

2003 MARINE TURTLE NESTING SUMMARY

CANAVERAL NATIONAL SEASHORE



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2003 MARINE TURTLE NESTING SUMMARY CANAVERAL NATIONAL SEASHORE

ABSTRACT

A total of 3320 sea turtle nests were deposited at CANA in 2003 - 3229 loggerhead, 74 green, 16 leatherback, and one Kemp's ridley. Nest densities were 84.3 per kilometer for the loggerhead, 1.9 per kilometer for the green and 0.4 per kilometer for the leatherback. False crawl densities were 38.1, 1.7 and 0.16 per kilometer, respectively. Over 99% of the nests were screened to exclude predators. During the season, 1.4% of the nests were depredated prior to discovery and four percent of screened nests were partially or totally depredated. Overall depredation rate for all nests was 06%. Every twentieth and all green, leatherback and Kemp's nests were marked for excavation. Hatching success rates of 71, 59 and 61 % were recorded for the loggerhead, green and leatherback sea turtles, respectively. Ninety-five percent (79 of 83) of the Kemp's ridley eggs hatched.

INTRODUCTION

Canaveral National Seashore (CANA) is an important nesting area for several species of threatened and endangered sea turtles. These are primarily the loggerhead (*Carretta caretta*), with a lesser number of green (*Chelonia mydas*) and an occasional leatherback (*Dermochelys coriacea*). In 2003 the first Kemp's ridley nest was recorded. Nest depredation, primarily by raccoons, is a serious threat, with depredation rates exceeding 90 % in the early 1980's (McMurtry 1986). In 1984, the park implemented a nest screening program to protect nests while allowing the raccoon to remain as an integral part of the seashore ecosystem. In 1993 and 1994, the University of Georgia compared three methods of nest protection, screening, predator removal and conditioned-taste-aversion (Ratnaswamy 1995; Warren 1996). They found screening to be most effective and compatible with National Park Service guidelines and objectives.

2003 was the twentieth year for CANA's sea turtle nest protection program. Since 1995, park staff has managed to screen over 90% of the several thousand nests deposited each year, reducing nest depredation to as low as 5.6 % in 2003. The park's goal is to achieve the 60% hatching rate targeted in the loggerhead and green sea turtle recovery plans (NMFS and USFWS 1991) without removing predators from their important role in the barrier island ecosystem.

A two year study was initiated by The University of Florida in 2003 that will provide information on the foraging grounds and genetic characteristics of CANA's nesting loggerhead population. Skin and scute samples are being collected in the northern half of the park. Similar work is being done by Dynamac in the southern portion.

STUDY SITES AND METHODS

Canaveral National Seashore is located along the east-central coast of Florida with Bethune Beach to the north and Kennedy Space Center to the south (Figure 1). The northern 18.1 kilometers (11.25 miles) of beach is situated in Volusia County and the southern 20.2 kilometers (12.5 miles) in Brevard County.

The beach is essentially undeveloped with only a few artificial lights and a number of boardwalks to protect the dune vegetation. The dune is well developed along most of the beach and is stabilized by a thick growth of sea oats (*Uniola paniculata*), sea grape (*Coccoloba uvifera*), saw palmetto (*Serenoa repens*) and other dune species. The beach was divided into 94 quarter-mile long grids by placing numbered four by four posts along the dune line. These grids provide a reference point for documenting nest locations.

The beach is closed to the public between sunset and sunrise except for occasional guided turtle walks. These walks are limited in size to minimize disturbance to the nesting turtles.

On April 15, 2003, the park initiated sporadic patrols of the South District beach on four-wheeled all-terrain vehicles (ATV's) to record sea turtle emergences (nests and false crawls) and to screen nests. Regular patrols of both districts were implemented on May 8, 2003. The 24 miles of beach was divided into two 12 mile segments, each covered by a team consisting of a ranger and a volunteer. The teams worked from 11:00 p.m. to 7:00 a.m., seven nights a week. In addition, daytime patrols were conducted at least three times a week to document any subsequent depredations to recorded nests. On August 11, 2003, patrols were switched to 4:00 a.m. to noon, due to a decrease in nesting and to enhance nest excavation activities.

Initial data collected for each nest included: date, nest number, species, grid, number of eggs depredated and sighting/treatment. Sighting/treatment referred to the condition of the nest upon discovery (undepredated, partially depredated or totally depredated) and the subsequent treatment (nest screened or left unscreened). Each nest was marked with a numbered stake for later identification. Date and grid location of each false crawl was also recorded.

The screening procedure consisted of placing a 4 feet x 4 feet wire mesh screen over the nest and staking down the corners with three foot sections of #3 rebar. The rebar was bent over near one end to form a 70 degree angle. The 2 inches x 4 inches mesh size was large enough to allow hatchlings to emerge while discouraging attempts by predators to reach the eggs. Partially depredated nests that retained a significant number of intact eggs had the broken eggs removed and were covered with clean sand.

During daytime patrols, all new nest depredations were recorded, number of depredated eggs counted and broken eggs removed from the nest site. The latter was done to deter predators from easily relocating any remaining eggs and to prevent counting depredations more than once. If a significant number of viable eggs remained, broken eggs were removed and the nest was re-covered with clean sand.



The stake for every twentieth loggerhead and every green nest was marked with white spray paint for ready identification. All leatherback nests were marked. After a minimum of 70 days, or 3 days after evidence of hatching, the nests were excavated and the following information recorded: number of hatchlings emerged (empty eggshells), number of unhatched eggs, number of live hatchlings in nest, number of dead hatchlings in nest and number of pipped eggs (hatchling still partially in eggshell). Depredated eggs recorded during daytime runs were added to the total of unhatched eggs prior to analysis. This data was then used to calculate average hatching success for the entire beach.

One hundred and sixty four (164) nests were relocated for one of three reasons: 1) the nest was located at the base of a heavily traveled boardwalk; 2) the nest cavity and eggs had been fouled by the contents of broken eggs; 3) the nest was in imminent danger of erosion. Pits approximating the natural nest cavity were dug near the base of the dune. The eggs were then carefully transferred, buried and screened in the usual manner.

An attempt was made to remove individual raccoons that had learned how to repeatedly tunnel under the screens. These raccoons were captured using Tomahawk live-traps.

RESULTS

Nesting and False Crawl Totals

A total of 3320 sea turtle nests were deposited at CANA in 2003 - 3229 loggerheads, 74 greens, 16 leatherbacks, and one Kemp's ridley (Table 1). The park was very excited to have its first recorded Kemp's ridley nest laid on May 22. Overall nest density was 84.3 per kilometer for the loggerhead, 1.9 per kilometer for the green and 0.4 per kilometer for the leatherback.

The total number of loggerhead false crawls was 1459 or 38.1 per kilometer, a false crawl to nest ratio of 1:2.2 (Table 1). There were 64 green false crawls or 1.7 per kilometer, a false crawl to nest ratio of 1:1.2. Six leatherback false crawls were recorded, or 0.16 per kilometer, for a false crawl to nest ratio of 1:2.7.

As in former years, the greatest concentration of nesting was noted in the southern half of CANA, with 60.9% (2022) of the nests occurring in the South District (Brevard County) and 39.1% (1298) in the North District (Volusia County) (Table 1). Nesting densities were 100.1 and 71.7 per kilometer respectively. Figures 2a and 2b show the number of nests and false crawls by individual grids for the entire beach.

Tagged Turtles

External flipper tags were observed on five nesting females. Three of these had been tagged at CANA or the adjacent Kennedy Space Center; one was tagged in Florida Bay at the southern tip of Florida and one was tagged in Mexico.

Initial Sighting and Nests Screened

In 2003, 99.6% (3307) of the 3320 nests deposited at CANA were screened, comprising 3273 undepredated and 34 partially depredated nests (Table 2, Initial Encounter). This included 3216 loggerhead, 74 green, 16 leatherback nests, and one Kemp's ridley.

Thirteen loggerhead nests were totally depredated prior to discovery (Table 2, Initial Encounter). No leatherback and green nests were depredated prior to discovery.

Table 1: 2003 Marine Turtle Crawl Survey, Canaveral National Seashore.

Overall

	Loggerhead	Green	Leatherback	Kemps	Total
Nests	3229	74	16	1	3320
False Crawls	1459	64	6	0	1529
Nest Density (nest/km)	84.3	1.9	0.4	0.03	86.7
FC Density (FC/km)	38.1	1.7	0.2	0	39.9
FC to Nest Ratio	1:2.2	1:1.2	1:2.7	0	1:2.2

Distribution by District

North District (Volusia County)

	Loggerhead	Green	Leatherback	Kemps	Total
Nests	1269	23	5	1	1298
False Crawls	523	19	3	0	545
Nest Density (nest/km)	70.1	1.3	0.3	0.1	71.7
FC Density (FC/km)	28.9	1.0	0.2	0	30.1
FC to Nest Ratio	1:2.4	1:1.2	1:1.7	0	1:2.4

South District (Brevard County)

	Loggerhead	Green	Leatherback	Total
Nests	1960	51	11	2022
False Crawls	936	45	3	984
Nest Density (nest/km)	97.0	2.5	0.5	100.0
FC Density (FC/km)	46.3	2.2	0.1	48.7
FC to Nest Ratio	1:2.1	1:1.1	1:3.7	1:2.1

Figure 2a. Nests, False Crawls, Depredations and Tunneling Activity - Grids 0 - 44.
Canaveral National Seashore - 2003

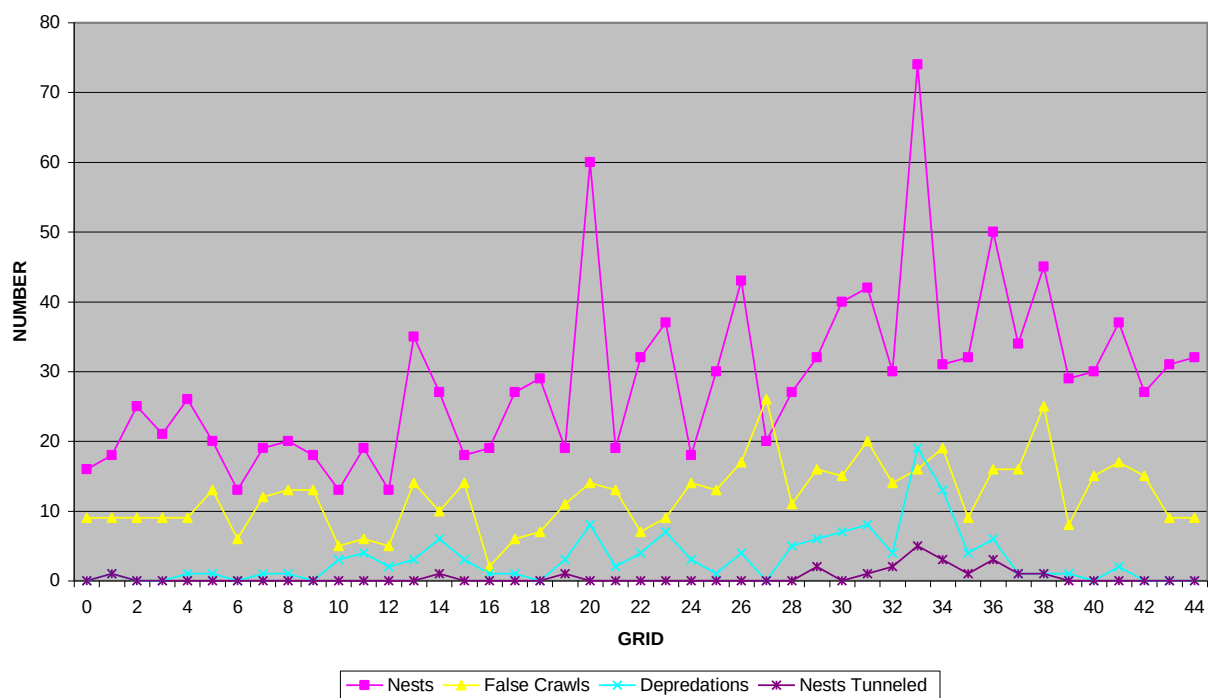


**Figure 2b. Nests, False Crawls, Depredations and Tunneling Activity - Grids 45 - 94.
Canaveral National Seashore - 2003.**

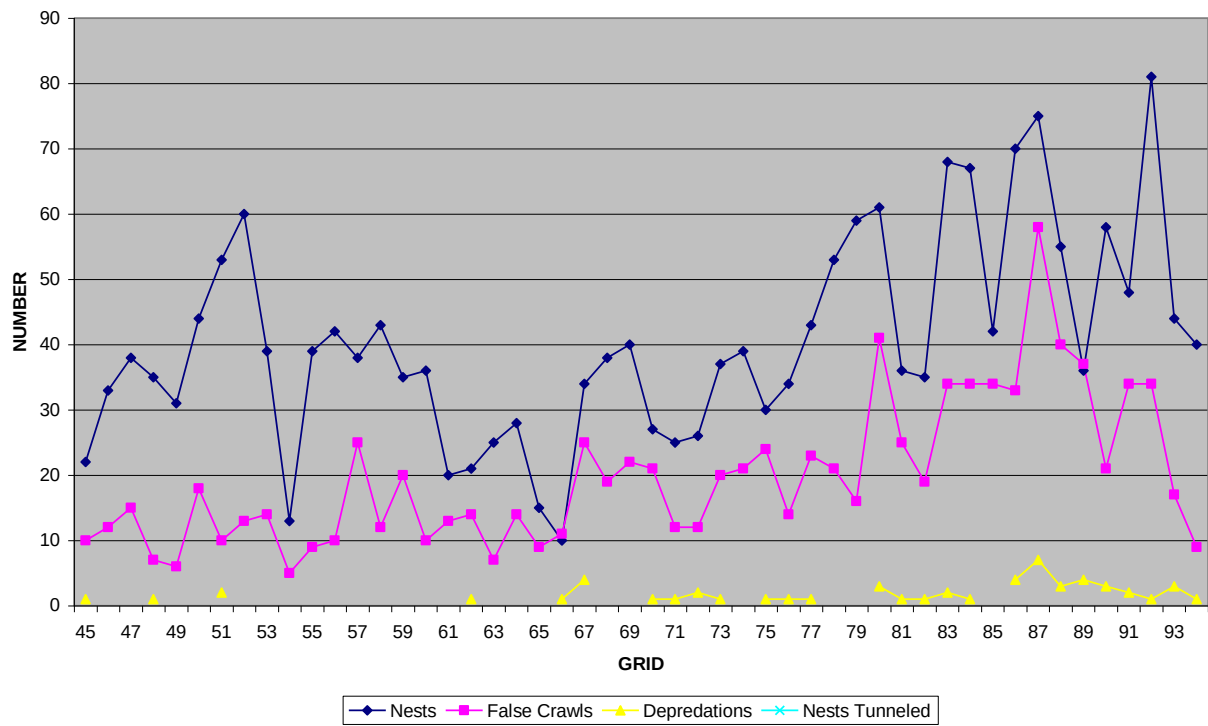


Table 2. Nest Treatment and Depredation, 2003. Canaveral National Seashore.

Initial Encounter

	Loggerhead	Green	Leatherback	Kemps	Total
Not Dep/Screened	3182	74	16	1	3273
Part Dep/Screened	34	0	0	0	34
Total Depredation	13	0	0	0	13
TOTAL	3229	74	16	1	3320

Part=Partial Dep=Depredation

Subsequent Depredation (G,I)

Screened Nests

	Loggerhead	Green	Leatherback	Kemps	Total
North District	93	0	0	0	93 (07%)
South District	51	0	0	0	51 (03%)
Total	144	0	0	0	144 (04%)

Overall Depredation (Initial Encounter and Subsequent Depredation)

All Nests

	Loggerhead	Green	Leatherback	Kemps	Total
Partial Depredation	163 (05%)*	0	0	0	163 (05%)
Total Depredation	26 (>01%)	0	0	0	26 (>01%)
Total	189 (06%)	0	0	0	189 (06%)

* Percentages in species columns are derived from total number of nests for that species

^ Percentages in Total column are derived from total number of nests for all species (3320)

By District

	Loggerhead	Green	Leatherback	Kemps	Total
North District	138	0	0	0	138 (11%)*
South District	51	0	0	0	51 (03%)*
Total	189	0	0	0	189 (06%)

* Percentages are derived from total number of nests in each district

Subsequent Depredations

Five percent (150) of screened nests were partially or totally depredated by predators that reached through the top of the screens to get the upper layers of eggs or tunneled underneath the screens (Table 2, Subsequent Depredation). Tunneling percentages were higher in the North District with 07% (93) of the screened nests depredated, versus 03% (51) in the South District. Eighteen (>01%) of the nests were recorded as being depredated more than once after initial screening (CANA files).

Overall Depredations

The overall depredation rate for both screened and unscreened nests and initial and subsequent depredations was 06%. All depredations were to loggerhead nests; no nests of the other three species were depredated (Table 2, Overall Depredation, All Nests). Specifically, >01% (26) of the loggerhead nests were totally depredated and 05% (163) were partially depredated.

As in past years, the highest percentage of depredations (partial and total) occurred in the North District, where 11% (138) of the nests were depredated, compared to 03% (51) in the South District (Table 2, Overall Depredation, By District). A small number of problem raccoons (“tunnelers”) were removed from the beach during the nesting season.

Hatching Success

Every twentieth loggerhead nest was marked for excavation after the incubation period to determine hatching success. Of the 163 marked loggerhead nests, 155 (95%) were excavated (Table 3). One hundred and forty eight (148) of these were un-depredated and seven (7) partially depredated. Eight (05%) were of unknown fate (Table 3). None of the marked nests were totally destroyed by predators. Hatching success was 73% for undepredated nests and 34% for partially depredated nests. Combining the two yielded a hatching success rate of 71%.

Average clutch size was 101.9 eggs for undepredated nests. An estimated number of loggerhead hatchlings produced on CANA’s beach in 2003 was calculated as follows:

$(71\% \text{ hatchling success}) \times (101.9 \text{ eggs/clutch}) \times (3229 \text{ nests}) = 233,615 \text{ hatchlings.}$

It is highly probable that at least some, if not all, of the eight nests of unknown fate were eroded away. These represent five percent of the marked nests. By subtracting five percent or 161 from the total nest number of 3229, we can derive a minimum estimate of hatchlings. The formula then becomes:

$(71\% \text{ hatchling success}) \times (101.9 \text{ eggs/clutch}) \times (3068 \text{ nests}) = 221,966 \text{ hatchlings.}$

Every green nest was marked for excavation. Of the 75 marked nests, 67 (89%) were excavated (Table 3). The other eight (11%) nests were eroded or of unknown fate (Table 3). None of the nests were depredated.

Hatching success was 59 % and average clutch size 109.0 eggs. The estimated number of green hatchlings was:

$(59\% \text{ hatchling success}) \times (109 \text{ eggs/clutch}) \times (75 \text{ nests}) = 4,823 \text{ hatchlings.}$

If we assume that the eight unfound nests were eroded away, we can derive a minimum estimate of hatchlings by subtracting eight from the total nest number of 75. The revised formula is:

$(59\% \text{ hatchling success}) \times (109 \text{ eggs/clutch}) \times (67 \text{ nests}) = 4,309 \text{ hatchlings.}$

All sixteen leatherback nests were excavated. Average clutch size was 69.8 eggs and hatching success was 61% (Table 3). None of the leatherback nests were depredated, eroded, or of unknown fate.

The one Kemp's ridley nest was excavated with much excitement. The clutch size was 83 eggs and hatching success was 95% (Table 3). The nest was not depredated. Two dead hatchlings were found in the nest. Tissue samples were sent to Donna Shaver of USGS at Padre Island.

Table 3. Hatching Success of Marked Nests, 2003. Canaveral National Seashore.

Loggerhead	Non-depredated	Partial Depredation	Eroded Unknown Fate	Overall
Nests marked	148	7	8	163
Nests Excavated	148	7	N/A	155
Total Eggs	15077	646	N/A	15723
Ave. Clutch Size	101.9	92.3	N/A	N/A
Hatchlings Emerged	10982	220	N/A	11202
Hatching Success	73%	34%	N/A	71%

Green	Non-depredated	Partial Depredation	Eroded Unknown Fate	Overall
Nests marked	67	0	8	75
Nests Excavated	67	N/A	N/A	67
Total Eggs	7304	N/A	N/A	7304
Ave. Clutch Size	109.0	N/A	N/A	109.0
Hatchlings Emerged	4318	N/A	N/A	4318
Hatching Success	59%	N/A	N/A	59%

Leatherback	Non-depredated	Partial Depredation	Eroded Unknown Fate	Overall
Nests marked	16	0	0	16
Nests Excavated	16	N/A	N/A	16
Total Eggs	1116	N/A	N/A	1116
Ave. Clutch Size	69.8	N/A	N/A	69.8
Hatchlings Emerged	685	N/A	N/A	685
Hatching Success	61%	N/A	N/A	61%

Kemp's Ridley	Non-depredated	Partial Depredation	Eroded Unknown Fate	Overall
Nests marked	1	0	0	1
Nests Excavated	1	N/A	N/A	1
Total Eggs	83	N/A	N/A	83
Clutch Size	83	N/A	N/A	83
Hatchlings Emerged	79	N/A	N/A	79
Hatching Success	95%	N/A	N/A	95%

DISCUSSION

Nesting and False Crawl Totals

The total of 3320 nests at CANA in 2003 was second lowest in the past six years (Table 4). As expected, the number of green nests dropped, following the distinctive biennial pattern noted since 1989 (Figure3). However, the total of 74 nests was higher than anticipated, exceeding all of the other “down” years. Loggerhead numbers increased slightly but remained below the prior four years (Table 4). The 16 leatherback nests were the most recorded for a single season at CANA. The Kemp’s ridley nest was the first ever recorded at CANA.

Loggerhead nests again exceeded false crawls, for the fifteenth time in the past 19 years (Table 5). The ratio of 2.2 nests to every false crawl was dramatically higher than any previous year. The leatherback nest total exceeded false crawls for the thirteenth time in 14 years (Table 5). The green pattern differs from the other two species; in 2003 nests exceeded false crawls for only the eleventh time in 19 years (Table 5).

Screening Activity and Nest Depredation

Ninety nine percent (3305) of the sea turtle nests deposited at CANA in 2003 were screened. Overall nest depredation dropped from 14.4% in 2002 to 5.6% in 2003 (Table 6). This was the lowest amount since 1994. The depredation rate has fluctuated between 29.9 and 5.6% since 1993, when daytime runs were implemented to detect subsequent nest depredations.

Tunneling activity, digging under the screens to reach the eggs, also decreased from 8.3% in 2002 to 4.4% in 2003 (Table 6). This too was the lowest value since 1994. Since 1985, tunneling has ranged from 18.7% in 1988 to 1.9% in 1990. The unusually high value in 1988 was almost twice that of any prior year.

Yearly oscillations in depredation and tunneling are likely tied to periodic fluctuations in the raccoon population and number of experienced animals foraging on the beach (i.e. individuals that have learned to tunnel). Kramer (1996) noted that breeding occurs in most months of the year at CANA. That, combined with ample food resources and the absence of natural predators, provides conditions for periodic surges in the raccoon population at CANA. Conversely, natural factors, such as distemper, will serve to return the raccoon population to lower levels.

In 2003, there were no obvious signs of a disease outbreak at CANA that would explain the decline in nest depredation. The efficiency of the seasonal employees may have been a key factor; all had extensive experience with the nest screening program from prior years.

Table 4. Sea Turtle Nest Totals, 1984-2003. Canaveral National Seashore.

YEAR	LOGGERHEAD	GREEN	LEATHERBACK	KEMPS	UNKNOWN	TOTAL
2003	3229	74	16	1		3320
2002	3161	857	8			4026
2001	3257	7	10			3274
2000	3892	662	9			4563
1999	4501	5	9			4515
1998	3976	427	5			4408
1997	2702	21	4			2727
1996	3260	222	3			3485
1995	4121	47	1			4169
1994	3886	364	2			4252
1993	3140	28	0			3168
1992	3279	298	0			3577
1991	4074	25	1			4100
1990	3922	185	1			4108
1989	3091	41	1			3133
1988	2203	43	0		4	2250
1987	1670	90	1		15	1776
1986	3349	22	3			3374
1985	2389	94	0		25	2508
1984	*					2125

* = Individual breakdown not available.

Taken from yearly Sea Turtle Nesting Summaries, 1984-2002, Canaveral National Seashore, Titusville, Florida.

**Figure 3. Green Sea Turtle Nesting Totals
Canaveral National Seashore 1985 - 2003.**

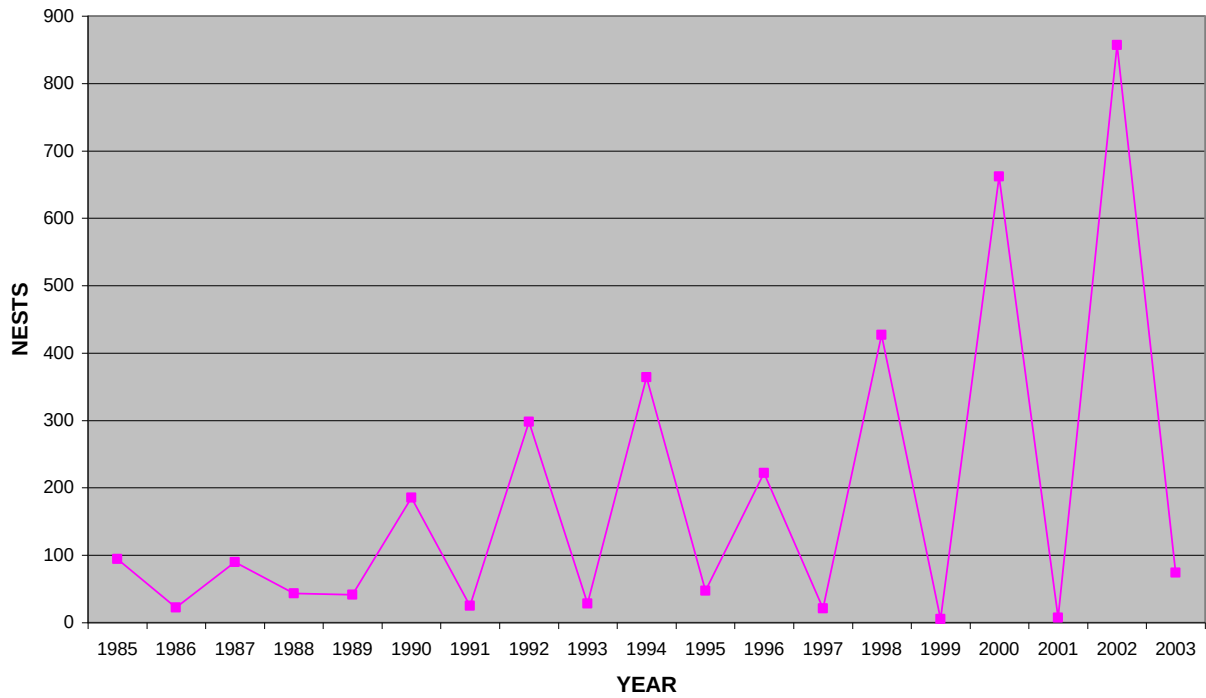


**Figure 4. Loggerhead Sea Turtle Nesting Totals
Canaveral National Seashore 1985 - 2003.**

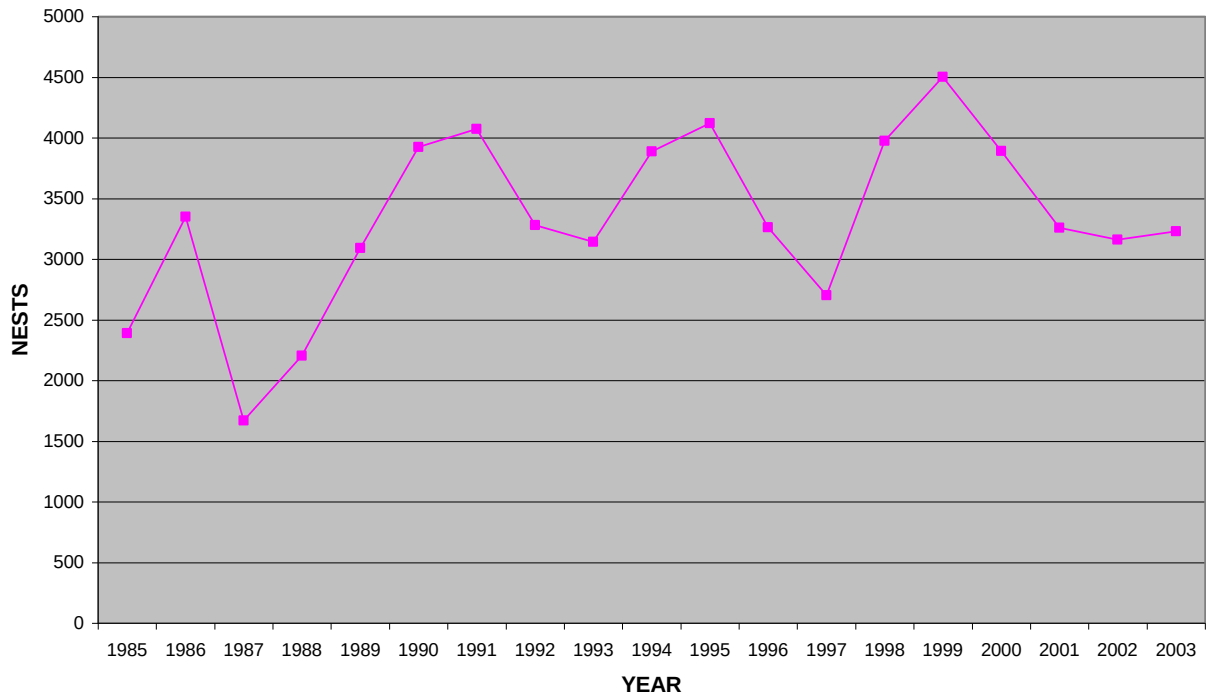


Table 5. False Crawl to Nest Ratio, 1984-2002. Canaveral National Seashore.

<u>Year</u>	<u>Loggerhead</u>	<u>Green</u>	<u>Leatherback</u>
2003	1:2.21	1:1.16	1:2.66
2002	1:0.95	1:1.27	1:2.66
2001	1:1.54	1:0.70	1:5.00
2000	1:1.02	1:0.71	1:3.00
1999	1:1.20	1:0.63	1:3.00
1998	1:0.99	1:0.52	1:0.63
1997	1:1.19	1:0.72	0:4.00
1996	1:1.32	1:0.77	1:1.00
1995	1:1.36	1:1.21	0:1.00
1994	1:1.60	1:1.38	0:2.00
1993	1:1.46	1:1.87	--
1992	1:1.43	1:1.10	--
1991	1:1.10	1:1.66	0:1.00
1990	1:1.31	1:1.17	1:1.00
1989	1:1.53	1:3.00	--
1988	1:0.94	1:1.16	--
1987	1:1.02	1:0.72	0:1.00
1986	1:0.98	1:0.76	0:3.00
1985	1:1.22	1:1.02	--
1984	--	--	--

Taken from yearly Sea Turtle Nesting Summaries, 1984-2002, Canaveral National Seashore, Titusville, Florida.

Table 6. Amount of Screening and Depredation of Screened Nests, 1984-2003.
Canaveral National Seashore.

YEAR	NESTS	NESTS SCREENED	SCREENED NESTS DEPREDATED (%)	ESTIMATED OVERALL DEPREDATION (%)
2003	3320	3307 (99%)	4.4	5.6
2002	4026	3957(98%)	8.3	14.4
2001	3274	3207 (98%)	9.9	19.9
2000	4563	4304 (94%)	7.2	23.0
1999	4515	4311 (95%)	8.2	22.2
1998	4408	4233 (96%)	7.2	19.3
1997	2727	2510 (92%)	9.6	29.9
1996	3485	3198 (92%)	5.7	19.7
1995	4169	3975 (95%)	4.8	14.8
1994	4252	1724 (41%)	4.3	18.7
1993	3168	1221 (39%)	7.6	28.6
1992	3579	2213 (62%)	4.3 *	11.6 *
1991	4100	1507 (37%)	3.3 *	13.9 *
1990	4108	1547 (38%)	1.9 *	9.2 *
1989	3132	1030 (33%)	3.4	17.5
1988	2250	887 (39%)	18.7	64.1
1987	1776	766 (43%)	7.2	58.7
1986	3374	1517 (45%)	3.7	47.3
1985	2508	1023 (41%)	5.0	41.7
1984	2125	213 (19%)	----	65.0

* Daytime runs to check secondary nest depredation were not conducted on a regular basis.

Hatching Success

The target level for hatching success was 60%, as established in the U.S. Fish and Wildlife Service sea turtle recovery plans for the loggerhead and green turtles (NMFS and USFWS 1991). The loggerhead rate of 71% far exceeded the goal, and was the highest observed in at least eight years (Table 7). The green rate was just under 60%, at 59%, and almost identical to the previous year (Table 7). The leatherback hatching success rate of 61% was also the highest in at least eight years. It was very exciting to see that 95% of the 83 Kemp's ridley eggs were successful (Table 3).

For the seven partially depredated loggerhead nests, 22% of the eggs were destroyed by predators, 34% hatched and 44% did not hatch. Of undamaged eggs remaining in the nests (after broken eggs were removed and the nest screened), 44% hatched in 2003, 47% in 2002, 55% in 2001 and 57% in 2000. This indicates that the effort to clean up and screen partially depredated eggs can save a significant portion of the remaining eggs. To ensure that all eggs in the marked nests were accounted for, daytime patrols were implemented at least three times a week to record any eggs lost to nest depredation after the night of initial deposition.

Table 7. Comparison of Hatching Success With Previous Years, 1996-2003.
Canaveral National Seashore

	Loggerhead	Green	Kemps	Leatherback
2003	71% (N/A)	59% (N/A)	95% (N/A)	61% (N/A)
2002	57% (55%)	60%(N/A)	-	43% (N/A)
2001	64% (62%)	-	-	31.5% (N/A)
2000	61% (56%)	56% (N/A)	-	38% (N/A)
1999	62% (53%)	64% (55%)	-	29% (N/A)
1998	64% (62%)	71% (N/A)	-	56% (42%)
1997	55% (49%)	51% (N/A)	-	23% (N/A)
1996	59% (53%)	65% (N/A)	-	27% (N/A)

() Percentages in parentheses are adjusted hatching rates, adding in average clutch size for totally depredated nests.

Weather and Tidal Influences

Erosion was not a major factor in 2003. Hurricane Isabella passed several hundred miles offshore during the fall, after the majority of the nests had hatched. Only five percent of the nests marked for excavations were eroded or of unknown fate (Table 3).

There was an unusual drop in water temperature during July, caused by prolonged winds from the southeast and an associated upwelling of cold water. Temperatures dipped 10 -15 degrees below normal, reaching as low as 62 degrees off Daytona Beach. During this period, sea turtle nesting activity declined noticeably and may have significantly affected the nesting totals for

2003. Other nesting beaches in Florida reported the same phenomena. The cold water also affected sea turtle hatchlings which were “stunned” by the cold water and washed ashore. Park staff collected live hatchlings on several different occasions and transported them to the Marine Science Center at Ponce Inlet.

Genetic Analysis of Nesting Loggerheads

In May, 2003, Kimberly Reich, of the University of Florida, collected skin and scute samples from 50 nesting loggerhead sea turtles in the northern half of the park. She was assisted by CANA Student Conservation Association interns. Skin samples are currently being analyzed for stable isotopes and mtDNA sequences and scute samples for stable isotopes. The purpose is to help determine what foraging areas are contributing CANA’s breeding loggerheads and if, as suspected, CANA lies along the boundary of two distinct loggerhead sub-populations. Samples from 50 more turtles will be collected in May, 2004.

ACKNOWLEDGEMENTS

Canaveral National Seashore's sea turtle nest screening program would not be possible without the effort of many dedicated people. Don Mock provided training and maintained supplies for the first half of the nesting season. The seasonal employees, Kristin Kniefl, Michael Daley and Sean McKenna, patrolled the beach each night, dealing with high humidity, bothersome insects and unexpected obstacles, but always accomplishing the task. The four Student Conservation Association (SCA) resource assistants, Sarah Shute, Amish Patel, Becky Antworth, and Stephanie Little, provided regular depredation patrols and maintained the large database. John Stiner and Stephanie Little analyzed data and wrote the final report. And then there were the 53 volunteers who sacrificed sleep and comforts to support the cause of sea turtle preservation. Thanks to you all.

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