Y	SSK227		SSK240		98	76	107	102	15 N	N	NV/OB	35121		4 S7	HGH/RIS/SP
123 S119	08/07/94	0410	Y		QQV805			96	67	102	92	15 N	N	OB	35407		3 S7	FALL/SPR
124 S120	08/07/94	2340	Y	SSK287		SSK244	GREEN TURTLE	101	78	110	102	8 N	N	NV	32834		4 S6	RIS/SPR
125 N121	09/07/94	0215	Y	SSK245		SSK235		89	59	95	86	9 N	N	CAS	21886		5 N2	RIS/SPR
126 S122	10/07/94	0332	Y	SSK226		SSK238		86	65	96.5	89.5	12 N	N	NV/OB	38818		3 S9	HGH/SPR
127 S123	12/07/94	0217	Y		QQN251			93	68	101	91	13 N	N	NV/OB	33164		4 S7	RIS/SPR
128 S124	12/07/94	0232	N									Y	8 N	OB	33582		4 S7	RIS/SPR
129 S125	12/07/94	0310	N									N	N	OB	35926		3 S8	RIS/SPR
130 S126	13/07/94	0012	N									N	N	OB	35899		3 S8	RIS/NP
131 N127	13/07/94	0204	Y		PPJ796			94	69.5	100	92	13 N	N	NV/CAS	25662		4 N4	RIS/NP
132 N128	14/07/94	0200	N									N	N	OB	24230		3 N3	RIS/NP
133 S129	14/07/94	0319	Y		QQE449			98	75	105.5	99	13.5 N	N	NV	28700		4 S5	RIS/NP
134 S130	14/07/94	0342	N									N	N	OB	34703		4 S7	RIS/NP
135 S131	14/07/94	0337	Y		CR983			83.5	59.5	93	82	12 N	N	CAS	28743		4 S5	RIS/NP
136 S132	14/07/94	0345	Y	SSK278		PPV968		78	59	89	80	13 N	N	NV	34987		5 S7	RIS/NP
137 S133	14/07/94	0550	Y	SSK213		SSK274		90	66	97	84	12.75 N	N	NV/OB	31994		4 S6	FALL/NP
138 N135	15/07/94	2222	N									N	N	OB	23255.9	3-4	N3	FALL/NP
139 N136	15/07/94	2343	Y		PPV946			82	62	90	82.5	10 N	N	OB	24710		4 N3	FALL/NP
140 S134	16/07/94	0136	N									N	N	NV	27874		4 S5	RIS/NP
141 S137	16/07/94	0222	Y		QQR943			96	70	102	93	12 N	N	OB	36347		3 S8	RIS/NP
142 N138	16/07/94	0312	N									N	N	CAS/OB	25675		4 N4	RIS/NP
143 N139	17/07/94	0202	Y		QQE502			87	66	94	80	12 N	N	OB	27140		4 N4	RIS/NP
144 N140	18/07/94	2200	Y		SSK917			86.5	66.5	92	86	13 N	N	CAS	24170		4 N3	RIS
145 S141	20/07/94	0003	Y	SSK230		SSK276		91	75.5	99.5	98	13 N	N	NV/OB	37867		4 S8	RIS/SPR
146 S142	20/07/94	0320	Y		Y							N	N	NV/CAS	35563		4 S8	FALL/SPR
147 S143	24/07/94	0100	Y	SSK201		SSK282		87.5	66	96	92	13 N	N	NV	27719		4 S5	RIS/SPR
148 N144	24/07/94	0217	Y		QQN251			93.5	70.5	99	90	14 N	N	NV	26889		4 N4	RIS/SPR
149 N145	24/07/94	0248	Y		PPJ796			89	69	99.5	89.5	14 N	Y	CAS/OB	23728	26698	5 N4	RIS/SPR
150 N146	24/07/94	2212	Y		PPJ765			96.5	73	101.5	95	12 N	N	OB	25664		3 N4	RIS/SPR
151 N147	24/07/94	2314	Y									N	N	OB	24204		3 N3	RIS/SPR
152 S148	25/07/94	0155	Y					99.5	73	106	101	14 N	N	NV	37185		5 S8	RIS/SPR
153 S149	26/07/94	0331	Y		QQR984			91	70	95.5	88	13 N	N	OB	29070		3 S5	HGH/SPR
154 S150	28/07/94		N									N	N	NV	37207		4 S8	RIS/NP
155 N151	29/07/94	0225	Y	SSK241		SSK273		86.5	67	92	86	12 N	N	OB	21140		3 N2	RIS/NP
156 N152	29/07/94	0505	N									N	N	OB	22238		3 N2	HGH/NP
157 S153	31/07/94	0355	Y	SSK296		SSK240		96	79	105	99	14 N	N	NV	31973		4 S6	RIS/NP
158 S154	01/08/94	0339	Y		SSK230			97	94.5	98	96	13.5 N	N	OB	34235		3 S7	RIS/NP
159 S155	01/08/94	2224	Y	SSK266		SSK220		87.5	66	94	82	14 N	N	OB	35008		4 S7	HIGH
160 N156	02/08/94	0341	Y		SSK232			90	72	97	89	14 N	N	OB	21756		3 N2	LOW
161 N157	06/08/94	0000	Y		PPJ765			97	71	101	93	12 N	N	OB	21754		3 N2	RIS
162 S158	06/08/94	2229	Y		SSK257			84	65	92.5	83	11.5 N	N	NV	30658		4 S6	RIS/SPR
163 P4	15/08/94	1530	N									Y	TOTAL N	CAS	29118		4 S5	WAX

NEST LAYING DATA 1994 - NORTH KEY ISLAND

NEST #	DATE	TIME	NEST DATA		RELOCATION	SURR	LOCATION DATA		WEATHER	COMMENTS
			PREDATION	#EGGS			ORIGINAL	RELOCATED		
			(Y/N)		(Y/N)		NEST	NEST	INDEX	
1 P1	14/05/94	1145	Y	ALL	N	NV/LOG	8650		4 RIS	LOOKS LIKE IT WAS PREDATED THE NIGHT BEFORE
237	25/05/94	1000	N		N	NV	4051		4 RIS/SFR	ORIGINALLY NEST C-1
31	27/05/94	1014	Y	30-40	N	NV	822		4 LOW	APPEARS TO HAVE CRAWLED BEFORE HIGH TIDE
42	27/05/94	1056	Y	20-30	N	NV/CAS	7020		4 RIS	CRAWLED AFTER HIGH TIDE
5 P2	27/05/94	1125	Y	ALL	N	NV/CAS	7988		4 RIS	
6 P3	27/05/94	1140	Y	ALL	N	NV/CAS	7928		4 RIS	
73	01/06/94	1030	N		N	CB	4611		4 FALL	RACCOON TRACKS
8 P4	03/06/94	1231	Y	ALL	N	CAS	8052		4 FALL	
9 P5	09/06/94	1030	Y	ALL	N	CB	8676		4 HGH/RIS/SFR	
104	09/06/94	1023	N	ATTEMPT	N	CAS/OB	5945		4 RIS/SFR	A PREDATION ATTEMPT WAS MADE, BUT UNSUCCESSFUL
115	09/06/94	1025	N		N	CAS/OB	6021		4 RIS/SFR	
126	11/06/94	1030	N		N	NV/OB	2987		4 RIS	
13 P6	11/06/94	1114	Y	ALL	N	CAS/OB	6209		4 RIS	
14 P7	12/06/94	1022	Y	ALL	N	CAS	9951		3 FALL	
15 P8	14/06/94	1016	Y	ALL	N	CB	4407		3 FALL/NP	LOOKS LIKE RACCOONS WHO ATE EGGS GOT SICK
167	15/06/94	1045	N		N	CAS	13560		4 FALL	OLD NEST
178	15/06/94	1110	N		N	CAS	13485		4 FALL	OLD NEST
189	15/06/94	1150	N		N	CAS	13395		4 LOW	OLD NEST
1938	15/06/94	1230	N		N	CAS	14015		4 RIS	ORIGINALLY RECORDED AS C-4
20 P9	15/06/94	1245	Y	ALL	N	CB	11287		3 RIS	OLD NEST, PREDATED AT LEAST ONE OR TWO DAYS AGO.
2110	18/06/94	1042	N		N	CAS	12295		4 FALL	
2211	18/06/94	1130	N		N	CAS	13337		3 FALL	
2312	18/06/94	1200	N		N	NV	14275		3 FALL	
2413	19/06/94	1030	N		N	NV	4460		4 HGH/FAL/SFR	
2514	21/06/94	1102	N		N	CB	7120		3 HGH/NP	FLOODED BY 03/07/94 STORM TIDE
2615	22/06/94	1024	Y	8	N	NV/OB	892		4 RIS/NP	
2716	24/06/94	1025	N		N	CB	5604		3 RIS/SFR	FLOODED BY 03/07/94 STORM TIDE
2817	25/06/94	1042	N		N	CAS/OB	7094		3 RIS/SFR	SEVERE FLOODED BY 03/07/94 STORM TIDE, NEST SITTING IN POOL ALSO FLOODS WITH EACH SPRING TIDE.
29 P10	26/06/94	1031	Y	52	N	CAS/OB	1188		3 RIS/SFR	
3018	28/06/94	1025	N		N	NV	5088		4 RIS/NP	
31 P11	28/06/94	1106	Y	ALL	N	CAS	11338		4 FALL/NP	
3219	29/06/94	1030	N		N	CB	5441		4 FALL/NP	
3320	30/06/94	1030	Y	1-2	N	NV	1120		4 FALL/NP	
3421	01/07/94	1020	Y	20-25	N	CB	4490		4 FALL/NP	
35 P12	03/07/94	1017	Y	TOTAL	N	CB	1082		3 FALL/NP-STORM HIGH	
3622	03/07/94	1031	N		N	NV/OB	2124		4 RIS/NP	OLD NEST, POSS LAID 6/30PM TO 7/1AM
3723	05/07/94	1020	N		N	NV/OB	2525		4 FALL/SFR	
3824	05/07/94	1110	N		N	CB	6255		4 FALL/SFR	
39 P13	08/07/94	1014	Y	TOTAL	N	NV/OB	4973		4 RIS/NP	
4025	09/07/94	1025	N		N	NV	2612		4 RIS/SFR	
4126	09/07/94	1100	N		N	NV	5712		4 RIS/SFR	
4227	11/07/94	1255	Y	75-80	N	NV	4423		4 RIS/SFR	
43 P14	13/07/94	1015	Y	TOTAL	N	CAS	15800	ESTIMATE	4 FALL/LOW	OLD NEST, FOUND FAR DOWN BEACH WHERE NO MEASUREMENT SO FAR TAKEN- LOCATION ESTIMATED
44 P15	13/07/94	1017	Y	TOTAL	N	CAS	16200	ESTIMATE	4 FALL/LOW	OLD NEST, FOUND FAR DOWN BEACH WHERE NO MEASUREMENT SO FAR TAKEN- LOCATION ESTIMATED
45 P16	13/07/94	1023	Y	TOTAL	N	CAS	16600	ESTIMATE	4 FALL/LOW	OLD NEST, FOUND FAR DOWN BEACH WHERE NO MEASUREMENT SO FAR TAKEN- LOCATION ESTIMATED
46 P17	13/07/94	1027	Y	TOTAL	N	CAS	16600	ESTIMATE	4 FALL/LOW	OLD NEST, FOUND FAR DOWN BEACH WHERE NO MEASUREMENT SO FAR TAKEN- LOCATION ESTIMATED
4728	15/07/94	0825	Y	65	N	CB	4460		4 FALL/SFR	15 EGGS LEFT UNHARMED
48 P18	16/07/94	1220	Y	TOTAL	N	NV	16000	ESTIMATE	4 FALL/SFR	
4929	17/07/94	1020	Y	54	N	CB	3790		3 FALL/SFR	
5030	19/07/94	1015	Y	52	N	CB	5524		3 HGH/SFR	APPROX 35 EGGS REMAIN
5131	20/07/94	1018	N		N	CAS/OB	6045		4 RIS/SFR	
5232	20/07/94	1051	Y	76	N	CB	8020		3 RIS/SFR	APPROX 10-20 EGGS REMAIN
53 P19	21/07/94	1033	Y	TOTAL	N	NV/OB	7894		4 RIS/SFR	
5433	22/07/94	1018	Y	15-25	N	CB	1162		4 RIS/SFR	
5538	23/07/94	1105	N		N	NV/OB	12896		4 RIS/SFR	ORIGINALLY RECORDED AS C-7
5634	26/07/94	1031	N		N	CB	1022		4 RIS/SFR	
5735	02/08/94	1015	N		N	CB	473		3 NP	
5836	07/08/94	1517	N		N	CAS	11928		4 FALL/SFR	