

U. S. FISH AND WILDLIFE SERVICE  
TRIP REPORTS FOR THE HAWAIIAN  
ISLANDS NATIONAL WILDLIFE REFUGE

compiled by

George H. Balazs



U. S. FISH AND WILDLIFE SERVICE TRIP REPORTS  
FOR  
THE HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE

compiled by

George H. Balazs  
Hawaii Institute of Marine Biology  
P. O. Box 1346  
Kaneohe, Hawaii 96744

December 1974



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Compiled, reviewed and duplicated during  
last week of December, 1974.

July 22-August 1, 1973	Expedition Report, HINWR- Olsen
June 1-5, 1973	" " " French Frigate Shoals- Olsen
May 27-June 2, 1973	Field Trip Report, HINWR
April 24-27, 1973	Expedition Report, HINWR- Olsen
September 3-17, 1972	" " "
May 4-11, 1972	" " " French Frigate Shoals- Olsen
May 13-20, 1971	" " "
July 15, 1971	Trip Report, Pearl and Hermes Reef
August 16-26, 1971	Expedition Report, HINWR
1970	Narrative Report (bound)- Kridler
April 12-16, 1970	Field Trip Report, HINWR
June 22, 1970	Pearl and Hermes
July, 1970	Expedition Report, French Frigate Shoals
August, 1970	Field Trip Report, HINWR, Nihoa
December, 1970	" " " " Pearl and Hermes
1969	Narrative Report (bound)- Kridler
February 9-13, 1969	Field Trip Report, HINWR
March 19-April 6, 1969	Spring Trip, HINWR
May 28-June 11, 1969	Field Trip, HINWR
August 19-September 23, 1969	Field Trip Report, HINWR
November 9-13, 1969	Expedition Report, Midway, Lisianski, and Laysan
September 1-December 31, 1967	Narrative Report, HINWR
May-June, 1967	Leeward Island Survey No. 20, French Frigate Shoals- Amerson
August-September, 1966	Leeward Survey No. 15, FFS Trip Report- Brian A. Harrington
June, 1966	" " No. 12 " " " Amerson, POBSP-S.I.
June 6, 1968	June trip to Hawaiian Islands Refuge-from Kridler to Regional
NO DATE (Aug 31, 1969 ?)	Progress Report No. 1, Populations and Movements of the Green Sea Turtle on the Hawaiian Islands National Wildlife Refuge



May 28-June 11, 1969      Tern- Lt (jg) Henry Cofrin      McVey on trip      two Ulua  
C. melampygus ; Carangoides equula

1971 Journal NWHI Trip      K.S. Norris      1 Lt (jg) Monsma

"loamy soil"      Audubon March, 1970

May-June, 1967      Lt(jg) Jack E. Rader      Example of recap data- 737-44156 banded: Sand, JI  
Cap &Release .....  
Cap &Release .....

June, 1966      Lt. Robert G. Bates C.O.

"wreck" May 1973 P & H

wreck (dive) 19 Aug - 23 Sept 1969



Miscellaneous notes taken during  
last week of December, 1974

May 28-June 11, 1969 Term-Lt (Jg) Henry Coffin McVey on trip two blue  
C. melanopygus; Caranxoides tenuis

1971 Journal WWII Trip K.E. Norris 1 Lt (Jg) Monama

"lamey soil" Audubon March, 1970

May-June, 1967 Lt (Jg) Rack E. Rabold Example of recap data- 737-44156 bands: 3 and 11

Cap Release .....  
Cap Release .....

June, 1966 Lt. Robert G. Bates C.O.

Island

Date

Carapace

Length St

Length Curv

Width St

Width Curv

Plastron

Length St

Width St

Weight

Sex



Trip Report Titles - BSFW KAILUA

May 1971 Pearl and Hermes - not prepared.

FFS 1971 May 13<sup>th</sup>-20<sup>th</sup> OLSEN, Kooka, Gilbert.

Pearl and Hermes 1971 July 15 HINWR P&H Trip Report.

Nihoa, Necker, <sup>FFS</sup> 1971 August 16 HINWR Expedition Report.

Many pages 1971 Sept 2-17 HINWR Trip Report <sup>ERIC</sup> Schlemmer

HINWR 1970 Narrative Report

? 1970 April 12-16 HINWR Field Trip Report - olsen

P&H 1970 June FTR

FFS 1970 July Expedition Report Kriedler

? 1970 August HINWR Kridler

? 1970 December HINWR FTR Kridler

1969 HINWR Narrative Report

Pearl & Hermes 1969 February 9-13 FTR

? 1969 <sup>MARCH 19</sup> April 6 HINWR 32pp

? 1969 May 25-June 1 ))



72 June 1-5 have  
73 May 27 - June 2 TR Knidler Lisian-P;H Layton Taylor  
73 March 11-18 TR Knidler-Olsen P;H  
73 April 24-27 ER Olsen clean-up have  
72 May 3-11 ER Olsen lots of turtles  
72 P;H June 25-29 Knidler

Turtle Folders on file 1) recapture data 2) misc.  
communications and reprint articles 3) old trip reports  
some carried out by F;G.

Concentration reported off Oahu, Haleiwa, Aina Haina, Barbers Point, Kuilima side  
of Kahuku. Lots of small ones 2/21/73 E.K. "all the old timers feel that there  
are fewer than previously" call 637-5689 ??

should read management study on turtles 1968 Sincock??  
American Scientist May 1965

Title Summary of World Sea Turtle Survival Situation IUCN NS Vol 2 No 11 April/June 69  
Gary Bloomfield 637-9208 Haleiwa--catches turtles

ITTSJ TURNER BEACH SANCTUARY LeBuff March/April 1970



Tagging since 1961 (?) by Hawaii Division of Fish and Game; Smithsonian personnel; Bureau personnel.

Midway-tagging at night? When tagging baskers, it is unknown if animals are sexually mature. Turtles seen to bask at night at P&H-hauling out at dusk.

Comment made that few baskers are seen at Laysan, in comparison to Lisianski. Platter size and Sub-A at both locations. A few pits at Laysan, P&H, Lisianski(?).

Laysan-30-35lb-few, but, may be more in water that are not basking.

FFS three animals-Aug 1965 tagged subsequently found in Nov 1969 at Lisianski (one is 66).

Aug-Sept: few basking at FFS but more at P&H.

Southeast and North Is. P&H: 40, 96 and 135 pounders. also 60-210lb range (ie 60, 125 and 155)

Formerly more nesting on Trig(?) Sept. 1969.

135 pounder at Necker.

Numerous tag returns at same tagging site.

Nihoa- 30-50lb swimming offshore.

Lisianski- CL 15 to 17 inches (n-8).

Whale-Skate 20 eggs seen in water. Stomach contents of May 30, 1973 male that died at Lisianski (32-1/2 x 25-1/4) ? *what happened to it ??*

April 29th 1973 turtle T19 at FFS (original tagging wt. 155lb), originally tagged May 4, 72 FFS.

Unique to be tagging males and less than sexually mature.

T736 originally tagged on 6/14/68; recovered by Olsen in water off Tern FFS 3-4/1969 plus?

Turtle A495 originally tagged at Lisianski 3/26/69; also at Lis on 7/24/73 (24 inch straight I

Growth rate of Subadult: originally tagged Lisianski on 9/25/67 (tag 64D) 155 lbs, return on 3/30/69 at Lisianski it weighed 145 lbs. Also same recovery date for tag 644, no weights given but stated that it grew 1/4" (originally tagged 9/26/67).

Note: Baskers equal Nesters (?)

Valuable to know total tagging # by site by year.

Egg laying appears to increase throughout the month of June.

Notes given throughout reports on the abundance of nesting (or basking)

No turtles seen at FFS during Sept 16 to 19, 1967, but one dead male tag 168 on back of Trig Island.

Few turtles observed at FFS on Aug 19 to Sept 23, 1969 trip.

Nihoa Finch transfer to Tern Island, FFS (n-27) made during March, 1967.



Tag recovery information found in  
Bureau reports on file (as of March, 1975) (not including Aug 31, 69)  
Progress report #1

Amerson- tag 96 original March 22, 1966 at Trig Is. FFS  
recaptured June 10, 1966 at WS, FFS

*Long range*  
Two animals recaptured at FFS during May-June, 1967 by Amerson, one was laying eggs  
1- tagged at P&H ← *in 69 report?*  
1- tagged at Laysan (female laying)

Necker Island recapture- originally tagged 426 female 30in 1551b March 10, 1967  
recaptured - Sept 15, 1967 Necker

*Long range*  
One animal originally tagged at P&H on March 21, 1965  
recaptured- December 13, 1967 Laysan Island ← *in 69 report*

*Long range*  
Two animals originally tagged at FFS and recovered at Lisianski-  
original tagging  
2-w/tag and plastic streamer put on FFS Aug, 1965  
1- no tag number on monel tag (only inscription)  
tag 66 Aug 26, 1965 FFS laying eggs (Amerson)

*PH → LAY*  
31 Aug 1969  
*PR & LAY*  
report

*FFS → LIS*  
Nov 9-13 1969  
occurred

Long range recoveries  
FROM AUGUST 1969 Report-

FFS to Oahu  
FFS to Molokai  
FFS to Hawaii  
FFS to Kauai  
FFS to P&H  
P&H to Laysan  
P&H to FFS

COMPILATION OF NO 1, 2 & 3

FFS to Oahu -- 10 (2F 2M)  
FFS to Kauai -- 8 (2F 1M)  
FFS to Molokai -- 4 (3F 1M)  
FFS to Maui -- 1 (1F)  
FFS to Hawaii -- 1 (1F)

2. FROM FIELD REPORTS (excluding any of above)-

FFS to Oahu 4 F  
FFS to Kauai 1 F  
FFS to P&H 2 F  
FFS to Lis 2 (1F&1M)  
Lis to FFS 2 F  
Lay to FFS 1 F

FFS to Laysan -- 0  
FFS to Lisianski -2 (2F)  
FFS to P&H -- 3 (2F)  
P&H to Lisianski - 0  
P&H to Laysan -- 1 (1F)  
P&H to FFS -- 1 (1M)

3. FROM HAND WRITTEN BASES OF TAG RETURNS-  
(excluding any of above)

FFS to Oahu 5 (3F&2M)  
FFS to Kauai 6 (5F&1M)  
FFS to Maui 1 F

Lisianski to P&H - 0  
Lisianski to Laysan - 0  
Lisianski to FFS -- 2 (2F)  
Laysan to Lisianski - 0  
Laysan to P&H -- 0  
Laysan to FFS -- 1 (1F)

NHI (excluding FFS) to Majors -- 0  
total - 34



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EXPEDITION REPORT  
Hawaiian Islands National Wildlife Refuge  
July 22 - August 1, 1973

Absence of  
prefix or inscription  
greatly confuses all  
FW Turtle tagging data

Personnel

David L. Olsen, Acting Wildlife Administrator  
John Sincock, Endangered Species Biologist, BSW, Kauai  
Dr. Leighton Taylor, Assistant Unit Leader - Cooperative  
Fisheries Unit, BSW, University of Hawaii  
Tom Telfer, Wildlife Biologist, Hawaii Division of Fish  
and Game, Kauai

Itinerary

- July 22 Scientific party flew to Midway via MAC flight.
- July 23 11:00 a.m. Scientific party boarded BUTTONWOOD and departed Midway enroute Lisianski.
- July 24 Arrived Lisianski 11:30 a.m. and completed cursory census of wildlife populations. Departed Lisianski 5:30 p.m. enroute Laysan.
- July 25 Arrived Laysan 9:00 a.m. Set up camp and completed seal and turtle counts. Conducted evening teal count.
- July 26 Completed Laysan finch transects and nest counts. Conducted fish survey with Taylor and evening teal count.
- July 27 Conducted early morning teal count and continued work with Laysan finch. Loaded out camp gear during early afternoon and conducted evening teal count. Scientific party departed Laysan 9:45 p.m. and BUTTONWOOD departed for French Frigate Shoals.
- July 28 Enroute French Frigate Shoals.
- July 29 BUTTONWOOD arrived off French Frigate Shoals 5:00 a.m. Inspected station rehabilitation project at Tern Island and discussed turtle tagging project with Lt. Trainor. Made repairs on Bureau Boston whaler. Visited Trig, Whale Skate, East and La Perouse Pinnacle and conducted "snorkel surveys" around each island. Party returned to BUTTONWOOD at 7:30 p.m.



- July 30 BUTTONWOOD departed for Necker at 2:30 a.m. after scuttling an "M boat." BUTTONWOOD arrived Necker 11:00 a.m. Landed on island and completed wildlife population census. Departed Necker 6:30 p.m. enroute Nihoa.
- July 31 BUTTONWOOD arrived off Nihoa 10:30 a.m. Party landed on island and completed finch and millerbird transects. BUTTONWOOD departed Nihoa 6:30 p.m. enroute Kauai.
- August 1 BUTTONWOOD arrived at Port Allen 7:00 a.m. and cleared Customs inspection. Departed Kauai 9:30 a.m. and arrived in Honolulu at 7:30 p.m.

### General

This trip constituted the annual inspection trip to the Hawaiian Islands National Wildlife Refuge. Upon formal request from the Bureau, the Commandant of the 14th Coast Guard District authorized travel of the scientific party on the Coast Guard cutter BUTTONWOOD. Detailed scheduling was worked out with LCDR Homer Purdy, commanding officer of the BUTTONWOOD.

The scientific party flew to Midway on July 22 and departed for Midway on the 23rd. Weather conditions during the trip were less than desirable since hurricane DORENE was situated south of the main Hawaiian Islands during the entire trip. Although skies were relatively clear, DORENE generated strong winds which were felt during the entire trip.

All islands of the refuge except Pearl and Hermes Reef and Gardner Pinnacles were visited. Pearl and Hermes had been visited several times earlier during the year while the seas were too rough to permit a landing on Gardner Pinnacles.

The primary objectives of the trip were as follows:

1. Conduct a cursory census of all wildlife populations on each island visited.
2. Conduct general survey of habitat conditions on all units of the refuge.
3. Conduct detailed population surveys for the threatened and endangered species found on the refuge including the following: Laysan teal, Laysan finch, Nihoa finch, Nihoa millerbird, green sea turtle, Hawaiian monk seal.



4. Conduct preliminary marine surveys. This was Dr. Taylor's first opportunity to visit many of the units within the refuge and his primary mission was to determine if any of the reefs and shoals around the refuge island would be suitable for future research studies.
5. Inspect the Tern Island and determine the status of the rehabilitation project including the Bureau lab-quarters facility.

### Lisianski Island

#### General

The scientific party spent only four hours on Lisianski. This was sufficient time to census the seal population, tag a few turtles and conduct a cursory census of the seabirds present.

#### Wildlife Populations

Only the dominant species of seabirds on the island were censused. A tape recorder was used for data recording, and the information collected is shown below:

Sooty Tern - Approximately 9,000 sooty terns were observed on the island. All chicks had apparently fledged. Class C

Common Noddy Tern - The island population was estimated at approximately 200 birds. Class C

Fairy Tern - The island population was estimated at approximately 50 birds. Some adults were noted on eggs and a few fully feathered chicks were noted. Class B

Red Tailed Tropicbird - Island population estimated at 150 birds.

Blue Faced Booby - A total of 365 blue faced boobies was observed. Most young were fully feathered. Class B

Brown Booby - A total of four adult brown boobies was observed. A single young bird was noted. Class B

Red Footed Booby - A total of 600 red footed booby chicks was noted. They varied in age from day-old chicks to almost fully feathered young. Class B



Frigatebird - A total of 880 frigatebird chicks was noted.  
They varied in age from day-old chicks to almost fully  
feathered young. Class C

Wandering Tattler - A single bird was observed.

Bristle Thighed Curlew - Approximately 100 birds were noted  
on the island. Class A

Ruddy Turnstone - Approximately 200 birds were noted along  
the shoreline around Lisianski. Class B

#### Studies of the Hawaiian Monk Seal

A seal census was conducted and the data are shown in the following table:

<u>Lisianski</u> <u>Seal Census Data</u>						
<u>Adults</u>			<u>Subadults</u>		<u>Pups</u>	<u>Total</u>
<u>M</u>	<u>F</u>	<u>Unk</u>	<u>M</u>	<u>Unk</u>	<u>Unk</u>	
5	2	69	1	10	16	103

A total of three previously tagged seals was observed, and the data are shown below. Only one of the nine seals tagged on Lisianski Island during 1971 was observed; however, both animals tagged on Lisianski during 1972 were again observed during this visit.

<u>Tag No.</u>	<u>Age</u>	<u>Date Originally Tagged</u>
1004	SA	9-5-71 (Also observed 5-30-73)
1070	SA	9-10-72
1071	SA	9-10-72

#### Studies of the Green Sea Turtle

While walking the shoreline, several turtle pits were observed. Judging from the condition of the surrounding vegetation, the shape of the pits, three were considered to be "good" viable pits.

A total of seven green sea turtles was observed basking on the beach during our visit to Lisianski. Three were previously tagged while, as shown in the following table, the remaining four were newly tagged.



Lisianski

Turtle Return Data

<u>Tag No.</u>	<u>Sex</u>	<u>Plastron Length</u>	<u>Plastron Width</u>	<u>Thick-ness</u>	<u>Carapace Length</u>	<u>Round Meas.</u>	<u>Wt.</u>	<u>Date</u>
A 495	F	19.4	18.8	9.2	24.2	Not taken		7/24/73
		Original tagging information				26x23	70#	3/26/69
877	M	25.4	24.1	11.9	30.1	No original tagging info.		
1051	M	23.9	23.3	10.1	30.2	No original tagging info.		

Newly Tagged Turtles

260	F	35.2	28.7	13.9	37.7	Not taken		
261	?	13.8	12.8	6.2	16.6	Not taken		
262	F	26.3	25.7	11.5	32.6	Not taken		
263	M	26.7	25.0	12.0	32.7	Not taken		

Vegetative Studies

The Cinchrus which for several years appeared to be on the increase now appears to be declining. Sincok walked toward the center of the island in several places and noted very little Cinchrus remaining. Possibly, the density of Cinchrus varies with the amount of precipitation the island receives.

During the 1972 survey, a small rooted coconut was observed along the south shoreline of the island. It was speculated at the time that it could have survived; however, high surf conditions during the winter apparently washed the tree away.

The Scaevola Sp. on the south and east sides of Lisianski appeared to have been drastically affected by some disease. Fully matured leaves had turned brown, withered and dropped off. This disease must have hit the island rapidly, since it was not reported by Kridler during his visit to the island in May. The effects of the disease were not exclusively confined to the



areas adjacent to the shoreline for extensive areas of diseased vegetation were noted within the interior of the island. The north and west shoreline of the island did not seem to be quite as severely affected. The disease was apparently species specific for the effects of it were not seen on other vegetation. Samples of the diseased vegetation were collected for analysis.

## Laysan Island

### General

The scientific party spent a total of three days on Laysan collecting wildlife population data. Special consideration was given to conducting Laysan teal counts since the population has been fluctuating rather drastically over the past few years. The finch transects were conducted; the seals were counted, and as time permitted, other seabirds were censused.

Although hurricane DORENE was situated some 800 miles to the southeast, the effects of this storm were felt while the party was on Laysan. Winds remained a constant 25-35 knots during the entire period and censusing conditions were less than ideal.

It was apparent that this had been an extremely dry year on Laysan for the water level in the lagoon was one inch lower than the bottom of the gauge. This was the lowest level recorded since the gauge was installed during 1965. The lagoon level was so low that most of the north and south ends of the lake were dry, thus exposing extensive areas of mud flat. Taylor and Olsen snorkeled in the lagoon, examining the bottom fauna. They found that the depths in the center of the lagoon varied between 12 and 15 feet.

The minimum and maximum thermometer on Laysan showed temperatures of  $38^{\circ}$  and  $86^{\circ}$  respectively. The minimum figure appears to be unreasonably low; however, it was double checked.

### Wildlife Populations

The island was divided into quarters, and each member of the party was assigned the responsibility of censusing selected seabird populations in his area. The data collected are shown in the following table:



## Seabird Populations on Laysan Island

- Sooty Tern - Present, however, very few chicks remained. The last remaining colony along the southeast portion of the island contained approximately 33,000 birds. Class C
- Laysan Albatross - Chicks fully feathered--most were capable of flight. A total of 13,000 dead chicks was noted around the lagoon. Class B
- Grey backed Tern - Chicks present--no counts made.
- Fairy Tern - Most chicks were fully grown. The island population estimated at less than 50 birds. Class C
- Christmas Island Shearwater - Present; no counts made.
- Wedge Tailed Shearwater - Present; no counts made.
- Red Tailed Tropicbirds - Only eight adults were actually censused; however, it was estimated that the island population did not exceed 100 birds. A single chick was noted. Class B
- Blue Faced Booby - A total of 56 adults was observed in the interior of the island. There was undoubtedly a greater number along the shoreline, and it was estimated that the island population was less than 200 birds. Class C
- Brown Booby - A single adult brown booby was noted.
- Red Footed Booby - A total of 311 red footed boobies was censused on the island. Only two chicks were noted. Class C
- Frigatebirds - A total of 966 frigatebirds was censused, and it was estimated that no less than 1,200 birds were utilizing the island. Approximately 129 chicks were observed. Class C
- Bristle Thighed Curlews - Approximately 80 bristle thighed curlews were observed, and it was estimated that approximately 100 birds were utilizing the island. Class B
- Ruddy Turnstone - Only 215 turnstones were noted. A significant increase can be expected with the advent of the fall migration. Class B



Golden Plover - A total of 10 plovers was observed. Class B

### Studies of the Laysan Teal

One of the primary objectives of the visit to Laysan was to census the teal population. Over the past several years it has been determined that the most reliable teal counts can be obtained during dawn and dusk lagoon counts. The usual method involves one observer stationing himself along the west shore of the lagoon while two other observers walk from the north and southwest ends of the lagoon toward the middle, meeting there. Using this method, the following counts were obtained.

#### July 25 - Sunset Count

1 brood containing 5 young - all capable of flight (6)  
1 brood containing 2 young - Class 2 C (3)  
2 "older type" adults - typical white eye patch  
14 other teal - unable to determine age

Total - 25 birds

The legs on all birds were seen and no bands were observed.

#### July 26 - Sunset Count

A total of 13 birds was observed. The same broods of five and two were observed, and the remainder was made up of "other birds."

#### July 27 - Sunrise Count

A total of 20 birds was censused--no breakdown of broods and age was obtained. In addition, two dead birds were found along the edge of the lagoon. Both had been dead for possibly over a month for the carcasses had dried. One of the birds was banded (615-30558), and the records indicated that this bird was originally banded as an adult on 3/26/66.

#### July 28 - Sunset Count

A total of 16 birds was censused, and all were observed along the eastern shore of the lagoon. A freshly dead duckling (Class 3) was found along the shoreline and collected.



## Studies of the Laysan Teal (Cont'd)

Censusing conditions were poor and high winds prevailed throughout most of the period. In spite of these less than ideal conditions, it was still our conclusion that there were less than 30 Laysan teal existing on the island. During previous years, substantial numbers of birds were observed while the finch transects were being conducted, however, during this visit only a single teal was observed, thus substantiating our cause for concern.

The reasons for the decline in the teal population are unknown, and we can only speculate concerning causes. Extremely dry conditions prevailed on Laysan and the lagoon level was lower than it has ever before been recorded. Extensive mud flats were evident between protective areas of vegetation and the open water. Certainly, young teal would have been more vulnerable to predation by frigate birds. Another possible reason for this decline might be a reduction in the available food supply. From field observations, we suspect that a teal food habits study would show that brine flies and insects make up their primary diet. However, base line studies with respect to abundance of these insects have not been conducted. A cursory survey of the lagoon was conducted by Taylor and Olsen and samples of brine shrimp, fly eggs and water were collected for analysis.

As a result of this decline in teal population it is recommended that high priority be given to placing a team of competent waterfowl biologists on Laysan Island for an extended period of time during the spring and early summer of 1974. Hopefully, they could spend a considerable amount of time simply observing the birds and attempting to determine if anything can be done to protect and/or enhance the few remaining Laysan teal.

Primary objective of this research should be directed toward the following:

1. Review previous census methods and if necessary recommend necessary changes in techniques.
2. Collect basic data on the formation of pair bonds nesting etc.
3. Study the effect of predation on the teal population.
4. By field observation, attempt to determine information on food habits.
5. Identification of any other factors which appear to be affecting the teal population.



Studies of the Hawaiian Monk Seal

A seal census was completed on the afternoon of July 26 and the data are shown in the following tables.

SEAL CENSUS DATA

<u>Adults</u>			<u>Sub Adults</u>	<u>Pups</u>		<u>Total</u>
Male	Female	Unk	Unknown	Male	Unknown	
7	6	68	40	1	35	157

SEAL RETURN DATA  
Laysan Island  
July 25, 1973

<u>Tag #</u>	<u>Location</u>	<u>Tag Date</u>	<u>Age</u>	<u>Sex</u>	<u>Location</u>	<u>Previous Returns</u>
A 197	Laysan	9/21/67	Y	M	Laysan	0
200	Laysan	9/21/67	Y	M	Laysan	4
931	Laysan	8/13/70	P	F	Laysan	2
939	Laysan	8/21/70	P	F	Linsianski	0
942	Laysan	8/17/70	P	M	Laysan	1
944	Laysan	8/17/70	P	F	Laysan	2
1018	Laysan	9/7/71	P	M	Laysan	1
1072	Laysan	(unable to locate original tag information)				

Studies of the Green Sea turtle

Three adult turtles were observed basing on the beach at Laysan. All were turned and two were tagged. The third No. 1013 was a retrapped animal.

Turtle Tagging Data

<u>Tag No.</u>	<u>Sex</u>	<u>Plastron</u>		<u>Thickness</u>	<u>Carapace Length</u>
		<u>Width</u>	<u>Length</u>		
1264	F	25.6	26.9	14.4	30.6
1265	F	24.1	22.4	11.6	27.5
1013	M	26.2	26.6	13.6	32.1

MOST BE  
"TS"

OR  
A?

ALAN kam

All of the above must be with Calipers



## Studies of the Laysan Finch

A total of 400 clumps of Eragrostis were checked for the presence of finch nests. Two fresh nests were found, however, there was no evidence of eggs. Two older nests were also found and they appeared to be the efforts of last years nesting.

A total of 120 random transects were run. Each measured 300 ft. long by 16.5 ft wide. Five observers helped in the census, and a total of 327 birds was counted on transect. Using the accepted formula for determining the population estimate, shown below, a population of 12,350 birds was calculated.

$$\text{Total birds} = \frac{\text{Number observed} \times \text{total vegetation}}{\text{Area sampled}}$$

$$\text{Total birds} = \frac{327 \times 2,243,400}{120 \times 16.5 \times 300} = \frac{733,591,800}{59,400} = 12,350$$

Raw field data are included in Table 5. Standard deviation was calculated at the 95% confidence level and the population was estimated at 12,350  $\pm$  23.8% or from 10,004 to 14,696.

$$s = \frac{n(EX^2) - (EX)^2}{n^2}$$

$$E x = 1959$$

$$s = \frac{120(1959) - (327)^2}{(120)^2}$$

$$E x = 327$$

$$n = 120$$

$$s = 235,080 - 106,929$$

$$95\% \text{ CL} = M \pm t_{.05} \times s\bar{x}$$

$$s = 8.8993$$

$$= 2.73 \pm 1.98 \times 0.272$$

$$s = 2.9831$$

$$= 2.73 \pm 0.539$$

$$s = 2.9831$$

$$= 2.73 \pm 19.7\%$$

$$s\bar{x} = 2.9831$$

$$= 12,350 \pm 2,346$$

$$s\bar{x} = 0.2723$$

$$= 10,004 \text{ to } 14,696$$



Table  
LAYSAN FINCH TRANSECT DATA

Transect Finch

1	0
2	0
3	4
4	0
5	1
6	3
7	2
8	1
9	7
10	4
11	2
12	0
13	2
14	7
15	0
16	0
17	6
18	4
19	0
20	2
21	1
22	2
23	1
24	0
25	0
26	2
27	1
28	0
29	8
30	3
31	9
32	3
33	0
34	4
35	0
36	5
37	0
38	2
39	2
40	0
41	1
42	1
43	2
44	0
45	1
46	0
47	1
48	2
49	0
50	2

Transect Finch

51	3
52	0
53	2
54	0
55	3
56	1
57	1
58	5
59	1
60	0
61	1
62	1
63	1
64	6
65	1
66	1
67	3
68	5
69	16
70	18
71	0
72	4
73	6
74	4
75	0
76	4
77	0
78	2
79	2
80	3
81	2
82	3
83	4
84	3
85	2
86	4
87	2
88	0
89	3
90	11
91	4
92	1
93	3
94	1
95	0
96	3
97	1
98	8
99	7
100	2

Transect Finch

101	5
102	3
103	1
104	6
105	3
106	3
107	1
108	7
109	6
110	1
111	8
112	6
113	5
114	1
115	0
116	4
117	4
118	3
119	0
120	4
	<u>327</u>

Telfer 1-31  
Taylor 31-60  
Sincock 61-90  
Olsen 91-120



## Marine Survey

Dr. Taylor conducted an "ichthionarcotic station" on the outside of the reef on the west side of Laysan. The specimens were collected, identified and reported on, in Taylor's report "Preliminary Observations of the Inshore Marine Ecosystem on the Leeward Hawaiian Islands", August 1973. Taylor's most significant find was the collection of a single specimen of Piopropona N. SP., commonly called the "Wrass Ass Bass". This was the second specimen known to science and it will be described and subsequently named.

## French Frigate Shoals

### General

A single day was spent at French Frigate Shoals and the primary objective of our work was to give Dr. Taylor an opportunity to make a cursory survey of the marine fauna. The Bureau's new Grand Zodiac rubber boat, approximately named the "Z bird", provided transportation between the islets.

A short inspection trip was made of the new lab quarters facility at Tern Island. It was evident that additional equipment will be necessary to fill space. The following items should be acquired for this facility:

- 1 desk
- 1 laboratory work table
- 2 double bunk beds and mattresses
- 2 wall lockers
- cabinets to be fastened over the counter

The 60 HP Evenrude Motor was removed from the Boston Whaler and taken back to Honolulu for repairs and a tuneup.

### Marine Surveys

Telfer, Olsen and Taylor snorkeled at the following locations:

<u>Location</u>	<u>Depth</u>	<u>Time</u>	<u>Activity</u>
West end of Trig	15 ft.	15 min.	General survey - Observed <u>Epibilus</u>
North end Whale Skate	15 ft.	20 min.	Photography- seal, turtles and rays
East Island	30 ft.	30 min.	Photography- Coral turtles
La Perouse Pinnacle	35 ft.	30 min.	General survey



## Studies of the Green Sea Turtle

Several turtles were noted swimming in the waters adjacent to the islets. A single basking turtle was observed on Whale Skate.

Both East and Whale Skate Islands appears to have been literally "torn up" by turtle digging. On Whale Skate especially, there was very little land left that had not been disrupted by turtle activity.

Lt. J.G. Trainor, the Commanding Officer at Tern Island, reported that the first hatch of young turtles was reported on the night of July 27, 1973. Approximately 50 young turtles were picked up around the station and released into the ocean. Ghost crabs had been observed eating a number of hatchlings.

### Necker Island

#### General

Sea conditions were "moderate" and a landing was made at the "sign site" near the Northwest Cape. A heavy mat was placed over the bow of the ship's boat, and the party jumped to the shoreline from the bow.

#### Wildlife Populations

A wildlife census of the seabirds was conducted and the data are shown in the following table:

##### Seabird Populations - Necker

<u>Species</u>	<u>No.</u>	<u>Comments and Data</u>	<u>Class</u>
<u>Sooty Tern</u>	190	fully feathered chicks remained on the island. Several thousand adults were observed flying around the island.	C
<u>Grey Backed Tern</u>	160	Chicks of varying sizes were observed and approximately 25 were still incubating.	C
<u>Blue Grey Noddy Tern</u>	40		C
<u>Common Noddy Tern</u>	11,000 800	Adults and Chicks Eggs also present.	C
<u>Fairy Tern</u>	200 50	Adults and Chicks were observed	B



## Seabirds Populations/Necker (Cont'd)

<u>Species</u>	<u>No.</u>	<u>Comments and Data</u>	<u>Class</u>
<u>Laysan Albatross</u>	40	Fully feathered chicks were observed.	A
<u>Wedge-tailed Shearwaters</u>	275	Nesting adults.	C
<u>Bulwers Petrels</u>		No population estimate was made. Many were heard "barking" deep in their burrows.	
<u>Red Tailed Tropicbirds</u>	95	Adults and chicks.	B
<u>Red Footed Booby</u>	108	Adults and chicks.	A
<u>Blue Faced Booby</u>	190	Chicks and adults.	A
<u>Frigatebird</u>	374	Chicks and adults.	
<u>Ruddy Turnstone</u>	A flock of 30 was observed near Cleopatra's pool.		

### Studies of the Hawaiian Monk Seal

A total of 18 seals were observed on Necker. All were adults, and no tagged animals were observed.

### Studies of the Green Sea Turtle

A single dead specimen was found along the shelf adjacent to shark cove. It had apparently been dead for some time and the cause for its death could not be determined.

### Marine Investigations

Dr. Taylor and two divers from the BUTTONWOOD dove adjacent to the landing near Northwest Cape. The depth adjacent to the shoreline was approximately 45 ft. and they dove for approximately 45 minutes. Several grey reef sharks remained near them throughout the duration of the dive. A tiger shark, judged to be approximately 10 ft., also cruised by the divers, and although he showed no aggressive movements, his size alone had the divers clinging to the bottom like "Opahi's".

Three turtles were also observed sleeping under a ledge near the landing at a depth of approximately 45 ft.



## Nihoa Island

### General

The effects of Hurricane DORENE were still being felt and during the morning we arrived off Nihoa, winds had shifted to the south east with velocities of from 25 to 30 knots. Had the winds shifted to the south, a landing would have been impossible.

Again, thanks to an expert coxswain on the ship's boat, we were able to land by jumping directly from the boat to the ledge.

Habitat conditions on Nihoa were extremely dry, and water was only present in a few seeps. Nihoa finch were concentrated around these areas. The minimum and maximum thermometer read 64°F and 76°F respectively.

### Wildlife Populations

The island was divided into 5 areas and each observer not only ran finch and millerbird transects, but censused the more obvious sea-bird populations. The data collected are shown in the following table:

<u>Species</u>	<u>No.</u>	<u>Data Class</u>	
Sooty Tern	3,000	C	
Grey Back Tern	1,500	C	
Common Noddy Tern	4,000	C	
Fairy Tern	2,000	D	
Blue Grey Noddy Tern	150	B	
Laysan Albatross	20	A	Fully feathered chicks
Wedge Tailed Shearwaters	500	D	
Bulwers Petrel	400	D	
Red Tailed Tropicbird	150	C	
Brown Booby	15	A	
Blue Faced Booby	300	C	
Red Footed Booby	350	C	
Frigatebirds	2,000	C	

### Studies of the Hawaiian Monk Seals

A total of 4 seals were observed noted basking on the beach at Darby's landing.



Studies of the Nihoa Finch

Fifty random transects were conducted on Nihoa. Each transect measured 16.5 feet wide by 250 feet long and the total area sampled was 4.7348 acres. A total of 40 birds was counted on transect. Using the accepted method of calculating the population the total finch count was 1,318.

$$\text{Total birds} = \frac{\text{Number counted} \times \text{total area}}{\text{Area sampled}}$$

$$\text{Total birds} = \frac{40 \times 156 \text{ acres}}{50 \times 250 \times 16.5} = \frac{6240}{43,560}$$

$$\text{Total birds} = \frac{6240}{4.7348} = 1,318$$

Standard deviation was calculated and at the 95% confidence level the population is  $1,318 \pm 32.3\%$  or from 892 to 1,744.

$$s = \sqrt{\frac{n(\sum x^2) - (\sum x)^2}{n^2}}$$

$$s = \sqrt{\frac{50(74) - (40)^2}{2500}}$$

$$s = 0.94$$

$$s \approx 0.91$$

$$s_x = \frac{s}{n}$$

$$s_x = \frac{0.91}{7.071}$$

$$s_x = 0.1286$$

$$\sum x^2 = 74$$

$$\sum x = 40$$

$$n = 50$$

$$m = .80$$

$$95\% \text{ CL} = m \pm t_{.05} \times .1286$$

$$= .80 \pm 2.008 \times .1286$$

$$= .80 \pm .25$$

$$= .80n \pm 32.3\%$$



Studies of the Nihoa Millerbird

Fifty random transects were conducted on Nihoa. Each transect measured 16.5 feet wide by 250 feet long and the total area sampled was 4.7348 acres. A total of 6 birds was counted on transect. Using the accepted method of calculating the population, the total millerbird count was 198.

$$\text{Total Birds} = \frac{\text{Number counted X total area}}{\text{Area sampled}}$$

$$\text{Total Birds} = \frac{936}{4.7348} = 198$$

Standard deviation was calculated and at the 95% confidence level the population was estimated to be 198 + 76.89%, or from 46 to 350. The low confidence limits are due to the degree of variability in the transect data.

$$s = \sqrt{\frac{n(\sum Ex^2) - (\sum Ex)^2}{n^2}}$$

$$\sum Ex^2 = 6$$

$$s = \sqrt{\frac{550(6)(6)^2}{(50)^2}}$$

$$\sum Ex = 6$$

$$n = 50$$

$$s = \sqrt{\frac{300-36}{2500}}$$

$$m = .12$$

$$95CL = M \pm T.05 \times .0459$$

$$s = \sqrt{0.7056}$$

$$= .12 \pm 2.008 \times .0459$$

$$s = .3249$$

$$= .12 \pm .0921$$

$$= .12 \pm 76.890$$

$$sx = \frac{.3249}{50}$$

$$sx = \frac{.3249}{7.0701}$$

$$sx = .0459$$



LIBRARY OF  
GEORGE H. BALAZS

HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE  
EXPEDITION REPORT  
FRENCH FRIGATE SHOALS  
JUNE 1-5, 1973

PERSONNEL

David L. Olsen, Acting Wildlife Administrator  
George Balazs, Marine Biologist, Hawaii Institute of Marine Biology  
John Wheeler, Hawaii Institute of Marine Biology

ITINERARY

- June 1 Depart Kailua 7:00 AM for Honolulu. Via FAA DC-3 departed Honolulu Airport 8:30 AM and arrived Tern Island, French Frigate Shoals 11:30 AM. Conducted aerial census of seals and turtles on the islets. Began collecting equipment and organizing work plan.
- June 2 Continued organizing equipment and moving into new Bureau lab facility at Tern Island. Made first visit to Trig and Whale Skate Islands. Presented slide talk on the Hawaiian Islands Refuge to crew at Tern Island.
- June 3 Visited La Perouse Pinnacle and collected rock samples for the University of New Mexico. Visited East and Whale Skate Islands and spent the night at East Island.
- June 4 Returned to Tern Island during the morning. Afternoon visited Gin and Little Gin Islands and returned to East Island, again spending the night.
- June 5 Returned to Tern Island and at 2:00 PM departed via FAA DC-3 for Honolulu. Arrived Honolulu 5:00 PM and via personal vehicle arrived Kailua 6:30 PM.

GENERAL

The primary purpose of this visit was to introduce Messrs. George Balazs and John Wheeler from the Hawaii Institute of Marine Biology to the area. They learned operational procedures using the Bureau Boston whaler and



also gained an appreciation for navigating between the reefs and shoals within the atoll.

Two nights were spent on East Island in an effort to familiarize them with problems which might be encountered in working with nesting turtles. The ultimate objective of their studies was to eventually arrive at a turtle nesting population for French Frigate Shoals. After observing numerous baskers on each of the islets, and the nesting attempts at night, it was decided that the best way to collect meaningful information was to spray numbers on the backs of turtles as they attempted to dig a nest pit. Only if the animal actually laid eggs would she be tagged. A relationship could then be developed between those turtles which came up to dig false pits and those which actually laid eggs. Theoretically, by applying this information to all islets, the actual number of turtle nests could be determined.

Although most of the time was spent working with the turtle population, an aerial seal census was conducted and cursory wildlife population estimates were made on several of the islets.

#### WILDLIFE POPULATIONS

All of the islets except Disappearing, Shark, Round and Mullet were visited during the stay. Bird population estimates were made on Trig, East and Gin Islands and the data are shown below.

##### East Island

Black-footed Albatross	550 chicks	Class A
Laysan Albatross	160 chicks	Class A
Wedgetailed Shearwaters	present in unknown numbers	
Red-tailed Tropicbirds	10 adults on eggs and small chicks	
Red-footed Boobies	50 adults	Class B
Blue-faced Boobies	30 adults - 15 adults were on eggs while the others had young chicks	
Sooty Terns	72,000 adults - approximately 50% of the birds had small chicks while the remainder were on eggs	



Gin Islands

Black-footed Albatross	160 chicks	Class A
Blue-faced Boobies	56 adults	Class A (on chicks and eggs)

Trig Island

Laysan Albatross	40 chicks	Class A
Blue-faced Boobies	45 adults	Class A
Sooty Terns	12,000 adults	Class C (young chicks and eggs)

STUDIES OF THE HAWAIIAN MONK SEAL

An aerial seal census was conducted on June 1 and more accurate ground count data were included for those islets visited during the period.

Seal Census Data

<u>Islet</u>	<u>Number of Animals</u>
Disappearing	30
Sandspits	17
Gin Islands	5
Little Gin	8
Sand Spits	4
Whale Skate	35
Trig	20
Trig Spits	7
Shark	3
Round	15



<u>Islet (cont.)</u>	<u>Number of Animals (cont.)</u>
Mullet	7
East	<u>45</u>
TOTAL	196

### STUDIES OF THE GREEN SEA TURTLE

An aerial census of green sea turtles was conducted on June 1 and more accurate ground count data were included for those islands visited during the period. Data collected are shown in the following table:

#### Turtle Population Data

<u>Islet</u>	<u>Baskers</u>	<u>In Water</u>
Trig	6	
Gin	4	4
Little Gin	1	
Whale Skate	11	
La Perouse		1

A turtle pit count was also conducted and efforts were made to include only those pits which appeared as though they might contain eggs. This rather subjective count is shown in the following table:

#### Turtle Pit Count

<u>Islet</u>	<u>Number of Animals</u>
East	36
Whale Skate	37
Trig	3
<del>East</del>	<del>37</del>
Gin	5



<u>Islet (cont.)</u>	<u>Number of Animals (cont.)</u>
Little Gin	10
Tern	<u>19</u>
TOTAL	147

A single previously tagged animal was observed at East Island and the previously recorded data on this animal are shown below:

<u>Tag #</u>	<u>Sex</u>	<u>Location</u>	<u>Date</u>	<u>Carapace Length</u>	<u>Carapace Width</u>	<u>Plastron Length</u>	<u>Thick.</u>	<u>Round Meas.</u>	<u>Weight</u>
Tern March 69 736	F	East Is.	6/14/68	No measurements taken					
	F	Trig Is.	5/17/71	37.8	28.6	29.9	13.7	40 x 36- 1/2	270
	F	Trig Is.	5/5/72	37-1/4	29.0	30	13-1/2	39 x 37	275
	F	East Is.	6/2/73	37-1/4	29-1/2	30-1/2	flippers missing		



MAY 27 - June 2, 1973

slow growth  
of SA - his

the population became relatively stable. Cause for the decline is unknown. Since this island is visited usually but once, and occasionally twice a year for only a day or so, human disturbance cannot be much of a factor.

The meagre data collected to date on productivity indicates that the usual number of pups were produced this year, 19. Of those recorded, 12 had already been weaned. The presence of some small pups, including one born but a day or so prior to the visit, plus several pregnant females shows that the pupping season was still not complete.

A number of seals had scars resembling those which might have been made by sharks. One adult had its rear flippers completely bitten off, while another was missing part of its left rear flipper. Although no sharks were noted this time near the island in about 12 hours of snorkeling and SCUBA diving by 5 men, during other visits they are frequently noted and are especially abundant in the shallow water of the ship anchorage several miles off the west shore.

During the May 29 ground count, some attempt was made to sex all animals, except nursing pups, before they escaped into the sea. This was accomplished with as little harassment as possible, and no special effort was made to prevent animals from escaping in order to obtain its sex. As a result about 59% of the adults were sexed. These showed an age ratio of 1 male per 1.8 females. Less than half of the wilder subadults were sexed, and a ratio of 1 male to 5 females was obtained. The sample is too small to rely on heavily. Of the 12 weaned pups sexed, the ratio was 1.1.

Moult data collected on 42 of the 58 adults counted on May 29 showed that 14.3% were moulting, 21.4% had moulted while 64.3% had not moulted. The proportions were about the same for both males and females. None of the females still nursing pups had moulted.

Since enough animals (over 800) had been tagged the past 6 years, this part of the study has been discontinued and the main effort is to obtain tag return information. Tag return data for this trip is shown on the following page. Four other tagged animals escaped into the ocean before their tags could be read.

LISIANSKI MAY 30, 73

Green Sea Turtle:

A total of 18 turtles were observed, and of these 3 were tagged and 5 were returns from previous taggings. Nine of the total were large adult animals while the others were small, about platter size or slightly larger. One male whose carapace taped at 32 1/2 x 25 1/4 inches was found hauled up on the east beach on May 29 with its tail bitten off to the base. The animal died overnight. The stomach contents were collected for later analysis. One other was captured in the water by swimming out to it and grabbing it as it dozed at the surface. Tagging and return data are as follows:

and the shell saved for the Captain at  
Midway!



Turtle Return Data

Lisianski Island

<u>No.</u>	<u>Date</u>	<u>Sex</u>	<u>CL</u>	<u>CW</u>	<u>PL</u>	<u>TH</u>	<u>CL</u>	<u>CW</u>	<u>WT.</u>	<u>Island</u>
399	8/21/70	F	15.5	12.5	12.6	5.6	16 X	14 1/2	NT	Lisianski
	5/30/73	F	16.4	13.2	13.5	6.1	17 1/2 X	15 3/8	NT	Lisianski
429	3/20/67	F	Not taken				17 1/4 X	15 1/2	NT	Lisianski
	5/30/73	F	21.6	18.0	18.3	8.5	23 X	21	NT	Lisianski
1011	9/5/71	F								
	5/30/73	F	Not taken				Not taken			Lisianski
1078	9/5/71		15.7	13.7	12.6	5.3	Not taken		20	Lisianski
	5/30/73		17.0	14.6	13.8	6.4	18 1/8 X	16 5/8	NT	Lisianski
1211	9/5/72	F	27.3	21.8	22.2	10.3				Lisianski
	5/30/73		Not taken				Not taken			Lisianski



Turtles Tagged on Lisianski Island

<u>Tag No.</u>	<u>Age</u>	<u>Sex</u>	<u>Straight Line</u>			<u>Thickness</u>	<u>Tape</u>		
			<u>Carapace Length</u>	<u>Carapace Width</u>	<u>Plastron Length</u>		<u>Length</u>	<u>Width</u>	<u>WT.</u>
T256	A	F	26.5	21.7	21.8	10.5	29 1/4	26	*NT
T257	A	F	26.9	22.0	21.8	10.7	28 7/8	26	3.4 NT
T258	A	M	36.1	27.2	29.4	14.2	38	35 3/8	NT

\* NT - Not taken



appeared normal with no unusual mortality. Frigatebird nests contained mainly eggs or small chicks. Blue-faced Booby had 80-90% small chicks. Eragrostis was thriving. Two Laysan Finch were seen briefly. No turtle pits were seen. 12 large animals were noted in the water in the cover where they usually haul up, but none came ashore.

Grass Island: Nothing of an unusual nature to report. A Bonin Island Petrel chick was found in a burrow. An estimated 3,000 Laysan albatross were present. Four Frigatebird nests with eggs were recorded. A lone Tropicbird found was incubating an egg. Two newly constructed turtle pits were found but not dug into to check for eggs. Again, time prevented. Eight Laysan Finch but only 1 newly constructed nest with no contents were also found.

Hawaiian Monk Seal: An aerial census of the unit was conducted on May 31 with the following results:

Aerial Seal Census-Pearl & Hermes Reef

May 31, 1973

<u>Island</u>	<u>Number of Animals</u>		
	<u>Adults</u>	<u>Pups</u>	<u>Total</u>
Southeast	5	1	6
North	3	1	4
Little North	2		2
Wreck	1		1
Bird	3	1	4
Sandspits	4		4
Grass	2	1	3
Seal	3	2	5
Kittery	7		7
Total	<u>30</u>	<u>6</u>	<u>36</u>

MAY 31, 73

This is the lowest number of seals seen on Pearl and Hermes Reef since regular counts were initiated in 1964. No reason can be found for the gradual decline unless it is excessive predation by sharks. This unit is not visited anymore than is French Frigate Shoals, actually somewhat less so, yet the population there continues to increase in recent years. The slight human disturbance caused by our brief visits (several days at a time on Southeast Island 2-3 times a year) cannot be a cause. We are not getting many returns of tagged seals considering the number which have been tagged there. During this trip, no tagged seals were seen.

Green Sea Turtle:

No animals were tagged or recaptured this trip. None were ashore while we were there. A total of 19 were seen from the air, 6 off Southeast Island,



see p. 21  
19 Aug - 23 Sept 1969  
"WRECK"

1 off the Wreck and 12 off North Island. All were large. Two newly dug pits were found on Grass Island but none on the others.

Laysan Finch:

No transects to determine population size were run this trip. This was done on the March trip. All Eragrostis clumps were searched on May 29 for nests with the following results:

New nest but no eggs	1
Nest w/1 egg	0
Nest w/2 eggs	1
Nest w/3 eggs	3
Nest w/4 eggs	1
Nest w/5 eggs	1
Nest w/2 nestlings	1
Total nests	<u>8</u>

Some searching for nests was done of the small Solanum clumps and some of the Setaria from which birds were flushed but with negative results.

On Grass Island 8 finch plus 1 newly constructed but empty nest were tallied, and 2 adults were seen on North Island.

The patch of Eragrostis which died several years ago in the middle of the large part of Southeast has never come back. Hawaiian noddy terns continue to utilize the tops of the clumps remaining on the smaller western part and beat them down. When searching through the clumps for finch nests, some of the noddies were flushed from their nests, and a finch was observed to fly up to one nest and peck a hole in the egg. It lost interest thereafter and did not eat any of the egg. If the noddies destroy the remaining few bunches of Eragrostis a question arises on just how this will affect the finches which prefer this grass as nesting habitat although nests have been found in other types of vegetation.

Fish and Other Marine Life

To be reported upon later upon receipt of Dr. Taylor's report.



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EXPEDITION REPORT

Hawaiian Islands National Wildlife Refuge  
April 24-27, 1973

*1/ month before 1973 nesting season study*

Personnel

David L. Olsen - Acting Wildlife Administrator

Itinerary

- April 24 Depart Kailua 7:00 AM for Honolulu via FAA DC 3 departed Honolulu International Airport 8:30 AM and arrived Tern Island, French Frigate Shoals 11:30 AM. Conducted aerial census of seals and turtles and visited East Island.
- April 25 With 6 man work party, began "Operation Cleanup" at East Island.
- April 26 Continued with "Operation Cleanup" at East Island.
- April 27 Conferred with station officials regarding rehabilitation project and planned research studies. Depart Tern Island via DC 3 and arrived in Honolulu 5:00 PM. Returned via Govt vehicle to Kailua at 6PM.

General

The primary purpose of this visit to French Frigate Shoals was to supervise "Operation Cleanup" at East Island. The Wilderness Proposal clearly indicated that East Island was littered with a considerable amount of trash which was left by the Coast Guard after they vacated the island during 1952. Concerned about their image, they agreed to clean up the islet to the satisfaction of the Bureau.

Involved was the removal of 4 standing 100 ft. telephone poles, demolition of a metal reefer and removal of a vast amount of trash which accumulated on the islet. A considerable amount of equipment such as cutting torches, chain saws, gasoline etc. was necessary and the contractor's "M" boat was used to transport this equipment back and forth to East Island.

Felling the poles and keeping wildlife damage to a minimum was no easy assignment, especially since there were between 30,000 and 50,000 sooty terns nesting around the poles. In spite of strong cross winds, the poles were felled with a minimum of loss. They were cut into 4 ft. logs, rolled to the shoreline and burned.

Foundations of old buildings, water tanks, and all other wood debris were piled on the shoreline and burned. Using a cutting torch, the 100 ft. metal antenna and metal reefer were cut up and removed. Pieces



of sheet metal, old engines and other scrap metal were taken out beyond the refuge boundary and dumped in deep water.

Most of the work was completed in 2 days, but work had to be halted since parts for the chain saw and the torch had to be flown in from Honolulu. The work will be completed by the Coast Guard work party.

Weather conditions during the visit were good. Winds varied between 15 and 20 knots while temperatures varied between 64° and 80°. With the strong northeast winds, lagoon conditions were constantly choppy.

The station rehabilitation project at Tern Island is proceeding on schedule. The buildings are almost complete with only painting and electrical work yet to be done. The two rooms which were added at the request of the Bureau have been completed and appear to be adequate for our needs. The entire project should be completed during the first part of June.

### Wildlife Populations

Little time was spent censusing wildlife populations since most of the activities involved "operation cleanup" on East Island. A brief stop was made at Trig, Whale Skate, Round and Gin Islands and turtle and seal populations data were collected there. These data were added to the information collected during the aerial seal counts. Detailed bird census data were not collected.

### Tern Island

For the second year a sooty tern nesting colony began to establish itself adjacent to the runway on the east end of Tern Island. Tern colonies have a tendency to grow at tremendous proportions. Once established such a concentration would pose a serious threat to the operation of the FAA DC 3 which provides logistic support for the Coast Guard. Efforts were made to discourage these nesting attempts and it appeared that they were successful.

Of particular interest was the observation of a cattle egret on Tern Island. Station personnel reported seeing up to 3 at one time, however, only a single bird was noted during our visit to the island.

Approximately 6 Nihoa finches were observed on Tern Island. Station personnel reported that the population is probably somewhere between 10 and 15 birds. No nesting attempts were noted in the brick pile at the east end of the island.

### Trig Island

Of particular interest was the fact that Trig Island is now separated into 2 separate islets. A channel approximately 60 ft. wide and 8 ft. deep now separates the east and west ends of the island.



Black-footed and Laysan Albatrosses and Blue-faced boobies appeared to be nesting in their usual numbers. A sooty tern colony was also noted on the islet. Wedge-tailed shearwaters were noted digging in their burrows.

#### Whale Skate Island

Black-footed and Laysan albatrosses, blue-faced and red-footed boobies, and frigatebirds were abundant all over the island. Several sooty tern nesting colonies had become established and wedge-tailed shearwaters were also observed digging in their burrows.

#### Round and Mullet Islands

Less than ten blue-faced boobies were observed nesting on Round Island while none were noted on Mullet. Both islands were well exposed although they gave every appearance of being washed over by storms during the past winter months.

#### Gin and Little Gin Islands

Forty nesting blue-faced boobies were observed on Gin Island while approximately 50 blue-faced boobies and 240 black-footed albatrosses were noted on Little Gin Island.

#### East Island

It was estimated that there were between 30,000 and 50,000 sooty terns nesting on the island. Eggs were being incubated and a few day old chicks were noted. Common noddy terns were present, but no nesting was observed. A few gray-back terns were seen flying around the island, however none were seen on the ground.

Red-tailed tropicbirds were found nesting under much of the debris. Most had young and a few were still on eggs. Approximately 50 nests were observed. With the clean-up of the island there will be fewer available nesting sites for this species.

Red-footed and blue-faced boobies were nesting and chicks were noted in a number of nests. Population estimates were not made.

### Wildlife Management Studies

#### Studies of the Hawaiian Monk Seal

A combination aerial ground seal census was conducted and the data are



shown in Table 1. The seal population at French Frigate Shoals appears to be holding up well. Census data collected from 1969 through 1971 have shown that the seal population varied between 149 and 166. Three complete counts taken in 1972 and 1973 have shown the population to be between 201 and 206.

Table 1  
Seal Census Data  
French Frigate Shoals

	<u>Adult</u>	<u>Subadult</u>	<u>Pups</u>	<u>Unknown</u>	<u>Total</u>
Shark				17	17
Trig	7	3	1	2	13
Whale Skate	9	9	9	5	32
East	16	3	8		27
Round	13		11		24
Mullet				4	4
Disappearing				42	42
Little Gin				2	2
Big Gin				5	5
Sand spits north of Gin				20	20
Sand spits south of Gin				20	20
Total	45	15	29	117	206

A decision was made to refrain from tagging seal pups on the refuge during 1973. Therefore, only tag return information from previously tagged animals were collected. These data are shown in Table 2.

Table 2  
Seal Tag Return Data

<u>Tag No.</u>	<u>Islet</u>	<u>Age</u>	<u>Originally tagged</u>	<u>Previous returns</u>
A13	East	Adult w/pup	3/13/67	2
910	East	Sub adult	7/11/70	2
914	Whale Skate	"	7/11/70	2
956	Trig	"	5/18/71	1
971	Whale Skate	"	5/16/71	1
985	Whale Skate	"	5/13/71	0
1032	Trig	"	5/10/72	0
1036	Whale Skate	"	5/10/72	0
1041	Little Gin	"	5/5/72	0
1093	Whale Skate	"	5/5/72	0
1098	East	"	5/5/72	0



## Studies of the Green Sea Turtle

While the aerial seal census was being conducted a number of turtles were noted on the shorelines and in the waters adjacent to the islets. However, we were unable to obtain an accurate count of these animals. The turtle census data shown in Table 3 were obtained from ground counts. In the past little effort has been made to determine the sex of the turtle on the islets, other than when they were tagged. However, during this visit, a disproportionately high number of males seemed to be present, and as a result an attempt was made to determine the sex of each of the animals. Of particular interest was the observation of 22 males and 3 females on Whale Skate Island. This high number of males may suggest that possibly the males are the first to arrive on the breeding areas.

Table 3  
Turtle Census Data  
East Island

	<u>Male</u>	<u>Female</u>	<u>Unknown</u>	<u>Total</u>
East	3	2	8	13
Whale Skate	22	3	-	25
Trig	-	4	6	10
Round				
Mullet				
Little Gin	2		1	3
Big Gin	1		2	3
Total	<u>28</u>	<u>9</u>	<u>15</u>	<u>54</u>

A total of 5 turtles were tagged and the data are shown in Table 4. Only straight-line length, width and thickness measurements were taken. A single previously tagged turtle was observed on Whale Skate Island and the data are shown in Table 5. The animal was not measured, therefore, only the original tagging data are shown.

Table 4  
Turtle Tagging  
East Island

T?

<u>Tag No.</u>	<u>Sex</u>	<u>Width</u>	<u>Thickness</u>	<u>Length</u>
251	M	25.0	11.6	32.1
252	M	27.0	12.6	34.3
253	F	26.5	13.7	34.8
254	F	27.0	15.9	35.8
255	M	26.0	12.6	34.2



Table 5  
Turtle Return Data  
April 29, 1973

<u>Tag</u>	<u>Plastron</u>	<u>Straight</u>		<u>Curved</u>		<u>Thickness</u>	<u>Weight</u>
		<u>Length</u>	<u>Width</u>	<u>Length</u>	<u>Width</u>		
T19	32 1/2	31 1/4	25 1/4	32 1/2	32	11 1/2	155

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## Kure Island

General

Kure Atoll, the western most Island in the Hawaiian archipelago is a State Wildlife Refuge, The Coast Guard maintains a LORAN station there, and logistic support is provided by the Midway Naval Air Station located approximately 65 miles to the east. Members of this scientific party accompanied a routine support flight from Midway on September 5. The purpose of this visit was to conduct a Hawaiian Monk seal census and also make a cursory census of the other forms of wildlife inhabiting the island.

Bruce Benson spent most of his time interviewing members of the Coast Guard LORAN station in an effort to obtain a human interest story relating to "Life on an Isolated LORAN Station."

Wildlife Populations

The limited time on the island only permitted a walk around the beach on Green Island. A single seal was noted on Green Island while the remainder of the seals were noted on the large sand spit about a quarter mile from Green Island. A single turtle was also noted on the sand spit.

Preliminary wildlife estimates were made and the data are included in Table 1.

Table 1  
KURE ISLAND  
Wildlife Populations

		<u>Data Class</u>
Sooty tern	50	C
Grey back tern	20	C
Common noddy	4,000	C
Hawaiian noddy	500	C
Wandering tattler	3	A
Red tailed tropic bird	10-500	C
Blue faced booby	10	C
Brown booby	2	B
Red footed booby	100	C
Frigatebird	80	C
Bristle-thighed curlew	5	A
Golden plover	20	B
Hawaiian monk seal	33	A
Green sea turtle	1	A



## Pearl and Hermes Reef

### General

The Navy provided two HU-34 helicopters for transportation from Midway to Pearl and Hermes on September 6. Only 4 hours were actually spent on the atoll, and only a limited number of observations were made. The helicopters landed on North, Southeast, Grass and Seal-Kittery Islands thus giving us the opportunity to census seals, turtles, read tags and conduct some wildlife census work.

The minimum/maximum thermometer at Southeast Island showed temperatures of 82° and 86°f respectively since the last visit which was in early July.

### Wildlife Populations

Bird population estimates are recorded by islets in table 2. These figures were considered to be head counts and in general they reflect an early fall population and not peak populations. Peaks for most species occur during the spring months. The counts of wedgetailed shearwaters are considered class C data while the remainder are considered class A data.

### Studies of the Hawaiian Monk Seal

A total of 38 seals were counted in the entire atoll, and for unknown reasons this was one of the lowest counts ever recorded on this atoll. During the past several years, counts at Pearl and Hermes have averaged approximately 100 animals and the lowest count recorded prior to this one was made during March 1969 when 62 animals were recorded.

Only 2 previously tagged seals were observed and both animals were originally tagged during June 1972.

### Studies of the Green Sea Turtle

Only four turtles observed at Pearl and Hermes Reef. Three were noted in the water while a single animal at Southeast Island was tagged and measured. It had originally been tagged number 152 on September 23, 1966 on Southeast Island. The tag was badly worn and was replaced with tag number 209 (table B).

The following numbers of turtle pits were observed on the following islets; Kittery 2; Southeast 1; North 1; Grass 1; Lack of time did not permit us to dig to check for presence of eggs.



LISIANSKI

Studies of the Green Sea Turtle

A total of 10 turtles were seen swimming in the shallows adjacent to Lisianski Island. One dead animal was observed, and two were captured, weighed, and measured (Table C).

A total of 26 turtle pits were recorded, but no sign of hatched eggs were found.

Vegetative Studies

During 1971, Cenchrus was observed all along the west shore of the island, and we believed that this weed was gradually taking over the island. During this visit however, it was much reduced in area. It was still found under the coconut tree and in the area adjacent to the refuge recognition sign. Boerhavia was very lush and there was speculation that this native plant may be crowding out the Cenchrus.

The single large coconut appears to be healthy. A sprouted coconut was observed under this tree.

Most observers have felt that it would be almost impossible for a coconut to drift up to one of the Leeward Islands and take root, since the salt water absorbed during its long period at sea would probably kill the nut. However, such a coconut apparently drifted up onto the beach on the southwest corner of Lisianski, and sprouted. It has taken root and it will be interesting to see how long the plant will last.



Studies of the Hawaiian Monk Seal

A total of 197 seals was censused on Layaan Island (Table A). During 1971 a total of 239 was observed and during 1970, 147 were censused. This years count is considered to be about average for Laysan Island. No sex determination has been made for several years in order to hold disturbance at a minimum.

Four pups were tagged although a number of others were censused. These data are recorded in (Table D).

Five previously tagged seals were recorded. (Table C) All had been previously tagged on Laysan Island.

Studies of the Green Sea Turtle

No turtles were observed on the beaches at Laysan; however, the tracks of 10 animals were seen on the west side of the island. Laysan is apparently used by nesting green sea turtles, however, we have not yet found pits where young turtles have actually emerged.



Table B  
Turtle Tagging Data  
September 5-15, 1972

<u>Location</u>	<u>Tag #</u>	<u>Sex</u>	<u>Carapace length</u>	<u>Carapace Width</u>	<u>Carapace Thickness</u>	<u>Plastron length</u>	<u>height</u>
Lisianski	1078	?	16.6	14.4	5.2	13.8	28*
Lisianski	211	F	27.3	21.8	10.3	22.2	100

\*inaccurate weight (used 500 capacity scale)

Turtle Recapture Data

<u>Tag #</u>	<u>Date</u>	<u>Length (Round)</u>	<u>Width (Round)</u>
209	9/66	36	35
	9/72	38 1/4	37

Tag #209 was placed on the animal that originally carried tag # 152.



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Hawaiian Islands National Wildlife Refuge  
Expedition Report  
French Frigate Shoals  
May 4-11, 1972

Personnel

David L. Olsen - Assistant Wildlife Administrator, Kailua, Hawaii  
Ronald Walker - District Biologist, Hawaii Division of Fish and Game

Itinerary

- May 4 Depart Kailua 6:15 AM. Arrive Honolulu International Airport 7:15 AM. Depart Honolulu via FAA DC-3 for French Frigate Shoals, 8:30 AM. Conducted serial census of seals and turtles at French Frigate Shoals. Arrive Tern Island 11:45 AM. Checked out equipment and inspected reef area adjacent to Tern Island.
- May 5 Completed wildlife populations census work on Tern Island. Conducted biological investigations on Trig and Whale Skate Islands.
- May 6 Attempted to conduct biological investigations on Shark Island, however, heavy seas prevented us from landing on the island. Completed wildlife populations inventory on La Perouse Pinnacle.
- May 7 Conducted biological investigations on East, Round, and Mullet Islands.
- May 8 Conducted biological investigations on East, Little Gin and Big Gin Islands.
- May 9 Conducted biological investigations on Shark Island during the AM hours. Conducted biological investigations on East Island during the afternoon. Spent the afternoon and night on East Island attempting to locate recent turtle activity.
- May 10 Completed wildlife inventory work on East, Whale Skate and Trig Islands.
- May 11 Assembled gear and departed Tern Island French Frigate Shoals 1:55 PM via FAA DC-3. Arrived Honolulu 5:10 and returned to Kailua via Government vehicle 6:30 PM.



## General

Weather conditions throughout the entire trip were good. No rain was received although a few squalls were noted some distance from the atoll. Winds varied from 10-16 knots during the week and the swell was reported from 2-6 feet. Larger swells noted on May 6 prevented us from getting near Shark Island.

The U. S. Coast Guard provided us with their 16 foot skiff together with a 40 HP motor, for our transportation from Tern Island to the other islets within the atoll. Lodging and meals were provided by the Coast Guard at a nominal cost.

The objectives of the expedition were as follows:

1. Attempt to collect freshly dropped turtle eggs for the proposed aquaculture research program being conducted by the University of Hawaii.
2. Measure, weigh and tag as many green sea turtles as possible. In addition any other unusual observations on behavior of the green sea turtles were to be recorded.
3. Tag as many Hawaiian monk seal pups as possible and obtain as much tag return data as possible.
4. Collect wildlife population data for use in calculating annual Refuge Benefit Unit Outputs.
5. Discuss plans for the Tern Island rehabilitation program with the Commanding Officer of the base and delineate out the areas where the stockpiling should be done.
6. Survey the reef life to determine any gross changes that might be occurring in the reef fauna of the atoll.

## Wildlife Populations

All of the islands except Disappearing were visited during our stay, and wildlife population estimates were completed on each. On Shark, La Perouse, Tern, Trig, Whale Skate, Round, East and the Gin Islands, head counts were made of each species of nesting seabird. Where chicks were present, head counts were also completed. Reliability data for each of the population estimates are included in the counts (Table 1).



Table 1  
Bird Population Data  
French Frigate Shoals  
May 5-10, 1972

Bird	Tern	Trits	Whale Skate	Round	East	L. Gin	Big Gin	La Perouse
Wedgetailed Shearwater	300A	100+A	650A		5A			
Tropicbird	44A							
Wandering Tattler	2		124A		110A			1
Red-footed Booby								
Brown Booby								
Blue-faced Booby		78A	222A	75A	44A	67A	19A	40A
						146R	6A	30A
Frigatebird			467A					10A
Golden Plover	13A		1A					
Kudzu Turnstone	79A		18A		10A	3A	2A	1A
Sanderling	5A					5A		
White-tailed tropicbird	1							
Grey Backed Tern			40A			1A		400A
Sooty Tern			400A		8,000*			12A
Common Noddy Tern	123A		1,230A		500A	45A		300A
Hawaiian Noddy Tern	160A							
Fairy Tern	190A							
Rhinoc Finch	11A							850A
Laysan Albatross	112A	3A						
	132ck	132ck	43ck		352ck			
Black-footed Albatross	4A	7A						5A
	5ck	91ck	420ck		1,070ck			58ck
Little Frigate	1A							

Reliability Data

A= Adult  
ck= Chick  
\*Estimated night population 30,000

Wedgetailed Shearwaters  
Sooty Terns  
Common Noddy Terns  
All other species

Class C  
Class B  
Class B  
Class A



La Perouse Pinnacle was visited and seabird populations estimates were made simply by circling the island in a small boat.

Our visit to the atoll was made approximately two to three weeks prior to the peak of the sooty tern nesting season. The birds had just begun to lay and probably no more than 5% of the birds had dropped eggs. A small group of approximately 5 chicks was noted on the south side of East Island.

Wedgetailed shearwaters were noted on most of the larger islets within the atoll. Personnel from Tern Island reiterated their complaints about the terrible groaning and moaning of the "moaning birds". However, two chiefs spent a night on East Island with us and after that night with thousands of "singing" sooty terns keeping them up while they attempted to get some sleep, they were anxious to return to their moaning birds under their trailer.

Unusual, was the sighting of a white-tailed tropic-bird. Although several reports had been received by personnel from the LORAN Station over the past several years, this was the first actual sighting of a white-tailed tropic-bird by Fish and Wildlife Personnel on any of the refuge islands. The bird was seen daily flying around Tern Island with a flock of approximately 20 red-tailed tropic-birds. It frequently circled as close as 20 feet from us and the long white tail and the dark bars on the wing coverts were clearly visible.

Crewmen from the LORAN station also reported that a "small white stork" had been seen around Tern Island for about a week. While conducting the bird count on Tern Island, an adult cattle egret was noted which was that "small white stork" reported by the crew. It was observed a number of days feeding among the albatrosses. We were able to get quite close to the bird and to those of us so familiar with the cattle egret on Oahu, there was not a doubt to its' identity.

Crew members also reported that a black goose visited the island for about a week during February. The bird was photographed and we identified it as a Pacific Brant.



7

Table 3  
Seal Tagging Data  
French Frigate Shoals  
May 5-10, 1972

<u>Tag No.</u>	<u>Sex</u>	<u>Location</u>
1087	F	Whale Skate
1088	M	Whale Skate
1089 *	M	Whale Skate
1090 **	F	Whale Skate
1091	M	Whale Skate
1092	F	Whale Skate
1093	M	Whale Skate
1094	F	Whale Skate
1095	F	Whale Skate
1096	M	East
1097	M	East
1098	M	East
1099	M	East
1026	M	East
1027	F	East
1028	F	East
1029	M	East
1030	F	East
1031	M	Round
1032	M	Round
1033	F	Round
1034	F	Round
1035	M	Round
1036	M	Round
1037	F	Round
1038	M	Round
1039	F	Round
1040	M	Round
1041	F	East
1042	F	East
1043	F	East
1044	F	East
1100	M	East

\* single tagged

\*\* Pup not yet weaned, weighed 200 lbs (turtle scale)



Studies of the Green Sea Turtle

From the aerial survey of the islets on May 4, it was evident that turtles were extremely abundant around the islets at French Frigate Shoals. Although no actual count was made from the air, it was estimated that approximately 50 were either in the water adjacent to the beaches of East Island. Ground counts of turtles on the islets revealed the totals shown here:

Ground Count

East	16
Trig	5
Whale Skate	26
Big Gin	3
Little Gin	3
Total:	<u>53</u>

A total of 52 turtles were weighed, measured and tagged during our stay at French Frigate Shoals (Table 6). The average weight was 237 lbs and the heaviest tipped the scales at 325 lbs. A record number was tagged on the afternoon of May 5 when 34 turtles were tagged on Trig, Whale Skate and East Islands. This was possible only as a result of the enthusiastic help received by two crewmen from the LORAN station.

Although some 52 turtles were checked, only one previously tagged turtle was observed (Table 7). There were more turtles present on the beaches during the afternoon hours than in the early morning. Copulating turtles were observed in the water almost every day and in each instant there were a number of turtles swimming around the copulating pair. *losing tags?*

Although it appeared that there were a number of turtles that had come up on the beaches at night only a few pits were found. Each of the pits that gave some indication of being active was probed with a rod; however no clutches were found. One night was spent on East Island in an attempt to locate nesting turtles. Although 2 turtles did come up on the beach neither showed any indication of attempting to nest.

In summary, it would appear that the first week in June was the peak of the breeding, however, it was probably at least a week before any significant amount of laying took place.



Table 6  
Turtle Tagging  
French Frigate Shoals  
May 1972

Tag #	Date	Sex	Plastron Length	Carapace				Thickness	Weight	Island
				Length Straight	Width	Length Curved	Width			
19	5/5	M	32 1/2	31 1/4	25 1/4	32 1/2	32	11 1/2	155	Trig
20	5/5	M	25 1/4	31 1/2	25	33	31 1/4	10 3/8	155	Trig
21	5/5	F	23 1/2	29 3/4	22 3/4	32	30	11 1/2	140	Trig
			Missing 1/2 hind right flipper							
22	5/5	F	30 1/4	36 1/4	28 3/4	38 1/2	40 1/4	13 1/8	280	Trig
			Missing 1/2 hind right flipper							
23	5/5	M	27 1/4	34	25 1/2	35 1/2	34 1/2	12 1/2	175	Trig
24	5/5	M	27 3/4	35 1/2	27 1/2	36	34 3/4	12 1/4	205	W.S.
25	5/5	M	24 1/4	31	24 3/4	32 1/4	30 1/4	10 1/4	145	W.S.
26	5/5	M	27 1/2	33 1/4	26 3/4	35 1/4	34 3/4	11 1/4	190	W.S.
27	5/5	F	28	36 1/4	27 1/2	38	34 1/4	16	210	W.S.
28	5/5	M	29	36 1/4	27 3/4	38 1/4	38	12 1/2	210	W.S.
29	5/5	M	27 3/4	34 3/4	29 1/4	38	35 3/4	10 1/4	215	W.S.
30	5/5	M	28 1/2	35 1/2	27 1/2	36 3/4	34 1/4	12 3/4	235	W.S.
31	5/5	M	26 3/4	31 3/4	24 1/2	34 1/4	33	13 1/2	185	W.S.
32	5/5	F	31 3/4	38 1/2	30	39 1/2	41	15 1/4	282	W. S.
33	5/5	M	25 3/4	32 1/4	25	34	32	12 1/4	160	W.S.
34	5/5	F	31 1/4	37 1/4	29	39	39	15 1/2	285	W.S.
35	5/5	M	26 1/4	33 1/4	24 3/4	34 3/4	32 1/2	11	175	W. S.
36	5/5	M	29	37	28	39	35	11 1/2	205	W. S.
37	5/5	M	26 1/2	33 1/4	25 1/2	35	33 3/4	11 1/2	180	W. S.
38			Tag lost in sand							
39	5/5	F	29 3/4	36	29 1/4	37 1/2	37 1/2	12 1/4	230	W. S.



Table 6

Tag #	Date	Sex	Plastron Length	Carapace				Thickness	Weight	Island
				Length Straight	Width	Length Curved	Width			
40	5/5	F	29	36	27 1/2	38	26	14 1/2	265	W. S.
41	5/5	F	29 1/2	35 3/4	28 3/4	38 1/4	35 1/2	14	255	W. S.
42	5/5	M	24 1/2	32 1/4	25 1/4	34	31	10 1/4	160	W. S.
43	5/5	F	30 1/4	35 3/4	27 3/4	39 1/2	36	15 1/4	280	W. S.
44	5/5	M	27 3/4	33 1/2	26	35	33 1/4	11 1/2	185	W. S.
45	5/5	M	25 3/4	33 1/4	25 1/4	35 1/2	32	11 3/4	180	W. S.
46	5/5	M	26	33 1/2	25 1/4	34 1/2	32 1/2	11 1/2	200	W. S.
47	5/5	M	27 1/2	32 3/4	26 1/2	34 1/2	34 1/4	13 1/4	210	W. S.
48	5/5	F	33 3/4	36 1/2	29	38 1/4	37 1/4	15 1/2	325	W. S.
49	Tag destroyed									
50	5/5	F	28 1/2	35 1/4	25	37 1/4	34 1/4	14 3/4	260	W. S.
51	5/5	F	27 1/2	35 1/4	26 3/4	38	34	13 1/2	250	East
52	5/5	F	29 1/4	35 3/4	26 3/4	37 3/4	36	14	255	East
53	5/5	F	29 1/4	35 1/2	28 3/4	38 1/4	35 1/2	12 1/4	230	East
54	5/5	F	30 1/2	37	28	39 1/2	38 1/2	14	280	East
55	5/7	F	28 1/4	36 1/4	27 1/2	36	34 1/4	13 1/4	205	East
56	5/7	F	29 1/4	36	26 1/2	39	37 1/2	16 3/4	315	East
57	5/7	F	29 1/2	37	28 3/4	39 1/4	37 1/4	14 3/4	280	East
58	5/7	M	28 1/4	34 1/4	25 3/4	35 1/2	33 3/4	12 1/2	220	East
59	5/7	F	28 1/4	35 1/4	28	38 1/8	35 1/4	14 1/4	205	East
60	5/7	F	28 1/2	34 3/4	27 1/4	38	26	15 1/4	255	East
	Photos of egg pit and sand									
61	5/8	F	27 1/4	33 3/4	25 3/4	36 3/4	35	14 1/4	210	East
62	5/8	F	29 3/4	35 1/4	28 1/4	38	37	14 1/4	230	East
63	5/8	F	28 3/4	35 3/4	26 1/2	38	36	13 1/2	230	East

Table 6

Tag #	Date	Sex	Plastron Length	Carapace		Length Curved	Width	Thickness	Weight	Island
				Length Straight	Width					
64	5/9	F	30	37 1/2	27 1/4	40	38	13 3/4	270 <sup>o</sup>	W.S.
65	5/9	M	27 3/4	34 3/4	25 3/4	37	34	13 3/4	210	W.S.
66	5/9	M	27 1/2	33 3/4	26 3/4	36	35 3/4	13 1/4	205	W. S.
67	5/9	M	26 3/4	33 3/4	25 3/4	35	32 1/4	12 1/2	190	W. S.
68	5/9	F	29 1/4	35 3/4	27 1/2	38	37 3/4	15 1/2	260	W. S.
69	5/8	F	28 1/4	35 3/4	27 1/4	36	36 3/4	14 1/4	230	W. S.
70	5/5	F	28 3/4	35 3/4	27	37	34 1/2	14 3/4	225	W. S.
71	5/9	M	28 1/4	36 1/4	27	38	34	13 3/4	225	W. S.
72	5/10	F	28 3/4	34	27 1/2	37 1/2	36 3/4	14 3/4	275	East
73	Lost in sand									
74	Did not use									
75	Did not use									



Table 7

Turtle Recaptures  
French Frigate Shoals

<u>Tag #</u>	<u>Sex</u>	<u>Location</u>	<u>Date</u>	<u>Carapace Length</u>	<u>Carapace Width</u>	<u>Plastron Length</u>	<u>Thick.</u>	<u>Round Measurements</u>	<u>Weight</u>
736	F	East Is.	6/14/68	No measurements taken					
	F	Trig Is.	5/17/71	37.8	28.6	29.9	13.7	40 X 36 1/2	270
	F	Trig Is.	5/5/72	37 1/4	29.0	30	13 1/2	39 X 37	275

Marine Investigations

Some preliminary marine investigations were conducted adjacent to some of the islets.

Diving Time

<u>Date</u>	<u>Islet</u>	<u>Time and Depth</u>
May 6	La Perouse	1 1/2 hours to 32 feet
May 7	East Island	1 hour to 20 feet
May 4	Tern Island	2 hours to 15 feet
May 9	Shark Island	3/4 hour to 8 feet
May 10	Trig Island	3/4 hour to 15 feet

Of interest was the report of an unusual shark taken by personnel from the LORAN station. Although a photograph taken did not show the entire shark, it did show that the teeth were different from other sharks that had previously been recorded there. The photograph and several teeth were examined by Dr. Testor, a shark expert from the University of Hawaii, and he concluded that the shark was a Mako (Isurus oxyrinus).

During April, personnel from the station took an unusual object from the stomach of a 10 foot tiger shark taken off of Tern Island. The object appeared to be the spike from a large marlin. It was found "crossways" inside the stomach of the shark and the fellow that cut it out reported that the sharp end had punched the stomach wall. The spike was examined by personnel from the National Marine Fisheries Service in Honolulu, and they reported that it came from a striped marlin and that the fish was approximately 9 feet long and weighed approximately 240 lbs.

Again this year approximately 50 adult grey reef sharks were observed along the shallows of Whale Skate Island. They were seen milling around in waters approximately 3 feet deep and apparently they use this area for breeding every spring.

A manta ray with a "wing span" of approximately 14 feet was seen near Gin Island. Twice, it came out of the water upside down and smacked on the surface. Reportedly, these large creatures do this to rid themselves of ectoparasites which attach onto their backs.



### Vegetative Studies

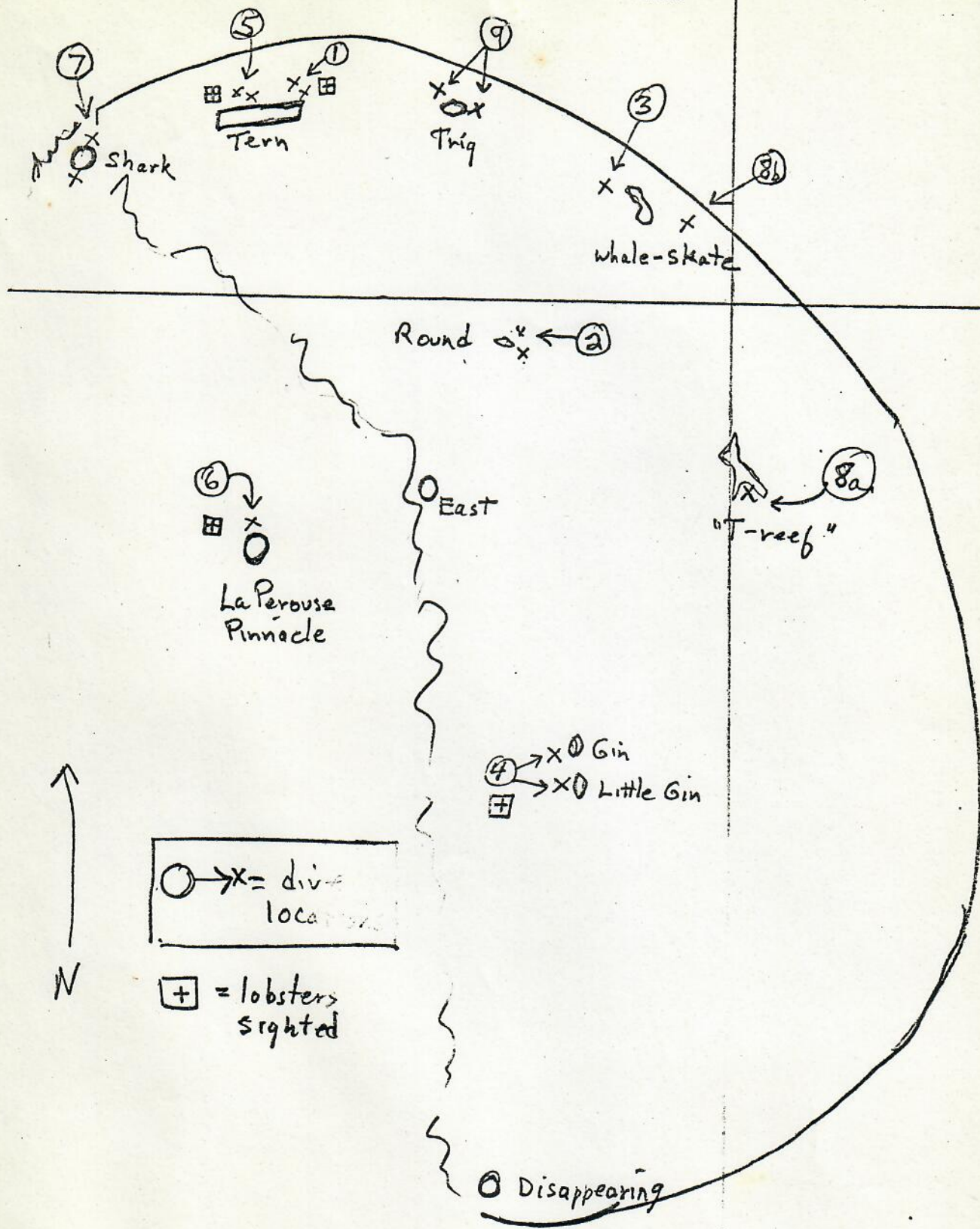
Approximately 15 clumps of Cinchrus sp. were found on Trig Island. All were pulled up and disposed of in the ocean.

Also interested was the discovery of several mangrove seeds on East Island. The seeds were not viable, however, their presence there at French Frigate Shoals, some 480 miles from Oahu, certainly shows how some specimens of plants are naturally transported from one oceanic island to another.

### Studies of the Nāhoa Finch

A total of 11 adult Nihos finches were observed on Tern Island. In addition, two active nests were observed in the brick pile at the east end of the island. One nest contained three eggs while the other had three young.

The finch population on Tern Island appears to be relatively stable.



# French Frigate Shoals



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Hawaiian Islands National Wildlife Refuge  
Expedition Report  
French Frigate Shoals  
May 4-11, 1972

Personnel

David L. Olsen - Assistant Wildlife Administrator, Kailua, Hawaii  
Ronald Walker - District Biologist, Hawaii Division of Fish and Game

Itinerary

- May 4 Depart Kailua 6:15 AM. Arrive Honolulu International Airport 7:15 AM. Depart Honolulu via FAA DC-3 for French Frigate Shoals, 8:30 AM. Conducted aerial census of seals and turtles at French Frigate Shoals. Arrive Tern Island 11:45 AM. Checked out equipment and inspected reef area adjacent to Tern Island.
- May 5 Completed wildlife populations census work on Tern Island. Conducted biological investigations on Trig and Whale Skate Islands.
- May 6 Attempted to conduct biological investigations on Shark Island, however, heavy seas prevented us from landing on the island. Completed wildlife populations inventory on La Perouse Pinnacle.
- May 7 Conducted biological investigations on East, Round, and Mullet Islands.
- May 8 Conducted biological investigations on East, Little Gin and Big Gin Islands.
- May 9 Conducted biological investigations on Shark Island during the AM hours. Conducted biological investigations on East Island during the afternoon. Spent the afternoon and night on East Island attempting to locate recent turtle activity.
- May 10 Completed wildlife inventory work on East, Whale Skate and Trig Islands.
- May 11 Assembled gear and departed Tern Island French Frigate Shoals 1:55 PM via FAA DC-3. Arrived Honolulu 5:10 and returned to Kailua via Government vehicle 6:30 PM.



### General

Weather conditions throughout the entire trip were good. No rain was received although a few squalls were noted some distance from the atoll. Winds varied from 10-16 knots during the week and the swell was reported from 2-6 feet. Larger swells noted on May 6 prevented us from getting near Shark Island.

The U. S. Coast Guard provided us with their 16 foot skiff together with a 40 HP motor, for our transportation from Tern Island to the other islets within the atoll. Lodging and meals were provided by the Coast Guard at a nominal cost.

The objectives of the expedition were as follows:

1. Attempt to collect freshly dropped turtle eggs for the proposed aquaculture research program being conducted by the University of Hawaii.
2. Measure, weigh and tag as many green sea turtles as possible. In addition any other unusual observations on behavior of the green sea turtles were to be recorded.
3. Tag as many Hawaiian monk seal pups as possible and obtain as much tag return data as possible.
4. Collect wildlife population data for use in calculating annual Refuge Benefit Unit Outputs.
5. Discuss plans for the Tern Island rehabilitation program with the Commanding Officer of the base and delineate out the areas where the stockpiling should be done.
6. Survey the reef life to determine any gross changes that might be occurring in the reef fauna of the atoll.

### Wildlife Populations

All of the islands except Disappearing were visited during our stay, and wildlife population estimates were completed on each. On Shark, La Perouse, Tern, Trig, Whale Skate, Round, East and the Gin Islands, head counts were made of each species of nesting seabird. Where chicks were present, head counts were also completed. Reliability data for each of the population estimates are included in the counts (Table 1).



Table 1  
Bird Population Data  
French Frigate Shoals  
May 5-10, 1972

Bird	Tern	Trig	Whale Skate	Round	East	L. Gln	Big Gln	La Perouse
Wedgetailed Shearwater	300A	100+A	650A					
Tropicbird	44A				5A			
Wandering Tattler	2				110A			1
Red-footed Booby			124A					
Brown Booby								
Blue-faced Booby		78A	222A	25A	44A	67A 14ck	19A 6ck	40A 30A
Frigatebird			467A					10A
Golden Plover	13A		1A					
Ruddy Turnstone	79A		18A		10A	3A	2A	1A
Sanderling	5A					5A		
White-tailed tropicbird	1							
Grey Backed Tern			40A					
Sooty Tern			400A		8,000*	1A		400A
Common Noddy Tern	123A				500A			12A
Hawaiian Noddy Tern	160A		1,230A			45A		300A
Fairy Tern	190A							
Nihoa Finch	11A							850A
Laysan Albatross	112A	3A						
Black-footed Albatross	132ck	132ck	43ck		352ck			
	4A	7A						5A
	5ck	91ck	420ck		1,070ck			58ck
Cattle Egret	1A							

A= Adult

ck= Chick

\*Estimated night population 30,000

## Reliability Data

Wedgetailed Shearwaters  
Sooty Terns  
Common Noddy Terns  
All other species

Class C  
Class B  
Class B  
Class A



La Perouse Pinnacle was visited and seabird populations estimates were made simply by circling the island in a small boat.

Our visit to the atoll was made approximately two to three weeks prior to the peak of the sooty tern nesting season. The birds had just begun to lay and probably no more than 5% of the birds had dropped eggs. A small group of approximately 5 chicks was noted on the south side of East Island.

Wedgetailed shearwaters were noted on most of the larger islets within the atoll. Personnel from Tern Island reiterated their complaints about the terrible groaning and moaning of the "moaning birds". However, two chiefs spent a night on East Island with us and after that night with thousands of "singing" sooty terns keeping them up while they attempted to get some sleep, they were anxious to return to their moaning birds under their trailer.

Unusual, was the sighting of a white-tailed tropic-bird. Although several reports had been received by personnel from the LORAN Station over the past several years, this was the first actual sighting of a white-tailed tropic-bird by Fish and Wildlife Personnel on any of the refuge islands. The bird was seen daily flying around Tern Island with a flock of approximately 20 red-tailed tropic-birds. It frequently circled as close as 20 feet from us and the long white tail and the dark bars on the wing covets were clearly visible.

Crewmen from the LORAN station also reported that a "small white stork" had been seen around Tern Island for about a week. While conducting the bird count on Tern Island, an adult cattle egret was noted which was that "small white stork" reported by the crew. It was observed a number of days feeding among the albatrosses. We were able to get quite close to the bird and to those of us so familiar with the cattle egret on Oahu, there was not a doubt to its' identity.

Crew members also reported that a black goose visited the island for about a week during February. The bird was photographed and we identified it as a Pacific Brant.



### Studies of the Hawaiian Monk Seal

An aerial census of the seal population was made on May 5. "Ground truth" counts were made during the week and more accurate data were included (Table 2). This was the highest number counted since 1969.

A total of 32 seal pups were tagged and the sex ratio was 16 males to 16 females again showing that sex ratios at birth are approximately 50:50 (Table 3). From the number of pregnant females noted, it was estimated that approximately 70 percent of the cows had already pupped. Several weaned pups were observed thus indicating a substantial number of early pups. Typically, those pups estimated to be approximately 2 months old and not yet weaned looked like roly polly blobs of fat. One such pup estimated to be less than 2 months old was weighed with the turtle weighing equipment and it tipped the scales at 200 lbs.

A total of 14 previously tagged seals were observed (Table 4) and 11 had been previously tagged at French Frigate Shoals. Although our visits to French Frigate Shoals have been relatively infrequent, the number of tag returns we have observed during the past few years have shown that there is apparently high rate of infant mortality among young animals. These data show that we can probably expect less than a 10 percent return on pups the following year after they are tagged (Table 5).

It appears that the use of double monel cattle ear tags is the best technique for tagging monk seals. Loss of tags appears to be minimal and there appears to be little or only slight injury to the animals.



Table 2  
 Seal Census Data  
 French Frigate Shoals  
 May 5-10, 1972

<u>Island</u>	<u>Adult</u>	<u>Yearling &amp; Subadult</u>	<u>Pup</u>	<u>Unknown</u>	<u>Total</u>
Tern	4				4
Shark	5	3			8
La Perouse	1				1
Trig	3	2			5
Whale Skate	16	7	9		32
Round	12	2	10		24
Mullet	2	5			7
Little Gin	7	—			7
Little Little Gin	2	6			8
Big Gin	5	2			7
East	19	3	16		38
Disappearing				45	45
Other Sandspits	—	—	—	<u>18</u>	<u>18</u>
Totals:	76	30	35	63	204



Table 3  
Seal Tagging Data  
French Frigate Shoals  
May 5-10, 1972

<u>Tag No.</u>	<u>Sex</u>	<u>Location</u>
1087	F	Whale Skate
1088	M	Whale Skate
1089 *	M	Whale Skate
1090 **	F	Whale Skate
1091	M	Whale Skate
1092	F	Whale Skate
1093	M	Whale Skate
1094	F	Whale Skate
1095	F	Whale Skate
1096	M	East
1097	M	East
1098	M	East
1099	M	East
1026	M	East
1027	F	East
1028	F	East
1029	M	East
1030	F	East
1031	M	Round
1032	M	Round
1033	F	Round
1034	F	Round
1035	M	Round
1036	M	Round
1037	F	Round
1038	M	Round
1039	F	Round
1040	M	Round
1041	F	East
1042	F	East
1043	F	East
1044	F	East
1100	M	East

\* single tagged

\*\* Pup not yet weaned, weighed 200 lbs (turtle scale)



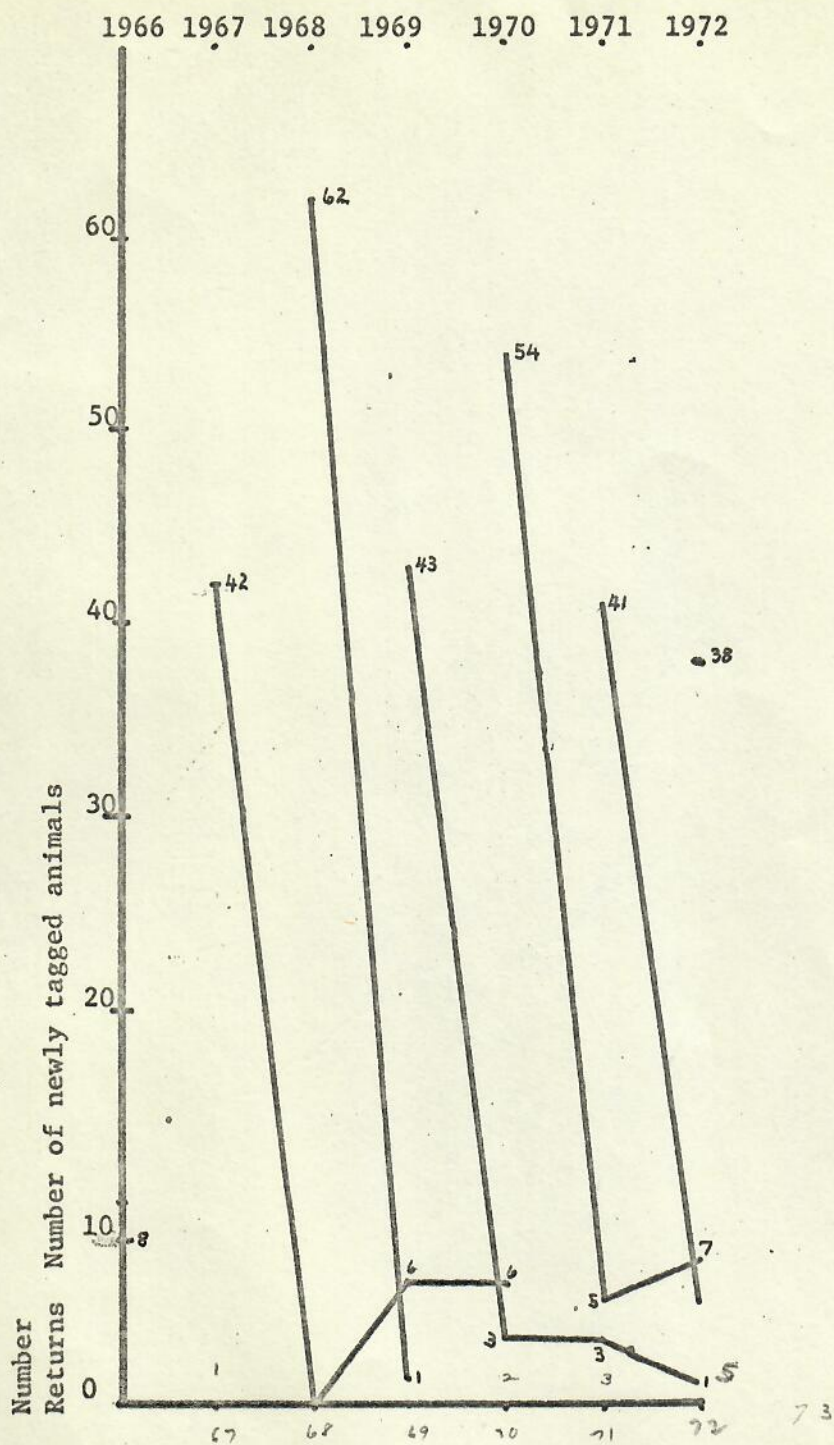
Table 4

Seal Recapture Information  
 French Frigate Shoals  
 May 5-10, 1972

<u>Tag No.</u>	<u>Location</u>	<u>Tag Date</u>	<u>Age</u>	<u>Sex</u>	<u>Location</u>
A700	Shark	6/16/69	P	M	East*
766	Whale Skate	7/10/70 5/16/71 9/3/71			Round Round Whale Skate
767	Mullet	5/10/70 5/12/71 8/22/71	P	M	Little Gin Little Gin Little Gin
768	Mullet	7/10/70	P	M	Round
902	Whale Skate	7/11/70	P	F	Whale Skate
903	Whale Skate	7/11/70	P	M	Whale Skate
905	Mullet	7/11/70	P	F	Whale Skate
910	Trig	7/11/70 8/22/71	P	M	Whale Skate Whale Skate
918	Whale Skate	8/22/71 5/5/72	P	M	Little Gin Whale Skate
954	Little Little Gin	5/18/71	P	F	East
958	Whale Skate	5/18/71	P	F	East
969	Whale Skate	5/16/71 8/22/71 9/13/71	P	M	Round Whale Skate Whale Skate
988	Whale Skate	5/15/71	P	F	Whale Skate
966	Whale Skate	5/15/71	P	M	Round

\*Single Tag remains - lost other tag together with yellow plastic.





(SUMMARY OF TAGGING AND RETURN DATA)  
French Frigate Shoals 1966-1972

The highest point on the line represents the total number of animals tagged that year. Other point on the line show the number of subsequent tag returns, by year.



### Studies of the Green Sea Turtle

From the aerial survey of the islets on May 4, it was evident that turtles were extremely abundant around the islets at French Frigate Shoals. Although no actual count was made from the air, it was estimated that approximately 50 were either in the water adjacent to the beaches at East Island. Ground counts of turtles on the islets revealed the totals shown here:

#### Ground Count

East	16
Trig	5
Whale Skate	26
Big Gin	3
Little Gin	5
Total:	<u>55</u>

A total of 52 turtles were weighed, measured and tagged during our stay at French Frigate Shoals (Table 6). The average weight was 237 lbs and the heaviest tipped the scales at 325 lbs. A record number was tagged on the afternoon of May 5 when 34 turtles were tagged on Trig, Whale Skate and East Islands. This was possible only as a result of the enthusiastic help received by two crewmen from the LORAN station.

Although some 52 turtles were checked, only one previously tagged turtle was observed (Table 7). There were more turtles present on the beaches during the afternoon hours than in the early morning. Copulating turtles were observed in the water almost every day and in each instant there were a number of turtles swimming around the copulating pair.

Although it appeared that there were a number of turtles that had come up on the beaches at night only a few pits were found. Each of the pits that gave some indication of being active was probed with a rod; however no clutches were found. One night was spent on East Island in an attempt to locate nesting turtles. Although 2 turtles did come up on the beach neither showed any indication of attempting to nest.

In summary, it would appear that the first week in June was the peak of the breeding, however, it was probably at least a week before any significant amount of laying took place.



$$CSL = \frac{\text{curved length}}{\text{straight length}}$$

$$CSW = \frac{\text{curved width}}{\text{straight width}}$$

$$SS = \frac{\text{straight length}}{\text{straight width}}$$

Table 6

Turtle Tagging  
French Frigate Shoals  
May 1972

Tag #	Date	Sex	Plastron Length	Carapace		Length	Width	Thickness	Weight	Island		
				Straight	Curved							
											Length	Width
1	19	5/5	M	CSL-1.04 32 1/2	CSW-1.27 31 1/4	79.4	64.1	SS-1.24 32 1/2	32 82.6 x 81.3	11 1/2	155	Trig
2	20	5/5	M	CSL-1.05 25 1/4	CSW-1.25 31 1/2	80.0	63.5	SS-1.26 33	83.8 31 1/4 79.4	10 3/4	155	Trig
21	5/5	F	23 1/2	29 3/4	22 3/4	32	30	11 1/2	140	Trig	Missing 1/2 hind right flipper	
22	5/5	F	30 1/4	36 1/4	28 3/4	38 1/2	40 1/4	13 1/2	280	Trig	Missing 1/2 hind right flipper	
3	23	5/5	M	CSL-1.04 27 1/4	CSW-1.35 34	86.4	64.8	SS-1.33 35 1/2	90.2 34 1/2 87.6	12 1/2	175	Trig
4	24	5/5	M	CSL-1.01 27 3/4	CSW-1.26 35 1/2	90.2	69.9	SS-1.29 36	91.4 34 3/4 88.3	12 1/4	205	W.S.
5	25	5/5	M	CSL-1.04 24 1/4	CSW-1.22 31	78.7	62.9	SS-1.25 32	1/4 81.9 30 1/4 76.8	10 1/4	145	W.S.
6	26	5/5	M	CSL-1.06 27 1/2	CSW-1.30 33 1/4	84.5	67.9	SS-1.24 35	1/4 89.3 34 3/4 88.3	11 1/4	190	W.S.
27	5/5	F	28	36 1/4	27 1/2	38	34 1/4	16	210	W.S.		
7	28	5/5	M	CSL-1.06 29	CSW-1.33 36 1/4	92.1	70.5	SS-1.31 38	1/4 97.2 37 9/4	12 1/2	210	W.S.
8	29	5/5	M	CSL-1.09 27 3/4	CSW-1.22 34 3/4	88.3	74.3	SS-1.19 38	96.5 35 3/4 90.8	10 1/4	215	W.S.
9	30	5/5	M	CSL-1.04 28 1/2	CSW-1.25 35 1/2	90.2	69.9	SS-1.29 36	3/4 93.3 34 1/4 87	12 3/4	235	W.S.
10	31	5/5	M	CSL-1.08 26 3/4	CSW-1.35 31 3/4	80.6	62.2	SS-1.30 34	1/4 87.7 33 83.8	13 1/2	185	W.S.
32	5/5	F	31 3/4	38 1/2	30	39 1/2	41	15 1/4	282	W. S.		
11	33	5/5	M	CSL-1.05 25 3/4	CSW-1.28 32 1/4	81.9	63.5	SS-1.29 34	86.4 32 81.3	12 1/4	160	W.S.
34	5/5	F	31 1/4	37 1/4	29	39	39	15 1/2	285	W.S.		
12	35	5/5	M	CSL-1.05 26 1/4	CSW-1.31 33 1/4	84.5	62.9	SS-1.34 34	3/4 88.3 32 82.6	11	175	W. S.
13	36	5/5	M	CSL-1.05 29	CSW-1.25 37	94	28 7/11	SS-1.32 39	99.1 35 88.9	11 1/2	205	W. S.
14	37	5/5	M	CSL-1.05 26 1/2	CSW-1.32 33 1/4	84.5	64.8	SS-1.29 35	88.9 33 3/4 85.7	11 1/2	180	W. S.
38	Tag lost in sand											
39	5/5	F	29 3/4	36	29 1/4	37 1/2	37 1/2	12 1/4	230	W. S.		



Table 6

Tag #	Date	Sex	Plastron Length	Carapace				Thickness	Weight	Island
				Length Straight	Width Straight	Length Curved	Width Curved			
40	5/5	F	29	36	27 1/2	38	36	14 1/2	265	W. S.
41	5/5	F	29 1/2	35 3/4	28 3/4	38 1/4	35 1/2	14	255	W. S.
15 42	5/5	M	CSL-105 csw-1.23 24 1/2	81.9 32 1/4	64.1 25 1/4	SS-1.28 34 86.4	31 78.7	10 1/4	160	W. S.
43	5/5	F	30 1/4	35 3/4	27 3/4	39 1/2	36	15 1/4	280	W. S.
16 44	5/5	M	CSL-104 csw-1.28 27 3/4	85.1 33 1/2	46 26	SS-1.29 35 88.9	84.5 33 1/4	11 1/2	185	W. S.
17 45	5/5	M	CSL-107 csw-1.27 25 3/4	84.5 33 1/4	64.1 25 1/4	SS-1.32.2 35 1/2 90.2	32 81.3	11 3/4	180	W. S.
18 46	5/5	M	CSL-103 csw-1.29 26	85.1 33 1/2	64.1 25 1/4	SS-1.33 34 1/2 87.6	82.5 32 1/2	11 1/2	200	W. S.
19 47	5/5	M	CSL-105 csw-1.29 27 1/2	83.2 32 3/4	67.3 26 1/2	SS-1.24.6 34 1/2 87.6	87 34 1/4	13 1/4	210	W. S.
48	5/5	F	33 3/4	36 1/2	29	38 1/4	37 1/4	15 1/2	325	W. S.
49	Tag destroyed									
50	5/5	F	28 1/2	35 1/4	25	37 1/4	34 1/4	14 3/4	260	W. S.
51	5/5	F	27 1/2	35 1/4	26 3/4	38	34	13 1/2	250	East
52	5/5	F	29 1/4	35 3/4	26 3/4	37 3/4	36	14	255	East
53	5/5	F	29 1/4	35 1/2	28 3/4	38 1/4	35 1/2	12 1/4	230	East
54	5/5	F	30 1/2	37	28	39 1/2	38 1/2	14	280	East
55	5/7	F	28 1/4	36 1/4	27 1/2	36 (?)	34 1/4	13 1/4	205	Tabu 1/31/73 Makuleia Pah East
56	5/7	F	29 1/4	36	26 1/2	39	37 1/2	16 3/4	315	East
57	5/7	F	29 1/2	37	28 3/4	39 1/4	37 1/4	14 3/4	280	East
20 58	5/7	M	CSL-104 csw-1.31 28 1/4	87 34 1/4	65.4 25 3/4	SS-1.33 35 1/2 90.2	85.7 33 3/4	12 1/2	220	East
59	5/7	F	28 1/4	35 1/4	28	37 1/2	35 1/4	14 1/4	205	East
60	5/7	F	28 1/2	34 3/4	27 1/4	38	36	15 1/4	255	East
Photos of egg pit and sand										
61	5/8	F	27 1/4	33 3/4	25 3/4	36 3/4	35	14 1/4	210	East
62	5/8	F	29 3/4	35 1/4	28 1/4	38	37	14 1/4	230	East
63	5/8	F	28 3/4	35 3/4	26 1/2	38	36	13 1/2	230	East



Table 6

Tag #	Date	Sex	Plastron Length	Carapace				Thickness	Weight	Island
				Length Straight	Width Straight	Length Curved	Width Curved			
64	5/9	F	30	37 1/2	27 1/4	40	38	13 3/4	270	W.S.
21	5/9	M	CSL-106 CSW-1.32 27 3/4	88.3 34 3/4	65.4 25 3/4	SS-1.35 37.94	34.864	13 3/4	210	W.S.
22	5/9	M	CSL-107 CSW-1.34 27 1/2	85.7 33 3/4	67.9 26 3/4	SS-1.26 36.914	90.8 35 3/4	13 1/4	205	W. S.
23	5/9	M	CSL-104 CSW-1.25 26 3/4	85.7 33 3/4	65.4 25 3/4	SS-1.31 35.889	81.9 32 1/4	12 1/2	190	W. S.
68	5/9	F	29 1/4	35 3/4	27 1/2	38	37 3/4	15 1/2	260	W. S.
69	5/9	F	28 1/4	35 3/4	27 1/4	36	36 3/4	14 1/4	230	W. S.
70	5/5	F	28 3/4	35 3/4	27	37	34 1/2	14 3/4	225	W. S.
24	5/9	M	CSL-105 CSW-1.26 28 1/4	92.1 36 1/4	68.6 27	SS-1.34 38.965	34.864	13 3/4	225	W. S.
72	5/10	F	28 3/4	34	27 1/2	37 1/2	36 3/4	14 3/4	275	East
73	Lost in sand									
74	Did not use									
75	Did not use									

$$CSW \bar{x} = 1.283$$



Table 7

Turtle Retraps  
French Frigate Shoals

<u>Tag #</u>	<u>Sex</u>	<u>Location</u>	<u>Date</u>	<u>Carapace Length</u>	<u>Carapace Width</u>	<u>Plastron Length</u>	<u>Thick.</u>	<u>Round Measurements</u>	<u>Weight</u>
736	F	East Is.	6/14/68	No measurements taken					
	F	Trig Is.	5/17/71	37.8	28.6	29.9	13.7	40 X 36 1/2	270
	F	Trig Is.	5/5/72	37 1/4	29.0	30	13 1/2	39 X 37	275



### Marine Investigations

Some preliminary marine investigations were conducted adjacent to some of the islets.

#### Diving Time

<u>Date</u>	<u>Islet</u>	<u>Time and Depth</u>
May 6	La Perouse	1 1/2 hours to 32 feet
May 7	East Island	1 hour to 20 feet
May 4	Tern Island	2 hours to 15 feet
May 9	Shark Island	3/4 hour to 8 feet
May 10	Trig Island	3/4 hour to 15 feet

Of interest was the report of an unusual shark taken by personnel from the LORAN station. Although a photograph taken did not show the entire shark, it did show that the teeth were different from other sharks that had previously been recorded there. The photograph and several teeth were examined by Dr. Testor, a shark expert from the University of Hawaii, and he concluded that the shark was a Mako (Isurus oxyrinus).

During April, personnel from the station took an unusual object from the stomach of a 10 foot tiger shark taken off of Tern Island. The object appeared to be the spike from a large marlin. It was found "crossways" inside the stomach of the shark and the fellow that cut it out reported that the sharp end had punched the stomach wall. The spike was examined by personnel from the National Marine Fisheries Service in Honolulu, and they reported that it came from a striped marlin and that the fish was approximately 9 feet long and weighed approximately 240 lbs.

Again this year approximately 50 adult grey reef sharks were observed along the shallows of Whale Skate Island. They were seen milling around in waters approximately 3 feet deep and apparently they use this area for breeding every spring.

A manta ray with a "wing span" of approximately 14 feet was seen near Gin Island. Twice, it came out of the water upside down and smacked on the surface. Reportedly, these large creatures do this to rid themselves of ectoparasits which attach onto their backs.



### Vegetative Studies

Approximately 15 clumps of Cinchrus sp. were found on Trig Island. All were pulled up and disposed of in the ocean.

Also interested was the discovery of several mangrove seeds on East Island. The seeds were not viable, however, their presence there at French Frigate Shoals, some 480 miles from Oahu, certainly shows how some specimens of plants are naturally transported from one oceanic island to another.

### Studies of the Nihoa Finch

A total of 11 adult Nihoa finches were observed on Tern Island. In addition, two active nests were observed in the brick pile at the east end of the island. One nest contained three eggs while the other had three young.

The finch population on Tern Island appears to be relatively stable.



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Studies of the Green Sea Turtle

Although an attempt was made to conduct an aerial census of the turtles on the islands it proved unsuccessful. From the air it was evident that many more turtles were in the shallow waters adjacent to the island than there were on the beaches. For example, approximately 40 turtles were noted just off the north end of East Island while only 8 were observed on the beach. Census figures of turtles found on each islet cannot be considered a reliable estimate of the turtle population present around the atoll. In light of the number of turtles seen in the water in comparison of the number tagged, we estimated the French Frigate turtle population at 250 animals during that week.

Although we visited several of the islets on several days our repeated visits seem to have no adverse affect on turtle use of the islets.

Two nights were spent on East Island in an effort to observe turtles in the process of nesting. During the first night a single turtle came up on the beach and nested. The process was not observed and no effort was made to excavate the nest site. On the second night three turtles apparently nested and one was observed during the entire nesting process. Once the body cavity and pit were excavated it took 15 minutes to lay the clutch of 68 eggs. An hour was spent filling and packing the hole, and concealing the site. A total of 42 fresh (considered to have been excavated during the past month) turtle pits were observed on East Island.

A total of 47 turtles were tagged during the week at French Frigate Shoals. The smallest was 130 lbs. while the largest tipped the scales at 305 lbs (Table 5). Four previously tagged turtles were recovered (Table 6). Two had been tagged at Lisianski over three years ago while the other were previously tagged at French Frigate Shoals. No significant changes in measurements were noted.

An unusual observation of copulating sea turtles was made. In the shallow waters adjacent to East Island a group of 6 turtles was observed milling around a copulating pair. Olsen observed the incident from underwater and recorded it on film. All of the turtles swimming around the pair were males and they exhibited rather aggressive behavior and attempted to break up the pair. A note on this observation will be published in one of the herpetological journals.



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Table 5  
Turtle Tagging  
French Frigate Shoals  
May 1971

Tag #	Date	Sex	Plastron Length	Carapace		Length	Width	Thickness	Weight	Is.
				Length Straight	Width Curved					
940	5/13	M	27.7	34.2	26.5			12.0	195	T
941	5/13	F	30.9	36.3	29.2			13.8	275	T
942	5/13	F	28.0	33.1	25.1			12.5	205	T
** 943	5/14	M	26.3	33.9	24.9	35 1/2	32 1/4	11.7	180	(S)
944	5/14	F	30.3	38.6	29.3	39 1/2	36	13.7	280	(S)
945	5/14	F	28.8	36.1	28.3			13.2	235	WS
946	5/14	M	25.9	33.3	26.2			12.3	180	WS
947	5/14	M	27.6	35.0	26.8			12.6	220	WS
948	5/14	M	24.1	31.0	24.1			10.5	130	WS
949	5/14	F	27.7	34.2	26.1			14.9	225	WS
950	5/14	M	28.2	34.5	27.1			12.1	220	WS
951	5/15	F	26.2	33.1	25.8			12.1	185	T
952	5/15	M	27.2	34.0	25.6			12.2	195	T
953	5/16	M	28.1	35.9	27.7	36	39.2	14.3	225	E
954	5/16	F	29.1	36.0	26.3	38	37	14.8		E
955	5/16	M	27.2	33.5	27.3	35 1/2	34	12.4		E
956	5/16	F	29.8	37.2	27.7	40	37 1/2	13.0		E
957	5/16	F	31.0	36.5	27.6	39 1/2	38	14.4		E
958	5/16	F	30.7	38.2	29.8	40	38	13.9		(E)
959	5/16	F	30.0	36.6	29.0	40	39 1/2	14.8		E

SHARK

17 June 1970 NI, PH

Ketch

TC 2 13.0 6/80 FFS CPST

6/19/78 East



Tag #	Date	Sex	Plastron Length	Carapace		Length	Width	Thickness	Weight	Is.
				Length Straight	Width Curved					
960	5/17	F	30.1	36.3	26.7	39 1/2	35	15.3	290	WS
961	5/17	F	29.6	35.8	28.4	38 1/2	36 1/2	13.1	230	WS
962	5/17	M	28.7	36.6	27.5	38 1/2		12.3	240	WS
963	5/17	F	29.8	37.6	27.6	40	38	15.2	253	WS
964	5/17	M	27.4	34.7	26.9	37 1/4	35	12.6	210	WS
965	5/17	M	27.0	34.7	26.5	38	32 3/4	10.5	155	WS
966	5/17	F	31.1	36.9	29.2	40 1/4	38	15.1	280	WS
967	5/18	M	26.1	33.4	24.5	35	31 1/2	11.6	175	E
968	5/18	M	25.1	33.3	26.3	35 1/2	34	11.1	180	E
969	5/18	F	28.8	35.1	26.9	37	35	14.9	235	E
970	5/18	F	28.8	35.3	27.8	36		14.8	260	E
971	5/18	F	30.8	38.5	27.6	40 1/2	39	13.8	275	E
972	5/18	F	27.6	33.3	27.1	35 1/2	35 1/2	13.3	230	E
973	5/18	F	27.5	34.5	26.9	36 1/2	36	14.9	255	E
974	5/18	F	30.0	37.2	28.2	40	38 1/2	15.8	305	BC
975	5/18	F	29.2	35.6	26.5	38	35 1/4	13.9		BC
976	5/18	F	30.5	37.3	27.6	40	36 1/4	15.3		BC
977	5/18	F	27.4	33.8	25.5	35 1/2	33	12.6		LG
978	5/18	M	27.8	34.7	27.8	36 1/2	33 1/8	13.1		LG
979	5/18	M	27.9	35.6	26.9	37 1/4	35 3/4	12.8		LG
980	5/18	M	25.2	31.4	23.9	33 1/5	33	11.7		LG
981	5/18	F	29.0	36.7	27.5	38 1/4	35 3/4	13.2		LG
982	5/18	F	29.6	36.9	28.9	39	38 1/4	13.9		LG



Tag #	Date	Sex	Plastron Length	Carapace		Length Curved	Width Curved	Thickness	Weight	Is.
				Length Straight	Width Straight					
983	5/18	F	29.9	37.3	30.1	40 1/4	39 1/4	14.7		LG
984	5/18	F	29.2	36.2	28.0	38 1/4	36 1/4	14.5		LG
985	5/18	F	29.7	37.4	28.6	40 1/2	37	14.9		LG
986	5/19	M	22.0	27.2	21.4	28.8	25.3	9.9		E

## Key to IS.

E - East Island

WS - Whale Skate

T - Trig Island

BG - Big Cin

LG - Little Cin

S - Shark Island



Table 6  
Turtle Retraps  
French Frigate Shoals

REVERSED?

Tag #	Sex	Location	Plastron Length	Carapace Length	Width	Thickness	Round Measurements	Weight	Date
660	F	East Is.	31.8	30.4	38.1	15.1	40 X 43	330	5/16/71
	F	Lisianski	32.0	30.3	33.4	15.7		325	3/20/68
59	F	Whale Skate	28.7	35.4	27.4	13.5	37 X 34.9	250	5/15/71
	F	Trig Is.					38 1/2 X 36		3/13/67
	F								2/23/69
644	F	Whale Skate	29.1	34.6	28.6	12.3	37 X 35 3/4	255	5/17/71
	F	Lisianski	29.6	34.4	28.6	12.7	37 X 35.5	225	3/30/69
	F	Lisianski					36 3/4 X 34 1/2		9/26/67
736	F	Trig Is.	29.9	37.8	28.6	13.7	40 X 36 1/4	270	5/17/71
	F	East Is.	No measurements taken - nesting						