NORTHWESTERN HAWAIIAN ISLANDS

GH BALAZS FILE
1 of 2

RESEARCH OPPORTUNITIES ON NATIONAL WILDLIFE REFUGES OF THE UNITED STATES

(A GUIDE FOR GRADUATE STUDENTS, COLLEGE & UNIVERSITY STAFFS)

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE

There are about 340 National Wildlife Refuges with approximately 30 million acres within the 50 States. These areas are managed by the Bureau of Sport Fisheries and Wildlife of the U. S. Department of Interior and represent unique opportunities for wildlife and wildlands-oriented research. The purpose of this publication is to briefly describe some of the types of areas to be found, objectives and research needs of the refuges, and procedures to be followed in obtaining approval to conduct field research on them.

A wide variety of biomes is to be found within the National Wildlife Refuge System. Southwest desert, arctic tundra, coastal rain forest, prairie pothole, timbered swamplands, eastern hardwood forest and estuarine marsh are but a few examples. Most of the refuges encompass wetlands supporting large numbers of waterfowl, but some have been set aside to preserve habitat for threatened species; yet others concern themselves with ungulates once endemic to large areas of the continent, and still others with colonial nesting sea birds.

Objectives of the National Wildlife Refuge System

The National Wildlife Refuge System's mission is to provide, manage and safeguard a national network of lands and waters sufficient in size, diversity and location as to meet people's needs for areas where the entire spectrum of human benefits associated with migratory birds, other wild creatures, and wildlands are enhanced and made available. To meet this overall mission, the system is concerned with perpetuation of endangered plant and animal species, supporting populations of migratory birds at desired levels, demonstrating wildlife and wildlands management practices, and expanding an understanding and appreciation of wildlife and wildlands ecology. The System contains a mosaic of wilderness areas, research natural areas, and lands and waters where vegetation is manipulated through various management practices. Providing wildlife diversity is an important consideration. Surplus refuge animals are often removed through public hunting. Historical, geological, archeological, and other scientific sites are given special consideration. The role of refuges in providing an ecological monitoring service to the nation has a high priority.

Research Needs and Support

Especially encouraged on National Wildlife Refuges are management-oriented research projects or studies which will lead toward solving management problems of individual refuges or the System as a whole. Refuge managers in charge of each area maintain lists of research needs or can inform potential researchers where their most important needs lie. Research Natural Areas have been established on many refuges to provide unique habitat types to be used primarily for research purposes.

The Bureau of Sport Fisheries and Wildlife seldom provides funds for research projects conducted by non-Bureau personnel on refuges. Only for critical refuge management problems are funds supplied--and for these studies, the Division of Wildlife Refuges of the Bureau sometimes has contracts with Cooperative Wildlife Research Units located on various college campuses or with universities having expertise in the area of concern. The Refuge System does, however, provide sites and coordinate research on refuges.

One of the objectives of the National Wildlife Refuge System is to allow people to appreciate and receive enjoyment from wildlife resources. Some of the System's most critical research needs involve people and avoidance of conflict between people and the resources they come to enjoy and study. Therefore, studies on determining compatibility between public uses and wildlife use are among the most critical needs at present. Refuge objectives are developed according to demands and capabilities on a sustained basis, and developing means for avoiding conflict between objectives is a challenge. There is a need not only to better define the capacity of individual refuges for various types of public uses but also for more information on anticipated demands for the years ahead. Maintaining quality in the public use program is paramount. Some examples of needed studies include quality versus quantity waterfowl hunting demands and capabilities; design and location of self-guided nature trails and auto tour routes; maintenance of threatened or unique non-game species in harmony with game species and public use; manipulation of vegetation to maintain desired plant succession for key wildlife species; and aquatic vegetation distribution, density and succession as related to water levels, soil and water chemistry, muskrats and grazing.

How to Obtain Permission to Conduct Studies on Refuge Lands

Individuals wishing to conduct graduate or post-doctorate level research studies on individual refuges are invited to submit outlines of study plans in triplicate to the Refuge Manager. The following includes items to be covered in the outline:

1. Title of study (state concisely).

2. Objectives: (number each objective, defining it clearly and concisely, limiting each statement to a goal of possible accomplishment.)

3. Justification: (outline extent of knowledge and background; describe briefly how the study will contribute to better management of the area or its importance to other fields.)

4. Procedure:
   a. Literature review.
   b. Data collecting (cover techniques and location of activities; describe any markers, structures, or other material to be placed on the refuge and affirm that such material will be removed by the investigator; describe in detail any capture, markings, or tagging techniques. Be sure to cover who is to do what, when, where and how.)
   c. Data analysis and interpretation.

5. Cooperators: (List other participating institutions, agencies, organizations, or individuals, if any.)

6. Responsibility: (Set forth work and supervision responsibilities.) Indicate role to be played by the refuge, especially anything in addition to providing the study area.

7. Cost: (Costs, if any, to the Bureau of Sport Fisheries and Wildlife should be broken down by fiscal year (July 1 to June 30) and include man-years, equipment, supplies, etc., to accomplish the study. Most studies will not involve any direct costs to the Bureau.)

8. Schedule: (Estimate starting and completion dates. If a portion of any given study is to be accomplished separately, the recommended starting and completion dates of each phase should be shown.)

9. Reports: (Establish due dates for progress and final reports and indicate three copies to be furnished to Refuge Manager.)

10. Publications: (State plans, if any.)

11. Submitted by: (If student study, major responsible professor should also sign.)
    Date:

12. Approved by: (Bureau Directorate) Date:

13. Cooperator(s) endorsement(s): Date:

Prescribed university or financial supporting agency outlines can be used providing they cover the information listed above. These should be accompanied by a Refuge Management Study Transmittal Form obtainable from the Refuge Manager. Studies submitted to and recommended by the Refuge Manager must in turn be approved by the Bureau Directorate. This procedure enables the Refuge Manager to have full knowledge of activities planned by the researcher and to coordinate any necessary management activities with the research project. It also avoids conflicts between two research projects as, for example, two researchers working on the same water body could have different needs for management of water levels. The approval procedure also enables the Refuge Manager, the Regional Director, and the Bureau Director to evaluate proposed studies to insure that they are in consonance with overall Bureau objectives.

Study outlines and reports are necessary to document the value and use of National Wildlife Refuges as outdoor laboratories. In addition, research work on refuges often improves the refuge program or provides additional information to use in educational or interpretive material provided the public.

The Refuge Manager may want additional information over and above that requested, such as car license numbers. Collecting, capture, and marking of animals and other activities must be under applicable state and federal regulations. It is the investigator's responsibility to obtain necessary permits for this purpose.

Undergraduates are also invited to use National Wildlife Refuges for field studies. Some or all of the above approval procedures apply to them, depending upon the scope of their project. Refuge Managers should be contacted during the planning stage for these studies as well.

Whom to Contact

Further information can be obtained from a Refuge Manager, or the Regional Director (Bureau of Sport Fisheries and Wildlife), closest to you. Regional Office addresses are as follows:

REGION 1 - P. O. Box 3737, Portland, Oregon 97208
(California, Idaho, Hawaii, Nevada, Oregon, Washington)

REGION 2 - P. O. Box 1306, Albuquerque, New Mexico 87103
(Arizona, New Mexico, Oklahoma, Texas)

REGION 3 - Federal Building, Fort Snelling, Twin Cities, Minnesota 55111
(Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)

REGION 4 - 17 Executive Park Drive, N.E., Atlanta, Georgia 30329
(Arkansas, Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee)

REGION 5 - John W. McCormack Post Office and Courthouse, Boston, Massachusetts 02109 (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia)

REGION 6 - 10597 West 6th Avenue, Denver, Colorado 80215
(Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming)

ALASKA - 813 "D" Street, Anchorage, Alaska 99501

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
INT: 5445-73

George Balazs
Hawaii Institute of Marine Biology
P.O. Box 1346
Coconut Island, Kaneohe, HI 96744

18 March 1983

Dear George,

I put in a request today to Smithsonian Archives for a search for that letter to Louis Agard, that you need. They may or may not come up with it. A lot of material was lost when quickly departing biologists left the POBSP near the end of its reign. If Binion, himself, does not have it squirreled away somewhere, it ought to be somewhere in the files that were used in putting together the French Frigate Shoals report.

As you might suspect, things are relatively dismal in Washington, particularly in the Department of Interior, which has no funds for travel, research, or employment. I put in a desk audit a year plus ago in the vain hope that they might recognize me as a biologist but the future does not look good. It seems like it is either happily go back to labeling and cataloguing birds or forget it.

I havent been in the field since November 1980, nor have I worked on almost anything else than this rather massive three volume bibliography plus status report on Marine Birds of the Southeastern United States. Volume III (terns, gulls, two phalaropes, and the Black Skimmer is almost complete and probably will run about 800 pages. While incorporating all too many errors and secondary citations (many of which were uncheckable) it still produces (I hope) the strongest species oriented bibliographies for these species ever put together.

If you ever hear of a survey that needs a peripatetic seabird surveyor, please let me know.

Hope things are going well with you,

Regards,

Roger

Roger B. Clapp

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE

National Museum of Natural History
Washington, D.C. 20560
(202) 357-1930

George Belazs
Hawaii Institute of Marine Biology
P. O. Box 1340
Kaneohe, Hawaii, 96744

28 March 1983

Dear George,

Sorry but your luck is bad. Susan Westgate went over everything relevant in the Archives pertaining to French Frigate Shoals but found no trace of the Agard letter. I went over to what remains of the POBSP files in the Natural History building and rooted through the completely disorganized four drawers that remain from Binion's files on the French Frigate Shoals report. I found lots of notes on this and that but found no correspondence. Presumably Binion has this letter in his personal correspondence that he took with him when he left the POBSP. Perhaps going through this file in detail might uncover some further clue but it would take me a day or more to re-organize it and I just don't have the time to do so now.

Hope things are going well with you and that you at least get a chance to see a little of those fascinating islands from time to time.

Sincerely yours,

Roger B. Clapp

FISH AND WILDLIFE SERVICE

INTER-OFFICE TRANSMITTAL

(NPS - Gil)

☐ Director, _____

☐ Denver Service Center, _____

☐ Regional Director, _____

☐ Project Leader, _____

☑ Area Office, Pacific Islands Administrator

☐ Regular Mail

☐ Air Mail

☐ Action

☑ Information

From	Office	Date
L Bames	AWR (PD)	3-18-83

Subject

Visit by Bur. Soc. of Japan -
not sure if you have seen
attached.

3-1908 (Attach securely to material to be transmitted & mail through regular channels)
(Rev. 11/78)

ADDRESS ONLY THE DIRECTOR
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

February 24, 1983

Dr. Nagahisa Kuroda
President, Biogeographical Society
of Japan
3-48-1 Yoyogi Shibuyaku
Tokyo 157
Japan

Dear Dr. Kuroda:

I am writing in connection with your Society's desire to conduct faunal surveys in U.S. areas of the eastern Pacific.

Entry into the U.S. and areas under U.S. jurisdiction will, of course, require your obtaining visas from the United States Embassy in Tokyo. I strongly urge you to visit with the Science Counselor, Dr. Gerard Helfrich, at the Embassy well in advance of your departure to discuss the objectives of your survey and your proposed itinerary.

You must advise the U.S. Fish and Wildlife Service Regional Office in Portland, Oregon, if you anticipate collecting any specimens during your visit as collection and/or export permits may be required. For this purpose you may correspond with:

Regional Director
U.S. Fish and Wildlife Service
500 N.E. Multonomah Street
Suite 1692
Portland, Oregon 97232
USA

cc:
Jeff Fountain - Refuges

Similarly, permits may be required from the State of Hawaii. You should inquire regarding this possibility by writing:

Director
Division of Forestry and Wildlife
Department of Agriculture
1151 Punchbowl Street
Honolulu, Hawaii 96813
USA

To assure entry and the opportunity to conduct survey work within the Hawaiian and Pacific Islands refuges complex, you should write to:

Manager, Hawaiian Islands National
Wildlife Refuges
P.O. Box 50167
300 Ala Moana Boulevard
Honolulu, Hawaii 96850
USA

It may also be necessary to be in telephone contact with the refuge office in Honolulu and their telephone number is 800/546-5608.

In principle, we encourage scientific research within our refuge system by any accredited organization. As you can understand, however, the management of wildlife resources, particularly threatened and endangered species, requires certain controls over entry into critical, fragile habitat areas and necessitates strict controls over the taking of specimens and of the methods of take. While these controls are essential, they are not intended to deter the conduct of valid research. It is important, however, that you contact the Embassy, the Regional Office, the Refuge Manager, and the State of Hawaii as early as possible with full and complete details of your survey expedition. Only in this way can you be assured of achieving the purpose of the Society's expedition.

Sincerely yours,

Lawrence N. Mason
Chief, International
Affairs Staff

cc:
IA-reading file
RD-Region 1
Mgr. Hawaiian & Pac. Is. Refuge
Dir. For./Wild. State of Hawaii
Dr. Gerard Helfrich - Scicouns,
U.S.Emb. Toyko
Japan Desk, State Dept.
Jeff Fountain-Refuges (no enc.)
IA-LNMason:jal 2/24/83

BIOGEOGRAPHICAL SOCIETY OF JAPAN

3-48-1 Yoyogi, Shibuyaku, Tokyo 157, Japan Phone: 03 (370) 4357.5855

Dr. Robert Jantzen
Director
Fish & Wildlife Service
United States Department
of the Interior
Washington D.C.

January 25, 1983

Dear Sir:

The Biogeographical Society of Japan was organized in 1928 at the National Museum in Tokyo with Dr. Shozaburo Watase, founder of the so-called Watase Line, one of the border lines in chorology, as its first president. Since then, the Society has changed its location of office several times but has remained unchanged in its dedication to worldwide studies and research, with a constant force of some 300 zoologists and botanists, on the genealogical, morphological and ecological aspects of faunas and floras with particular emphasis on chorology.

The studies have covered the islands located in the western part of the Pacific, i.e such islands forming, in particular, the Japanese Archipelago including the Kuriles in the north, Bonins and Ryukyus, as well as Taiwan and its annexed islands, down to Micronesia in the south.

The Society lost some of its activities after the end of the Pacific War but has somehow managed to send expeditions to various areas concerned almost every year. The result of these expeditions have crystalized in the form of 38 papers on the Kuriles (dating back to 1931), 10 papers on the Bonins (dating back to 1929) , 43 papers on the Ryukyus (dating back to 19340, 28 papers on Taiwan (dating back to 1930) and five papers on Micronesia (dating back to 1939). These papers, through the bulletins of the Society and Biogeographica, were introduced to academic societies throughout the world and have contributed a great deal to the growth of cultures worldwide. For details, please refer to the list of published papers attached to this letter.

The year 1983 marks the 55th anniversary of the founding of the Society. To commemorate the occasion, we plan to depart from the traditional patern of research territories and venture into the east side of the Pacific and the sorrounding islands. As the first step, we have selected the Hawaian islands, specifically the Leewards Island, which is designated a special

sanctuary for the preservation of natural environment, as well as the French Frigate and Laysan Islands around the region.

Our plan calls for making a survey of the fauna of this region and comparing its results with those of surveys made already on the west side of the Pacific. The comparative surveys should enable us to identify the points of similarity and difference between organisms in both regions. By getting to know the route via which organisms migrated to these islands we should also be able to establish the rule governing the geographical distribution of plants and animals in the realm of nature. At the same time, our survey of the special sanctuary is expected to give us first-hand knowledge of the nature conservation policy of the U.S. toward sub-tropical islands, thereby providing us with data required for the establishment of Japan's nature conservation policy in future.

We therefore would like to ask for the approval of competent U.S. authorities to make the proposed survey a joint project with local Hawaiian biologists. We would also like to get permission from the National Hawaii Wildlife Refuge, which has jurisdiction over the region, for entry therein.

Upon approval, we will immediately embark on preliminary communication with our Hawaiian colleagues and the agency concerned.

Your special consideration and cooperation would be greatly appreciated.

Sincerely,

Nagahisa Kuroda

Nagahisa Kuroda
President of Biogeographical Society
of Japan

BIOGEOGRAPHICAL SOCIETY OF JAPAN

3-48-1 Yoyogi, Shibuyaku, Tokyo 157, Japan Phone: 03 (370) 4357, 5855

1. Survey items:

Terrestrial fauna

1. Mammals --- The ecological status, specifically feeding characteristics and conservation, of monk seals.

2. Birds --- The ecological aspects, specifically feeding and breeding characteristics of gulls, petrels, shearwaters, terns, boobies, frigate birds and albatrosses. Species and guild composition of land birds in each island.

3. Reptiles--- Observations of green turtles and sea snakes (akin to banded sea snakes), specifically their feeding characteristics and egg-laying habits.

4. Insects --- The ecological aspects of large moths (akin to atlas moths) and butterflies, specifically their life history.

Marine fauna

1. Fishes --- The morphological and ecological aspects of coastal fishes or so-called coral atoll fishes, i.e. butterfly fish, rabbitfish, damselfish, anemone-fish, shrimp-fish orrazorfish, etc., as well as their correlation and life history.

2. Mollusks -- The life of cuttlefish and octopus and its relationship with environment, as well as the morphologcal, ecological, and distribution aspects of conch shells and bivalves.

3. Shells --- The morphological and ecological aspects of lobsters and crabs, particularly large hermit crabs, as well as their relationship with other terrestrial creatures.

4. Spine-covered creatures -- The eating characteristics of sea urchins and starfish, particularly crown-of-thorns starfish, as well as their relationship with mollusks and coral.

2. Survey method:

Entry into the region will be made by a survey ship to be chartered either in Honolulu or Tokyo. A large rubber boat will be used, as the occasion may demand, for landing and subsequent survey. The survey ship will provide, in principle, sleeping quarters for expedition.
An accompanying recording squad will do terrestrial and underwater photographic and filming work using still and video cameras, as well recording work.

3. Survey period:

About 30 days spanning the April-May period in 1983.

4. Survey team lineup:

Japanese side	Leader---	Nagahisa Kuroda, PhD. President of Biogeographical Society of Japan and Research Director of Yamashina Institute for Ornithology.
	Seabird - squad	Hiroyoshi Higuchi PhD, a committee of Biogeographic Society of Japan and an assistant professor in Dep. of Agriculture, Tokyo University
	Aquatic - organism squad	Etsuko Shimura (tentative) A graduate, Oceanic Research Institute, Tokyo University.
	Ichthyological- squad	Masao Watanabe, PhD. ex-professor of Waseda University and former Research Associate in the Fish Division, Museum of Zoology, The University of Michigan. Vice President of Biogeographical Society of Japan.
American side	Undecided	

Assistants and recording squad - 6-7 person

5. Survey report:

a) To academic societies:

1) Briefing sessions

2) Survey report with photos

b) To the public:

1) Publication of the report with photos in general science magazines.

2) Exposure in a science education program, using an edited version of the video tape.

Waialae Avenue; and along Waialae Avenue from Saint Louis Drive to Wilhelmina Rise. Then for east-bound destinations only, the route follows Waialae Avenue from Wilhelmina Rise to Kalanianaole Highway. For west-bound bicycle traffic the route will proceed on Waialae Avenue from Kalanianaole Highway to the Waialae Drive-In Theater. Here, the cyclist will be channelled onto the existing pedestrian walkway at the Drive-In/21st/Waialae Avenue intersection by a bike route sign. Curb cuts will be provided in the island at that intersection and onto the pedestrian walkway which will be widened to accommodate both pedestrains and bicyclists and the grade adjusted. Where the H-1 Freeway off-ramp lane and Waialae Avenue merge, the walkway becomes a roadside sidewalk upon which the cyclist will continue onto Ekaha Avenue following the existing contour of the sidewalk. The bike route then follows Ekaha Avenue to Keanu Street; Keanu Street from Ekaha Avenue to Wilhelmina Rise; and Wilhelmina Rise from Keanu Street to Waialae Avenue where the cyclist will continue in the west direction.

FRENCH FRIGATE SHOALS

ANALYSIS OF TOTAL REEF FISH COMMUNITIES AT FRENCH FRIGATE SHOALS AND THEIR TROPHIC RELATIONSHIPS BY QUANTITATIVE CHEMICAL COLLECTION, FRENCH FRIGATE SHOALS, U.S. Dept. of Interior, Fish and Wildlife Service Hawaii Cooperative Fishery Research Unit

The Hawaii Cooperative Fishery Research Unit, under supervision of its leader, Dr. James D. Parrish, proposes to make 4 fish collections using rotenone during March 1983 (probably within the period 18-28 Mar 83, depending on logistic constraints). These collections will involve application of several pounds of a commercial chemical product containing up to 8% rotenone on each of 4 isolated patch reefs at French Frigate Shoals. The exact amount used will depend upon the size of the individual patch reef and the conditions of the site at the time of collection. In all cases, the minimum area will be collected (i.e. the hard substrate of the patch reef only,) typically several meters squared. The relative isolation of the discrete patch reefs and the absence of strong currents in the area permit good control of the distribution of the chemical. Minimum concentrations for effective fish collection will be used (typically about 1 ppm). Measurements of the reef size and water depth will enable calculation of the amount of chemical required to produce this concentration. Collections will be made within the lagoon, at distances of at least several hundred meters from any island, within a large, sandy area containing many well separated patch reefs. Each patch reef will be completely surrounded by a fine mesh net from the bottom to the water surface during the collection. All specimens affected by the chemical will be collected, examined in the field, and analyzed in the laboratory.

ENVIRONMENTAL IMPACT STATEMENTS

EIS's listed in this section are available for review at the following public depositories: Environmental Quality Commission; Legislative Reference Bureau; Municipal Reference and Records Center (Oahu EIS's); Hamilton Library; State Main Library and the Kaimuki, Kaneohe, Pearl City, Hilo, Kahului and Lihue Regional Libraries. Statements are also available at State Branch Libraries that are in proximity to the site of a proposed action (indicated by project description).

Comments on the following EIS's may be sent to: 1) the accepting authority; and 2) the proposing agency. Please note the deadline date for submitting written comments on the EIS.

LAHAINA WASTEWATER TREATMENT PLANT EXPANSION, HONOKOWAI, LAHAINA, MAUI, County of Maui Dept. of Public Works

The County of Maui is seeking to construct an expansion to their existing wastewater treatment facility at Honokowai (TMK:2nd 4-4-02:3). Proposed site is 8 acres and is located adjacent to the existing County wastewater facility. The project is currently leased by the Pioneer Mill Company from the State of Hawaii. Proposed facility will be constructed by Amfac Property Corporation and will be operated and ultimately owned by the County of Maui Dept. of Public Works. The expansion will have a capacity of 3.5 mgpd and will provide secondary treatment

for wastewater generated by the West Maui communities and the Kaanapali Beach Resort. Construction is scheduled for June 1983. Proposed facility will accommodate further development in the Lahaina district and will result in selected agricultural lands being converted to urban uses.

This EIS is also available at the Kahului, Lahaina, Makawao and Molokai Branch Libraries.

Deadline: February 22, 1983.

HONOKAHUA WELL "B," LAHAINA DISTRICT, MAUI, County of Maui Dept. of Water Supply

Previously published January 8, 1983.

This EIS is also available for review at the Kahului, Lahaina, and Makawao libraries.

Deadline: February 7, 1983.

ULILI AND ELEPAIO STREETS DRAINAGE IMPROVEMENTS, TMK:3-5-04 and 3-5-03:39, KAHALA, OAHU, Dept. of Public Works, City and County of Honolulu

Previously published January 8, 1983.

This EIS is also available at the Waikiki-Kapahulu Library.

Deadline: February 7, 1983.

KAHANA "315" RESERVOIR PROJECT, TMK:5-2-01,02,03, and 06, KAHANA VALLEY, OAHU, Board of Water Supply, City and County of Honolulu

Previously published January 8, 1983.

This EIS is also available at the Kahuku and Kailua Libraries and the Windward Community College Library.

Deadline: February 7, 1983.

EIS'S SUBMITTED FOR ACCEPTANCE.
The following EIS's have been submitted for acceptance and contain comments and responses made during the review and response period.

HONAUNAU BOAT LAUNCHING RAMP, HONAUNAU, SOUTH KONA, HAWAII, TMK:8-4-13:14, County of Hawaii Dept. of Parks and Recreation

The County of Hawaii, Department of Parks and Recreation is proposing the construction of a single-lane boat launching ramp on the north side of Kapuwai Cove at the head of Honaunau Bay in the district of South Kona, Island of Hawaii (TMK:8-4-13:14). The proposed ramp will replace an existing but deteriorating boat ramp, and will be oriented from noth-north-east to south abutting the existing ramp. Overall measurements of the proposed ramp are 153-ft. long by 15-ft. wide, covering an area of 2,295 sq. ft. The subject parcel is owned by the Bishop Estate and leased to the County of Hawaii. The site is located immediately to the north of Pu'uhonua O Honaunau National Historical Park (formerly City of Refuge). The proposed development is to be located within the County of Hawaii Special Management Area and the State Conservation District.

This EIS is also available at the Bond Memorial, Holualoa, Kailua-Kona, Kealakekua, Waimea, Pahala Community-School and Pahoa Community-School Libraries.

Status: Accepted by Mayor Matayoshi on November 29, 1982.

REVISED ENVIRONMENTAL IMPACT STATEMENT FOR THE WAILUPE WELL WATER DEVELOPMENT PROJECT, TMK:3-6-19:35, HONOLULU, HAWAII, Board of Water Supply, City and County of Honolulu

The objective of the proposed project is the development of groundwater within Wailupe Valley to assist in meeting the increasing domestic demand in the Honolulu Water Use District. The project proposed by the Board of Water Supply consists of the development of groundwater within Wailupe Valley. This involves the conversion of an existing exploratory well, drilled and tested by the Division of Water and Land Development (DOWALD) of State Department of Land and Natural Resources (DLNR), to a viable production well. The well will then be put into service at its rated capacity of 0.2

The State of Hawaii has created a marine sanctuary on the fringing reef and waters within 50 feet of the reef edge around Coconut Island. Living organisms cannot be removed or molested without a permit, and these permits are normally only issued to HIMB scientists.

C. Climate

The subtropical climate of Hawaii can most often be described as steady and benign. Trade winds blow about 85% of the time, bringing with them mostly sunny weather with a few showers. Annual mean air temperature is 23°C, with monthly mean values between 19° and 25°C. Annual mean relative humidity is about 80%. Annual rainfall at Coconut Island is almost 1100 mm/yr, but the orographic effect caused by trade wind impingement on the nearby Koolau mountain range produces a steep rainfall gradient to the west, and results in a high runoff rate in the Kaneohe Bay watershed. A slight seasonal trend exists, with more rainfall in winter months than in summer. Winter time is also the period during which the trade winds are most frequently interrupted by the disappearance of the subtropical atmospheric high pressure area. Periods in which trades are absent can normally be characterized by either clear, calm conditions with afternoon sea breezes and orographic clouds over the interior of Oahu, or strong, wet southerly winds preceding a cold front moving in from the northwest. Winds in excess of 15 m/sec (30 knots) are infrequent and usually associated with frontal storms.

D. Geology

Oahu is a high basalt island with fringing coral reefs and numerous sandy beaches around its periphery. The island consists of two parallel mountain ranges, the Koolau and Waianae ranges, joined by a central alluvial plain. The windward face of the Koolau range bears the brunt of the trade winds and associated orographic showers. This range is therefore eroded back to the hard vertical dike structure, resulting in spectacular windward cliffs of 800 meters elevation, and a broad coastal plain. Kaneohe Bay is an erosional feature of this coastal plain, and is protected from ocean wave activity by a barrier reef (Figure 1). This barrier reef consists of a steep, high-energy face that absorbs most of the wave energy, a wide algal flat, and a sandy backslope into the lagoon. The lagoon floor

is muddy with small, scattered patch reefs. These patch reefs, and the fringing reef adjoining the land, have coral cover up to 95% and abundant fish and other marine life on their slopes, and rubble-strewn reef flats behind the reef crests.

Coconut Island is a basalt island left after erosion of surrounding areas. It is completely surrounded by coral reefs except where channels have been cut. About half of the island's area is of man-made origin, produced by the dredging of channels, harbors and a swimming pool. Maximum elevation of the island is 18 meters.

E. Biological and Environmental Factors

The principal biological features of conern here are those related to the function of HIMB; i.e., the marine environment. The most prominent such feature is the presence of coral reefs, which are of course complex assemblages of corals and other invertebrates, algae, and associated epifauna. The principal coral species on Kaneohe Bay reefs are Porites compressa, P. lobata, Montipora verrucosa, Fungia scutaria, Pocillopora damicornis, and P. meandrina. Coral cover on the patch reefs varies from nearly zero on the reef flats to as high as 95% on slopes. The soft corals Palythoa psammophila and Zoanthus pacificus are conspicuous on reef flats in the southern end of the bay.

The most conspicuous environmental features are gradients in the degree of land and urban influence on the bay. Specifically, land influence in the form of fresh water and terrigenous sediment generally increases going across the bay from northeast to southwest, and urban influence increases along the bay from northwest to southeast. These gradients result in a heavy combined terrestrial impact in the southern basin. This impact, coupled with generally poorer circulation in the southern basin than elsewhere, results in higher levels of suspended organic matter and plankton biomass in the southern basin. Thus a gradient in water quality and plankton abundances exists from the southern basin, through the rest of the bay, and out to the ocean.

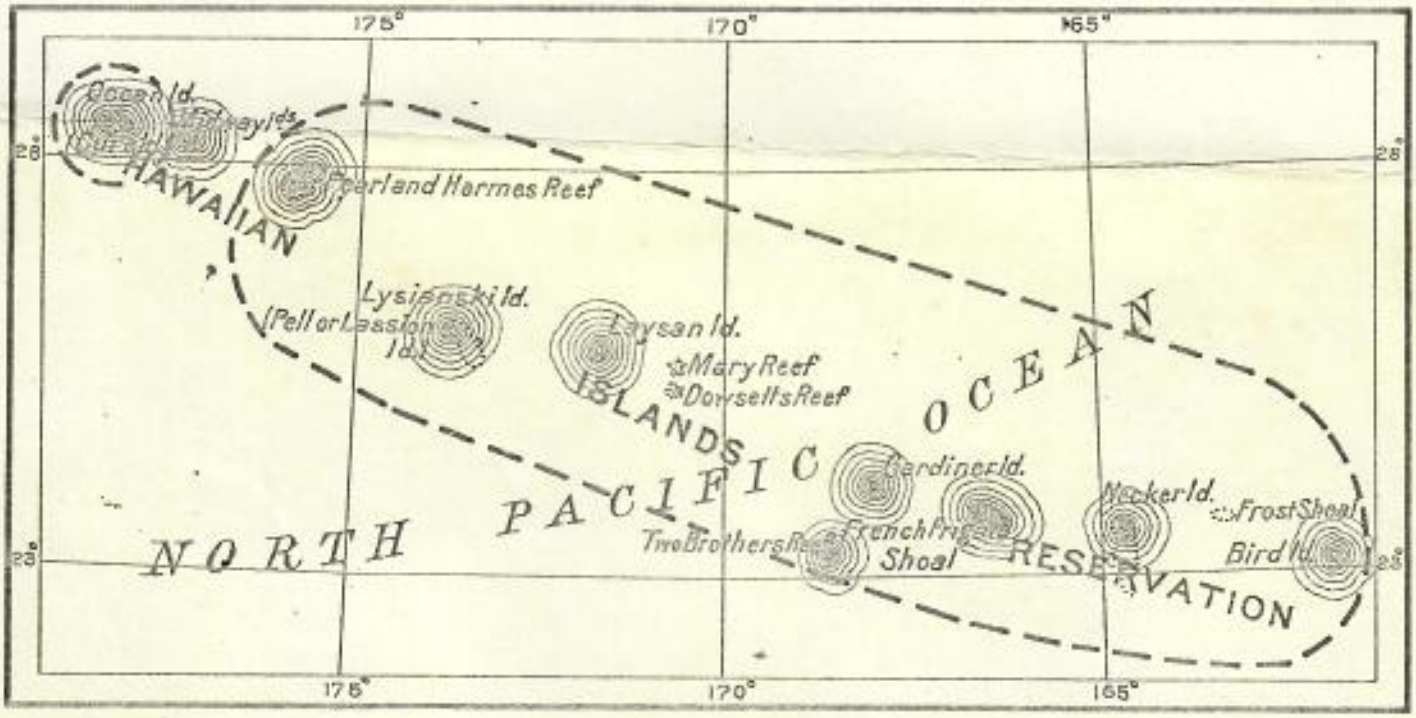
One effect of this gradient has been to alter the benthic communities, particularly in the vicinity of stream discharges in the southern basin. An additional influence was the discharge of treated sewage from 1963 until

HAWAIIAN ISLANDS RESERVATION

For Protection of Native Birds

TERRITORY OF HAWAII

Embracing the islets and reefs segregated by the broken lines and designated "Hawaiian Islands Reservation"



DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE
Fred Dennett, Commissioner

Executive Order

It is hereby ordered that the following islets and reefs, namely: Cure Island, Pearl and Hermes Reef, Lysianski or Pell Island, Laysan Island, Mary Reef, Dowsetts Reef, Gardiner Island, Two Brothers Reef, French Frigate Shoal, Necker Island, Frost Shoal and Bird Island, situated in the Pacific Ocean at and near the extreme western extension of the Hawaiian archipelago between latitudes twenty-three degrees and twenty-nine degrees north, and longitudes one hundred and sixty degrees and one hundred and eighty degrees west from Greenwich, and located within the area segregated by the broken lines shown upon the diagram hereto attached and made a part of this order, are hereby reserved and set apart, subject to valid existing rights, for the use of the Department of Agriculture as a preserve and breeding ground for native birds. It is unlawful for any person to hunt, trap, capture, wilfully disturb, or kill any bird of any kind whatever, or take the eggs of such birds within the limits of this reservation except under such rules and regulations as may be prescribed from time to time by the Secretary of Agriculture. Warning is expressly given to all persons not to commit any of the acts herein enumerated and which are prohibited by law.

This reservation to be known as the Hawaiian Islands Reservation.

THEODORE ROOSEVELT

THE WHITE HOUSE,
February 3, 1909.

[No. 1019.]

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

CRUISE REPORT

VESSEL: Townsend Cromwell, cruise 80-03 (TC-89), Part I

CRUISE PERIOD: May 28-June 27, 1980

AREA OF OPERATION: Northwestern Hawaiian Islands

ITINERARY:

May 28 - Departed Snug Harbor, Honolulu

29-31 - Nihoa Island. Trolled, handlined, and set fish traps. Debarked Conant and Collins with supplies and equipment on May 31.

June 1-2 - Necker Island. Trolled, handlined, night-lighted, and set shrimp pots. Harrison, Ludwig, Seki, and Saito camped on the island.

3-4 - French Frigate Shoals. Unloaded supplies for U.S. Fish and Wildlife Service (USFWS) and the turtle-tracking group. Monk seal count on Disappearing Island with Flint and Schulmeister aboard. Harrison, Ludwig, Seki, and Saito camped on East Island. Loaded Parrish's supplies and equipment for transport to Midway Island. Trolled, handlined, and night-lighted.

5 - Raita Bank. Trolled and handlined.

6-9 - Laysan Island. Supplies unloaded for Brian and Pattie Johnson and other people. Harrison, Ludwig, Seki, and Saito camped on the island. Ran bird transects with Naughton on board. Trolled, handlined, set fish traps, and night-lighted. Handlined at Northampton Seamounts during a bird transect.

10-12 - Lisianski Island. Ran bird transects with Knudtson aboard. Handlined, trolled, and night-lighted. Embarked Gilmartin, DeLong, Kooyman Loughlin, and Knudtson with all of their supplies and equipment.

June 13-14 - Midway Island. Debarked Gilmartin, DeLong, Kooyman, Loughlin, and Knudtson with some of their supplies, etc. Unloaded Parrish's supplies and equipment.

15 - Ladd Bank. Handlined and trolled after survey for Gambia Shoal proved negative.

16-20 - Pearl and Hermes Reef. Harrison, Ludwig, Seki, and Saito camped on the island. Handlined, trolled, and night-lighted.

20 - Salmon Bank. Handlined, trolled, and surveyed.

21 - Nero Bank. Handlined, trolled, and surveyed.

22-25 - Kure Island. Handlined, trolled, set fish and lobster traps, and night-lighted. Harrison, Ludwig, Seki, and Saito camped on Green Island.

26-27 - Midway Island. Handlined and trolled. Debarked Hida, Aldridge, Harrison, Ludwig, Seki, and Saito. End of Part I.

MISSIONS AND RESULTS: A. For the U.S. Fish and Wildlife Service:

1. Conduct radial transects from the Townsend Cromwell around selected islands to determine feeding areas.

Seabird observations were conducted as follows: A total of 4 h on two transects at Nihoa, a total of 15 h on four transects at Laysan, and a total of 13 h on three transects at Lisianski. The data may give a general idea of where the seabirds may be feeding in the vicinity of the breeding colonies.

2. Collect stomach samples from selected bird species and areas.

Stomach samples were collected from 283 seabirds representing 14 species at Nihoa, Necker, Lisianski, Pearl and Hermes Reef, Midway, and Kure.

3. Conduct intensive population work on selected species.

Seabird population estimates were made at Nihoa, Necker, French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Reef, and at Kure using various methods.

4. Study the activity patterns of selected species.

The brown noddy, Anous stolidus, was studied on Kure to determine incubation shifting behavior. Twenty-three individuals incubating eggs and their nests were marked. The nests were then examined every 2 h for 36 h to determine if a marked or unmarked bird was present.

5. Collect some birds for ciguatera analysis.

One bonin petrel, Pterodroma hypoleuca hypoleuca, and one sooty tern, Sterna fuscata, were collected.

6. Make population estimates of Hawaiian monk seals, Monachus schauinslandi, and green sea turtles, Chelonia mydas.

During the period May 28-June 27, 311 adults, 115 immatures, and 106 pups, plus 4 Hawaiian monk seals of undetermined maturity, were counted. Most of the seals, 258, were on French Frigate Shoals, while 120 were counted on Laysan, 84 on Lisianski, and lesser numbers on the other islands.

The green sea turtle count included 22 on Pearl and Hermes Reef.

7. Collect birds in feeding flocks (optional).

Poor weather precluded this activity.

B. For the National Marine Fisheries Service (NMFS):

1. Conduct offshore trolling surveys for tunas and other pelagic species.

Trolling, mostly incidental, with three to four lines was conducted throughout the cruise whenever it was feasible. The catch during 151.2 h of trolling included 35 yellowfin tuna, Thunnus albacares, 28 kawakawa, Euthynnus affinis, 22 skipjack tuna, Katsuwonus pelamis, 2 mahimahi, Coryphaena hippurus, 2 omilu, Caranx melampygus, 2 bigeye tuna, T. obesus, 3 wahoo, Acanthocybium solandri, 3 ulua, C. ignobilis, and 3 gold-striped kahala, Seriola aureovittata. The best catch rate of 0.9 fish/line-hour was made off Midway.

2. Conduct fishing operations using shrimp pots and handlines for shrimp and bottom fish to determine their availability, catchability, distribution, and relative abundance.

a. Shrimp pots. Only one shrimp pot station was conducted off Necker. The catch from three strings (five pots/string) was as follows:

240 fathoms - 4.1 kg of Heterocarpus ensifer
272 fathoms - 1.9 kg of H. ensifer, <0.1 kg of H. laevigatus
311 fathoms - <0.1 kg of H. ensifer, 0.4 kg of H. laevigatus, <0.1 kg of crab.

b. Handlines. Nineteen handline stations were occupied. Ehu, Etelis marshi, was the predominant species in the catch followed by hapu'upu'u, Epinephelus quernus; opakapaka, Pristipomoides filamentosus; butaguchi, C. cheilio; kahala, S. dumerili; and kalikali, P. sieboldii. Numerous other species were caught in small numbers. Of interest was the capture of a 2.0 kg armorhead, Pentaceros richardsoni, and a large opelu, Decapterus sp., at Ladd Bank and another armorhead of 2.8 kg off Kure. The total catch by handlining was 357 fish weighing 1,472.8 kg. The best catch by weight, consisting mostly of butaguchi and opakapaka, was made off Laysan with a catch rate of 30 kg/line-hour. The best catch rate by number, 6.2 fish/line-hour, was made at Pearl and Hermes Reef and Midway.

3. Conduct experimental fishing with deepwater fish traps fitted with modified entrances.

Three fish trap stations were occupied. One trap was lost off Nihoa; the other caught a dogfish, Squalus blainvillei. Two traps were lost off Laysan. Only four E. quernus and one moray eel, Gymnothorax eurostus, were caught in two fish traps off Kure.

4. Collect stomachs, ovaries, and otoliths from commercially valuable species and liver and blood samples from wahoo, skipjack tuna, and kawakawa.

Stomach samples, ovaries, and otoliths were collected from various commercial fish species and either preserved in Formalin or frozen for shoreside analysis. Liver and blood samples from 3 wahoo, 20 skipjack tuna, and 5 kawakawa were collected and frozen.

5. Collect fish flesh, kahala stomachs and gonads, and whole moray eels for ciguatoxin studies.

Tissue samples were collected from 199 fishes: 65 ehu, 35 hapu'upu'u, 13 kawakawa, 9 yellowfin tuna, 15 kalikali, 11 opakapaka, 11 kahala, 4 gold-striped kahala, 2 omilu, 9 ulua, 16 butaguchi, 3 wrasse, Bodianus oxycephalus, 2 wahoo, 2 gindai, Pristipomoides zonatus, 1 butterfish, Hyperoglyphe japonica, and 1 onaga, Etelis carbunculus. Two whole eels, a G. hepaticus and a G. eurostus, were also frozen.

6. Assist Marine Mammal Laboratory personnel and William G. Gilmartin in transporting supplies and equipment between the vessel and campsites at selected islands.

   The Hawaiian monk seal research team at Lisianski, their supplies, and equipment were successfully taken off the island and transported to Midway. The personnel debarked at Midway and some of their supplies and equipment were unloaded although most were kept aboard for return to Honolulu.

7. Conduct night-light fishing stations with dip nets, handline, and spin fishing gear to determine availability, catchability, distribution, and relative abundance of squid, mackerel, and baitfish.

   Eleven night-light stations were conducted. Opelu, D. pinnulatus, were attracted to the light at French Frigate Shoals. Some of the opelu were sampled with mackerel handlines and spinning gear. Aholehole, Kuhlia sandvicensis, were attracted to the light at Pearl and Hermes Reef and sampled with spinning gear. Akule, Trachurops crumenophthalmus, were attracted to the light at Kure together with some menpachi, Myripristis sp., and aweoweo, Priacanthus sp. They were sampled with both mackerel handlines and spinning gear. None of the aggregations beneath the light could be called large.

8. At French Frigate Shoals, assist NMFS personnel engaged in green sea turtle tracking studies and University of Hawaii Cooperative Fishery Research Unit personnel engaged in reef survey with loading, unloading, and storing of gear and supplies, as required.

   The supplies and equipment for the turtle tracking studies were unloaded at Tern Island. The supplies and equipment for the University of Hawaii Cooperative Fishery Research Unit were loaded on the vessel off Tern and unloaded at Midway for Dr. Parrish. Some supplies and equipment were also offloaded at Tern for the USFWS.

9. Collect and freeze mahimahi fillets from six fish per request from the U.S. Public Health Service for histamine studies. On the label indicate: species, size in length, weight, left or right fillet, sex, date of capture, and location.

   Fillets from two mahimahi were collected and frozen. These mahimahi were the only two caught during the cruise.

10. Miscellaneous observations and activities:

a. Seven XBT casts together with surface temperature readings and salinity samples were made during the cruise.

b. Standard weather observations were taken at 0000, 0600, 1200, and 1800 G.m.t. by the ship's officers.

c. The Operations Log, Deck Log, Dead Reckoning Abstracts, and chartlets of the stations were made by the ship's officers.

d. The Occurrence of Birds, Aquatic Mammals, and Fish School Logs were maintained by the ship's crew and officers.

e. Size frequency and sex data were taken for most of the handline and troll-caught fishes, as well as the shrimps and lobsters which were caught by traps.

f. Bottom surveys were made at Northampton Seamounts, Salmon Bank, Nero Seamount, and in the vicinity of Gambia Shoal by the ship's officers. The search for Gambia Shoal was unsuccessful.

g. Conant and Collins were transported and landed on Nihoa together with their supplies and equipment. The ship's crew and scientific complement aided them in establishing their camp.

SCIENTIFIC PERSONNEL: NMFS, Southwest Fisheries Center, Honolulu Laboratory

Thomas S. Hida	- Chief Scientist, Fishery Biologist
Andrew J. Aldridge	- Research Assistant
William G. Gilmartin	- Wildlife Biologist (June 11-14)

Other scientific investigators

Sheila Conant	- Cooperating Scientist, UH (May 28-31)
Mark Collins	- Cooperating Scientist, UH (May 28-31)
Robert DeLong	- Wildlife Biologist, NMFS, Northwest and Alaska Fisheries Center, MML (June 11-14)
Elizabeth Flint	- Cooperating Scientist, UCLA (June 3-4)
Craig S. Harrison	- Cooperating Scientist, USFWS
Eric Knudtson	- Cooperating Scientist, USFWS (June 10-14)
Gerald Kooyman	- Cooperating Scientist, Scripps Institution of Oceanography (June 11-14)
Thomas R. Loughlin	- Wildlife Biologist, NMFS, Washington, D.C. (June 11-14)

Jerry Ludwig	- Cooperating Scientist, USFWS
Mara Naughton	- Cooperating Scientist, USFWS (June 7-9)
Ralph Saito	- Cooperating Scientist, HDFG
Susan Schulmeister	- Cooperating Scientist, USFWS (June 3-4)
Michael T. Seki	- Cooperating Scientist, USFWS

Submitted by: Thomas A. Hida
Thomas S. Hida
Chief Scientist

Approved by:
Richard S. Shomura
Director, Honolulu
Laboratory

Attachment

August 13, 1980

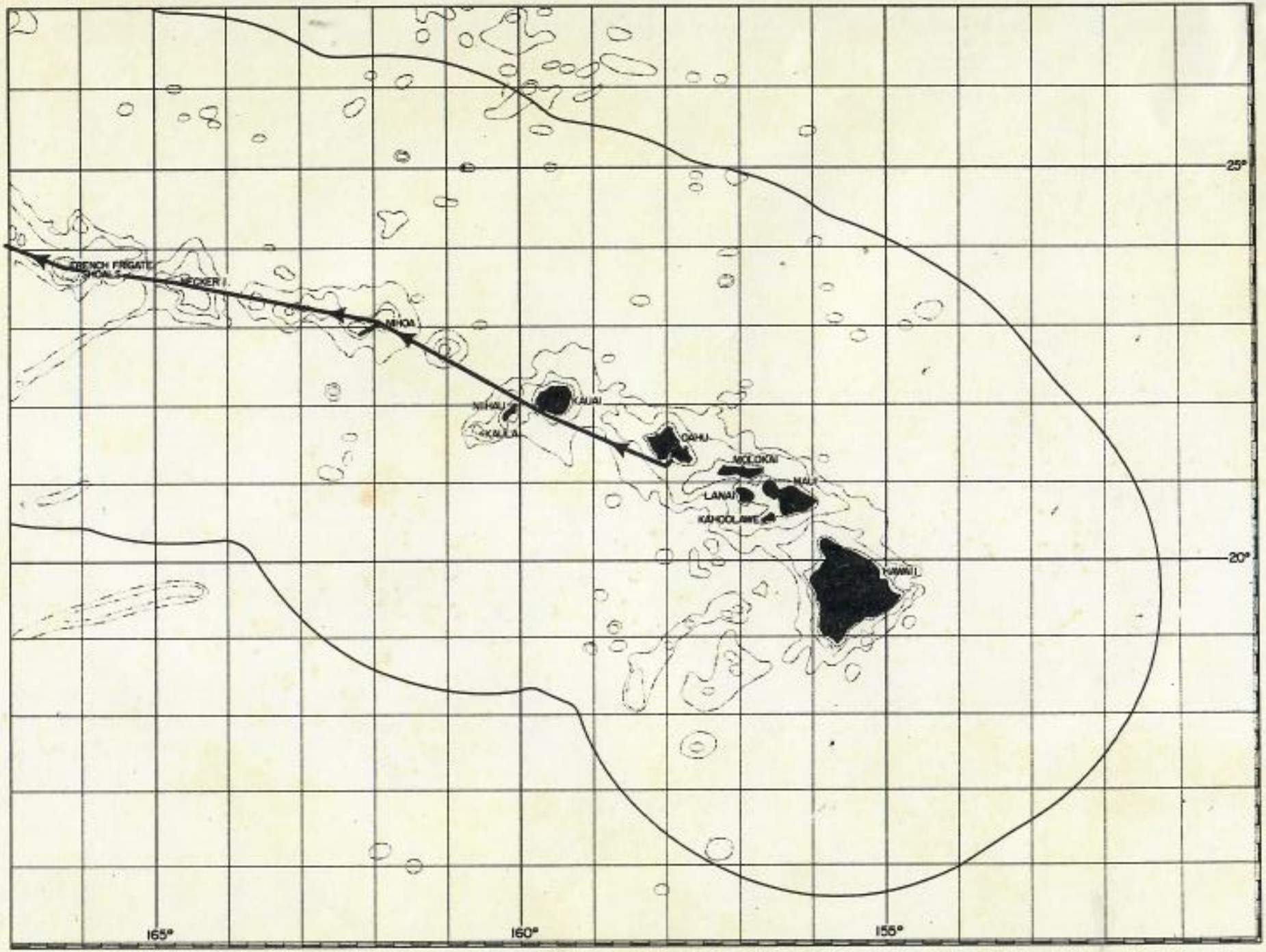


Figure 1.--Track chart for Townsend Cromwell, cruise 80-03 (TC-89), Part I, May 28-June 27, 1980.

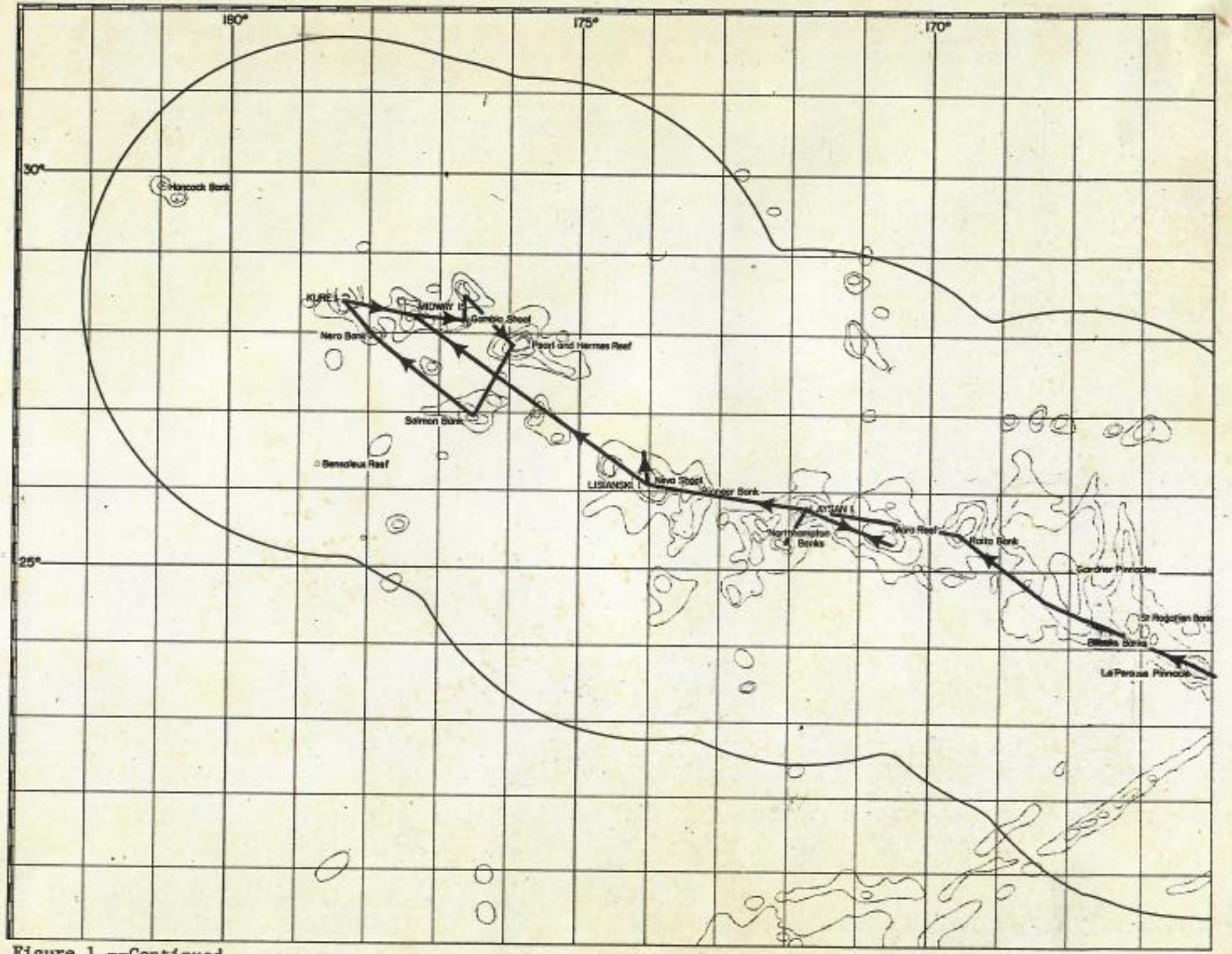


Figure 1.--Continued.

Scientist's Log
Cruise IX H.M.Smith 1951
P.O.F.I.

5. General remarks:

a. Morphometric measurements taken on troll caught E. yaito (see troll data)

b. Anchored south and of Necker Is. 1736 after circling Is. in counterclockwise direction.

c. Weather 1900 - showers; wind 69° 0 23 knots.

d. 2030 - up anchor; 2040 underway to FRENCH FRIGATE SHOALS.

8 May 1951

1. On course to FRENCH FRIGATE SHOALS.

2. Surface trolling:

a. 4 lines out at 0610 (maintaing +10 zone time).

b. Catch - 1 E. yaito 620 mm. fork length; caught ca 4 mi. SE of TERN IS., FR. FR. SHOALS: 0615. 1 Caranx sp., 569 mm fork length; caught 2 mi. SW EAST IS. FR. FR. SHOALS. 0720.

3. Fish signs & sights - None

4. General observations:

a. 0800 - school of porpoise (30-40 animals) swimming about vessel; species (?)

b. Sooty terns (Sterna fuscata) nesting on East Island, Mullet, Gin, and LittleGin Is. Laysan albatross (Diomedea immutabilis) and black footed albatross' young beginning to "feather out." Hawaiian noddy terns (Megalopterus melanogenys) also nesting on previously mentioned islands. Several hundred blue-faced boobies (sula dactylatra) seen an Gin and Mullet Is., no nesing sites observed.

c. Basking seals observed on following islands: 4 - Mullet Is., 3 Gin Is., 2 Little Gin Is.

5. General remarks:

a. 0600 - sighted French Frigate Shoals, Tern Is.

b. 0815 - Anchored 1/4 mi. SW East Is.

c. Weather 1900 - fair, partly cloudy - 3 ac. Wind 50° 18 kts.

d. Morphometric maesurements taken on troll caught E. yaito.

From narrative report, under General Biological Observations-
"Counts were made of the basking seal populations at each of the islands ..." "At P & H an effort was made to look for turtles ... tagged by Territorial Div Fish Game in 1950, however, none were seen."

6. Bait fishing activities

a. 0900 - 1100 Commenced scouting for bait at East Is. 1 school of "iao" (atherina insularum) spotted along north shore. Sighted one school of aholeahole" (Kuhlia sp) at NE point of East Is.
1030 - Set on school of "iao" sighted above captured 18 buckets (from net to bait skiff).
1115 - Loaded 20 buckets (from bait skiff) in to forward bait tank. Large fish 3-1/2 - 4 in. Began cinching in tank within 10 min. after transfer.
1130 - Bait skiff returned to East Is. One school of "iao" sighted, but headed for deep water. No set made.
1300 - 1400 Scouted Round and Mullet Is. for bait. 2 schools of needlefish (Belonids) sighted; species (?). No other indications of small fish.
1430 - 1600 Scouted Gin & Little Gin Is. for bait. No signs.
1700 - 1830 Returned to East Is. To scout for bait. 1 very small school (2-3 buckets (?)) of "iao" area where set was made earlier in day. One large school of "ahohahole" sighted along NE side of island - estimated 25-30 buckets. No other bait observed.

b. 18 - 22 Kt. wind throughout day restricted bait sighting;; moderate chop accompanied by turbid water along windward shores.

c. Captured "iao" in early advanced stages of sexual maturity; no gravid ♀'s observed.

d. at 2000 bait - lark circling quietly - no observed mortality.

9 May 1951

1. Anchored French Frigate Shoals; baiting operations.

2. Surface trolling:

a. 2 lines out during run from anchorage off East Is. to Tern Is. No catch.

3. Fish signs & sights - None

4. General observations

a. Many thousands of sooty terns nesting on Tern Is., a few fledgling Hawaiian noddy terns, sooty terns, Laysan and black-footed albatross, 8 blue-faced boobies nesting on Trig, Whale and Skate Is.

b. Green Sea turtles breeding on Trig, Whale & Skate Is.

5. General remarks

a. 1055 - Hoist anchor and move to anchorage 1/2 mi. SE of Tern Is. Anchor at 1225.

b. Weather 2030 - 8-9 tenths cloud cover stratocu &cu.; wind 20 kts. 55°.

6. Bait fishing activities:

a. 0600 - 1030 bait scouting at East, Mullet, Round, Gin, and Little Gin Is. plus several small sand spits off Gin Is. Bait observed only at Gin Is. - amount - 2 or 3 buckets of "aholehole" and one small school of halfbeaks (Hemiramphids)

1230 - 1900 - Scout Tern, Trig, Whale, and Skate Is. 3 small schools of "aholehole" (Kuhlia sandvicensis) captured at Tern Is. 1 small school (2 buckets) of "iao" (A. insularn) captured at Whale Is. also, 1 school of "ahalohale" and mullet (Neomyrus chaptalii) Total bait captured 1 ½ buckets.

b. Mullet and "aholehale" in strbd. bait well; "iao" mixed those captured previously (frvod) bait tank).

c. No observed mortality among iao in tank. Calmly circling; fed on cream of wheat.

d. Between 20-26 kts. of wind throughout day; difficult to spot bait along s orelines. Heavy waves may keep bait from coming in close to shore. No signs of small-size "iao".

10 May 1951

1. a. At anchor 1/2 mi. SE Tern Island.

b. Up anchor and underway to anchorage 1/2 mi. SE East Is. 1540

c. 1825 up anchor and underway from French Frigate Shoals to Maro Reef.

2. Surface trolling

a. 2 lines out during run from Tern to East Is.; 2 lines out sampan departure anchorage at 1825 until 1930.

b. No catch. 1 strike (E. yaito) lost as it was being landed.

3. Fish signs & sights - No remarks

4. General observations

a. Only Hawaiian noddy terns and 5-6 great frigate birds (Fregata minor) observed on Shark Is. No nesting sites evident.

5. General remarks

a. Retard clocks 1 hour to ZT ½ 11 at 1400.

b. Weather 2030 - Fair, partly cloudy 2 Ac. Wind 10 kts. 156°

c. 'Iao' in tank & "well bait" (aholehole and mullet) doing well. 15-20 dead "aholehole" removed from well. About a half dozen dead "iao" in the tank. Galley sevaps cream of wheat and ground fish fed to bait once daily.

d. Speed boat laid up half-day; broken rudder post.

6. Bait fishing activities

a. 0635 - 1130 Scouted Shark, Tern, Trig, Skate, & Whale Is. Scattered small amounts of "aholehole" at all but Whale Is. At the latter one large school of the same bait fish was observed along the east shore over coral bottom. Because of low tide and coral heads it was impossible to make a set. Estimated 30 - 40 buckts in the school.

1230 - bait party returned to Whale Is. - the previously sighted school had dissipated. One set was made on a small school yielding approximately 3 buckets which were plaud in the bait well. 1530 - bait party returned to vessel.

1540 - 1815 Scouted East, Gin, Little Gin, Round & Mullet Is. No bait schools observed.

b. The complete coverage of all islands during the 3-day stay at French Frigate Shoals indicated that (1) "iao" was not found to occur in quantity at any time during this period (2) "aholehole" ofsuitable size for bait (3-5 inches), occurred at each of the islands visited, but only once in sufficient quantity to make a set feasible (Whale Is.)

Weather and sea conditions throughout the day were excellent for scouting.

11 May 1951

1. Underway to Maro Reef; approach reef at 2000.
Av. vessel speed from Fr. Fr. Shoals 10 kts.

2. Surface trolling

a. 4 trolling lines out

b. No catch

3. General observations

a. School of about 40 porpoise encountered at 0540 swimming alongside; species?

4. General remarks

a. Weather 1900 - fair; 1/10 cloud cover Sc and Cc. Wind 204° 13 kts. Sea 2-3

b. No mortality among "iao" in bait tank during last 24 hours; - feeding well. Approximately 1 bucket of dead "aholehole" and mullet in stbd. bait tank - mostly large fish. Remaining bait in well circling calmly and taking food.

5. Fish signs & sights

a. 0610 - 24°39'N. - 168°12.5'W. Bird flock; between 75-100 birds traveling in westerly direction, occasionally grouping and diving as if feeding. 2-1/2 mi. distant, bearing 310°. No surface signs of fish. Birds unidentified.

b. 0618 - 24°37.5'N. - 168°13.5'W. Bird flock; 30-40 "working" birds (appeared to be wedge-tailed shearwaters?) extremely active; 1 mi. distant, bearing 235°. No surface signs of fish.

c. 0622 - 24°39'N. - 168°15'W. Bird flock; 50-75 (?) "working" wedge tailed shearwaters (Puffinus pacificus) and four sooty terns; birds moving rather slowly. Distance from vessel 2 mi.; bearing 310°. No surface signs of fish.

d. 0640 - 24°42.5'N. - 168°15'W. Bird flock unidentified species; estimate of number not made -- too distant. Estimated distance to birds - 4-1/2 mi. bearing 30°. Birds appeared to be very numerous. No other data.

e. 0705 - 24°44'N. - 168°21'W. - Bird flock. Appeared to be many birds; identification not made; estimated distance 4 mi.; bearing 350°. No other data.

f. 0825 - 24°45.5'N. - 168°34.5'W. - Bird flock. 50-75 "working" wedge-tailed shearwaters to sooty terns; actively feeding and traveling west; distance from vessel 1 mi., bearing 300°. No surface signs of fish.

g. 0928 - 24°48'N. - 168°44'W. Bird flock. 25-30 "working" w.-tailed shearwaters sooty and Haw'n noddy terns passed within 500 yds. of vessel, bearing 200°; traveling in SE direction. No surface signs of fish.

h. 1005 - 24°50'N. - 168°51'W. Bird flock. 30-40 wedge-tailed shearwaters actively feeding; several fish breaks at the surface, but species identification not made. School passed within 100 yds. of vessel, bearing 240°.

i. 1010 - 24°49'N. - 168°53'W. Bird flock; bird species not identified positively, appeared to be W-T shearwaters and Haw'n noddy terns; also rather numerous. Distance to school 3 mi?, bearing 230°.

j. 1130 - 24°58'N. - 169°05'W. Bird flock. Bird species unidentified traveling SE. Distance to school 3 mi.?, bearing 340°.

k. 1515 - 25°02'N. - 169°21.5'W. - Bird flock. 40-60 wedge-tailed shearwaters actively "working"; birds in compact flock, passing within 200 yds. of ship, bearing 210°. No surface signs of fish.

l. 1440 - 25°08'N. - 169°34'W. - Bird flock. 50-75 sooty terns traveling in rather loosely knit flock; not observed "working". Distance to flock - 1 mi., bearing 30°. No signs of fish.

m. 1445 - 25°08' - 169°35'W. - Jumping school accompanied by 150-200 actively "working" wedge-tailed shearwaters and Haw'n noddy terns. Fish appeared to be small skipjack. School passed within 500 yds. of vessel. Breaks at surface over a distance of about 100 yds.

n. 1510 - 25°10'N. - 169°40'W. - Bird flock. Species Haw'n noddy terns and wedge-tailed shearwaters; approximately 150 in number. "Working" and traveling slowly. Distance from vessel 1-1/2 mi., bearing 310°. No surface signs of fish.

o. 1525 - 25°12'N. - 169°43'W. - Bird flock; species unidentified; also, no estimate of number. Distance to school 2-1/2 - 3 mi. No other data.

p. 1610 - 25°13'N. - 169°49'W. - Bird flock. 50-60 "working" wedge-tailed shearwaters and mixed sooty & Haw'n noddy terns traveling N. passing within 700 yds. of vessel, bearing 10°. No surface signs of fish.

q. 1620 - 25°11'N. - 16°51'W. - Bird flock. Species and number not determined. Birds traveling S; distance to flock 3 (?) miles, bearing 180°. No other data.

r. 1715 - 25°17'N. - 170°00'W. - Bird flock. Haw'n & sooty terns mixed with wedge-tailed shearwaters; 200-250 birds traveling S., no evidence that birds were working. 1/2 mi. distant, bearing 220°. No surface signs of fish.

s. 1725 - 25°19'N. - 170°02.5'W. - Bird flock. Appeared to be Haw'n noddy & sooty terns; no good estimate of number 2 mi. distant, bearing 325°. No other data.

12 May 1951

1. Underway to Laysan Is.

0710 anchor NE end of Laysan Is. 1248 up anchor, proceed to south end of Laysan Is. for better protection.

1345 anchor 1/2 mi. SE Laysan Is.
1920 up anchor and underway for Lisianski Is.

2. Surface trolling

a. 4 lines from 0530 to 0710.

b. catch: 1 E. yaito, for length 402 mm., 500 fathom curve SE of Laysan Is. Time - 0600; 1 E. yaito, for length 408 mm., 500 fathom curve SE of Laysan Is., time - 0600. 1 E. yaito, for length 453 mm., 100 fathom curve SE of Laysan Is., time - 0645.

3. General Observations

A. Counted 174 basking seals (?) on Laysan Is., some of the pups just recently born.

b. no tagged green sea turtles observed; turtles numerous along NE, N and W side of island

c. Following birds observed either nesting or with young Laysan albatross - with young, black-footed albatross - with young, gray-backed tern - eggs, Hawaiian noddy tern - eggs, sooty tern - eggs. Brown boody - no nesting sites seen, blue-faced boody - with young in dawn, wedge-tailed shearwater, frigate birds - with eggs and young, white terns - with eggs, noddy terns - with eggs, laysan finch- not observed nesting

1. Green-winged teal (Laysan teal?) Bristle - thighed curluos - not observed nesting, ruddy turnstone - not observed nesting.

4. General remarks

a. Weather 1900 - complete overcast - SE; wind 8 kts. 320°; Sea 2.

b. No additional mortality among "iao" - bait tank - total so far 6. About a dozen more "aholehole" died - the bait well - all large fish; the smaller ones appear to be growing on the ground fish food they receive once each day. Dead fish taken out of well.

c. Morphometrics and stomach contents taken on the 3 troll caught E. yaito.

5. Fish signs & sights - none

6. Bait fishing activities

Upon arrival Laysan Is., impossible to find shelter from heavy sea and swell - which to launch skiff. By 1400 wind had shifted from 204°T. to 320°T. and velocity decreased from 23 to 8 kts. 1400 - launched bait skiff and bait party went ashore. Scouted permits of entire island - only 3 small schools of "aholehole" observed; estimated size of schools - 3-4 buckets - no sets made.

No signs of any other bait fish.

13 May 1951

1. Underway to Lisianski Is.
0940 anchor 2-1/4 mi. W of south tip of island.
1920 - up anchor and underway to Pearl & Hermes reef.

2. Surface trolling

a. 4 lines out - 0530 to 0930.

b. catch - 1 E. yaito, fork length 639 mm. caught 174°01'W. - 26°04'N., time 0850. 1 E. yaito, f.l. 658 mm. caught 174°01'W. - 26°04'N. position, time 0850. 1 E. Yaito, f.l. 630 mm. 174°01'W. - 26°04'N position, time 0900. 1 E. yaito f.l. 626 mm. same position 0850. 1. E. yaito f.l. 687 mm. same position and time.

3. General observations

a. whale species (?) sighted at 26°10'N. - 173°41'W. bearing from ship 50° - 3/4-1 in distant.

b. counted 195 basking seals on Lisianski Is., (about half dozen recently born pups).

c. Following birds observed at Lisianski:

Red-tailed tropic bird-nesting sight not ob.
Great frigate bird - nesting
Laysan albatross - with half-grown young
Black-footed albatross - with half-grown young
Blue-faced booby - with half-grown young
Brown booby - no nesting sites seen
Haw'n noody tern - not observed nesting
Gray-backed tern - -ditto-
Common noddy tern - "

d/ no turtles observed.

4. General remarks

a. Weather 1900 - partly cloudy 6 Sc. wind 320°T. 9 kts., sea 2.

b/ morphometric measurements taken on 5 troll-caught E. yaito; stomachs preserved.

c. bait - both tank and well circling; no additiona nortality observed.

5. Fish signs & sights

a. 0650 - 26°11'N. - 173°42'W. - Bird flock 150-200(?)

Haw'n noddy terns "working" an area several hundred yds. in length, traveling in various directions. 1/2 mi. distant, bearing 55°. No surface signs of fish.

b. 0717 - 26°08'N. - 173°45'W. - Bird flock mostly Haw'n noddy terns; estimated number - 100-150, traveling E; although a closely knit flock, no evidence of feeding activity; 1 mi. distant, bearing 140°. No surface signs of fish.

6. Bait fishing activities

1003 - bait party left ship to scout Lisianski Is. for bait. One school of "iao" spotted close to shore off N tip of island. One set with the 40 fathom net yielded 10 buckets of 3-4 in. "iao" which were plaud in fish tank together with previously caught "iao". Transferred from bait skiff to tank by buckets.
1330 - 2 sets made on 2 schools of "aholehole" (K. sandvicensis) along NE shore of island. 40 fathom net yielded 31 scoops (1-1/4 scoops 1 bucket - el scoops = 25 buckets) which were mixed with previously caught "aholehole" in stbd. bait well; size range of fish - 3-5 inches.
1515 - One set made with 40 fathom net on school of "aholehole" along NE shore of island. Total catch 30 scoops (see note above= 24 buckets) Size range of fish 2-1/2 - 5 inches.
1640 - 1820 - scouted NE and to shore of island making 6 sets on small schools (20 fathom net) Total catch 30 scoops (24 buckets) which were plaud in stbd. bait well. Size range 2-6 inches. Al "aholehole" transferred from bait skiff to well by scoop nets.

Only 3 additiona small schools of "aholehole" were seen and it was not deemed practical to make any additiona bait hauls.

Many small "aholehole" (1 in. and under) were observed close inchore along the NE coast. No small "iao" went observed.

From sites of capture bait was hauled a distance of 3-4 miles in the biat skiff. Engine trouble with the speedboat necessitated long transport time. (20-30 min. from site of capture to ship).

Bait in both tank and well swimming in confused pattern, not circling. No mortality observed in tank at 2000. Estimated 1 bucket dead "aholehole" in well at 2000.

1900 - all boats hoisted aboard.

14 May 1951

1. Underway to Pearl & Hermes Reef
1226 - Anchor off southeast Island, Pearl & Hermes Reef.
2120 Underway for Midway Is.

2. Surface trolling

a. 4 lines out from 0530 - 1220. No catch.

3. General observations

a. Wealth of seabord life on Southeast Is. Albatross (black-footed & Laysan) also nesting on Bird Is.

b. Seals with pups on Grass Is.

4. General remarks

a. Weather 1900 - cloudy 7/10 cloud cover Ac. Wind 4 kts. 350°T. Water temp. 21.1°C. air 69°F.

b. Several buckets of dead "aholehole" in well; mostly large fish that had been badly sealed during capture & subsequent handling. No additional mortality among "iao" Some spawing of "iao" observed at the surface of the bait tank, extruding area.

5. Fish signs & sights - None

6. Bait fishing activities

Scouted Southeast, Bird, Sand, Grass, Seal, and Kittery Is. between 1300-1830. 3 small schools of "aholehole" seen along W. side of Se. E. Island. Several schools of small "piha" (Spratillaides delicatulus) observed off Bird Is. These were about 1/2 - 3/4 in. in length and occurred at the water's edge. No evidence of "iao".

15 May 1951

1. Underway to Midway Is.
0725 - anchor pier 6 Sand Is.
Courtesy call to Comdr. Boyle, co. Midway Islands. We were informed that advance notice of our arrival should have been sent, preferably through commandant 14 naval Dist. I The futu e, any calls in closed areas must be given advance notice.

2. Surface trolling

a. 3 lines out during tuna fishing.

b. 1 yf tuna which was given to the navy. 1 E. yaito

3. General observations - None

attach news clipping

date of vessel sinking ?

21 AUGUST, 1979

MR. G.H. Balazs, Assistant Marine Biologist
HAWAII INSTITUTE OF MARINE BIOLOGY
P.O. BOX 1346, Coconut Island,
KANEHOE, Hawaii.

Dear Mr. Balazs:

Your letter dated 7 August, directed to Sarah Miller has been given to me with a request that I answer your query about the marine life observed by our crew during our recent "yacht-trip" northwest of the Hawaiian chain of islands.

On the 6th day adrift we observed, for a few minutes, a large Green turtle - he was gracefully making about 2 knots in a westerly direction - with the current. The position was approximately 33° 58'N, 175° 20'W. He was a beautiful creature, male (long tail) measuring about 2'6" across the shell. It was early in the morning, and I wondered if he might travel at a greater depth during the heat of the day?. This was the only turtle seen by our group during the eight days adrift. At this point we were definitely in the north equitorial current. The trades were blowing sporadically from calm to 30 kts and east of the east.

With regard to sharks - we had what I thought to be a large number of visits during the trip! When we were fighting the fire on 'White Eagle' I noted a group of White-tipped sharks - possibly 8 in number - keeping track of our efforts! They were

not 'surfacing' but were staying about a fathom down. The largest was not more than 7 or 8 feet in length. (I did not mention anything about them to my mates, but made sure that when we abandoned ship - no one jumped into the water.) I assume it was this same group that stayed with us during that first night adrift and until about 1000 the next day. During the night they came to the surface and several of them made repeated sorties to our rafts - nudging against the rubber - trying to figure out what we were I suppose?! The only day that I did not see a shark was on a very calm day. The rafts were not making much of a commotion and I guess that that lack of action plus the surface water temperature being quite warm were the reasons. On the 5th night on my watch a large MAKO shark visited our flotilla. He gave our raft a good bump (and the force of it dumped me headlong into the raft. (No correct direction!) I tried to guage his size over the next hour and my conclusion was that he measured a good 10-12 feet. A most formidable creature. On the day of the turtle sighting I noted only a small White-fin Shark during the entire day.

When we got into the North Equatorial current on the night of the 2nd day there was a noticable increase in sea life. We had large schools of Yellow-fin tuna briefly chasing flying fish, and many dorados with their beautiful colored flashing bodies with us. The dorados remained at 20-30' below the surface for the most part and were not in the least interested in our phoney lures! Unfortunately for us.

We had a small number of black + white vertically striped pilot fish with our rafts constantly. The only fish we managed to catch were in several small schools (20 - 50 per group). They were not interested in lures so we made 'jigers' and managed in this manner to catch a total of 3 fish before they caught-on to our devious method.... I could not identify these fish, and have not yet found their species in books here in Vancouver. I called them "sea-trout". In length they did not measure more than 12". They resembled a brook-trout in shape. Skin a blue-spotted-grey except for a prominent yellow stripe running from head to tail along with yellow fins and tail. They were sweet and tender and our bodies enjoyed them very much.

When it was calm it was interesting to note the plankton density. It is quite amazing to see so much life-so close. (It is good food too-but not really the most flavourful stuff). At the most dense occurrence I would say that there was an organism every 6 inches - from the surface to approximately 1 fathom down. It might have been deeper but the motion plus the transparent nature of the creatures made useful vision impossible beyond a few feet in depth.

We saw only 2 whales in the eight days but I was unable to distinguish clearly their shapes so I'm not sure of the species.

We had constant contact with small crabs. They were a blue-grey in color and never more than 1" across the shell. The fish did not accept them as bait so I assumed they were of a poisonous nature, and

assumed further that perhaps this was the reason for their being around at all – otherwise they should have been nice bite-size morsels for many creatures. Because of these observations I did not let the crew eat these crabs. I would be most interested to learn about these crabs and know whether or not we were missing an important, easily caught food supply? . .

Well – that's about it – but getting back to that turtle again – the current was about 1 knot and he was moving with it. His speed over the bottom would have been about 3 to 3.5 kts. My impression was that he was definitely "steaming" somewhere. In May, 1975, northwest of the Galapagos Archipelago I observed many turtles in similar currents. They were always quite erratic in their courses and so I guessed that they were feeding. They tended to swim into the current and concentrate on "rip" areas. Perhaps the feed was good and in enough concentration to hold the turtles in and around a given area.

By the way – our vessel sank at 35°40'N 174°55'W and from there we drifted S.E. for 2 days until we encountered the North equitorial current. Then we moved SW x W to a point 33°55'N x 175°30'W where we were rescued by the Soviet Vessel. We averaged 27 miles per day. Our course was

I would assume the enclosed information would be of very little value to yourself but I have enjoyed writing about it because I love so much the residents of the water and the birds that live in such a nicely balanced way with them.

Best Regards.

Jon P. van Tamelen

JON P. VAN TAMELEN (CAPT.)
1405 WINSLOW AVE.
COQUITLAM, B.C., CANADA.
V3J 2G5.

Note - F/V FINBACK
sighted "green turtle" at
about 32°N, 177°W during
late August or early Sept.
(as per Noftel)

August 7, 1979

Ms. Sara Miller
c/o Ms. Pat Morosic
186 Kailua Road
Kailua, Hawaii 96734

Dear Ms. Miller:

My purpose in writing to you is to ask if you or your shipmates made observations of sea turtles during the eight days adrift north of Midway. Our knowledge of the lives of sea turtles while in the open ocean pelagic environment is extremely sparse, therefore any information that you can provide is potentially very valuable. I would also be interested in your observations of open ocean sharks, since such animals are likely to be predators of small turtles drifting at the surface. Were you able to identify any of the sharks that came around your raft? The oceanic white-tip shark, *Carcharhinus longimanus*, can be easily distinguished by the white tip on its dorsal fin.

You may be interested to learn of the book STAYING ALIVE by Maurice and Maralyn Bailey (Ballantine Books, N.Y.) which describes the experiences of being adrift from 3 April to 30 June 1973 after the sinking of a small sailboat near the Galapagos. The Baileys were able to catch a number of sea turtles during this time, a factor that helped them survive.

Enclosed is a short color booklet on Hawaii's seabirds, turtles and monk seals that I hope you will find interesting. I look forward to hearing from you when your time permits.

Sincerely,

George H. Balazs
Assistant Marine Biologist and
Deputy Chairman
IUCN/SSC Marine Turtle Group

GHB:md

Encl.

Whereas, the biota and ecosystems of remote and uninhabited islands are unique, delicate and easily destroyed by human presence; and

Whereas, many of these islands have been set aside as National Wildlife Refuges for the specific purpose of preserving the unique flora, fauna and other features; and

Whereas, in recent years military and other government-sponsored organizations have occupied refuges on some Aleutian Islands and Hawaiian Islands without notifying refuge managers or without obtaining guidance on care and protection of these refuges; and

Whereas, it appears questionable that the public interest was served by classifying as secret the 1964 operations on Amchitka Island; and

Whereas, destruction of wildlife by personnel occupying refuge islands is reported; and

Whereas, many refuge islands' floras and faunas were irreparably damaged by vehicles and by introduction of nonnative rats during World War II; and

Whereas, already rare and endangered wildlife species have, in recent years, been subjected to additional harassment by personnel of the military and of other government-sponsored organizations;

Therefore be it Resolved, that the American Society of Mammalogists requests President Lyndon B. Johnson to issue instructions that under no circumstances will parties of government-employed personnel, or personnel of organizations acting under government contract, visit or establish camps or undertake any activity on uninhabited islands without first consulting with officials directly responsible for the protection of flora and fauna on those islands;

And be it Further Resolved, that military and other personnel who are to be stationed on or visit islands having unique biota, whether these islands be inhabited or uninhabited, be instructed through a formal course of training on the care and preservation of the unique biota of islands.

Carried Unanimously

Resolution of the 45th Annual Meeting of the American Society of Mammalogists, June 20-24, 1965, Winnipeg, Manitoba, Canada.

Reprinted from the Journal of Mammalogy (1965), 46,4:732-733.

TURTLE'S EGGS

We yesterday saw a calabash of turtles eggs laid by the turtles in the pond adjoining Emmes & Co's ship-yard. They were quite a curiosity to any one who had never seen such a thing before. About the size of a hen's eggs, but round, and soft-shelled. They were being taken to Waikiki, to be placed in the sand and hatched by the sun's rays, which is the way in which nature produces the young turtles.

A day or two ago, one of the largest turtles from the French (Frigate) shoal was killed for the table, and on being opened over four hundred eggs, some of full size and many of them very small, were taken out. This shows how prolific these animals are. The young probably furnish food for the thousands of sharks that infest the lagoon, where these turtles were obtained.

June 29, 1867
Pacific Commercial Advertiser

reprinted by G. H. Balazs
Hawaii Institute of Marine Biology

TROPIC SEAS FOODS
Division of Tropic Seas Enterprises
677 Ahua Street
Honolulu, Hawaii 96819
Tel. (808) 833-2228

Customer information regarding farmed Turtle Products;

The incredible taste of turtle expertly prepared by your chef makes an excellent meal! In addition to its supurb taste, Turtle is extremely high in protein, yet lower in calories than beef and foul, plus there is virtually no cholesterol.

Turtle is one of the most highly demanded of the delicacy sea foods. Our Turtle comes from the Cayman Islands in the Carribean Sea where it is Farm fed, Farm raised, and Farm prepared. As you may know, the Green Sea Turtle was nearing the endangered species list. Now, through the efforts of the Cayman Farm, the species is finally on an upswing. After maturity, a certain percentage of Turtles are returned to the sea. This percentage is far greater than those that could have lived in the wild. More important, the Green Sea Turtle of Hawaii has been benifiting by the Farm as well. Now that there is a continuous quality supply of Turtle products, from the Farm, and a strict licensing program by the State Department of Fish and Game, poaching has nearly been eliminated.

Any further questions regarding Turtle products sold in Hawaii, please feel free to call me.

Enjoy your meal

Mahalo,

(signed) Lee Mench

Transcribed from display sheet at
Fisherman's Wharf Restaurant
Honolulu, Hawaii

by G. H. Balazs
April 1978

Balazs

MEMORANDUM

TO: NWHI Investigators; Refuge Manager, U.S. Fish & Wildlife Svc.

FROM: J. D. Parrish DATE: 19 Nov 79

SUBJECT: Cruise report of Easy Rider NWHI trip 11 Oct-6 Nov 79

The scientific party consisted of Steve Ralston (P.I.) and Lori Madsen (Bishop Museum), Jim Parrish (P.I.), Stan Blum, Steve Feldkamp, Tom Hourigan, Therese Hayes, and Laurie Sanderson. The Easy Rider departed Honolulu the evening of 11 Oct and offloaded Parrish and the shore party 14 Oct at Tern Island, French Frigate Shoals. The vessel then performed bottom handline fishing and trap fishing for opakapaka for Ralston and Shaklee at French Frigate Shoals and Maro Reef. Lobsters were collected for Shaklee at Maro Reef and opihi for Shaklee at La Perouse Pinnacle, French Frigate Shoals. Fishing was done with standardized gear and effort for sharks by longlining (7 sets) and for jacks by pole-and-line (30 hours) at French Frigate Shoals.

Parrish and the shore party worked from the U.S. Fish & Wildlife Service Refuge facility from 14 Oct through 2 Nov and were picked up by the Easy Rider 3 Nov. Their nearshore work from small craft included (1) reconnaissance of much of the shallow water between Shark Island and Whale/Skate Island, both inside and outside the "lagoon", (2) fish census on a few transects in selected study sites, along with habitat mapping of the sites and records of "megainvertebrates", (3) collection of a broad cross-section of demersal fishes at selected study sites, (4) collection of complete benthic invertebrate communities from samples of consolidated and unconsolidated substrate. Samples of the pomacentrid fish, Stegastes fasciolatus, were collected for Shaklee.

A stop was made at Necker to collect opihi for Shaklee and opakapaka for Ralston. At both French Frigate Shoals and Necker, captured opakapaka were kept alive for age determination in the laboratory. The vessel left Necker 4 Nov and arrived in Honolulu late 6 Nov.

All objectives were at least partially accomplished ; most were accomplished fully. Shaklee received adequate samples of labster, opihi, opakapaka, and Stegastes tissue for the biochemical genetic determinations. Ralston obtained adequate opakapaka catches for gear performance and fish distribution data and for otoliths. At one time or another, more than a dozen opakapaka were kept alive in the boat's fish tank. Three survived the return to Honolulu and are now in the Waikiki Aquarium. Shark fishing produced 36 sharks of 5 species. Grey reef sharks, tiger sharks and Galapagos sharks dominiated. Jack fishing by the Easy Rider produced useful catch/effort data but low yield - 5 specimens. Parrish collected an adult specimen of the touau, Lutjanus fulvus (=vaigensis), probably the first report that this species, introduced to the high islands, has moved so far up the archipelago. Juveniles of another introduced species, the taape (Lutjanus kasmira), were occasionally seen in depths of 8' to 25'. This species is often collected in deep traps at French Frigate Shoals.

The Fish & Wildlife Service Refuge station at Tern Island proved to be an excellent shore base for research work with small craft in the northern end of French Frigate Shoals.

J. D. Parrish

September 27, 1978

Mr. George Balazs
Hawaii Institute of Marine
Biology, UH
P. O. Box 1346
Kaneohe, HI 96744

TOWNSEND CROMWELL CRUISE SCHEDUI

FY 1979

Cruise No.	Date Start	Date End	Days at sea	Shore days[1]	Days between cruises[2]	Area and type of operation
	10/01/78	10/15/78			15[3]	In port, Honolulu
C-78-04 TC #81)	10/16/78	12/17/78	61	2		NWHI - insular resources survey; environmental and productivity studies
	12/18/78	1/02/79			16	In port, Honolulu
C-79-01 TC #82)	1/03/79	3/17/79	67	7		Eastern tropical Pacific - porpoise surveys
	3/18/79	4/30/79			44	Shipyard, Honolulu
C-79-02 TC #83)	5/01/79	6/04/79	33	2		NWHI - seabird and monk seal surveys; insular resources survey
	6/05/79	6/15/79			11	In port, Honolulu
C-79-03 TC #84)	6/16/79	7/27/79	40	2		NWHI - nearshore resources survey; environmental and productivity studies
	7/28/79	8/08/79			12	In port, Honolulu
C-79-04 TC #85)	8/09/79	9/30/79	49	4		American Samoa - aggregation objects; insular resources (continues into FY-80)
TALS			250	17	98	365

[1]Mandatory shore days, 2 for every 19 sea days; usually taken away from home port, e.g., Midway Islands, Pago Pago.

[2]Days taken between cruises for post- and pre-cruise activities, minor maintenance; usually taken in home port, Honolulu.

[3]Plus 3 days in FY 1978.

9/78 RAS

September 27, 1978

TOWNSEND CROMWELL CRUISE SCHEDULE

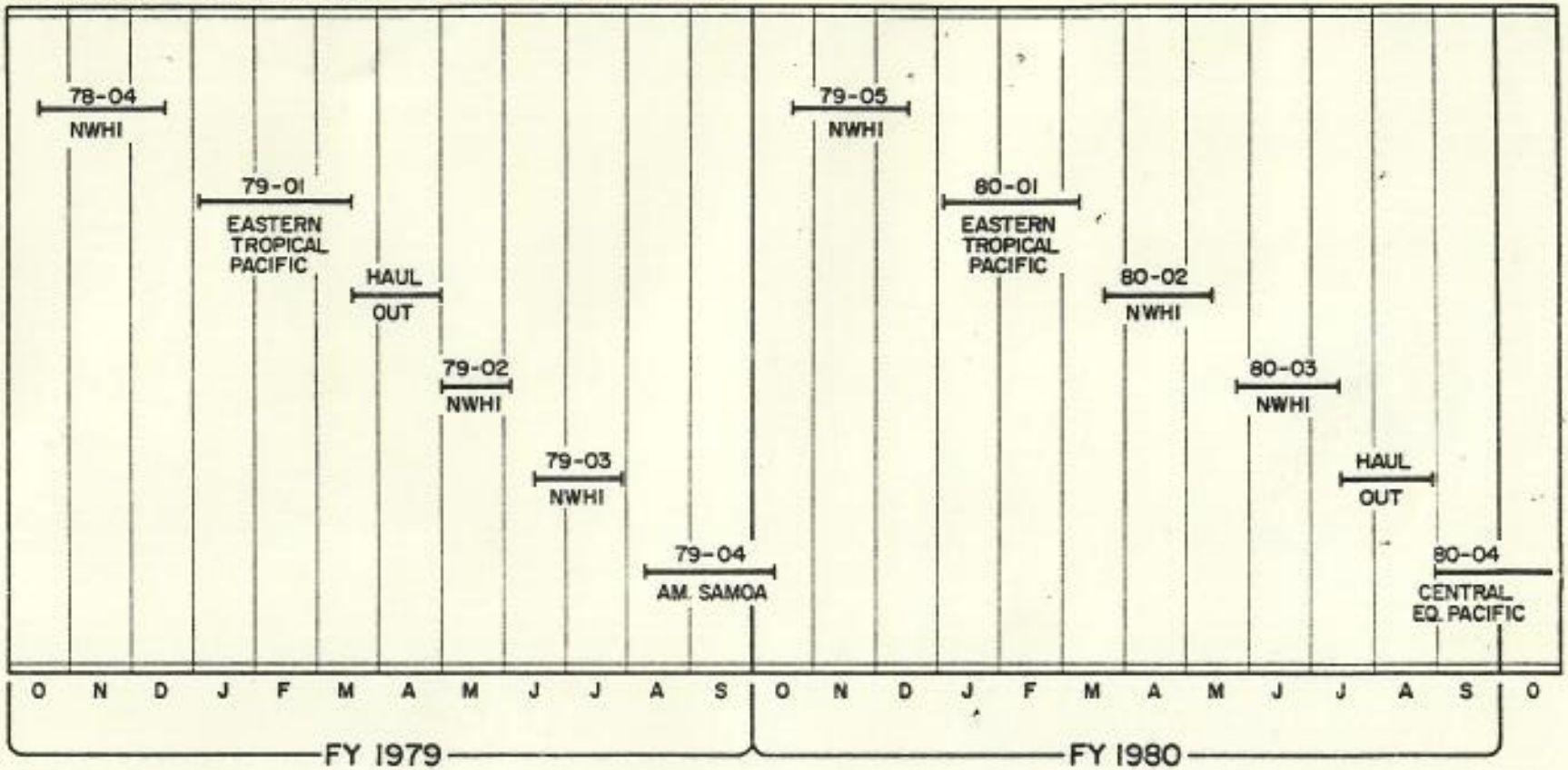
FY 1980

Cruise No.	Date Start	Date End	Days at sea	Shore days[1]	Days between cruises[2]	Area and type of operation
TC-79-04 (TC #85)	cont'd	10/12/79	10	2		American Samoa - aggregation objects; insular resources survey
	10/13/79	10/23/79			11	In port, Honolulu
TC-79-05 (TC #86)	10/24/79	12/17/79	51	4		NWHI - insular resources survey
	12/18/79	1/02/80			16	In port, Honolulu
TC-80-01 (TC #87)	1/03/80	3/09/80	60	7		Eastern tropical Pacific - porpoise survey
	3/10/80	3/19/80			10	In port, Honolulu
TC-80-02 (TC #88)	3/20/80	5/13/80	51	4		NWHI - nearshore resources survey; seabird and monk seal surveys; insular resources surveys
	5/14/80	5/24/80			11	In port, Honolulu
TC-80-03 (TC #89)	5/25/80	7/14/80	47	4		NWHI - insular resources survey or midlite refurbishing
	7/15/80	8/28/80			45	Shipyard, Honolulu
TC-80-04 (TC #90)	8/29/80	(9/30/80)	31	2		Central/equatorial Pacific - fisheries research (continues into FY-81)
TOTALS			250	23	93	366

[1]Mandatory shore days, 2 for every 19 sea days; usually taken away from home port, e.g., Midway Islands, Pago Pago.

[2]Days taken between cruises for post- and pre-cruise activities, minor maintenance; usually taken in home port, Honolulu.

TOWNSEND CROMWELL – CRUISE SCHEDULE



elsewhere within the Territory of Hawaii, and such permittees may take species of fish or shellfish, when and as approved by regulation of the board, during times when the legal season for taking such species elsewhere in the Territory of Hawaii is closed. The fee for the Leeward Islands fishing permit shall be one dollar ($1.00).

Sec. 1241.10 (as enacted by Act 57, SLH '53). Penalty. Any person violating the provisions of this Act or rule or regulation made pursuant to it shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than twenty-five dollars ($25.00) nor more than two hundred dollars ($200.00) or by imprisonment of not more than ninety days or by both fine and imprisonment.

Board Regulation No. 17 (adopted June 24th 1953, pursuant to authority granted by Act 57, SLH '53). Relating to fishing in the Leeward Islands of the Territory of Hawaii and authorizing taking of mullet and lobster during closed seasons and the use of non-portable fish traps.

Section 1. Permit. Any commercial fisherman who takes fish in the Leeward Island area during a closed season for such fish or uses fishing devices which are otherwise illegal shall first obtain from the Board of Commissioners of Agriculture and Forestry or a properly authorized employee of said Board a Leeward Island fishing permit. Where the Board has authorized the taking of a species of fish in the Leeward Island area during an established closed season or where the Board has authorized the use of fishing devices in the Leeward Island area which are otherwise illegal, the terms and conditions under which the permittee may take such species of fish or use such illegal fishing devices shall appear on said permit. A permit shall be required for each vessel or independent fishing operation even though several vessels or independent fishing operations are owned or conducted by the same person.

Section 2. Lobsters. The restrictions forbidding the catching, possession or sale of lobsters or ula or ula papapa (Members of the families Palinuridae and Scyllaridae) in Section 1245, Revised Laws of Hawaii 1945, shall not apply to lobsters taken in the waters of the Leeward Islands as defined by Act 57, Session Laws of Hawaii 1953, provided such lobsters are taken by a commercial fisherman possessing a valid permit to fish the Leeward Islands issued by the Board of Commissioners of Agriculture and Forestry, and further provided that the lobster shall be landed entire and shall not weigh less than one pound or carry eggs as prohibited by Sections 1232 and 1246 of the Revised Laws of Hawaii 1945.

Section 3. Mullet. The restrictions forbidding the catching, possession or sale of mullet or amaama or anaeholo (Mugil cephalus) in Section 1236, Revised Laws of Hawaii 1945, shall not apply to mullet taken in the waters of the Leeward Islands as defined by Act 57, Session

Laws of Hawaii 1953, provided such mullet are taken by a commercial fisherman possessing a valid permit to fish the Leeward Islands issued by the Board of Commissioners of Agriculture and Forestry, and further provided that mullet less than seven (7) inches in length shall not be sold.

Section 4. Fish traps. It shall be lawful to use fish traps that are fixed or that are larger than provided by Section 1223, Revised Laws of Hawaii 1945, as amended, in the Leeward Islands. Such fish traps may be used only by a commercial fisherman possessing a valid permit to fish the Leeward Islands issued by the Board of Commissioners of Agriculture and Forestry and the location, number and dimension of such traps operated by any fisherman shall be only in accord with the description of same on the Leeward Island fishing permit issued to said fisherman.

Section 5. Penalty. As provided by Act 57, Session Laws of Hawaii 1953.

NETS AND TRAPS

Sec. 1223 (as amended by Act 211, SLH '49 and Act 74, SLH '55).[4] Nets and traps, minimum sizes. It shall be unlawful for any person to use fish nets or traps of any type with a stretched mesh of less than two inches, or to use any trap which is not portable or which is more than ten feet in length or six feet in height or width; provided, that (a) persons engaged in sport fishing may use throw nets with a stretched mesh of not less than one and one-half inches, (b) pond owners or operators who hold a license issued under Section 1236 may use nets of smaller mesh to take young mullet or pua for stocking their fish ponds, (c) commercial fishermen who hold a permit issued under Section 1237 may use nets of smaller mesh to take nehu and iao for bait, and (d) all persons may use nets of smaller mesh to take shrimp or opae or opelu; and provided, further, that in the taking of akule a net with mesh of not less than one and one-half inches may be used.

Board Regulation No. 20 (adopted August 30, 1955, pursuant to authority granted by Section 1006 (4), Revised Laws of Hawaii 1945 as amended). Providing for the minimum sizes of fish nets and traps in the Territory of Hawaii and seizure of fishing gear.

Section 1. Nets and traps, minimum sizes. It shall be unlawful for any person to use fish nets or traps of any type with a stretched mesh

[4]This section now contained in Regulation 20 and penalty as provided therein.

From Territory of Hawaii
Fish and Game Laws 1955-56

DECLARING THE HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE
A WILDLIFE REFUGE

Board Resolution No. 7

(Adopted April 25, 1952, pursuant to authority granted by Act 6 Sessions Laws of Hawaii 1951)

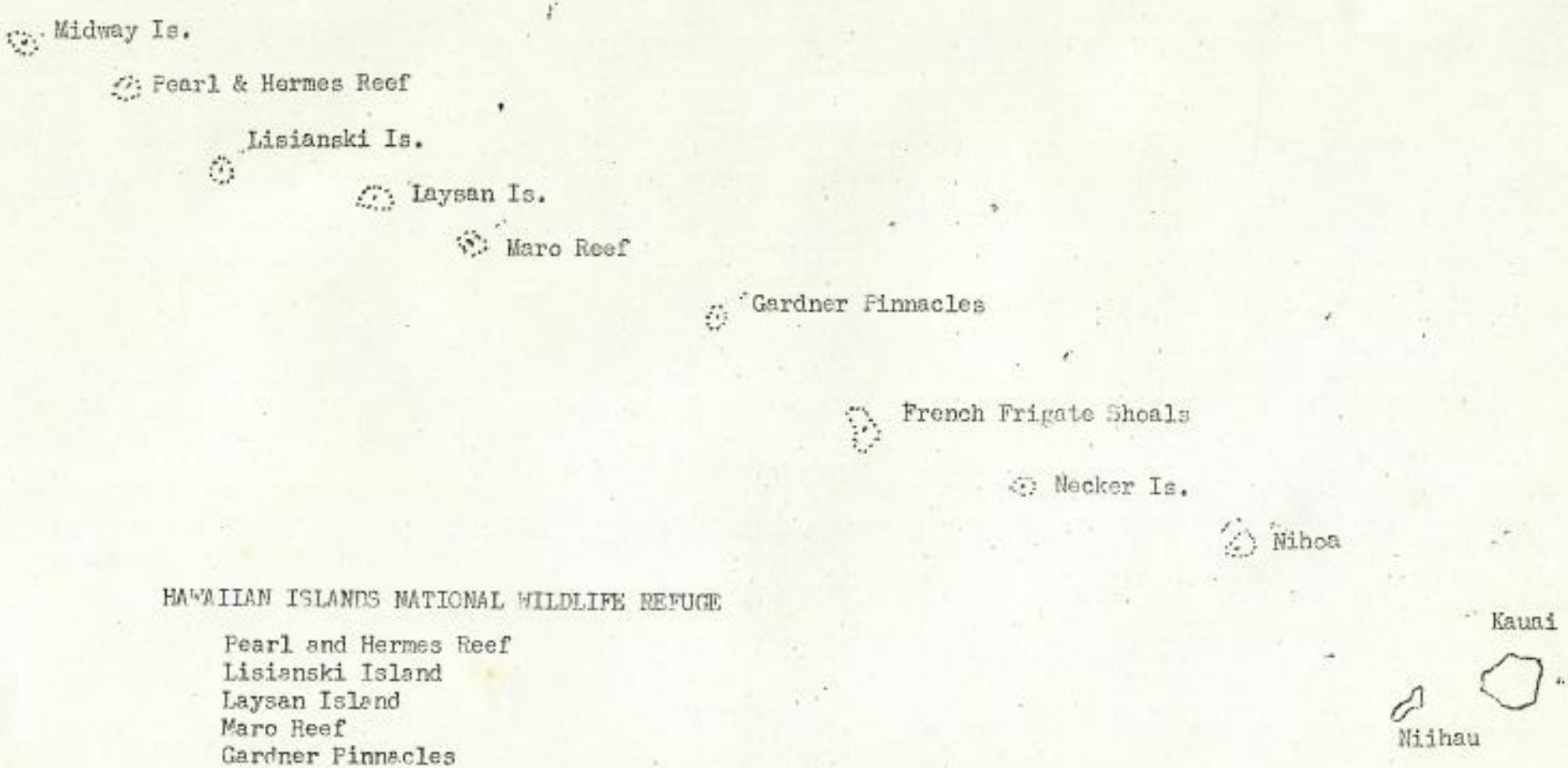
WHEREAS, on December 27, 1951, the board of commissioners of agriculture and forestry, Territory of Hawaii, and the fish and wildlife service, U. S. department of interior, did enter into an agreement for the management of the Hawaiian Islands National Wildlife Refuge; and

WHEREAS, the fish and wildlife service in said agreement did authorize the board of agriculture and forestry to designate lands and waters of the Hawaiian Islands National Wildlife Refuge as a refuge for the protection of migratory birds and other wildlife under laws and regulations of the Territory of Hawaii; and

WHEREAS, in accordance with Regulation 15, division of fish and game, board of agriculture and forestry, Section 1, this board may by resolution accept any area of land, either public or privately owned, for management as a refuge for the mammal and bird wildlife found thereon for the purpose of preserving, protecting and propagating such wildlife.

NOW, THEREFORE, BE IT RESOLVED, that those islands to the north and west of Kauai known as the Leeward Islands [3] and designated as the Hawaiian Islands National Wildlife Refuge by Presidential Proclamation of July 25, 1940, be declared a refuge and be subject to the provisions of Regulation 15, division of fish and game, board of agriculture and forestry.

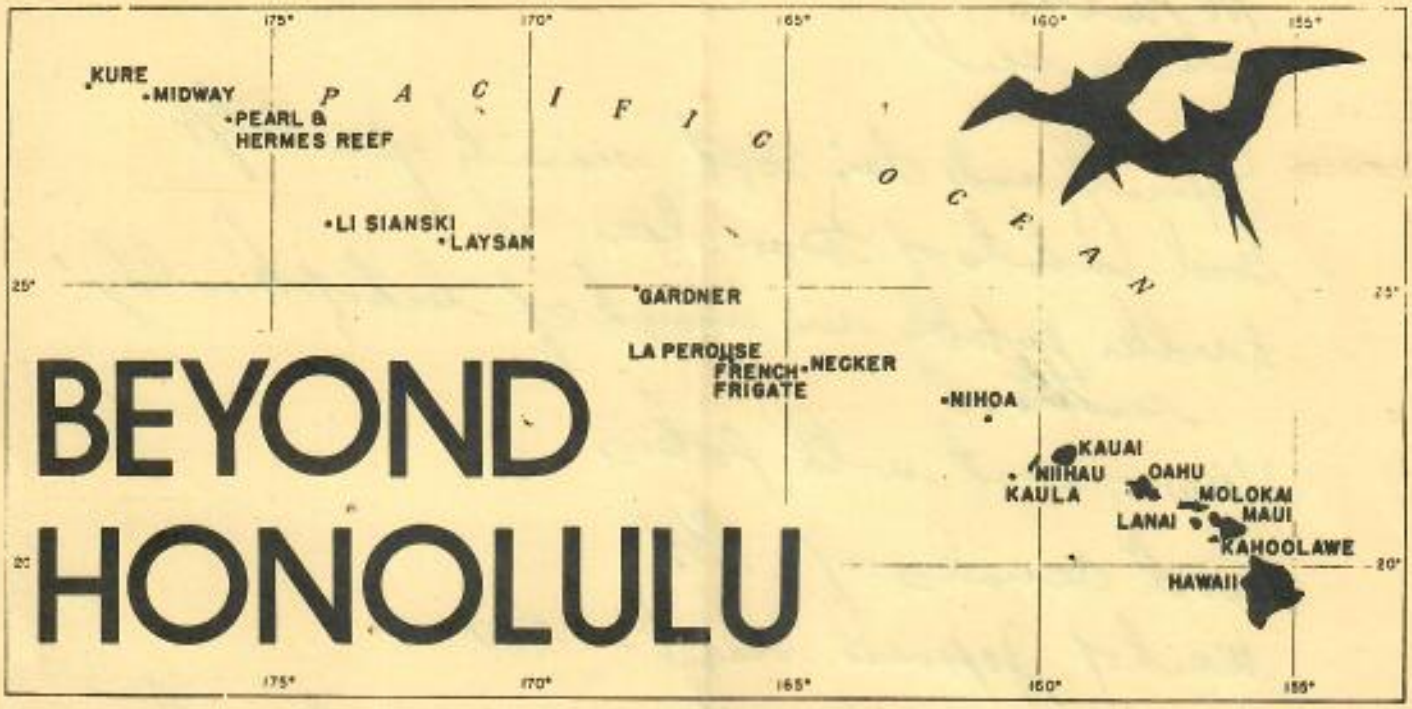
[3] Nihoa Island, Necker Island, Lisianski Island, Pearl and Hermes Reef, French Frigate Shoal, Gardner Pinnacles, Maro Reef and Laysan Island.



HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE

Pearl and Hermes Reef
Lisianski Island
Laysan Island
Maro Reef
Gardner Pinnacles
French Frigate Shoals
Necker Island
Nihoa Island

PREMIERE SHOWING



BEYOND HONOLULU

July 29

JULY 29 McCoy Pavilion 7:30

In the early 1900's, President "Teddy" Roosevelt set aside these islands as a wildlife sanctuary. They stretch from Hawaii to Midway and beyond. This is the first film to be released on the Leeward Islands since the 1920's, and shows rare and endangered species of birds & seals in their native environment.

HAWAII FILM BOARD

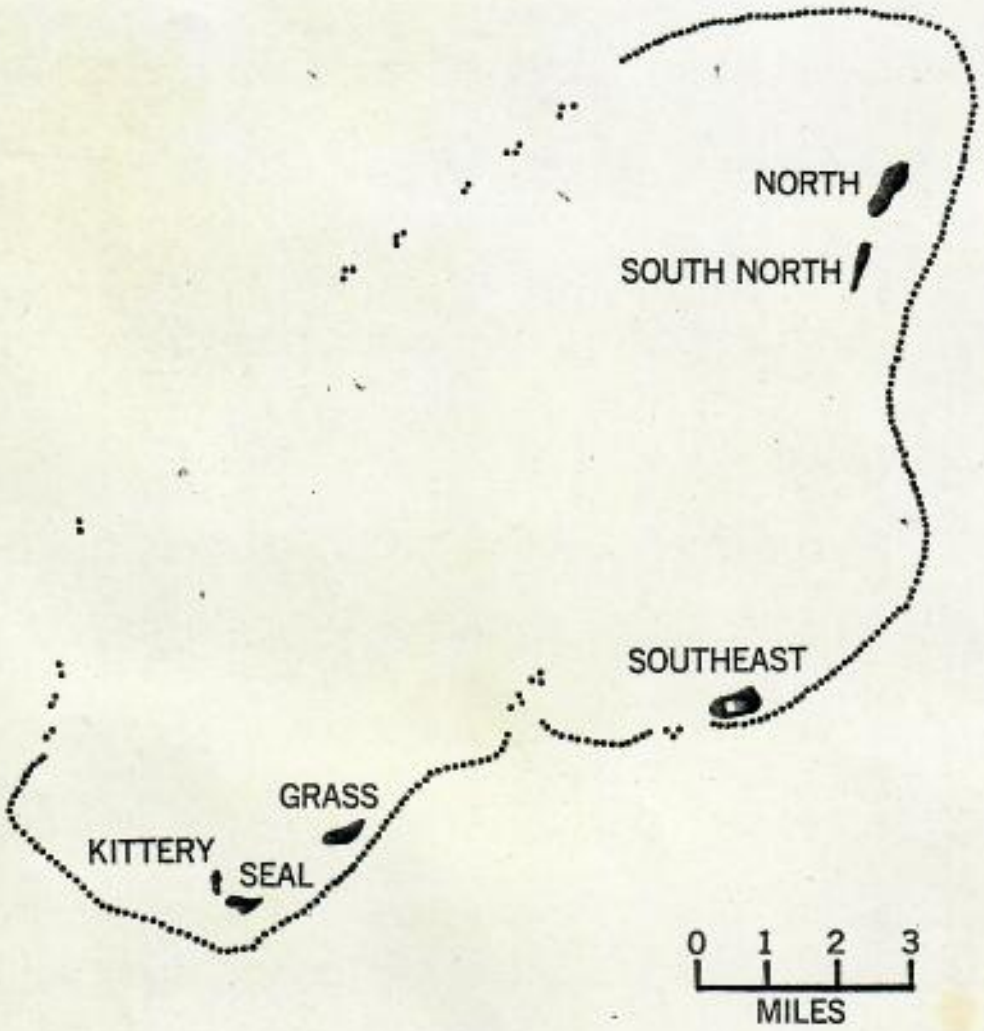
Written, Directed by Bruce Bensen

Narrated by Bob Sevey

Edited by Thom Moore

Original score by Keola & Kapono Beamer

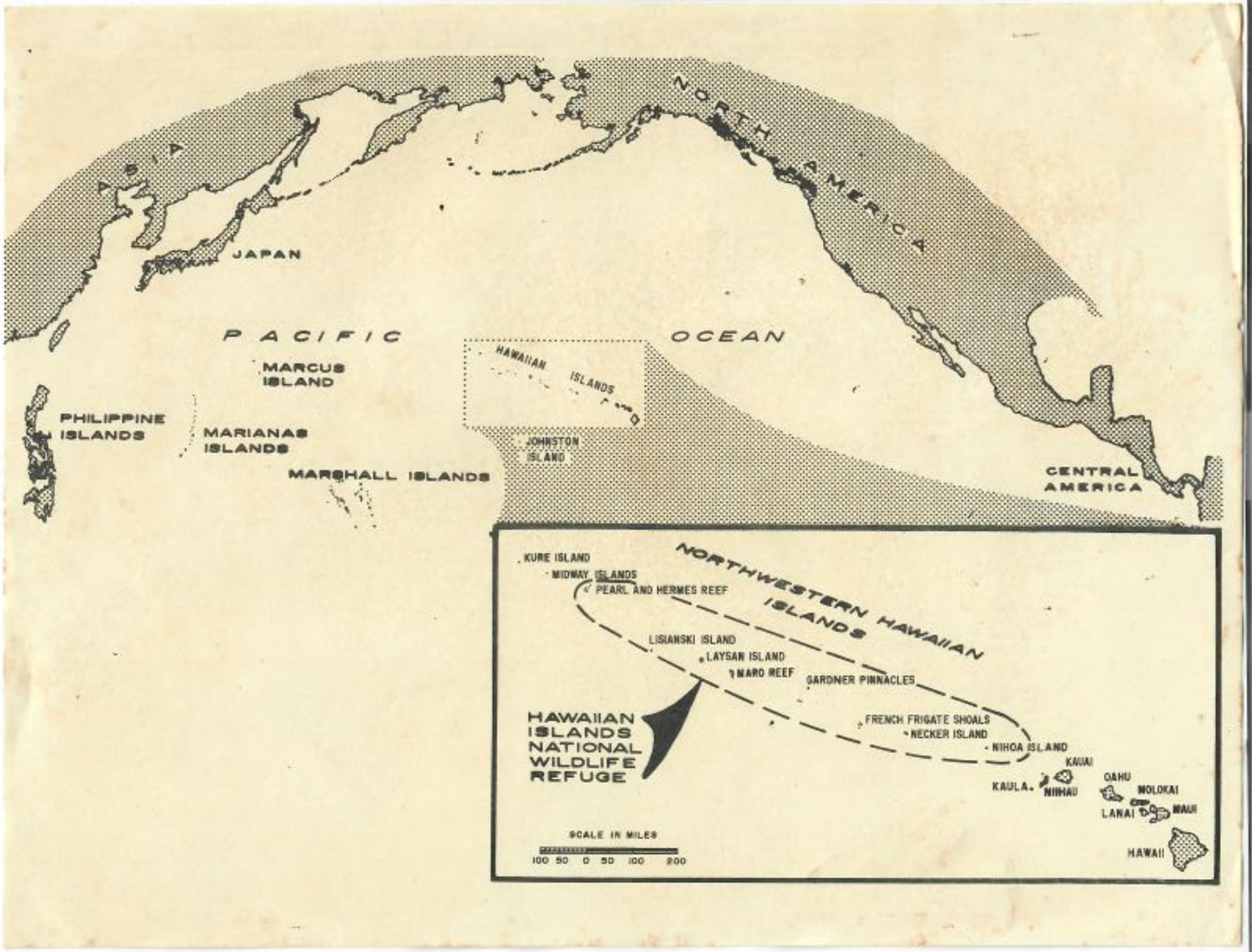
no chart
No turtles
only one seal
apparently wide diversity of wildlife
Good shots of Dave Olsen
Kridler probably was aware of "lack of knowledge" routine.
View of boat with poles
Good aerials of P.H.
Wreck of Japanese vessel - 1969
Mr. Bryan was there - doing book (bibliography on HFS)
1200 references?



Pearl and Hermes Reef is an atoll with a barrier reef which is vaguely defined or absent on the northwest side. It contains six coral islets which lie close to the reef.

Pacific accumulate lines of clouds that group into a brief, drenching squall and then pass on. These showers are local, and may miss one islet yet wet other within an atoll. Between these scant rains, the atoll is bared to the sun, and plants on the islets must be able to resist it.

Leaf surfaces hint how dryness and sun are counteracted. The amaranth *Achyranthes splendens* and the nightshade *Solanum nelsoni* have leaves that are gray-green with an ashy velour of very fine hairs. The puncture vine *Tribulus* has leaves shiny with a felt of hairs, hairs that can be a "microscopic windbreak" preventing the wind from drying the surface of the leaf, and that also


ASIA
NORTH AMERICA
JAPAN
PACIFIC
OCEAN
HAWAIIAN ISLANDS
MARCUS ISLAND
PHILIPPINE ISLANDS
MARIANAS ISLANDS
JOHNSTON ISLAND
MARSHALL ISLANDS
CENTRAL AMERICA
KURE ISLAND
MIDWAY ISLANDS
PEARL AND HERMES REEF
NORTHWESTERN HAWAIIAN ISLANDS
LISIANSKI ISLAND
LAYSAN ISLAND
MARO REEF
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER ISLAND
NIHOA ISLAND
KAUAI
OAHU
KAULA
NIIHAU
MOLOKAI
LANAI
MAUI
HAWAII
HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE
SCALE IN MILES
100 50 0 50 100 200

Enjoyable 'Zoo Islands'...

Continued from Page 2

Island. It is 14 miles long, seven miles wide and has six inland lakes. Hog Island lies to the north and the Fox Islands to the south.

The modern history of Beaver Island goes back over 170 years. Before 1800 traders of the Northwest Company made trips to the island and built the fur house which, the last I heard, still stands.

Members of the Mormon faith were among those who went to the island and settled under the leadership of James J. Strang, whose claim to fame rests on his coronation in 1850 as the only king ever crowned in the US, outside of Hawaii! From Beaver Island he proceeded to rule over much of Northern Michigan which had become a state of the union only a decade and a half previously.

Alarmed by Strang's growing power, President Millard Fillmore dispatched a government cutter to the island to depose the new monarch. In the meantime, however, Strang introduced polygamy on the island. This alarmed one man so much that, together with another islander, he shot King Strang, who died six days later.

The US Government proceeded to move out most of the Mormons and the Irish moved in. They adopted the island as home and prospered and multiplied. Of the population of some 400, nearly half are Indians and most of the rest are of Irish descent. Today, visitors to the island still experience the touch of Old Ireland in the fenced, front yard flower gardens.

Another interesting personality in Beaver Island's history was Dr. Feodora Protar, a Russian nobleman exiled by the czar for freeing his serfs. He came to Beaver Island, lived alone in a log house and was the only doctor on the island for 30 years. His grave site is marked by bronze tablets.

The island may be reached by airplane or boat from Charlevoix, 32 miles to the southeast. The harbor, said to be one of the best in the Great Lakes, is at the island's only town, St. James, which was named after James J. Strang.

In summer, Beaver Island's forest roads are long green tunnels. In October the island is a mass of flaming color with a background of dark evergreens. A growing herd of deer inhabits the island, fox and coyotes abound, fishing is fine, and fish nets on reels add a quaint flavor to the island. Lumber mills and logging folks riding in horse-drawn sleighs in winter and Indian boys diving for coins when the boat docks also add local color to this "Zoo Island" with such a fascinating history.

Perhaps this summer some of you will have the opportunity to personally visit one of these interesting islands. If so, I'd appreciate a post card from it dropped my way!

Enjoyable 'Zoo Islands'

By Nehemiah Ames

Elk Island is one of the 21 islands located in what Cree Indians named Astotin (the lake of many islands), situated in the Beaver Hills of Central Alberta, Canada.

Surrounding this small island is Elk Island National Park, 76 square miles of what is in essence an 'island' of nature surrounded by farmland today. Viewed from an airplane, the park even looks like an island of forested hills in the midst of the comparatively flat farmlands all around it.

Within its boundaries, the native elk of the Canadian prairies has been preserved along with bison, which once roamed in the millions. In all, some 30 species of mammals, just over 200 species of birds and 240 plant varieties have been recorded in the park.

The park contains some plants which are no longer locally common outside its borders, including the marsh marigold, wild sarsaparilla and some members of the orchid and lily families. White or paper birch trees from which the Indians made canoes, shelter, dishes and clothing are still common within the park.

The first white man to explore the area arrived in 1756 and found a band of Cree called the Beaver Hills People who established an extensive trade in beaver pelts with the early traders.

With the gradual disappearance of the animals upon which their livelihood depended, the Indians left the area until by 1870 only a few still lived in the Beaver Hills. Then in the 1890s homesteaders began to arrive, some of whom were Ukranians. Today, a replica of a Ukranian pioneer home is located in the park. Operated as a museum, it contains artifacts made by early settlers or brought over from the Ukraine.

Came the early 1900s and trapping, hunting and settlement seriously threatened many of Alberta's large game animals. For example, the only elk known to still exist outside the province's mountain regions were inhabiting the Beaver Hills. Concerned, five Albertans decided to preserve the last elk by establishing a 16-square-mile wildlife preserve. In 1913 Elk Island was established as a Dominion Park. Later, more land was added and in 1930 it became a National Park.

Situated some 28 miles east of Edmonton's city limits and easily reached by road, the park is open all year, but campgrounds and most tourist services are available only from mid-May to mid-September. Camping space is allocated on a first-come, first-served basis for a maximum stay of two weeks. Motorboats are allowed on Astotin Lake, while rowboats and canoes are permitted on most of the park's other lakes and ponds as well.

Canadian national parks are "areas of outstanding natural features . . . dedicated to the people of Canada for their benefit and enjoyment . . . and made use of so as to leave them unimpaired for the enjoyment of future generations." For this reason, all wildlife, plants, trees, rocks and fossils in Elk Island National Park are to be left undisturbed; even the wildflowers are not to be picked, but left for others to enjoy.

Here, I'd like to gratefully acknowledge that the information from which this article has been written was provided by the superintendent of Elk Island National Park to share with WSC readers. If any prospective visitors would like further information, he will be pleased to hear from you. His address is Superintendent, Elk Island National Park, Fort Saskatchewan, Alberta, Canada T0B 1P0.

Nehemiah Ames
P. O. Box 274
Gibraltar (Europe)

BEAVER ISLAND

Behind this not unusual po
mark lies a strange story. It com
from what once formed part
the kingdom of the only ki
ever to be crowned in the co
tinental United States!

Almost due west of the Strai
of Mackinac that connect Lak
Michigan and Lake Huron, bu
slightly to the south, are
islands known as the Beave
group, the largest called Beave

Continued on Page 11

NEHEMIAH AMES
P.O. Box 274
GIBRALTAR (EUROPE)

May 20, 1973
Ref.: 215-A

Gene Kridler, Manager, Jr. Frigate Shoals
Hawaiian Is. National Wildlife Refuge
U.S. Fish & Wildlife Service
Honolulu, Hawaii, U.S.A.

Dear Mr. Kridler,

Would you be willing to do me a big favor? It may sound silly, but would you be willing to take the enclosed envelope with you next time you visit WHALE ISLAND and autograph & date it to show that it has been there? I would be very highly grateful to you for such a favor.

You see, I am making a collection of envelopes which have come from islands all over the world which bear the names of wildlife and it won't be complete without the world's largest animal being represented!

Also, as you can see from the enclosed article, some of these envelopes provide the basis for a series of articles I am writing for Western Stamp Collector. Islands described so far in this series have included, besides ELK and BEAVER, ELEPHANT, SABLE, HORSE, PUFFIN, KANGAROO & DOG Islands.

If you care to add any comments about whale Island, they would be very appreciated. But even if your busy schedule doesn't permit much writing, I'll be delighted to receive back my envelope from whale Is.!

Thanks ever so much!

Nehemiah Ames

BY AIR MAIL
PAR AVION

BUREAU OF SPORT FISHERIES AND WILDLIFE
RECEIVED
MAY 30 1973
HONOLULU, HAWAII
Hawaiian Islands Nat'l. Wildlife Refuges

GIBRALTAR
22 5 73
FIRST DAY OF ISSUE

Please forward to
Bureau of Sport Fisheries & Wildlife
337 Uluniu St.
Kailua, Oahu, Hawaii
96734

MR. GENE KRIDLER, MANAGER,
FRENCH FRIGATE SHOALS
HAWAIIAN IS. NATIONAL WILDLIFE REFUGE,
U. S. FISH + WILDLIFE SERVICE
HONOLULU, HAWAII, U. S. A.

From: N. Ames, P.O. Box 274, Gibraltar

Certificate of Appreciation

The Federal, State and Provincial Conservation Agencies join with thousands of professional and amateur ornithologists throughout North America in expressing their sincere appreciation for the interest and cooperation shown by reporting the bird band number and recovery data noted below. A report containing these data will be forwarded to the ornithologist who banded the bird and these data will be permanently retained in the cooperative North American Bird Banding files maintained at the Bird Banding Laboratory, Office of Migratory Bird Management, Laurel, Maryland 20811, U.S.A.

It is only through the continued cooperation of interested conservationists such as yourself that these important data can continue to be compiled and made available to the scientists who study our wild bird populations.

Awarded To

GEORGE H BALAZS
PO BOX 1346 COCONUT IS
KANEOHE HI 96744

BANDING DATA:

BAND NUMBER: 723-63993 KIND OF BIRD: SOOTY TERN SEX: UNKNOWN

AGE OF BIRD: IT WAS TOO YOUNG TO FLY WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 06/10/63

RECOVERY DATA: FILE REF.: 20348

LOCATION: EAST ISLAND HI DATE: 06/18/75

CANADIAN WILDLIFE SERVICE

U. S. FISH AND WILDLIFE SERVICE

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Awarded To

GEORGE H BALAZS
PO BOX 1346 COCONUT IS
KANEOHE HI 96744

BANDING DATA:

BAND NUMBER: 863-22456 KIND OF BIRD: SOOTY TERN SEX: UNKNOWN

AGE OF BIRD: IT WAS AT LEAST ONE YEAR OLD WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 08/09/65

RECOVERY DATA: FILE REF.: 20348

LOCATION: EAST ISLAND HI DATE: 06/20/75

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Awarded To

GEORGE H BALAZS
PO BOX 1346 COCONUT IS
KANEOHE HI 96744

BANDING DATA:

BAND NUMBER: 923-13188 KIND OF BIRD: NODDY TERN SEX: UNKNOWN

AGE OF BIRD: IT WAS AT LEAST ONE YEAR OLD WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 06/16/66

RECOVERY DATA: FILE REF.: 20348

LOCATION: EAST ISLAND HI DATE: 06/20/75

CANADIAN WILDLIFE SERVICE

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Awarded To

GEORGE H BALAZS
PO BOX 1346 COCONUT IS
KANEOHE HI 96744

BANDING DATA:

BAND NUMBER: 923-24892 KIND OF BIRD: SOOTY TERN SEX: UNKNOWN

AGE OF BIRD: IT WAS AT LEAST ONE YEAR OLD WHEN BANDED

BANDER: IT WAS BANDED BY PERSONNEL OF US NATIONAL MUSEUM
C/O C D HACKMAN 3033 WOODSIDE PARKVILLE MD 21234

BANDING LOCATION: NEAR EAST IS FR FRG SHL HAWI DATE: 08/23/66

RECOVERY DATA: FILE REF.: 20348

LOCATION: EAST ISLAND HI DATE: 06/20/75

CANADIAN WILDLIFE SERVICE

U. S. FISH AND WILDLIFE SERVICE

ALBATROSS CASTINGS

EAST ISLAND, FRENCH FRIGATE SHOALS

1974 BACALS

Sample No.	Total wt.	Residue	% Residue	No. Beaks (SQUID)
1	24.2	9.7	40.1	250
2	32.3	9.4	29.1	--
3	10.8	3.3	30.6	98
4	33.3	4.2	12.6	--
5	40.8	25.0	61.3	--
6	51.4	29.2	56.8	280
7	36.5	11.7	32.1	156
8	32.5	15.8	48.6	150
9	39.2	10.2	26.0	--
10	23.6	3.0	12.7	146
11	27.3	10.0	36.6	128
12	21.5	2.5	11.6	146
13	18.2	0.8	4.4	88

ARB No 174 Dec 31, 1974
Nat Hist Pearl & Hermes Reef
AB Amerson, R.B. Clapp & W.O. Wirtz II

a range of 5 knots. Maximum winds occur generally from the east from July through October, and from the west during the remainder of the year. From May through August peaks range from 35 to 41 knots and in the remaining months from 42 to 55 knots. Peak gusts of 77 and 67 knots have been recorded in December and January, respectively.

The mean tenths of total sky cover is fairly uniform throughout the year, ranging from a low of 5.3 in August to a high of 7.3 in March. The yearly mean is 6.2. The occurrence of fog and haze is negligible, but highest in January and March. Minimum visibility caused by rain of less than 1 mile occurs rarely, most often from December through April.

HISTORY

The atoll derives its name from those of two English whaling vessels, the Pearl and the Hermes, which ran aground at nearly the same time on the then unknown reef during the night of 25 April 1822. No lives were lost and provisions and timber were salvaged and used to sustain the crews for two months during which they built a schooner from the salvaged timbers. Shortly before the crews were ready to launch their new schooner, named the Deliverance, another ship--the Thames--was saved from disaster on the reef. Captain Phillips of the Hermes was able to warn her captain in time. While most of the two crews were safely taken off the reef by the Thames, 12 elected to sail the Deliverance into Honolulu (Hawaiian Mission Children's Society Library, Missionary Letters; Bryan, 1942: 197).

The next recorded visit was that of Captain Benjamin Morrell, Jr., from 8 to 10 July 1825, who wrote of seeing "pearl-oysters and biuche de mer" as well as green turtles, seal elephants and sea leopards (Morrell, 1832: 217-218).

Twenty-five years later Albert G. Osbun, aboard the brig Rodolph, visited the atoll on 11 August 1850 in search of sea turtles. Captain Perry and three crewmen landed on a "small island not 1 mile in circumference." They found the island covered with grass and a vine; nesting birds, seals, one small turtle, fish, and shell were noted. After killing 10 or 12 seal for food, they departed (Kemble, 1966: 154-156).

Captain John Paty of the Hawaiian schooner Manokawai stopped at Pearl and Hermes in May 1857 to determine its position and map the islands (Paty, 1857: 2-3; Bryan, 1942: 197). In 1859 Captain N.C. Brooks sailed the Hawaiian bark Gambia there and on 5 July took possession, probably in the name of Hawaii; he reported 12 islands (see Fig. 3), 6 more than Captain Paty observed (Brooks, 1860: 502-503; U.S. Nat. Archives, Frear to Sec. Interior Dept. letter of 30 April 1909, R.G. 48). U.S. Naval Hydrographic Office chart 4 (see Fig. 4) which resulted from the USS Lackawanna's hydrographic observations in August 1867, Captain William Reynolds commanding,

shows the position of just five islands (U.S. Nat. Archives, Cartogr. Div., R.G. 37), not two as reported by Bryan (1937: 30; 1942: 197). Reynolds also took possession of the atoll for the United States.[1]

During the off season of sea otter hunting, the Japanese schooner Ada was charted by an American, George Mansfield, and his friends. They sailed from Yokahama, Japan, on 10 December 1881, bound first for the Bonin Islands and thence to the Northwestern Hawaiians hoping for a cargo of fish, shark, turtle and bêche-de-mer. On 19 January 1882 the Ada, commanded by Harry Hardy, anchored off Pearl and Hermes Reef and in the next two days her crew of 17 killed 28 turtles and collected 54 beche-de-mer and 43 pounds of albatross down. The down was obtained by killing the chicks, dipping them in boiling water, and then stripping off the feathers; petrels, boobies, and frigates were treated in like fashion. The Ada visited the remaining islands down to French Frigate Shoals and stopped a second time at Midway in May 1882 to reprovision before returning to Japan (Hornell, 1934: 426-432).

On 6-7 July 1891, Henry C. Palmer and George C. Munro, who were employed by the Honorable Walter Rothschild of England, the former as his bird collector, anchored off the Reef on the refitted schooner Kaalokai, Captain F.D. Walker in command. They did not land because of "submerged coral patches and sandbars" but described the largest island and the birds sighted (Munro, 1942: 12).

Sometime during the late 1880's or early 1890's John Cameron reported pitching a tent on Pearl and Hermes, but did not remain long (Farrell, 1928: 415).

During this entire period there was little political interest in Pearl and Hermes Reef. In fact, its name was omitted in various official listings of the Hawaiian Islands (Galtsoff, 1933: 11-12). On 15 February 1894, however, an indenture was entered into between J.A. King, Minister of the Interior for the Provisional Hawaiian Government, and a Hawaiian company then known as The North Pacific Phosphate and Fertilizer Company,[2] for the

---

[1] The question of who possessed Pearl and Hermes was resolved when Hawaii became a United States territory on 30 April 1900. The atoll became part of the State of Hawaii when the Territory of Hawaii was admitted as the 50th State in the Union on 21 August 1959 (Pearcy, 1959; U.S. Dept. of State, 1965). Presently, the City and County of Honolulu hold jurisdiction over Pearl and Hermes Reef by virture of Section 1717 of Chapter 118 in the Revised Laws of Hawaii dated 1925 (Morris, 1934).

[2] The name changed to The Pacific Guano and Fertilizer Company in April 1894, but until its sale in 1904 the only island worked appears to have been Laysan (Anon., 1939: 2-22).

lease of Morrell, Ocean, Pearl and Hermes Reef, Midway, and French Frigate Shoals for 25 years at $1.00 per year. This company, which had been bringing guano into Hawaii from Laysan since 1891 (Anon., 1939: 2-22), was granted the exclusive right to remove guano, phosphate, fertilizers and other material, a royalty of 50 cents for each ton to be paid to the Hawaiian government semi-annually (U.S. Nat. Archives, King - Glade and Hackfeld indenture dated 15 Feb. 1894, R.G. 126).

Beginning in 1902, Japanese feather poachers visited the Northwestern Hawaiian Islands and killed thousands of albatrosses but the extent of their poaching at Pearl and Hermes is not known. The USS Iroquois under Captain Niblack sailed past the atoll on 29 September 1904 and noted "wreckage...but no signs of human beings" (Wilder, 1905: 393). Three Japanese were left there in July 1908 by a Japanese schooner; they were rescued in January 1909 by the schooner Florence Ward (Thrum, 1909: 176). By Executive Order No. 1019, Theodore Roosevelt made Pearl and Hermes a part of the Hawaiian Islands Reservation in February 1909, and placed it under the jurisdiction of the Bureau of Biological Survey, Department of Agriculture.[1]

During the years 1910 to 1916 the U.S. Revenue Cutter Thetis visited Pearl and Hermes numerous times, sometimes landing, other times merely sailing around it. After arresting Japanese plumage hunters at both Laysan and Lisianski on 17 and 20 January 1910, Commander Jacobs proceeded to Pearl and Hermes but found "no evidence of it having been visited in recent times." On 24 December 1912 the Thetis returned and Commodore Salisbury visited "the sand islands inside the reef." In addition, Hawaii Governor W.F. Frear landed on one of the islands to take photographs (U.S. Nat. Archives, Thetis logs, R.G. 26).

On 15 March 1913, the Thetis landed Alfred M. Bailey and George Willett at the northern island. In September of the following year Carl Elschner, a chemical engineer, although unable to land on the southwest island, visited the northeast island and found it "overgrown with high grass which offers attractive breeding places for the numerous Terns and Boobies." He also observed other birds, seals, and turtles and made geological observations (U.S. Nat. Archives, Thetis logs, R.G. 26; Elschner, 1915: 59-60; Bailey, 1956: 30-31).

In March 1915 and in February 1916 the Thetis checked the atoll for feather poachers but found none. During the latter visit, W.H. Munter reported birds, seals, turtles, and, on Southeast Island, rabbits. He also indicated that Southeast Island had "been recently visited by man; probably within a year and a half, judging by the conditions of the remains of a crude shelter that had been constructed on the north side of the island near its eastern end. They were Japanese fishermen most likely,

---

[1] In 1940, the preserve was transferred to the Department of the Interior.

for the reason that the shelter was constructed from bamboo and thatched straw or grasses....a number of upright poles was all that was left standing...[of] the shelter" (U.S. Nat. Archives, Thetis logs, R.G. 26; Munter, ms.).

During April and May 1923, the Tanager Expedition visited the atoll to make scientific observations and collections for the Bureau of Biological Survey. The old Japanese camp was noted. They also reported rabbits on Southeast. In May all but one rabbit were killed and several kinds of plants and trees were planted. Two new islands, Grass and Seal, were charted in the lagoon (Gregory, 1924: 20-21; Wetmore, ms.) and the results of the expedition's observations were incorporated into U.S. Naval Hydrographic Office chart 4, revised August 1924 (see Fig. 5). Marine life at Pearl and Hermes was again studied in 1928 by Victor Pietschmann, a Bernice P. Bishop Museum fellow from Vienna (Bryan, 1942: 198).

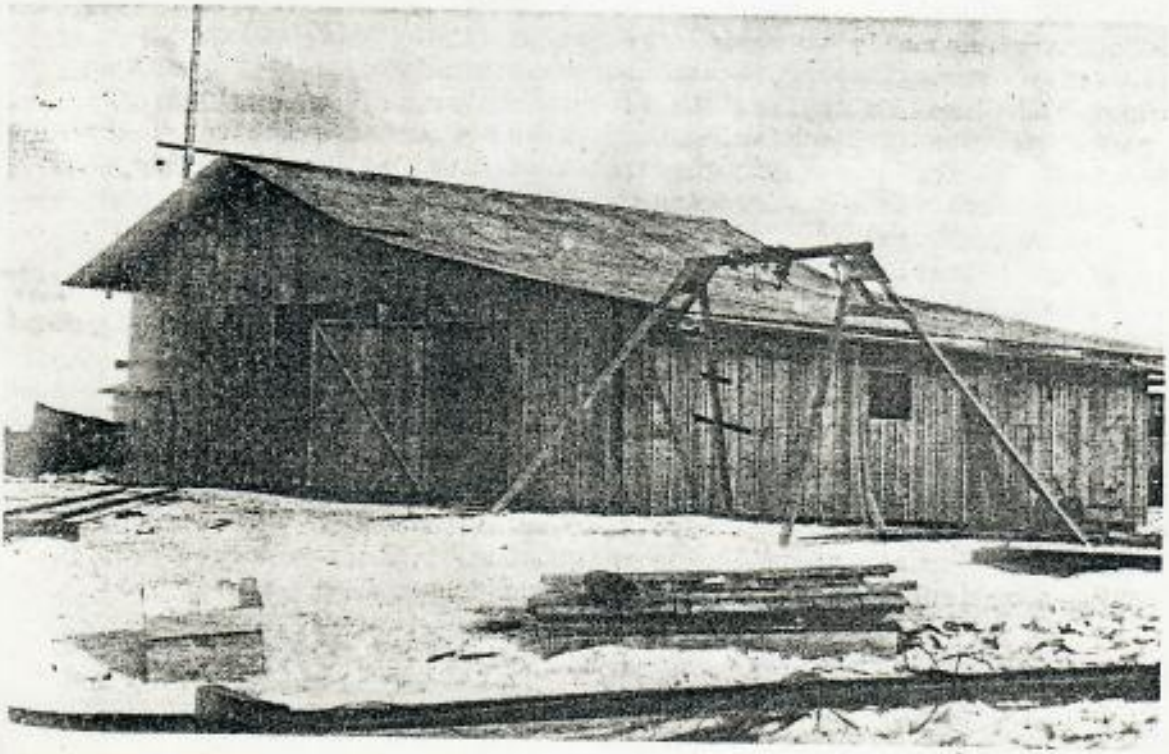
In May 1924 the USS Pelican, with Federal Game Warden Gerrit Wilder aboard, surveyed and photographed--with the aid of a seaplane--the atoll during its annual inspection. The north side of Southeast Island was determined to be the best place to land and beach seaplanes (U.S. Nat. Archives, Pelican log, R.G. 24; also USNHO corresp., R.G. 37).

From 1926 to 1930 fishing operations became important in the history of the Reef. The Lanikai Fishing Company, Ltd., operated during 1926 and 1927 but by December 1928 had failed financially. Pearl oysters, which yield mother-of-pearl shell, had been discovered in May 1928 by Captain William B. Anderson who commanded the schooner Lanikai for the Lanikai Fishing Company. Because of its financial difficulties, the company transferred its rights to the pearl beds to Hawaiian Tuna Packers, Ltd., with the two companies annually to divide the net profits. Another company, Hawaiian Sea Products Company, meanwhile, was quickly organized and on 3 December 1928 filed an application with the Department of Agriculture for a permit to establish a fishing station and to erect buildings on Pearl and Hermes. Anderson became vice president of Hawaiian Sea Products, as well as its general field manager and captain of the newly acquired schooner Lanikai. Hawaiian Tuna Packers subsequently made application in February 1929 to the Department of Agriculture for a license to develop the pearl beds (U.S. Nat. Archives, application of Hawaiian Sea Products Co. to USDA, 3 Dec. 1928; and letter from Hawaiian Tuna Packers to Sec. of USDA, 13 Feb. 1929, R.G. 22).

The Department of Agriculture declined jurisdiction over the fisheries in waters adjacent to reefs and authority was given to the Governor of Hawaii to grant use and occupation permits for the fishing operations, provided protection was accorded to wild animals and birds on the National Refuge (U.S. Nat. Archives, letter from R.W. Dunlap, Acting Sec. of USDA to E.C. Winston, Pres., Hawaiian Tuna Packers, 2 Mar. 1929; and copy of USDA Order signed by R.W. Dunlap, 15 May 1929; R.G. 22; memorandum on Administrative Control, 18 June 1929, R.G. 126). The newly organized Hawaiian Sea Products Company received permission to erect buildings (Figs. 23 and 24) on Southeast Island and subsequently brought several tons of pearl shells to Honolulu. They later sold them to San Francisco and New York button manufacturers (Bryan, 1942: 196).

23. Fishing camp of the Hawaiian Sea Products Company at Southeast Island, summer 1930. Photograph by P.S. Galtsoff.

24. One of three buildings at Southeast Island constructed by the Hawaiian Sea Products Company, summer 1930. Photograph by P.S. Galtsoff.



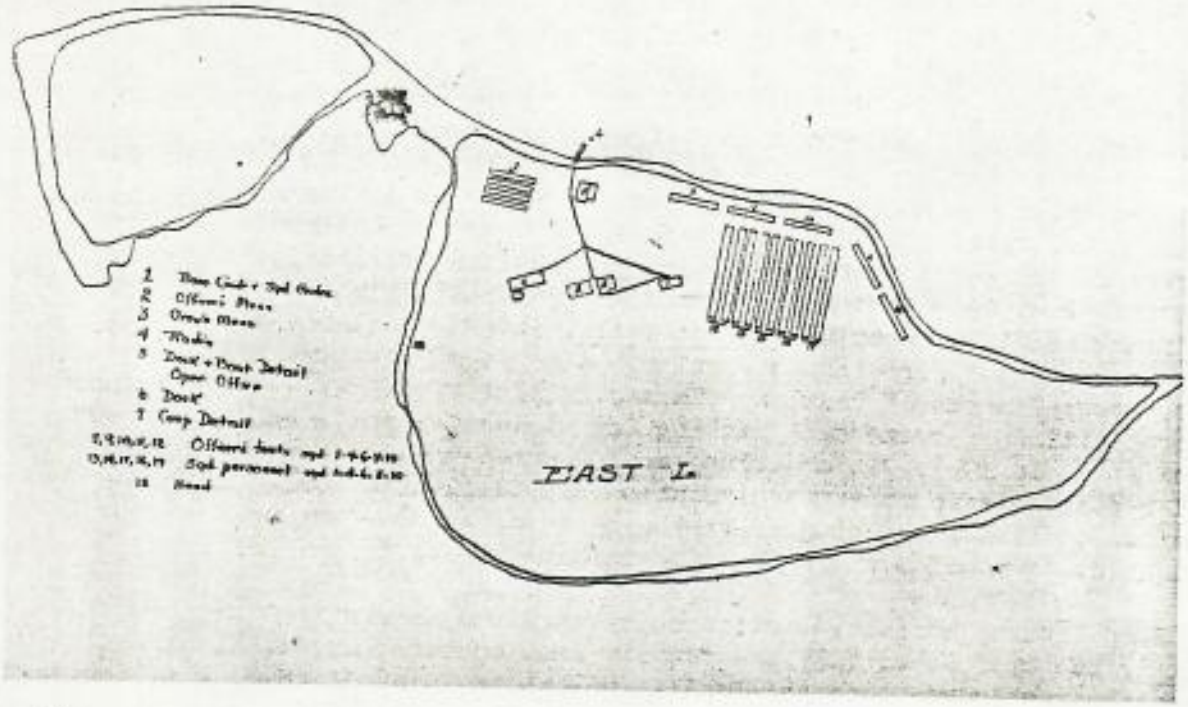
Because of the increased interest in the proposed establishment of a fishing station and cold storage plant and in the development of the pearl oyster beds, "the Territorial Government requested the U.S. Bureau of Fisheries to outline methods for [the] conservation and development" of the pearl oyster bottoms of the atoll. Acting on the Bureau's advice, the Territorial Government passed an act in May 1929 making it unlawful to take pearl oysters in Hawaiian waters and appropriated money to make a survey of the pearl oyster fisheries in Hawaiian territorial waters (Bryan, 1942: 196). This survey, conducted from 15 July to 1 September 1930 from the minesweeper USS Whippoorwill, Lt. M.M. Nelson Commanding Officer, under the direction of Paul S. Galtsoff of the Bureau of Fisheries, spent 4 weeks at Pearl and Hermes. Galtsoff (1933: 47) recommended the prohibition of commercial fishing for at least 5 years and a resurvey of the atoll in 1935. In addition, he suggested the establishment of a pearl oyster reserve for transplantation and cultivation only, the continuation of biological studies on the oysters, and the encouragement of cultivation of pearl oysters in suitable habitats by private citizens.

Some fishing activity continued at Pearl and Hermes from the schooner Lanikai, but by October 1931 the fishing base operated by Hawaiian Sea Products was abandoned and the Lanikai was to be laid off (U.S. Nat. Archives, letter from F.L. Earnshaw to G.P. Wilder, 28 Oct. 1931, R.G. 22).

During the mid-1930's regular inspection cruises, such as that of the USCGC Itasca in June 1934, were made to the Northwestern Hawaiians. In May 1935 the USS Lark, taking part in U.S. Naval war games, anchored at Pearl and Hermes on 15 May; she departed the next day. A hydrographic survey of the atoll was made in April 1935 by the USS Avocet, in company with the USS Quail, Tanager and Oglala. This resulted in the production of a modern chart of the atoll, but because of the political turmoil in the Pacific it was not officially published as USNHO chart 5647 until February 1947. In October 1937, another U.S. Navy exercise involved the USS Swan at Pearl and Hermes (Figs. 25, 26, and 27). Her log for the 26th records that 12 planes of Patrol Squadron 8 from French Frigate Shoals landed and tied up at temporary moorings in the lagoon; later in the day the planes returned to French Frigate. Ten planes of Patrol Squadron 4 also made a round trip visit from French Frigate Shoals that same day (U.S. Nat. Archives, Itasca log, R.G. 26; logs of the Avocet, Lark, and Swan, R.G. 24).

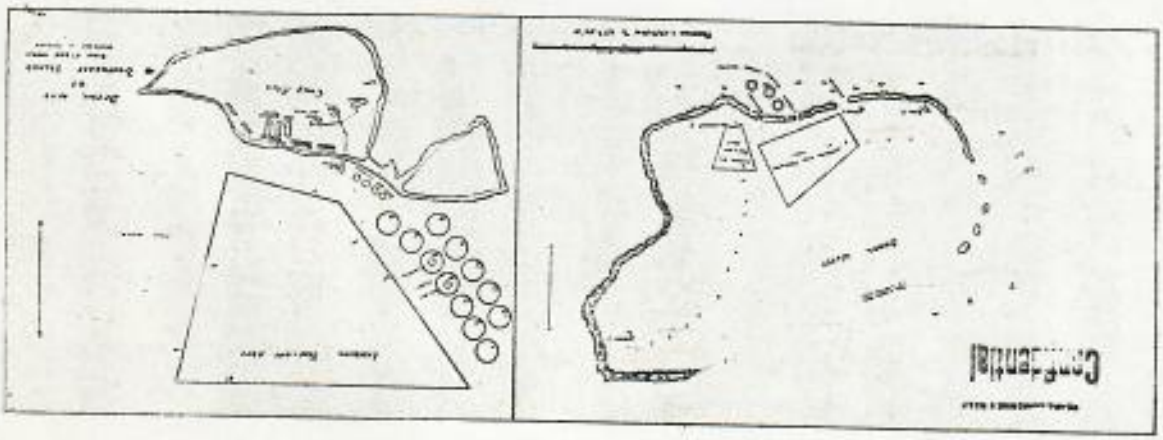
Pearl and Hermes was involved in World War II in 1942. Acting under CINEPAC 190251 (19251?), the USS Preble arrived on 19 April and at 1018 hours fired 4-inch batteries at the old fishing buildings on Southeast Island. With two U.S. Marine Corps VMF planes from Midway, they bombed and strafed the buildings; a subsequent landing party set them afire. All buildings were completely destroyed by 1408 hours when the Preble departed for Midway. No evidence was found on the island of recent habitation or landing (U.S. Nat. Archives, Preble log, R.G. 24; U.S. Navy, Class. Oper. Archives, Preble war diary).

In defense of Midway Island during May and June 1942, the oiler USS Kaloli, the civilian yacht Crystal, and the minesweeper USS Vireo were



25. Drawing of U.S. Navy base camp at Southeast Island, drawn 6 August 1936. Official U.S. Navy photograph no. 80-CF-79797-3 in the U.S. National Archives.

26. Chart of tender anchorages, plane moorings, and base camp for U.S. Navy exercise, 1 October 1937. Official U.S. Navy photograph no. 80-CF-79797-4 in the U.S. National Archives.



27. Aerial view of Southeast Island from 300 feet showing details of base camp, probably October 1937. Official U.S. Navy photograph no. 80-G-11878 in the U.S. National Archives.

deployed to Pearl and Hermes Reef. The Vireo, Lt. James C. Legg commanding, was the first to reach the carrier USS Yorktown on 5 June 1942, after it was severely damaged during the Battle of Midway (Morison, 1949: 93, 154).

Personnel of the Pacific Ocean Fisheries Investigations (hereafter referred to as POFI) visited the atoll five times between June 1950 and May 1956. Aerial surveys were conducted in May 1949 by Alfred Bailey, during the 1950's by A.F. Carr, J.W. Aldrich, K.W. Kenyon, and D.W. Rice (see Scientific Visits section).

On 12 March 1961, David H. Woodside and Raymond J. Kramer of the Division of Fish and Game of the State of Hawaii landed on Southeast Island and made general wildlife observations. They reported finding deep tracks made on the beach landing point by an amphibious tractor, as well as a 15-foot "steel observation tower...several 55 gallon drums, some apparently full of fuel...[and] hollow tile blocks." Subsequent investigation revealed these items had been left in 1960 by LORAC, an amphibious military operation from Midway which occupied the island without permit. The nature of this project is unknown. Also in 1961, personnel from another military project, HIRAN, which was engaged in plotting the exact location of Southeast, "landed by helicopter and camped for a few days" (HDFG, 1961).

Beginning in February 1963 POBSP personnel made 12 trips to Pearl and Hermes Reef; BSFW personnel made 12 other trips. These are detailed in the Scientific Visits section.

SCIENTIFIC VISITS

Early information on the natural history of Pearl and Hermes Reef is available only from the reports made by various ships' captains who visited or were wrecked there. Even observations by scientists who visited the atoll prior to 1923 were limited to a few hours. Such early observations were made by Munro (1942: 12) and Palmer in July 1891, Bailey, Fullaway and Willett (Bailey 1956: 30-32) in March 1913, Elschner (1915: 59-67) in September 1914, and Munter (ms.) in February 1916.

The Tanager Expedition visited from 26 through 28 April and again from 17 through 19 May in 1923. Hydrographic charts were made of the atoll and two previously uncharted islands were named. Collections were made of birds, mammals, insects, arachnids, plants, fish, and many varieties of marine invertebrates. In all, 21 species of birds including a mummified gull (Wetmore, ms.) were recorded, and the bird and mammal life was discussed by Wetmore (1925). Insects collected were reported in papers by Bryan et al. (1926), and Zimmerman (1948a, b, c, d). Eleven growing plant species and two represented in beach drift were discussed by Christophersen and Caum (1931). Myriapods were mentioned by Attems (1938). The Crustacea were treated by Edmondson (1925), the Echinodermata by Fisher (1925), and H.L. Clark (1925) and A.H. Clark (1949), and the Foraminifera by Cushman (1925).

Kemble J.H. (Ed.) 1966. To California and the south seas: the diary of Albert G. Osburn, 1849-1851. The Huntington Library, San Marino, Calif 233pp.

Elschner, C. 1915. The Leeward Islands of the Hawaiian Group. Honolulu Advertiser, Honolulu 68pp.

JJ Parsons

The green turtle, though known throughout the Pacific Islands, does not appear to be found in major concentrations anywhere among them. In most of the islands the taking of a turtle is an event sufficiently rare to call for a community celebration. There are indications, however, of a few more favored nesting beaches and feeding grounds and there were many more in the past.

A modest turtle fishery exists in the Hawaiian Islands, especially off the islands of Oahu, Molokai, and Maui. Between 1948 and 1958 official statistics indicate a catch averaging some 10,000 pounds a year, most of which finds its way to Honolulu restaurant tables. *Chelonia mydas*, however, is not known to nest anywhere on the main islands nor are specimens smaller than ten to fifteen inches in diameter ever taken by local fishermen.° Circumstantial evidence points to French Frigate Shoal (23° 45′ N.) and the other islands of the remote Leeward group as the home of most of the turtles found in Hawaiian waters. Of this string of tiny islands stretching northwest for more than 1,000 miles from Honolulu, only Midway and French Frigate Shoal are inhabited, the latter by a small Coast Guard detachment. All but Midway are in the Leeward Islands National Wildlife Refuge, so that the turtles are protected along with other wildlife. Even though there is no patrolling or supervision of these islands, they are so infrequently visited that violations must be extremely rare.

Most reports of green turtles in this area are of individuals basking on the shore during daylight hours, a behavior pattern that has been previously suggested as distinguishing the Indo-Pacific population from its Atlantic counterpart. While it is apparent that certain of the Hawaiian Leewards must be targets for nesting females during the fall of the year, the favored beaches do not seem to have been identified except in the case of French Frigate Shoal, where both nesting and basking populations have been reported. Dale Rice, who made numerous flights over the Leewards during 1957 and 1958 and spent time ashore on several of them observing the Hawaiian monk seal, reports having seen especially large concentrations of basking green turtles on Pearl and Hermes Reef, always on the same beaches, namely, on the north side of Southeast Island (usually twenty to fifty turtles) and a small bight on the south side of North Island (nor-

° Personal correspondence, Vernon Brock, Director of Division of Fish and Game, Territory of Hawaii, November 28, 1955; see also *160*.

mally ten to twenty turtles). Smaller numbers were present on Lisianski and Laysan atolls.* On more remote Midway juvenile greens are occasionally taken in the lagoon by skin-divers from the naval base, but adult turtles do not appear to haul out there today, undoubtedly because of the considerable human activity ashore.

The extent to which the Hawaiian Leewards may have been exploited for turtles in the past is conjectural. One account, at least, suggests that it was more than a casual matter. In the spring of 1882 a Japanese-chartered vessel for which we have a record took at least 390 turtles, including an undetermined number of hawksbills, in the Hawaiian Leewards beyond French Frigate Shoal. Of these 10 were taken at Midway, 28 at Pearl and Hermes Reef, 126 at Lisianski, 17 at Marco Reef, and 191 at Layson. Some were turned on the beaches and others harpooned at sea, but it is not clear whether those taken on land were turned during daytime hours or as they came ashore at night to make their nests. At Laysan, where 61 were turned within a few hours, a sign was found on shore that carried an appeal for passing ships not to take more turtles than needed. Their abundance at this time must have been such as to have encouraged waste. The visitors, apparently in sympathy with the recommendation, repainted the sign and placed it on a pole before leaving. At French Frigate Shoal, where they slaughtered a part of the catch and dried the meat in the sun, they must have taken more turtles. The account left to us only states that 47 gallons of turtle oil and 1,500 pounds of shell were added to their stocks there, along with bêche de mer, albatross down, and shark fins. The entire product of the voyage was eventually transshipped to Hong Kong, from where the turtle was sent on to England. (See *110;* the log was kept for six months by George Mansbridge, an employee of the Mitsubishi Company of Madagascar.)

It seems generally agreed that green turtles are much rarer today than they formerly were in Hawaiian waters. It is even possible to speculate that they once congregated on the beaches of Honolulu itself. Although, according to W. A. Bryan (*26*:299-300), the name is generally agreed to have been derived from a Hawaiian word, *hono,* meaning harbor (Honolulu, "quiet harbor"), one cannot resist pointing out that the Hawaiians know the green turtle by the almost identical term of *honu* and that beaches such as Waikiki might

* Personal correspondence, Dale Rice, Richmond, California, August 14, 1959, and Karl Kenyon, Sand Point Naval Air Station, Seattle, August 13, 1959; see also *117.*

History of com exploit. observations incidence

Other Islands

The other sand islands--Bare, Disappearing, Mullet, and Near--have no records of vegetation because of their small size and low height. Salt water washes over them regularly, precluding growth of vegetation.

No vegetation has been recorded from La Perouse Pinnacle. Wetmore (ms.) found none when he climbed the rock in 1923. Richardson (1954a: 63) found no vegetation on the cliff faces around the west end on 31 October 1953. POBSP personnel found no vegetation on the northeast face or on the entire top of the main rock in June 1969. The nearby little rock is also barren.

H_2O temp data?

REPTILES

American complete sailer reports

Two reptiles--the Green Sea Turtle and the Mourning Gecko--are known from French Frigate Shoals. Both species breed on the atoll. The gecko is an introduced species, whereas the turtle species is a resident. Possibly the Pacific Hawksbill Turtle, Eretmochelys imbricata, an uncommon species in the Hawaiian Islands, has visited the atoll, but no records exist of its occurrence.

GREEN SEA TURTLE — Chelonia mydas

Status

Common resident breeder; occurs on all islands, except those awash at high tide; nests on the six major sand islands. Maximum recent population estimate 1,300 in August 1965.

NO

Tern, Trig, W-S East, Gin, Little Gin

Observations

Sea turtles were first recorded from the sand islands of French Frigate Shoals 3 to 7 January 1859 by Lt. John M. Brooke of the USS Fenimore Cooper (U.S. Nat. Archives, Old Mil. Hist., Log of USS Fenimore Cooper for 1859). In May (?) of the same year Captain N.C. Brooks of the Gambia also found the Shoals abounding with turtles.

From 3 February to 1 May 1882, the crew of the Japanese-owned American-chartered schooner Ada, with two sampans, visited French Frigate Shoals "to get anything they could sell in the way of fish, shark, [and] turtle" (Hornell, 1934). When the Ada departed on 1 May its cargo included 47 gallons of turtle oil and 1,543 pounds of turtle shell. The Ada's log gives some indication as to how much turtle was actually taken. Prior to

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by A. Binion Amerson Jr. Smithsonian Institution

its arrival at the Shoals, 168 turtles had been collected. Assuming a single adult turtle yields three pounds of tortoise shell (Parsons, 1962), about 346 turtles were taken by the Ada's crew. Turtles were not eliminated, however, for great numbers were present in early 1888 when the Wandering Minstrel visited the atoll (Farrell, 1928), as well as in May and June 1891 when the Kaalokai surveyed the atoll (Walker, 1909; Munro, 1941a).

The USS Rainbow's hydrographic survey of French Frigate Shoals in the late summer and fall of 1914 found turtles plentiful (U.S. Nat. Archives, Mod. Mil. Hist. Div., Rainbow corresp., R.G. 37, 1132-100666). Turtles and turtle eggs, as well as evidence of previous turtle slaughter, were found by Wetmore (ms.) during the April 1923 visit of the Tanager Expedition.

Two commercial fishing companies, the Hawaiian-American Fisheries, headed by Louis K. Agard, Jr., and the Seaside Fishing Company, established a fishing base on Tern Island in November 1946. A great many turtles were captured and taken to the Honolulu market. Turtle meat became one of the mainstays of the crew's diet, supplanting beef. However, the turtle numbers dwindled, probably more as a result of human disturbance than actual killing, and soon turtle was not taken for the commercial market. Agard (in litt.) estimates taking about 200 turtles between 1946 and 1948. Commercial fishermen again took turtle from the atoll in the spring of 1957 (POFI, 1957).

HDFG, BSFW, AND POBSP personnel have recorded turtles on almost all visits during the 1960's. All turtle observations at French Frigate Shoals are presented in Tables 4-9.

Annual Cycle

French Frigate Shoals' Green Sea Turtle population is the largest in the Hawaiian Islands. Turtles have been recorded year-round. The adult population is lowest in the fall, winter, and early spring. The highest population occurs in the late spring and summer and coincides with breeding. Copulation has been observed in early May; nesting usually commences in late May. Infrequent egg-laying has been noted in August and September. Hatchlings probably appear in late July and are commonly seen in August and early fall.

Hendrickson (1969: 90) suggests that French Frigate Shoals' turtle hatchling production exceeds that of all the other Hawaiian nesting sites combined.

Table 4. Green Sea Turtle observations at East Island

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

Table 4. (continued)

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1967 Mar. 11-12	1	Offshore (BSFW, 1967a; POBSP, 1967b).
May 26-31, June 9-13	20-60	Adults daily, 5-21 ♀♀ laying nightly; 1 subadult (POBSP, 1967a).
Dec. 9	0	5 old nest pits at east end (BSFW, 1967c).
1968 June 6-11, 14-16, 25	present	Adults laying (POBSP, 1968a).
1969 June 5-10, 21	15-40	Adults daily; ♀♀ laying nightly (POBSP, 1969).
Aug. 22, 30	6	Adults in nearby water; many nest pits, only a few appeared freshly dug (BSFW, 1969c).

Table 5. Green Sea Turtle observations at Gin Island.

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1923 June 24	3-4	1 with a front flipper missing (Wetmore, ms.)
1956 Apr. 11	9	Ca. 100 lbs. each (POFI, 1956a).
June 4	4	(POFI, 1956b).
1957 Apr. 25	10-15	(POFI, 1957).
May 12	10-12	(POFI, 1957).
1961 Feb. 18	2	(POFI, 1961a).
1963 June 9	10	Adults (POBSP, 1963).
1966 Mar. 23	2	♂ adults (BSFW, 1966a).
Sept. 14	0	20 nest pits, but no hatchlings (BSFW, 1967b).
1967 June 9	5	Adults, no nest pits (POBSP, 1967a).
1969 Aug. 23, 30	0	25 old nest pits counted (BSFW, 1969c).

Table 6. Green Sea Turtle observations at Little Gin Island

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1923 June 24	?	Nest of turtle eggs with developing embryos (Wetmore, ms.).
1950 June 19	4	(POFI, 1950c).
1956 Apr. 11	1	ca. 100 lbs. (POFI, 1956a).
June 4	6	(POFI, 1956b).
1957 Apr. 25	10-15	(POFI, 1957).
1961 Feb. 18	2	(POFI, 1961a).
1966 Mar. 23	0	25 old nest pits on higher ground (BSFW, 1966a).
1967 June 9	3	Adults; no nest pits (POBSP, 1967a).
1969 Aug. 23, 30	0	66 old nest pits counted (BSFW, 1969c).

Table 7. Green Sea Turtle observations at Tern Island

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1959 July 21	1	1-year old pet kept in salt-water pond; 1 haul-out track on beach; USCG C.O. revealed that 25-50 turtles had been taken by commercial fishermen from French Frigate Shoals by air during past few months (POFI, 1959).
1962 June 11-13, 21-22	?	Artificial turtle pond started (BSFW, 1962b).
1964 Sept. 27-28	0	Several nests reported to have hatched about 1 month prior (BSFW, 1964b; POBSP, 1964).
1966 June 8-10, 14-16, 21-23, 29 July 1, 4-7	0	Old nest pits on southeast beach (POBSP, 1966a).

Table 7. (continued)

Date of Survey		Population Estimate	Breeding Status, Remarks, and References
1966	Aug. 11-15, 17-18, 24-26, 30-Sept. 16	75	Hatchlings, no adults (POBSP, 1966b).
1967	May 25-26, 31-June 2, 7-9, 13-15, 18, 20-22	3	Adults; some nest pits (POBSP, 1967a).
1968	Mar. 11-15	1	Adult ♂ (POBSP, 1968b).
	May 29-June 6, 11-14, 16-17, 19-20, 22-27	present	Adults in nearby water (POBSP, 1968a).
1969	Mar. 23	1	Near pier (BSFW, 1969b).
	June 2-4, 11-15, 25-26	2	Adults: 1 on north beach, 1 in water (POBSP, 1969).
	Aug. 21-Sept. 6	2	1 adult on beach, 1 subadult in water; 1 nest pit (BSFW, 1969c).

Table 8. Green Sea Turtle observations at Trig Island

Date of Survey		Population Estimate	Breeding Status, Remarks, and References
1923	June 26	?	Considerable turtle signs on beach (Wetmore, ms.).
1950	Jan. 19, 23-25	1	Caught on 23rd (POFI, 1950a).
1951	May 8-10	?	Breeding (POFI, 1951).
1953	Oct. 28	2	Large sea turtles sleeping on beach (Richardson, 1954a: 62).

Table 8. (continued)

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1956 Apr. 11	2	Ca. 100 lbs. (POFI, 1956a).
June 5	1	(POFI, 1956b).
1957 May 10	12	(POFI, 1957).
1959 July 21	1	Recently-butchered parts of large turtle; no haul-out tracks (POFI, 1959).
1961 Feb. 18	12	(POFI, 1961a).
1963 June 14,15	20	Adults daily (POBSP, 1963).
1964 Sept. 27	23	5 adults; 1♂, 2♀, 2 unknown; 18 hatchlings: 1 alive, 17 petrified (BSFW, 1964b; POBSP, 1964).
1965 Aug. 16, 29, 31	28+	Adults: 13♂, 15♀; 5-20 adults daily; ♀♀ laying nightly (POBSP, 1965a).
1966 Mar. 22	12	Adults: 4♂, 3♀, 5 unknown (BSFW, 1966a).
June 10-23, July 1,3-4	5-24	Adults daily; 5+ ♀♀ laying eggs nightly (POBSP, 1966a).
Aug. 13-14, Sept. 4,12	27+	Adults on the 13th; some ♀♀ laying eggs; hatchlings present (POBSP, 1966b).
Sept. 12	5	Adults: 1♂, 1♀, 3 unknown (BSFW, 1966b).
1967 Mar. 13-14	29	Adults: 14♂, 15♀ (23 adults on 1st day count); another 15-20 adults sleeping on bottom between Trig and seaward reef (BSFW, 1967a; POBSP, 1967b).
June 2, 8-9, 19-20	10-25	Adults daily; 5± ♀♀ laying nightly; adult sex ratio on 20th: 3♂, 1♀ (POBSP, 1967a).
Sept. 17	1	Dead adult (BSFW, 1967b).
Dec. 7	2	Adults, sighted from plane (BSFW, 1967c).

Table 8. (continued)

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1968 June 6, 11, 22, 24-25	present	Adult ?? laying (POBSP, 1968a).
1969 Feb. 22-23	8	Adults on 23rd; 1 on 22nd (BSFW, 1969a).
June 3, 14 23-24	5-20	Adults daily, ?? laying nightly (POBSP, 1969).
Aug. 23, 27	1	Adult daily; west end literally torn up by turtle digging; some new digging; 12 eggs almost fully developed collected (BSFW, 1969c).

Table 9. Green Sea Turtle observations at Whale-Skate Island

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1923 June 26	?*	Turtle bones near a rock fireplace (Wetmore, ms.).
June 26	?**	Remains of a number of turtles lay scattered about (Wetmore, ms.).
1951 May 8-10	?*	Breeding (POFI, 1951).
May 8-10	?**	Breeding (POFI, 1951).
1953 Oct. 28	1*	Dead newly hatched young (Richardson, 1954a).
1956 Feb. 21	1*	(Svihla, 1957).
Feb. 21	2**	(Svihla, 1957).
Apr. 11	14*	100 to 150 lbs; a large 10' shark attacked a 100 lb. turtle just offshore, turtle later seen on beach minus its left front flipper (POFI, 1956a).
June 5	10-12	(POFI, 1956b).

Table 9. (continued)

Date of Survey	Population Estimate	Breeding Status, Remarks, and References
1957 May 10	36	(POFI, 1957).
1959 July 21	12	Large shells: carapace and plastron cut apart, flippers and head lacking; slaughter appeared recent; few haul-out tracks (POFI, 1959).
1963 June 12-15	20	Adults daily; much egg laying (POBSP, 1963).
1964 Sept. 27	0	125 nest pits counted (BSFW, 1964b; POBSP, 1964).
1965 Aug. 17, 29-Sept.1	27*	Adults: 1♂, 26♀; numerous hatchlings; 5-20 adults daily; ♀♀ laying nightly (POBSP, 1965a).
1966 Mar. 22	4	Adults (BSFW, 1966a).
June 10, 23-July 3	5-24	Adults counted daily; 5+ ♀♀ laying nightly (POBSP, 1966a).
Aug. 15-17, Sept. 4	2+	Adults; some ♀♀ laying eggs; hatchlings present (POBSP, 1966b).
1967 June 2-7, 15-19	20-45	Adults daily, 5-10 ♀♀ laying nightly; 3 subadults; adult sex ratio on 18th and 19th: 6♂, 24♀ (POBSP, 1967a).
1968 June 6, 16-25	present	Adult ♀♀ laying (POBSP, 1968a).
1969 June 3, 16-20,22	10-35	Adults daily; ♀♀ laying nightly (POBSP, 1969).
Aug. 23,27	6	1 adult, 5 subadults in nearby water; none on beach; some digging activity (BSFW, 1969c).

* Whale ** Skate

Estimating the Green Sea Turtles' population is complicated by several factors. Adult turtles of both sexes bask on the beaches during the day, perhaps, as Hendrickson (in litt.) has suggested, to aid in digestion of their food.[1] If disturbed by humans, these baskers leave. Adult females lay their eggs only at night and may relay after about a week. Tagging has shown that there is a large daily island population turnover, with new turtles being found each day. Few turtles are seen within the lagoon. This indicates that turtles return to the sea after basking in the sun or laying eggs on the island. In 1965, 86 adult turtles were tagged by POBSP on 3 islands during August; an average of 5 turtles was tagged on each of the 17 days tagging occurred. Thus, if new turtles arrived and departed each day, this would mean roughly 150 using each of the 3 islands during the month, or a total of 450 for these 3 islands for August. But this is a minimum figure for several were lost or missed each day and from 5 to 20 were actually observed each day. Using 10 as a more realistic average, the estimate for these 3 islands then becomes 900. If we consider those using the other 2 turtle islands in the atoll, the August population could range from 650 to as many as 1,300.

The June and July breeding populations are probably higher than in August for as many as 60 turtles have been counted on a single island at one time. The total population using the atoll may be very large. Hendrickson (1969: 90) discussed the POBSP August 1965 estimates and noted that they were "highly tentative," but suggests "that one might assume twice the August number to represent the month of July and take the same increment for the early part of the season. One would then obtain a figure of between 2,600 and 5,200 turtles as the Hawaiian breeding population (1 + 2 + 1 times 650 - 1,300, and ignoring all other island nestings)." He then states "flatly that this estimate has little basis and is not to be trusted," but then notes "that it does not appear to conflict violently with any other available information."

BSFW personnel, assisted by POBSP personnel, inaugurated a tagging operation throughout the Northwest Hawaiian Islands; present and future retrap data will provide more information on French Frigate Shoals' turtle population. These data are being analyzed by Kridler and Sincock.

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1 The surrounding water, being cooler than at other breeding areas, may hinder digestion; basking in the sun would aid the digestive process.

Table 8. (continued)

Date of Survey		Population Estimate	Breeding Status, Remarks, and References
1968	June 6, 11, 22, 24-25	present	Adult ♀♀ laying (POBSP, 1968a).
1969	Feb. 22-23	8	Adults on 23rd; 1 on 22nd (BSFW, 1969a).
	June 3, 14 23-24	5-20	Adults daily, ♀♀ laying nightly (POBSP, 1969).
	Aug. 23, 27	1	Adult daily; west end literally torn up by turtle digging; some new digging; 12 eggs almost fully developed collected (BSFW, 1969c).

Table 9. Green Sea Turtle observations at Whale-Skate Island

Date of Survey		Population Estimate	Breeding Status, Remarks, and References
1923	June 26	?*	Turtle bones near a rock fireplace (Wetmore, ms.).
	June 26	?**	Remains of a number of turtles lay scattered about (Wetmore, ms.).
1951	May 8-10	?*	Breeding (POFI, 1951).
	May 8-10	?**	Breeding (POFI, 1951).
1953	Oct. 28	1*	Dead newly hatched young (Richardson, 1954a).
1956	Feb. 21	1*	(Svihla, 1957).
	Feb. 21	2**	(Svihla, 1957).
	Apr. 11	14*	100 to 150 lbs; a large 10' shark attacked a 100 lb. turtle just offshore, turtle later seen on beach minus its left front flipper (POFI, 1956a).
	June 5	10-12	(POFI, 1956b).

Ecological Distribution

Green Sea Turtles are known from Disappearing, East, Gin, Little Gin, Tern, Trig, Round, and Whale-Skate Islands. Nesting occurs on each of these islands, except Disappearing (?) and Round.

East Island: Although turtles were probably first observed at East Island in the mid-1800's, the first known record was by POFI personnel in May 1955. Since then, except for 1958 and 1960, turtles have been recorded each year (Table 4).

BSFW and POBSP personnel found the turtle population on East Island to be the highest in the atoll during the 1960's. Most likely, however, the breeding turtle population at East was eliminated, or discouraged, during the 1944 to 1952 Coast Guard tenure.

The sun-basking areas at East are the north lagoon beach, the southeast lagoon beach (Fig. 48), and the south seaward beach. The entire seaward 50-foot edge of the vegetated portion is preferred by turtles for digging their nest pits (Fig. 49). They also utilize the vegetated edge of the lagoon side. These nesting areas are subjected to much digging which destroys many seabird nests, especially those with eggs or small chicks. Species affected include Sooty Tern, Brown Noddy, Wedge-tailed Shearwater, and Blue-faced Booby.

Gin Island: Wetmore (ms.) first recorded turtles at Gin in June 1923. POFI personnel observed them there in the 1950's and BSFW and POBSP personnel found them breeding in the 1960's (Table 5).

The population is small, with from 2 to 15 basking on the beaches. Twenty-five nest pits were counted in August 1969. Turtles usually sun bask on Gin's leeward beaches. Nest pits are dug above the beach crest.

Little Gin Island: Turtles were first found at Little Gin Island by Wetmore (ms.) in June 1923. POFI personnel recorded them there in the 1950's, and BSFW and POBSP observed them there during the 1960's (Table 6).

Sixty-six nest pits were counted on Little Gin in August 1969. Turtles utilize the southwest leeward beach cove area for sun basking and the area just above the beach crest for digging their nest pits.

Tern Island: Although turtles probably utilized the original Tern Island for basking and nesting prior to the 1942 Navy construction, no such records exist. POFI personnel noted

Figure 48. Green Sea Turtles sun-basking on the southeast lagoon beach of East Island, 19 June 1966. POBSP photograph by A. B. Amerson, Jr.

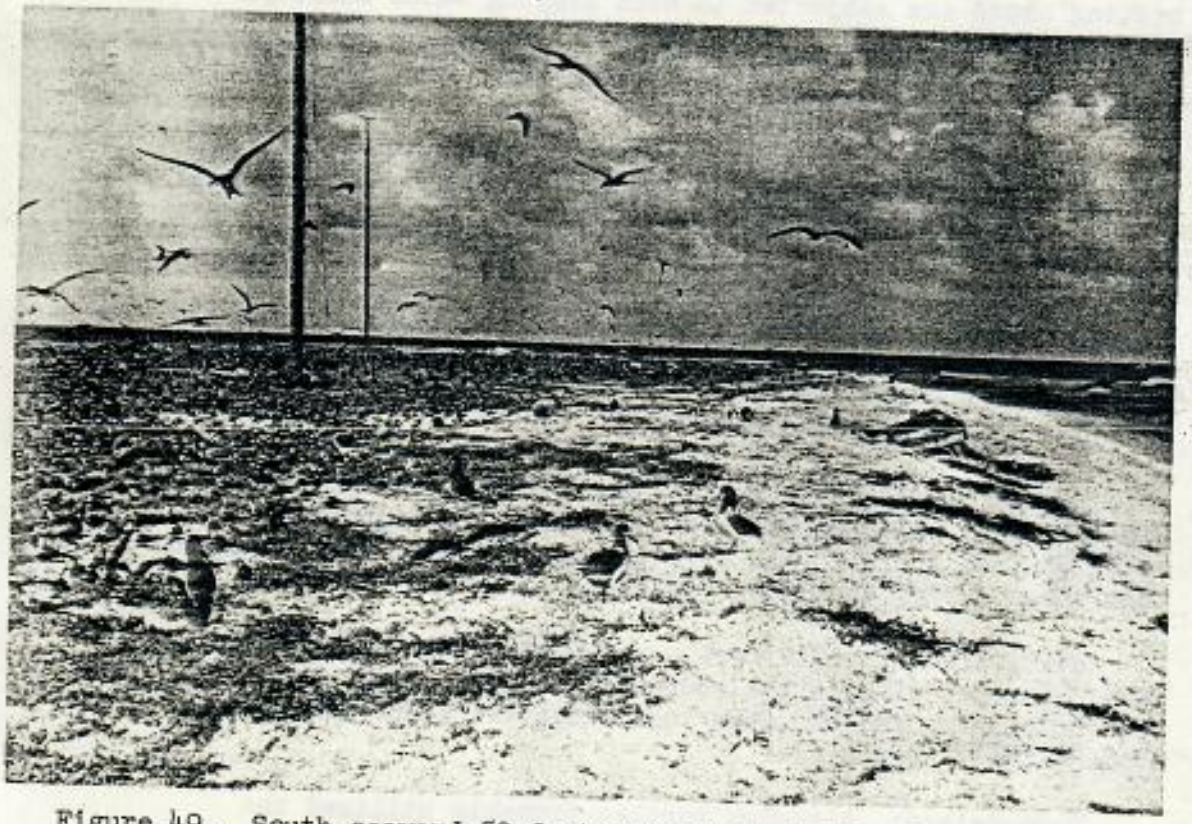

Figure 49. South seaward 50-foot edge of East Island utilized by Green Sea Turtles for nest pits, 19 June 1966. POBSP photograph by A. B. Amerson, Jr.

one set of haul-out tracks on Tern's beach in July 1957. Since then, BSFW and POBSP personnel have seen a few adults, as well as several nest pits (Table 7). Nest pits are most common at the southeast lagoon edge. In June 1969 one frequently was found basking on the small sandy north beach.

Trig Island: Wetmore (ms.) noted "considerable turtle sign" in June 1923. POFI personnel found them breeding in the 1950's; BSFW and POBSP personnel frequently recorded them during the 1960's (Table 8).

At Trig, turtles sun bask primarily on the north seaward beach. Nest pits are placed above the beach crest of this same area. After June 1968 turtle nesting activity was so extensive in the western vegetated portion that by February very little vegetation remained.

Whale-Skate Island: Wetmore (ms.) found a few turtle bones on Whale-Skate Islands in June 1923. POFI personnel recorded them breeding in the 1950 s. BSFW and POBSP personnel found them to be numerous during the 1960's (Table 9).

Turtles most frequently utilize the north beach for sun basking. They prefer the sandy lagoon edge of the vegetated portion, however, for placing their nest pits.

Other Islands: Ten adult turtles were recorded basking at Disappearing Island on 9 June 1963 by POBSP personnel. An adult was seen swimming near La Perouse Pinnacle on both 6 and 13 June 1969 by POBSP personnel. POFI personnel noted a 100-pound adult at Round Island 11 April 1956 and another at Shark Island on 25 April 1957. POBSP personnel observed four adults at Shark 4 June 1969. No nest pits were seen on any of these islands.

Tagging and Movement

Since 1963 BSFW and POBSP personnel have tagged 288 Green Sea Turtles at French Frigate Shoals, as follows: 3 in 1964, 86 in 1965, 3 in 1966, 61 in 1967, 121 in 1968, and 13 in 1969. At least 18 turtle recaptures have been taken on the atoll. Of these, one tagged at Laysan Island was captured at East Island; another tagged at Southeast Island, Pearl and Hermes Reef, was captured at Whale-Skate Island. Two female turtles tagged at Whale-Skate Island were captured at Southeast Island, Pearl and Hermes Reef. In addition, two turtles tagged at French Frigate Shoals were taken in the main Hawaiian Islands (Hendrickson, 1969: 93). These data are being further analyzed by BSFW personnel.

ARB No 186 Feb 15, 1975

Nat Hist. of Lisianski Is by R.B. Clapp ?, W.O. Wirtz II

HISTORY

Discovery of Lisianski Island

Lisianski was discovered when the Russian exploring vessel Neva, captained by Urey Lisiansky, grounded on a nearby reef. At the time the Neva was sailing from Sitka to rendezvous at Macao with the Nadeshda, her companion on the first Russian circum-global expedition (Buck, 1953: 72).

The Neva ran aground at 2200 on 15 October 1805 but the crew was able to refloat the vessel by throwing cannons and other heavy objects overboard. At dawn the crew observed a low sandy island to the west. Shortly thereafter the ship was driven onto another reef by a sudden squall but was refloated by 17 October when cables, anchors, and all remaining heavy items were thrown overboard.

That evening some of the ship's officers landed on the island and returned with four large seals that had been killed with hand spikes. On the 18th the crew retrieved the items that had been thrown overboard and went ashore. They found birds very numerous; at almost every step they sank almost to their knees in burrows dug by the birds. They saw seals and turtles but did not find water. A tall pole was fixed in the sand, and a bottle containing an account of the island was buried near it.

Lisiansky (1814: 256) concluded his comments on the island by stating that "this island promises nothing to the adventurous voyager but certain danger....to the southeast point of the bank where the vessel grounded, I gave the name of Neva; while the island itself, in compliance with the unanimous wishes of my ship's company, received the appelation of Lisiansky."

The next recorded visit to Lisianski occurred when Capt. Benjamin Morrell, Jr., of the ship Tartar landed there 6 July 1825. Morrell commented in some detail on the surrounding reefs but only made a few remarks about the island itself. He stated that it was "only about six miles in circumference, presenting a few small spots of vegetation, consisting of coarse grass and a little shrubery. The whole surface...[was] nearly covered with rookeries of different kinds of birds, among which are whale-birds, wake-up-kittles, man-of-war birds, gulls, and tropic-birds. On the shores we found an abundance of sea-elephants and green turtles, but nowhere...could obtain fresh water" (Morrell, 1841: 216).

First Scientific Visit

The next known visit to the island was by another Russian exploring vessel, the Moller, commanded by Capt. Stanikowitch. A party landed on the island on 3 April 1828 and the ship's surgeon, Herr C. Isenbeck, "did his best to bear all he saw in mind, and to prepare and keep as many of the birds, which were mostly caught by hand, as the very unfavorable circumstances allowed him to do" (von Kittlitz in Rothschild, 1893-1900: 11).

Several years later his observations were reported to F.H. von Kittlitz who subsequently wrote a paper that was translated by Rothschild (op. cit.).

Isenbeck's observations comprise the first list of birds from the island, but in many instances his observations are of doubtful validity, both as to specific identifications and as to observations on breeding biology.

Shipwrecks

Lisianski, like other Northwestern Hawaiian Islands, has had its share of shipwrecks. The accounts of these wrecks clearly show the tenacity and resourcefulness of early voyagers in the Pacific.

Wreck of the Holder Borden - 1844

The first known wreck was that of the 442-ton whaler Holder Borden of Fall River, Massachusetts. The ship, captained by Javes J. Pell (from whom Lisianski derived one of its earlier, alternative names), ran aground on a sandbank at 0300 on 12 April 1844.[1] Shortly thereafter the ship swung around onto a coral reef from which she could not be extricated. By morning there was 4 feet of water in the hold and the crew, observing a low sandy island some 4 or 5 miles away, abandoned the ship, taking everything of value with them to the island.

Members of the crew spent some 5 months on the island, living on ship's provisions and on seals, turtles, and birds. During their stay they built a 38-ton schooner from the wreckage of the Holder Borden. By September 8 they had completed their vessel, "painted, sheath, and copper-fastened throughout," which was named the Hope. On 14 September she sailed for Honolulu with Captain Pell and most of the crew and arrived there on 8 October. Eleven men were left on the island to look after the rest of the wreckage and its cargo of whale oil (Ward, 1967: 31-54).

Pell then purchased the American brig Delaware and set forth on 20 October to recover the men and supplies left on Lisianski. He arrived there on 1 November and spent 42 days loading oil and other salvage from the wreck. Before departing on 14 December, Pell planted about 80 coconuts on the southeast point of the island (Ward, op. cit.).

Wreck of the Konohasset[2] - 1846

Two years later another whaler, the 426-ton Konohasset, of Sag Harbor, met a similar fate. This ship, captained by Theron B. Worth, struck a reef under full sail about 17 miles from Lisianski at 0100 on on 24 May 1846. All hands were forced to leave in lifeboats when the ship was bilged by increasing swells over the reef. The following morning they reboarded the ship and sighted Lisianski from aloft. They proceeded to the island where they found the remains of the Holder Borden, and a house and well that had been constructed by the crew of that ship.

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[1] Not November 1844 as indicated by Bryan, 1942: 192.

[2] Another account spelled the name Conohasset but we did not resolve which spelling was correct.

During the following days the crew returned to the wreck and salvaged materials from which they built an 8-ton, 22-1/2-foot sailing sloop which they named the Konohasset, Jr. The keel was laid on 28 May and the ship was completed but 18 days later. Captain Worth and six other crew members then sailed for Honolulu, arriving there 31 July 1846 after 42 days at sea. The rest of the crew was subsequently taken off the island by the Hawaiian schooner Halilee, which the American Consul had dispatched to rescue them (Ward, 1967: 55-67).

Wreck of the Wanderer - 1872

In 1872 Captain E. Wood of the Kamehameha V found the remains of yet another ship that was lost on the treacherous reefs surrounding Lisianski. When the Kamehameha V arrived at Lisianski on 24 July the crew saw a wreck on the reefs to the southeast. During the afternoon two boats from the Kamehameha V went ashore and found evidence that the crew of the ill-fated Wanderer had landed there. On the beach were the remains of clothing, some food, water, and other debris. The ship's longboat, rigged for sea, was found on the northeast corner of the island where it had drifted ashore and the Wanderer's quarterboat was found moored to two water casks and a grapnel offshore.

The wrecked ship itself was visited the following day. On board was found the log, its last entry dated May 9, which identified the ship as the North German brig Wanderer of Hamburg (The Friend, 2 October 1872: 81). The crew was never found, leaving this one of the great shipwreck mysteries of the Pacific.

Wreck of the Afton - 1887

In 1887 still another ship was wrecked on the reefs. The bark Afton, carrying a cargo of coal from New South Wales to California, went aground on 13 April and could not be gotten off. Captain Gilmour and the crew abandoned the ship on the 16th and sailed for Honolulu in the ship's two 28-foot lifeboats.

After sailing about 120 miles to the E-SE, they found they could make no headway against the Northeast Trades; they then decided to turn about and run before the wind to Guam. Despite much suffering from thirst and the loss of the first mate overboard, the lifeboats eventually arrived at Guam, covering some 3,000 miles of open sea in 29 days (Cresswell, 1939: 53).

Other Visits in the 19th Century

Visit of the Manuokawai

On 10 May 1857[3] Captain John Paty landed on the island from the Hawaiian schooner Manuokawai. His purpose in visiting the island was to

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[3] Hawaiian Privy Council documents, vol. 10: 154. State of Hawaii Archives, Honolulu.

ascertain the nature and amount of guano deposits and to take possession of the island for the Hawaiian Kingdom. He reported that the surface was obtained by digging a hole 5 feet deep in the center of the former lagoon. His party found lumber, a house, and other artifacts left from the wreck of the Holder Borden, and noted that birds, fish, seals, and turtles were plentiful, though not so abundant as on Laysan. No trace was found of the coconuts planted by Pell (Paty, 1857: 40; Bryan, 1942: 191-192).

Visit of the Gambia

Captain N.C. Brooks visited Lisianski on the Hawaiian bark Gambia about May 1859. His comments on its position, the surrounding reef, sailing directions for the island, and observations on the island scarcely differ from Paty's. One observation of note was the discovery on the west beach of a notice that had been left by the San Diego, 27 April 1859, taking possession of the island for parties in San Francisco (Brooks, 1860: 501-502).[4]

Visit of the Ada

In 1882 Lisianski was twice visited by the crew of the Ada, a British schooner that was engaged in harvesting fish, sharks, turtles, and bêche-de-mer in the Hawaiian leewards. On her first visit to Lisianski on 24 January, 13 turtles and 47 bêche-de-mer were collected. On her second visit in early May, 107 turtles and 307 bêche-de-mer were taken (Hornell, 1934: 432-433).

Visit by the Rothschild Expedition

The second visit to Lisianski of ornithological interest occurred during the summer of 1891 when the island was surveyed for a few days by the Rothschild Expedition. Henry Palmer and his assistant, George C. Munro, had been engaged by Walter Rothschild to collect birds in the Northwestern Hawaiian Islands. The schooner Kaalokai, captained by F.D. Walker, had been hired to transport them to the various islands. They landed on Lisianski on 29 June and remained there until 7 July. In all, 16 species of birds, four of them shorebirds, were recorded and bird specimens were obtained. (See Appendix Tables 1 to 3 for additional details and references.)

Cameron's Visits

John Cameron visited Lisianski on the sloop Ebon in the 1890's to kill seals and turtles for meat and to fish for sharks. On a visit in the summer of 1893 he noted "miriads of mice" that overran the island but made little reference to other animal life (Farrell, 1928: 397-399). Since the account of Cameron's visit was written many years after his trips to the Hawaiian leewards, and since no other observer from that period reported "mice," we suspect that his observations of Lisianski were probably confused with those of another atoll.

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[4]This is the only reference to the visit of the San Diego.

Cameron revisited the island twice during the summer of 1894. On the second visit the crew fished for sharks for a few days and then spent the remainder of the visit killing turtles and seals (Farrell, 1928: 414).

Lisianski and its Leases

On 29 March 1890 rights to remove phosphates and guano from Lisianski (and Laysan) were granted to Charles N. Spencer and George D. Freeth by the Hawaiian Kingdom.[5] These rights were subsequently signed over to the North Pacific Phosphate and Fertilizer Company which formally leased Laysan and Lisianski on 17 April 1893 for a period to extend until 29 March 1910. The island was visited in July 1890 by George D. Freeth on the schooner Kaalokai, presumably to investigate the status of guano deposits.[6] With him was A.B. Lyons, who, with Freeth, had just previously visited Laysan Island. Lyons (1890) later published an account of his visit to Laysan but no details of the visit to Lisianski are now available.

In March 1904 Max Schlemmer, the "King of Laysan," applied for a lease to Lisianski, Laysan, and French Frigate Shoals, but his plea was rejected. Shortly thereafter, 6 May 1904, the Pacific Guano and Fertilizer Company,[7] which had ceased to work Laysan for guano, made Schlemmer an agent who could represent it with the power to act in accordance with the terms of its contract and lease with the Hawaiian Government.

In late 1907 Schlemmer again applied to the Hawaiian Government for a lease to Laysan and Lisianski but did not obtain it until 8 February 1909. (This lease was later declared invalid since it postdated Theodore Roosevelt's Presidential Executive Order of 3 February that had placed these islands within the Hawaiian Islands Reservation.)

Schlemmer had previously visited Japan and there, on 22 December 1908, had concluded a contract with a Japanese, Genkichi Yamanouchi, in which he granted the Japanese whatever rights he held or would hold to the two Islands. Genkichi was in the feather trade and later sent a crew of Japanese to Lisianski and Laysan to harvest feathers (for more details on this raid, see below).

Such rights as Schlemmer had accorded the Japanese were soon valueless since the Pacific Guano and Fertilizer Company surrendered its lease to the Hawaiian Government on 31 December 1908.

Exploitation of Lisianski's Guano Deposits

Various authors--e.g., Bryan (1942: 192) and Hutchinson (1950: 207)--have recorded that guano was removed from Lisianski, but a reconsideration

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[5] For a more detailed account of this and other contracts dealing with Lisianski, see the historical account of Laysan in Ely and Clapp, 1973.

[6] Freeth visited Lisianski again during the summer of 1894 (Farrell, 1928: 414).

[7] The North Pacific Phosphate and Fertilizer Company had changed its name to the Pacific Guano and Fertilizer Company on 3 April 1894.

of the evidence indicates that no guano, other than small samples for chemical testing, was ever taken. Both Bryan's and Hutchinson's statements refer to a comment by Carl Elschner, who visited the Northwestern Hawaiian Islands, including Lisianski, in September 1914, long after the Pacific Guano and Fertilizer Company had ceased operations in that area. Elschner (1915: 56) stated that "at some time or other guano and phosphates were shipped...." However, the historical absence of structures such as wharfs used for loading guano, and the lack of any other physical evidence of guano operations, as well as the vagueness of Elschner's comment, strongly suggest that Elschner was only reporting hearsay and had no direct evidence of guano operations. In addition, an anonymous article in a Honolulu trade magazine, "The Sales Builder," states that the only island worked by the company for guano was Laysan (Anon., 1939: 19).[8]

Plumage Hunters on Lisianski - 1904

On 8 January 1904 a party of 38 Japanese landed on Lisianski from the schooner Yeiju Maru for the purpose of securing birds' feathers that eventually were to be used in the French millinery trade.[9] About 18 January the ship broke loose from her anchorage in a heavy gale and was evidently lost on the reef as much debris from this ship later washed ashore. In late February the Tiyo Maru put an additional 39 men ashore and departed for Tokyo with no cargo (Hamlet, ms.).[10]

On 11 April 1904 Captain A.P. Niblack of the U.S.S. Iroquois went ashore and warned the Japanese of their violation of customs and immigration

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[8] This article contains many details of the history of guano operations on Laysan that are to be found in no other account. The nature of the statements suggests that the author had access to the files of the guano company which are apparently no longer available.

[9] This was probably not the first time that Lisianski had been visited by feather hunters. The previous year, Hugh Rodman, then commander of the U.S.S. Iroquois, had ordered from Lisianski some Japanese that he had previously found killing birds on Midway (Hugh Rodman to the Assistant Secretary of the Navy, 1 July 1903, Rec. Group 126, U.S. Nat. Archives, Washington).

[10] This account of Japanese activities, derived from an interview conducted by Hamlet with the leader of the Japanese, Tsunetare Sugiye, has the ring of authenticity. When the Japanese reached Honolulu they presented a different story, reported by Bryan (1942: 194), who relates: "The leader of the bird poachers told Acting Governor Atkinson that the party has been stranded....when the schooner, Aju, sank. He said that they had put up a signal of distress, seen by the Tiyo Maru, which had spared them some provisions and removed one of their party."

laws.[11] This warning probably had little effect since Niblack spoke no Japanese and the Japanese spoke no English. Niblack reported their presence on Lisianski when he returned to Honolulu and the U.S. Revenue Cutter Thetis was dispatched to remove the Japanese from the island.

The Thetis anchored off Lisianski on 16 June and Captain O.C. Hamlet and a party, including an interpreter, went ashore to investigate. There they found a camp, consisting of four thatched-roof shacks, and a party of 77 Japanese. If anything, the Japanese were pleased at being apprehended. They had been short of food for some time prior to the arrival of the Thetis and were down to 600 pounds of rice, a few beans and some dried tern meat which they had been preparing against the day that their rice would be gone (Hamlet, ms.).

Hamlet's party also found great quantities of dead birds as well as many packages of dried birds and skins. The manager of the feather-gathering operation, Tsunetare Sugiye, stated that 110 sacks of wings, 100 crates of whole dried birds, and 116 cases of birds and wings had been gathered up to the time of the Thetis' arrival. His records indicated that these packages contained approximately 121,768 whole birds and 162,223 pairs of wings. Nearly all of the approximately 284,000 birds killed had been "black and white terns" [= Sooty Terns], but both Laysan and Black-footed Albatrosses, Gray-backed Terns, and Red-tailed Tropicbirds had also been killed. The most highly prized catch was the "all white tern" [= White Tern] which, however, was scarce on Lisianski. "Black terns [= Noddy sp.] were not killed as they had no practical use for ornament (Hamlet, ms.).

Hamlet brought all the Japanese and their personal effects, as well as some bird specimens,[12] on the Thetis the same day, and departed for Honolulu that evening. All the rest of the birds and plumage was left on Lisianski since Hamlet, in a discussion with the Japanese consul-general, had previously stated that another Japanese vessel would be allowed to remove the catch from Lisianski (Hamlet, ms.).

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[11] Log of the U.S.S. Iroquois, Rec. Group 24, U.S. Nat. Archives, Washington.

[12] Hamlet states that "Examples of black and white and gray and white Terns and one Boatswain Bird, as put up on the island, and heads and necks of white Gonies...and a bottle of coral sand...has been mailed to The Department today [23 June 1904]." Some of these birds (2 Laysan Albatross, a Red-tailed Tropicbird, 2 Gray-backed Terns, 4 Sooty Terns, and a White Tern) were subsequently donated to the U.S. National Museum.

Feather Poachers Visit Lisianski Again

On 3 February 1909, probably partly as a result of pressure by conservation groups, Theodore Roosevelt issued Presidential Executive Order No. 1019 which included Lisianski in the Hawaiian Islands Reservation. This order stipulated that the islands were to be set aside as a preserve for the native birds. The Department of Agriculture received jurisdiction over the refuge.

Nonetheless, the Japanese raided Lisianski again that same year. Early in the year, probably in April, a party of 10 Japanese landed on Lisianski and began harvesting feathers. On or about 21 August the party was removed from the island by the schooner Tempou. A new party of eight Japanese, under the direction of Nichichi Odaka, went ashore to continue harvesting feathers. At that time about 50 bales of birds' wings were taken onto the schooner for shipment to Japan, most of them from petrels and terns (Jacobs, ms.).[13]

Rumors that Japanese poachers were again at work in the Northwestern Hawaiian Islands reached American ears in late 1909. As a result, the U.S. Revenue Cutter Thetis, commanded by W.V.E. Jacobs, was dispatched in January 1910 to investigate. After finding no poachers on the inner islands, and after apprehending the poachers on Laysan, the Thetis proceeded to Lisianski, arriving there on the morning of the 19th. An officer and armed boat's crew went ashore and arrested the Japanese.[14] The following day the plumage that had been harvested was brought aboard ship. It consisted of 19 bales of feathers, a box of stuffed birds, and 1 box and 65 bags of birds' wings. The feathers weighed about 1-1/4 tons and the number of wings was calculated at about 140,400 (Jacobs, ms.). The value of the birds' feathers collected on Lisianski in 1909 would have been about $97,000.[15]

While ashore the crew of the Thetis found four small buildings, probably constructed by the Japanese. These structures consisted of a frame building with a corrugated tin roof where the Japanese dwelt, a similar shed used as a cookhouse, and two huts built of bamboo and mats used for storing cured plumage.

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[13] At an estimated 1,830 wings to the bale (Jacobs, ms.), ca. 108,000 bird wings were harvested; judging from the present composition of the Lisianski avifauna, the species killed in greatest numbers were probably Bonin Petrels and Sooty Terns.

[14] The Japanese presented a document signed by Max Schlemmer which they believed gave them the right to harvest feathers. For details on this contract and ensuing legal action, see Ely and Clapp, 1973.

[15] The Japanese overseers stated that the lowest price for the plumage gathered was $.33 per wing and $6.00 per pound of feathers (Jacobs, ms.).

After investigating the rest of the islands of the chain, the Thetis returned to Honolulu on 2 February and delivered the Japanese into the custody of the U.S. Marshall (Jacobs, ms.).

Subsequent Visits by the Thetis

In the years following the capture of the feather poachers, Lisianski was often visited by the Thetis which made regular tours of inspection of the Northwestern Hawaiian Islands. On several occasions scientists accompanied the Thetis on her voyages but most of their efforts were concentrated on Laysan and relatively little information on the fauna and flora of Lisianski was obtained. A short resume of these visits by the Thetis is given below.

On 1 September 1910 two boats were sent ashore from the Thetis to investigate conditions on Lisianski. No signs of habitation were found. The following spring, on 28 April, another investigation by the Thetis again revealed no evidence of habitation. The Thetis visited Lisianski next on 23 April 1912 and found no evidence that the island had been inhabited since the previous visit.

When the Thètis next visited the island, 12 March 1913, George Willett and Alfred M. Bailey, members of a party from the Bureau of Biological Survey that had recently completed a survey of Laysan, went ashore for about half a day. A number of Laysan Rails were introduced and a seal and a Brown Booby were collected. A few brief notes on the birds and seals were later published by Bailey (1952a: 13, 1952b: 7; 1956: 30) but no detailed account of their observations was ever made.

On 12 September 1914, the next visit by the Thetis, Carl Elschner, a chemical engineer, went ashore with the survey party and spent a few hours observing conditions on the island. He subsequently published a few notes on the island, including comments on the position of Lisianski, its surrounding reefs and currents, and a chemical analysis of some of the sand. He also reported that

> At the time of my visit there were two houses on the island which, as well as the phosphate deposits, lay in the former lagoon, that is, in a depression, which however does not contain water any more. Surrounding the houses are small patches of tobacco, which grow wild, having been brought by Captain Schlemmer. This is in fact the only vegetation on the island, and there hardly is a blade or stalk of any other plant to be seen with the exception of perhaps two poorly looking specimens of Ipomea, which I saw....The rabbits introduced have just exterminated the flora...now the rest of these rabbits (we found many dead but very few living ones) will have to submit to starvation. (Elschner, 1915: 56).

When the Thetis visited Lisianski again on 24 March 1915, Lieutenant William H. Munter landed on the island with a boat's crew at about 1400

and remained there until 1815. His observations on the wildlife were later published in a little known article in the Annual Report of the Coast Guard for 1915 (Munter, 1915: 134-136). Although not an ornithologist, Munter's account clearly indicates that he knew birds well. He reported 15 species of birds, including the Laysan Rail that had been introduced two years previously. Munter's paper was the first to give numerical estimates for the birds of Lisianski and contained more details on avian reproduction than any previous publications.

The Thetis paid her last visit to Lisianski on 5 February 1916 and a party went ashore for about two hours. Second Lieutenant Stanley Parker, by no means as discerning an observer as Munter, reported on his return that

> The principal kinds of birds noted were the Laysan Albatross, Black-footed Albatross, Frigate Bird, Hawaiian Tern, Blue-faced Booby, Common Booby, and one or two Laysan Rail. Every particle of vegetation, except an algae in a damp spot, has disappeared from the island, ...and the rabbits have entirely disappeared. The buildings are very dilapidated and show no signs of recent occupancy, and no signs of poaching could be found. A few Wedge-tailed Shearwaters were noted.[16]

This report is particularly valuable since it fixes the date of extinction of the rabbits as between March 1915 and February 1916 and establishes that the introduced Laysan Rail population survived for at least 4 years.

The Tanager Expedition Visits Lisianski

In 1923 the U.S. Navy, Bernice P. Bishop Museum, and U.S. Biological Survey cooperated in formulating plans for a thorough survey of the Northwestern Hawaiian Islands. The following year the U.S.S. Tanager set sail on its second trip (Trip B) to the leeward islands. Lisianski was visited by a scientific party staffed primarily by personnel of the Bishop Museum but under the direction of Alexander Wetmore of the U.S. Biological Survey. The field party (see Appendix Table 1) arrived on 15 May and set up camp on the west side of the island. Part of the party left for Pearl and Hermes Reef the same day, but the rest surveyed the island until 20 May. During their stay a broad spectrum of organisms was collected, many of them subsequently reported in Bishop Museum publications (see Appendix Table 3). Many of the bird observations, hitherto unreported, are mentioned in this report through the courtesy of Dr. Wetmore.

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[16] Report by Parker to Captain Brown of the Thetis, dated 21 February 1916. Rec. Group 26, U.S. Nat. Archives, Washington.

Visits to Lisianski - 1924-1943

At least one visit was made to Lisianski by the fishing schooner Lanikai under Captain William G. Anderson in the late 1920's. During that period a fishing base was established at nearby Pearl and Hermes Reef and the Lanikai often made one or more visits there a year. On several of these visits fishing operations were conducted off Lisianski or other of the Northwestern Hawaiian Islands, and in some instances visits were made to the islands. Few details of these visits are available.

Lisianski was visited by the Lanikai on 14 April 1928 and Anderson collected some fishes 3/4 miles from shore (Schindler, 1932: 4). Some of this material was later used in a study of sexually mature larval Hemiramphidae (Schindler, op. cit.). Other specimens presumably collected during this visit were polychaetes and one inshore fish.

In 1931 Lisianski was visited twice by the U.S. Coast and Geodetic ship Pioneer. During the first visit, 16 to 28 August, various aspects of the island were studied and buoys were set offshore. A number of Casuarina trees were planted by the party. Some of the trees planted during this visit are probably those still present.

More buoys were laid and soundings were made around the island during the second visit, 22 September to 10 October (Honolulu Star Bulletin, 10 Sept. 1931).[17]

In June 1934 the U.S. Coast Guard Cutter Itasca made a series of inspections of the Northwestern Hawaiian Islands. The Captain, John S. Baylis, and three others went ashore on Lisianski for about 5 hours on 25 June. Baylis (ms.) reported that they found no inhabitants and stated that the party saw about 25 large shedding seals and 25 large turtles on the beaches.

Two large turtles--one weighing 180 pounds--were captured by the party and brought back to the Itasca. On 26 June, on course 6 hours from Laysan to French Frigate Shoals, three turtles, presumably including these two, were marked with brass tags inscribed "U.S.S. ITASCA, 1934" and thrown overboard.

In late 1934 or January 1935 Captain Northrup H. Castle visited Lisianski on the schooner Lanikai. Castle was searching for traces of a missing plane, the Star of Australia, piloted by C.T.P. Ulm (Honolulu Star Bulletin, 30 Jan., 6 Feb., 29 Mar. 1935).

Lisianski was visited again on 14 October 1943 by the U.S.S. YMS-299 commanded by Captain E.H. Gentry. A demolition team spent a few hours

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[17]Log of the U.S.S. Pioneer. Rec. Group 27, U.S. Nat. Archives, Washington.

ashore achieving the objective of the visit--the disposal of a mine that had washed ashore on the southeastern corner of the island.[18]

Visits to Lisianski During the 1950's

Visits by Ships of the Pacific Ocean Fisheries Investigation Program (POFI)

Lisianski was visited three times in the early 1950's by Bureau of Commercial Fisheries vessels engaged in fish surveys of the north-central Pacific. The primary purpose of visits to Lisianski (and other Northwestern Hawaiian Islands) was to conduct fish-bait surveys. Sometimes brief observations were made of fauna and flora. Most such data may be found in the "Scientist's Logs" for a given vessel's cruise; other brief comments on the visits may be found in the Narrative Reports of each cruise.

The first of these visits was made by the Hugh M. Smith on 24 June 1950. Vernon E. Brock, Director of the Hawaii Division of Fish and Game, was along as a collaborator. He and several others spent about 7 hours on the island which was thoroughly scouted for bait fishes. Very little bait was found. An estimate was made of the number of seals seen and a count of turtles was taken. Seven species of birds were recorded in the notes of the "Scientist's Log" (POFI).

The Hugh M. Smith visited Lisianski a second time on 13 May 1951.[19] During the 9 hours ashore the survey party collected fish bait and scouted the entire shoreline of the island. A complete count was made of the seals and nine species of birds were recorded in the notes (POFI).

A third such visit was made by the John R. Manning on 8 May 1955. A bait scouting party spent about eight hours on the island and made a few brief notes on seals, turtles, and several species of birds (POFI).

Other Surveys of Lisianski During the 1950's

On 26 March 1954 Frank Richardson of the University of Washington visited Lisianski for three and a half hours. During his brief visit he

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[18] Gentry, C.H. ms. Report of voyage to Lisianski with 16 accompanying photographs. Rec. Group 37, U.S. Nat. Archives, Washington.

[19] Svihla (1959: 227) stated that "Vernon Brock reported 407 seals while on a fishery cruise aboard the 'H.M. Smith' during June and July, 1951..." and listed a count or estimate of the number of seals on Lisianski, implying that the Hugh M. Smith was in the Northwestern Hawaiian Islands at this time. This report is erroneous. The Hugh M. Smith was conducting fish-bait surveys in the Line and Phoenix Islands in June and July 1951, and Brock was in the Line Islands on George Vanderbilt's schooner, the Pioneer.

noted 18 species of birds and estimated their numbers (Richardson, pers. comm.). Some of these observations were subsequently incorporated in a study of the breeding cycles of Hawaiian seabirds that was supported by a Yale-Bernice P. Bishop Museum fellowship (Richardson, 1957).

On 1 November 1954 an aerial survey was made by Philip A. Dumont and Johnson A. Neff of the Bureau of Sport Fisheries and Wildlife.

Dale W. Rice and Karl W. Kenyon of the Bureau of Sport Fisheries and Wildlife made a number of low-level aerial inspections of Lisianski and other Northwestern Hawaiian Islands in 1957 and 1958. Lisianski was flown over on 7 January, 15 April, and 28 December 1957, and 28 June 1958.

The prime purpose of these surveys was to determine albatross and Hawaiian monk seal populations. Results of this work were later reported by Kenyon and Rice (1959), Rice (1960), and Rice and Kenyon (1962).

Surveys of Lisianski in the 1960's

On 9 and 10 March 1961 David H. Woodside and Raymond J. Kramer of the Hawaii Division of Fish and Game visited Lisianski from the U.S. Coast Guard vessel Planetree as part of an inspection trip of the Hawaiian Islands National Wildlife Refuge. A particular objective of their visit to Lisianski was to determine whether the island would afford suitable habitat for the introduction of the Laysan Teal.

The two biologists visited the island both days--for about three and a half hours on the 9th and for seven hours on the 10th. During this period they made observations of seals, turtles, and birds, erected refuge signs, and established photographic stations for the study of changes in the vegetation. In an unpublished report Woodside and Kramer reported ten species of seabirds and implied the presence of two others, and listed three species of shorebirds but gave no detailed information on them. As a result of their observations, they concluded that Lisianski was definitely not suited for teal and recommended that none be introduced.

Later in the month Lisianski was visited by the U.S.S. Duval County which was transporting a party that was establishing first order astronomic stations and HIRAN and azimuth marks in connection with the Hawaiian geodetic survey (Roach, ms.). The ship arrived on 16 March and debarked the survey party. The ship then departed for islands further up the chain, returning on the 24th to remove the party from the island.

Lisianski was visited subsequently one or more times by parties engaged in other aspects of the HIRAN operation, but we have no details of these visits.

On 18 July 1962 Harvey I. Fisher visited Lisianski from a naval vessel. During his visit, 1,697 nestling Laysan Albatross that had been captured on Sand Island, Midway Atoll, were banded and released on Lisianski. This was done to determine whether young albatross would return to their natal island or would return to the foster island from which they had fledged.

Surveys by the POBSP and Bureau of Sport Fisheries and Wildlife

From early 1963 through June 1969 Lisianski was frequently surveyed by personnel from the Smithsonian Institution's Pacific Ocean Biological Survey Program (POBSP) and by field parties under the direction of the Bureau of Sport Fisheries and Wildlife (BSFW) (Table 1). The latter organization assumed responsibility for inspection and patrol of the refuge in 1964 when a refuge manager was assigned to Hawaii.

Table 1. Recent surveys of Lisianski Island by the POBSP and BSFW*

Month	Year 1963	1964	1965	1966	1967	1968	1969	Total Days of Observation
Feb.	POBSP (.3)							.3
Mar.	POBSP (.6)	BSFW POBSP (.9)	POBSP (2.1)		BSFW POBSP (.3)	BSFW POBSP (1.2)	BSFW (.2)	5.3
June				POBSP (3.2)	POBSP (4.3)		BSFW (.4)	7.9
July			POBSP (2.7)					2.7
Aug.		POBSP (1.9)						1.9
Aug.-Sept.					POBSP (4.8)			4.8
Sept.		BSFW POBSP (.4)		BSFW (.2)	BSFW (1.2)			1.8
Oct.				POBSP (1.9)				1.9
Total Days of Observation	.9	3.2	4.8	5.3	10.6	1.2	.6	26.6

*POBSP is listed under BSFW when POBSP personnel accompanied BSFW personnel on one of their regular inspection trips. Figures in parentheses are the approximate number of days spent on the island. Table is complete through 1969 but does not include visits during which no landing was made.

During these brief visits, refuge personnel were concerned primarily with administrative functions, and studies of seals, turtles and albatross. POBSP efforts were primarily directed towards surveys of the avifauna, bird-banding, and, to a lesser degree, other aspects of terrestrial ecology. Data obtained on these visits, and hitherto unpublished data from earlier visits, are the primary basis for the faunistic accounts presented in following sections of this report.

Lisianski, and the other islands in the Hawaiian Islands National Wildlife Refuge, were designated "natural areas" in February 1967. This means that refuge policy is to administer the refuge in such a manner that the island's ecology remains as undisturbed as possible. As a result, visits may be made to the island only by scientific parties that have obtained entry permits from the Bureau of Sport Fisheries and Wildlife in Kailua.

VEGETATION

Early reports of the vegetation indicate that Lisianski was well covered with "scrub," "grass," and "creeping plants" prior to its defoliation by rabbits (Christophersen and Caum, 1931: 14). By September 1914, about 10 years after the introduction of rabbits, the only plants left were introduced tobacco and several specimens of an unidentified Ipomoea. By February 1916 no vegetation remained.

When the island was visited in 1923 "the vegetation was apparently slowly starting to come back..." but was "exceedingly poor, one patch of grass at the north end and a few other plants sparsely distributed being all that was to be found" (Christophersen and Caum, op. cit.). Wetmore (ms.) further noted "The only vegetation on the island is a narrow strip of grass, and a pigweed of perhaps two acres that extends along the ridge above the beach in a narrow line at the northwest point. Elsewhere the place is absolutely bare." The Tanager Expedition collected four species of plants, Eragrostis, Nama, Portulaca, and Sesuvium, found the seed of another (an unidentified Ipomoea), and introduced a tree (Barringtonia).

Comparison of two aerial photographs, one taken in May 1943 (Fig. 21) and the other in January 1966 (see Fig. 2) shows a progressive pronounced change in the amount of Scaevola present. Areas containing Scaevola in 1943 now contain much more, with the greatest increase on the southwestern, southeastern, and northwestern portions of the interior. Several areas on the eastern and southeastern edge of the island, beaches in 1943, have been colonized and thereby stabilized. There has also been a considerable increase in the amount of Scaevola in the center of the island. There seems no reason to believe that the process of expansion and colonization by Scaevola is not now continuing, nor to think that the revegetation process, begun in the 2nd decade of this century, is yet completed.

On recent visits in the mid- and late 1960's, the vegetation was thick and composed of three major associations. These were: Scaevola-Eragrostis, Ipomoea, Sicyos, Boerhavia, and Tribulus; Eragrostis-Boerhavia; and Nama. These associations formed concentric bands. The Nama was found

Table 46. (continued)

Date of Survey	Population Estimate	Breeding Status, Remarks and References
1966 18-20 Oct.	111	Counted on 18 October. Total includes 9 pups. An unspecified number of yearling seals were also present (POBSP).
1967 20 Mar.	139	Count includes 10 pups and 17 yearlings (BSFW).
2-6 June	128	Counted on 6 June. Total includes 12 pups and 11 yearlings (POBSP).
31 Aug.- 5 Sept.	141	Counted on 2 September. Total includes 10 pups (POBSP).
25-26 Sept.	181	Counted on 25 September. Total includes 28 yearlings (BSFW).
1968 20-21 Mar.	123	Counted on 20 March. Total includes 10 pups and 19 yearlings (BSFW).
1969 30 Mar.	130	Count includes 18 pups and 17 juveniles [= yearlings] (BSFW). 12 pups born recently (Laycock, 1970: 59).
4 June	127	Count includes 26 pups and 2 yearlings (BSFW).

*Table does not include several mentions of seals on Lisianski in the 1950's that add nothing to our knowledge other than the fact that they occurred there.

**Seals aged as yearlings in March are young from the preceding breeding season, while many, if not most, of those aged as yearlings on summer and fall surveys are young born that year.

Reptiles

GREEN TURTLE — Chelonia mydas

Status

Formerly a common to abundant breeder; now uncommon and not known to breed; maximum recent count 15.

Observations

Comments by early observers (Table 47) clearly indicate that Green Turtles were once a conspicuous and numerous element in the Lisianski fauna. Although hundreds were present in 1923, the population was almost certainly even then much reduced in abundance.

More recent observations, primarily by the BSFW, show a great reduction in numbers since 1923. Much of this decrease is probably attributable to poaching by fishermen in the decade after the Tanager Expedition.

The number currently utilizing Lisianski is undoubtedly higher than the maximal count but it seems doubtful that the breeding population, if in fact there is one, consists of more than a very few turtles.

No nests or hatchlings have been seen by any recent observer. This fact, and the preponderance of rather small turtles seen on most recent visits, suggests that many of the turtles are probably visitors from other islands in the chain, particularly from French Frigate Shoals, the primary breeding area; and possibly to some extent from Pearl and Hermes Reef, the only other atoll in the chain where fairly large numbers of turtles may still be found. Hopefully, the intensive tagging program being conducted by the BSFW will show to what extent the current "Lisianski population" consists of turtles from other islands.

Table 47. Observations of Green Turtles on Lisianski Island

Date of Survey	Number Seen	Remarks and References
1805 15-18 Oct.	many	(Lisiansky, 1814).
1825 6 July	in abundance	(Morrell, 1841: 216).
1857 10 May	plentiful	(Paty, 1857: 40)
1882 24 Jan.	?	13 captured by crew of the Ada (Hornell, 1934: 432-433).
early May		107 captured by the crew of the Ada (Hornell, 1934: 432-433).
1894 summer	?	Many turtles undoubtedly killed by the crew of the Ebon (Farrell, 1928: 414).
1923 15-20 May	large numbers	80 from 15" to 4' long counted in one 300-yard stretch of beach (Wetmore, 1925: 97). 25-50 frequently seen at one time; some females killed contained eggs ready to be laid (Wetmore, in Mellen, 1925: 181).

Table 47. (continued)

Date of Survey	Number Seen	Remarks and References
1934 25 June	>400	(Ball, ms.).
	ca. 25	Large turtles (Boylis, ms.).
1950 24 June	6	Count (POFI).
1951 13 May	0	(POFI).
1961 9 Mar.	11	Counted along shoreline 9 March; several fairly small individuals seen (Woodside and Kramer, ms.).
1963 14 Feb.	ca. 30	Seen on the beach and offshore. Several small individuals weighing less than 15 pounds seen (POBSP; Kramer, ms.).
1964 11-12 Mar.	13	Counted by BSFW; 6 males and 7 females, 3 platter-sized (BSFW, POBSP).
21-23 Aug.	?	A few seen (POBSP).
18 Sept.	5	Counted by BSFW: 2 ca. 30" and 3 ca. 18" (BSFW, POBSP).
1965 12-14 Mar.	6	5, 2-3' in length counted on 12 March. a smaller individual seen on 14 March (POBSP).
14-17 July	13	Counted on 13 July (POBSP).
1966 16-19 June	4	Count (POBSP).
19 Sept.	4	Counted by BSFW; 1 large and 3 small (ca. 18") (BSFW).
18-20 Oct.	15	Counted on 18th; 5 large (3 males, 2 females) and 10 small (ca. 15") (POBSP).
1967 20 Mar.	10	Counted by BSFW: 6 large and 4 small; 2 males and 8 females (BSFW, POBSP).
25-26 Sept.	?	At least 6 seen (BSFW).
1968 20-21 Mar.	13	Counted by BSFW (BSFW, POBSP).
1969 30 Mar.	11	All tagged or receptures (BSFW).
4 June	13	Counted; 3 ca. 150 lbs., and the rest small (BSFW).

Morrell, B. Jr. 1841. a narrative of four voyages to the South Sea, north and south Pacific ocean from 1822 to 1831 Harpers & Brothers, N.Y. 492p.