1981, 82 & 84

Seam
∴ 1-2nd lat. left.

TURTLE HATCHLING (Control of Live-tag group from ~~MARCH~~ AUGUST 1982, FFS)

MEASURED (cm): 14 DECEMBER 1982

(S) 11.5 x 9.93

PL 9.35

HEAD 2.63

TAIL 1.76

TAG # Size #1

NMFS "N711" RFL w/ TAILING (ie distal)

NMFS N846 LFL w/ TAILING (ie distal)

NMFS N847 RFL

DATE OF RELEASE: 4 Feb 83

AREA: Kailua Beach - Boat Ramp (far pt. of rocks)

NOTES: 5:40 pm - high tide - last seen swimming ≈100 yd off shore toward Flat Island

TURTLE RELEASE

5 OCTOBER 1982

9/80 hatchlings
J. Hendrickson's study graft site

FFS / Carapace - Plastron' live-tag turtles released today eastern side of Sandy Beach, Oahu 1205 : TIME.

653 RFL hl (small tag) #6345 RFL NEW TAG

5713 RFL hl # 468 RFL hl (small)
768 LFL hl (small)

5726 RFL hl # 772 LFL (small tag)

5612 RFL # ? 400 or 430 RFL (small tag)

5676 RFL

Total 5 turtles released in to nearshore waters. 5 sited staying in area around white water of submerged reef. All swimming

GALC - FOR YOUR RECORDS

2 Turtles from Kewalo sent to the Seattle Aquarium on Sept 21, 82.

Straight carapace length -
Both - 8.3 cm

"No Grafts" seen on either turtle.

Returned to Honolulu May 23, 83

TAGGED AND MEASURED AT the Waikiki Aquarium June 25, 83

3686 R flipper 21.7 cm 13.4 cm in 9 mo = 1.49 cm/mo
white graft present seam of 1-2nd lateral left; nothing ventral.

3687 R flipper 22.6 cm 14.3 cm in 9 mo 1.59 cm/mo
no white graft but small mutilation mark obvious 1-2nd lateral left

3687 Scheduled for release at night in front of the Aquarium.

3686 "On loan" to the Aquarium for display purposes until it becomes too large. George

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FISH AND GAME
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

January 27, 1981

Elliott Jacobson, D.V.M., Ph.D.
Division of Laboratory Animal and Wildlife Medicine
J. Hillis Miller Health Center
P.O. Box J-6
University of Florida
Gainesville, Florida 32610

Dear Dr. Jacobson,

Dr. George Balazs wrote to you in December 1980 regarding a disease problem in captive juvenile green sea turtles belonging to the NMFS in Hawaii. Since that time I was asked to examine several turtles from the population to determine the cause of a periocular dermatitis affecting the majority of these turtles. In conjunction with the State Veterinary Diagnostic Laboratory I have processed several tissue specimens using routine microbiological and histopathological procedures.

Much of the clinical and gross pathological data gathered and evaluated by myself and Dr. Tom Sawa, State Veterinary Pathologist, suggest these turtles are affected with "grey patch disease". However, neither Dr. Sawa nor I have recognized intranuclear inclusion bodies in keratinocytes in these lesions. The etiologic diagnosis in this case is at present undetermined.

I have enclosed H + E stained and unstained slides of periocular tissues from two of the turtles we necropsied. In addition tissue biopsy specimens preserved in 10% formalin from two other affected turtles are included. We are very interested in your pathologic and etiologic diagnosis regarding these lesions. If you wish to evaluate additional tissue specimens or other data we have gathered regarding this case, please let me know and I'll gladly send the material to you.

Thank you for your time and help.

Sincerely,

James A. Brock, D.V.M.
Aquaculture Disease Specialist
DPED

cc: Dr. Tom Sawa, DOA
✓Dr. Bill Gillmartin, NMFS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P.O. BOX 50167
HONOLULU, HAWAII 96850

IN REPLY REFER TO:

26 Oct 1981

Dear George,

You see from the 2 enclosed tags that we found one of the Head-start turtles at FFS. It was found on Trig Island on 24 October 1981. It was partially covered with coarse sand about 3 m from the south edge of the island and about 10 m east of the most narrow part of the island. It was quite rotten and the scutes were beginning to peel off. The body was lying with the plastron down. Your guess is as good as mine as to whether it crawled onto the island and died or died in the water and washed onto the island. There was no evidence of injury, i.e. all flippers, head and tail was intact.

Let me know if I can supply you with any other information.

Please

John A.

Headstarted 9/80 hatchling from J. Hendrickson graft study

5656

956

J. HILLIS MILLER HEALTH CENTER • UNIVERSITY OF FLORIDA • GAINESVILLE, FLORIDA 32610
HEALTH CENTER ANIMAL RESOURCES DEPARTMENT
P. O. BOX J-6
Ph. 904/392-2977

March 19, 1981

Dr. James A. Brock
Aquaculture Disease Specialist
Division of Fish and Game
Dept. of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Brock:

Thank you for allowing me to review the material on the green turtles.

The periocular lesions described by both you and Dr. Balazs are commonly seen in aquaculture reared marine turtles. I have seen them both in Ridley's at Galveston, Texas, and in green turtles at Cayman Farm, Grand Cayman, B.W.I. I am more familiar with the syndrome in the Caymans.

As far as I know, grey patch disease has only been conclusively demonstrated in green turtles at Cayman Turtle Farm. This does not mean it is found nowhere else, but it has only been from turtles at Cayman Turtle Farm that the virus has been isolated and demonstrated in tissue section. Over the last few years I have seen hundreds of cases. Morbidity and mortality vary from year to year with each new group of hatchlings. It is generally not seen within the first two months following hatchling, nor after one year of age. Lesions can be seen over the entire body surface (plastron and carapace included) and start out as small papules that eventually coalesce into patches (in this month's issue of "The Compendium on Continuing Education for the Practicing Veterinarian" there is a gross photo of grey-patch in an article I have contributed). Very rarely is there involvement at only one site such as the periocular tissue. Generally it will become diffuse across the cervical skin and forelimbs. Secondary bacterial and mycotic infection add to the problem. Enclosed you will find a slide of grey-patch. Note the characteristic hyperplasia and hypertrophy of epithelial cells with lightly basophilic (somewhat glassy appearance) intranuclear inclusions.

The tissues that you sent represented necrotizing ulcerative epidermal lesions with dermal necrosis and inflammation in most areas. The surface was covered with necrotic debris containing myriads of bacteria. By Gram stain the predominant organisms were gram-negatives. GMS stained sections failed to reveal any fungi. The lesion, in the material I reviewed, was necrotizing compared to a more proliferative response for Gray-Patch. No inclusions were seen in your material.

In my experience most green turtles raised in aquaculture are kept under crowded conditions. Palpebral lesions commonly begin as abrasions from turtles rubbing against one another. Further damage, or initial damage, may be from rubbing against the walls of the holding tanks. Since these animals are constantly being bathed in a sea of microorganisms, traumatic lesions easily become infected. I would be curious in knowing the type of filtration system that is being used. Have the eyelid lesions been cultured, and have you tried any type of antibiotic therapy? Dr. George Leong at Galveston, and the people at Cayman Turtle Farm have had some success in controlling these lesions with antibiotic soaks.

Thus, in summary, I do not believe that you have a herpes virus infection. It very well may be that this is a husbandry problem that may be controlled by improved husbandry techniques. If you could supply me with information regarding the rearing techniques maybe I could be of further help.

I look forward to hearing from you and if you have any other material that you would like me to evaluate please send it along.

With best regards,

Elliott Jacobson

Elliott Jacobson, D.V.M., Ph.D.

EJ:ck

INTRODUCTION

This report describes work with green turtle hatchlings, *Chelonia mydas*, performed by National Marine Fisheries Service (NMFS) personnel under U.S. Fish and Wildlife Service Special Use Permit for the Hawaiian Islands National Wildlife Refuge. Work in the refuge at French Frigate Shoals was conducted between 3 and 20 August 1982 inclusive. During this period, over 1,200 hatchlings were collected from Tern, East, and Whale-Skate Islands. Of these, 1,100 hatchlings were marked with "living tags" (Hendrickson 1980) and released from the ___?_____ end of Tern Island. Forty individuals were chosen randomly throughout the marking program to be held for both short- and long-term observations at the NMFS Kewalo Research Facility. Several individuals were released unmarked due to malformations in the carapace. There was a small percentage of mortality, as would be expected when working with hatchlings dug from previously erupted nest.

ITINERARY

Project personnel spent the majority of time at Tern Island with periodic visits to other islands. On Tern Island personnel made two daily beach surveys (0700 and 1700) in an effort to locate erupted nest and/or hatchlings on the beach slope. At midday 16 August, personnel conducted a beach crest search on Whale-Skate Island; this was the only time hatchlings were collected on Whale-Skate.

Several overnight trips to East Island were made for the purpose of collecting turtle hatchlings, *Chelonia mydas*. The overnight trips were

made on the following dates in August: 3-4, 7-8, 10-11, 13-14, and 16-17.

On these trips, three team members arrived at East Island at approximately 1600. A monk seal survey was conducted immediately (Ittner-Appendix A). Remaining personnel set up camp, then began a search of the island for sites of recent nest eruptions (depressions in the sand/coral). These inspections and the resulting digs were completed prior to the monk seals moving up the slopes to the beach crest for the night. After completing the initial crest check (1600-1900), personnel remained at the campsite until sunset. At sunset, personnel began conducting a systematic search of the beach slope at the water's edge which continued until 2400. The island was divided into three sections allowing each person to be familiar with the seals and turtles and that area and reducing possible disturbances. Personnel took care to avoid both resting seals and nesting turtles while conducting the roving searches. They remained on the slopes until hatchlings were found. At this point, a crest search was conducted in the immediate area in an attempt to locate the nest. No searches were conducted from 0000 to 0630. A follow-up search was made each morning (0700-0900) in an attempt to locate those nests that had hatched, but were not located the previous night. During the morning follow-up search, a second monk seal survey was taken to determine what effect, if any, the hatchling collection made of the monk seals at East Island. Personnel secured camp and returned to Tern Island at approximately 1100 on the second day of each overnight trip.

Collecting and Holding Methods

Hatchlings were collected during the afternoon crest checks by

locating and digging probable erupted nest sites. On 3-4 August, project members were instructed by George Balazs on locating and excavating these sites which varied from the obvious (turtle heads and flippers exposed) to the obscure, small 2-3 cm depressions properly located on a nest mound. After a site was located, personnel carefully removed the first 5-6 cm of soil while observing soil density, hole structure, and possible movement. The erupted nests had anywhere from 0 to 70 turtles remaining in them. Personnel slowly (and cautiously) lossened the soil 8-10 cm deep at a time, digging out and removing any visible turtles. The excess sand/soil was removed either by hand or with a small camp shovel. This process was continued until the egg shells were located (anywhere from 30-90 cm deep) and it was determined no other hatchlings were trapped in a side chamber or pocket off the main nest. After the complete check, the nest was refilled with the same soil/sand. In some nest digs, dead hatchlings were uncovered. These hatchlings were buried when the dig site was refilled. Occasionally a digging was aborted after 8-10 cm because soil structure and packing did not confirm initial determination as a probable site. These sites were also recovered to near original contours. The individual nest sites were not marked in any manner. It is recommended that in any future large collection efforts, that a coded marker be placed at each dig site. The following information should be included: date of first dig, number of hatchlings collected, number found dead, were egg shells found (complete dig) or was digging aborted before locating any turtles and/or egg shells. and the same information on any additional digs at that location.

After turtles were removed from the nest as a temporary holding method, they were placed in a bucket or burlap sack that was turned inside

out to avoid strangulation on frayed threads. At the end of the presunset digs or when overcrowding deemed necessary, the turtles were transferred into "long term" holding facilities, plastic trays with 3-4 cm of moist sand covering the bottom. On the average 40-50 hatchlings were held in each tray. The tray was then placed in a moist burlap sack and secured to prevent possible escape. On nights when an extremely large number of hatchlings was collected, some individuals were held in plastic baskets without the moist sand. It is felt that the primary holding method was more suitable for several reasons.

1) Moist sand was cooler and reduced activity.
2) Turtles remained moist even when held for longer periods.
3) For marking purposes.--The turtles were "self-cleaning" by the abrasive action of the sand on each other. This reduced the processing time required for each turtle.

The above information describes the collecting methods used on Whale-Skate and Tern Islands and on East Island through the 10-11 August trip. On the 13-14 and 16-17 August trips to East Island, additional methods were used for postsunset collection of hatchlings. After discussing it with U.S. Fish and Wildlife Service personnel, it was decided to attempt to attract the hatchlings to lighted areas on the island. The light apparatus was made by attaching a 6-V headlamp to the top of a PVC pipe 1.5-2 m long. This unit was then slipped over a piece of rebar (0.5 m) that was half buried in the ground (see Figure 1). These light units were placed at three locations on East Island on the 13-14 August trip (see Figure 2). Personnel positioned these lights during the initial crest search in an attempt to reduce beach crest activities. Lights were

activated at approximately 1945 as beach slope searches were begun. Personnel continued to walk beach slopes making periodic checks at the light stations. These checks were at intervals of not more than 20 minutes to insure collection of all attracted hatchlings and minimize predation by ghost crabs (specify name). Lights were secured at 2330; special care was taken on morning searches to locate any disoriented hatchlings near the light stations. While the lights attracted approximately 115 hatchlings, the trip total, 204 hatchlings, did not show as large an increase as hoped. The average total for previous trips without lights was 133 hatchlings.

The collecting procedure was again modified for the 16-17 August overnight. Three additional light units were placed on East Island (Figure 2) and beach slope searches were eliminated. Each team member was responsible for two light units and the isolated area of beach crest between them. Periodic trips to the campsite were necessary to secure hatchlings when temporary holding means were filled. This reduced activity method was used to further reduce impact on resting seals and nesting turtles. Due to a change in project personnel on the 16-17 August trip, impact data for this day has a variable not consistent with all other data collected (Appendix A). The data compiled on the following tables show the results of the aforementioned collection methods.

Table 1.--East Island.

Date August 1982	No. of hatchlings/No. of nests (top entry) No. of "stray" hatchlings (bottom entry)					
	1600-1930	1930-2200	2200-2400	0700-1000	Totals	
3-4	74/1 --	-- 1	-- --	71/1 --	145/2 1	146
7-8	53/4 --	34/2 40	15/1 7	12/3 --	114/10 47	161
10-11	68/2 --	-- 17	-- --	9/1 --	77/3 17	94
13/14	84/2 1	84/1* 30	-- --	5/1 --	173/3 31	204
16/17	169/6 9	-- 136	-- 78	50/2 2	219/8 225	444

*Found few turtles coming to light then located eruption site. Did not dig out but one additional. Picked up entire nest as erupting and coming to lights.

DISTURBANCE TO SEALS AND ADULT TURTLES ON EAST ISLAND, FRENCH FRIGATE SHOALS, DURING TURTLE HATCHLING RECOVERY PROJECT 3 - 20 August, 1982.

Ruth Ottner

Three[1] people camped on East Island five nights during the project. Different hatchling collection methods were used each night and therefore the disturbance potential varied. Also the search for hatchlings was conducted at different times of the day which can also vary the potential for disturbance.

In general, disturbance to other animals was kept down as much as possible. A few individuals of both species did leave the island because of us but as the project progressed a night-time technique using stationary lights was developed allowing minimal disturbance and a very high catch rate.

When five people were on the island together, 3 August, looking for partially emerged nests to dig up, a subadult seal saw us and hurriedly left the island. Several other seals gave indications of nervousness by changing positions and watching us closely. I attribute that to the number of people on the island. Digging nests during dawn and dusk as we did can be productive and nondisturbing if conducted by two people who are conscientious toward the basking seals and turtles. All subsequent trips were accomplished by three people with two of them doing the dawn and dusk excavations and one surveying monk seals.

One time a mother with pup in shallow water about 30 meters away yelled at us for several minutes while we were digging a nest about 3 meters from the beach crest. We continued digging with our bodies low to the ground and soon she and her pup returned to their normal hauling area about 100 meters away.

These two examples of disturbance to seals are the most extensive that I am aware of. Both could have been avoided using strictly the stationary light method.

The most disturbing time for adult turtles seemed to be soon after sundown . Any time we saw turtles we turned our lights out but sometimes the impact was made before we got the light off. This could be avoided entirely using the stationary light technique. The stationary lights apparently had no effect on adult turtles

1. Five people camped on East the night of 3 Aug.

since several hauled up and dug pits within 10 - 15 feet of the lights.

Seal surveys were done early evening and the following morning for four of the trips.

		Adult	Sub Adult	Juvenile	Weaned Pup	Nursing Pup	TOTAL
7 August	1600-1745	15	7	5	23	5	55
8 August	0800-0930	16	6	6	13	5	46
10 August	1615-1800	16	6	3	25	4	54
11 August	0745-0900	16	7	2	16	5	46
13 August	1600-1730	19	10	6	18	4	57
14 August	0700-0830	15	2	6	5	4	32
16 August	1600-1745	15	7	3	22	3	55
17 August	0715-0815	10	8	1	5	3	27

Collection Techniques

#1 Digging Partially emerged nests are located during daylight hours and excavated by hand and shovel.

#2 Roving with lights a.) Workers walk around the island at the waters edge scanning the beach for hatchlings on their way to the water. We used two-D cell flashlights.

b.) Workers walk both the beach and the island platform with flashlights looking for hatchlings on their way to the water.

c.) - Not Tried - Workers walk the waters edge scanning the beach with red lenses in their lights.

#3 Stationary lights Light stations are established along the mid-line of the island during daylight hours. A light station is a 4 - 6 foot length of PVC with a 6 volt head lamp fastened at the top. A short

piece of rebar, half buried, holds it upright. The lamp is directed down and turned on from 2030 to 2300. The hatchlings are collected as they come to the light.

Methods Overview

Method	Number of Workers	Disturbance Factor	Camp	Number of Hatchlings Collected
#1	1 - 2	low - medium	no	medium
#2	3 - 4	medium - high	yes	low
#3	2 - 3	low	yes	high

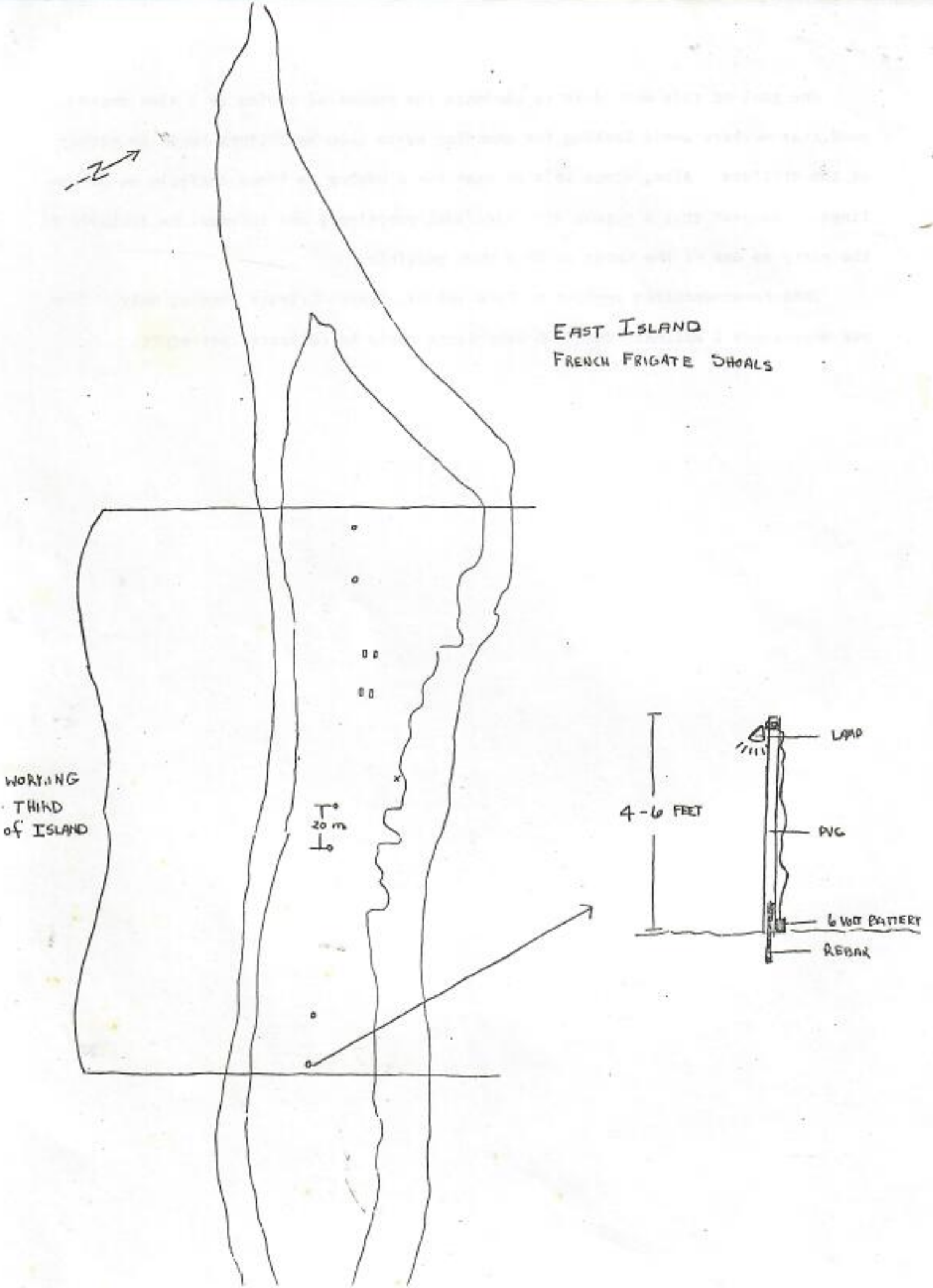
My Recommendation

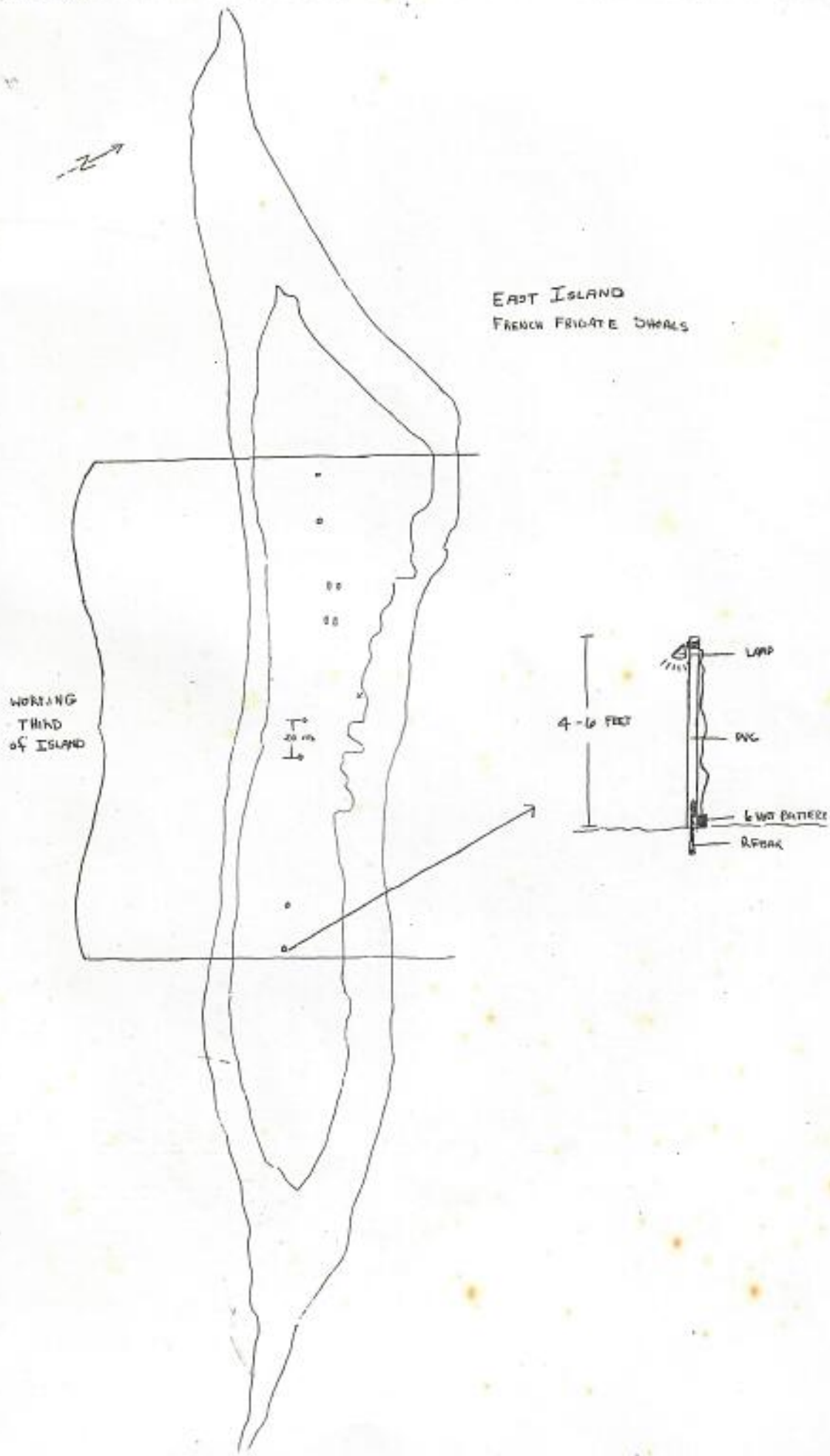
If 300 or fewer hatchlings are needed, technique #1 is most appropriate. By visiting the island (Fast) at mid-day for a few hours every second or third day, 50 or more hatchlings could be collected each trip with little disturbance to other animals.

If more than 300 hatchlings are needed for a project, technique #3 is most appropriate. At about 1700, before seals begin hauling up for the night, set up three 2 - light stations. Set the two lights at each station about 20 meters apart so one person can attend both with very little walking. Work only the middle third of the island to avoid bothering any groups of basking animals on the ends of the island (see diagram). Turn the lights on from 2030 to 2300 and collect the hatchlings as they come to the lights.

One goal of this method is to minimize the amount of roving so I also recommend that workers avoid looking for emerging nests when hatchlings begin to gather at the stations. Also, since it's so easy for a worker to focus entirely on hatchlings, I suggest that a person with bird/seal experience and interest be included in the party as one of the three workers when possible.

This recommendation applies to East Island, French Frigate Shoals, only. From our experience I estimate that 200 hatchlings could be collected per night.


N
EAST ISLAND
FRENCH FRIGATE SHOALS
WORKING
THIRD
of ISLAND
20 m
4-6 FEET
LAND
PVC
6 VOLT BATTERY
REBAR


EAST ISLAND
FRENCH FRIGATE SHOALS
WORKING THIRD of ISLAND
4-6 FEET
LAMP
RAC
6 VOLT BATTERY
REBAR

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

IN REPLY REFER TO:

SE

May 17, 1984

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

Dear George:

Some months ago you informed me of work by Gail Patterson and William Gilmartin in which they used living tag methodology in August 1982, on 1,000 Hawaiian green turtle hatchlings at French Frigate Shoals; my notes read that 1,000 hatchlings were tagged on the seam between the first and second left lateral scutes and the same 1,000 were tagged on the first plastral scute after the gular scute on the anterior left side. I have not received any verification of this tagging effort for the living tag registry and I would be grateful if you would tell me how to contact Patterson and Gilmartin. Also, do you know if any other living tags have been used? Thanks for your help.

1100

Thanks also for the article on marine turtle postage stamps. Makes you wonder why the U.S. Postal Service doesn't issue a sea turtle commemorative series doesn't it?

You are probably aware that Bill Gordon (NMFS Deputy Director) has invited Fish and Wildlife Service to participate in a Pacific Sea Turtle Recovery Team; Fish and Wildlife Service/Region 1 had decided to form a Pacific team prior to Gordon's letter, but things should be easier with Gordon's support. Region 2 will form an East Pacific subteam. Jack Woody has been named Sea Turtle Coordinator for the entire Fish and Wildlife Service and I expect he will give the Pacific a lot of his time. By the way, Jack received a Gulf Oil Conservation Award for his sea turtle work; I'm sure you are as pleased as all of us here in Albuquerque.

You previously declined to suggest names for members and consultants for a Pacific recovery team. I'll ask you again: Would you please suggest names

as possible members and consultants to a West Pacific and an East Pacific Sea Turtle Recovery Teams? Speak now or forever work with a team you might not like!

Hoping to hear from you soon.

Cordially yours,

David

David Bowman
Endangered Species Biologist

FTS - 474-3972

505-766-3972 Alb. N.M.

FORM 3-1383
(REV. 11/75)

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service

Hawaiian Islands National Wildlife Refuge

SPECIAL USE PERMIT

Permit number	Sta. No. to be credited
HWN-8-84	12510

Contract number

Date July 3, 1984

Permittee (Name and address) William Gilmartin, Leader
Marine Mammals and Endangered Species Program
National Marine Fisheries Service
P.O. Box 3830
Honolulu, HI 96813

Period of use (inclusive)
From July 15 19 84
To August 30 19 84

Purpose (Specify in detail privilege requested, or units of products involved)

Tag 3,500 green turtle hatchlings from East, Whale-Skate, Trig and Tern Islands, French Frigate Shoals to study growth, migration and tag retention. 200 of the above will be taken back to Honolulu for temporary captive maintenance.

Description (Specify unit numbers; metes and bounds; or other recognizable designations)

3,300 hatchlings will be collected, tagged with a small metal (titanium) flipper tag, and immediately released at the same location in which they were collected. 200 hatchlings will be collected, tagged (with titanium tags and by autograft transplant) and maintained in captivity for at least a year to study tag retention. Time and location of release will be worked out with the FWS at a later date.

Amount of fee $_____ If not a fixed fee payment, specify rate and unit of charge: _____

Fees will be at prevailing rates when personnel are at Tern Island:
$19.25 if food is provided by refuge,
$ 5.00 if party supplies food.

☐ Full payment

☐ Partial payment-Balance of payments to be made as follows:

Record of Payments

Special Conditions

Personnel involved in field work are: Gail A. Peiterson (Supervisor), Robin L. Westlake, Julie J. Eliason and Robert J. Morrow.

See attachment for special conditions.

This permit is issued by the U.S. Fish and Wildlife Service, and accepted by the undersigned, subject to the terms, covenants, obligations, and reservations, expressed or implied therein, and to the conditions and requirements appearing on the reverse side.

Permittee (Signature) William G. Gilmartin

Issuing Officer (Signature and title) Richard C. Wass
Richard C. Wass, Refuge Manager (Remote Islands)

SPECIAL CONDITIONS - GILMARTIN SUP (page 1)

1. The taking of any animal, vegetable or mineral matter except as authorized in writing by the Refuge Manager or by this Special Use Permit, is prohibited on all refuge lands and waters.

2. Seabird nesting colonies will be avoided to the extent practicable. Travel through the interior portions of all islands will be kept to the minimum necessary to carry out this research and will be conducted in a manner that minimizes disturbance to nesting birds and their habitat. Movement about these island should generally be limited to the beach crest. If travel through colonies is necessary, a trail should be marked to limit the area of disturbance. Trail markers should be removed when no longer in use.

3. The permittee will be responsible for removing all trash and refuse resulting from his activities. No trash or pollutants of any kind will be dumped into refuge waters.

4. The permittee shall protect, maintain and keep in good order the premises and/or facilities occupied under this SUP.

5. The permittee and others covered by this SUP will coordinate all activities on a daily basis with the Refuge staff member in charge of the Tern Island field station. Refuge staff will have the authority to regulate and restrict activities more stringently than defined in this SUP if, in his/her opinion, such action is necessary to limit disturbance to wildlife, to protect government equipment or to insure safety of all personnel. The Complex Refuge Manager or Refuge Manager (Remote Islands) will resolve any disputes which may arise. "Rules for Tern Island" will apply, except as exempted by other provisions of this SUP.

6. All activities of the permittee and his assistants are subject to all Federal laws, rules and regulations governing national wildlife refuges (50CFR).

7. The permittee will furnish the Complex Refuge Manager with a report of work accomplished and study results on or before December 31, 1984. This report should include, at a minimum, an itinerary of field activities, a description of each project undertaken and a summary of results. The report should include a listing of all specimens taken or collected (with location), a record of all unusual observations and a preliminary description of anticipated future work relating to this project. In addition, the permittee will provide the Complex Refuge Manager with copies of all reports (internal and external) and publications resulting from this work, in both draft and final stages.

8. The permittee will implement necessary precautions to limit the transportation of exotic pest plants and insects between and around refuge islands.

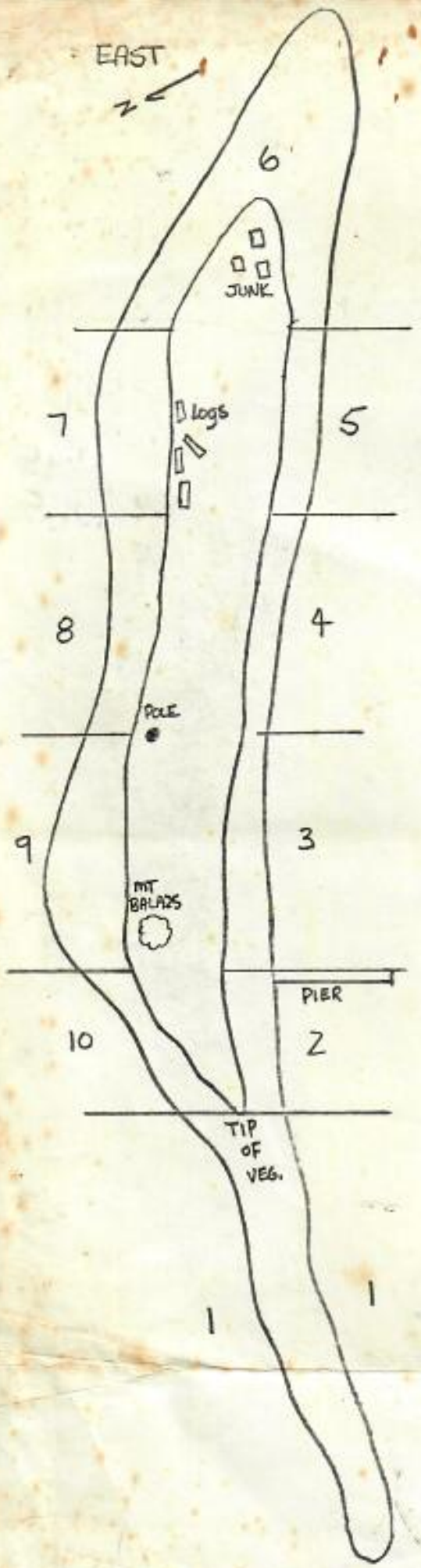
Having read the cover page and two pages of attachments in this Special Use Permit, I, the undersigned, agree to the terms of the SUP:

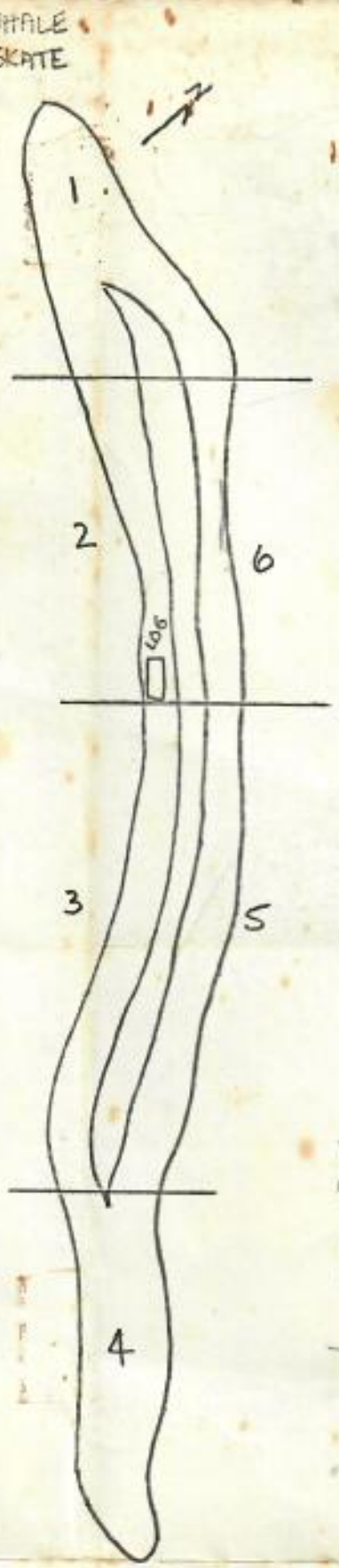
William G. Gilmartin

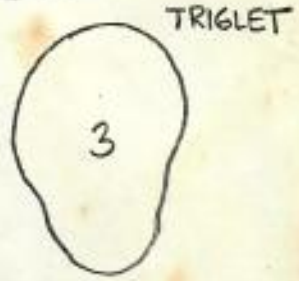
William G. Gilmartin

Richard C. Wass

Richard C. Wass
Refuge Manager
(Remote Islands)







North Gin Spit

N

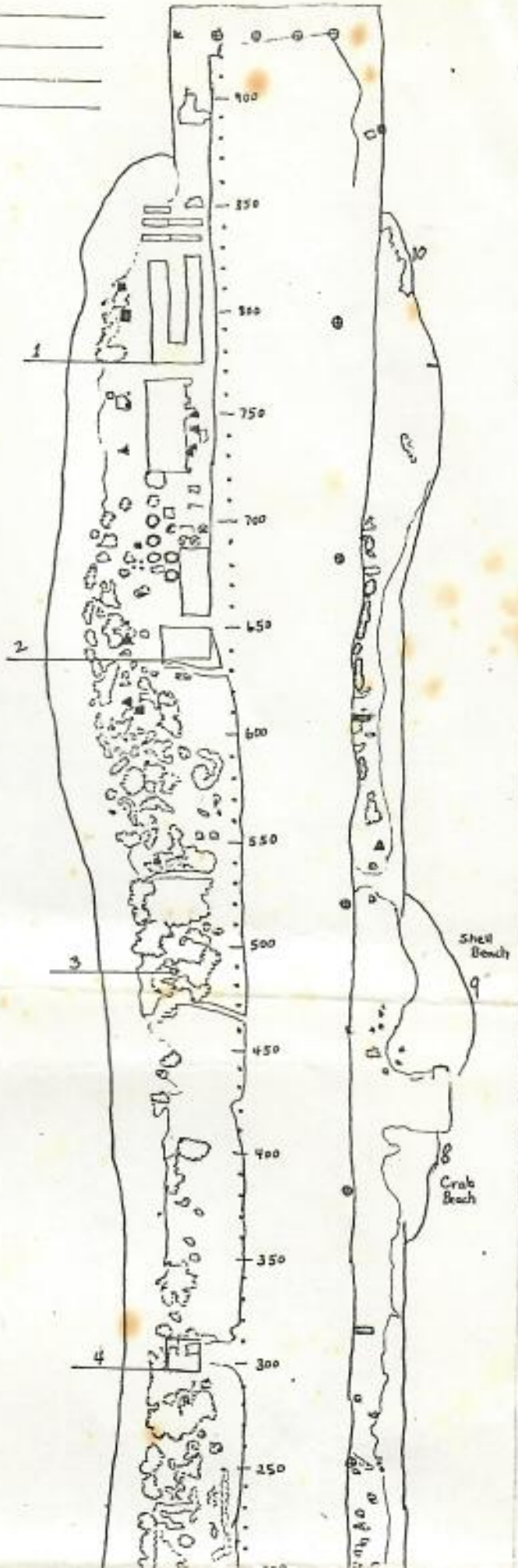
TERN ISLAND

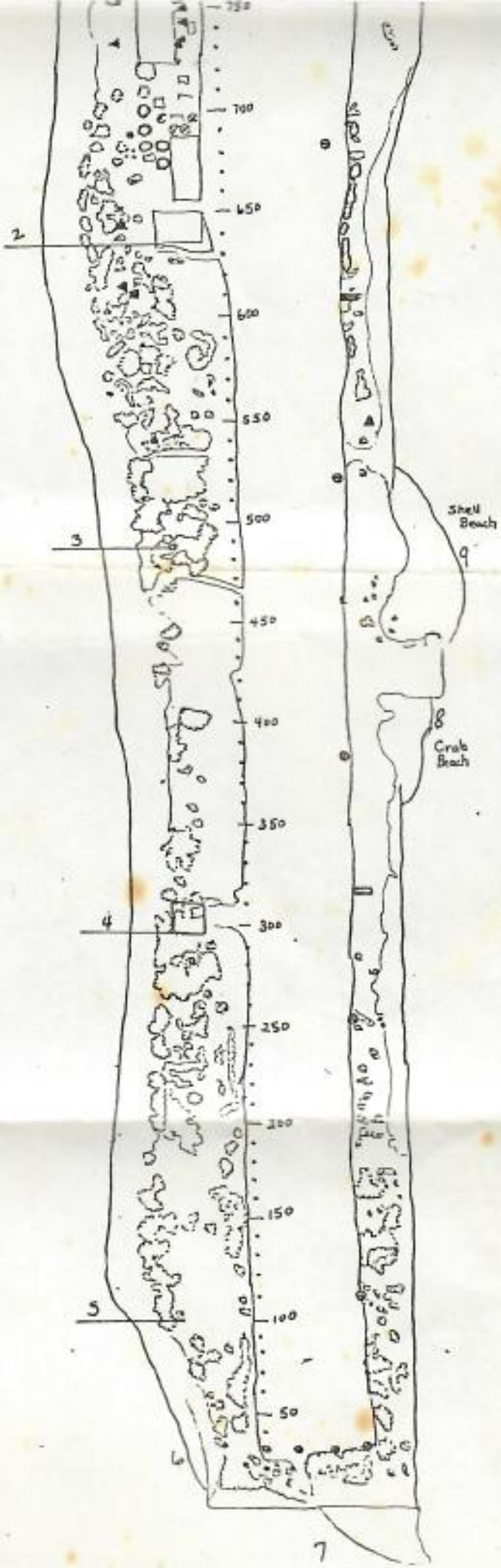
DATE
TIME
OBSERVER

WIND SPEED
DIR.
PRESS.

% CLOUDS
TEMP.
TOTAL
% ID

#	AGE SEX	ID #	MOLT	SECT	ZONE	HAB	ASSO.	BEHAVIOR




750
700
650
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Shell Beach
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Crab Beach
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CRUISERS

PALAU HAWKSBILL HEADSTARTING

The government of Palau is presently sponsoring a headstarting programme for hawksbills at the Micronesian Mariculture Demonstration Center. The programme is modest in scale, with 3 technicians hatching about 1000 turtles per year and releasing them after 6 months. There are excellent facilities for research on hawksbills in Palau and anyone interested is encouraged to get in touch with G.A. Heslinga, MMDC Box 359, Koror, Palau, Caroline Islands 96940.

TAG LOCATIONS RESERVED

A recent note and editorials in the Marine Turtle Newsletter (1981, 19:6-7; 1982, 20: 1 & 22: 1-2) regarding use of living tags on sea turtles were read with much interest and support. Uncontrolled duplication could make the entire system worse than useless. I request your assistance in notifying your readers that the U.S. Fish and Wildlife Service, in cooperation with the Galveston Laboratory of the U.S. National Marine Fisheries Service (NMFS), Galveston, Texas, wishes to reserve the following series of scutes on the Kemp's ridleys for scute coding of headstarted hatchlings at the NMFS facility:

Year Class	Scute Code
1982	LC3*
1983	LC4
1984	LC5
1985	N4**

*LC = left costal and is followed by the scute number in the left costal series, and

**N4 = fourth neural scute.

The following scutes have been used in previous experiments with the living tag on Kemp's ridleys of the 1980 year class (note: In parentheses, n = the number of turtles marked):

Neural scute 2 - N2 (n = 4)
Neural scute 3 - N3 (n = 6)
*Left costal scute 2 - LC2 (n = 87)
*Right costal scute 2 - RC2 (n = 59, 45 of these also listed as RC3)
Right costal scute 3 - RC3 (n = 122, 45 of these also listed as RC2 and 1 listed as RC4)
*Right costal scute 4 - RC4 (n = 1, also listed as RC3)
*Left humeral scute - LHS (n = 98, 9 of these also listed as LPS)
Left pectoral scute - LPS (n = 94, 9 of these also listed as LHS and 28 listed as LAS)
*Left abdominal scute - LAS (n = 54, 28 of these also listed as LPS)

*Due to grafts spanning seams between scutes.

Anyone encountering a Kemp's ridley suspected of bearing a living tag is requested to contact me at the address below, or Mr. C.T. Fontaine, NMFS, 4700 Avenue U, Galveston, Texas 77550, or Mrs. Lupe Hendrickson, 4917 N. Camino Arenoso, Tucson, Arizona 85718.

The larger question of coordination among turtle investigators who may use living tags must also be addressed. Therefore, as suggested by Mrs. Hendrickson, we propose that the Office of Endangered Species, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103, USA, should serve as the clearinghouse for all sea turtle living tag activities. Specifically, we propose that investigators planning to use living tags should notify this office of their intentions; we would then promptly reply with a designation of which carapace scutes should be tagged for that particular study. We would require the following information in order to designate the scutes to be coded and to maintain appropriate records:

1. person or institution proposing to do the marking;
2. species (one or more) of sea turtle to be marked;
3. location where marking will occur;
4. year class(es) to be marked;
5. date(s) and location(s) of proposed release(s) of marked turtles.

DAVID BOWMAN
U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico, 87103, U.S.A.

RECENT PAPERS

BALAZS, G.H. 1982. Driftnets catch leatherback turtles. Oryx. G. Balazs, Hawaii Institute of Marine Biology, P.O. Box 1346, Kaneohe, Hawaii 96744, U.S.A.

BJORNDAL, K.A., MEYLAN, A.B. and TURNER, B.J. 1983. Sea turtles nesting at Melbourne Beach, Florida, I. Size, growth and reproductive biology. Biol. Conserv. 26:65-77. K.A. Bjorndal, Department of Zoology, University of Florida, Gainesville, Florida 32611, U.S.A.

de SILVA, G.S. 1982. The leathery turtle in Sabah. Borneo Research Bulletin, 14:87-88. G.S. de Silva, Turtle Islands National Park, P.O. Box 768, Sandakan, Sabah, Malaysia.

DUGUY, R. 1983. La Tortue luth (Dermochelys coriacea) sur les côtes de France. Annales de la Société des Sciences Naturelles de la Charente-Maritime, Supplément, 38 pp. R. Duguy, Muséum d'Histoire Naturelle, 28 rue Albert Premier, 17000, La Rochelle, France.

DUGUY, R. et DURON, M. 1983. Observations de Tortues luth (Dermochelys coriacea) sur les côtes de France en 1982. Annales de la Société des Sciences Naturelles de la Charente-Maritime 7:153-157. R. Duguy, Muséum d'Histoire Naturelle, 28 rue Albert Premier, 17000, La Rochelle, France.

GRASSMAN, M.A. and OWENS, D.W. 1982. Development and extinction of food preferences in the loggerhead sea turtle, Caretta caretta. Copeia, 4:965-969. M.A. Grassman, Department of Biology, Texas A&M University, College Station, Texas 77843, U.S.A.

GUPTA, N.K. and MEHROTRA, V. 1979, publ. 1981. A detailed account of Neoadenogaster glanduaris Mehrotra, 1973 (Trematoda: Pronocephalidae) from the intestine of Chelone mydas (Linn.) in India. Research Bulletin of the Panjab University 30:87-91. N.K. Gupta, Department of Zoology, Panjab University, Chandigarh, India.

GUPTA, N.K. and MEHROTRA, V. 1981. On two blood flukes (Trematoda) of the family Spirorchidae Stunkard, 1921 from Indian marine turtles. Acta Parasitologica Polonica 28:11-20. N.K. Gupta, Department of Zoology, Panjab