

1994

Dry Tortugas National Park

Sea Turtle Nesting Report

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INTRODUCTION:

The Dry Tortugas is a near pristine marine environment located seventy miles west of Key West. When Ponce de Leon visited the chain of seven islands in 1513, he called them Las Tortugas due to the abundance of sea turtles. Mariners later added the word dry to signify the lack of fresh water. Over 170 turtles were butchered to feed his crew, marking the first exploitation of the rookery.

Today, almost half a century later, the Dry Tortugas still supports a significant number of the long lived reptiles. 72 Nests were documented in 1994, and 25 of them were green turtles (*Chelonia mydas*). The remaining 47 nests were loggerheads (*Caretta caretta*). There was a time frame of two months on East Key, and one month on Loggerhead Key when nesting activity was not monitored. Even with these gaps in data, more nests were located in 1994 than any previous year. This can be attributed to the fact that in the past, researchers left before all the nests emerged.

This has been a record year for green turtle nests in the Dry Tortugas, with 25 known nests. Positive identification was verified either by traplings or undeveloped embryos. The remainder of the nests were deemed loggerheads when unhatched eggs were indiscernible and no traplings were present. Unknown green turtle crawls were distinguished by their large, deep body pits that were usually in the vicinity of vegetation lines.

Loggerhead and East Key contain over 95% of the turtle nests in the Dry Tortugas. Fort Jefferson is located on Garden key, which is approximately 16 acres. It has 3 small beaches and only 1-3 nests per year. Bush Key is critical nesting habitat for over 80,000 sooty terns and 4,500 pairs of brown noddies. It covers about 20 acres and, to my knowledge, has never had more than six documented nests. Hospital key varies due to accretion and erosion. It is home to the only masked boobie rookery in the United States, and has 2-4 crawls annually. The smallest of the seven islands, Middle key, is frequently awash in the summer. Long key is only about an acre and consists of coral debris. The trees of Long key support the only magnificent frigatebird rookery in the United States. Loggerhead key, which is covered with *Casuarina equisetifolia*, is a 30 acre island that has close to 100 crawls annually. This year, 74 crawls were documented and 30 nests located. East key ranges in size from 9-12 acres. It had over 200 crawls in 1992 and 1993. However, the 1994 season only provided 94 crawls with 42 nest. Over 300 crawls were documented in 1992 and 1993. Out of 168 crawls logged in 1994, 72 nests were located. Considering this, I find it safe to assume the Dry Tortugas has over 150 nests on a peak year.

TURTLE SIGHTINGS:

Kim and Sandford Fox, of the M/V Flying Cloud, spotted eight adult leatherbacks within two miles of each other. The sighting took place on the edge of a riptide, forty miles west of the Dry Tortugas in June. The Fox's said it was more than they had ever seen in eleven years of fishing.

Although mature hawksbills have not been recorded, juveniles are frequently seen on the reefs of the Dry Tortugas. This summer, a pair of twenty year old breeding adults were released just off of Garden Key. The pair had been held in captivity for over twenty years at Turtle Kraals in Key West. To my knowledge no one has seen them since their release.

METHODS AND PROCEDURES:

East and Loggerhead key are both marked with numbered PVC pipes at 100' increments. When a crawl is found, distance and direction are recorded in reference to the closest marker. A numbered stake is then placed next to the body pit, and the nesting form is filled out. Excavation takes place 3 days after emergence. If emergence doesn't occur, excavation takes place 70 days after the crawl was documented. In the event traplings are found, they are released on site. Upon excavation, all egg shells are counted. Unhatched eggs are opened to determine infertile and undeveloped eggs. Green hatchlings are easily identified, but inframarginal scutes are being closely observed on loggerheads in the event we have a hawksbill nest.

ACKNOWLEDGEMENTS:

I would like to thank Phyllis Fahey and Lisa Millard for their research. Special thanks to Jeannie and Jim Saddler for training me in the field, and their hard work, which was a major contribution to the project. Thanks to Elaine Wilmers and Martha Resk for their help in the field. Thanks to Tom Wilmers for his comments on my paper. I am extremely grateful to Carolyn Wiley for all of her help and support on this project. I would also like to thank the Key West Seaplane Service, the Yankee Freedom, and the Gulfstream Falcon for transportation to and from the fort. Finally, thanks to the Dry Tortugas National Park and SCA Americorps for making this study possible.

Table 1. Number of unknown crawls and nests of loggerhead turtles in the Dry Tortugas National Park, 1994.

Area	Unknown Crawls	Nests	Total Crawls
East Key	39	29	68
Loggerhead Key	37	18	55

Table 2. Number of unknown crawls and nests of green turtles in the Dry Tortugas National Park, 1994.

Area	Unknown Crawls	Nests	Total Crawls
East Key	14	13	27
Loggerhead Key	7	12	19

Table 3. Total number of unknown crawls and nests in the Dry Tortugas National Park, 1994.

Species	Unknown Crawls	Nests	Total Crawls
Green	21	25	46
Loggerhead	76	47	123
Combined	97	72	169

Table 4. Number of loggerhead turtle crawls, percent of crawls that culminated in nesting, and percent successful in the Dry Tortugas National Park, 1994.

Area	# Crawls	# Nests	% Nests	# Nests Successful	% Nests Successful
East Key	68	29	43%	27	93%
Loggerhead Key	55	18	33%	18	100%

Table 5. Number of green turtle crawls, percent of crawls that culminated in nesting, and percent successful in the Dry Tortugas National Park, 1994.

Area	# Crawls	# Nests	% Nests	# Nests Successful	% Nests Successful
East Key	27	13	48%	11	85%
Loggerhead Key	19	12	63%	12	100%

Table 6. Total number of crawls, percent of crawls that culminated in nesting, and percent successful in the Dry Tortugas National Park, 1994.

Species	# Crawls	# Nests	% Nests	# Nests Successful	% Nests Successful
Green	46	25	54%	23	92%
Loggerhead	123	47	38%	45	96%
Combined	169	72	43%	68	94%

Nests are deemed successful if hatchlings were produced. Due to salt water inundation, 4 nests were unsuccessful.

Table 7. Clutch size and hatching success for all turtle nests in the Dry Tortugas National Park, 1994.

Species	Nests	# Eggs Laid	# Eggs Hatched	% Eggs Hatched	Average Clutch
Green	25	3,091	2,450	79%	124
Loggerhead	33	3,238	2,821	87%	90

14 Loggerhead nests were not included in the above data due to unknown clutch sizes, and indiscernible unhatched eggs.

Table 8. Reproductive success of loggerhead turtles in the Dry Tortugas National Park, 1994.

Area	# Nests	Successful # Nests %	Hatchlings	#Hatchlings Nest Attempt	#Hatchlings Success Nest
East Key	19	17 89%	1,293	68	76
Logg Key	17	17 100%	1,495	88	88
Combined	36	34 94%	2,788	77	82

11 Loggerhead nests were not included in the above data due to unknown clutch sizes.

Table 9. Reproductive success of green turtles in the Dry Tortugas National Park, 1994.

Area	Nests	Successful # Nests %	Hatchlings	#Hatchlings Nest Attempt	#Hatchlings Success Nests
East Key	13	11 85%	961	74	87
Logg Key	12	12 100%	1,414	118	118
Combined	25	23 92%	2,375	95	103

Hatchlings Nest Attempt is the number of hatchlings divided by the number of nests.

Hatchlings Success Nests is the number of hatchlings divided by the number of successful nests.

LOGGERHEAD KEY SEA TURTLE NESTING REPORT 1994

Loggerhead Key was monitored by Fahey and Millard from 5/18 until 7/2. Jeanne and Jim Sadler arrived on 8/11, and monitored the island until I arrived on 9/14 to complete the nesting season. Nesting activity was not monitored from 7/3 until 8/11. Thirty crawls were documented by Fahey and Millard during their research. When the Sadlers arrived on 8/11, they staked crawls number 31-65. Since the actual crawl dates were unknown, I waited seventy days after 8/11 to excavate the ones that had not emerged. The only crawl after 8/11 was crawl # 32, that was laid on 8/20. It was a green nest and emerged on 10/16. Upon excavating it on 10/19, I found one live mutant albino with yolk sac still inside the egg. The turtle had no eyes, mouth, or nostrils. It died within hours and the specimen was sent to, Pat Wells, Park Manager of Lignumvitae Key State Botanical Site. Of 74 known crawls, 30 nests were located. 12 Of the 30 were greens, with the remainder being loggerheads. It is possible that there were more green turtle nests, but positive identification was only made on 12. Seven of the 44 unknown crawls were positively identified as greens.

Table 10. Clutch size and hatching success for Loggerhead Key. Ranges are included above the averages.

Species	# Nests	# Eggs Laid	# Eggs Hatched	% Eggs Hatched	Average Clutch
Green	12	1,661	1,462	76%-98% 88%	109--191 138
Loggerhead	17	1,706	1,527	74%-99% 90%	70 - 147 100

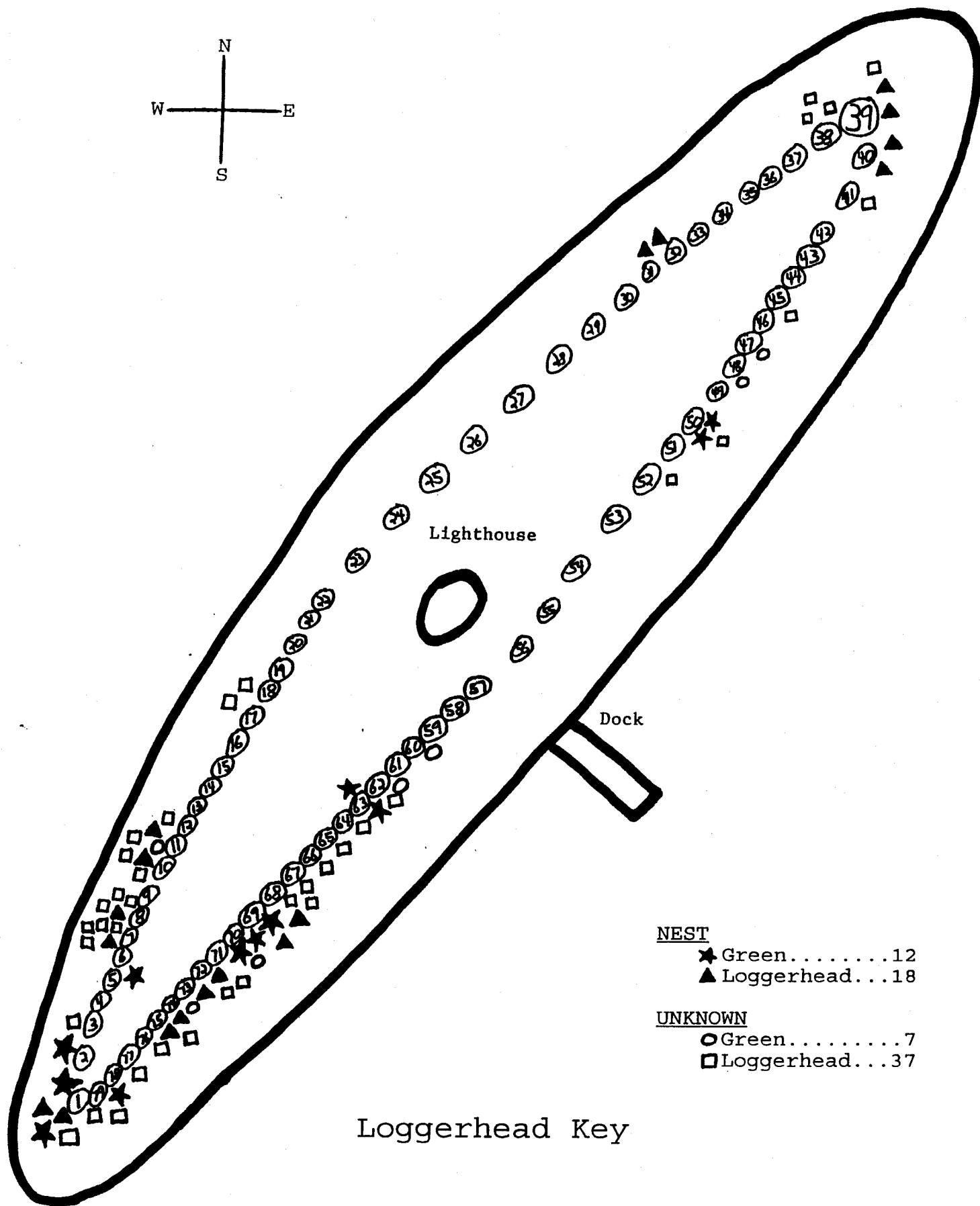
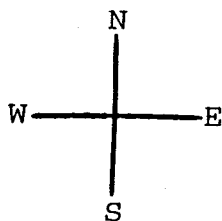
One loggerhead nest was not included due to unknown clutch size.

Table 11. Hatchling success, percent infertile, and percent undeveloped for Loggerhead Key. Ranges are included above the averages.

Species	# Nests	Hatchling Success	% Infertile	% Undeveloped
Green	11	56% - 98% 86%	0 - 17% 6%	0 - 10% 3%
Loggerhead	17	73% - 99% 88%	0 - 18% 3%	0 - 16% 6%

One green turtle nest is not included in the above data due to indiscernible unhatched eggs. 12 Nests are included in the Hatchling success. Hatchling success is based on the # of eggs hatched, excluding the dead, divided by the # of eggs laid.

APPENDIX I. Loggerhead Key Nest Locations.



NEST

- ★ Green.....12
- ▲ Loggerhead...18

UNKNOWN

- Green.....7
- Loggerhead...37

Loggerhead Key

APPENDIX II. Loggerhead Key Nest Data Chart.

LOGGERHEAD KEY NEST DATA 1994

#	Crawl#	Eggs	Hatch	Infert	Undev	Dead	Hatch	Live	Infert	Undev	Dead
1	74	?	28	?	?	?	---	---	---	---	---
2	73	80	59	14	7	0	74%	74%	18%	9%	0%
3	72 Cm	109	107	0	2?	0	98%	98%	---	---	0%
4	71 Cm	113	108	1	0	4	96%	92%	1%	0%	4%
5	70 Cm	133	101	0	6	26	76%	56%	0%	5%	26%
6	69	126	120	2	3	1	95%	94%	2%	2%	1%
7	68 Cm	131	123	0	1	7	94%	89%	0%	1%	6%
8	67	87	67	5	14	1	77%	76%	6%	16%	2%
9	66	87	78	0	8	1	90%	89%	0%	9%	1%
10	64	105	88	6	0	11	84%	73%	6%	0%	13%
11	56 Cm	115	113	1	1	0	98%	98%	1%	1%	0%
12	51	70	67	3	0	0	96%	96%	4%	0%	0%
13	50 Cm	144	126	4	14	0	88%	88%	3%	10%	0%
14	45 Cm	111	93	12	0	6	84%	78%	11%	0%	7%
15	43 Cm	175	147	12	12	4	84%	82%	7%	7%	3%
16	42 Cm	138	103	23	12	0	75%	75%	17%	9%	0%
17	39	89	83	1	4	1	93%	92%	1%	5%	1%
18	36	147	141	3	2	1	96%	95%	2%	1%	1%
19	32 Cm	135	130	3	1	1	96%	96%	2%	1%	1%
20	31 Cm	191	170	21	0	0	89%	89%	11%	0%	0%
21	30	87	86	1	0	0	99%	99%	1%	0%	0%
22	26	131	109	0	14	8	83%	77%	0%	11%	7%
23	25	90	82	0	5	3	91%	88%	0%	6%	4%
24	23	120	102	0	16	2	85%	83%	0%	13%	2%
25	22	77	71	4	2	0	92%	92%	5%	3%	0%
26	21	99	90	3	6	0	91%	91%	3%	6%	0%
27	20	89	79	3	7	0	89%	89%	3%	8%	0%
28	19 Cm	166	141	16	9	0	85%	85%	10%	5%	0%
29	11	95	87	3	5	0	92%	92%	3%	5%	0%
30	9	127	118	1	6	2	93%	91%	1%	5%	2%

Cm = Green turtle nest

Hatch = The # of hatched eggs, divided by the # of eggs laid.

Live = The # of hatched eggs, excluding the dead, divided by # eggs laid.

EAST KEY SEA TURTLE NESTING REPORT 1994

Fahey and Millard monitored East Key from 5/7 until 7/5. Nesting activity was not monitored from 7/6 until I arrived on 9/19. 47 Crawls were documented by Fahey and Millard. I recorded an additional 39, bringing the crawl number to 86. Since crawl dates were unknown for # 48-86, I waited until 10/21 to begin excavation. I found an additional 9 nests that were being washed over by the tide. Unfortunately, the tide that revealed the nests also took some of the eggs. Those nests will not be included in the success rates. 14 Nests were located out of the 47 documented by Fahey and Millard. Of the 39 crawls I logged, 19 nests were located. Upon excavating nest # 73 on 10/20, I found 3 green turtle hatchlings. I believe this to be the last nest laid on East Key. Out of 95 known crawls, 42 nests were located. 13 of the 42 were greens, with the remainder being loggerheads. Out of the 53 unknown crawls, 14 were obviously made by greens due to the massive body pits.

Table 12. Clutch size and hatching success for East Key. Ranges are included above the averages.

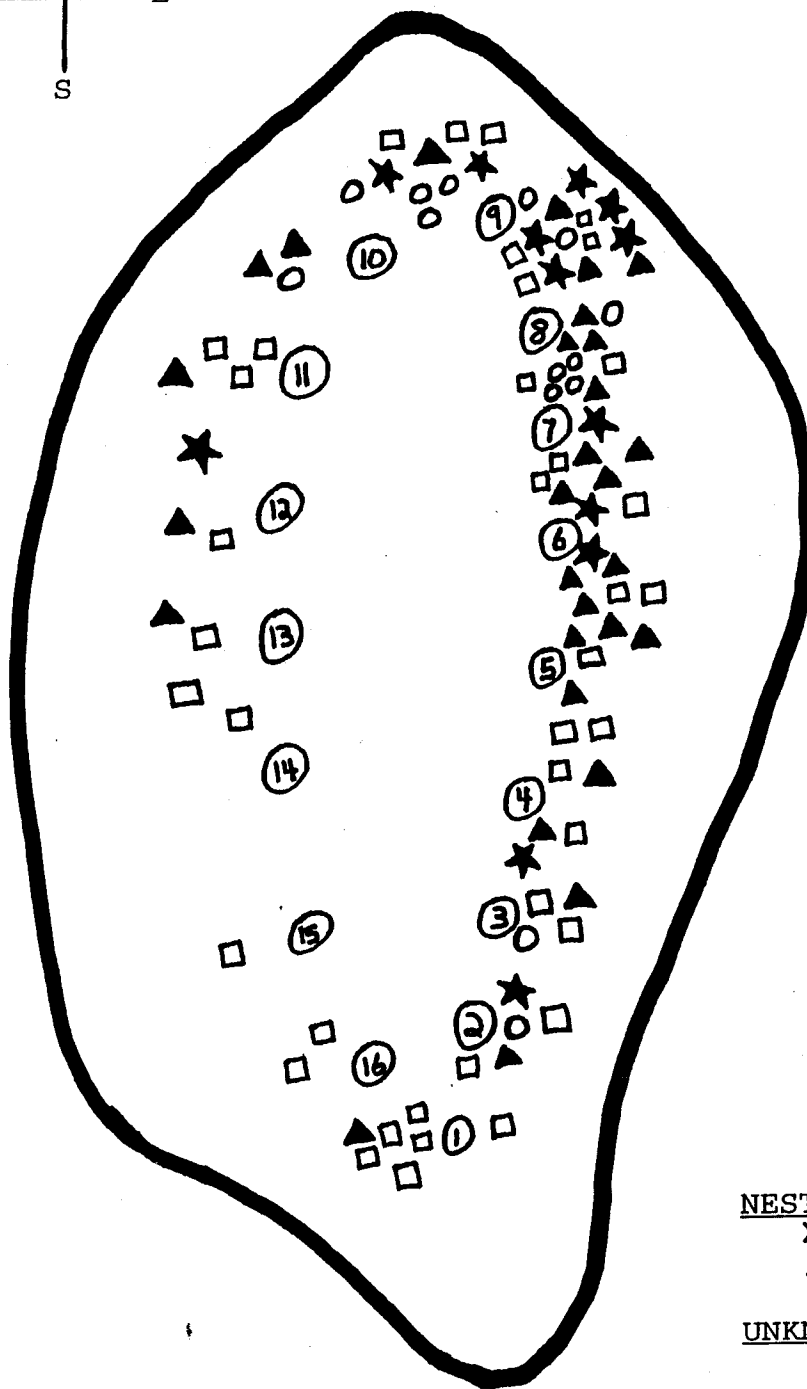
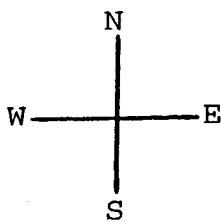
Species	# Nests	# Eggs Laid	# Eggs Hatched	% Eggs Hatched	Average Clutch
Green	13	1,430	988	2% - 95% 69%	55 - 128 110
Loggerhead	19 %Hatch 21 Clutch	1,532	1,294	0% - 98% 79%	57 - 125 80

Table 13. Hatchling success, percent infertile, and percent undeveloped for East Key. Ranges are included above the averages.

Species	# Nests	Hatchling Success	% Infertile	% Undeveloped
Green	13	1% - 95% 69%	0% - 62% 12%	0% - 77% 17%
Loggerhead	16	0% - 98% 79%	0% - 100% 14%	0% - 38% 6%

Loggerhead nests fluctuate in the above data due to indiscernible unhatched eggs. 16 Nests are included in the infertile and undeveloped, while 19 are included in the hatchling success. Hatchling success is based on the # of eggs hatched, excluding the dead, divided by the # of eggs laid.

APPENDIX III. East Key Nest Locations.



NEST

- ★ Green.....13
- ▲ Loggerhead...29

UNKNOWN

- Green.....14
- Loggerhead...39

East Key

APPENDIX IV. East Key Nest Data Chart.

EAST KEY NEST DATA 1994

#	Crawl#	Eggs	Hatch	Infert	Undev	Dead	Hatch	Live	Infert	Undev	Dead
1	95	?	27	?	?	?	---	---	---	---	---
2	94Cm	128	101	3	24	0	79%	79%	2%	19%	0%
3	93	89	83	1	5	0	93%	93%	1%	6%	0%
4	92	?	39	?	?	?	---	---	---	---	---
5	91	57	56	1	0	0	98%	98%	2%	0%	0%
6	90	?	26	?	?	?	---	---	---	---	---
7	89	?	45	?	?	?	---	---	---	---	---
8	88	66	60	0	6	0	91%	91%	0%	9%	0%
9	87	?	15	?	?	?	---	---	---	---	---
10	86	71	59	0	12	0	83%	83%	0%	17%	0%
11	77 Cm	123	72	17	34	0	59%	56%	14%	28%	0%
12	73 Cm	109	100	9	0	0	92%	92%	8%	0%	0%
13	70 Cm	122	113	5	4	0	93%	93%	4%	3%	0%
14	68	76	72	4	0	0	95%	95%	5%	0%	0%
15	66	64	38	2	24	0	59%	59%	3%	38%	0%
16	61 Cm	100	95	2	3	0	95%	95%	2%	3%	0%
17	60	62	?	?	?	?	---	---	---	---	---
18	58	?	?	?	?	?	---	---	---	---	---
19	57 Cm	115	106	7	0	2	92%	90%	6%	0%	2%
20	56	85	81	?	4?	0	95%	95%	---	---	0%
21	55 Cm	126	119	0	0	6	94%	90%	1%	0%	5%

Cm = Green turtle nest

Hatch = The # of hatched eggs, divided by the # of eggs laid.

Live = The # of hatched eggs, excluding the dead, divided by # eggs laid.

EAST KEY NEST DATA 1994

#	Crawl#	Eggs	Hatch	Infert	Undev	Dead	Hatch	Live	Infert	Undev	Dead
22	54 Cm	105	47	14	42	2	45%	43%	13%	40%	4%
23	53	?	?	?	?	?	---	---	---	---	---
24	52 Cm	88	80	1	2	5	91%	85%	1%	2%	6%
25	51	91	?	?	?	?	---	---	---	---	---
26	50 Cm	128	swi 2	27	98	1	2%	1%	21%	77%	50%
27	49 Cm	55	42	8	5	0	76%	76%	15%	9%	0%
28	48 Cm	115	swi 10	71	33	1	9%	98%	62%	29%	10%
29	47	67	62	2	3	0	93%	93%	3%	5%	0%
30	44	61	58	?	3?	0	95%	95%	---	---	---
31	43 Cm	116	101	0	15	0	87%	87%	0%	13%	0%
32	41	77	swi 0	77	0	0	0%	0%	100%	0%	0%
33	38	115	108	7	0	0	94%	94%	6%	0%	0%
34	37	66	60	5	1	0	91%	91%	8%	2%	0%
35	32	103	swi 0	103	0	0	0%	0%	100%	0%	0%
36	25	108	104	1	3	0	96%	96%	1%	3%	0%
37	18	59	29	0	30?	0	49%	49%	---	---	0%
38	15	125	123	2	0	0	98%	98%	2%	0%	0%
39	13	74	70	?	4?	0	95%	95%	---	---	0%
40	12	?	39	?	?	?	---	---	---	---	---
41	11	80	77	?	3?	0	96%	96%	---	---	0%
42	3	89	77	?	11?	0	87%	87%	---	---	0%

Cm = Green turtle nest

#? = Indiscernible unhatched eggs

swi = Salt water inundated

Hatch = The # of hatched eggs, divided by the # of eggs laid.

Live = The # of hatched eggs, excluding the dead, divided by # eggs laid.

DRY TORTUGAS NATIONAL PARK
SEA TURTLE NEST SURVEY FORM

CRAWL#: _____

ISLAND: _____

BEACH: _____

DATE: __/__/__

SURVEYOR # 1: _____

SURVEYOR # 2: _____

SPECIES: _____

SURVEYOR # 3: _____

CRAWL TYPE: FALSE

NEST

UNKNOWN

SWI

100' MARKER #: _____

DISTANCE: _____ DIRECTION: _____

100' MARKER #: _____

DISTANCE: _____ DIRECTION: _____

REMARKS: _____

STAKE

STAKE

HATCHLING INFORMATION

EXPECTED EMERGENCE: __/__/__

EXCAVATION DATE: __/__/__

ACTUAL EMERGENCE : __/__/__

3 DAYS POST EMERGENCE OR

INCUBATION PERIOD : __ DAYS

70 DAYS POST NESTING.

TOTAL EGGS: _____

INFERTILE: _____
UNDEVELOPED: _____

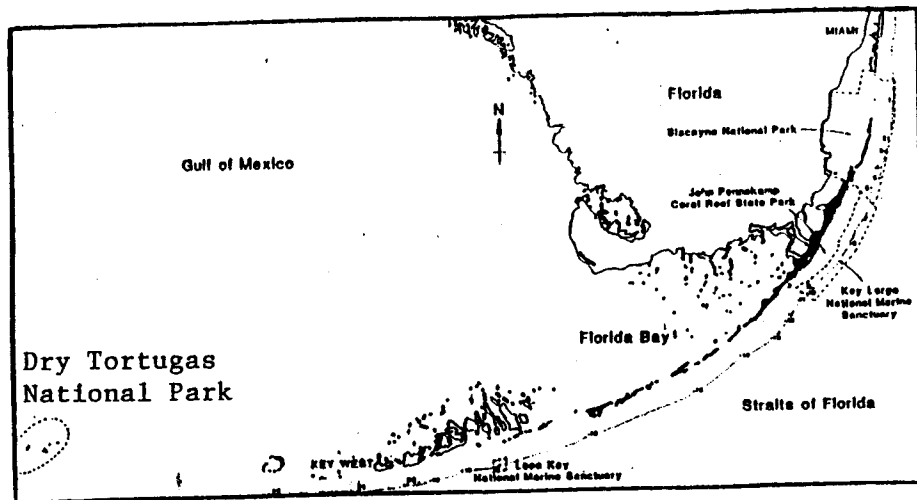
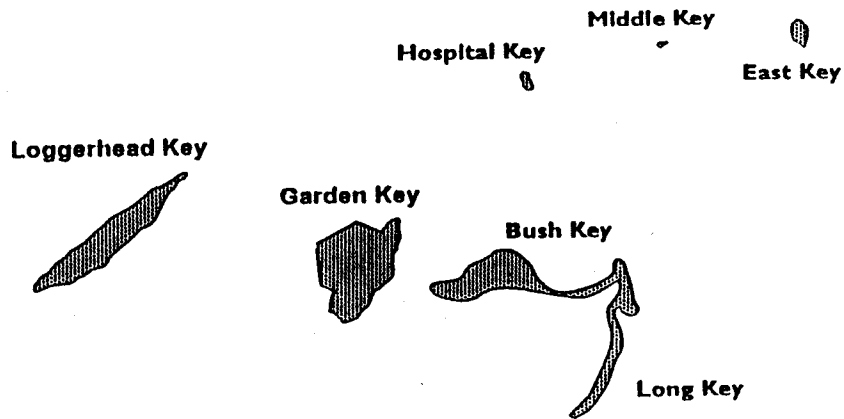
LIVE HATCHLINGS: _____
DEAD HATCHLINGS: _____

SPECIES: _____

REMARKS: _____

APPENDIX V. Map/Charts Showing Dry Tortugas National Park

Dry Tortugas National Park



locks or plots designated
or official Government
use is prohibited.
The monument superin-
tendent may waive any
or all of the above regu-
lations in an emergency
that poses a threat of life
or property.

