

Table 4. Green Sea Turtle observations at East Island

<u>Date of Survey</u>	<u>Population Estimate</u>	<u>Breeding Status, Remarks, and References</u>
1955 May 5	2	Medium-sized (POFI, 1955).
1956 Apr. 11	2	Ca. 100 lbs. each (POFI, 1956a).
June 4	6	(POFI, 1956b).
1957 Apr. 24	10-15	(POFI, 1957).
May 11	12	(POFI, 1957).
1959 July 21	4	Dead, appeared to have been killed, but not butchered; 0 adults diurnally; 33 sets of fairly fresh haul-out tracks on beaches; nest pits (POFI, 1959).
1961 Feb. 9	1	In nearby water (POFI, 1961a).
Mar. 4	1	Dead newly hatched turtle (HDFG, 1961b).
July 13	3	(POFI, 1961c).
1962 June	present	Considerable number noted, nest pits (HDFG, 1962a).
1963 June 7-11	20+	Adults nightly; much egg laying (POBSP, 1963).
1964 Sept. 27	5	Dead: 2 adults, 3 hatchlings; 250 nest pits counted (BSFW, 1964b; POBSP, 1964).
1965 Aug. 5-10, 23-28	32+	Adults: 1♂, 31♀; numerous hatchlings; 5-20 adults daily; ♀♀ laying nightly (POBSP, 1965b).
1966 Mar. 23	4	Adults: 2♂, 2 unknown (BSFW, 1966a).
May 13	12-15	Copulation observed (POFI, 1966).
June 10-14, 16-21	5-24	Adults observed daily; 5+ ♀♀ laying nightly (POBSP, 1966a).
Aug. 18-24, 26-30	1-3+	Adults daily; some laying eggs; hatchlings present (POBSP, 1966b).
Sept. 13-14	86+	1 adult ♀ at night may have hauled up to lay eggs; 85 hatchlings seen on the 14th (BSFW, 1966b).

Table 1.--Expeditions to tag green turtles at French Frigate Shoals made during the 10-year period, 1973-82.

Expedition No.	Duration (days)	Dates
1	48	1 June-19 July 1973
2	6	11-17 October 1973
3	21	30 May-20 June 1974
4	21	27 June-18 July 1974
5	20	26 July-15 August 1974
6	21	19 September-10 October 1974
7	7	13-20 February 1975
8	6	16-22 May 1975
9	20	6-26 June 1975
10	20	18 July-7 August 1975
11	2	26-28 August 1975
12	3	1-4 December 1975
13	7	15-22 January 1976
14	11	8-19 April 1976
15	6	7-13 May 1976
16	14	28 June-12 July 1976
17	5	18-23 November 1976
18	13	20 June-3 July 1977
19	6	22-28 September 1977
20	7	1-8 December 1977
21	16	5-21 June 1978
22	5	2-7 May 1979
23	20	10-30 June 1979
24	25	6 June-1 July 1980
25	3	5-8 September 1980
26	4	15-19 December 1980
27	23	25 May-18 June 1981
28	1	15-16 November 1981
29	1	14-15 April 1982
30	21	5-26 June 1982
31	1	3-4 August 1982
32	1	3-4 September 1982
33		2- June 1983

SUMMARY OF DATA ON BONY FISH SAMPLING AT FRENCH FRIGATE SHOALS,

JULY - OCTOBER, 1974

	<i>Carangoides ajax</i> (ulua)	<i>Caranx melampygus</i> (ulua)	<i>Sphyraenidae</i> (barracuda)
Total no. captured	76	25	4
Mean fork length, inches range	29 1/4 13 1/2 - 49	24 1/4 20 1/4 - 29	23 18 - 28 1/4
Stomach contents			
no. containing file fish (<i>Pervagor spilosoma</i>)	25	22	0
% of total	32.9	88.0	0
no. containing file fish (<i>Pervagor spilosoma</i>) and cephalopod parts	3	0	0
% of total	3.9	0	0
no. containing unidentified fish parts	6	2	1
% of total	7.9	8.0	25.0
no. containing unidentified crab parts	1	0	0
% of total	1.3	0	0
no. with empty stomachs	41	1	3
% of total	54.0	4.0	75.0

TAGGING ENCOUNTERS WITH IMMATURE GREEN TURTLES AT FRENCH FRIGATE SHOALS

by
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Year	J	F	M	A	M	J	J	A	S	O	N	D	No. Captured	No. Tag Recoveries	Total No. Newly Tagged
1974						5	4	3	1				13	1	12
1975	12			3	14	7	11				6		53	12	41
1976	30			63	13	4	5						115	54	61
1977	1					1		2					4	3	1
1978						9							9	6	3
1979				12	10								22	7	15
1980						3									3 ^d

1981

Data summary for the June 1980 green turtle tagging study focused on
 East Island, French Frigate Shoals, Northwestern Hawaiian Islands

by

George H. Balazs

This field research constituted the eighth consecutive season of monitoring and tagging at the Hawaiian green turtle breeding colony for the purpose of determining basic life history characteristics.

Tagging encounters by activity, island and sex					
Activity/Island	Males		Females		Total Encounters
	new tag	tag recovery	new tag	tag recovery	
Nesting					
East	-	-	24	21	45
Whale-Skate	-	-	3	0	3
Basking					
East	5	4	3	1	13
Whale-Skate	9	12	7	6	34
Trig	1	1	5	5	12
Little Gin	0	0	1	0	1
Total encounters	15	17	43	33	108

Percent tagging encounters representing tag recoveries

Males -	53.1%
Females -	43.4%
Males and females -	47.2%
Females, East Island - Including 5 females with scars suggestive of tag loss -	44.8%
Males, East Island -	51.1%
	44.4%

Island fidelity for 22 tagged females recovered on East Island--

Island of encounter during previous breeding season

East
21 turtles

Whale-Skate
1 turtle

Tag loss in 22 East Island females originally having two or more tags

No. years since tagged	No. tags lost	No. tags remaining	No. turtles
2	1	1	1
3	1	1	4
5	1	1	1
6	1	1	1
7	2	1	1
Total -			8 (36.4%)

Apparent breeding cycles of previously tagged turtles encountered on East Island

Years	Females (%)	Males (%)
1	0	50.0
2	22.7	50.0
3	36.4	0
4	4.5	0
5	4.5	0
6	22.7	0
7	4.5	0
8	0	0
9	4.5	0

Tag recoveries representing long-distance migrations

Original tagging site	Date	Status	Recovery site	Date	Status
Lisianski	3-20-68	basking	East	6-13-80	nesting
Lisianski	3-20-68	basking	East	6-13-80	nesting
Pearl & Hermes	3-13-64	basking	East	6-23-80	nesting
Pearl & Hermes	3-22-68	basking	Tern	6-16-80	nesting
Laysan	9-17-66	basking	Whale-Skate	6-30-80	basking

Number of females nesting each night on East Island from June 10 - 30th

No. females ashore each night

mean - 4.8

range - 2-9

No. females nesting successfully each night

mean - 2.9 (61%)

range - 0-6

Interesting intervals of 19 females renesting on East Island

mean - 13.2 days

range - 12-15 days

Estimated number of females present at French Frigate Shoals for the 1980 breeding season

East - 69

Whale-Skate - 43

Trig - 6

Tern - 7

Gin - 1

Little Gin - 4

Total for French Frigate Shoals - 130

Straight carapace length of 42 females nesting on East Island

mean - 93.2 cm

range - 85.9 - 103.6 cm

Straight carapace length of 25 previously tagged females

mean - 93.9 cm

range - 85.9 - 103.6 cm

Straight carapace length of 17 newly tagged females (possibly new recruits)

mean - 92.3 cm

range - 88.5 - 96.9 cm

Growth rates of 6 tagged females recovered on East Island

Carapace length cm	Increase cm	Interval years-months	Growth rate cm/month
92.7	0.7	6-0	.010
93.2	0.8	3-0	.022
94.0	0.3	3-0	.008
94.4	0.4	3-0	.011
95.5	0.9	3-0	.025
96.1	1.6	9-1	.015
			Mean - .015

13 other tagged females recovered after intervals of 2-7 years showed no measurable increase in carapace length.

Maximum number of turtles observed basking at one time

Whale-Skate	-	31 turtles on June 8th
Trig	-	20 turtles on June 8th
East	-	29 turtles on June 20th

Sea surface temperature off East Island

mean	-	27.4°C
range	-	26.2 - 28.5°C

Other significant findings

1. Radio telemetry of four male and four female green turtles equipped with transmitters at Whale-Skate and Trig revealed that most marine habitat utilized was within 1 km of the island where tagged. One of the females tagged on Trig regularly traveled to Tern Island for nesting purposes. The mean dive time exhibited by the turtles was 20 minutes. The longest periods spent under water occurred at night and lasted approximately 2 hours.
2. An adult male green turtle with a freshly amputated front flipper was found dead washed up on the beach at East Island on June 29th. Internal examination revealed three lead slugs in the pectoral muscles, indicating that the turtle had been shot at some earlier date. The cause of death, however, appeared to be shark attack.
3. A 44 cm juvenile green turtle found basking on East Island that had been originally tagged in June of 1979 (at East Island) showed no measurable increase in carapace length.
4. Erosion from wave action continued to take place along the northeast shore of East Island, with the central vegetated segment having lost approximately 6 meters since 1975. This appears to be part of a long-term trend that has been underway since at least 1945. The gradual loss of this critical nesting habitat places importance on the need to remove man-made debris that obstructs nesting on East Island and, to the extent possible, enhance Tern Island's south-shore beach as a desirable nesting site.
5. Fewer than 50 sooty terns were present on East Island for either nesting or roosting purposes. The numbers of these birds have decreased dramatically over the past eight years. In 1973 an estimated 40,000 sooty terns used the island. Colonies of this magnitude probably cause a reduction in the turtles' efficiency in excavating nests and laying eggs. In addition, the turtles at times inflicted considerable damage to sooty tern eggs and chicks as the result of crawling over the island searching for nesting sites.

NUMBER OF GREEN TURTLES NESTING AT FRENCH FRIGATE SHOALS

by

George H. Balazs

	1977	1978	1979	1980	1981	1982	1983	1984
East Island total no. turtles successfully nesting in monitoring period	44	66	55	45	127	111	28	
No. days monitored	9	11	13	20	23	19	17	
East Island 14-day total successfully nesting	68	84	59	42	101	98	26	
East Island no. successfully nesting per night (14 days)	4.9	6.0	4.2	3.0	7.2	7.0	1.9	
East Island estimate for full season (61%)	111	138	97	69	166	161	43	
FFS - Estimate for all islands (55%)	202	251	176	125	301	293	77	

1987 Tagging data for green turtles at East Island, French Frigate Shoals.

Compiled by George H. Balazs

New tag	Old tag	1987 Date first sighted	Curved carapace length, cm	Resighting catalog No.	Comments
<u>FEMALES</u>					
9951	--	5/25	--	--	--
--	3432, 3433	5/25	--	344	Nest relocated
--	3362, 3363	5/26	--	345	--
--	2212	5/26	99	92	--
--	3181, 5339	5/26	--	45	Nest relocated; DNA8
9953	--	5/26	--	--	--
--	5184	5/26	--	144	--
--	6580, 6581	5/26	--	363	--
9952	--	6/1	--	--	--
--	3600, 3601, 6256	5/27	100	194	--
--	6243, 6244	5/27	--	358	Tumor
9954, 9994	--	5/27	102	--	Tumor; DNA10
10004	+1	5/28	--	--	--
--	5244 + 1	5/29	--	119	DNA7
--	8190	5/29	99	346	--
--	3541, 3542	5/29	--	347	--
9955, 9956	--	6/8	--	--	--
9966, 9967	--	6/1	--	--	--
--	3147, 6211	6/1	--	171	--
--	7963, 8212	6/3	--	348	--

New tag	Old tag	1987 Date first sighted	Curved carapace length, cm	Resighting catalog No.	Comments
9957	--	6/3	--	--	--
--	6057, 6103	6/3	--	358	Also basking at Gin
9958	--	6/3	--	--	--
9959	--	6/3	99	--	Also basking at L. Gin
9960	--	6/3	101	--	--
9961	--	6/3	93	--	--
--	8108	6/4	--	349	--
--	5306	6/4	--	277	--
9962	--	6/4	93	--	--
--	8179, 8217	6/4	88	350	--
--	3411, 3422	6/4	99	351	--
9963	--	6/4	95	--	Inland at 1 pm
9964	--	6/4	94	--	--
--	3538	6/5	97	352	Also basking at W-S
9968	--	6/5	98	--	--
9970	--	6/6	98	--	--
--	3229, 3437	6/6	--	248	--
9971	--	6/6	104	--	--
--	5999, 6131	6/7	--	256	--
9972	--	6/7	95	--	--
9974	--	6/11	92	--	DNA2

New tag	Old tag	1987 Date first sighted	Curved carapace length, cm	Resighting catalog No.	Comments
--	2767, 2768, 5341	6/11	--	123	--
--	6260	6/11	--	199	DNA12
--	3213, 5420	6/11	101	140	--
9975	--	6/11	91	--	--
9979	--	6/11	--	--	--
9976	--	6/11	--	--	--
--	5221	6/11	97	356	--
--	3217	6/11	101	221	--
--	3711, 5209, 5210	6/11	96	229	--
--	2244, 5299	6/11	--	115	DNA1
9977	--	6/12	101	--	--
9978	--	6/12	101	--	DNA4
10005	--	6/12	97	--	Tumor
--	2232	6/12	103	67	--
9980	--	6/12	99	--	--
9981	--	6/13	92	--	--
9982	--	6/13	--	--	--
--	3182, 3723, 5281	6/13	--	104	Chun's Reef
9983	--	6/13	91	--	--
--	6183, 6192	6/13	98	257	--
9984, 10024	--	6/13	104	--	--
9985	--	6/13	96	--	--
9986	--	6/14	95	--	--

New tag	Old tag	1987 Date first sighted	Curved carapace length, cm	Resighting catalog No.	Comments
9987	--	6/14	103	--	--
--	3836	6/14	103	235	Tumor; DNA6
9988	--	6/15	87	--	DNA9
9989	--	6/15	99	--	--
9990	--	6/15	99	--	--
--	8163, 8171	6/16	--	353	--
9991	--	6/16	96	--	--
9992	--	6/16	95	--	Tumor
9993	--	6/16	93	--	--
--	7560, 7562	6/16	--	343	Johnston Island
--	6205	6/16	--	359	--
--	3137, 3138, 6138	6/16	--	168	--
9995	--	6/17	101	--	--
9996	--	6/17	100	--	DNA11
--	2652, 3772, 6161	6/17	--	81	--
--	6048, 6261	6/17	--	314	--
--	3733	6/18	--	260	--
9997	+1	6/18	95	--	--
9999, 10000	--	6/18	95	--	--
9998	--	6/18	97	--	--
10001, 10018	--	6/19	98	--	--
10002	--	6/19	90	--	--
10003	--	6/20	96	--	Gin

New tag	Old tag	1987 Date first sighted	Curved carapace length, cm	Resighting catalog No.	Comments
--	6273	6/20	--	310	--
10006	--	6/21	97	--	--
10007	+1	6/21	91	--	--
--	5368, 3178	6/21	--	143	--
10022	?870	6/21	--	--	--
10008	--	6/26	95	--	--
--	6158	6/26	--	360	--
10009	--	6/26	92	--	--
10013	--	6/26	103	--	--
--	3714	6/26	--	357	Tumor
10012	--	6/26	95	--	--
10011	--	6/26	107	--	--
--	3175, 3176	6/26	--	222	--
10010	--	6/26	92	--	--
10014	--	6/26	102	--	--
10015	--	6/27	95	--	--
10016	--	6/27	101	--	--
10019	--	6/28	92	--	--
--	7178, 7179	6/27	--	362	--
--	2794, 3803 5063, 5137	6/27	--	130	--
--	6082, 6083	6/28	--	361	--
10020	--	6/28	--	--	--
--	8119	6/28	--	354	Also on Tern

New tag	Old tag	1987 Date first sighted	Curved carapace length, cm	Resighting catalog No.	Comments
10023	--	6/28	90	--	--
--	4257, 4258	7/15	--	355	--
--	9372	7/14	--	364	--
10025	--	7/14	--	--	--
--	6172	7/14	--	100	--

MALES

--	6077, 4273	5/26	--	108	--
--	4275	5/26	--	114	--

Number of adult female green turtles recorded nesting during June 1986 at East Island, French Frigate Shoals (for 15 nights with complete coverage).

Date June 1986	Total No. ashore to nest	No. of new females first seen ashore to nest in 1986	Short term repeat nesters seen ashore	Long-term tag recoveries
1	4	4	0	3
2	6	6	0	1
3	7	3	4	3
4	5	4	1	2
--	--	--	--	--
9	6	6	0	2
10	6	3	3	2
11	4	0	4	0
12	4	2	2	2
--	--	--	--	--
15	4	2	2	2
16	3	1	2	0
17	8	3	5	1
18	8	1	7	1
--	--	--	--	--
21	5	5	0	2
22	5	3	2	1
23	9	3	6	1
Total	--	46	--	23 (50%)

1985 GREEN TURTLE TAGGING
 SUMMARY FOR FRENCH FRIGATE SHOALS
 (11 - 30 JUNE)

NATIONAL MARINE FISHERIES SERVICE
 HONOLULU LABORATORY
 P. O. BOX 3830
 HONOLULU, HAWAII 96812

	<u>NO. NEWLY TAGGED</u>	<u>NO. TAG RECOVERIES</u>	<u>TOTAL NO. TAGGING ENCOUNTERS</u>
ADULT FEMALES	99	65	164
ADULT MALES	6	3	9
TOTAL	105	68 (39.3%)	<u>173</u>

ISLAND FIXITY OF THE GREEN TURTLE BREEDING COLONY AT FRENCH FRIGATE SHOALS

BASED ON TAG RECOVERIES MADE THROUGH JUNE 1980

By George H. Balazs

	No.	Trig		WS		Trig/WS		East		LG		G		Overall	
		Same	Differ.	S	D	S	D	S	D	S	D	S	D	S	D
MALES*															
	recoveries	13	6	20	2	33	8	16	2	-	-	-	-	49	10
	%	68.4	31.6	90.9	9.1	80.5	19.5	88.9	11.1	-	-	-	-	83.1	16.9
FEMALES*															
	recoveries	10	2	5	3	15	5	68	3	0	2	0	1	83	11
	%	83.3	16.7	62.5	37.5	75.0	25.0	95.8	4.2	0	100	0	100	88.7	11.3

* 36 (81.8%) of the 44 males were recovered exclusively on the same island where originally tagged.

** 65 (87.8%) of the 74 females were recovered exclusively on the same island where originally tagged.