FILE FOLDER

DESCRIPTION ON TAB:

Sea Turtle

Report 79-80

☒ **Outside/inside of actual folder did not contain hand written information**

☐ **Outside/inside of actual folder did contain hand written information**
***Scanned as next image**

Confidential Records Management, Inc.
New Bern, NC
1-888-622-4425
9/08

SEA TURTLE INVENTORY

FOR

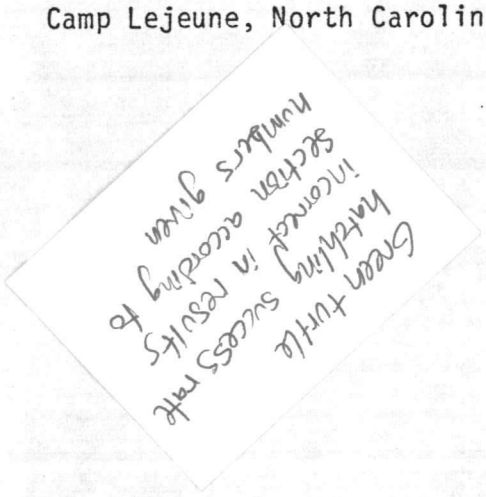
SUMMER AND FALL 1980

Natural Resources and Environmental Affairs Branch

Base Maintenance Division

Marine Corps Base

Camp Lejeune, North Carolina 28542



JULIAN I. WOOTEN
Director

DR. FRANK B. SCHWARTZ
Advisor
Institute of Marine Science
Morehead City, North Carolina

CHARLES D. PETERSON
Supervisor, Wildlife Management

JOHN A. FRIDELL

&

HUGH R. PASSINGHAM

Technicians

SEA TURTLE INVENTORY

FOR

SUMMER AND FALL 1980

Natural Resources and Environmental Affairs Branch

Base Maintenance Division

Marine Corps Base

Camp Lejeune, North Carolina 28542

JULIAN I. WOOTEN
Director

DR. FRANK B. SCHWARTZ
Advisor
Institute of Marine Science
Morehead City, North Carolina

CHARLES D. PETERSON
Supervisor, Wildlife Management

JOHN A. FRIDELL

&

HUGH R. PASSINGHAM

Technicians

INTRODUCTION

The Sea Turtle Inventory for 1980 is a continuation of past efforts by Marine Corps Base, Camp Lejeune, North Carolina to protect threatened Atlantic Loggerhead Sea Turtles. The program began in 1974 by the Marine Corps and Camp Lejeune biologists when evidence indicated that a high percentage of Atlantic Loggerhead nests on Onslow Beach were being destroyed by predators. This action was taken prior to the addition of the Atlantic Loggerhead Sea Turtle to the Endangered Species List, as threatened. The protection program to date has had three main objectices. First, for the compliance of the Endangered Species Act through Biological Opinions rendered by the U. S. Fish and Wildlife Service. Second, and probably the most important, conservation practices have been initiated to protect the turtles and their nests from predation. Third, has been to study the nesting habits of the Atlantic Loggerhead Sea Turtle (Caretta caretta).

There are several related projects that comprise the protection program. These include:

- Nightly Beach Patrols
- Tagging Adult Turtles
- Collection of Nesting Data
- Insitu Weather Observations
- Aerial Surveys
- Nesting and Hatching Success
- Occasional Hatchling Tagging
- Stranding Reports on Dead Turtles

The University of North Carolina Institute of Marine Sciences in Morehead City, North Carolina (IMS) assisted the Marine Corps in the turtle protection program. IMS provided tags for adult and hatchling turtles and assisted in the tagging process. Dr. Frank Schwartz of IMS is also a valuable source of information for the Camp Lejeune biologists.

In 1980, the Loggerhead program took on new dimensions when a Green Turtle (Chelonia mydas mydas) nested on Onslow Beach. The Green Turtle was observed nesting four times and is believed to have nested five times, since for one unobserved nest, the crawl, nest, eggs, and hatchlings were indicated of a Green Turtle.

INDICATIVE

RESULTS

The nesting season for 1980 began with the first nest on 30 May 1980 and ended with the last nest on 25 August 1980. There were a total of 125 crawls to nest on Onslow Beach of which 65 were successful. This compares closely to the data from the 1979 nesting season where 138 crawls and 63 successful nests were observed.

The rate of nest predation on Onslow Beach for the 1980 nesting season was zero. There were 37 nests, 35 loggerheads and 2 Green Turtles, protected by wire cages on Onslow Beach.

During the 1980 nesting season, a total of 36 turtles were tagged, One turtle had been tagged previously with Tag No. NC0001 and subsequently was not retagged by the Camp Lejeune technicians. Of the 36 tagged turtles, there were 29 return trips to the beach to lay (See Table III). One Loggerhead was observed laying 5 times at 12-13 day intervals. Four Loggerheads were observed 4 times. Three were observed 3 times, six turtles were observed 2 times and 23 were observed laying 1 time for a total of 59 sightings of tagged turtles. No turtles were observed on Onslow Beach that had been tagged on previous years. The Green Turtle was observed 4 times, retagged twice and is believed to have nested 5 times.

The Green Turtle nests produced 819 eggs of which 387 hatched for a 47.2% success rate. There were 2 deformed and 5 white (not albino) Green Turtle hatchlings from the 5 nests. Two of the Green Turtle nests were naturally incubated. Those nests contained 315 eggs of which 292 hatched for an 83.2% rate of hatchling success (See Table IV). The three remaining Green Turtle nests were taken to IMS where they were artifically incubated. Those nests contained 468 eggs, of which 95 hatched for a 20.3% rate of hatchling success (See Table VI).

Loggerhead nests produced 6,554 eggs total. Of the 6,554 eggs, 4,178 were allowed to hatch naturally, 3,467 of those eggs hatched for a 83% success rate (See Table IV). IMS artifically incubated 2,376 Loggerhead eggs of which 1,157 hatches for 48.7% success rate (See Table VI). Therefore, of 6,554 total Loggerhead Turtle eggs laid, 4,624 hatched for a 70.6% success rate. When Green and Loggerhead Turtle nests data are combined, a total of 7,373 eggs were laid of which 5,011 hatched for a

year's success rate of 67.96%. This overall success rate is better than the 1979 season success rate which was 57%.

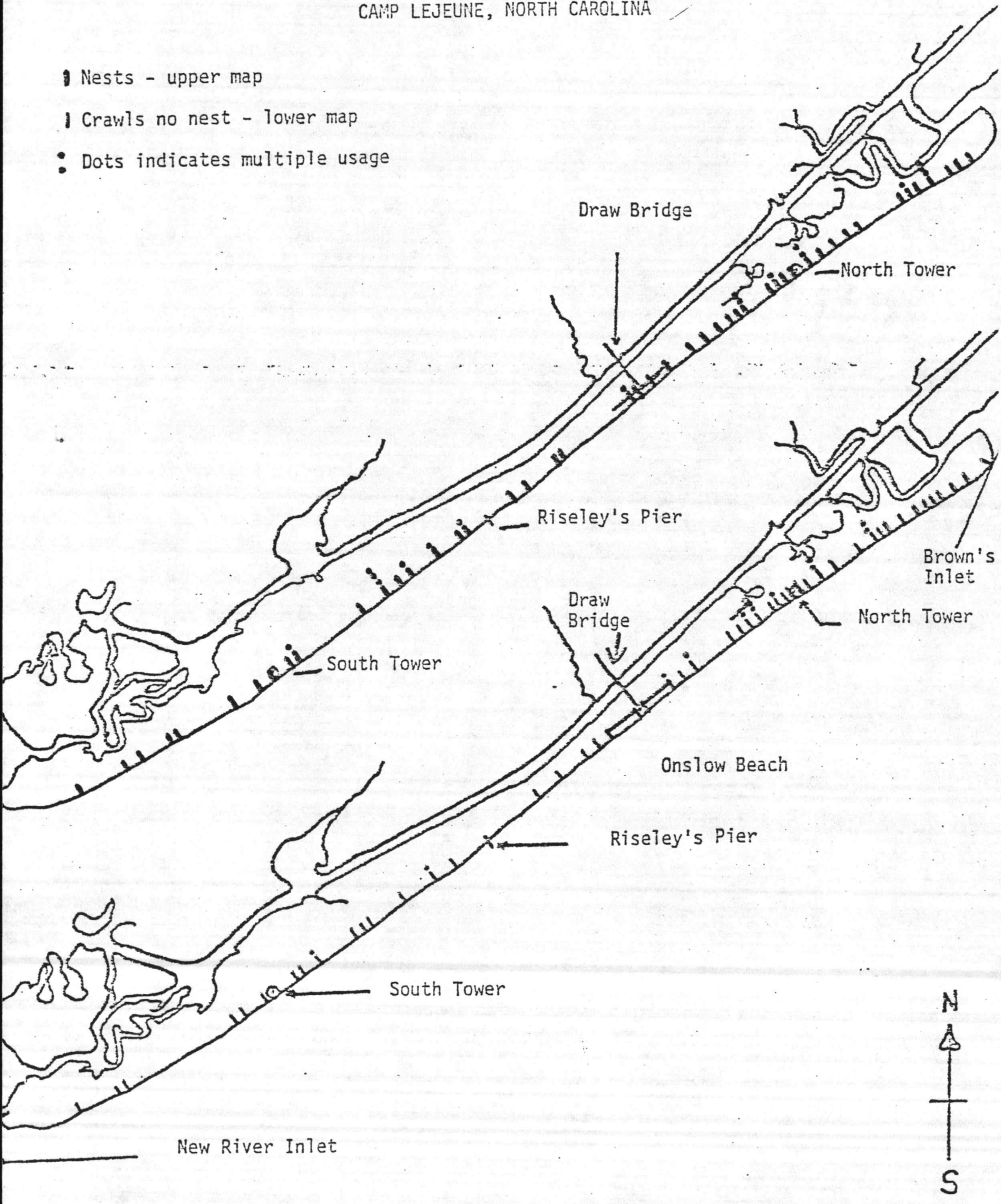
The Camp Lejeune Sea Turtle aerial surveillance flights covered beaches from New River Inlet to north to Bouge Inlet, which included Onslow Beach, Camp Lejeune, Brown's Island, Camp Lejeune and Bear Island (Hammock Beach State Park). Flight dates were scheduled such that they would fit in with the North Carolina to Louisiana surveys planned for 1980. The surveys were conducted from military helicopters piloted by Marine Corps personnel dispatched from Marine Corps Air Station, New River. Flights averaged 1 hour 15 minutes in duration and were flown at an altitude of 200 to 300 feet and a velocity of 30-60 knots. The return flights were flown approximately one half- one mile off the coast in an attempt to spot turtles in the water. A total of 12 flights were flown in sets of two at scattered intervals throughout the nesting period, for a total of 15 hours 35 minutes flight time. The number and location of all fresh nests and false crawls sighted were recorded along with the number and location of turtles observed offshore and of shrimping vessels within the survey data. Hammock Beach State Park personnel were notified in the event that nests and/or false crawls were sighted on their beach and written records of each flight were sent to State Fish and Wildlife personnel, Raleigh, North Carolina and Dr. F. J. Schwartz at IMS, Morehead City, North Carolina.

The Camp Lejeune Aerial Survey results (See Table III) are insignificant unless comparted to the overall aerial survey program for the East Coast, conducted by the U. S. Fish and Wildlife Service. Consequently, the discussion of the results will be held to a statement of total data taken. Observations were: 42 new nests, 18 false crawls, 10 swimming turtles and 30 shrimp boats within the survey bounds.

Questions concerning data contained in this report should be directed to the Commanding General, Marine Corps Base, Camp Lejeune, North Carolina - (Attention: Base Maintenance Division, Natural Resources and Environmental Affairs Branch).

MAP I

NEST AND CRAWL ACTIVITY
ONSLOW BEACH, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



MAP II

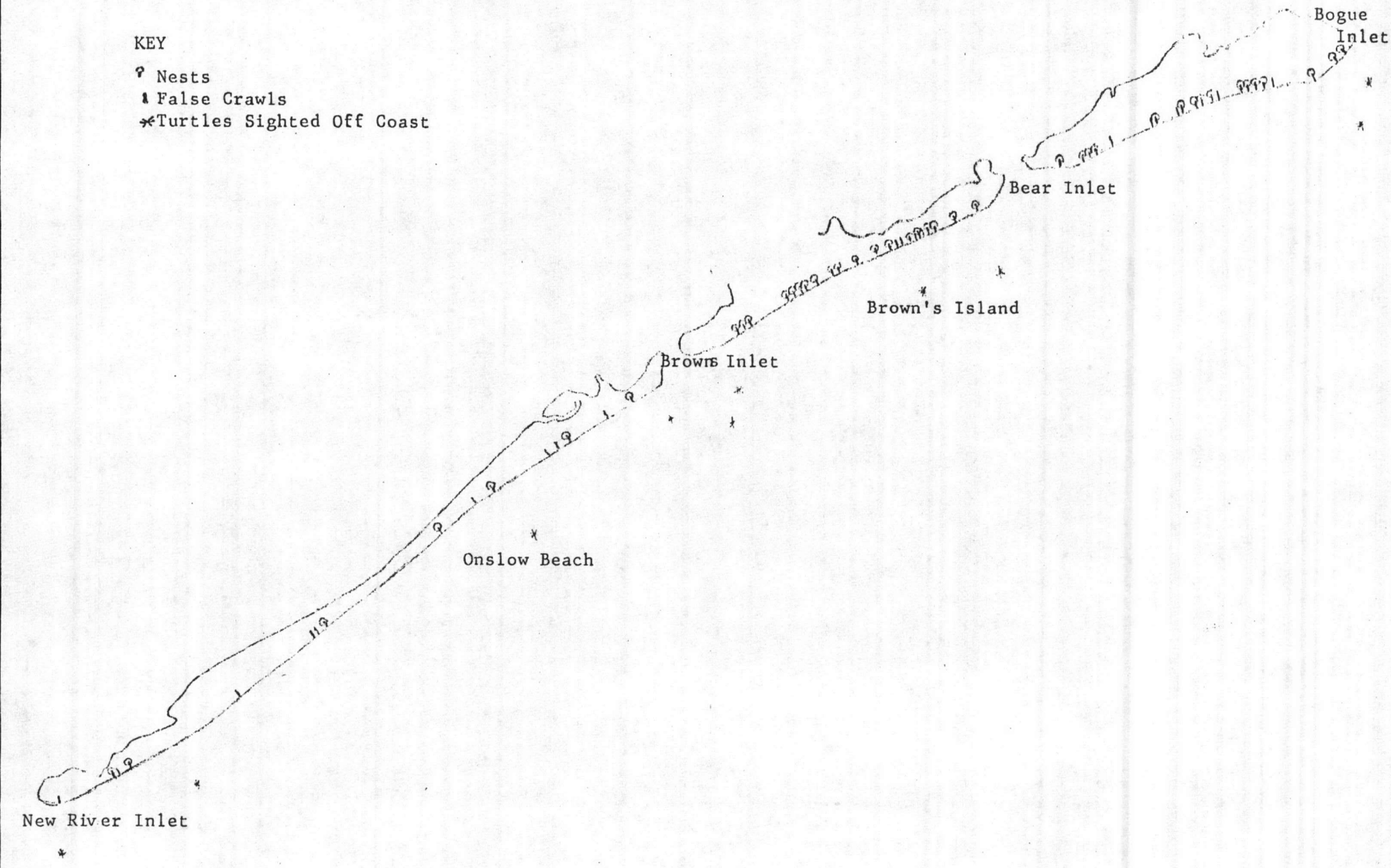

KEY
Nests
False Crawls
Turtles Sighted Off Coast
Bogue Inlet
Bear Inlet
Brown's Island
Browns Inlet
Onslow Beach
New River Inlet

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
5-30-80		-		1	1	Clear Fair	20.5°C	19°C
5-31-80					0			
6-01-80	2151-95%	2130			0			
6-02-80	2241-90%	2216		1	1	Fair, Sctrd Clouds	22°C	21°C
6-03-80	2326-82%	2307			0			
6-04-80	0008-73%	0007	1	1	2	Fair Partly Cloudy	22°C	18.5°C
6-05-80	0047-63%	0103			0			
6-06-80	0125-51%	0207			0			
6-07-80	0203-40%	0311			0			
6-08-80	0242-29%	0412			0			
6-09-80	0323-19%	0512	1		1			
6-10-80	0407-11%	0607			0			
6-11-80	0455-05%	1835 0701 1926	1	2	3	Fair Partly Cloudy	24.9°C	-
6-12-80	0547-01%	0752			0			
6-13-80		2015	1		1			
6-14-80	0642-02%	2012	2		2			
6-15-80	0742-06%	2147			0			
6-16-80	0837-11%	2231			0			
6-17-80	0934-18%	2317		2100 2250	2	Fair Few Clouds	24°C	22°C
6-18-80	1030-27%	0005			0	Cool, Windy Cloudy	24°C	20°C
6-19-80	1125-36%	0053	2345	2345	2	Fair Clear	24.5°C	24°C
6-20-80	1219-45%	0144	2300	2210	2	Fair Cloudy	24°C	22.5°C
6-21-80	1313-55%	0237	2300	2300	2			
6-22-80	1407-64%	0330		2300 -	2			
6-23-80	1501-73%	0420			0	Fair	24°C	24°C
6-24-80	1558-81%	0508			0	Stormy	23°C	24°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/o nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
6-25-80	1655-88%	0555 1819	0030 0200	2300	3	Partly Cloudy	24°C	23°C
6-26-80	1753-94% Full	0638 1901			0	Cloudy	24°C	23.5°C
6-27-80	1850-98%	0723	2200	2245	2	Fair & Clear	24°C	24°C
6-28-80	1945-100%	1943		2200	0	Fair & Clear	24°C	26°C
6-29-80	2037-99%	2028		6030 0100	3	Fair & Cloudy	25°C	26°C
6-30-80	2125-97%	2114	2115 2300		1	Fair & Cloudy	24°C	22.5°C
7-1-80	2209-92%	2201	0030		2	Fair & Clear	24°C	24°C
7-2-80	2249-85%	2251	0215		1	Fair & Clear	26°C	27°C
7-3-80	2328-75%	2346	2245	2230 2300	2	Thunderstm Clearing	24.5°C	23°C
7-4-80	0005-65%	0043		2300	3	Cloudy, Occ. Showers	24.5°C	24°C
7-5-80	0043-54%	0148		2400	1	Fair & Clear	26°C	26°C
7-6-80	0122-42%	0253	2345 0200	2310 2330	3	Fair & Ptly Cloudy	26°C	26°C
7-7-80	0203-31%	0356	0230	2340	3	Fair & Clear	24.5°C	26°C
7-8-80	0248-27%	0457		0200	1	Fair & Cloudy	26°C	26°C
7-10-80	0431-6%	1820 0645 1910	0015 0115 0030 0335	2345	5	ThundStm 2200 Clearing2400	26°C	23°C
7-11-80	0527-2%	0734	2340	0200	2	Fair & Clear	26.5°C	26°C
7-12-80	0624-0%	1957			0	Fair & Clear	26°C	27°C
7-13-80	- 1%	2038	0140 0115 0140 2320	0250 2315	4	Fair & Ptly Cloudy	26.5°C	24.5°C
7-14-80	0722-03%	2120	2310 2340 2340	0040	4	Fair & Clear	26°C	25°C
7-15-80	0819-08%	2201	2350 0215	0330 2145	4	Fair & Clear	25.5°C	25.5°C
7-16-80	0914-14%	2242	0315 2240	2310 0300	5	Fair & Clear	26°C	26°C
7-17-80	1009-21%	2323	0400	0245	3	Fair & In-crsg Clouds	27.5°C	26°
7-18-80	1103-29%	0006	2200	0305	1	Fair & Ptly Cloudy	27°C	26°
7-19-80	1156-38%	0057	0100 0200		3	Fair & Clear	27°C	27.5°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
7-20-80	1250-48%	0149	2200	2330 0330	3	Fair & Clear	27°C	28.5°C
7-21-80	1345-57%	0241			0	Fair & Incrsg Cloudiness	27.5°C	27°C
7-22-80	1442-67%	0338		0040 0035	2	Fair & Cloudy	27°C	27°C
7-23-80	1539-76%	0431		0030	1	Rainy	25°C	25°C
7-24-80	1639-84%	0521		2215	1	Fair & Cloudy	26°C	26°C
7-25-80	1733-91%	0612		2215	1	Fair & CLoudy	26°C	26.5°C
		1835	2200 1835			2200-2400 Rainy		
7-26-80	1827-96%	0658	0200		3	0200 Thundstms	26°C	24.5°C
		1922	2200 2210			Heavy		
7-27-80	1917-99%	0745	2200 2230		4	Rain	-	-
7-28-80	Full 2004-100%	2009		2210 2210	2	Cloudy	27°C	26°C
7-29-80	2047-98%	2054			0	Partly Cloudy	27°C	25°C
7-30-80	2128-93%	2144		2120	1	Fair & Clear	27°C	26°C
7-31-80	2206-86%	2233	0130		1	Fair & Clear	27.5°C	27.5°C
8-01-80	2224-77%	2328	0315	2200 2200 0245	4	2000-2200 Thunderstorm 2400 Clearing	27°C	26.5°C
8-02-80	2323-67%	0026		2330 0245 0300	3	Fair & Clear	27°C	28°C
8-03-80	0003/44%	0129	2		2		-	-
8-04-80	0047-33%	0235		2250	1	Partly Cloudy	27°C	28°C
8-05-80	0134-23%	0343		2230	1	Clear	27.5°C	28°C
8-06-80	0224-15%	0444			0	Clear	27°C	28°C
8-07-80	0318-8%	0540	2400		1	Partly Cloudy	27°C	26.5°C
8-08-80	0414-3%	1806 0630 1852	2300 0200	2245 2315	4	Fair & Clear	27°C	27.5°C
8-09-80	0511-1%	0715 1934			0			
8-10-80	0608-0%	0758		2	2			
8-11-80	- -	2013			0	Fair & Clear	27°C	27.5°C
8-12-80	0705-1%	2052		0230	1	Cloudy	27°C	27°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

Date Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Air
8-13-80	0800-5%	2129			0	Fair & Clear	27°C	28°C
8-14-80	0854-10%	2206	2230	2300	2	Fair & Clear	27°C	28°C
8-15-80	0948-16%	2243			0	Clear & Windy	27.5°C	26.5°C
8-16-80	1041-23%	2323		1	1			
8-17-80	1135-32%	0010	0245		1	Cool & Cloudy	27°C	22°C
8-18-80	1230-41%	0100		0200	1	Thunderhd moving in Cloudy	26°C	23°C
8-19-80	1326-51%	0158			0	Cloudy	25.5°C	25°C
8-20-80	1422-60%	0258			0			
8-21-80	1518-70%	0356			0			
8-22-80	1613-79%	0258	1		1	Fair & Clear	25°C	23°C
8-23-80	1705-87%	0356						
8-24-80	1754-94%	0452	0100		1	Fair & Clear	23°C	19°C
8-25-80	1839-98%	0543 1721	between 2200-2400	between 2200-2400	2	Fair & Clear	23°C	19°C
8-26-80	1922-100%	0634 1859						
8-27-80	2002-99%	0723 1948						
8-28-80	2042-95%	0812						
8-29-80	2121-88%	2036						
8-30-80	2202-80%	2125						
8-31-80	2245-69%	2216						

TABLE II

RETURN RECORD OF TAGGED TURTLES

1980 SEA TURTLE INVENTORY

DATES 6/17/80 - 8/9/80

Date	Tag #	Return	Return	Return	Return
6/17/80	651				
6/17/80	652	7/3/80 (⊗)	7/16/80	7/28/80	
6/19/80 (⊗)	653				
6/19/80	654				
6/20/80	655	7/3/80 (⊗)	7/15/80 (⊗) Retag 640	7/28/80	8/8/80
Green					(2)
6/25/80	657*	7/9/80 Retag 669	7/21/80 Retag 649	8/2/80	8/17/80
6/26/80 (⊗)	NC0001	7/11/80 (⊗)	7/24/80		
6/27/80 (⊗)	648	7/24/80			
6/27/80	658				
6/29/80	650	7/12/80			
6/29/80	659				
6/30/80	660	7/14/80 (⊗) Retag 672	7/16/80	8/1/80	
7/1/80 (⊗)	661	7/14/80	7/26/80 (⊗)	8/8/80	
7/3/80	662				
7/6/80	663				
7/6/80 (⊗)	664				
7/7/80	667	8/18/80 (⊗)	8/20/80		
7/8/80 (⊗)	665				
7/8/80 (⊗)	666				
7/10/80 (⊗)	670	7/23/80			
7/11/80 (⊗)	671				
7/14/80	673				
7/14/80 (⊗)	674				
7/15/80	675				
7/17/80	641				
7/17/80 (⊗)	642	7/18/80			
7/18/80 (⊗)	647	7/20/80	8/2/80		
7/19/80	645				
7/23/80	646				
7/25/80	644				
7/30/80	633				
8/1/80 (1)	639	8/14/80			
8/3/80	638				
8/4/80	634				
8/5/80	637				
8/7/80 (⊗)	636	8/12/80			
8/9/80 (⊗)	635				

(⊗) - Turtle was tagged but did not nest.

(1) - Turtle previously tagged but tag missing - tag hole present

(2) - Crawl body pit and eggs indicative of Green Turtle but turtle not observed

Tagged or

1 Turtle observed 5 times; 4 turtles observed 4 times; 3 turtle observed 3 times; 6 turtles observed 2 times; 23 turtles observed 1 time

TABLE III

AERIAL SURVEY

flights

	May 30				May 31			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	1	0	0	2	0	0	0	1
Brown's Island	0	2	0	1	0	0	0	2
Bear Island	0	0	0	0	2	0	0	0

	June 13				June 14			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	2	1	0	1	0	3
Brown's Island	0	0	0	0	0	0	1	1
Bear Island	1	0	0	0	0	0	0	3

	July 1				July 2				July 11				July 12				July 21			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	0	0	0	0	2	0	0	1	3	2	0	1	1	0	2	1	0	0	1
Brown's Island	0	0	1	0	5	1	0	0	0	0	0	1	3	0	0	1	4	1	2	1
Bear Island	2	0	2	0	2	2	0	0	0	0	0	0	1	0	0	2	4	1	0	0

	Aug 1				Aug 11				Aug 12			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	0	1	2	0	0	0	1	0	0	2
Brown's Island	2	0	0	2	3	0	0	1	2	0	0	1
Bear Island	1	0	0	0	2	0	0	0	1	2	0	1

TOTAL

	N	FC	T	SB
Onslow Beach	7	9	4	13
Brown's Island	19	4	4	11
Bear Island	16	5	2	6
	42	18	10	30

Key N – Fresh Nests
FC – Fresh False Crawls
T – Turtles sighted off coast
SB – Shrimp Boats

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

TABLE IV

1980

*Green Turtle

Nest No.	Incubation Period DAYS	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
001	65	115	67	39	106	92.2%
002	63	166	158	3	161	97 %
003	63	134	4	69	73	54.5%
006 IMS	69	53	24	--	24	45.3%
007	--	126	0	0	0	0
012	65	102	81	4	85	83.3%
013	64	175	4	119	123	70.3%
015	63	134	0	128	128	95.5%
016 IMS		121				
018 IMS		101				
019	64	86	6	75	81	94.2%
021	63	143	0	114	114	79.7%
* 022	56	168	148	0	148	88.1%
026	60	100	0	91	91	91 %
027	59	72	0	71	71	98.6%
028 IMS		119				
029	60	113	0	78	78	69 %
034	60	127	25	21	46	36.2%
036	60	152	53	56	109	71.7%
037	59	116	4	89	93	80.2%
038	59	131	8	75	83	63.4%
039	60	167	161	0	161	96.4%
040	62	131	125	4	129	98.5%
042	59	78	7	58	65	83.3%
043	62	99	98	0	98	99.9%
046	58	183	144	0	144	78.7%

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base 1980
Camp Lejeune, North Carolina

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
104 IMS	0	1	0	0	0	0
107 IMS		179				
108 IMS		134				
110 IMS		104				
112 IMS		104				
114 IMS		120				
115 IMS		80				
116 IMS		83				
118 IMS		112				
*119 IMS		145				
121 IMS		75				
125 IMS		99				
	TOTALS					
64		7352				
26 IMS		2823				
37 O B		4529				
GREEN TURTLE		819	(11.14% OF TOTAL)			

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
048 IMS		124				
054	59	89	64	23	87	97.8%
058	58	109	51	55	106	97.2%
059	59	118	13	99	112	94.9%
062	58	97	3	91	94	96.9%
066	57	131	27	80	117	89.3%
067	63	99	0	88	88	88.9%
069	60	131	109	0	109	83.2%
072 IMS		123				
073	60	119	2	112	114	95.8%
075	60	160	4	154	158	98.75%
080		117	0	101	101	86.3%
*081 IMS		166				
082 IMS		96				
083		134				
084	59	116	4	106	110	94.8%
085	61	114	0	111	111	97.4%
086		89				
094 IMS		132				
095 IMS		102				
096		88	0	74	74	84.1%
098 IMS		114				
099 IMS		78				
*100 IMS		157				
102 IMS		114				
103 IMS		78				

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

TABLE V

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
5-30-80		1	1
6-2-80		1	1
6-4-80	1	1	2
6-9-80	1		1
6-11-80	1	2	3
6-13-80	1		1
6-14-80	2		2
6-17-80		2	2
6-19-80	1	1	2
6-20-80	1	1	2
6-21-80	1	1	2
6-22-80		2	2
6-25-80		1	1
6-26-80	2		2
6-27-80	1	1	2
6-29-80		2	2
6-30-80	1	1	2
7-1-80	1		1
7-2-80	1		1
7-3-80	2	1	3
7-4-80		3	3
7-5-80		1	1
7-6-80	1	2	3
7-7-80		1	1
7-8-80	2		2
7-9-80		1	1
7-10-80	1	1	2
7-11-80	5		5
7-12-80		1	1
7-14-80	5	2	7
7-15-80	3	1	4
7-16-80		3	3
7-17-80	3	1	4
7-18-80	1	1	2
7-19-80	1	1	2
7-20-80	3	1	4
7-21-80		1	1
7-23-80		2	2
7-24-80		2	2
7-25-80		1	1
7-26-80	2		2
7-27-80	5		5
7-28-80		2	2
7-30-80		1	1

TABLE V Cont'd

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
8-1-80	1	2	3
8-2-80	1	2	3
8-3-80	2	2	4
8-4-80		1	1
8-5-80		1	1
8-7-80	1		1
8-8-80	1	2	3
8-9-80	1		1
8-10-80		2	2
8-12-80		1	1
8-14-80	1	1	2
8-15-80			0
8-16-80			0
8-17-80		1	1
8-18-80	1		1
8-19-80			0
8-20-80			0
8-21-80			0
8-22-80	1		1
8-23-80			0
8-24-80	1		1
8-25-80	1	1	2
8-26-80			0
8-27-80			0
8-28-80			0
8-29-80			0
8-30-80			0

TABLE VI

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

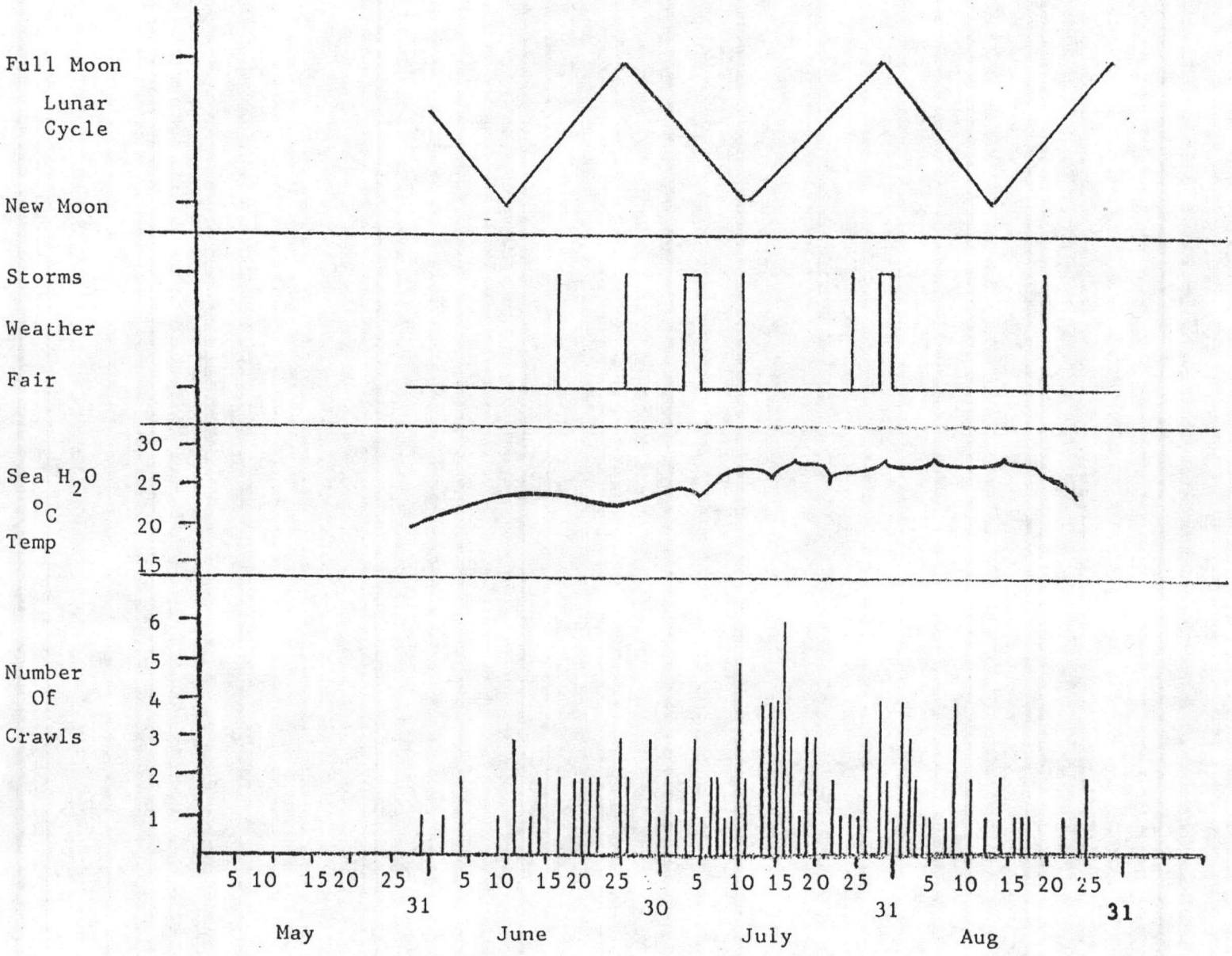
1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

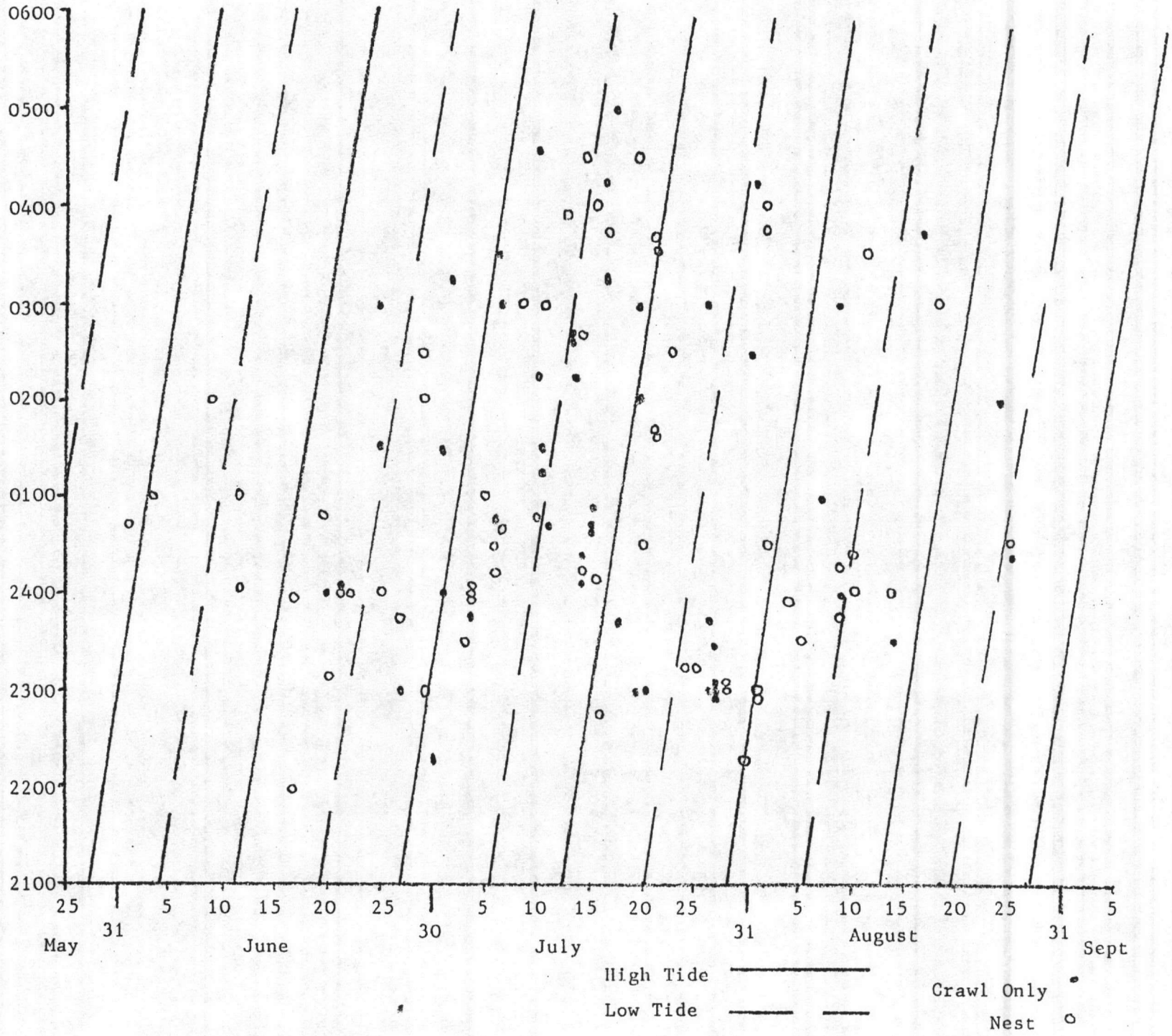
% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

GRAPH I


Full Moon
Lunar Cycle
New Moon
Storms
Weather
Fair
Sea H_2O ^oC Temp
30
25
20
15
Number Of Crawls
6
5
4
3
2
1
5 10 15 20 25 31 5 10 15 20 25 30 5 10 15 20 25 31 5 10 15 20 25 31
May
June
July
Aug

GRAPH II NESTING IN RELATION TO TIME AND TIDAL CYCLE



GRAPH III

Total Crawls and Nest by Month 1980 Nest Season

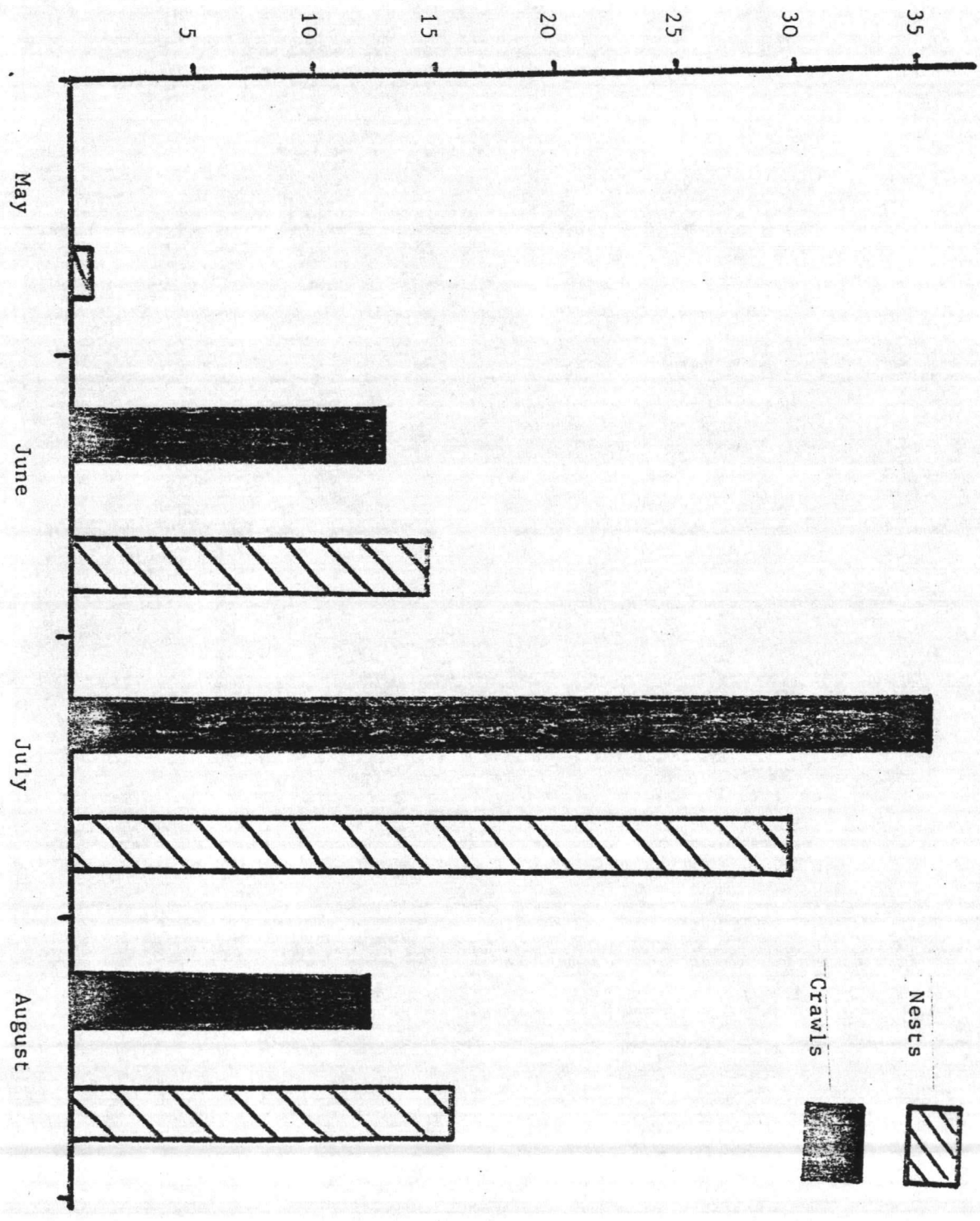


TABLE III

AERIAL SURVEY

	May 30				May 31			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	1	0	0	2	0	0	0	1
Brown's Island	0	2	0	1	0	0	0	2
Bear Island	0	0	0	0	2	0	0	0

	June 13				June 14			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	2	1	0	1	0	3
Brown's Island	0	0	0	0	0	0	1	1
Bear Island	1	0	0	0	0	0	0	3

	July 1				July 2				July 11				July 12				July 21			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	0	0	0	0	2	0	0	1	3	2	0	1	1	0	2	1	0	0	1
Brown's Island	0	0	1	0	5	1	0	0	0	0	0	1	3	0	0	1	4	1	2	1
Bear Island	2	0	2	0	2	2	0	0	0	0	0	0	1	0	0	2	4	1	0	0

	Aug 1				Aug 11				Aug 12			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	0	1	2	0	0	0	1	0	0	2
Brown's Island	2	0	0	2	3	0	0	1	2	0	0	1
Bear Island	1	0	0	0	2	0	0	0	1	2	0	1

TOTAL

	N	FC	T	SB
Onslow Beach	7	9	4	13
Brown's Island	19	4	4	11
Bear Island	16	5	2	6
	42	18	10	30

Key N - Fresh Nests
FC - Fresh False Crawls
T - Turtles sighted off Coast
SB - Shrimp Boats

TABLE IV

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

*Green Turtle

Nest No.	Incubation Period DAYS	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
001	65	115	67	39	106	92.2%
002	63	166	158	3	161	97 %
003	63	134	4	69	73	54.5%
006 IMS	69	53	24	--	24	45.3%
007	--	126	0	0	0	0
012	65	102	81	4	85	83.3%
013	64	175	4	119	123	70.3%
015	63	134	0	128	128	95.5%
016 IMS		121				
018 IMS		101				
019	64	86	6	75	81	94.2%
021	63	143	0	114	114	79.7%
* 022	56	168	148	0	148	88.1%
026	60	100	0	91	91	91 %
027	59	72	0	71	71	98.6%
028 IMS		119				
029	60	113	0	78	78	69 %
034	60	127	25	21	46	36.2%
036	60	152	53	56	109	71.7%
037	59	116	4	89	93	80.2%
038	59	131	8	75	83	63.4%
039	60	167	161	0	161	96.4%
040	62	131	125	4	129	98.5%
042	59	78	7	58	65	83.3%
043	62	99	98	0	98	99.9%
046	58	183	144	0	144	78.7%

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
104 IMS	0	1	0	0	0	0
107 IMS		179				
108 IMS		134				
110 IMS		104				
112 IMS		104				
114 IMS		120				
115 IMS		80				
116 IMS		83				
118 IMS		112				
*119 IMS		145				
121 IMS		75				
125 IMS		99				
	TOTALS					
64		7352				
26 IMS		2823				
37 O B		4529				
GREEN TURTLE		819	(11.14% OF TOTAL)			

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
048 IMS		124				
054	59	89	64	23	87	97.8%
058	58	109	51	55	106	97.2%
059	59	118	13	99	112	94.9%
062	58	97	3	91	94	96.9%
066	57	131	27	80	117	89.3%
067	63	99	0	88	88	88.9%
069	60	131	109	0	109	83.2%
072 IMS		123				
073	60	119	2	112	114	95.8%
075	60	160	4	154	158	98.75%
080		117	0	101	101	86.3%
*081 IMS		166				
082 IMS		96				
083		134				
084	59	116	4	106	110	94.8%
085	61	114	0	111	111	97.4%
086		89				
094 IMS		132				
095 IMS		102				
096		88	0	74	74	84.1%
098 IMS		114				
099 IMS		78				
*100 IMS		157				
102 IMS		114				
103 IMS		78				

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

TABLE V

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
5-30-80		1	1
6-2-80		1	1
6-4-80	1	1	2
6-9-80	1		1
6-11-80	1	2	3
6-13-80	1		1
6-14-80	2		2
6-17-80		2	2
6-19-80	1	1	2
6-20-80	1	1	2
6-21-80	1	1	2
6-22-80		2	2
6-25-80		1	1
6-26-80	2		2
6-27-80	1	1	2
6-29-80		2	2
6-30-80	1	1	2
7-1-80	1		1
7-2-80	1		1
7-3-80	2	1	3
7-4-80		3	3
7-5-80		1	1
7-6-80	1	2	3
7-7-80		1	1
7-8-80	2		2
7-9-80		1	1
7-10-80	1	1	2
7-11-80	5		5
7-12-80		1	1
7-14-80	5	2	7
7-15-80	3	1	4
7-16-80		3	3
7-17-80	3	1	4
7-18-80	1	1	2
7-19-80	1	1	2
7-20-80	3	1	4
7-21-80		1	1
7-23-80		2	2
7-24-80		2	2
7-25-80		1	1
7-26-80	2		2
7-27-80	5		5
7-28-80		2	2
7-30-80		1	1

TABLE V Cont'd

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
8-1-80	1	2	3
8-2-80	1	2	3
8-3-80	2	2	4
8-4-80		1	1
8-5-80		1	1
8-7-80	1		1
8-8-80	1	2	3
8-9-80	1		1
8-10-80		2	2
8-12-80		1	1
8-14-80	1	1	2
8-15-80			0
8-16-80			0
8-17-80		1	1
8-18-80	1		1
8-19-80			0
8-20-80			0
8-21-80			0
8-22-80	1		1
8-23-80			0
8-24-80	1		1
8-25-80	1	1	2
8-26-80			0
8-27-80			0
8-28-80			0
8-29-80			0
8-30-80			0

TABLE VI

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

SEA TURTLE INVENTORY

FOR

SUMMER AND FALL 1980

Natural Resources and Environmental Affairs Branch

Base Maintenance Division

Marine Corps Base

Camp Lejeune, North Carolina 28542

JULIAN I. WOOTEN
Director

DR. FRANK B. SCHWARTZ
Advisor
Institute of Marine Science
Morehead City, North Carolina

CHARLES D. PETERSON
Supervisor, Wildlife Management

JOHN A. FRIDELL

&

HUGH R. PASSINGHAM

Technicians

INTRODUCTION

The Sea Turtle Inventory for 1980 is a continuation of past efforts by Marine Corps Base, Camp Lejeune, North Carolina to protect threatened Atlantic Loggerhead Sea Turtles. The program began in 1974 by the Marine Corps and Camp Lejeune biologists when evidence indicated that a high percentage of Atlantic Loggerhead nests on Onslow Beach were being destroyed by predators. This action was taken prior to the addition of the Atlantic Loggerhead Sea Turtle to the Endangered Species List, as threatened. The protection program to date has had three main objectices. First, for the compliance of the Endangered Species Act through Biological Opinions rendered by the U. S. Fish and Wildlife Service. Second, and probably the most important, conservation practices have been initiated to protect the turtles and their nests from predation. Third, has been to study the nesting habits of the Atlantic Loggerhead Sea Turtle (Caretta caretta).

There are several related projects that comprise the protection program. These include:

- Nightly Beach Patrols
- Tagging Adult Turtles
- Collection of Nesting Data
- Insitu Weather Observations
- Aerial Surveys
- Nesting and Hatching Success
- Occasional Hatchling Tagging
- Stranding Reports on Dead Turtles

The University of North Carolina Institute of Marine Sciences in Morehead City, North Carolina (IMS) assisted the Marine Corps in the turtle protection program. IMS provided tags for adult and hatchling turtles and assisted in the tagging process. Dr. Frank Schwartz of IMS is also a valuable source of information for the Camp Lejeune biologists.

In 1980, the Loggerhead program took on new dimensions when a Green Turtle (Chelonia mydas mydas) nested on Onslow Beach. The Green Turtle was observed nesting four times and is believed to have nested five times, since for one unobserved nest, the crawl, nest, eggs, and hatchlings were ~~indicated~~ indicative of a Green Turtle.

RESULTS

The nesting season for 1980 began with the first nest on 30 May 1980 and ended with the last nest on 25 August 1980. There were a total of 125 crawls to nest on Onslow Beach of which 65 were successful. This compares closely to the data from the 1979 nesting season where 138 crawls and 63 successful nests were observed.

The rate of nest predation on Onslow Beach for the 1980 nesting season was zero. There were 37 nests, 35 loggerheads and 2 Green Turtles, protected by wire cages on Onslow Beach.

During the 1980 nesting season, a total of 36 turtles were tagged. One turtle had been tagged previously with Tag No. NC0001 and subsequently was not retagged by the Camp Lejeune technicians. Of the 36 tagged turtles, there were 29 return trips to the beach to lay (See Table III). One Loggerhead was observed laying 5 times at 12-13 day intervals. Four Loggerheads were observed 4 times. Three were observed 3 times, six turtles were observed 2 times and 23 were observed laying 1 time for a total of 59 sightings of tagged turtles. No turtles were observed on Onslow Beach that had been tagged on previous years. The Green Turtle was observed 4 times, retagged twice and is believed to have nested 5 times.

The Green Turtle nests produced 819 eggs of which 387 hatched for a 47.2% success rate. There were 2 deformed and 5 white (not albino) Green Turtle hatchlings from the 5 nests. Two of the Green Turtle nests were naturally incubated. Those nests contained 315 eggs of which 292 hatched for an 83.2% rate of hatchling success (See Table IV). The three remaining Green Turtle nests were taken to IMS where they were artifically incubated. Those nests contained 468 eggs, of which 95 hatched for a 20.3% rate of hatchling success (See Table VI).

Loggerhead nests produced 6,554 eggs total. Of the 6,554 eggs, 4,178 were allowed to hatch naturally, 3,467 of those eggs hatched for a 83% success rate (See Table IV). IMS artifically incubated 2,376 Loggerhead eggs of which 1,157 hatches for 48.7% success rate (See Table VI). Therefore, of 6,554 total Loggerhead Turtle eggs laid, 4,624 hatched for a 70.6% success rate. When Green and Loggerhead Turtle nests data are combined, a total of 7,373 eggs were laid of which 5,011 hatched for a

year's success rate of 67.96%. This overall success rate is better than the 1979 season success rate which was 57%.

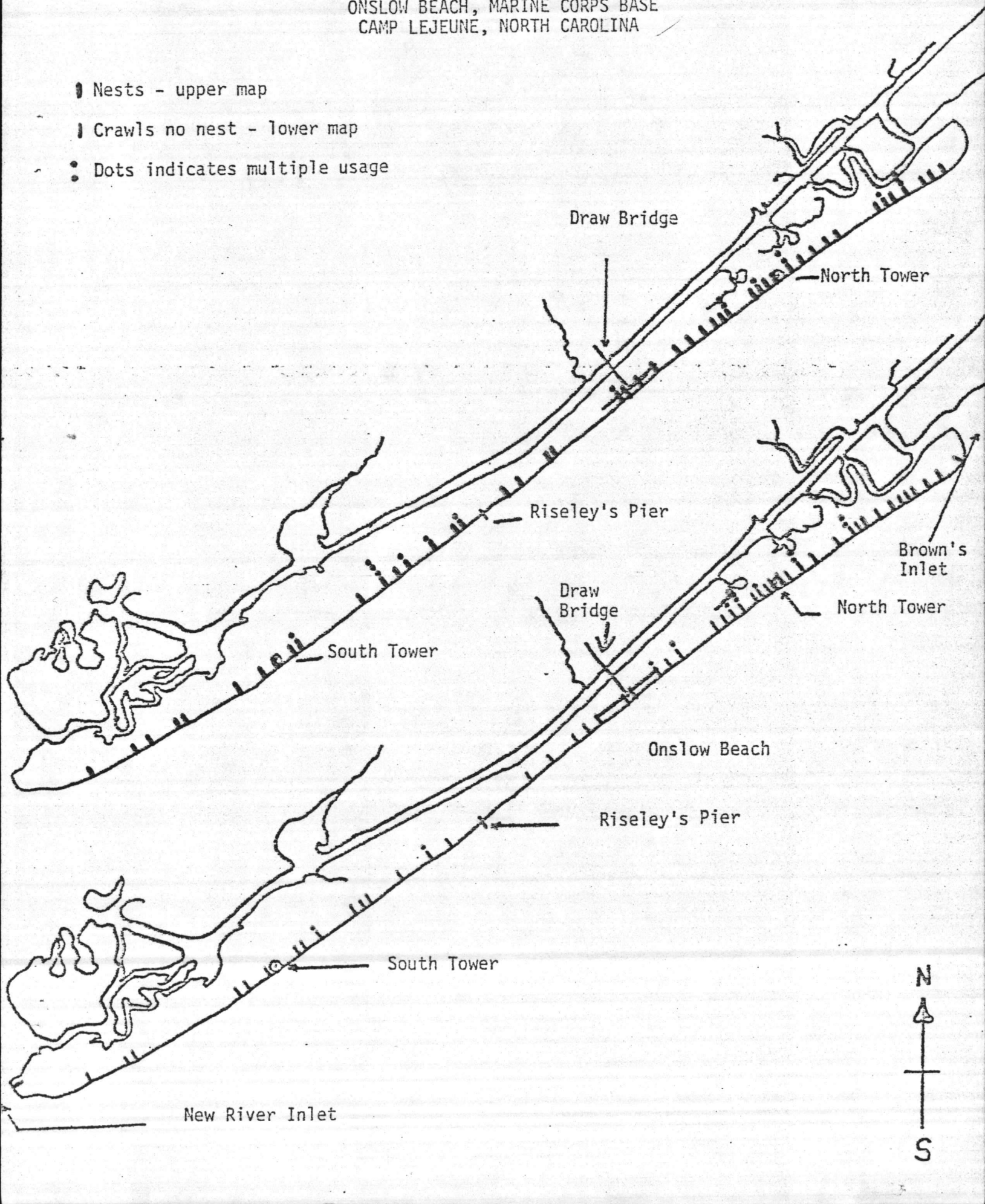
The Camp Lejeune Sea Turtle aerial surveillance flights covered beaches from New River Inlet to north to Bouge Inlet, which included Onslow Beach, Camp Lejeune, Brown's Island, Camp Lejeune and Bear Island (Hammock Beach State Park). Flight dates were scheduled such that they would fit in with the North Carolina to Louisiana surveys planned for 1980. The surveys were conducted from military helicopters piloted by Marine Corps personnel dispatched from Marine Corps Air Station, New River. Flights averaged 1 hour 15 minutes in duration and were flown at an altitude of 200 to 300 feet and a velocity of 30-60 knots. The return flights were flown approximately one half- one mile off the coast in an attempt to spot turtles in the water. A total of 12 flights were flown in sets of two at scattered intervals throughout the nesting period, for a total of 15 hours 35 minutes flight time. The number and location of all fresh nests and false crawls sighted were recorded along with the number and location of turtles observed offshore and of shrimping vessels within the survey data. Hammock Beach State Park personnel were notified in the event that nests and/or false crawls were sighted on their beach and written records of each flight were sent to State Fish and Wildlife personnel, Raleigh, North Carolina and Dr. F. J. Schwartz at IMS, Morehead City, North Carolina.

The Camp Lejeune Aerial Survey results (See Table III) are insignificant unless comparted to the overall aerial survey program for the East Coast, conducted by the U. S. Fish and Wildlife Service. Consequently, the discussion of the results will be held to a statement of total data taken. Observations were: 42 new nests, 18 false crawls, 10 swimming turtles and 30 shrimp boats within the survey bounds.

Questions concerning data contained in this report should be directed to the Commanding General, Marine Corps Base, Camp Lejeune, North Carolina - (Attention: Base Maintenance Division, Natural Resources and Environmental Affairs Branch).

MAP I

NEST AND CRAWL ACTIVITY
ONSLOW BEACH, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



MAP II

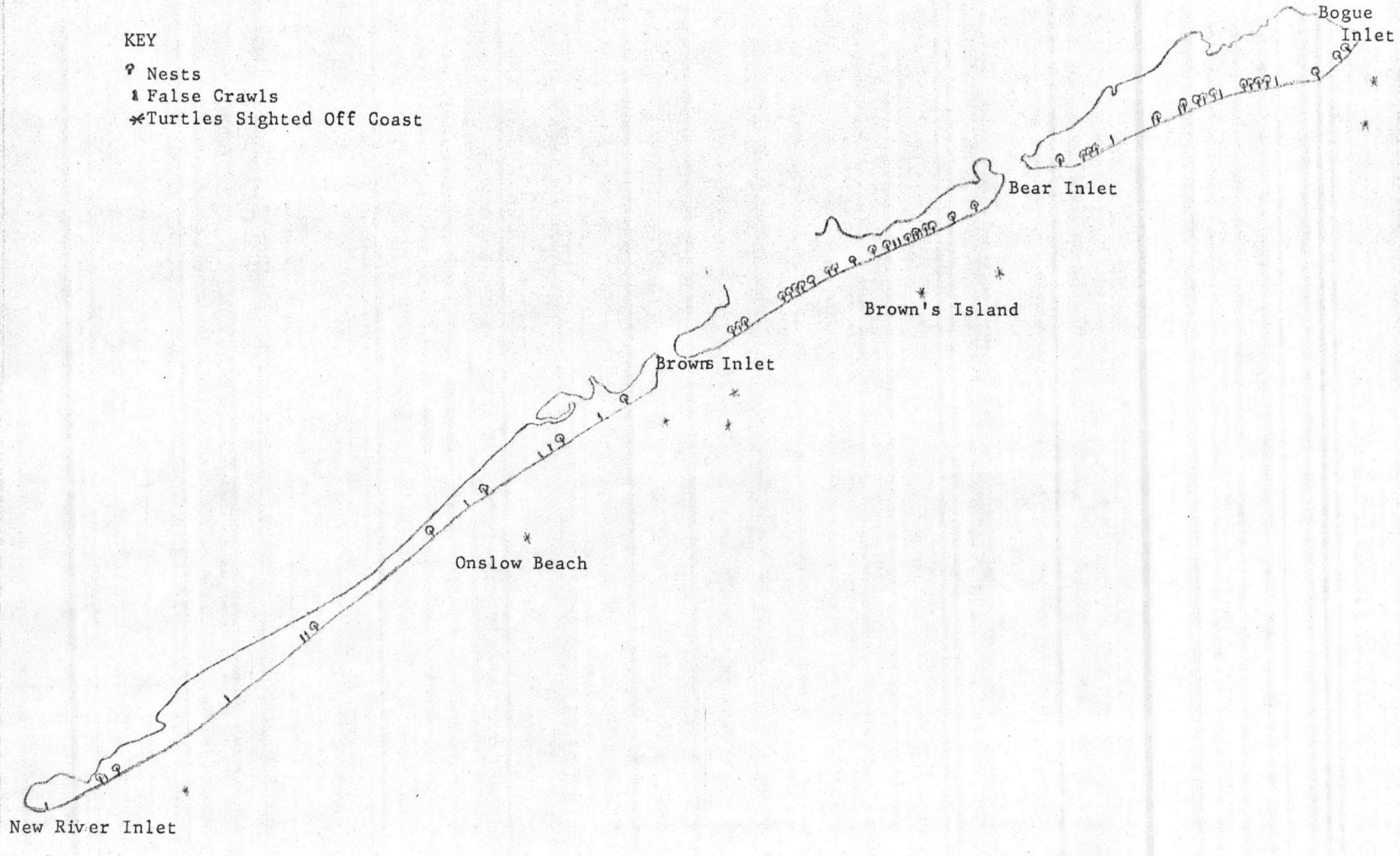

KEY
Nests
False Crawls
Turtles Sighted Off Coast
Bogue Inlet
Bear Inlet
Brown's Island
Browns Inlet
Onslow Beach
New River Inlet

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
5-30-80		-		1	1	Clear Fair	20.5°C	19°C
5-31-80					0			
6-01-80	2151-95%	2130			0			
6-02-80	2241-90%	2216		1	1	Fair, Sctrd Clouds	22°C	21°C
6-03-80	2326-82%	2307			0			
6-04-80	0008-73%	0007	1	1	2	Fair Partly Cloudy	22°C	18.5°C
6-05-80	0047-63%	0103			0			
6-06-80	0125-51%	0207			0			
6-07-80	0203-40%	0311			0			
6-08-80	0242-29%	0412			0			
6-09-80	0323-19%	0512	1		1			
6-10-80	0407-11%	0607			0			
6-11-80	0455-05%	1835 0701 1926	1	2	3	Fair Partly Cloudy	24.9°C	-
6-12-80	0547-01%	0752			0			
6-13-80		2015	1		1			
6-14-80	0642-02%	2012	2		2			
6-15-80	0742-06%	2147			0			
6-16-80	0837-11%	2231			0			
6-17-80	0934-18%	2317		2100 2250	2	Fair Few Clouds	24°C	22°C
6-18-80	1030-27%	0005			0	Cool, Windy Cloudy	24°C	20°C
6-19-80	1125-36%	0053	2345	2345	2	Fair Clear	24.5°C	24°C
6-20-80	1219-45%	0144	2300	2210	2	Fair Cloudy	24°C	22.5°C
6-21-80	1313-55%	0237	2300	2300	2			
6-22-80	1407-64%	0330		2300 -	2			
6-23-80	1501-73%	0420			0	Fair	24°C	24°C
6-24-80	1558-81%	0508			0	Stormy	23°C	24°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/o nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
6-25-80	1655-88%	0555 1819	0030 0200	2300	3	Partly Cloudy	24°C	23°C
6-26-80	1753-94% Full	0638 1901			0	Cloudy	24°C	23.5°C
6-27-80	1850-98%	0723	2200	2245	2	Fair & Clear	24°C	24°C
6-28-80	1945-100%	1943			0	Fair & Clear	24°C	26°C
6-29-80	2037-99%	2028		2200 0030 0100	3	Fair & Cloudy	25°C	26°C
6-30-80	2125-97%	2114	2115 2300		1	Fair & Cloudy	24°C	22.5°C
7-1-80	2209-92%	2201	0030		2	Fair & Clear	24°C	24°C
7-2-80	2249-85%	2251	0215		1	Fair & Clear	26°C	27°C
7-3-80	2328-75%	2346	2245	2230 2300	2	Thunderstm Clearing	24.5°C	23°C
7-4-80	0005-65%	0043		2300 2300	3	Cloudy, Occ. Showers	24.5°C	24°C
7-5-80	0043-54%	0148		2400	1	Fair & Clear	26°C	26°C
7-6-80	0122-42%	0253	2345 0200	2310 2330	3	Fair & Ptly Cloudy	26°C	26°C
7-7-80	0203-31%	0356	0230	2340	3	Fair & Clear	24.5°C	26°C
7-8-80	0248-27%	0457		0200	1	Fair & Cloudy	26°C	26°C
7-10-80	0431-6%	1820 0645 1910	0015 0115 0030 0335	2345	5	ThundStm 2200 Clearing2400	26°C	23°C
7-11-80	0527-2%	0734	2340	0200	2	Fair & Clear	26.5°C	26°C
7-12-80	0624-0%	1957			0	Fair & Clear	26°C	27°C
7-13-80	- 1%	2038	0140 0115 0140 2320	0250 2315	4	Fair & Ptly Cloudy	26.5°C	24.5°C
7-14-80	0722-03%	2120	2310 2340 2340	0040	4	Fair & Clear	26°C	25°C
7-15-80	0819-08%	2201	2350 0215	0330 2145	4	Fair & Clear	25.5°C	25.5°C
7-16-80	0914-14%	2242	0315 2240	2310 0300	5	Fair & Clear	26°C	26°C
7-17-80	1009-21%	2323	0400	0245	3	Fair & In-crsg Clouds	27.5°C	26°
7-18-80	1103-29%	0006	2200	0305	1	Fair & Ptly Cloudy	27°C	26°
7-19-80	1156-38%	0057	0100 0200		3	Fair & Clear	27°C	27.5°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
7-20-80	1250-48%	0149	2200	2330 0330	3	Fair & Clear	27°C	28.5°C
7-21-80	1345-57%	0241			0	Fair & Incrsg Cloudiness	27.5°C	27°C
7-22-80	1442-67%	0338		0040 0035	2	Fair & Cloudy	27°C	27°C
7-23-80	1539-76%	0431		0030	1	Rainy	25°C	25°C
7-24-80	1639-84%	0521		2215	1	Fair & Cloudy	26°C	26°C
7-25-80	1733-91%	0612		2215	1	Fair & CLoudy	26°C	26.5°C
7-26-80	1827-96%	1835 0658	2200 1835 0200		3	2200-2400 Rainy 0200 Thundstms	26°C	24.5°C
7-27-80	1917-99%	1922 0745	2200 2210 2200 2230		4	Heavy Rain	-	-
7-28-80	Full 2004-100%	2009		2210 2210	2	Cloudy	27°C	26°C
7-29-80	2047-98%	2054			0	Partly Cloudy	27°C	25°C
7-30-80	2128-93%	2144		2120	1	Fair & Clear	27°C	26°C
7-31-80	2206-86%	2233	0130		1	Fair & Clear	27.5°C	27.5°C
8-01-80	2224-77%	2328	0315	2200 2200 0245	4	2000-2200 Thunderstorm 2400 Clearing	27°C	26.5°C
8-02-80	2323-67%	0026		2330 0245 0300	3	Fair & Clear	27°C	28°C
8-03-80	0003/44%	0129	2		2		-	-
8-04-80	0047-33%	0235		2250	1	Partly Cloudy	27°C	28°C
8-05-80	0134-23%	0343		2230	1	Clear	27.5°C	28°C
8-06-80	0224-15%	0444			0	Clear	27°C	28°C
8-07-80	0318-8%	0540	2400		1	Partly Cloudy	27°C	26.5°C
8-08-80	0414-3%	1806 0630	2300 0200	2245 2315	4	Fair & Clear	27°C	27.5°C
8-09-80	0511-1%	1852 0715			0			
8-10-80	0608-0%	1934 0758		2	2			
8-11-80	- -	2013			0	Fair & Clear	27°C	27.5°C
8-12-80	0705-1%	2052		0230	1	Cloudy	27°C	27°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

Date Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
8-13-80	0800-5%	2129			0	Fair & Clear	27°C	28°C
8-14-80	0854-10%	2206	2230	2300	2	Fair & Clear	27°C	28°C
8-15-80	0948-16%	2243			0	Clear & Windy	27.5°C	26.5°C
8-16-80	1041-23%	2323		1	1			
8-17-80	1135-32%	0010	0245		1	Cool & Cloudy	27°C	22°C
8-18-80	1230-41%	0100		0200	1	Thunderhd moving in Cloudy	26°C	23°C
8-19-80	1326-51%	0158			0	Cloudy	25.5°C	25°C
8-20-80	1422-60%	0258			0			
8-21-80	1518-70%	0356			0			
8-22-80	1613-79%	0258	1		1	Fair & Clear	25°C	23°C
8-23-80	1705-87%	0356						
8-24-80	1754-94%	0452	0100		1	Fair & Clear	23°C	19°C
8-25-80	1839-98%	0543 1721	between 2200-2400	between 2200-2400	2	Fair & Clear	23°C	19°C
8-26-80	1922-100%	0634 1859						
8-27-80	2002-99%	0723 1948						
8-28-80	2042-95%	0812						
8-29-80	2121-88%	2036						
8-30-80	2202-80%	2125						
8-31-80	2245-69%	2216						

TABLE II

RETURN RECORD OF TAGGED TURTLES

1980 SEA TURTLE INVENTORY

DATES 6/17/80 - 8/9/80

Date	Tag #	Return	Return	Return	Return
6/17/80	651				
6/17/80	652	7/3/80 (⊗)	7/16/80	7/28/80	
6/19/80 (⊗)	653				
6/19/80	654				
6/20/80	655	7/3/80 (⊗)	7/15/80 (⊗) Retag 640	7/28/80	8/8/80
Green					(2)
6/25/80	657*	7/9/80 Retag 669	7/21/80 Retag 649	8/2/80	8/17/80
6/26/80 (⊗)	NC0001	7/11/80 (⊗)	7/24/80		
6/27/80 (⊗)	648	7/24/80			
6/27/80	658				
6/29/80	650	7/12/80			
6/29/80	659				
6/30/80	660	7/14/80 (⊗) Retag 672	7/16/80	8/1/80	
7/1/80 (⊗)	661	7/14/80	7/26/80 (⊗)	8/8/80	
7/3/80	662				
7/6/80	663				
7/6/80 (⊗)	664				
7/7/80	667	8/18/80 (⊗)	8/20/80		
7/8/80 (⊗)	665				
7/8/80 (⊗)	666				
7/10/80 (⊗)	670	7/23/80			
7/11/80 (⊗)	671				
7/14/80	673				
7/14/80 (⊗)	674				
7/15/80	675				
7/17/80	641				
7/17/80 (⊗)	642	7/18/80			
7/18/80 (⊗)	647	7/20/80	8/2/80		
7/19/80	645				
7/23/80	646				
7/25/80	644				
7/30/80	633				
8/1/80 (1)	639	8/14/80			
8/3/80	638				
8/4/80	634				
8/5/80	637				
8/7/80 (⊗)	636	8/12/80			
8/9/80 (⊗)	635				

(⊗) - Turtle was tagged but did not nest.

(1) - Turtle previously tagged but tag missing - tag hole present

(2) - Crawl body pit and eggs indicative of Green Turtle but turtle not observed

Tagged or

1 Turtle observed 5 times; 4 turtles observed 4 times; 3 turtle observed 3 times; 6 turtles observed 2 times; 23 turtles observed 1 time

61 sightings of tagged turtles

TABLE III

AERIAL SURVEY

Flights

	May 30				May 31			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	1	0	0	2	0	0	0	1
Brown's Island	0	2	0	1	0	0	0	2
Bear Island	0	0	0	0	2	0	0	0

	June 13				June 14			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	2	1	0	1	0	3
Brown's Island	0	0	0	0	0	0	1	1
Bear Island	1	0	0	0	0	0	0	3

	July 1				July 2				July 11				July 12				July 21			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	0	0	0	0	2	0	0	1	3	2	0	1	1	0	2	1	0	0	1
Brown's Island	0	0	1	0	5	1	0	0	0	0	0	1	3	0	0	1	4	1	2	1
Bear Island	2	0	2	0	2	2	0	0	0	0	0	0	1	0	0	2	4	1	0	0

	Aug 1				Aug 11				Aug 12			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	0	1	2	0	0	0	1	0	0	2
Brown's Island	2	0	0	2	3	0	0	1	2	0	0	1
Bear Island	1	0	0	0	2	0	0	0	1	2	0	1

TOTAL

	N	FC	T	SB
Onslow Beach	7	9	4	13
Brown's Island	19	4	4	11
Bear Island	16	5	2	6
	42	18	10	30

Key N - Fresh Nests
FC - Fresh False Crawls
T - Turtles sighted off coast
SB - Shrimp Boats

TABLE IV

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina
1980

*Green Turtle

Nest No.	Incubation Period DAYS	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
001	65	115	67	39	106	92.2%
002	63	166	158	3	161	97 %
003	63	134	4	69	73	54.5%
006 IMS	69	53	24	--	24	45.3%
007	--	126	0	0	0	0
012	65	102	81	4	85	83.3%
013	64	175	4	119	123	70.3%
015	63	134	0	128	128	95.5%
016 IMS		121				
018 IMS		101				
019	64	86	6	75	81	94.2%
021	63	143	0	114	114	79.7%
* 022	56	168	148	0	148	88.1%
026	60	100	0	91	91	91 %
027	59	72	0	71	71	98.6%
028 IMS		119				
029	60	113	0	78	78	69 %
034	60	127	25	21	46	36.2%
036	60	152	53	56	109	71.7%
037	59	116	4	89	93	80.2%
038	59	131	8	75	83	63.4%
039	60	167	161	0	161	96.4%
040	62	131	125	4	129	98.5%
042	59	78	7	58	65	83.3%
043	62	99	98	0	98	99.9%
046	58	183	144	0	144	78.7%

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base 1980
Camp Lejeune, North Carolina

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
104 IMS	0	1	0	0	0	0
107 IMS		179				
108 IMS		134				
110 IMS		104				
112 IMS		104				
114 IMS		120				
115 IMS		80				
116 IMS		83				
118 IMS		112				
*119 IMS		145				
121 IMS		75				
125 IMS		99				
	TOTALS					
64		7352				
26 IMS		2823				
37 O B		4529				
GREEN TURTLE		819	(11.14% OF TOTAL)			

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
048 IMS		124				
054	59	89	64	23	87	97.8%
058	58	109	51	55	106	97.2%
059	59	118	13	99	112	94.9%
062	58	97	3	91	94	96.9%
066	57	131	27	80	117	89.3%
067	63	99	0	88	88	88.9%
069	60	131	109	0	109	83.2%
072 IMS		123				
073	60	119	2	112	114	95.8%
075	60	160	4	154	158	98.75%
080		117	0	101	101	86.3%
*081 IMS		166				
082 IMS		96				
083		134				
084	59	116	4	106	110	94.8%
085	61	114	0	111	111	97.4%
086		89				
094 IMS		132				
095 IMS		102				
096		88	0	74	74	84.1%
098 IMS		114				
099 IMS		78				
*100 IMS		157				
102 IMS		114				
103 IMS		78				

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

TABLE V

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
5-30-80		1	1
6-2-80		1	1
6-4-80	1	1	2
6-9-80	1		1
6-11-80	1	2	3
6-13-80	1		1
6-14-80	2		2
6-17-80		2	2
6-19-80	1	1	2
6-20-80	1	1	2
6-21-80	1	1	2
6-22-80		2	2
6-25-80		1	1
6-26-80	2		2
6-27-80	1	1	2
6-29-80		2	2
6-30-80	1	1	2
7-1-80	1		1
7-2-80	1		1
7-3-80	2	1	3
7-4-80		3	3
7-5-80		1	1
7-6-80	1	2	3
7-7-80		1	1
7-8-80	2		2
7-9-80		1	1
7-10-80	1	1	2
7-11-80	5		5
7-12-80		1	1
7-14-80	5	2	7
7-15-80	3	1	4
7-16-80		3	3
7-17-80	3	1	4
7-18-80	1	1	2
7-19-80	1	1	2
7-20-80	3	1	4
7-21-80		1	1
7-23-80		2	2
7-24-80		2	2
7-25-80		1	1
7-26-80	2		2
7-27-80	5		5
7-28-80		2	2
7-30-80		1	1

TABLE V Cont'd

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
8-1-80	1	2	3
8-2-80	1	2	3
8-3-80	2	2	4
8-4-80		1	1
8-5-80		1	1
8-7-80	1		1
8-8-80	1	2	3
8-9-80	1		1
8-10-80		2	2
8-12-80		1	1
8-14-80	1	1	2
8-15-80			0
8-16-80			0
8-17-80		1	1
8-18-80	1		1
8-19-80			0
8-20-80			0
8-21-80			0
8-22-80	1		1
8-23-80			0
8-24-80	1		1
8-25-80	1	1	2
8-26-80			0
8-27-80			0
8-28-80			0
8-29-80			0
8-30-80			0

TABLE VI

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

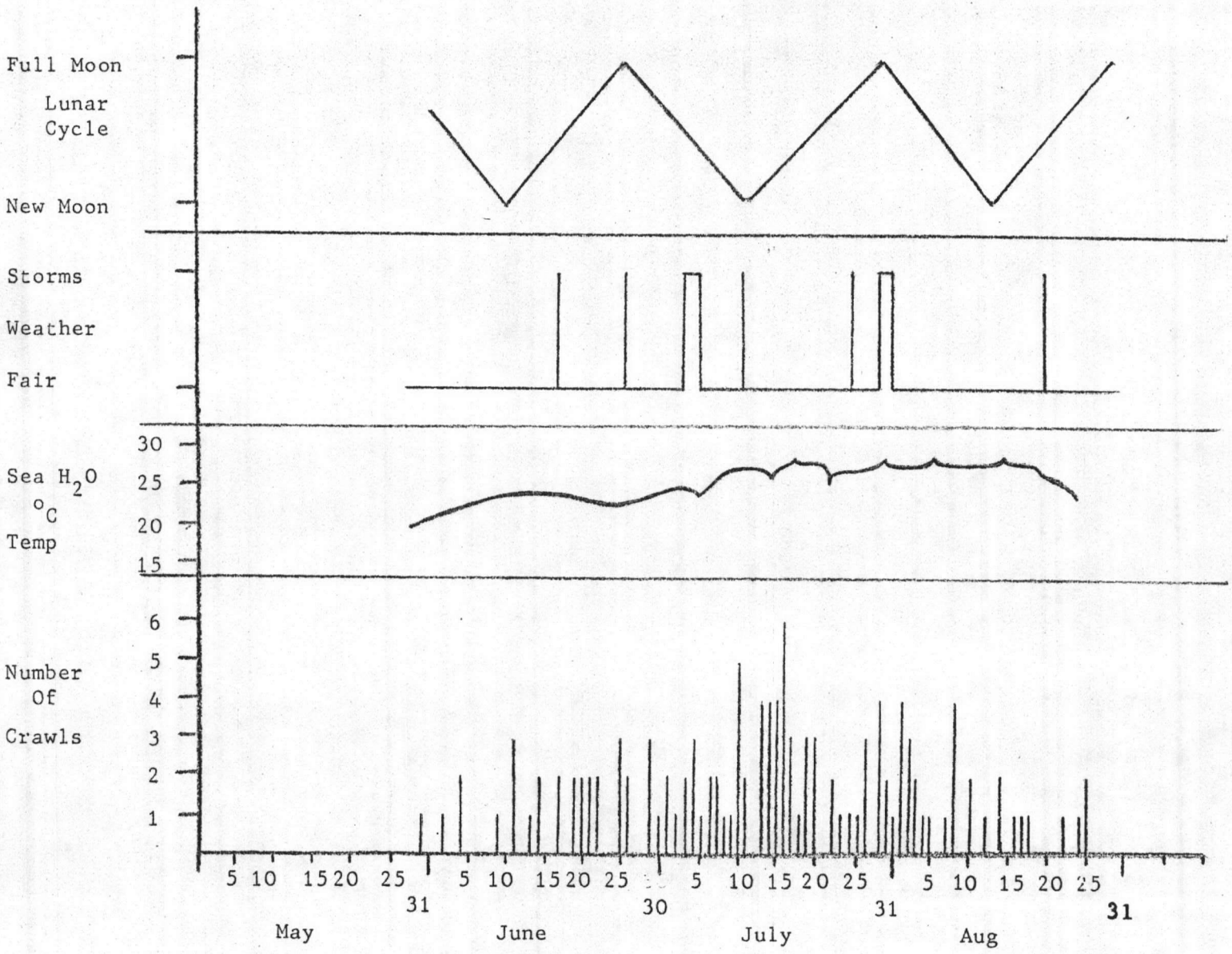
1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

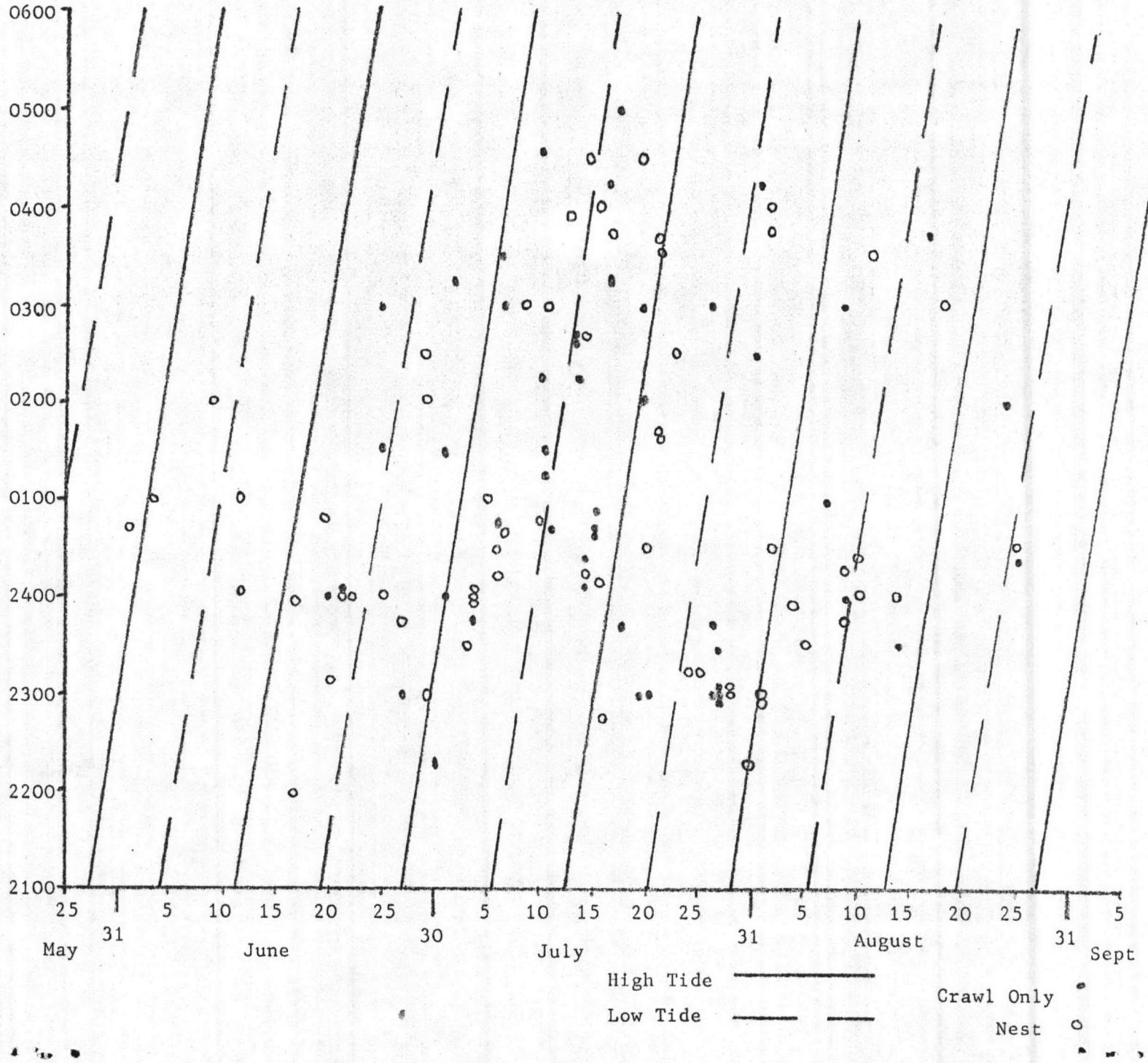
% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

GRAPH I


Full Moon
Lunar Cycle
New Moon
Storms
Weather
Fair
Sea H_2O ^oC Temp
30
25
20
15
Number Of Crawls
6
5
4
3
2
1
5 10 15 20 25 31 5 10 15 20 25 30 5 10 15 20 25 31 5 10 15 20 25 31
May
June
July
Aug

GRAPH II NESTING IN RELATION TO TIME AND TIDAL CYCLE



GRAPH III

Total Crawls and Nest by Month 1980 Nest Season

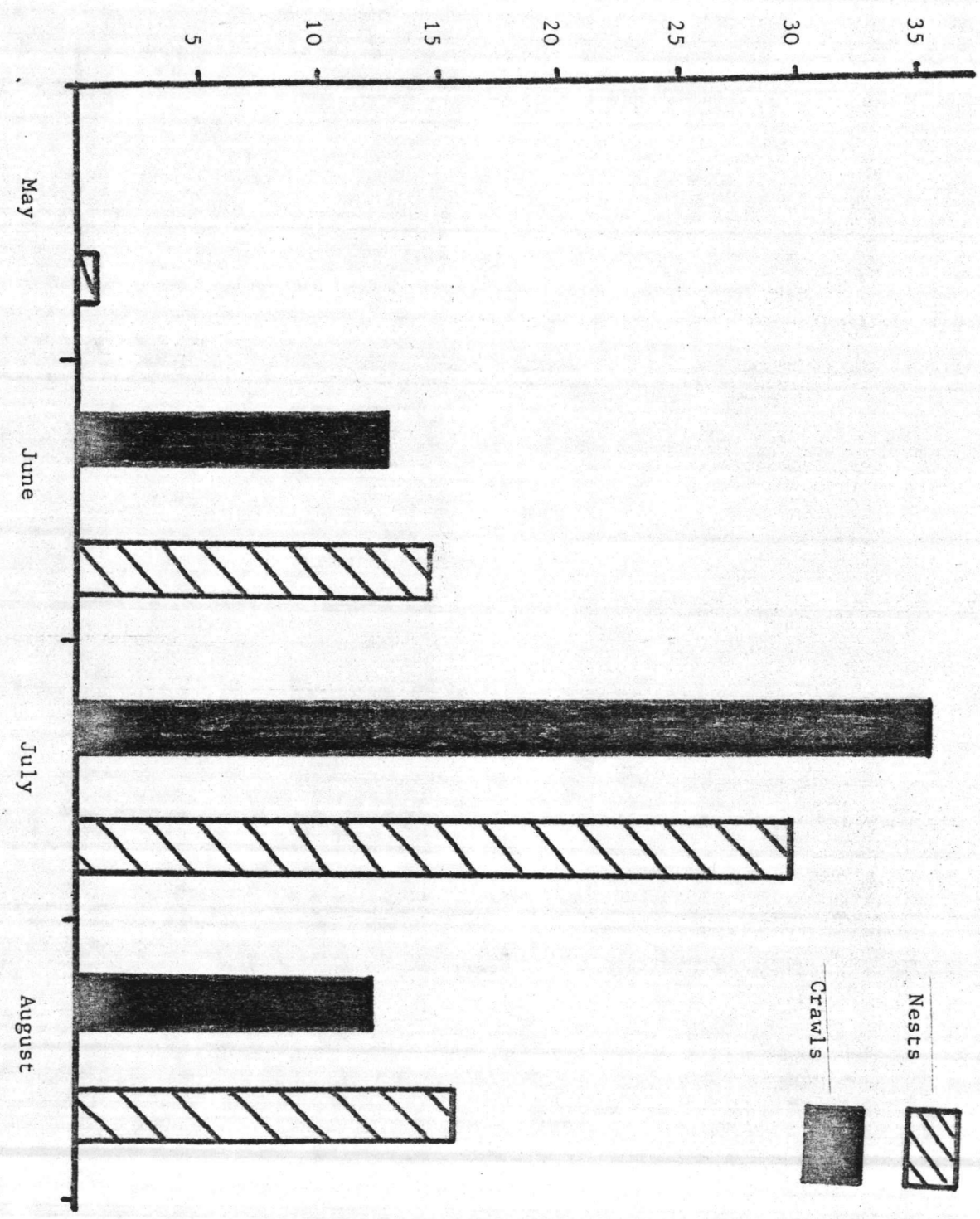


TABLE III

AERIAL SURVEY

	May 30				May 31			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	1	0	0	2	0	0	0	1
Brown's Island	0	2	0	1	0	0	0	2
Bear Island	0	0	0	0	2	0	0	0

	June 13				June 14			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	2	1	0	1	0	3
Brown's Island	0	0	0	0	0	0	1	1
Bear Island	1	0	0	0	0	0	0	3

	July 1				July 2				July 11				July 12				July 21			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	0	0	0	0	2	0	0	1	3	2	0	1	1	0	2	1	0	0	1
Brown's Island	0	0	1	0	5	1	0	0	0	0	0	1	3	0	0	1	4	1	2	1
Bear Island	2	0	2	0	2	2	0	0	0	0	0	0	1	0	0	2	4	1	0	0

	Aug 1				Aug 11				Aug 12			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	0	1	2	0	0	0	1	0	0	2
Brown's Island	2	0	0	2	3	0	0	1	2	0	0	1
Bear Island	1	0	0	0	2	0	0	0	1	2	0	1

TOTAL

	N	FC	T	SB
Onslow Beach	7	9	4	13
Brown's Island	19	4	4	11
Bear Island	16	5	2	6
	42	18	10	30

Key N - Fresh Nests
FC - Fresh False Crawls
T - Turtles sighted off Coast
SB - Shrimp Boats

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

TABLE IV

1980

*Green Turtle

Nest No.	Incubation Period DAYS	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
001	65	115	67	39	106	92.2%
002	63	166	158	3	161	97 %
003	63	134	4	69	73	54.5%
006 IMS	69	53	24	--	24	45.3%
007	--	126	0	0	0	0
012	65	102	81	4	85	83.3%
013	64	175	4	119	123	70.3%
015	63	134	0	128	128	95.5%
016 IMS		121				
018 IMS		101				
019	64	86	6	75	81	94.2%
021	63	143	0	114	114	79.7%
* 022	56	168	148	0	148	88.1%
026	60	100	0	91	91	91 %
027	59	72	0	71	71	98.6%
028 IMS		119				
029	60	113	0	78	78	69 %
034	60	127	25	21	46	36.2%
036	60	152	53	56	109	71.7%
037	59	116	4	89	93	80.2%
038	59	131	8	75	83	63.4%
039	60	167	161	0	161	96.4%
040	62	131	125	4	129	98.5%
042	59	78	7	58	65	83.3%
043	62	99	98	0	98	99.9%
046	58	183	144	0	144	78.7%

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
104 IMS	0	1	0	0	0	0
107 IMS		179				
108 IMS		134				
110 IMS		104				
112 IMS		104				
114 IMS		120				
115 IMS		80				
116 IMS		83				
118 IMS		112				
*119 IMS		145				
121 IMS		75				
125 IMS		99				
	TOTALS					
64		7352				
26 IMS		2823				
37 O B		4529				
GREEN TURTLE		819	(11.14% OF TOTAL)			

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
048 IMS		124				
054	59	89	64	23	87	97.8%
058	58	109	51	55	106	97.2%
059	59	118	13	99	112	94.9%
062	58	97	3	91	94	96.9%
066	57	131	27	80	117	89.3%
067	63	99	0	88	88	88.9%
069	60	131	109	0	109	83.2%
072 IMS		123				
073	60	119	2	112	114	95.8%
075	60	160	4	154	158	98.75%
080		117	0	101	101	86.3%
*081 IMS		166				
082 IMS		96				
083		134				
084	59	116	4	106	110	94.8%
085	61	114	0	111	111	97.4%
086		89				
094 IMS		132				
095 IMS		102				
096		88	0	74	74	84.1%
098 IMS		114				
099 IMS		78				
*100 IMS		157				
102 IMS		114				
103 IMS		78				

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

TABLE V

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
5-30-80		1	1
6-2-80		1	1
6-4-80	1	1	2
6-9-80	1		1
6-11-80	1	2	3
6-13-80	1		1
6-14-80	2		2
6-17-80		2	2
6-19-80	1	1	2
6-20-80	1	1	2
6-21-80	1	1	2
6-22-80		2	2
6-25-80		1	1
6-26-80	2		2
6-27-80	1	1	2
6-29-80		2	2
6-30-80	1	1	2
7-1-80	1		1
7-2-80	1		1
7-3-80	2	1	3
7-4-80		3	3
7-5-80		1	1
7-6-80	1	2	3
7-7-80		1	1
7-8-80	2		2
7-9-80		1	1
7-10-80	1	1	2
7-11-80	5		5
7-12-80		1	1
7-14-80	5	2	7
7-15-80	3	1	4
7-16-80		3	3
7-17-80	3	1	4
7-18-80	1	1	2
7-19-80	1	1	2
7-20-80	3	1	4
7-21-80		1	1
7-23-80		2	2
7-24-80		2	2
7-25-80		1	1
7-26-80	2		2
7-27-80	5		5
7-28-80		2	2
7-30-80		1	1

TABLE V Cont'd

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
8-1-80	1	2	3
8-2-80	1	2	3
8-3-80	2	2	4
8-4-80		1	1
8-5-80		1	1
8-7-80	1		1
8-8-80	1	2	3
8-9-80	1		1
8-10-80		2	2
8-12-80		1	1
8-14-80	1	1	2
8-15-80			0
8-16-80			0
8-17-80		1	1
8-18-80	1		1
8-19-80			0
8-20-80			0
8-21-80			0
8-22-80	1		1
8-23-80			0
8-24-80	1		1
8-25-80	1	1	2
8-26-80			0
8-27-80			0
8-28-80			0
8-29-80			0
8-30-80			0

TABLE VI

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Number Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

SEA TURTLE INVENTORY

FOR

SUMMER AND FALL 1980

Natural Resources and Environmental Affairs Branch

Base Maintenance Division

Marine Corps Base

Camp Lejeune, North Carolina 28542

JULIAN I. WOOTEN
Director

DR. FRANK B. SCHWARTZ
Advisor
Institute of Marine Science
Morehead City, North Carolina

CHARLES D. PETERSON
Supervisor, Wildlife Management

JOHN A. FRIDELL

&

HUGH R. PASSINGHAM

Technicians

INTRODUCTION

The Sea Turtle Inventory for 1980 is a continuation of past efforts by Marine Corps Base, Camp Lejeune, North Carolina to protect threatened Atlantic Loggerhead Sea Turtles. The program began in 1974 by the Marine Corps and Camp Lejeune biologists when evidence indicated that a high percentage of Atlantic Loggerhead nests on Onslow Beach were being destroyed by predators. This action was taken prior to the addition of the Atlantic Loggerhead Sea Turtle to the Endangered Species List, as threatened. The protection program to date has had three main objectices. First, for the compliance of the Endangered Species Act through Biological Opinions rendered by the U. S. Fish and Wildlife Service. Second, and probably the most important, conservation practices have been initiated to protect the turtles and their nests from predation. Third, has been to study the nesting habits of the Atlantic Loggerhead Sea Turtle (Caretta caretta).

There are several related projects that comprise the protection program. These include:

- Nightly Beach Patrols
- Tagging Adult Turtles
- Collection of Nesting Data
- Insitu Weather Observations
- Aerial Surveys
- Nesting and Hatching Success
- Occasional Hatchling Tagging
- Stranding Reports on Dead Turtles

The University of North Carolina Institute of Marine Sciences in Morehead City, North Carolina (IMS) assisted the Marine Corps in the turtle protection program. IMS provided tags for adult and hatchling turtles and assisted in the tagging process. Dr. Frank Schwartz of IMS is also a valuable source of information for the Camp Lejeune biologists.

In 1980, the Loggerhead program took on new dimensions when a Green Turtle (Chelonia mydas mydas) nested on Onslow Beach. The Green Turtle was observed nesting four times and is believed to have nested five times, since for one unobserved nest the crawl, nest, eggs and hatchlings were indicated of a Green Turtle.

RESULTS

The nesting season for 1980 began with the first nest on 30 May 1980 a
with the last nest on 25 August 1980. There were a total of 125 crawls to r
on Onslow Beach of which 65 were successful. This compares closely to the
from the 1979 nesting season where 138 crawls and 63 successful nests were observed.

The rate of nest predation on Onslow Beach for the 1980 nesting season was zero. There were 37 nests, 35 loggerheads and 2 Green Turtles, protected by wire
each.

1980 nesting season, a total of 36 turtles were t
gged previously with Tag No. NC0001 and subseque
mp Lejeune technicians. Of the 36 tagged turtle
return trips to the beach to lay (See Table III). One Loggerhead was observed laying 5 times at 12-13 day intervals. Four Loggerheads were observed 4 times. Three were observed 3 times, six turtles were observed 2 times and 23 were observed laying 1 time for a total of 59 sightings of tagged turtles. No turtles were observed on Onslow Beach that had been tagged on previous years. The Green Turtle was observed 4 times, retagged twice and is believed to have nested 5 times.

The Green Turtle nests produced 819 eggs of which 387 hatch
success rate. There were 2 deformed and 5 white (not albino) Gr
om the 5 nests. Two of the Green Turtle nests were naturally incub
contained 315 eggs of which 292 hatched for an 83.2% rate of hatching success (See Table IV). The three remaining Green Turtle nests were taken to IMS where they were artifically incubated. Those nests contained 468 eggs, of which 95 hatched for a 20.3% rate of hatchling success (See Table VI).

Loggerhead nests produced 6,554 eggs total. Of the 6,554 eggs, 4,178 were allowed to hatch naturally, 3,467 of those eggs hatched for a 83% success rate (See Table IV). IMS artifically incubated 2,376 Loggerhead eggs of which 1,157 hatches for 48.7% success rate (See Table VI). Therefore, of 6,554 total Loggerhead Turtle eggs laid, 4,624 hatched for a 70.6% success rate. When Green and Loggerhead Turtle nests data are combined, a total of 7,373 eggs were laid of which 5,011 hatched for a

RESULTS

The nesting season for 1980 began with the first nest on 30 May 1980 and ended with the last nest on 25 August 1980. There were a total of 125 crawls to nest on Onslow Beach of which 65 were successful. This compares closely to the data from the 1979 nesting season where 138 crawls and 63 successful nests were observed.

The rate of nest predation on Onslow Beach for the 1980 nesting season was zero. There were 37 nests, 35 loggerheads and 2 Green Turtles, protected by wire cages on Onslow Beach.

During the 1980 nesting season, a total of 36 turtles were tagged. One turtle had been tagged previously with Tag No. NC0001 and subsequently was not retagged by the Camp Lejeune technicians. Of the 36 tagged turtles, there were 29 return trips to the beach to lay (See Table III). One Loggerhead was observed laying 5 times at 12-13 day intervals. Four Loggerheads were observed 4 times. Three were observed 3 times, six turtles were observed 2 times and 23 were observed laying 1 time for a total of 59 sightings of tagged turtles. No turtles were observed on Onslow Beach that had been tagged on previous years. The Green Turtle was observed 4 times, retagged twice and is believed to have nested 5 times.

The Green Turtle nests produced 819 eggs of which 387 hatched for a 47.2% success rate. There were 2 deformed and 5 white (not albino) Green Turtle hatchlings from the 5 nests. Two of the Green Turtle nests were naturally incubated. Those nests contained 315 eggs of which 292 hatched for an 83.2% rate of hatchling success (See Table IV). The three remaining Green Turtle nests were taken to IMS where they were artifically incubated. Those nests contained 468 eggs, of which 95 hatched for a 20.3% rate of hatchling success (See Table VI).

Loggerhead nests produced 6,554 eggs total. Of the 6,554 eggs, 4,178 were allowed to hatch naturally, 3,467 of those eggs hatched for a 83% success rate (See Table IV). IMS artifically incubated 2,376 Loggerhead eggs of which 1,157 hatches for 48.7% success rate (See Table VI). Therefore, of 6,554 total Loggerhead Turtle eggs laid, 4,624 hatched for a 70.6% success rate. When Green and Loggerhead Turtle nests data are combined, a total of 7,373 eggs were laid of which 5,011 hatched for a

year's success rate of 67.96%. This overall success rate is better than the 1979 season success rate which was 57%.

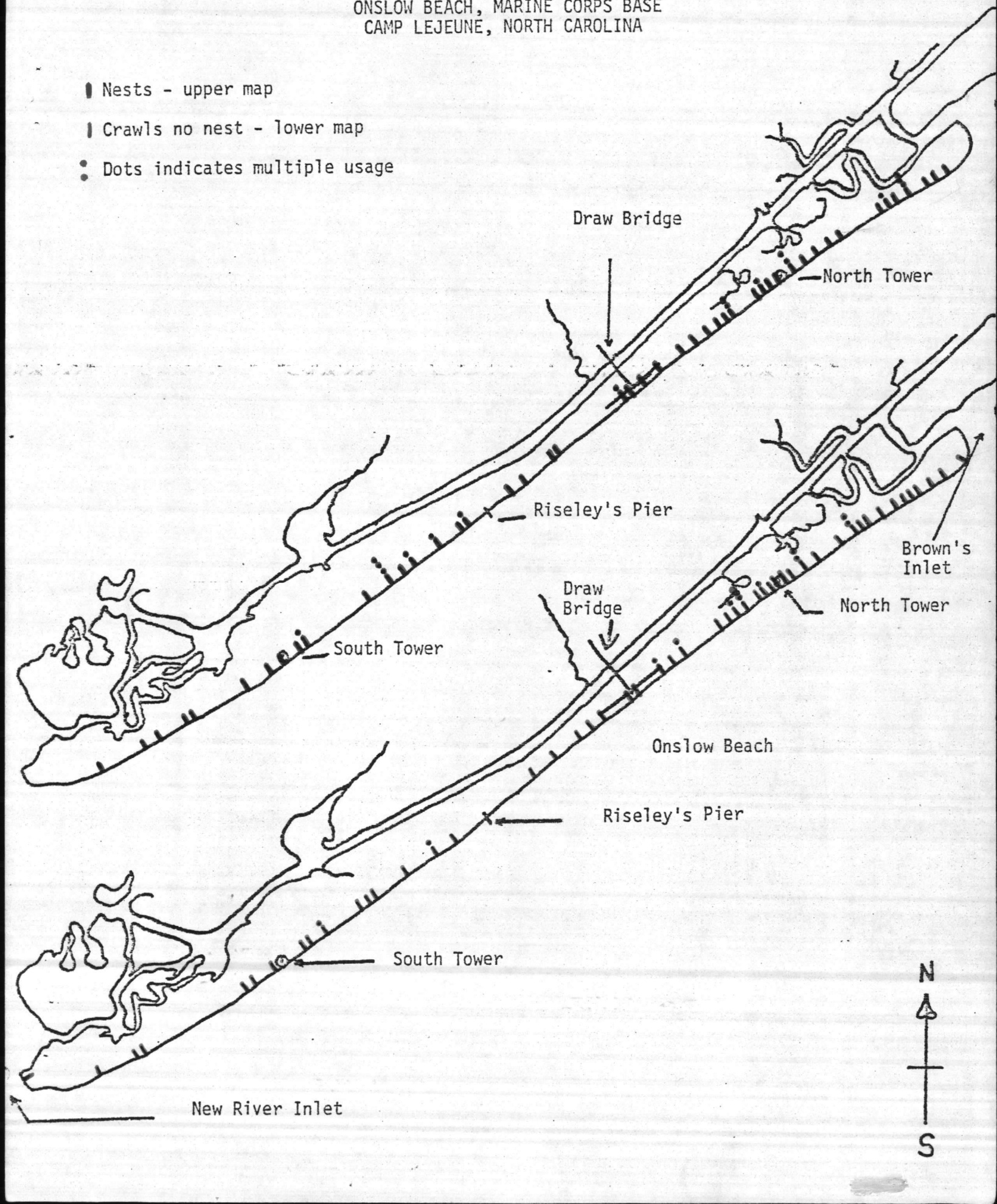
The Camp Lejeune Sea Turtle aerial surveillance flights covered beaches from New River Inlet to north to Bouge Inlet, which included Onslow Beach, Camp Lejeune, Brown's Island, Camp Lejeune and Bear Island (Hammock Beach State Park). Flight dates were scheduled such that they would fit in with the North Carolina to Louisiana surveys planned for 1980. The surveys were conducted from military helicopters piloted by Marine Corps personnel dispatched from Marine Corps Air Station, New River. Flights averaged 1 hour 15 minutes in duration and were flown at an altitude of 200 to 300 feet and a velocity of 30-60 knots. The return flights were flown approximately one half- one mile off the coast in an attempt to spot turtles in the water. A total of 12 flights were flown in sets of two at scattered intervals throughout the nesting period, for a total of 15 hours 35 minutes flight time. The number and location of all fresh nests and false crawls sighted were recorded along with the number and location of turtles observed offshore and of shrimping vessels within the survey data. Hammock Beach State Park personnel were notified in the event that nests and/or false crawls were sighted on their beach and written records of each flight were sent to State Fish and Wildlife personnel, Raleigh, North Carolina and Dr. F. J. Schwartz at IMS, Morehead City, North Carolina.

The Camp Lejeune Aerial Survey results (See Table III) are insignificant unless comparted to the overall aerial survey program for the East Coast, conducted by the U. S. Fish and Wildlife Service. Consequently, the discussion of the results will be held to a statement of total data taken. Observations were: 42 new nests, 18 false crawls, 10 swimming turtles and 30 shrimp boats within the survey bounds.

Questions concerning data contained in this report should be directed to the Commanding General, Marine Corps Base, Camp Lejeune, North Carolina - (Attention: Base Maintenance Division, Natural Resources and Environmental Affairs Branch).

MAP I

NEST AND CRAWL ACTIVITY
ONSLOW BEACH, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



MAP II

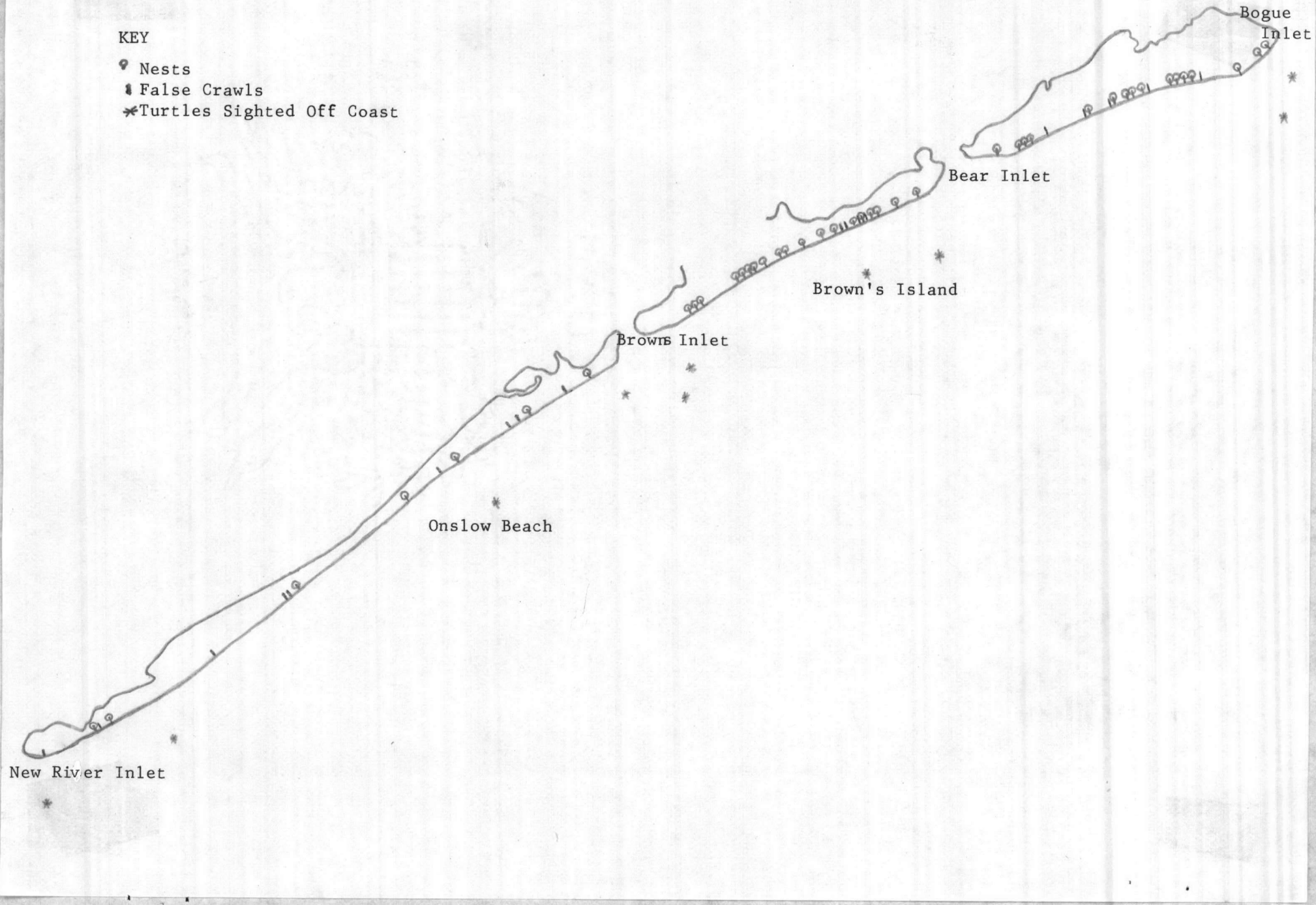
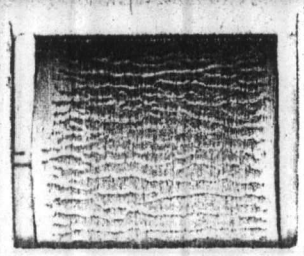

KEY
Nests
False Crawls
Turtles Sighted Off Coast
Bogue Inlet
Bear Inlet
Brown's Island
Browns Inlet
Onslow Beach
New River Inlet

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
5-30-80		-		1	1	Clear Fair	20.5°C	19°C
5-31-80					0			
6-01-80	2151-95%	2130			0			
6-02-80	2241-90%	2216		1	1	Fair, Sctrd Clouds	22°C	21°C
6-03-80	2326-82%	2307			0			
6-04-80	0008-73%	0007	1	1	2	Fair Partly Cloudy	22°C	18.5°C
6-05-80	0047-63%	0103			0			
6-06-80	0125-51%	0207			0			
6-07-80	0203-40%	0311			0			
6-08-80	0242-29%	0412			0			
6-09-80	0323-19%	0512	1		1			
6-10-80	0407-11%	0607			0			
6-11-80	0455-05%	1835 0701 1926	1	2	3	Fair Partly Cloudy	24.9°C	-
6-12-80	0547-01%	0752			0			
6-13-80		2015	1		1			
6-14-80	0642-02%	2012	2		2			
6-15-80	0742-06%	2147			0			
6-16-80	0837-11%	2231			0			
6-17-80	0934-18%	2317		2100 2250	2	Fair Few Clouds	24°C	22°C
6-18-80	1030-27%	0005			0	Cool, Windy Cloudy	24°C	20°C
6-19-80	1125-36%	0053	2345	2345	2	Fair Clear	24.5°C	24°C
6-20-80	1219-45%	0144	2300	2210	2	Fair Cloudy	24°C	22.5°C
6-21-80	1313-55%	0237	2300	2300	2			
6-22-80	1407-64%	0330		2300 -	2			
6-23-80	1501-73%	0420			0	Fair	24°C	24°C
6-24-80	1558-81%	0508			0	Stormy	23°C	24°C



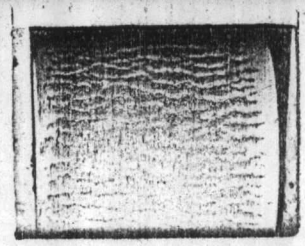
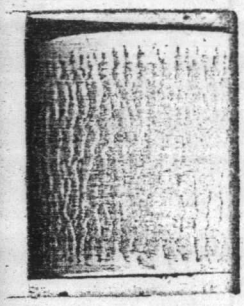


TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/o nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
6-25-80	1655-88%	0555 1819	0030 0200	2300	3	Partly Cloudy	24°C	23°C
6-26-80	1753-94% Full	0638 1901			0	Cloudy	24°C	23.5°C
6-27-80	1850-98%	0723	2200	2245	2	Fair & Clear	24°C	24°C
6-28-80	1945-100%	1943			0	Fair & Clear	24°C	26°C
6-29-80	2037-99%	2028		2200 0030 0100	3	Fair & Cloudy	25°C	26°C
6-30-80	2125-97%	2114	2115 2300		1	Fair & Cloudy	24°C	22.5°C
7-1-80	2209-92%	2201	0030		2	Fair & Clear	24°C	24°C
7-2-80	2249-85%	2251	0215		1	Fair & Clear	26°C	27°C
7-3-80	2328-75%	2346	2245	2230 2300	2	Thunderstm Clearing	24.5°C	23°C
7-4-80	0005-65%	0043		2300 2300	3	Cloudy, Occ. Showers	24.5°C	24°C
7-5-80	0043-54%	0148		2400	1	Fair & Clear	26°C	26°C
7-6-80	0122-42%	0253	2345 0200	2310 2330	3	Fair & Ptly Cloudy	26°C	26°C
7-7-80	0203-31%	0356	0230	2340	3	Fair & Clear	24.5°C	26°C
7-8-80	0248-27%	0457		0200	1	Fair & Cloudy	26°C	26°C
		1820	0015 0115			ThundStm 2200		
7-10-80	0431-6%	0645 1910	0030 0335	2345	5	Clearing2400	26°C	23°C
7-11-80	0527-2%	0734	2340	0200	2	Fair & Clear	26.5°C	26°C
7-12-80	0624-0%	1957			0	Fair & Clear	26°C	27°C
7-13-80	- 1%	2038	0140 0115 0140 2320	0250 2315	4	Fair & Ptly Cloudy	26.5°C	24.5°C
7-14-80	0722-03%	2120	2310 2340 2340	0040	4	Fair & Clear	26°C	25°C
7-15-80	0819-08%	2201	2350 0215	0330 2145	4	Fair & Clear	25.5°C	25.5°C
7-16-80	0914-14%	2242	0315 2240	2310 0300	5	Fair & Clear	26°C	26°C
7-17-80	1009-21%	2323	0400	0245	3	Fair & Incrsg Clouds	27.5°C	26°
7-18-80	1103-29%	0006		0305	1	Fair & Ptly Cloudy	27°C	26°
7-19-80	1156-38%	0057	2200 0100 0200		3	Fair & Clear	27°C	27.5°C



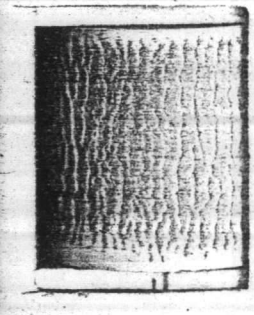
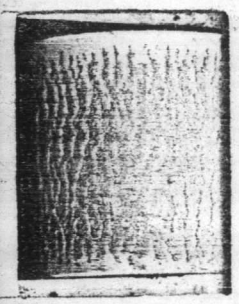


TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
7-20-80	1250-48%	0149	2200	2330 0330	3	Fair & Clear	27°C	28.5°C
7-21-80	1345-57%	0241			0	Fair & Incrsg Cloudiness	27.5°C	27°C
7-22-80	1442-67%	0338		0040 0035	2	Fair & Cloudy	27°C	27°C
7-23-80	1539-76%	0431		0030	1	Rainy	25°C	25°C
7-24-80	1639-84%	0521		2215	1	Fair & Cloudy	26°C	26°C
7-25-80	1733-91%	0612		2215	1	Fair & CLoudy	26°C	26.5°C
7-26-80	1827-96%	1835 0658	2200 1835 0200		3	2200-2400 Rainy 0200 Thundstms	26°C	24.5°C
7-27-80	1917-99%	1922 0745	2200 2210 2200 2230		4	Heavy Rain	-	-
7-28-80	Full 2004-100%	2009		2210 2210	2	Cloudy	27°C	26°C
7-29-80	2047-98%	2054			0	Partly Cloudy	27°C	25°C
7-30-80	2128-93%	2144		2120	1	Fair & Clear	27°C	26°C
7-31-80	2206-86%	2233	0130		1	Fair & Clear	27.5°C	27.5°C
8-01-80	2224-77%	2328	0315	2200 2200 0245	4	2000-2200 Thunderstorm 2400 Clearing	27°C	26.5°C
8-02-80	2323-67%	0026		2330 0245 0300	3	Fair & Clear	27°C	28°C
8-03-80	0003/44%	0129	2		2		-	-
8-04-80	0047-33%	0235		2250	1	Partly Cloudy	27°C	28°C
8-05-80	0134-23%	0343		2230	1	Clear	27.5°C	28°C
8-06-80	0224-15%	0444			0	Clear	27°C	28°C
8-07-80	0318-8%	0540	2400		1	Partly Cloudy	27°C	26.5°C
8-08-80	0414-3%	1806 0630	2300 0200	2245 2315	4	Fair & Clear	27°C	27.5°C
8-09-80	0511-1%	1852 0715			0			
8-10-80	0608-0%	1934 0758		2	2			
8-11-80	- -	2013			0	Fair & Clear	27°C	27.5°C
8-12-80	0705-1%	2052		0230	1	Cloudy	27°C	27°C



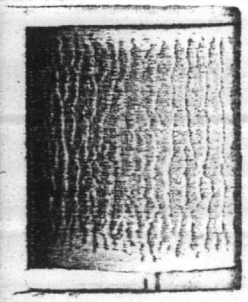
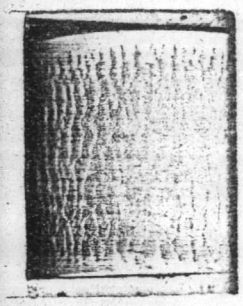


TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

Date Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
8-13-80	0800-5%	2129			0	Fair & Clear	27°C	28°C
8-14-80	0854-10%	2206	2230	2300	2	Fair & Clear	27°C	28°C
8-15-80	0948-16%	2243			0	Clear & Windy	27.5°C	26.5°C
8-16-80	1041-23%	2323		1	1			
8-17-80	1135-32%	0010	0245		1	Cool & Cloudy	27°C	22°C
8-18-80	1230-41%	0100		0200	1	Thunderhd moving in Cloudy	26°C	23°C
8-19-80	1326-51%	0158			0	Cloudy	25.5°C	25°C
8-20-80	1422-60%	0258			0			
8-21-80	1518-70%	0356			0			
8-22-80	1613-79%	0258	1		1	Fair & Clear	25°C	23°C
8-23-80	1705-87%	0356						
8-24-80	1754-94%	0452	0100		1	Fair & Clear	23°C	19°C
8-25-80	1839-98%	0543 1721	between 2200-2400	between 2200-2400	2	Fair & Clear	23°C	19°C
8-26-80	1922-100%	0634 1859						
8-27-80	2002-99%	0723 1948						
8-28-80	2042-95%	0812						
8-29-80	2121-88%	2036						
8-30-80	2202-80%	2125						
8-31-80	2245-69%	2216						



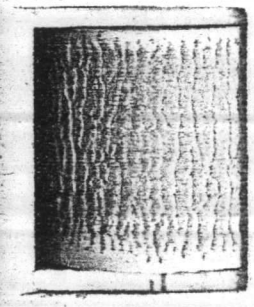


TABLE II
RETURN RECORD OF TAGGED TURTLES

1980 SEA TURTLE INVENTORY

DATES 6/17/80 - 8/9/80

Date	Tag #	Return	Return	Return	Return
6/17/80	651				
6/17/80	652	7/3/80 (⊗)	7/16/80	7/28/80	
6/19/80 (⊗)	653				
6/19/80	654				
6/20/80	655	7/3/80 (⊗)	7/15/80 (⊗) Retag 640	7/28/80	8/8/80
Green					(2)
6/25/80	657*	7/9/80 Retag 669	7/21/80 Retag 649	8/2/80	8/17/80
6/26/80 (⊗)	NC0001	7/11/80 (⊗)	7/24/80		
6/27/80 (⊗)	648	7/24/80			
6/27/80	658				
6/29/80	650	7/12/80			
6/29/80	659				
6/30/80	660	7/14/80 (⊗) Retag 672	7/16/80	8/1/80	
7/1/80 (⊗)	661	7/14/80	7/26/80 (⊗)	8/8/80	
7/3/80	662				
7/6/80	663				
7/6/80 (⊗)	664				
7/7/80	667	8/18/80 (⊗)	8/20/80		
7/8/80 (⊗)	665				
7/8/80 (⊗)	666				
7/10/80 (⊗)	670	7/23/80			
7/11/80 (⊗)	671				
7/14/80	673				
7/14/80 (⊗)	674				
7/15/80	675				
7/17/80	641				
7/17/80 (⊗)	642	7/18/80			
7/18/80 (⊗)	647	7/20/80	8/2/80		
7/19/80	645				
7/23/80	646				
7/25/80	644				
7/30/80	633				
8/1/80 (1)	639	8/14/80			
8/3/80	638				
8/4/80	634				
8/5/80	637				
8/7/80 (⊗)	636	8/12/80			
8/9/80 (⊗)	635				

(⊗) - Turtle was tagged but did not nest.

(1) - Turtle previously tagged but tag missing - tag hole present

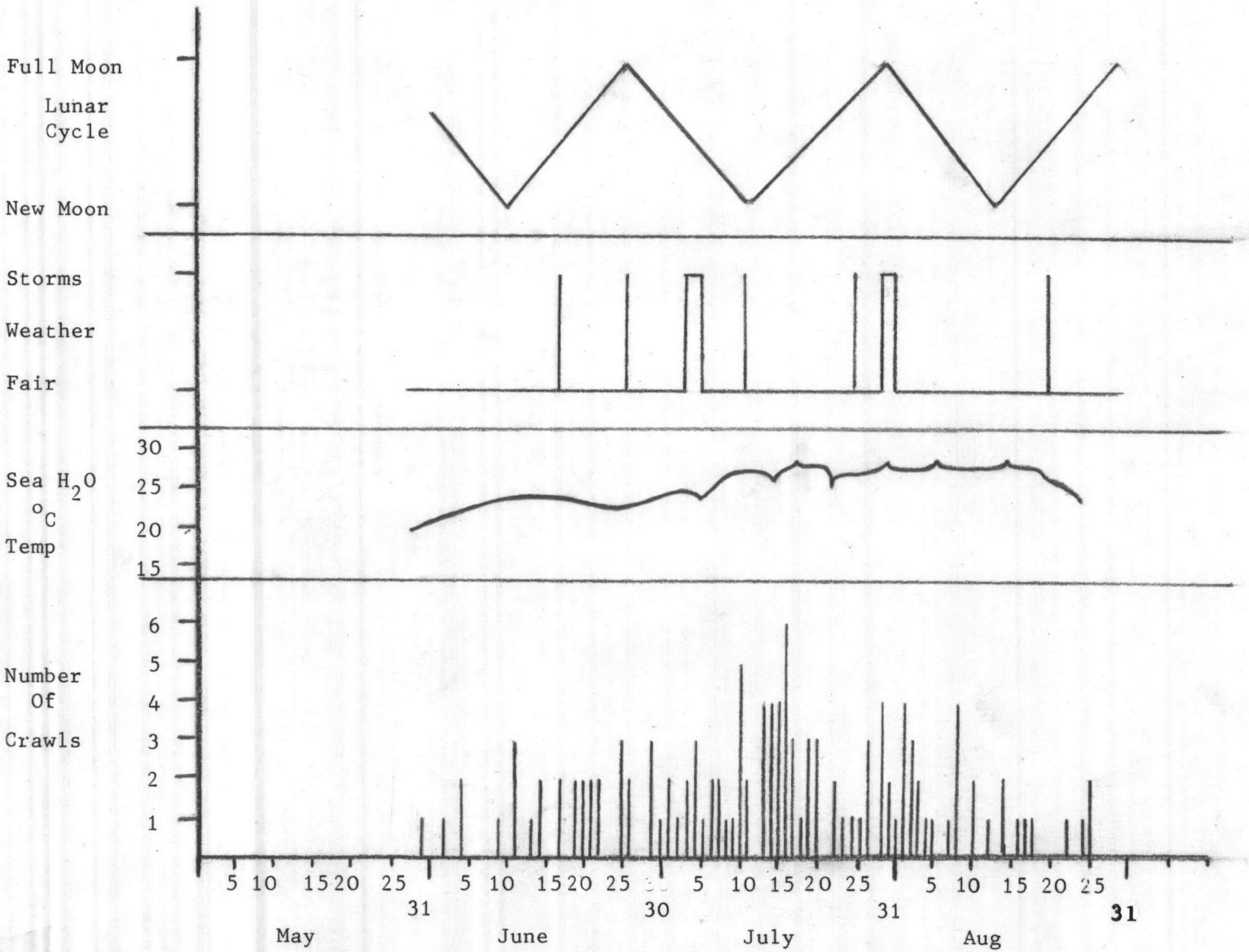
(2) - Crawl body pit and eggs indicative of Green Turtle but turtle not observed

Tagged or

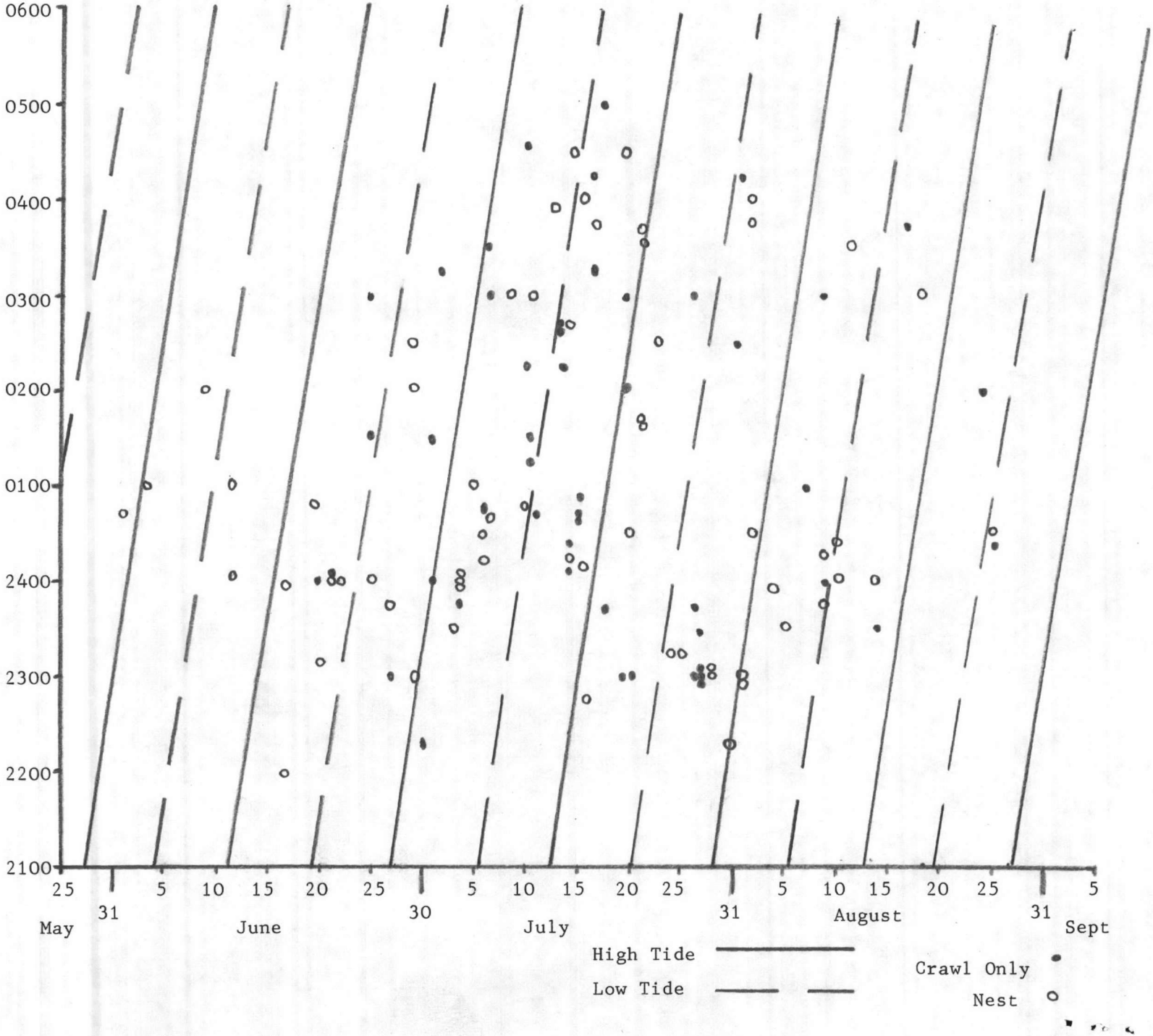
1 Turtle observed 5 times; 4 turtles observed 4 times; 3 turtle observed 3 times;
6 turtles observed 2 times; 23 turtles observed 1 time

61 sightings of tagged turtles

GRAPH I


Full Moon
Lunar Cycle
New Moon
Storms
Weather
Fair
Sea H_2O ^oC Temp
30
25
20
15
Number Of Crawls
6
5
4
3
2
1
5 10 15 20 25 31 5 10 15 20 25 30 5 10 15 20 25 31 5 10 15 20 25 31
May
June
July
Aug

GRAPH II NESTING IN RELATION TO TIME AND TIDAL CYCLE



GRAPH III

Total Crawls and Nest by Month 1980 Nest Season

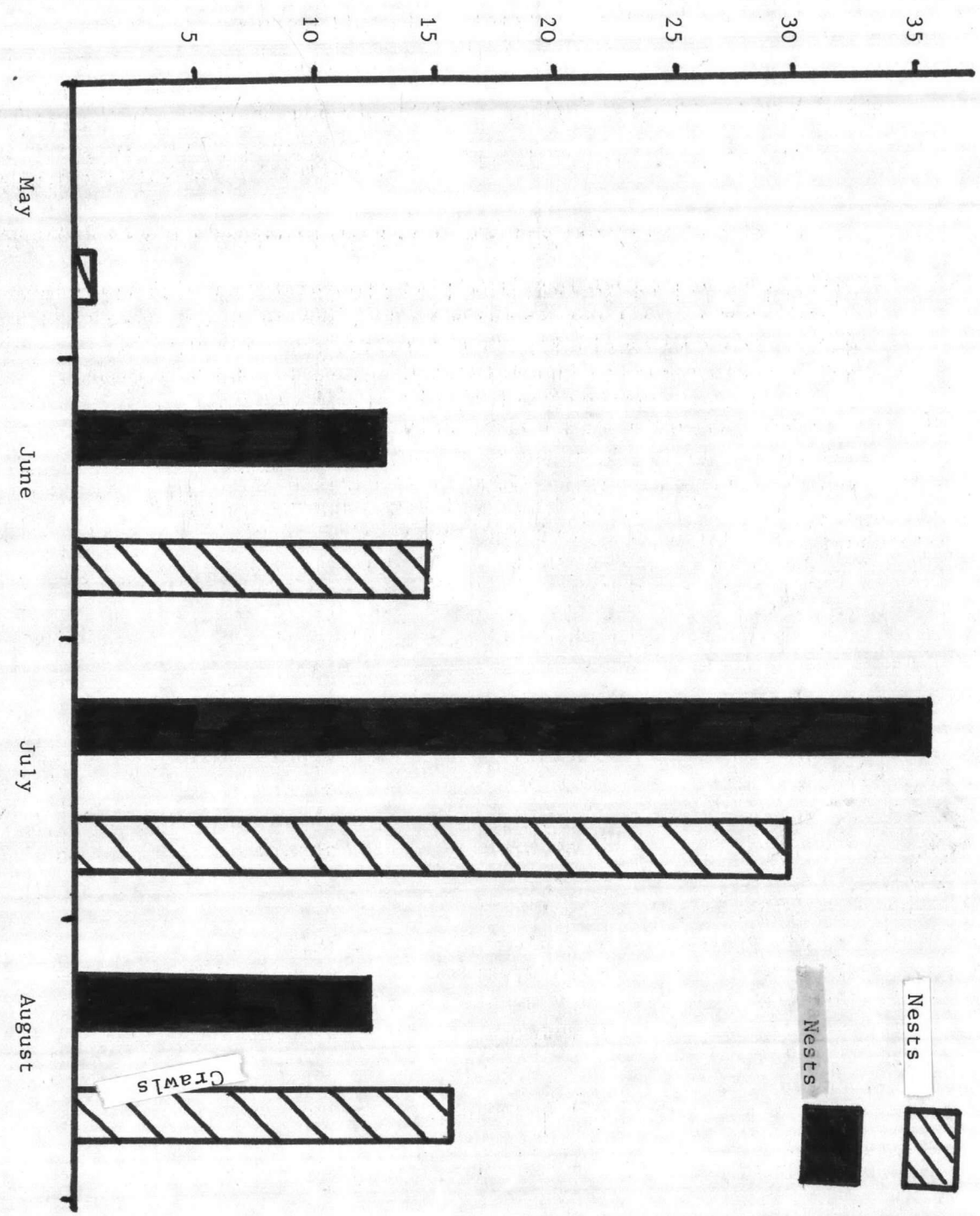


TABLE III

AERIAL SURVEY

	May 30				May 31			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	1	0	0	2	0	0	0	1
Brown's Island	0	2	0	1	0	0	0	2
Bear Island	0	0	0	0	2	0	0	0

	June 13				June 14			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	2	1	0	1	0	3
Brown's Island	0	0	0	0	0	0	1	1
Bear Island	1	0	0	0	0	0	0	3

	July 1				July 2				July 11				July 12				July 21			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	0	0	0	0	2	0	0	1	3	2	0	1	1	0	2	1	0	0	1
Brown's Island	0	0	1	0	5	1	0	0	0	0	0	1	3	0	0	1	4	1	2	1
Bear Island	2	0	2	0	2	2	0	0	0	0	0	0	1	0	0	2	4	1	0	0

	Aug 1				Aug 11				Aug 12			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	0	1	2	0	0	0	1	0	0	2
Brown's Island	2	0	0	2	3	0	0	1	2	0	0	1
Bear Island	1	0	0	0	2	0	0	0	1	2	0	1

TOTAL

	N	FC	T	SB
Onslow Beach	7	9	4	13
Brown's Island	19	4	4	11
Bear Island	16	5	2	6
	42	18	10	30

Key N - Fresh Nests
FC - Fresh False Crawls
T - Turtles sighted off Coast
SB - Shrimp Boats

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

TABLE IV

1980

*Green Turtle

Nest No.	Incubation Period DAYS	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
001	65	115	67	39	106	92.2%
002	63	166	158	3	161	97 %
003	63	134	4	69	73	54.5%
006 IMS	69	53	24	--	24	45.3%
007	--	126	0	0	0	0
012	65	102	81	4	85	83.3%
013	64	175	4	119	123	70.3%
015	63	134	0	128	128	95.5%
016 IMS		121				
018 IMS		101				
019	64	86	6	75	81	94.2%
021	63	143	0	114	114	79.7%
* 022	56	168	148	0	148	88.1%
026	60	100	0	91	91	91 %
027	59	72	0	71	71	98.6%
028 IMS		119				
029	60	113	0	78	78	69 %
034	60	127	25	21	46	36.2%
036	60	152	53	56	109	71.7%
037	59	116	4	89	93	80.2%
038	59	131	8	75	83	63.4%
039	60	167	161	0	161	96.4%
040	62	131	125	4	129	98.5%
042	59	78	7	58	65	83.3%
043	62	99	98	0	98	99.9%
046	58	183	144	0	144	78.7%

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
048 IMS		124				
054	59	89	64	23	87	97.8%
058	58	109	51	55	106	97.2%
059	59	118	13	99	112	94.9%
062	58	97	3	91	94	96.9%
066	57	131	27	80	117	89.3%
067	63	99	0	88	88	88.9%
069	60	131	109	0	109	83.2%
072 IMS		123				
073	60	119	2	112	114	95.8%
075	60	160	4	154	158	98.75%
080		117	0	101	101	86.3%
*081 IMS		166				
082 IMS		96				
083		134				
084	59	116	4	106	110	94.8%
085	61	114	0	111	111	97.4%
086		89				
094 IMS		132				
095 IMS		102				
096		88	0	74	74	84.1%
*098 IMS		114				
099 IMS		78				
*100 IMS		157				
102 IMS		114				
103 IMS		78				

57

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
104 IMS	0	1	0	0	0	0
107 IMS		179				
108 IMS		134				
110 IMS		104				
112 IMS		104				
114 IMS		120				
115 IMS		80				
116 IMS		83				
118 IMS		112				
*119 IMS		145				
121 IMS		75				
125 IMS		99				
	TOTALS					
64		7352				
26 IMS		2823				
37 O B		4529				
~~63~~ ?						
GREEN TURTLE		819	(11.14% OF TOTAL)			

TABLE V

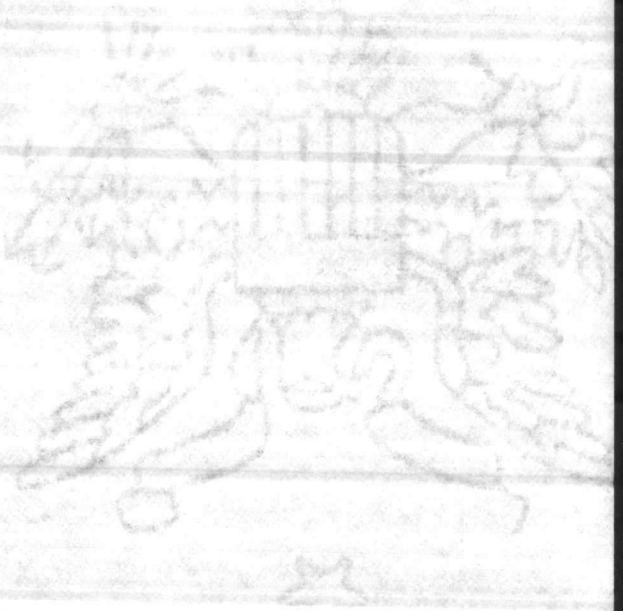
Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
5-30-80		1	1
6-2-80		1	1
6-4-80	1	1	2
6-9-80	1		1
6-11-80	1	2	3
6-13-80	1		1
6-14-80	2		2
6-17-80		2	2
6-19-80	1	1	2
6-20-80	1	1	2
6-21-80	1	1	2
6-22-80		2	2
6-25-80		1	1
6-26-80	2		2
6-27-80	1	1	2
6-29-80		2	2
6-30-80	1	1	2
7-1-80	1		1
7-2-80	1		1
7-3-80	2	1	3
7-4-80		3	3
7-5-80		1	1
7-6-80	1	2	3
7-7-80		1	1
7-8-80	2		2
7-9-80		1	1
7-10-80	1	1	2
7-11-80	5		5
7-12-80		1	1
7-14-80	5	2	7
7-15-80	3	1	4
7-16-80		3	3
7-17-80	3	1	4
7-18-80	1	1	2
7-19-80	1	1	2
7-20-80	3	1	4
7-21-80		1	1
7-23-80		2	2
7-24-80		2	2
7-25-80		1	1
7-26-80	2		2
7-27-80	5		5
7-28-80		2	2
7-30-80		1	1

TABLE V Cont'd

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
8-1-80	1	2	3
8-2-80	1	2	3
8-3-80	2	2	4
8-4-80		1	1
8-5-80		1	1
8-7-80	1		1
8-8-80	1	2	3
8-9-80	1		1
8-10-80		2	2
8-12-80		1	1
8-14-80	1	1	2
8-15-80			0
8-16-80			0
8-17-80		1	1
8-18-80	1		1
8-19-80			0
8-20-80			0
8-21-80			0
8-22-80	1		1
8-23-80			0
8-24-80	1		1
8-25-80	1	1	2
8-26-80			0
8-27-80			0
8-28-80			0
8-29-80			0
8-30-80			0



Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

26 nests

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

SEA TURTLE INVENTORY

FOR

SUMMER AND FALL 1980

Natural Resources and Environmental Affairs Branch

Base Maintenance Division

Marine Corps Base

Camp Lejeune, North Carolina 28542

JULIAN I. WOOTEN
Director

DR. FRANK B. SCHWARTZ
Advisor
Institute of Marine Science
Morehead City, North Carolina

CHARLES D. PETERSON
Supervisor, Wildlife Management

JOHN A. FRIDELL

&

HUGH R. PASSINGHAM

Technicians

INTRODUCTION

The Sea Turtle Inventory for 1980 is a continuation of past efforts by Marine Corps Base, Camp Lejeune, North Carolina to protect threatened Atlantic Loggerhead Sea Turtles. The program began in 1974 by the Marine Corps and Camp Lejeune biologists when evidence indicated that a high percentage of Atlantic Loggerhead nests on Onslow Beach were being destroyed by predators. This action was taken prior to the addition of the Atlantic Loggerhead Sea Turtle to the Endangered Species List, as threatened. The protection program to date has had three main objectices. First, for the compliance of the Endangered Species Act through Biological Opinions rendered by the U. S. Fish and Wildlife Service. Second, and probably the most important, conservation practices have been initiated to protect the turtles and their nests from predation. Third, has been to study the nesting habits of the Atlantic Loggerhead Sea Turtle (Caretta caretta).

There are several related projects that comprise the protection program. These include:

Nightly Beach Patrols
Tagging Adult Turtles
Collection of Nesting Data
Insitu Weather Observations
Aerial Surveys
Nesting and Hatching Success
Occasional Hatchling Tagging
Stranding Reports on Dead Turtles

The University of North Carolina Institute of Marine Sciences in Morehead City, North Carolina (IMS) assisted the Marine Corps in the turtle protection program. IMS provided tags for adult and hatchling turtles and assisted in the tagging process. Dr. Frank Schwartz of IMS is also a valuable source of information for the Camp Lejeune biologists.

In 1980, the Loggerhead program took on new dimensions when a Green Turtle (Chelonia mydas mydas) nested on Onslow Beach. The Green Turtle was observed nesting four times and is believed to have nested five times, since for one unobserved nest the crawl, nest, eggs and hatchlings were indicated of a Green Turtle.

RESULTS

The nesting season for 1980 began with the first nest on 30 May 1980 and ended with the last nest on 25 August 1980. There were a total of 125 crawls to nest on Onslow Beach of which 65 were successful. This compares closely to the data from the 1979 nesting season where 138 crawls and 63 successful nests were observed.

The rate of nest predation on Onslow Beach for the 1980 nesting season was zero. There were 37 nests, 35 loggerheads and 2 Green Turtles, protected by wire cages on Onslow Beach.

During the 1980 nesting season, a total of 36 turtles were tagged, One turtle had been tagged previously with Tag No. NC0001 and subsequently was not retagged by the Camp Lejeune technicians. Of the 36 tagged turtles, there were 29 return trips to the beach to lay (See Table III). One Loggerhead was observed laying 5 times at 12-13 day intervals. Four Loggerheads were observed 4 times. Three were observed 3 times, six turtles were observed 2 times and 23 were observed laying 1 time for a total of 59 sightings of tagged turtles. No turtles were observed on Onslow Beach that had been tagged on previous years. The Green Turtle was observed 4 times, retagged twice and is believed to have nested 5 times.

The Green Turtle nests produced 819 eggs of which 387 hatched for a 47.2% success rate. There were 2 deformed and 5 white (not albino) Green Turtle hatchlings from the 5 nests. Two of the Green Turtle nests were naturally incubated. Those nests contained 315 eggs of which 292 hatched for an 83.2% rate of hatchling success (See Table IV). The three remaining Green Turtle nests were taken to IMS where they were artifically incubated. Those nests contained 468 eggs, of which 95 hatched for a 20.3% rate of hatchling success (See Table VI).

Loggerhead nests produced 6,554 eggs total. Of the 6,554 eggs, 4,178 were allowed to hatch naturally, 3,467 of those eggs hatched for a 83% success rate (See Table IV). IMS artifically incubated 2,376 Loggerhead eggs of which 1,157 hatches for 48.7% success rate (See Table VI). Therefore, of 6,554 total Loggerhead Turtle eggs laid, 4,624 hatched for a 70.6% success rate. When Green and Loggerhead Turtle nests data are combined, a total of 7,373 eggs were laid of which 5,011 hatched for a

year's success rate of 67.96%. This overall success ate is better than the 1979 season success rate which was 57%.

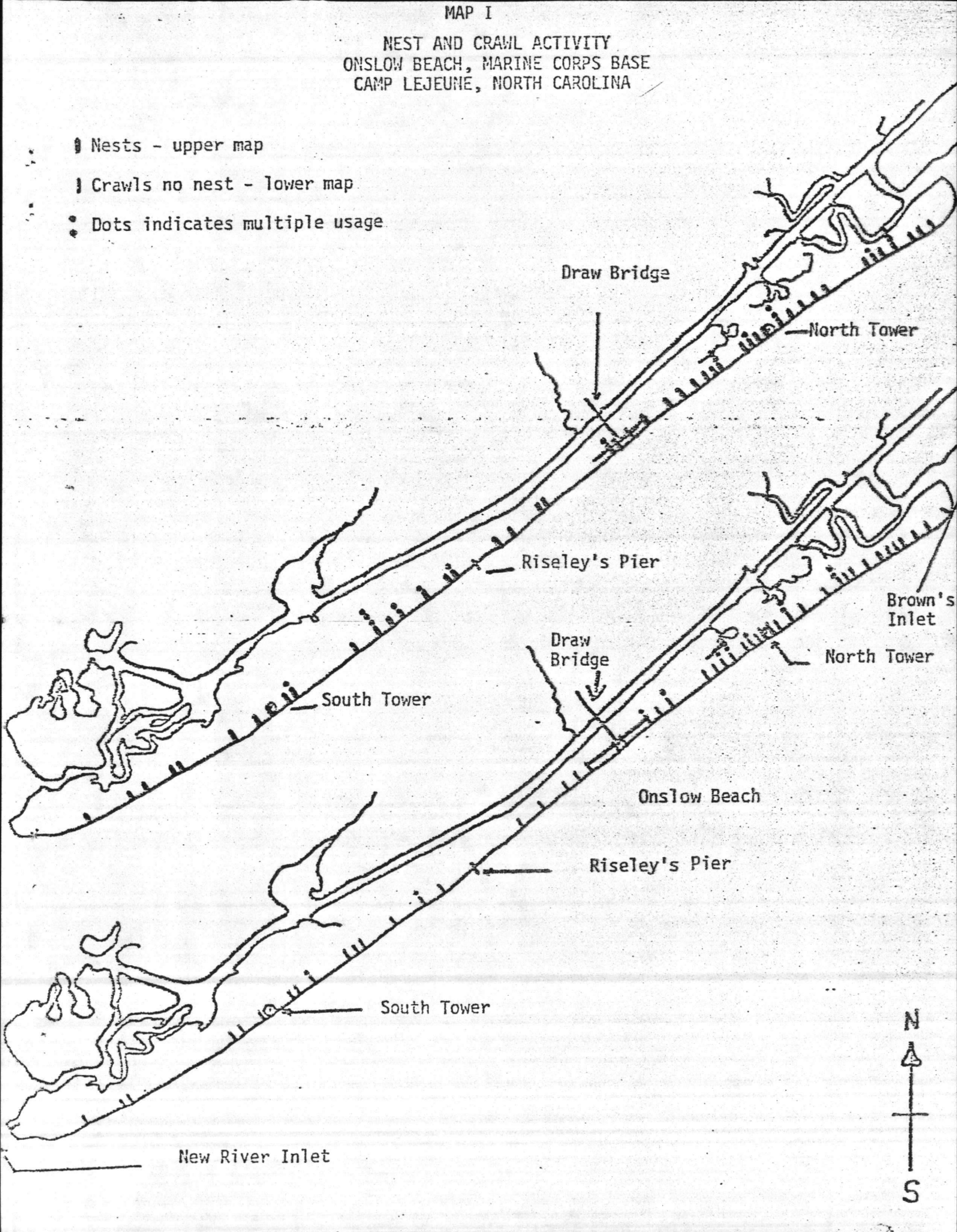
The Camp Lejeune Sea Turtle aerial surveillance flights covered beaches from New River Inlet to north to Bouge Inlet, which included Onslow Beach, Camp Lejeune, Brown's Island, Camp Lejeune and Bear Island (Hammock Beach State Park). Flight dates were scheduled such that they would fit in with the North Carolina to Louisiana surveys planned for 1980. The surveys were conducted from military helicopters piloted by Marine Corps personnel dispatched from Marine Corps Air Station, New River. Flights averaged 1 hour 15 minutes in duration and were flown at an altitude of 200 to 300 feet and a velocity of 30-60 knots. The return flights were flown approximately one half- one mile off the coast in an attempt to spot turtles in the water. A total of 12 flights were flown in sets of two at scattered intervals throughout the nesting period, for a total of 15 hours 35 minutes flight time. The number and location of all fresh nests and false crawls sighted were recorded along with the number and location of turtles observed offshore and of shrimping vessels within the survey data. Hammock Beach State Park personnel were notified in the event that nests and/or false crawls were sighted on their beach and written records of each flight were sent to State Fish and Wildlife personnel, Raleigh, North Carolina and Dr. F. J. Schwartz at IMS, Morehead City, North Carolina.

The Camp Lejeune Aerial Survey results (See Table III) are insignificant unless comparted to the overall aerial survey program for the East Coast, conducted by the U. S. Fish and Wildlife Service. Consequently, the discussion of the results will be held to a statement of total data taken. Observations were: 42 new nests, 18 false crawls, 10 swimming turtles and 30 shrimp boats within the survey bounds.

Questions concerning data contained in this report should be directed to the Commanding General, Marine Corps Base, Camp Lejeune, North Carolina - (Attention: Base Maintenance Division, Natural Resources and Environmental Affairs Branch).

MAP I

NEST AND CRAWL ACTIVITY
ONSLOW BEACH, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



MAP II

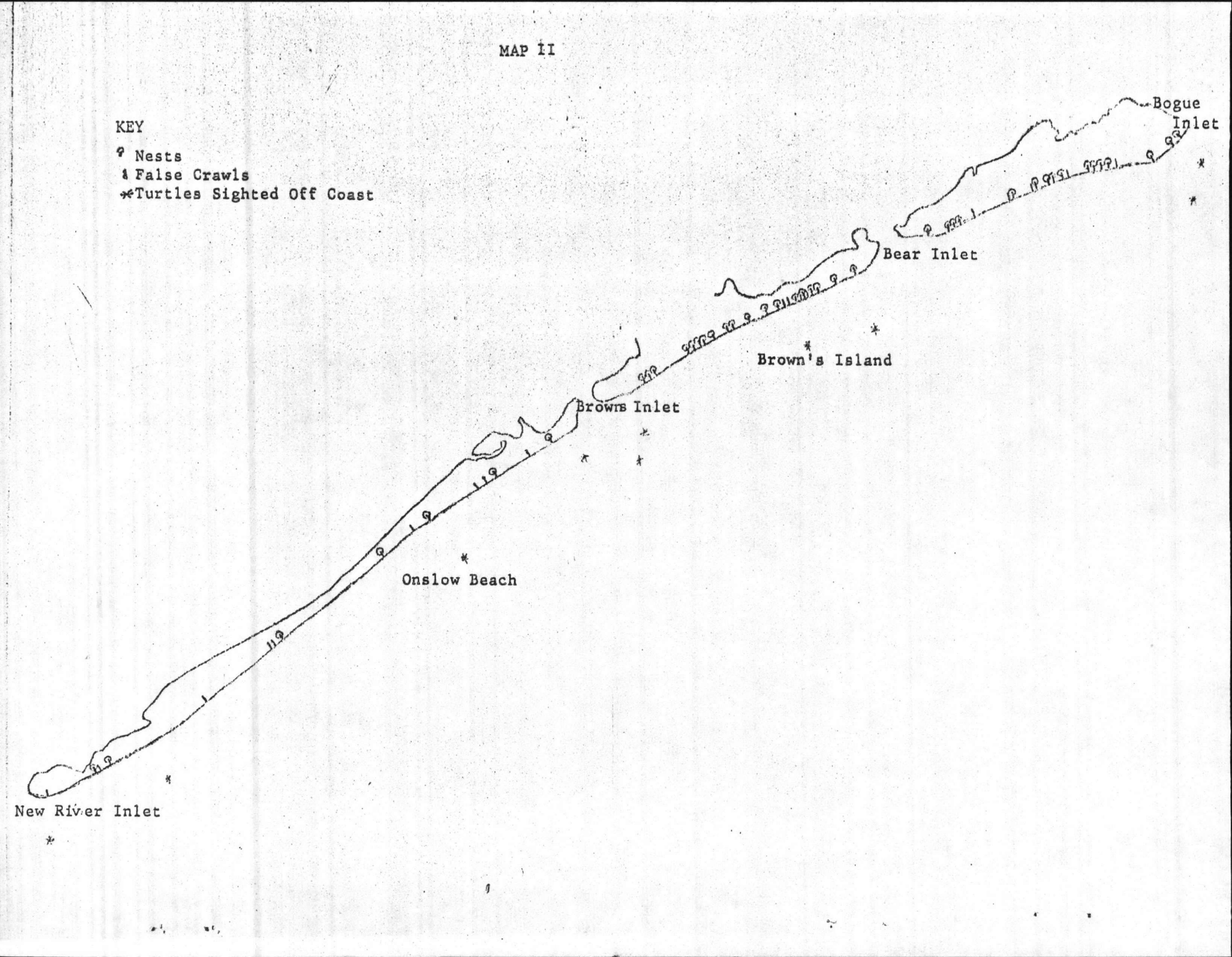

KEY
Nests
False Crawls
Turtles Sighted Off Coast
Bogue Inlet
Bear Inlet
Brown's Island
Browns Inlet
Onslow Beach
New River Inlet

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
5-30-80		–		1	1	Clear Fair	20.5°C	19°C
5-31-80					0			
6-01-80	2151-95%	2130			0			
6-02-80	2241-90%	2216		1	1	Fair, Sctrd Clouds	22°C	21°C
6-03-80	2326-82%	2307			0			
6-04-80	0008-73%	0007	1	1	2	Fair Partly Cloudy	22°C	18.5°C
6-05-80	0047-63%	0103			0			
6-06-80	0125-51%	0207			0			
6-07-80	0203-40%	0311			0			
6-08-80	0242-29%	0412			0			
6-09-80	0323-19%	0512	1		1			
6-10-80	0407-11%	0607			0			
6-11-80	0455-05%	1835 0701 1926	1	2	3	Fair Partly Cloudy	24.9°C	–
6-12-80	0547-01%	0752			0			
6-13-80		2015	1		1			
6-14-80	0642-02%	2012	2		2			
6-15-80	0742-06%	2147			0			
6-16-80	0837-11%	2231			0			
6-17-80	0934-18%	2317		2100 2250	2	Fair Few Clouds	24°C	22°C
6-18-80	1030-27%	0005			0	Cool, Windy Cloudy	24°C	20°C
6-19-80	1125-36%	0053	2345	2345	2	Fair Clear	24.5°C	24°C
6-20-80	1219-45%	0144	2300	2210	2	Fair Cloudy	24°C	22.5°C
6-21-80	1313-55%	0237	2300	2300 2300	2			
6-22-80	1407-64%	0330		–	2			
6-23-80	1501-73%	0420			0	Fair	24°C	24°C
6-24-80	1558-81%	0508			0	Stormy	23°C	24°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/o nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
6-25-80	1655-88%	0555 1819	0030 0200	2300	3	Partly Cloudy	24°C	23°C
6-26-80	1753-94% Full	0638 1901			0	Cloudy	24°C	23.5°C
6-27-80	1850-98%	0723	2200	2245	2	Fair & Clear	24°C	24°C
6-28-80	1945-100%	1943			0	Fair & Clear	24°C	26°C
6-29-80	2037-99%	2028		2200 0030 0100	3	Fair & Cloudy	25°C	26°C
6-30-80	2125-97%	2114	2115 2300		1	Fair & Cloudy	24°C	22.5°C
7-1-80	2209-92%	2201	0030		2	Fair & Clear	24°C	24°C
7-2-80	2249-85%	2251	0215		1	Fair & Clear	26°C	27°C
7-3-80	2328-75%	2346	2245	2230 2300 2300	2	Thunderstm Clearing Cloudy, Occ.	24.5°C	23°C
7-4-80	0005-65%	0043		2300	3	Showers	24.5°C	24°C
7-5-80	0043-54%	0148		2400	1	Fair & Clear	26°C	26°C
7-6-80	0122-42%	0253	2345 0200	2310 2330	3	Fair & Ptly Cloudy	26°C	26°C
7-7-80	0203-31%	0356	0230	2340	3	Fair & Clear	24.5°C	26°C
7-8-80	0248-27%	0457		0200	1	Fair & Cloudy	26°C	26°C
7-10-80	0431-6%	1820 0645 1910	0015 0115 0030 0335	2345	5	ThundStm 2200 Clearing2400	26°C	23°C
7-11-80	0527-2%	0734	2340	0200	2	Fair & Clear	26.5°C	26°C
7-12-80	0624-0%	1957			0	Fair & Clear	26°C	27°C
7-13-80	- 1%	2038	0140 2320	0250 2315	4	Fair & Ptly Cloudy	26.5°C	24.5°C
7-14-80	0722-03%	2120	2310 2340 2340	0040	4	Fair & Clear	26°C	25°C
7-15-80	0819-08%	2201	2350 0215	0330 2145	4	Fair & Clear	25.5°C	25.5°C
7-16-80	0914-14%	2242	0315 2240	2310 0300	5	Fair & Clear	26°C	26°C
7-17-80	1009-21%	2323	0400	0245	3	Fair & Incrsg Clouds	27.5°C	26°
7-18-80	1103-29%	0006	2200 0100	0305	1	Fair & Ptly Cloudy	27°C	26°
7-19-80	1156-38%	0057	0200		3	Fair & Clear	27°C	27.5°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole, not broken at midnight.)

DATE Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
				2330		Fair &		
7-20-80	1250-48%	0149	2200	0330	3	Clear	27°C	28.5°C
						Fair & Incrsg		
7-21-80	1345-57%	0241			0	Cloudiness	27.5°C	27°C
				0040		Fair &		
7-22-80	1442-67%	0338		0035	2	Cloudy	27°C	27°C
7-23-80	1539-76%	0431		0030	1	Rainy	25°C	25°C
						Fair &		
7-24-80	1639-84%	0521		2215	1	Cloudy	26°C	26°C
						Fair &		
7-25-80	1733-91%	0612		2215	1	CLoudy	26°C	26.5°C
		1835	2200 1835			2200-2400 Rainy		
7-26-80	1827-96%	0658	0200		3	0200 Thundstms	26°C	24.5°C
		1922	2200 2210			Heavy		
7-27-80	1917-99%	0745	2200 2230		4	Rain	-	-
	Full			2210				
7-28-80	2004-100%	2009		2210	2	Cloudy	27°C	26°C
						Partly		
7-29-80	2047-98%	2054			0	Cloudy	27°C	25°C
						Fair &		
7-30-80	2128-93%	2144		2120	1	Clear	27°C	26°C
						Fair &		
7-31-80	2206-86%	2233	0130		1	Clear	27.5°C	27.5°C
				2200		2000-2200		
				2200		Thunderstorm		
8-01-80	2224-77%	2328	0315	0245	4	2400 Clearing	27°C	26.5°C
				2330		Fair &		
8-02-80	2323-67%	0026		0245 0300	3	Clear	27°C	28°C
8-03-80	0003/44%	0129	2		2		-	-
						Partly		
8-04-80	0047-33%	0235		2250	1	Cloudy	27°C	28°C
8-05-80	0134-23%	0343		2230	1	Clear	27.5°C	28°C
8-06-80	0224-15%	0444			0	Clear	27°C	28°C
						Partly		
8-07-80	0318-8%	0540	2400		1	Cloudy	27°C	26.5°C
		1806	2300	2245		Fair &		
8-08-80	0414-3%	0630	0200	2315	4	Clear	27°C	27.5°C
		1852						
8-09-80	0511-1%	0715			0			
		1934						
8-10-80	0608-0%	0758		2	2			
						Fair &		
8-11-80	- -	2013			0	Clear	27°C	27.5°C
8-12-80	0705-1%	2052		0230	1	Cloudy	27°C	27°C

TABLE I

CRAWL INFORMATION IN RELATION TO MOON AND TIDE CYCLES AND WEATHER CONDITIONS

(Nights handled as a whole not broken at midnight)

Date Night of	Moon Rise % Illumin	Time of Hi Tide	Time Crawl W/O nest	Time Crawl W/ nest	Total	Weather	Temp H_2O	Temp Air
8-13-80	0800-5%	2129			0	Fair & Clear	27°C	28°C
8-14-80	0854-10%	2206	2230	2300	2	Fair & Clear	27°C	28°C
8-15-80	0948-16%	2243			0	Clear & Windy	27.5°C	26.5°C
8-16-80	1041-23%	2323		1	1			
8-17-80	1135-32%	0010	0245		1	Cool & Cloudy	27°C	22°C
8-18-80	1230-41%	0100		0200	1	Thunderhd moving in Cloudy	26°C	23°C
8-19-80	1326-51%	0158			0	Cloudy	25.5°C	25°C
8-20-80	1422-60%	0258			0			
8-21-80	1518-70%	0356			0			
8-22-80	1613-79%	0258	1		1	Fair & Clear	25°C	23°C
8-23-80	1705-87%	0356						
8-24-80	1754-94%	0452	0100		1	Fair & Clear	23°C	19°C
8-25-80	1839-98%	0543 1721	between 2200-2400	between 2200-2400	2	Fair & Clear	23°C	19°C
8-26-80	1922-100%	0634 1859						
8-27-80	2002-99%	0723 1948						
8-28-80	2042-95%	0812						
8-29-80	2121-88%	2036						
8-30-80	2202-80%	2125						
8-31-80	2245-69%	2216						

TABLE II
RETURN RECORD OF TAGGED TURTLES

1980 SEA TURTLE INVENTORY

DATES 6/17/80 - 8/9/80

Date	Tag #	Return	Return	Return	Return
6/17/80	651				
6/17/80	652	7/3/80 (⊗)	7/16/80	7/28/80	
6/19/80 (⊗)	653				
6/19/80	654				
6/20/80	655	7/3/80 (⊗)	7/15/80 (⊗) Retag 640	7/28/80	8/8/80
Green 6/25/80	657*	7/9/80 Retag 669	7/21/80 Retag 649	8/2/80	(2) 8/17/80
6/26/80 (⊗)	NC0001	7/11/80 (⊗)	7/24/80		
6/27/80 (⊗)	648	7/24/80			
6/27/80	658				
6/29/80	650	7/12/80			
6/29/80	659				
6/30/80	660	7/14/80 (⊗) Retag 672	7/16/80	8/1/80	
7/1/80 (⊗)	661	7/14/80	7/26/80 (⊗)	8/8/80	
7/3/80	662				
7/6/80	663				
7/6/80 (⊗)	664				
7/7/80	667	8/18/80 (⊗)	8/20/80		
7/8/80 (⊗)	665				
7/8/80 (⊗)	666				
7/10/80 (⊗)	670	7/23/80			
7/11/80 (⊗)	671				
7/14/80	673				
7/14/80 (⊗)	674				
7/15/80	675				
7/17/80	641				
7/17/80 (⊗)	642	7/18/80			
7/18/80 (⊗)	647	7/20/80	8/2/80		
7/19/80	645				
7/23/80	646				
7/25/80	644				
7/30/80	633				
8/1/80 (1)	639	8/14/80			
8/3/80	638				
8/4/80	634				
8/5/80	637				
8/7/80 (⊗)	636	8/12/80			
8/9/80 (⊗)	635				

(⊗) - Turtle was tagged but did not nest.

(1) - Turtle previously tagged but tag missing - tag hole present

(2) - Crawl body pit and eggs indicative of Green Turtle but turtle not observed

Tagged or

1 Turtle observed 5 times; 4 turtles observed 4 times; 3 turtle observed 3 times; 6 turtles observed 2 times; 23 turtles observed 1 time

TABLE III

AERIAL SURVEY

	May 30				May 31			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	1	0	0	2	0	0	0	1
Brown's Island	0	2	0	1	0	0	0	2
Bear Island	0	0	0	0	2	0	0	0

	June 13				June 14			
	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	2	1	0	1	0	3
Brown's Island	0	0	0	0	0	0	1	1
Bear Island	1	0	0	0	0	0	0	3

	July 1				July 2				July 11				July 12				July 21			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	0	0	0	0	2	0	0	1	3	2	0	1	1	0	2	1	0	0	1
Brown's Island	0	0	1	0	5	1	0	0	0	0	0	1	3	0	0	1	4	1	2	1
Bear Island	2	0	2	0	2	2	0	0	0	0	0	0	1	0	0	2	4	1	0	0

	Aug 1				Aug 11				Aug 12			
	N	FC	T	SB	N	FC	T	SB	N	FC	T	SB
Onslow Beach	0	1	0	1	2	0	0	0	1	0	0	2
Brown's Island	2	0	0	2	3	0	0	1	2	0	0	1
Bear Island	1	0	0	0	2	0	0	0	1	2	0	1

TOTAL

	N	FC	T	SB
Onslow Beach	7	9	4	13
Brown's Island	19	4	4	11
Bear Island	16	5	2	6
	42	18	10	30

Key N – Fresh Nests
FC – Fresh False Crawls
T – Turtles sighted off coast
SB – Shrimp Boats

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

TABLE IV

1980

*Green Turtle

Nest No.	Incubation Period DAYS	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
001	65	115	67	39	106	92.2%
002	63	166	158	3	161	97 %
003	63	134	4	69	73	54.5%
006 IMS	69	53	24	—	24	45.3%
007	—	126	0	0	0	0
012	65	102	81	4	85	83.3%
013	64	175	4	119	123	70.3%
015	63	134	0	128	128	95.5%
016 IMS		121				
018 IMS		101				
019	64	86	6	75	81	94.2%
021	63	143	0	114	114	79.7%
* 022	56	168	148	0	148	88.1%
026	60	100	0	91	91	91 %
027	59	72	0	71	71	98.6%
028 IMS		119				
029	60	113	0	78	78	69 %
034	60	127	25	21	46	36.2%
036	60	152	53	56	109	71.7%
037	59	116	4	89	93	80.2%
038	59	131	8	75	83	63.4%
039	60	167	161	0	161	96.4%
040	62	131	125	4	129	98.5%
042	59	78	7	58	65	83.3%
043	62	99	98	0	98	99.9%
046	58	183	144	0	144	78.7%

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
104 IMS	0	1	0	0	0	0
107 IMS		179				
108 IMS		134				
110 IMS		104				
112 IMS		104				
114 IMS		120				
115 IMS		80				
116 IMS		83				
118 IMS		112				
*119 IMS		145				
121 IMS		75				
125 IMS		99				
	TOTALS					
64		7352				
26 IMS		2823				
37 O B		4529				
GREEN TURTLE		819	(11.14% OF TOTAL)			

SEA TURTLE INVENTORY
(Hatching Success)
Marine Corps Base
Camp Lejeune, North Carolina

1980

Nest No.	Incubation Period	Total Eggs	Released Young	Emerged Young	Total Young	Percent of Success
048 IMS		124				
054	59	89	64	23	87	97.8%
058	58	109	51	55	106	97.2%
059	59	118	13	99	112	94.9%
062	58	97	3	91	94	96.9%
066	57	131	27	80	117	89.3%
067	63	99	0	88	88	88.9%
069	60	131	109	0	109	83.2%
072 IMS		123				
073	60	119	2	112	114	95.8%
075	60	160	4	154	158	98.75%
080		117	0	101	101	86.3%
*081 IMS		166				
082 IMS		96				
083		134				
084	59	116	4	106	110	94.8%
085	61	114	0	111	111	97.4%
086		89				
094 IMS		132				
095 IMS		102				
096		88	0	74	74	84.1%
098 IMS		114				
099 IMS		78				
*100 IMS		157				
102 IMS		114				
103 IMS		78				

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

TABLE V

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
5-30-80		1	1
6-2-80		1	1
6-4-80	1	1	2
6-9-80	1		1
6-11-80	1	2	3
6-13-80	1		1
6-14-80	2		2
6-17-80		2	2
6-19-80	1	1	2
6-20-80	1	1	2
6-21-80	1	1	2
6-22-80		2	2
6-25-80		1	1
6-26-80	2		2
6-27-80	1	1	2
6-29-80		2	2
6-30-80	1	1	2
7-1-80	1		1
7-2-80	1		1
7-3-80	2	1	3
7-4-80		3	3
7-5-80		1	1
7-6-80	1	2	3
7-7-80		1	1
7-8-80	2		2
7-9-80		1	1
7-10-80	1	1	2
7-11-80	5		5
7-12-80		1	1
7-14-80	5	2	7
7-15-80	3	1	4
7-16-80		3	3
7-17-80	3	1	4
7-18-80	1	1	2
7-19-80	1	1	2
7-20-80	3	1	4
7-21-80		1	1
7-23-80		2	2
7-24-80		2	2
7-25-80		1	1
7-26-80	2		2
7-27-80	5		5
7-28-80		2	2
7-30-80		1	1

TABLE V Cont'd

Ground Survey Numbers

Date	Crawls No Nest	Crawls/Nest	Total Crawls
8-1-80	1	2	3
8-2-80	1	2	3
8-3-80	2	2	4
8-4-80		1	1
8-5-80		1	1
8-7-80	1		1
8-8-80	1	2	3
8-9-80	1		1
8-10-80		2	2
8-12-80		1	1
8-14-80	1	1	2
8-15-80			0
8-16-80			0
8-17-80		1	1
8-18-80	1		1
8-19-80			0
8-20-80			0
8-21-80			0
8-22-80	1		1
8-23-80			0
8-24-80	1		1
8-25-80	1	1	2
8-26-80			0
8-27-80			0
8-28-80			0
8-29-80			0
8-30-80			0

TABLE VI

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

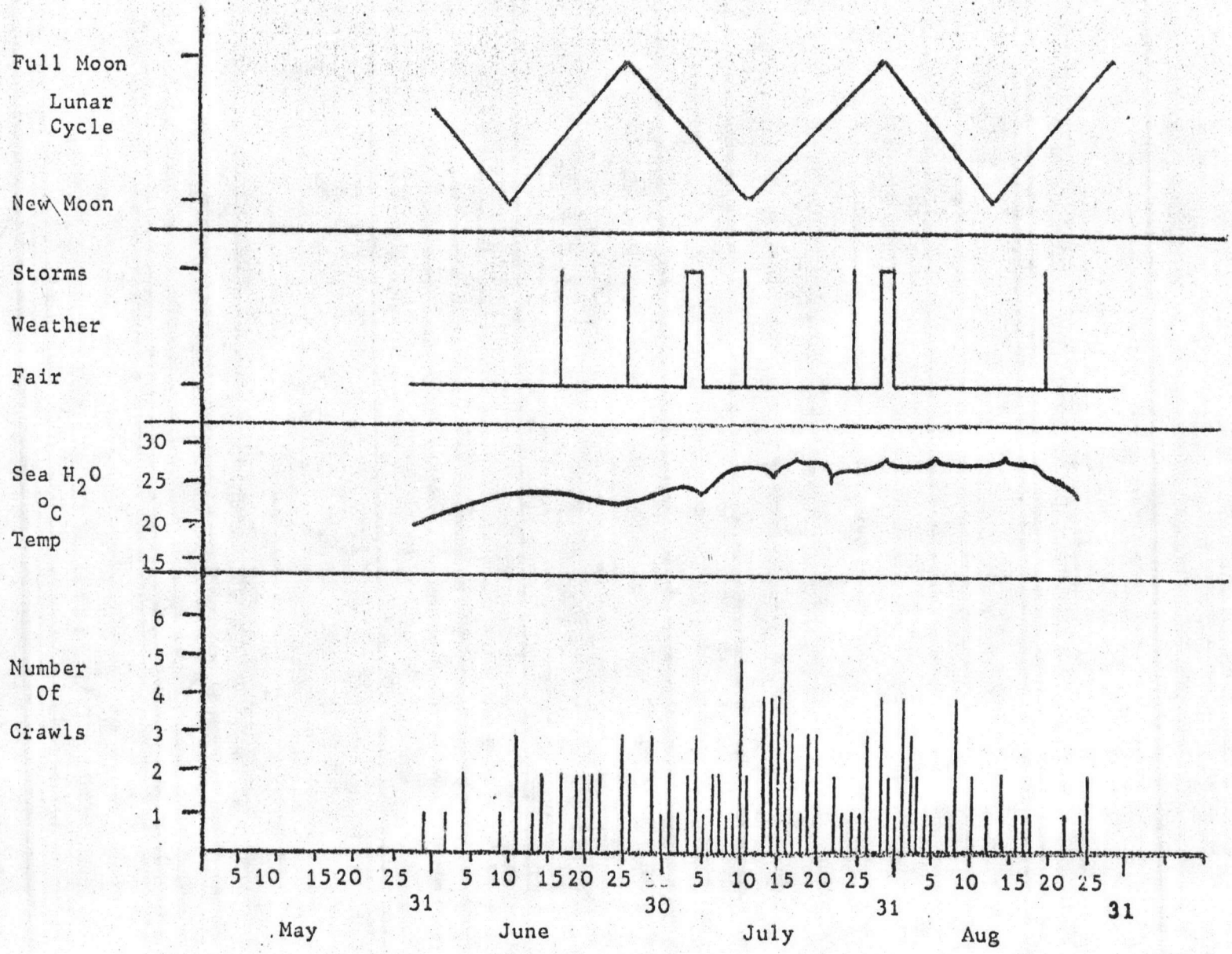
1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

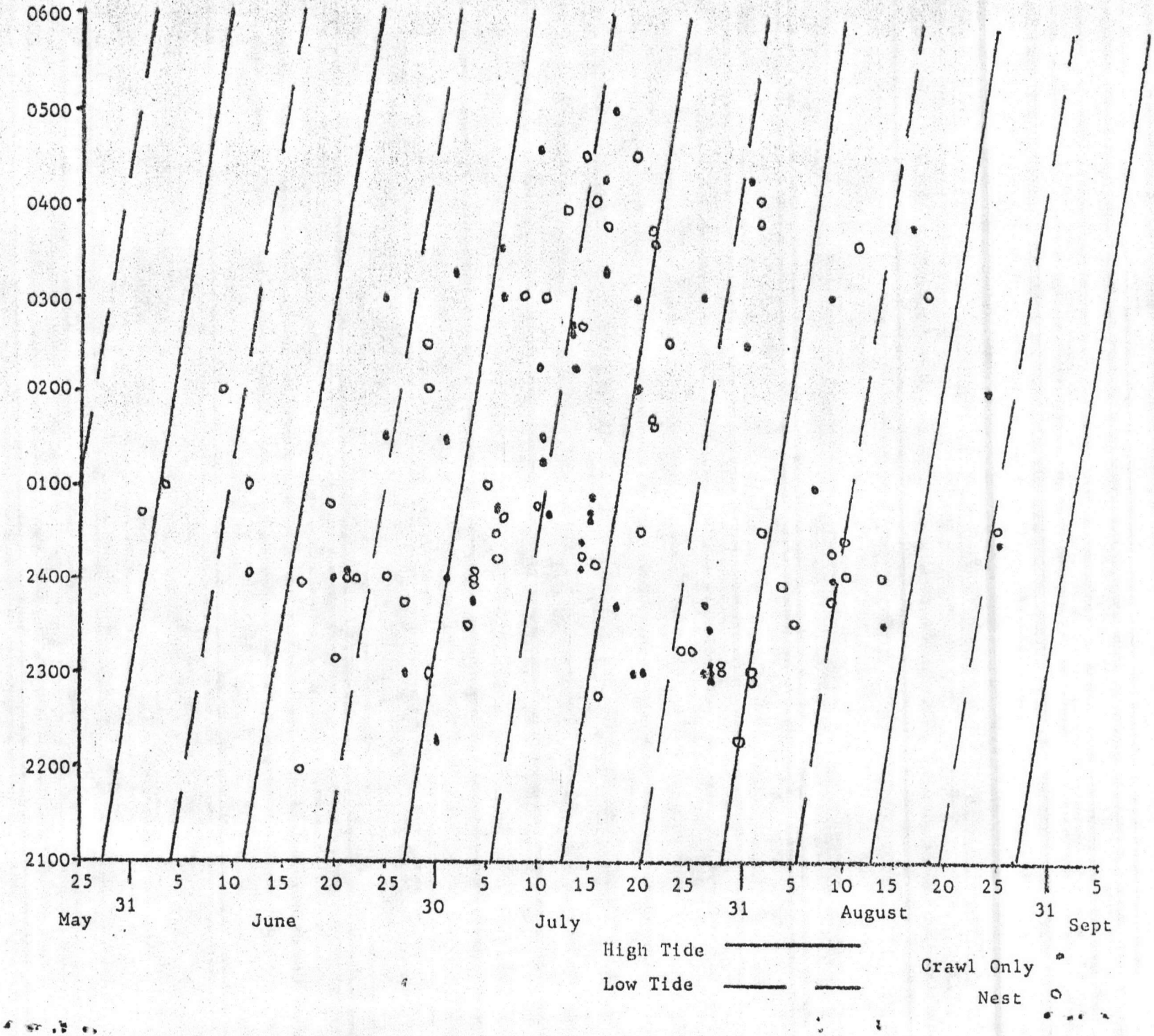
% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

GRAPH I

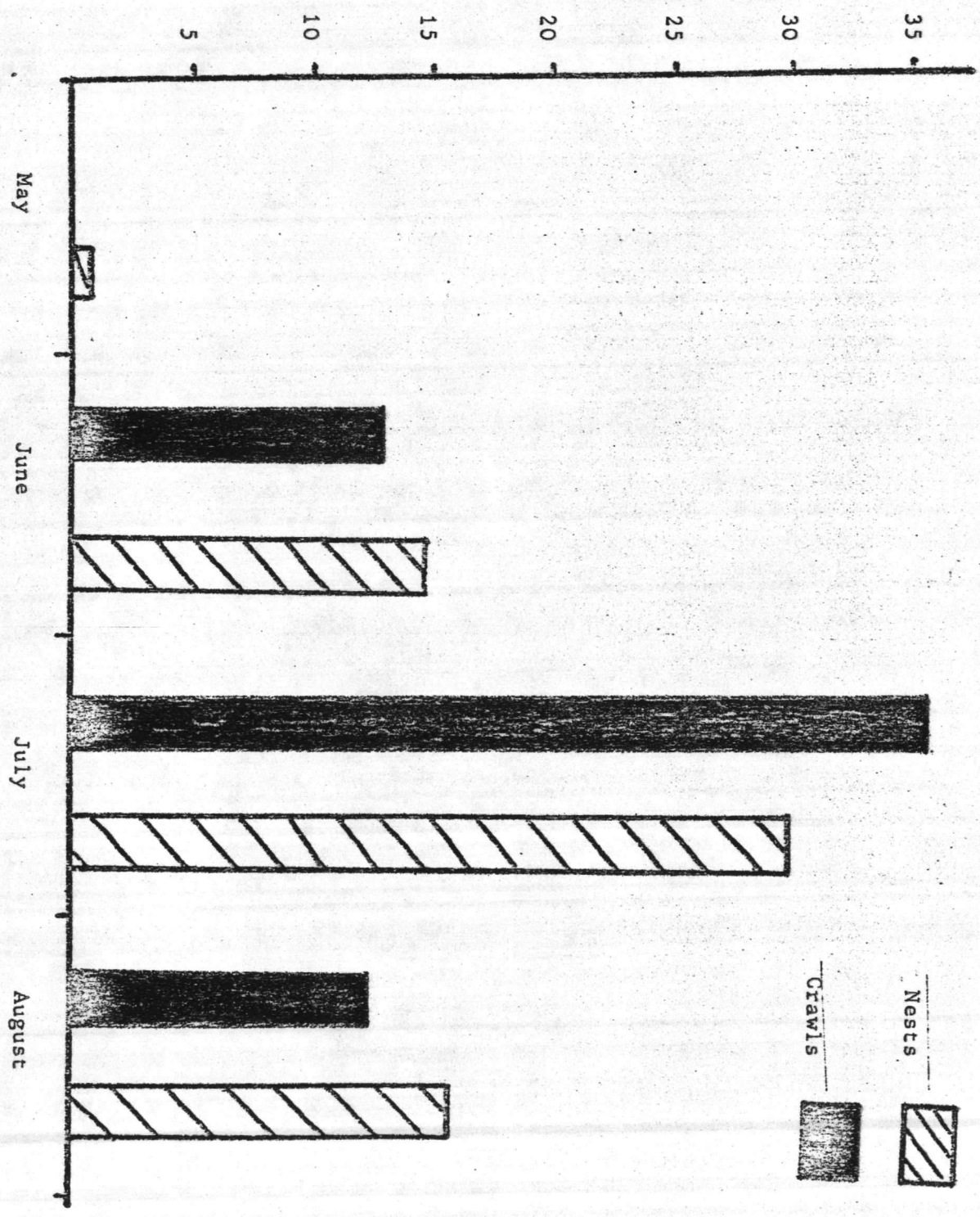

Full Moon
Lunar Cycle
New Moon
Storms
Weather
Fair
Sea H_2O °C Temp
30
25
20
15
Number Of Crawls
6
5
4
3
2
1
5 10 15 20 25 31 5 10 15 20 25 30 5 10 15 20 25 31 5 10 15 20 25 31
May
June
July
Aug

GRAPH II NESTING IN RELATION TO TIME AND TIDAL CYCLE



GRAPH III

Total Crawls and Nest by Monch 1980 Nest Season



GRAPH III TOTAL CRAWLS AND NEST BY MONTH 1980 NEST SEASON

TABLE VI

Camp Lejeune 1980 Nests Incubated at Institute of Marine Sciences
26 Nests (3 of which were green)

Date Lain	Number Lain	Hatched	% Hatch	Locality
11 June	54	24	44.4	0.15 mi S. Risley Pier
20 June	121	82	68.1	0.6 mi S. Risley Pier
22 June	101	87	86.1	2.7 mi N. Risley Pier Sheet 16
29 June	117	26*	22.2	1.0 mi S. Risley Pier Sheet 16
10 July	119	0	0.0	Nest 048 - all infertile
17 July	120	43**	26.7	0.8 mi S. Risley Pier Grid 843254
21 July	166	1	.006	green turtles
20 July	96	94	98.0	0.8 mi S. Risley Pier Grid 892255
28 July	128	52	40.6	0.4 mi S. Risley Pier Grid 897258
28 July	101	11	10.9	0.8 mi S. Risley Pier Grid 892255
2 Aug	157	32	20.4	Nest 100 Grid 916275 - green turtles
1 Aug	75	68	90.7	Nest 099 Grid 894257
1 Aug	114	39	34.2	Nest 098 Grid 917275
2 Aug	114	61	53.5	Grid 933276
3 Aug	68	12	17.7	Grid 897258
4 Aug	179	63	35.2	Grid 952298 - Tag 634
5 Aug	132	1	0.75	Nest 108 - Tag 637
8 Aug	82	50	60.9	Nest 110 renest 661 - Grid 932286
8 Aug	103	99	96.1	Nest 112 renest 640 - Grid 882245
10 Aug	118	56	46.6	Nest 114 Grid 922279, 1.7 mi N. Risley Pier
10 Aug	71	65	91.4	Nest 115 Grid 871238, renest 645
12 Aug	82	76	92.7	Nest 116 2.1 mi N. Risley Pier - Grid 928284
14 Aug	110	54	49.1	Nest 118 retag 639 1.53
17 Aug	145	62	42.8	Nest 119 Grid 925281, 1.9 mi N. Risley Pier green turtles
20 Aug	73	38	52.1	3.4 mi N. Risley Pier - Grid 946295, Tag 667
26 Aug	98	56	57.2	Camp Lejeune
	2,844	1,252	44.0	Total Green and Loggerhead
	2,426	1,157	47.7	Total Loggerhead
	418	95	22.7	Total Green

Total Released - 1,581
" Loggerhead - 1,329 84.1%
" Green - 89 93.8%

1979 Camp Lejeune Data - 21 Nests (all loggerheads)

Total Eggs Lain	Hatched	%	Released	%
2,572	1,378	53.6	1,357	98.5

% Hatch Ranged: 0.8-99.2

*67 others developed but did not hatch.
**44 others developed but did not hatch.

TABLE II
RETURN RECORD OF TAGGED TURTLES

1980 SEA TURTLE INVENTORY

DATES 6/17/80 - 8/9/80

Date	Tag #	Return	Return	Return	Return
6/17/80	651				
6/17/80	652	7/3/80 (⊗)	7/16/80	7/28/80	
6/19/80 (⊗)	653				
6/19/80	654				
6/20/80	655	7/3/80 (⊗)	7/15/80 (⊗) Retag 640	7/28/80	8/8/80
Green					(2)
6/25/80	657*	7/9/80 Retag 669	7/21/80 Retag 649	8/2/80	8/17/80
6/26/80 (⊗)	NC0001	7/11/80 (⊗)	7/24/80		
6/27/80 (⊗)	648	7/24/80			
6/27/80	658				
6/29/80	650	7/12/80			
6/29/80	659				
6/30/80	660	7/14/80 (⊗) Retag 672	7/16/80	8/1/80	
7/1/80 (⊗)	661	7/14/80	7/26/80 (⊗)	8/8/80	
7/3/80	662				
7/6/80	663				
7/6/80 (⊗)	664				
7/7/80	667	8/18/80 (⊗)	8/20/80		
7/8/80 (⊗)	665				
7/8/80 (⊗)	666				
7/10/80 (⊗)	670	7/23/80			
7/11/80 (⊗)	671				
7/14/80	673				
7/14/80 (⊗)	674				
7/15/80	675				
7/17/80	641				
7/17/80 (⊗)	642	7/18/80			
7/18/80 (⊗)	647	7/20/80	8/2/80		
7/19/80	645				
7/23/80	646				
7/25/80	644				
7/30/80	633				
8/1/80 (1)	639	8/14/80			
8/3/80	638				
8/4/80	634				
8/5/80	637				
8/7/80 (⊗)	636	8/12/80			
8/9/80 (⊗)	635				

(⊗) - Turtle was tagged but did not nest.

(1) - Turtle previously tagged but tag missing - tag hole present

(2) - Crawl body pit and eggs indicative of Green Turtle but turtle not observed

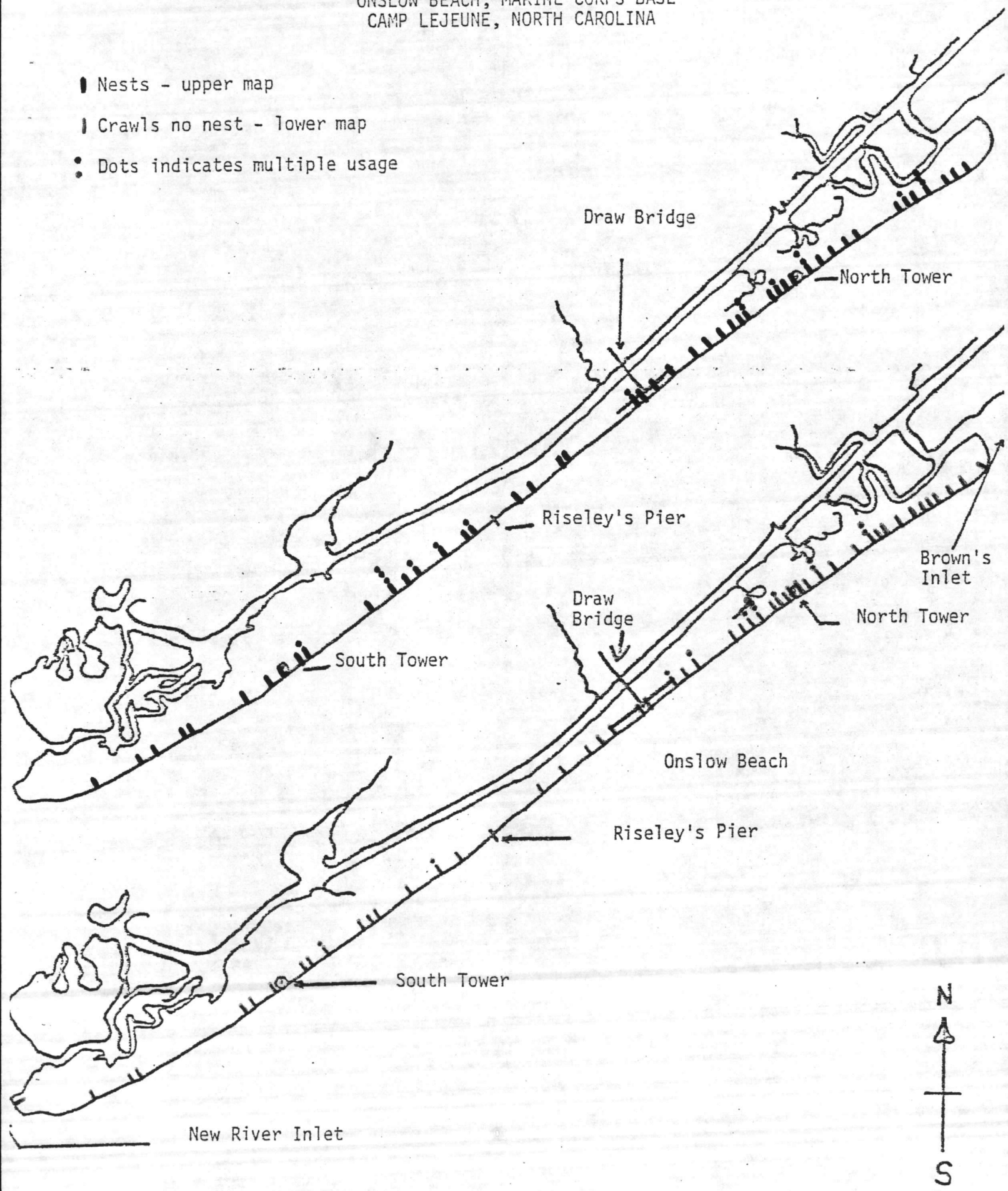
Tagged or

1 Turtle observed 5 times; 4 turtles observed 4 times; 3 turtle observed 3 times;
6 turtles observed 2 times; 23 turtles observed 1 time

61 sightings of tagged turtles

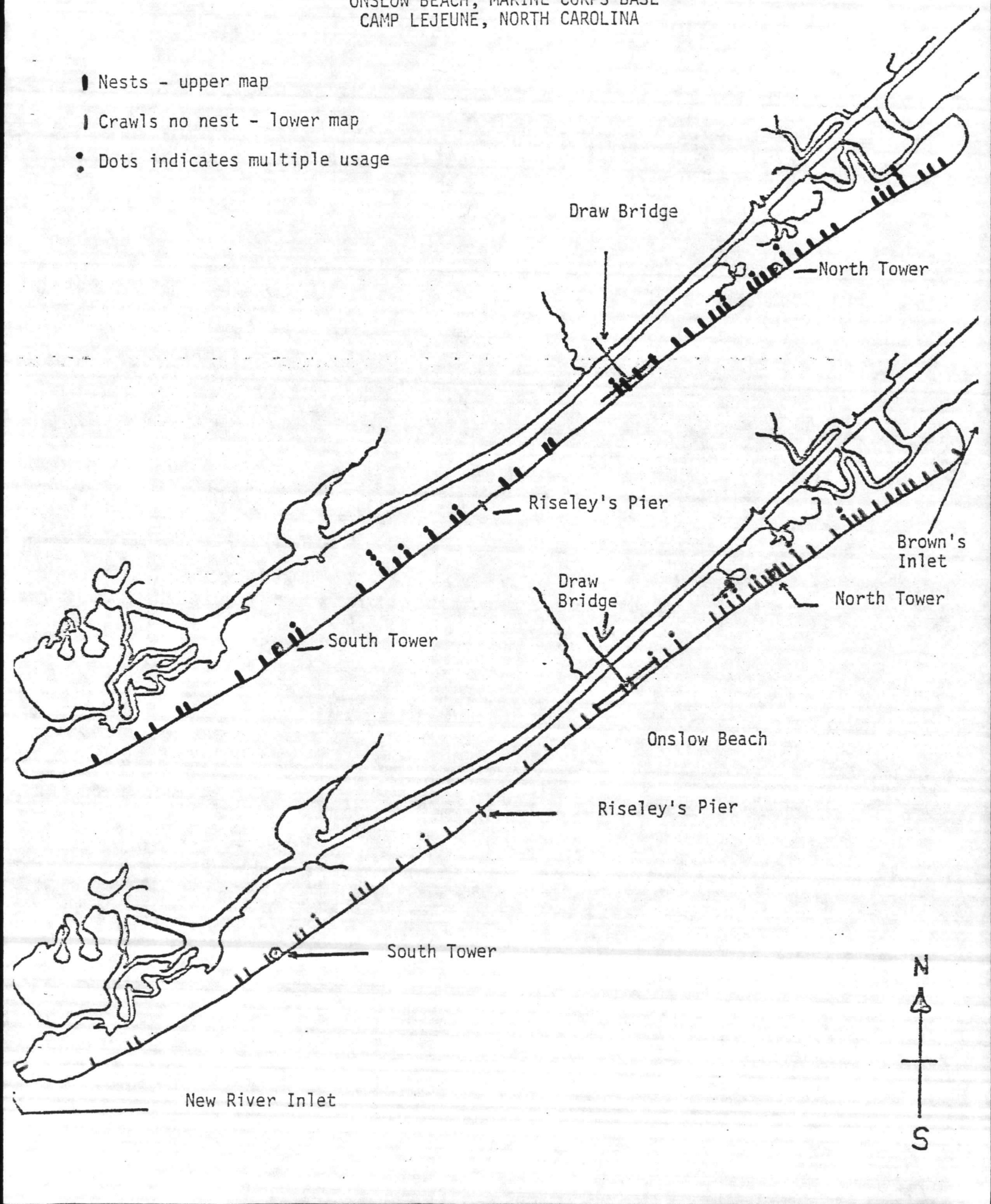
MAP I

NEST AND CRAWL ACTIVITY
ONSLOW BEACH, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



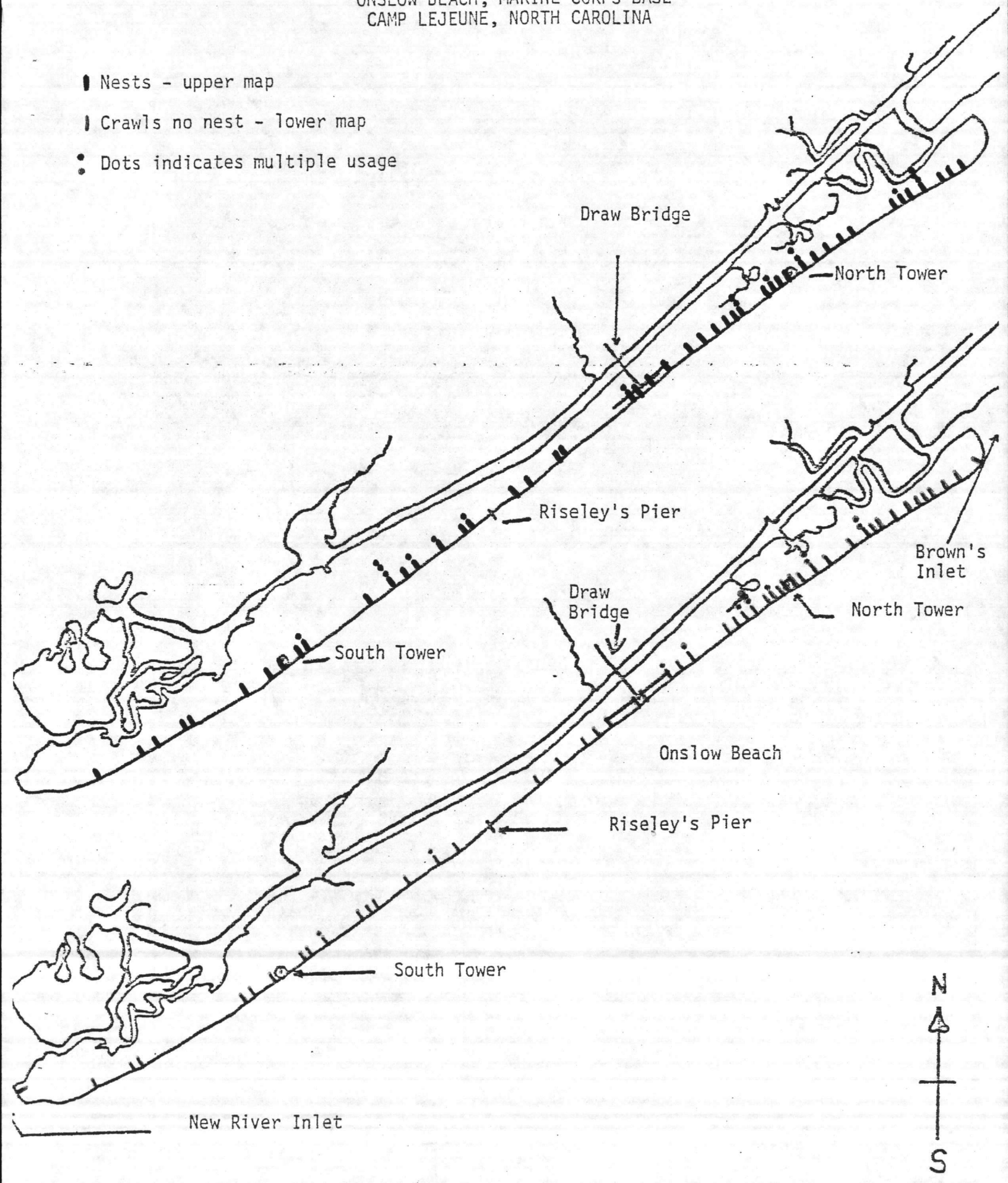
MAP I

NEST AND CRAWL ACTIVITY
ONSLOW BEACH, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



MAP I

NEST AND CRAWL ACTIVITY
ONSLOW BEACH, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA



ATLANTIC LOGGERHEAD SEA TURTLE PROGRAM 1979

Natural Resources and Environmental Affairs Division

Base Maintenance Department

Marine Corps Base

Camp Lejeune, North Carolina 28542

Submitted by

Hugh R. Passingham

November 1979

BACKGROUND

The Atlantic Loggerhead Sea Turtle (Caretta caretta caretta) (Photo 1, page 2) has nested along the coast of the Southeastern United States for thousands of years. In recent years biologists have noticed a decrease in the numbers of Loggerhead turtles nesting on these shores.

Marine Corps Base, Camp Lejeune, a 170 square mile infantry training installation located in Onslow County, North Carolina, includes approximately 12 miles of barrier islands which are used by the Atlantic Loggerhead Sea Turtle. The primary mission of Camp Lejeune is to provide housing, training facilities, logistic support and certain administrative support for Fleet Marine Force Units and other units assigned. The base has a Long Range Management Plan which provides for management of all natural resources including the sea turtle. Protective measures for the turtle were begun in 1974. The short range goal for the program was to stop animal predation on the nest sites. The chief predators were the Raccoon (Procyon lotor) and the Fox (Urocyon cineroargenteus). This has been accomplished by placing a predator-proof wire cage (Photo 2, page 3) over each nest immediately after the turtle has left the nest. This method of protection has proven highly successful, since the only damage due to predators now, is that done prior to installation of the cages. The long range goal of the program is two-fold, one to increase the dwindling population of the Atlantic Loggerhead Sea Turtle and two, to study the nesting habits of the turtles.

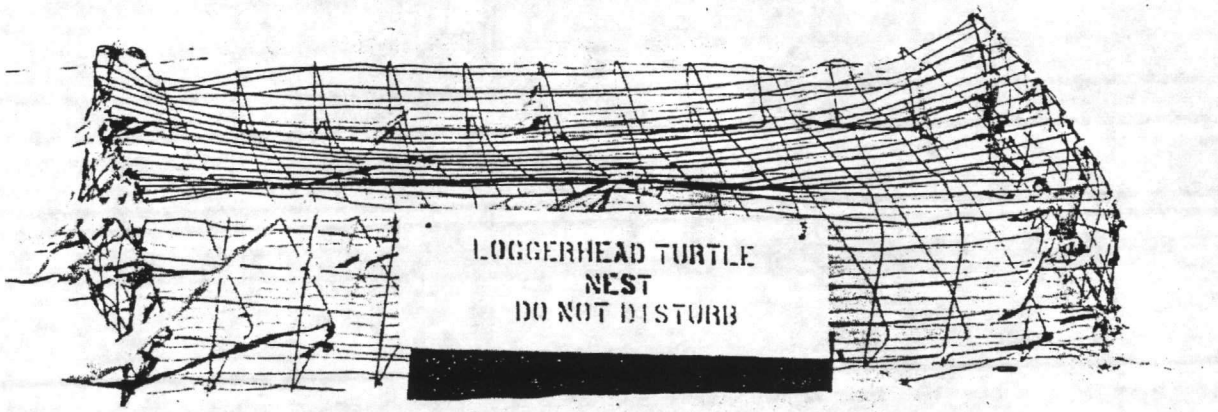
Since implementation of this program just prior to the nesting season of 1974, the Atlantic Loggerhead was placed on the National Endangered

Species List as threatened in August 1978. After the turtle was listed as threatened, Marine Corps Base requested formal consultation with the United States Fish and Wildlife Service to determine if a conflict existed as a result of military training on Onslow Beach and Browns Island. The United States Fish and Wildlife Service rendered a non-jeopardy opinion and recommended continuation of the sea turtle management program.

Also since its conception, this management program has increased its scope to include aerial surveys of the nesting grounds, tagging adult female turtles and follow-up work to determine nesting success on a seasonal basis.

The Institute of Marine Science (IMS) at Morehead City, North Carolina headed by Dr. Frank Schwartz, has shown a keen interest in the management program. IMS has implemented a headstart program which has provided valuable assistance in caring for nests that have to be removed from the amphibious vehicle landing site on Onslow Beach. Dr. Schwartz has also been a valuable source of information concerning the Atlantic Loggerhead and it's management.

By the summer of 1979, the program had expanded to the point that a biological technician was employed to assume the sea turtle management program during the nesting and hatching season.



STUDY AREA

The study area for the management program includes the barrier islands from New River Inlet north to Bear Inlet. Aerial observation includes that area from Smith's Island, at the mouth of the Cape Fear River, northward to the southern tip of the Cape Lookout National Seashore, on the North Carolina coast. This overall area was studied by aerial survey to determine actual nests versus nesting attempts (Table I). An area midway between Cape Lookout and Smith's Island is the primary study site. This barrier island is Onslow Beach, and is part of Marine Corps Base, Camp Lejeune. Onslow Beach is a seven mile stretch of beach lying just north of New River Inlet and separated from the Hammocks Beach State Park by the Marine Corps Bombing Range on Brown's Island. The beach strand on Onslow Beach was divided into two areas. A north and a south area separated by Riseley's Pier, which was the reference point for locating nests on the beach.

METHODS

The first phase of the study was that of nightly patrols of the beach strand on Onslow Beach by a biological technician. These patrols, using a four-wheel drive vehicle and beginning one hour before the high tide or not later than 2200 hours, generally began at the south end of the beach.

A search was made for turtle tracks or turtles just leaving the surf. If no turtles were located during a patrol, there would be a one-half hour wait before beginning the next patrol. Upon location of turtles, all lights were extinguished until it could be ascertained whether or not the

turtle would nest. After a turtle nested, a numbered tag was attached to a posterior marginal scute. Midway through the nesting season, carapace tags (actually a small disc fish tag) were replaced by live stock ear tags, which were attached on the trailing edge of the right front flipper. During the tagging operation, measurements of the carapace, head, right front and rear flippers and identifying characteristics of each turtle were noted. This data was recorded on the Sea Turtle Inventory (Nesting Data) form (See pages 15 and 16). Nests laid in areas of heavy human use, below the tideline or other seemingly undesirable locations, were relocated, generally at the base of the dunes above the tideline in relatively unused areas of the beach. Nests located in an area extending from Riseley's Pier south approximately two miles to a training observation tower were removed and sent to IMS. These eggs were counted and allowed to hatch under controlled conditions. All other nests, after being located, were protected by burying to a depth of six inches, a four foot square, eighteen inches high cage, made of 2" by 4" electrically welded wire, over the nest. The case was then marked with yellow surveyors plastic tape and a 8" by 20" white sign with red lettering stating "Endangered Wildlife Nest Do Not Disturb." Each nest was tagged using a small plastic tag attached to the protection cage. This tag was marked with the date, nest number, location and number of eggs in the nest. Once a nest was protected, it was checked occasionally until hatch-out of the young was observed. When hatch-out occurred, which was normally from fifty to seventy days, the nest was re-entered and the unhatched eggs were counted. The number of eggs that did not hatch were compared to the total number of eggs for each nest to determine hatching success.

The second phase of the study consisted of aerial surveys. This segment of the program was accomplished with the aid of the Marine Corps. Helicopters and crew were dispatched from the Marine Corps Air Station (Helicopter), New River to assist in making sightings and counts of turtle crawls and apparent nest sights along the beach strands of the coastal islands involved in the survey. Flights were not always over the entire coastal area, but were divided into a northern section and a southern section. The northern section included the barrier islands from Onslow Beach to Cape Lookout. The southern section included the barrier islands from Onslow Beach to Smith's "Baldhead" Island. There were nine flights total; four during June and five during July. All flights were made during the prime nesting period before, during and after the full moon for each month (Table II). The data from the aerial surveys was compared to other aerial surveys conducted by Dr. Schwartz of IMS.

RESULTS

During the nesting season, from June to August of 1979, a total of one hundred thirty eight attempts to nest were made by sea turtles. Of these attempts, sixty-three clutches were laid of which forty-seven were protected. (Table I). Four nests were entered by predators, before they could be protected, with a loss of approximately fifty eggs. Eggs from fourteen nests totaling 1,595 eggs were sent to IMS. Of these 1,595 eggs, 912 hatched for a success rate of 57.2%. Eggs from an additional nine nests were removed and sent to IMS when the coolness of the weather ruled out any chance of hatch-out of 378 for a success rate of 36.2%. The remaining forty nests contained 4,439 eggs, of which 2,747 eggs hatched for a 61.8% rate of success. Six nests were destroyed by Hurricane David. The most

successful nests had an incubation period of sixty days or more. A total of 7,077 eggs were counted from all nests, protected or removed, with a hatch-out of 4,037 for a year's success of 57% (Table III).

Of the sixty-three nests, twenty-six turtles were tagged. Three of these turtles had been previously tagged on Onslow Beach and one had been tagged by the University of Georgia in Athens with the number "NC00020" (Table I).

Other data taken during the nesting season which has some bearing on nesting activity is sea water temperatures, lunar cycle and weather conditions. Graphs I, II and III detail the results of lunar cycle and temperature effects.

DISCUSSION

Nesting during June was minimal, probably due to early summer cool temperatures. Once the air and sea water temperatures rose to twenty-two degrees celsius, nesting activity began to increase.

Lunar cycle as evidenced by Graph II seems to have little effect on nesting activity. The tides also had less effect than expected, since turtles were observed to crawl up the beach at all tides, including dead low tides.

Weather had some effect on nesting activity. Crawls were made during rainy weather but very few nests were completed. It seemed that the wetness of the sand discouraged the turtles.

Lights on the beach, especially stationary lights, appeared to have little or no effect on turtles choice of nest sites. Turtles nested often near very well lighted buildings. Moving lights, either vehicular or pedestrian flashlights, caused immediate abortive reactions by nearly all turtles that were approached.

There was one case of nest predation of a protected nest due to technician error. This nest site had two clutches of eggs deposited under one protective cage. The error occurred after one nest was checked for hatching, at which time the cage was improperly replaced allowing space for raccoons to reach through the cage into the nest. Fifteen hatchlings were destroyed in this case.

Recent studies done in Canada have indicated that nest tampering of any kind could be detrimental to hatching success. This was of particular interest to the Camp Lejeune biologists since clutch size was to be an integral part of their management program. A deadline of forty-eight hours was adhered to for any egg handling by the Lejeune group. The Canadian theory was given a severe test inadvertently by the Lejeune technician when an entire clutch of eggs was dropped. Clutch number 92 of July 24 1979, which was being removed for head-start (IMS) was dropped from four feet when the container they were in collapsed. This clutch was artifically incubated at IMS with excellent results, of 133 eggs (two broke in the fall) 113 hatched for an 84.9% success. From this experience the Lejeune biologists gained more confidence in the 48-hour deadline for moving nests.

Nesting activity seemed to be determined by individual turtle cycles,

not the moon phase or weather. Evidence for this was the return of previously tagged turtle number 33-796, later tagged IMS 26 flipper tag. This turtle returned to the beach after 14 days (July 12 and July 26, 1979). The first clutch was laid on a rainy night at 2215 hours and contained 149 eggs. The second nest was laid on a fair night with good visibility but no moon at 2230 hours. This nest contained 157 eggs. The time ashore was about the same each time, and for each nesting the tide was near high.

Several unusual eggs were discovered during the study. Many subnormal size eggs were found. The most unusual eggs were a double and one triple yolk. Both these eggs were transported to IMS where they were artificially incubated. Neither of the unusual eggs hatched.

Hurricane David which passed through the study area in late August 1979 destroyed six nests, inundated six nests and deposited up to eighteen inches of sand over four of the inundated nests. The destroyed nests were completely washed away. Some of the partially developed eggs were found in the debris of the high water mark. The nests that were barely reached by wave wash seemed to be unaffected by this light inundation. Nest of July 24, 1979 had 123 eggs hatch for 100% hatch out. Another nest, however, under nearly identical conditions and laid on the same day, had only 48% hatch-out (76 of 159 eggs hatched). Since the nests were not opened immediately after the storm, no clear conclusions can be drawn. The nests that had sand deposited over them by the storm would have failed completely without human intervention. One nest of 150 eggs laid on July 5, 1979 produced 101 hatchlings for 67.3% success. When this nest was entered, about eighteen inches of sand and matted sargassum weed were removed from

over the hatchlings. It was the opinion of the technicain that the hatchlings were not capable of making the ascent to the surface.

Correlation of beach contour to turtle utilization on Onslow Beach was attempted using map 1, page . The areas at two miles north and south appear to have the greatest utilization. The beach contour from one to three miles north is a very flat wide beach. At low water, from the base of the dunes to the water line, is as far as 150 yards. The area from .5 to 2.5 miles south has a high berm with no more than 30 yards of flat beach to the water line at low water. Also, in the section from 1 to 1.5 miles south, the beach composition is largely shell fragments and sand stone. With this information in mind, and a visual examination of map 1, there seems to be no preferred types of beach contour.

Toward the end of the nesting season, turtles spent less time on the beach. Also after several observations, it appeared that there was some urgency to the nesting activity. Turtles would choose the nest site rapidly, nest, then return to the ocean with fewer rests. Evidence being turtles missed by technicain during normal 50-minute patrol cycle. Also, the choice of nest sites seemed to be done with less care. One nest, August 9, 1979 (130 eggs) as an example, was laid in front of a well lighted beach pavalion where the turtle pushed a trash can aside to use that spot to lay.

TABLE I

GROUND SURVEY ONSLOW BEACH

	Crawls	Nests	Nest Protected	Nest Removed For Headstart	Turtles Tagged
May	0	0	0	0	0
June	32	16	14	2	2
July	31	26	19	7*	12**
August	9	21	15	5***	12****

Note: * - (7-17-79) Remove 1 double yolk egg from protected nest for H. S.

** - Two of the 12 were returns

*** - (8-6-79) removed, triple yolk egg from protected nest

**** - Three of these turtles previously tagged July 79 on Only Beach - 1 turtle previously tagged by University of Georgia, Athens (#NC0020)

ATLANTIC LOGGERHEAD SEA TURTLE PROGRAM 1979

Natural Resources and Environmental Affairs Division

Base Maintenance Department

Marine Corps Base

Camp Lejeune, North Carolina 28542

Submitted by

Hugh R. Passingham

November 1979

BACKGROUND

The Atlantic Loggerhead Sea Turtle (Caretta caretta caretta) (Photo 1, page 2) has nested along the coast of the Southeastern United States for thousands of years. In recent years biologists have noticed a decrease in the numbers of Loggerhead turtles nesting on these shores.

Marine Corps Base, Camp Lejeune, a 170 square mile infantry training installation located in Onslow County, North Carolina, includes approximately 12 miles of barrier islands which are used by the Atlantic Loggerhead Sea Turtle. The primary mission of Camp Lejeune is to provide housing, training facilities, logistic support and certain administrative support for Fleet Marine Force Units and other units assigned. The base has a Long Range Management Plan which provides for management of all natural resources including the sea turtle. Protective measures for the turtle were begun in 1974. The short range goal for the program was to stop animal predation on the nest sites. The chief predators were the Raccoon (Procyon lotor) and the Fox (Urocyon cineroargenteus). This has been accomplished by placing a predator-proof wire cage (Photo 2, page 3) over each nest immediately after the turtle has left the nest. This method of protection has proven highly successful, since the only damage due to predators now, is that done prior to installation of the cages. The long range goal of the program is two-fold, one to increase the dwindling population of the Atlantic Loggerhead Sea Turtle and two, to study the nesting habits of the turtles.

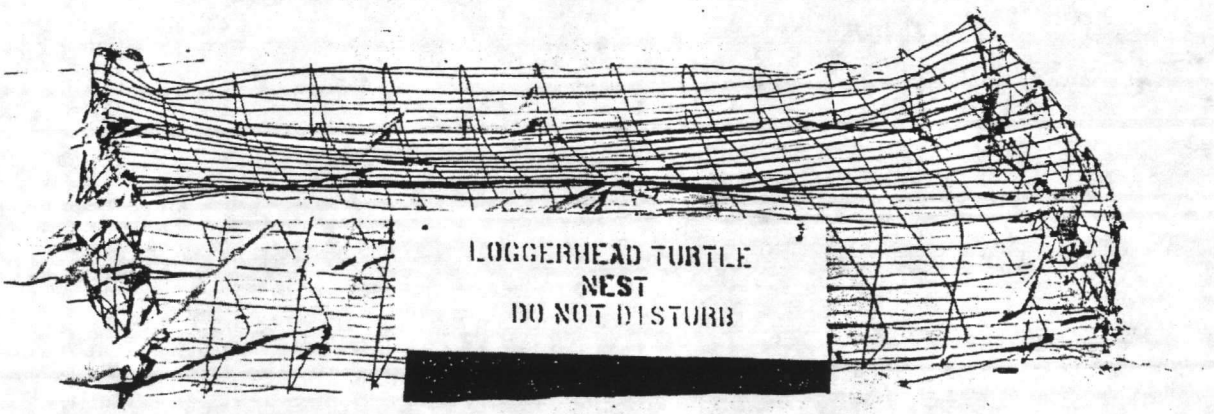
Since implementation of this program just prior to the nesting season of 1974, the Atlantic Loggerhead was placed on the National Endangered

Species List as threatened in August 1978. After the turtle was listed as threatened, Marine Corps Base requested formal consultation with the United States Fish and Wildlife Service to determine if a conflict existed as a result of military training on Onslow Beach and Browns Island. The United States Fish and Wildlife Service rendered a non-jeopardy opinion and recommended continuation of the sea turtle management program.

Also since its conception, this management program has increased its scope to include aerial surveys of the nesting grounds, tagging adult female turtles and follow-up work to determine nesting success on a seasonal basis.

The Institute of Marine Science (IMS) at Morehead City, North Carolina headed by Dr. Frank Schwartz, has shown a keen interest in the management program. IMS has implemented a headstart program which has provided valuable assistance in caring for nests that have to be removed from the amphibious vehicle landing site on Onslow Beach. Dr. Schwartz has also been a valuable source of information concerning the Atlantic Loggerhead and it's management.

By the summer of 1979, the program had expanded to the point that a biological technician was employed to assume the sea turtle management program during the nesting and hatching season.



STUDY AREA

The study area for the management program includes the barrier islands from New River Inlet north to Bear Inlet. Aerial observation includes that area from Smith's Island, at the mouth of the Cape Fear River, northward to the southern tip of the Cape Lookout National Seashore, on the North Carolina coast. This overall area was studied by aerial survey to determine actual nests versus nesting attempts (Table I). An area midway between Cape Lookout and Smith's Island is the primary study site. This barrier island is Onslow Beach, and is part of Marine Corps Base, Camp Lejeune. Onslow Beach is a seven mile stretch of beach lying just north of New River Inlet and separated from the Hammocks Beach State Park by the Marine Corps Bombing Range on Brown's Island. The beach strand on Onslow Beach was divided into two areas. A north and a south area separated by Riseley's Pier, which was the reference point for locating nests on the beach.

METHODS

The first phase of the study was that of nightly patrols of the beach strand on Onslow Beach by a biological technician. These patrols, using a four-wheel drive vehicle and beginning one hour before the high tide or not later than 2200 hours, generally began at the south end of the beach.

A search was made for turtle tracks or turtles just leaving the surf. If no turtles were located during a patrol, there would be a one-half hour wait before beginning the next patrol. Upon location of turtles, all lights were extinguished until it could be ascertained whether or not the

turtle would nest. After a turtle nested, a numbered tag was attached to a posterior marginal scute. Midway through the nesting season, carapace tags (actually a small disc fish tag) were replaced by live stock ear tags, which were attached on the trailing edge of the right front flipper. During the tagging operation, measurements of the carapace, head, right front and rear flippers and identifying characteristics of each turtle were noted. This data was recorded on the Sea Turtle Inventory (Nesting Data) form (See pages 15 and 16). Nests laid in areas of heavy human use, below the tideline or other seemingly undesirable locations, were relocated, generally at the base of the dunes above the tideline in relatively unused areas of the beach. Nests located in an area extending from Riseley's Pier south approximately two miles to a training observation tower were removed and sent to IMS. These eggs were counted and allowed to hatch under controlled conditions. All other nests, after being located, were protected by burying to a depth of six inches, a four foot square, eighteen inches high cage, made of 2" by 4" electrically welded wire, over the nest. The case was then marked with yellow surveyors plastic tape and a 8" by 20" white sign with red lettering stating "Endangered Wildlife Nest Do Not Disturb." Each nest was tagged using a small plastic tag attached to the protection cage. This tag was marked with the date, nest number, location and number of eggs in the nest. Once a nest was protected, it was checked occasionally until hatch-out of the young was observed. When hatch-out occurred, which was normally from fifty to seventy days, the nest was re-entered and the unhatched eggs were counted. The number of eggs that did not hatch were compared to the total number of eggs for each nest to determine hatching success.

The second phase of the study consisted of aerial surveys. This segment of the program was accomplished with the aid of the Marine Corps. Helicopters and crew were dispatched from the Marine Corps Air Station (Helicopter), New River to assist in making sightings and counts of turtle crawls and apparent nest sights along the beach strands of the coastal islands involved in the survey. Flights were not always over the entire coastal area, but were divided into a northern section and a southern section. The northern section included the barrier islands from Onslow Beach to Cape Lookout. The southern section included the barrier islands from Onslow Beach to Smith's "Baldhead" Island. There were nine flights total; four during June and five during July. All flights were made during the prime nesting period before, during and after the full moon for each month (Table II). The data from the aerial surveys was compared to other aerial surveys conducted by Dr. Schwartz of IMS.

RESULTS

During the nesting season, from June to August of 1979, a total of one hundred thirty eight attempts to nest were made by sea turtles. Of these attempts, sixty-three clutches were laid of which forty-seven were protected. (Table I). Four nests were entered by predators, before they could be protected, with a loss of approximately fifty eggs. Eggs from fourteen nests totaling 1,595 eggs were sent to IMS. Of these 1,595 eggs, 912 hatched for a success rate of 57.2%. Eggs from an additional nine nests were removed and sent to IMS when the coolness of the weather ruled out any chance of hatch-out of 378 for a success rate of 36.2%. The remaining forty nests contained 4,439 eggs, of which 2,747 eggs hatched for a 61.8% rate of success. Six nests were destroyed by Hurricane David. The most

successful nests had an incubation period of sixty days or more. A total of 7,077 eggs were counted from all nests, protected or removed, with a hatch-out of 4,037 for a year's success of 57% (Table III).

Of the sixty-three nests, twenty-six turtles were tagged. Three of these turtles had been previously tagged on Onslow Beach and one had been tagged by the University of Georgia in Athens with the number "NC00020" (Table I).

Other data taken during the nesting season which has some bearing on nesting activity is sea water temperatures, lunar cycle and weather conditions. Graphs I, II and III detail the results of lunar cycle and temperature effects.

DISCUSSION

Nesting during June was minimal, probably due to early summer cool temperatures. Once the air and sea water temperatures rose to twenty-two degrees celsius, nesting activity began to increase.

Lunar cycle as evidenced by Graph II seems to have little effect on nesting activity. The tides also had less effect than expected, since turtles were observed to crawl up the beach at all tides, including dead low tides.

Weather had some effect on nesting activity. Crawls were made during rainy weather but very few nests were completed. It seemed that the wetness of the sand discouraged the turtles.

Lights on the beach, especially stationary lights, appeared to have little or no effect on turtles choice of nest sites. Turtles nested often near very well lighted buildings. Moving lights, either vehicular or pedestrian flashlights, caused immediate abortive reactions by nearly all turtles that were approached.

There was one case of nest predation of a protected nest due to technician error. This nest site had two clutches of eggs deposited under one protective cage. The error occurred after one nest was checked for hatching, at which time the cage was improperly replaced allowing space for raccoons to reach through the cage into the nest. Fifteen hatchlings were destroyed in this case.

Recent studies done in Canada have indicated that nest tampering of any kind could be detrimental to hatching success. This was of particular interest to the Camp Lejeune biologists since clutch size was to be an integral part of their management program. A deadline of forty-eight hours was adhered to for any egg handling by the Lejeune group. The Canadian theory was given a severe test inadvertently by the Lejeune technician when an entire clutch of eggs was dropped. Clutch number 92 of July 24 1979, which was being removed for head-start (IMS) was dropped from four feet when the container they were in collapsed. This clutch was artifically incubated at IMS with excellent results, of 133 eggs (two broke in the fall) 113 hatched for an 84.9% success. From this experience the Lejeune biologists gained more confidence in the 48-hour deadline for moving nests.

Nesting activity seemed to be determined by individual turtle cycles,

not the moon phase or weather. Evidence for this was the return of previously tagged turtle number 33-796, later tagged IMS 26 flipper tag. This turtle returned to the beach after 14 days (July 12 and July 26, 1979). The first clutch was laid on a rainy night at 2215 hours and contained 149 eggs. The second nest was laid on a fair night with good visibility but no moon at 2230 hours. This nest contained 157 eggs. The time ashore was about the same each time, and for each nesting the tide was near high.

Several unusual eggs were discovered during the study. Many subnormal size eggs were found. The most unusual eggs were a double and one triple yolk. Both these eggs were transported to IMS where they were artificially incubated. Neither of the unusual eggs hatched.

Hurricane David which passed through the study area in late August 1979 destroyed six nests, inundated six nests and deposited up to eighteen inches of sand over four of the inundated nests. The destroyed nests were completely washed away. Some of the partially developed eggs were found in the debris of the high water mark. The nests that were barely reached by wave wash seemed to be unaffected by this light inundation. Nest of July 24, 1979 had 123 eggs hatch for 100% hatch out. Another nest, however, under nearly identical conditions and laid on the same day, had only 48% hatch-out (76 of 159 eggs hatched). Since the nests were not opened immediately after the storm, no clear conclusions can be drawn. The nests that had sand deposited over them by the storm would have failed completely without human intervention. One nest of 150 eggs laid on July 5, 1979 produced 101 hatchlings for 67.3% success. When this nest was entered, about eighteen inches of sand and matted sargassum weed were removed from

over the hatchlings. It was the opinion of the technicain that the hatchlings were not capable of making the ascent to the surface.

Correlation of beach contour to turtle utilization on Onslow Beach was attempted using map 1, page . The areas at two miles north and south appear to have the greatest utilization. The beach contour from one to three miles north is a very flat wide beach. At low water, from the base of the dunes to the water line, is as far as 150 yards. The area from .5 to 2.5 miles south has a high berm with no more than 30 yards of flat beach to the water line at low water. Also, in the section from 1 to 1.5 miles south, the beach composition is largely shell fragments and sand stone. With this information in mind, and a visual examination of map 1, there seems to be no preferred types of beach contour.

Toward the end of the nesting season, turtles spent less time on the beach. Also after several observations, it appeared that there was some urgency to the nesting activity. Turtles would choose the nest site rapidly, nest, then return to the ocean with fewer rests. Evidence being turtles missed by technicain during normal 50-minute patrol cycle. Also, the choice of nest sites seemed to be done with less care. One nest, August 9, 1979 (130 eggs) as an example, was laid in front of a well lighted beach pavalion where the turtle pushed a trash can aside to use that spot to lay.

TABLE I

GROUND SURVEY ONSLOW BEACH

	Crawls	Nests	Nest Protected	Nest Removed For Headstart	Turtles Tagged
May	0	0	0	0	0
June	32	16	14	2	2
July	31	26	19	7*	12**
August	9	21	15	5***	12****

Note: * - (7-17-79) Remove 1 double yolk egg from protected nest for H. S.

** - Two of the 12 were returns

*** - (8-6-79) removed, triple yolk egg from protected nest

**** - Three of these turtles previously tagged July 79 on Only Beach - 1 turtle previously tagged by University of Georgia, Athens (#NC0020)