

808-395-6409

BALAZS -

27-30 AUGUST 96 (2 ST-145)
9-11 JULY 2000

KATME HANNE
Book II



2 of 2

25695 Date : 23.03.97 17:32:04 LC : A IQ : 60
Lat1 : 23.364N Lon1 : 167.996W Lat2 : 19.050N Lon2 : 153.803W
167 30 1284 16
00 00

25695 Date : 25.03.97 00:58:28 LC : A IQ : 60
Lat1 : 16.655N Lon1 : 175.599W
168 1725 1285 35187
02 52

25695 Date : 04.03.97 17:47:43 LC : (0) IQ : 50
Lat1 : 20.567N Lon1 : 155.734W
165 2135 454 4142

25695 Date : 01.04.97 17:37:59 LC : 1 IQ : 50
Lat1 : 20.932N Lon1 : 156.441W
167 11 414 50
00 01

25695 Date : 05.04.97 00:40:55 LC : B IQ : 00
Lat1 : 20.904N Lon1 : 156.446W
166 703 1152 18
00 00

25695 Date : 08.04.97 12:43:53 LC : A IQ : 00
Lat1 : 20.908N Lon1 : 156.383W
166 2216 588 45
00 41

25695 Date : 10.04.97 23:39:57 LC : A IQ : 00
Lat1 : 21.007N Lon1 : 156.357W
167 1126 33164 2108
00 00

25695 Date : 13.04.97 18:15:14 LC : B IQ : 00
Lat1 : 20.971N Lon1 : 156.475W
165 1445 1599 13
00 00

25695 Date : 13.04.97 11:46:35 LC : (B) IQ : 00
Lat1 : 20.953N Lon1 : 156.488W
165 2531 1591 13
00 00

25695 Date : 13.04.97 04:08:59 LC : (i) A IQ : 00
Lat1 : 20.914N Lon1 : 156.443W
166 610 1149 18
00 00

25695 Date : 13.04.97 11:46:35 LC : B IQ : 00
Lat1 : 20.953N Lon1 : 156.488W
165 2531 1591 13
00 00

25695 Date : 14.04.97 05:22:07 LC : B IQ : 00
 Lat1 : 20.884N Lon1 : 156.417W
 166 1977 1291 16
 00 00

25695 Date : 14.04.97 16:09:32 LC : A IQ : 00
 Lat1 : 20.838N Lon1 : 157.194W
 165 1290 1734 12
 00 00

25695 Date : 15.04.97 17:28:54 LC : A IQ : 00
 Lat1 : 20.871N Lon1 : 156.317W
 166 1272 1730 12
 00 00

25695 Date : 24.04.97 00:33:41 LC : B IQ : 00
 Lat1 : 20.926N Lon1 : 156.372W
 168 1482 551 37
 00 00

25695 Date : 26.04.97 12:47:40 LC : A IQ : 00
 Lat1 : 20.907N Lon1 : 156.441W
 167 1896 1475 14
 00 00

25695 Date : 27.04.97 23:52:07 LC : B IQ : 00
 Lat1 : 20.902N Lon1 : 156.394W Lat2 : 24.357N Lon2 : 140.741W
 Nb mes : 002 Nb mes>-120dB : 000 Best level : -133 dB
 Pass duration : 046s NOPC : 1
 Calcul freq : 401 650239.2 Hz Altitude : 0 m
 166 1124 1460 14
 00 00

25695 Date : 07.05.97 23:41:57 LC : B IQ : 00
 Lat1 : 20.891N Lon1 : 156.448W
 40 1317 16978 32802
 00 00

25695 Date : 12.05.97 00:36:29 LC : B IQ : 00
 Lat1 : 20.789N Lon1 : 156.508W Lat2 : 19.320N Lon2 : 163.233W
 Nb mes : 002 Nb mes>-120dB : 000 Best level : -129 dB
 Pass duration : 046s NOPC : 1
 Calcul freq : 401 650239.2 Hz Altitude : 0 m
 169 948 782 26
 00 00

25695 Date : 29.05.97 00:54:20 LC : Z IQ : 00
 Lat1 : ??????? Lon1 : ???????? Lat2 : ???????? Lon2 : ????????
 Nb mes : 001 Nb mes>-120dB : 000 Best level : -132 dB
 Pass duration : ? s NOPC : ?
 Calcul freq : 401 650000.0 Hz Altitude : 0 m
 169 05 928 22
 00 01

25695 Date : 21.06.97 00:06:12 LC : Z IQ : 00
Lat1 : ??????? Lon1 : ??????? Lat2 : ??????? Lon2 : ???????
Nb mes : 001 Nb mes>-120dB : 000 Best level : -136 dB
Pass duration : ? s NOPC : ?
Calcul freq : 401 650000.0 Hz Altitude : 0 m
170 1116 2981 16406
00 00

25695 Date : 18.07.97 00:12:00 LC : Z IQ : 00
Lat1 : ??????? Lon1 : ??????? Lat2 : ??????? Lon2 : ???????
Nb mes : 001 Nb mes>-120dB : 000 Best level : -135 dB
Pass duration : ? s NOPC : ?
Calcul freq : 401 650000.0 Hz Altitude : 0 m
170 11 1284 16
00 00

25695 Date : 21.07.97 17:06:52 LC : Z IQ : 00
Lat1 : ??????? Lon1 : ??????? Lat2 : ??????? Lon2 : ???????
Nb mes : 001 Nb mes>-120dB : 000 Best level : -135 dB
Pass duration : ? s NOPC : ?
Calcul freq : 401 650000.0 Hz Altitude : 0 m
171 1017 1156 18
00 00

25695 Date : 04.08.97 16:58:15 LC : Z IQ : 00
Lat1 : ??????? Lon1 : ??????? Lat2 : ??????? Lon2 : ???????
Nb mes : 001 Nb mes>-120dB : 000 Best level : -135 dB
Pass duration : ? s NOPC : ?
Calcul freq : 401 650000.0 Hz Altitude : 0 m
171 33846 15483 55946
03 58

25695 Date : 12.08.97 00:39:31 LC : Z IQ : 00
Lat1 : ??????? Lon1 : ??????? Lat2 : ??????? Lon2 : ???????
Nb mes : 001 Nb mes>-120dB : 000 Best level : -134 dB



CHRISTMAS 2000
DAWN AND PAUL

1996 Annual Report
Hawksbill Turtle, *Eretmochelys imbricata*, Recovery Program
Hawaii Volcanoes National Park

Ref: U.S. Fish and Wildlife Service Permit #739923

Prepared by: Larry Katabira, Hawaii Volcanoes National Park

The objectives of the hawksbill turtle recovery program were to: 1) monitor nesting activities and to protect nests and hatchlings from predators, 2) determine post-nesting migration and resident foraging habitat via satellite tracking and radio telemetry, 3) develop and implement an environmental education program, and 4) coordinate a video documentation for the hawksbill recovery efforts in the Hawaiian Islands.

It was a highly successful season primarily due to the efforts of 35 dedicated volunteers. Hawaii Volcanoes National Park implemented and coordinated the monitoring program with funding support from the U.S. Fish and Wildlife Service and the Hawaii Natural History Association. George Balazs from the National Marine Fisheries Service provided and attached satellite transmitters, and summarized location sightings. Bill Gilmartin from the Hawaii Wildlife Fund provided radio transmitters and coordinated the radio telemetry study. FWS provided additional funds for the information/education position and the video documentation.

Nest monitoring and protection

From June to December 1996, volunteers provided nearly continuous nightly coverage and predator control at two principal nesting beaches on the island of Hawaii--Apua Point which is located within Hawaii Volcanoes National Park and Kamehame located in the district of Kau. In addition, frequent monitoring for nesting activities was conducted at Kawa, Halape, Ninole, Punaluu, Horseshoe and Pohue. This was the first year we extended our coverage to Pohue in south Kona, a beach which is owned by an international consortium with plans for ecotourism for this area.

Standard monitoring methods were implemented on nesting turtles. This included tagging, measuring carapace length and width, noting external injuries or abnormalities, and marking nest sites. During the hatching emergence phase, personnel rescued and released stranded turtles found in vegetation and in rock cobbles. Following the major hatching emergence, all nests were excavated to determine nest success and to rescue stranded hatchlings that were found within the nest cavity.

Small mammal live traps were placed at Apua and Kamehame to control mongooses, feral

cats and rats. Captured animals were euthanized with carbon dioxide or .22 caliber pistol.

A total of 67 Hawksbill nests were found--45 at Kamehame, 21 at Apua, and 1 at Punaluu. Thirteen tagged Hawksbill turtles accounted for 40 of these nests; unobserved turtles accounted for the remaining nests. Of the 13 turtles, four were tagged in 1996, three returned on a 2-year nesting cycle and six returned on a 3-year cycle. The nest clutch size ranged from 99 to 242 eggs with a mean of 166 eggs; the nests success ranged from 21% to 100% with a mean of 75%. Turtle tracks and diggings were observed at Kawa and Pohue but no nests were confirmed.

Predator control resulted in dispatching 62 mongooses, 4 feral cats, and 16 rats. A pig-proof fence constructed in 1995 prevented pigs from impacting the nests at Kamehame.

The 67 hawksbill turtle nests in 1996 equals the highest number which was documented during the 1995 nesting season. Our program is continuing to gather new and significant baseline data as indicated by the arrival of 4 untagged nesting turtles at Kamehame this season. From 1991 to 1996, a total of 31 nesting hawksbill turtles have been tagged, 6 at Apua and 25 at Kamehame (see attached list).

To implement a more comprehensive recovery program for the hawksbill turtle in Hawaii, we need to expand our nest search to other remote beaches on the island of Hawaii as well as to other islands. Since 1989, we have only monitored the beaches from Hawaii Volcanoes National Park to sections of Kau on the southeast coast of the island. We have received reports from hikers and fishers of possible nesting in numerous remote beaches along the Kau and South Kona coast, however, personnel and funding constraints have prevented any systematic follow-up monitoring.

When additional nesting beaches are confirmed, we need to implement management actions, particularly predator control, to ensure nest success. Predation on eggs from mongooses is the main limiting factor at most of the principal nesting beaches on the island of Hawaii.

Satellite and Radio Transmitter

Two nesting hawksbill turtles at Kamehame were attached with satellite and radio transmitters to track their post-nesting migration and to determine their resident foraging habitat. After the nesting season, both turtles migrated around South Point and along the western coast of the island of Hawaii. One individual continued its migration clockwise around the island and is currently residing along the Hamakua coast travelling 255 km from Kamehame. The other turtle migrated to Maui and is positioned in the nearshore waters off Kahului bay travelling 315 km from Kamehame (see attached article).

Together with the two transmitter turtles from the 1995 season, we have now identified the post nesting migration route and resident foraging habitats for four nesting hawksbill turtles

from Kamehame. Three have resided off the coast of Hamakua, Hawaii and one off Kahului, Maui. We need to expand this program by attaching transmitters on other hawksbill turtles from different nesting beaches to identify their movements and to have a better understanding of the marine habitat utilized by hawksbill turtles. This information, together with the monitoring and protection of nesting beaches, will allow us to implement and focus recovery efforts to different aspects of the life history of hawksbill turtles in the Hawaiian Islands.

Education and Public Outreach

Donna O'Daniel was hired as the information/education specialist for the turtle program. She did an outstanding job of providing presentations at nearly all schools on the island of Hawaii, as well as the high schools on Maui and Molokai. Her outreach program also included public presentations and articles published in the local newspapers.

Her programs were well received with many schools requesting presentations for the upcoming year and offering assistance to the turtle monitoring and recovery program.

Video Documentation

A private non-profit organization called Honu Project was contracted to film and produce a documentation on the hawksbill turtle in Hawaii. We collaborated in developing the outline for the script and coordinated field outings to film hawksbill turtle nesting beaches on Hawaii, Maui and Molokai, interviews with local folks, helicopter flights, and numerous logistics and meetings. By late 1997, two video segments (1 hr. and 30 min. each) will be completed. The video quality is planned for the general public, educational and governmental institutions, and public television.

NESTING HAWKSBILL TURTLES TAGGED ON THE ISLAND OF HAWAI'I, 1991-1996
[] TAG FALLEN OFF

LFF	RFF	LRF	RRF	DATE TAGGED	LOCATION	SEASON RETURNED
N-451	N-452			19-Jul-91	APUA	1993,1995
N-454, B-585	N-455			03-Sep-91	APUA	1993,1996
N-443	N-444			04-Aug-92	APUA	1994,1996
R-129	R-130			17-Jul-93	APUA	1996
R-138	R-137			25-Aug-93	APUA	
J-83	J-86, B-590			04-Aug-94	APUA	1996
N-403	N-404			04-Aug-91	KAMEHAME	1993,1996
N-439	N-440		B-800	03-Sep-91	KAMEHAME	1993,1995
[N-468], B-770/B769	N-467			04-Aug-92	KAMEHAME	1995
N-411	B-760			19-Sep-92	KAMEHAME	1995
[R-108], B-706	R-109			03-Jul-93	KAMEHAME	1996
R-111	R-110			04-Jul-93	KAMEHAME	
R-112	R-114			07-Jul-93	KAMEHAME	
R-156/R-185	R-157/R-184			14-Jul-93	KAMEHAME	1996
R-159	R-158, B-562			18-Jul-93	KAMEHAME	1996
[R-162], B-759	R-161			24-Jul-93	KAMEHAME	1995
R-164	[R-163], B-765			25-Jul-93	KAMEHAME	1995
R-170/R-171	R-169			05-Aug-93	KAMEHAME	
R-177/B-768	[R-180], R-183			24-Aug-93	KAMEHAME	1995
[R-188], [B-785], B-561	R-189, B-560			23-Jun-94	KAMEHAME	1996
R-194	R-195			29-Jul-94	KAMEHAME	
B-757	B-755	B-767	B-766	18-Jun-95	KAMEHAME	
B-762/B763	B-761			28-Jun-95	KAMEHAME	
B-771	NO RFF			09-Jul-95	KAMEHAME	
B-775	B-772			11-Jul-95	KAMEHAME	
B-774	B-773			17-Jul-95	KAMEHAME	
B-777	B-778			11-Aug-95	KAMEHAME	
B-538	[B-543], B-556			12-Jun-96	KAMEHAME	
B-713	B-714			25-Jun-96	KAMEHAME	
B-565	B-566			12-Aug-96	KAMEHAME	
B-569	B-568			20-Aug-96	KAMEHAME	

TURTLES TAGGED AT HAVO 1991-1996

[] TAG FALLEN OFF

LFF	RFF	LRP	RRF	DATE TAGGED	LOCATION	SPECIES	SEASON RETURNED
N-451	N-452			19-Jul-91	APUA	HAWKSBILL	1993,1995
N-454, B-585	N-455			03-Sep-91	APUA	HAWKSBILL	1993,1996
N-443	N-444			04-Aug-92	APUA	HAWKSBILL	1994,1996
R-129	R-130			17-Jul-93	APUA	HAWKSBILL	1996
R-138	R-137			25-Aug-93	APUA	HAWKSBILL	
J-83	J-86, B-590			04-Aug-94	APUA	HAWKSBILL	1996
N-403	N-404			04-Aug-91	KAMEHAME	HAWKSBILL	1993,1996
N-439	N-440	B-800		03-Sep-91	KAMEHAME	HAWKSBILL	1993,1995
[N-466], B-770/B769	N-457			04-Aug-92	KAMEHAME	HAWKSBILL	1995
N-411	B-760			19-Sep-92	KAMEHAME	HAWKSBILL	1995
[R-108], B-708	R-109			03-Jul-93	KAMEHAME	HAWKSBILL	1996
R-111	R-110			04-Jul-93	KAMEHAME	HAWKSBILL	
R-112	R-114			07-Jul-93	KAMEHAME	HAWKSBILL	
R-158/R-165	R-157/R-164			14-Jul-93	KAMEHAME	HAWKSBILL	1996
R-159	R-158, B-562			18-Jul-93	KAMEHAME	HAWKSBILL	1996
[R-162], B-759	R-161			24-Jul-93	KAMEHAME	HAWKSBILL	1995
R-164	[R-163], B-766			25-Jul-93	KAMEHAME	HAWKSBILL	1995
R-170/R-171	R-169			05-Aug-93	KAMEHAME	HAWKSBILL	
R-177/B-768	[R-180], R-183			24-Aug-93	KAMEHAME	HAWKSBILL	1995
[R-188], [B-785], B-561	R-189, B-560			23-Jun-94	KAMEHAME	HAWKSBILL	1996
R-194	R-196			29-Jul-94	KAMEHAME	HAWKSBILL	
B-757	B-755	B-767	B-766	18-Jun-95	KAMEHAME	HAWKSBILL	
B-782/B763	B-761			28-Jun-95	KAMEHAME	HAWKSBILL	
B-771	NO RFF			09-Jul-95	KAMEHAME	HAWKSBILL	
B-775	B-772			11-Jul-95	KAMEHAME	HAWKSBILL	
B-774	B-773			17-Jul-95	KAMEHAME	HAWKSBILL	
B-777	B-778			11-Aug-95	KAMEHAME	HAWKSBILL	
B-538	[B-543], B-556			12-Jun-96	KAMEHAME	HAWKSBILL	
B-713	B-714			25-Jun-96	KAMEHAME	HAWKSBILL	
B-585	B-566			12-Aug-96	KAMEHAME	HAWKSBILL	
B-569	B-568			20-Aug-96	KAMEHAME	HAWKSBILL	
N415/N-412(3-4 web)	N-414	N-413	N-416	14-Jul-92	KAMEHAME	GREEN	
N474	N-475			20-Jul-92	KAMEHAME	GREEN	
N-460	N-459			22-Jul-92	KAMEHAME	GREEN	
N-463	N-457		N-462	22-Jul-92	KAMEHAME	GREEN	
N-485	N-484		N-486	22-Jul-92	KAMEHAME	GREEN	
B738	B737/B739			11-Jun-90	KAMEHAME	GREEN	
N-426	N-427			13-Jun-91	HALAPE IKI	GREEN	
N-428	N-429			13-Jul-91	HALAPE IKI	GREEN	
N-430	N-431			13-Jul-91	HALAPE IKI	GREEN	
N-432	N-433			13-Jul-91	HALAPE IKI	GREEN	
N-434	N-435			13-Jul-91	HALAPE IKI	GREEN	
B629	B628			29-Oct-96	RICHARDSON	GREEN (JUVENILE WITH TUMORS)	

F A X
.....

Department of the Interior
National Park Service
Hawaii Volcanoes National Park/
Resources Management Division
Mail: P.O. Box 62, Hawaii National Park, HI 96718-0062
Location: Hawaii Volcanoes National Park, Building 322
Voice: (808) 985-6085 Fax: (808) 985-6029

Date 12 June 97

To: George Belez

Fax #: 808 / 943-1290

From: Larry Katahira

Pages: 2

Subject: Tags

Hi George,

The following is a list of turtles tagged from 1991-96. I will give you a comprehensive list of tags on hand by next week ~~practice~~ and return all used tags. We currently have 4 applicators.

We plan to monitor 4 to 5 beaches this season and would like to have dedicated tagging kits for each site. size of turtles

The measurements for the green at Richardson were 59 cm curve length & 52 curve width. There were 3 tumors on right eye & 2 on left eye & 2 in mouth. The size of all tumors were "pea size". I apologize for not getting the info to you sooner. See ya, TS = 1 Larry

Notify MITRP TO SHIP TO HONOLULU

over TS = 2



United States Department of the Interior

NATIONAL PARK SERVICE
HAWAII VOLCANOES NATIONAL PARK
P. O. BOX 52
HAWAII 96718-0052

IN REPLY REFER TO:

N1621

January 28, 1991

Office of Management Authority
PO Box 3507
Arlington, Virginia 22203-3507
Attn: Karen Wilson

Enclosed is the annual report of Hawksbill turtle activities in Hawaii Volcanoes National Park under PRT-739923. Any questions may be directed to the Resources Management division at (808)967-8226.

Sincerely,


Hugo H. Huntzinger
Superintendent

cc: Pacific Island Administrator, USFWS
George Balazs, NMFS

1990 ANNUAL REPORT- HAWKSBILL TURTLE PRT-739923

Hawaii Volcanoes National Park conducted its second year of monitoring Hawksbill turtle (*Eretmochelys imbricata*). As in 1989, the objectives of the program were to locate nests, determine incubation period, rescue strandlings, control predators, and mitigate recreational use conflicts on nesting beaches.

RESULTS

Six nests were laid at Apua Point many of which did not completely incubate. Only one nest was successful. Another nest did not hatch at all. In four nests a high percentage of eggs (up to 90%) did not hatch showing incomplete embryonic development. Most were only 45 days old with large yolk sacs. It is believed that abnormal fluctuations in the temperature and heavy rains may have affected the incubation conditions. No turtles were tagged. A total of 87 hatchlings were rescued and released. The incubation period ranged from 54 to 75 days. Eight mongooses, three black rats and two feral cats were trapped.

At Halape, campsites and trails were relocated to restore the beach to natural nesting conditions and to reduce human impacts. Unfortunately, there has not been adequate compliance to the new backcountry regulations. No nesting activity occurred although there may have been some nesting attempts. Two black rats and 17 mongooses were trapped.

At Kamehame, which is located about two miles outside of the Park, two nests were found with evidence of predation by mongooses and feral cats. In 1991, the Park anticipates obtaining a permit from the State to control predators.



United States Department of the Interior

NATIONAL PARK SERVICE
Hawaii Volcanoes National Park
P.O. Box 52
Hawaii 96718-0052



1992 ANNUAL REPORT- HAWKSBILL TURTLE, PRT-739923
HAWAII VOLCANOES NATIONAL PARK

IN REPLY REFER TO
N1621

January 22, 1992

US Fish and Wildlife Service
Office of Management Authority
PO Box 3507
Arlington, VA 22203-3507

Dear Sirs:

The following activities were conducted during the 1991 calendar year. Four nesting adult Hawksbill turtles were handled and tagged under PRT-739923, Endangered Species Permit to capture, tag, measure, and examine Hawksbill turtles, *Eretmochelys imbricata*. In addition, 100 hatchlings were rescued and released into the ocean at Apua Point.

Date	Location	Length	Tag numbers
7/19/91	Apua Point	84.5cm SCL	N451, N452
9/3/91	Apua Point	not taken	N454, N455
8/4/91*	Kamehame	88.0cm curved	N403, N404
9/3/91	Kamehame	84.0 SCL	N439, N440

*This tagging was carried out with personnel from the National Marine Fisheries Service, Southwest Laboratory.

If there are any questions regarding our activities, please direct them to Larry Katsura, Resources Management Specialist (908-967-8226).

Sincerely,

Hugo H. Hanzinger
Superintendent

cc: HAVO
PAAR
WRO
✓NMFS



We monitored nesting activities of the Hawksbill turtle, (*Eretmochelys imbricata*), from June through December 1992. Nesting occurred at Apua Point in Hawaii Volcanoes National Park, and at Kamehame and Kawa which are two beaches located a few miles southwest of the National Park boundary. Our primary objectives were to locate nests, control predators, and rescue stranded hatchlings. We spent 92 nights at Apua, 42 nights at Kamehame, and 4 nights at Kawa. Despite this effort, we were unable to document all nesting and hatching episodes, primarily due to lack of personnel and the remoteness of these nesting beaches.

At Apua Point we found evidence of six nests, tagged one Hawksbill (LFL N443, RFL N444), found 226 dead hatchlings stranded in cobblestones, and trapped 7 mongooses and 14 rats. As in past years, the major problem is a barrier of cobblestones between the nest sites and the ocean where hatchlings get stranded.

At Kamehame, we found evidence of four nests, tagged two Hawksbill (LFL N468, RFL N467; LFL N411), and trapped 62 mongooses, 9 rats, and 1 feral cat. We assume the hatchlings were successful in reaching the ocean since there are no physical obstacles and we did not find evidence of predation.

At Kawa, we found Hawksbill turtle tracks on two occasions and it appeared there were two to three nests. On subsequent checks we observed off-road vehicle tire tracks throughout the beach. We could not locate the nests and felt they failed due to the compaction from vehicles. This beach is privately owned and we are seeking cooperation by beach users.

F A X

ONSIGHT
Kamehameha Sand

Department of the Interior
National Park Service
Hawaii Volcanoes National Park/
Resources Management Division
Mail, P.O. Box 52, Hawaii National Park, HI 96718-0052
Location: Hawaii Volcanoes National Park, Building 322
Voice: (808) 967-8226 Fax: (808) 965-6614

Date 23 June 96

To: George Balazs

Fax #: (808) 943-1290

From: Larry Katahira

Pages: 6

Subject: Update + '95 Annual Report

Hi George!
Attached is the 1995 Annual Report about the satellite tracking report (Balazs, et al Feb 96 Sympo).

So far... 1-2 possible nests at Apua, ~~as~~ I confirmed + 1 possible at Kauhane + 1 possible at Panalua. We started monitoring in June '95. I have a really good group of volunteers + many are looking forward to seeing your findings at Panalua. I thought Charlotte had sent you the information. I'll look for it. Sorry -

Least while I want to Polue w/ the land manager heading to the reports received, it's almost certain that's nesting at 2-3 beaches along that coastline. I didn't observe any activity but the beaches are good habitat. I will be doing occasional monitoring of can get #s from FOS. Could I get from you 3 more sets of pliers + tags? This year I'm hoping to have concurrent coverage at 4-6 beaches. Polue might be an excellent place for satellite transmitter work. I'll see you on Wed at Panalua -
Henry

1995 Annual Report
Hawskbill Turtle, *Exemochelys imbricata*, Monitoring Program
Hawaii Volcanoes National Park

Ref: 1) U.S. Fish and Wildlife Service Permit #739923
2) State Dept. of Land and Natural Resources, Division of Aquatics, Permit to Monitor Hawksbill Turtles

Prepared by: Larry Katahira, Hawaii Volcanoes National Park

Introduction

For the 1995 season, the objectives of the Hawksbill turtle monitoring program were: 1) to obtain baseline data on number and location of nesting turtles, 2) to control predators to protect nests and hatchlings, 3) to rescue stranded hatchlings, and 4) to determine post-nesting migration and resident foraging habitat.

Hawaii Volcanoes National Park implemented and coordinated the monitoring program with funding support from the U.S. Fish and Wildlife Service and the Hawaii Natural History Association. George Balazs from the National Marine Fisheries Service provided invaluable technical assistance and materials for the satellite tracking program. This included providing and attaching transmitters, providing satellite time costs, and summarizing the migration data.

Methods

From June to November 1995, hired and volunteer personnel provided nearly continuous nightly coverage at two nesting beaches on the island of Hawaii--Apua Point which is located within Hawaii Volcanoes National Park and Kamehame located in the district of Kau. Incidental day checks for nesting activities were conducted at Kawa, Haape, Ninole, Punaluu, and Horseshoe.

Standard monitoring methods were implemented on nesting turtles. This included tagging, measuring carapace length and width, noting external injuries or abnormalities, and marking nest sites. During the hatching emergence phase, personnel rescued and released stranded turtles found in vegetation and in rock cobbles. Following the major hatching emergence, all nests were excavated to determine nest success and to rescue stranded hatchlings that were found within the nest cavity.

Small mammal live traps were placed at Apua and Kamehame to control mongooses, feral cats and rats. In addition, a pig trap was located at Kamehame to prevent predation on turtle eggs. The small mammals were euthanized with carbon dioxide or .22 caliber pistol, and pigs were dispatched with a .357 caliber pistol.

1995 Tagged Hawksbill Turtles, *Eretmochelys imbricata*
Island of Hawaii

April 1996, satellite transmissions positioned both turtles within the nearshore waters of Hamakua coast which indicated their resident foraging habitat. The post-nesting migration travel from Kamehame to Hamakua coast for both turtles was 135 kilometers and 180 kilometers respectively (see attached report for details).

Summary and Recommendations

The 67 hawksbill turtle nests in 1995 was the highest since we began intensive and systematic monitoring in 1993. Our program is continuing to gather new and significant baseline data as indicated by the arrival of 6 untagged nesting turtles at Kamehame this season and the documentation of an individual turtle nesting at 2 different beaches during the same season.

Probably the most critical aspects of the program leading to immediate survivorship of individuals are controlling predators and rescuing hatchlings. In 1995, no predation occurred at Kamehame. Prior to our trapping program in 1993, fisherman reported that mongoooses frequently dug and ate turtle eggs at this beach. It is believed that feral pigs were also preying on nests. At Apua, the major obstacle preventing hatchlings to enter the sea is a barrier of rock cobbles. Constructed hatching corridors and presence of personnel during emergencies allowed for all 7 nests to be successful.

To ensure successful nesting at Punaluu in the future, we need to mitigate the affects of artificial lights, coconut tree roots, and roads. This area is a very popular recreational beach and visitor attraction, and it is the only easily accessible Hawksbill nesting beach for public. However, most users are unaware that Punaluu is an important nesting site for Hawksbill turtles and that the habitat has been modified. It would be very opportunistic to develop an educational and interpretive program on sea turtle conservation and to involve the local community, tour groups, and government officials. Examples of this involvement and cooperation could be monitoring of nest sites by school groups and residents ("adopt a nest"), developing interpretive exhibits, closing the beach road during the nesting season, shielding and reducing the affects of street lights, and removing coconut trees and replanting with indigenous vegetation such as maupaka and pohuehue.

For the upcoming nesting seasons, we need to continue our monitoring and predator control efforts. However, in addition to emphasis to Kamehame and Apua, we need to enhance our coverage at Punaluu, Kawa, and Halape. The lesser number of nesting activities found at these beaches may have been a result of minimal monitoring.

To develop a comprehensive recovery effort for this species, we need to inventory other remote beaches on the island of Hawaii. Since 1989, we have only monitored the beaches from Hawaii Volcanoes National Park to Kau on the southeast coast of the island. We have received reports from hikers and fishers of possible nesting along the south Kona coast at Pohue, Keluli, and Kahakabakea, however, personnel and funding constraints have prevented any follow-up monitoring.

Left Front Flipper	Right Front Flipper	Left Rear Flipper	Right Rear Flipper	Date	Location
B-757	B-755	B-767	B-766	June 18, 1995	Kamehame
B-762, B-763	B-761			June 28, 1995	Kamehame
B-771				July 9, 1995	Kamehame
B-775	B-772			July 11, 1995	Kamehame
B-774	B-773			July 17, 1995	Kamehame
B-777	B-778			August 11, 1995	Kamehame
(*N-439)	(*N-440)		B-800	(*initially tagged on September 3, 1991); B-800 on August 22, 1995	Kamehame

Satellite telemetry using the Argos system was implemented at Kamehame. Transmitters each weighing 765 grams were attached to the frontal section of the carapace using silicone, fiberglass cloth, and resin. The transmitters were programmed to synchronize with satellite overpass.

Results

A total of 67 Hawksbill nests were found—53 at Kamehame, 7 at Apua, 4 at Halape, 2 at Kawa, and 1 at Punaluu. Tracks and diggings were found at Ninole but no nest was confirmed. Thirteen tagged Hawksbill turtles accounted for 58 nests; unobserved turtles accounted for the remaining 9 nests. Of the 13 turtles, 6 were tagged in 1995 (see attached), 5 returned on a 2-year nesting cycle and 2 returned on a 3-year cycle.

The nest clutch size ranged from 119 to 245 eggs with a mean of 174 eggs; the nests success ranged from 35% to 100% with a mean of 81%. A total of 413 hatchlings were rescued.

Predator control resulted in dispatching 89 mongoooses, 2 feral pigs, and 22 rats. At Kamehame, a pig-barrier fence was constructed behind the nesting beach after observing numerous signs of pig activity and noting that pigs were becoming trap-wary.

Overcrowding of nests occurred at Kamehame where at least 2 of the 53 nests were destroyed by the digging activities of other nesting turtles. The nesting habitat at Kamehame is only a linear distance of about 30 meters.

A significant nesting event occurred where the same individual Hawksbill (tag #'s B761, B762, B763) nested at two different beaches. She nested twice, June 28 and July 18, at Kamehame a remote isolated beach, and once, October 2, at Punaluu a popular beach for visitors and local residents. These two beaches are approximately 4 kilometers apart.

At Punaluu, this turtle encountered difficulties digging a nest and returning to the ocean. Her initial digging attempts to construct a nest failed due to the roots of planted coconut trees. She finally nested in marginal habitat closer to a brackish pond. Upon completion of the nest, the turtle was disoriented by a street light causing her to crawl inland approximately 200 meters and be stranded along a road shoulder. With the help of a local resident couple, we managed to transport the turtle back to the ocean. The nest site was fenced to prevent impacts from people as well as to prevent predation from feral animals and domestic dogs. The nest hatched after a 75-day incubation period, 15 days longer than average. It appeared that the affects of the pond's ground water lowered the nest temperature causing the extended incubation. Since temperature is a sex determinant during incubation, it is likely that the sex ratio was skewed towards males in this particular nest.

On August 22 and 24, two adult females at Kamehame were attached with satellite transmitters. After the nesting season, both turtles migrated towards the northeast around Cape Kumukahi and headed northwest towards Hilo coast. From December 1995 through

The satellite telemetry data has indicated that the 2 nesting turtles from Kamehame have relatively short post-nesting migration but more importantly, that the nearshore waters at Hamakua coast are important resident foraging habitat for this species.

If other nesting beaches are located, we should also identify the post-nesting and resident foraging habitat for these turtles using the satellite telemetry methods. It is possible that nesting turtles may have numerous resident habitats off the island of Hawaii or that they migrate to other islands in the Hawaiian chain. The identification and protection of these migration routes and resident foraging sites are critical to the long term recovery efforts for this species.

Author: larry katahira at np--wr

Date: 8/12/97 3:07 PM

Priority: Normal

TO: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu> at NP--INTERNET

Subject: Nesting Update

----- Message Contents -----

Hi George,

Thanks for the Kealia memo.

This year has been a fairly low-moderate nesting season as compared to 1995 and 96. For instance, at Kamehame, in 1995 there were 12 turtles, in 1996 there were 9 turtles but this year only 6 nesting turtles. Usually, by August we are aware of most individuals nesting.

Here's the nesting update for Kamehame: There are 16 known nests, one hatched this past weekend. Six turtles account for these nests; five are returnees including the transmitter one, N439/N440; one turtle was newly tagged this year. The renesting interval ranges from 15 to 22 days. We expect renesting to continue to late September to early October.

It appears that the best window to transmitter turtles will be late August to early September. We will have a better idea by late this week when more nesting are anticipated.

We tagged two nesting turtles at Kawa! It's the first time for Kawa. There's five nests at Apua, one newly tagged. No activity at Halape or Punaluu.

Let's coordinate your outing soon. I'll keep you informed. Could you pass this on to Bill Gilmartin? I don't have his address.

Thanks,
Larry K.

22126 AUGUST
 1995
 N439/N440
 180 km

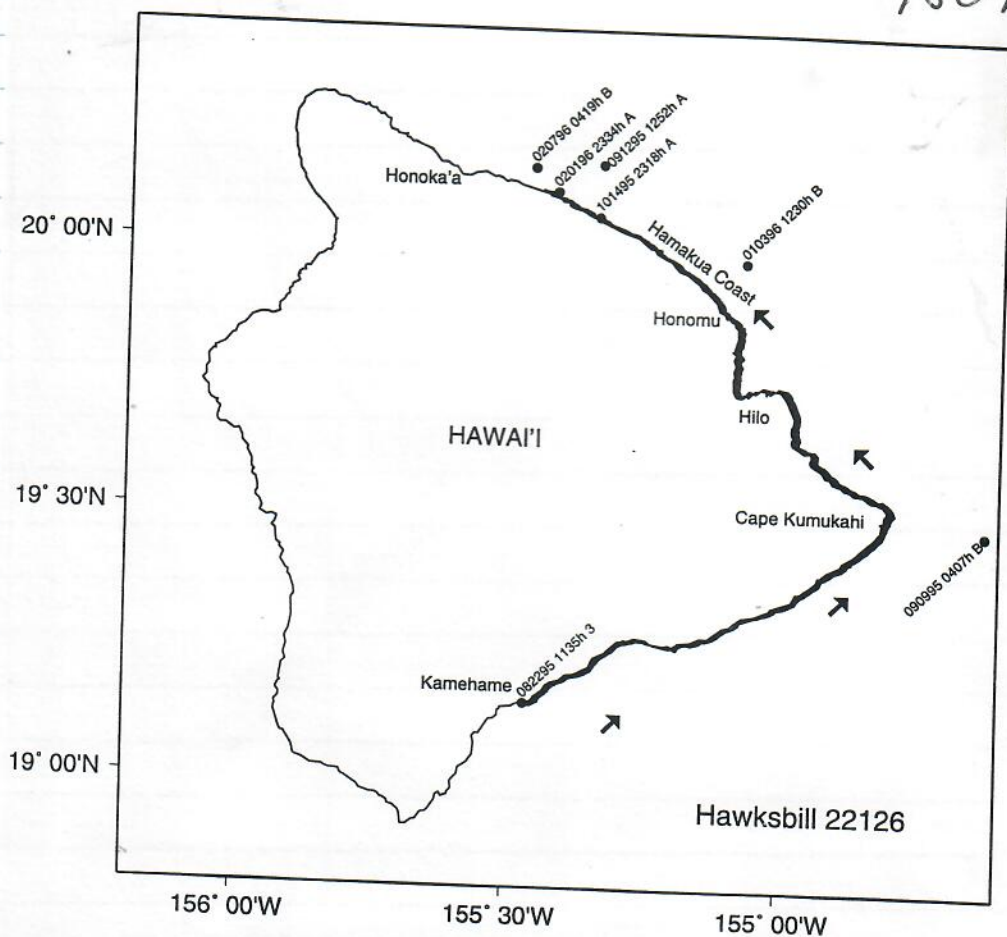


Figure 1. Post-nesting migration of hawkbill 22126 from Kamehame to the Hamakua Coast, a distance of approximately 180 km.

see p. 102
 transmitter removed
 8/22/97 nesting at
 Kamehame.

22134 August 1995
135 km

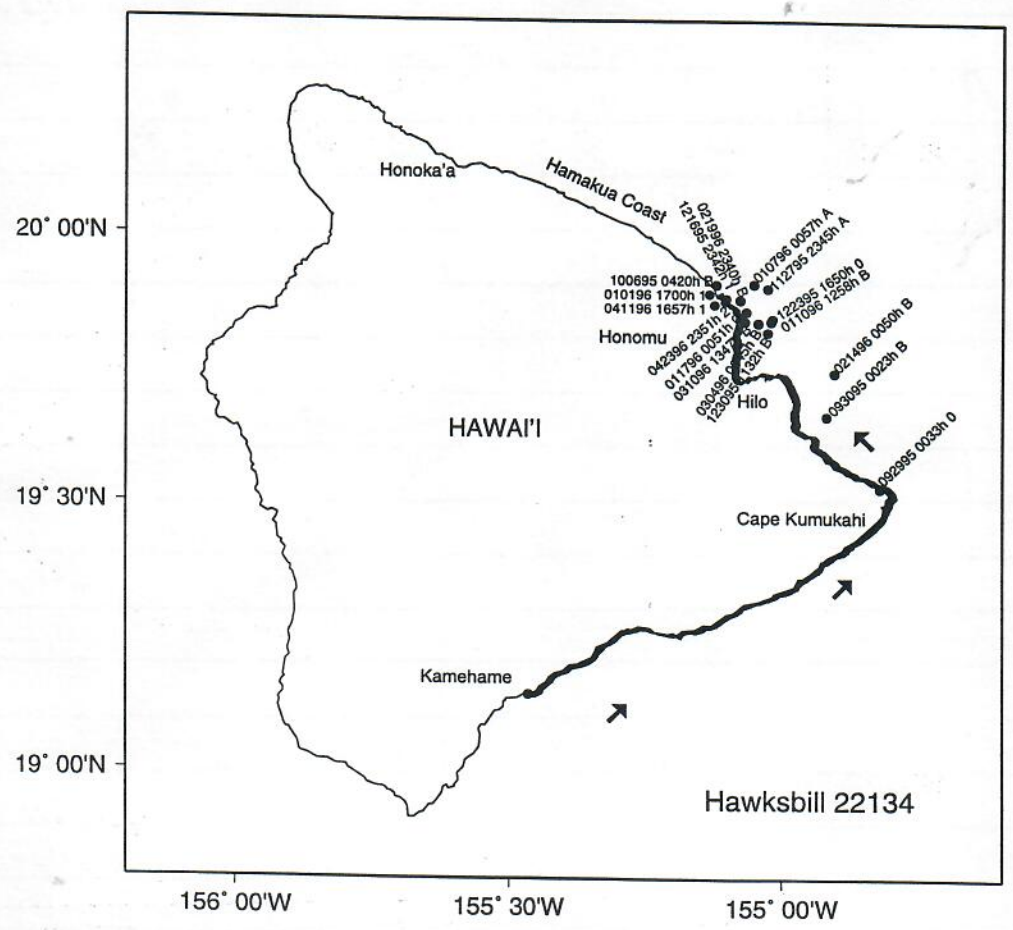


Figure 2. Post-nesting migration of hawksbill 22134 from Kamehame Beach to Honomu on the Hamakua coast, a distance of approximately 135 km.

266 p. 105
transmission records
of
Kamehame Beach

24191 AUGUST
1996

255 km

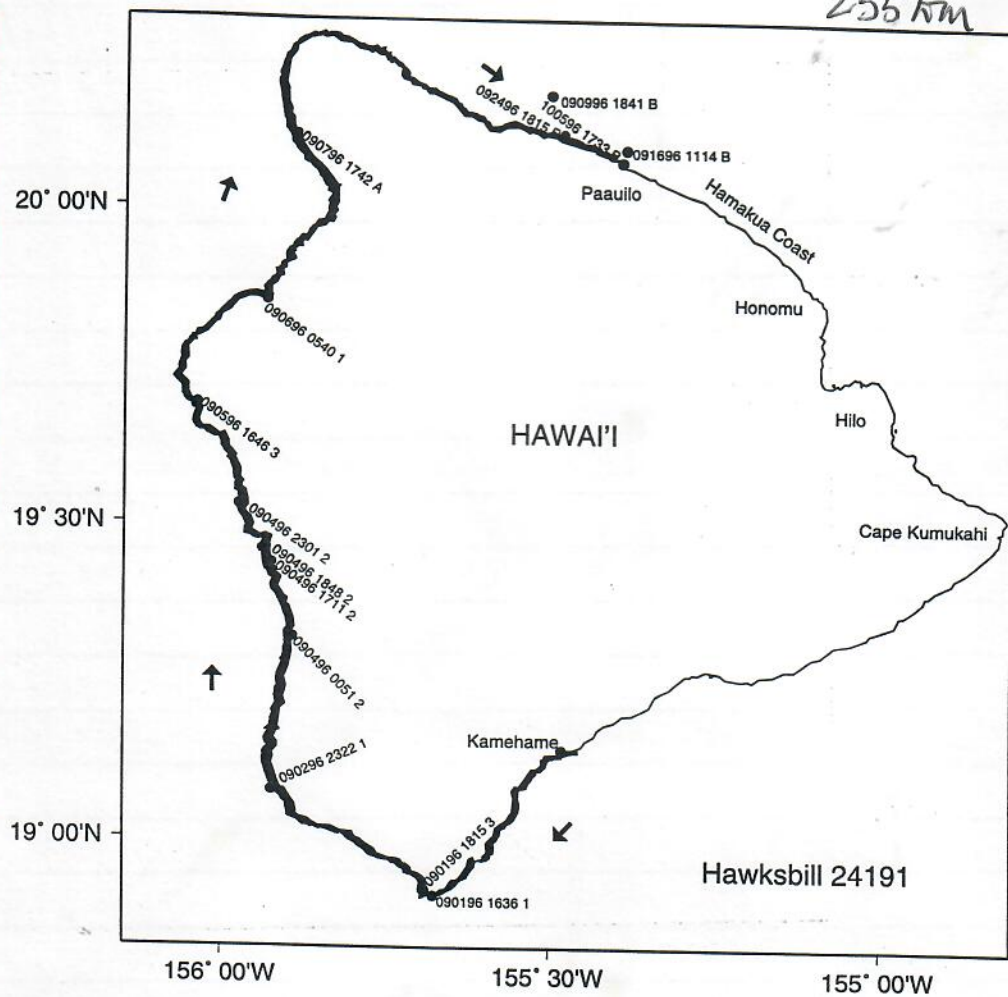


Figure 3. Post-nesting migration of hawkbill 24191 from Kamehame to Paauilo on the Hamakua coast, a distance of approximately 255 km.

TRAD A
JPPPI

2P257B

212 KM

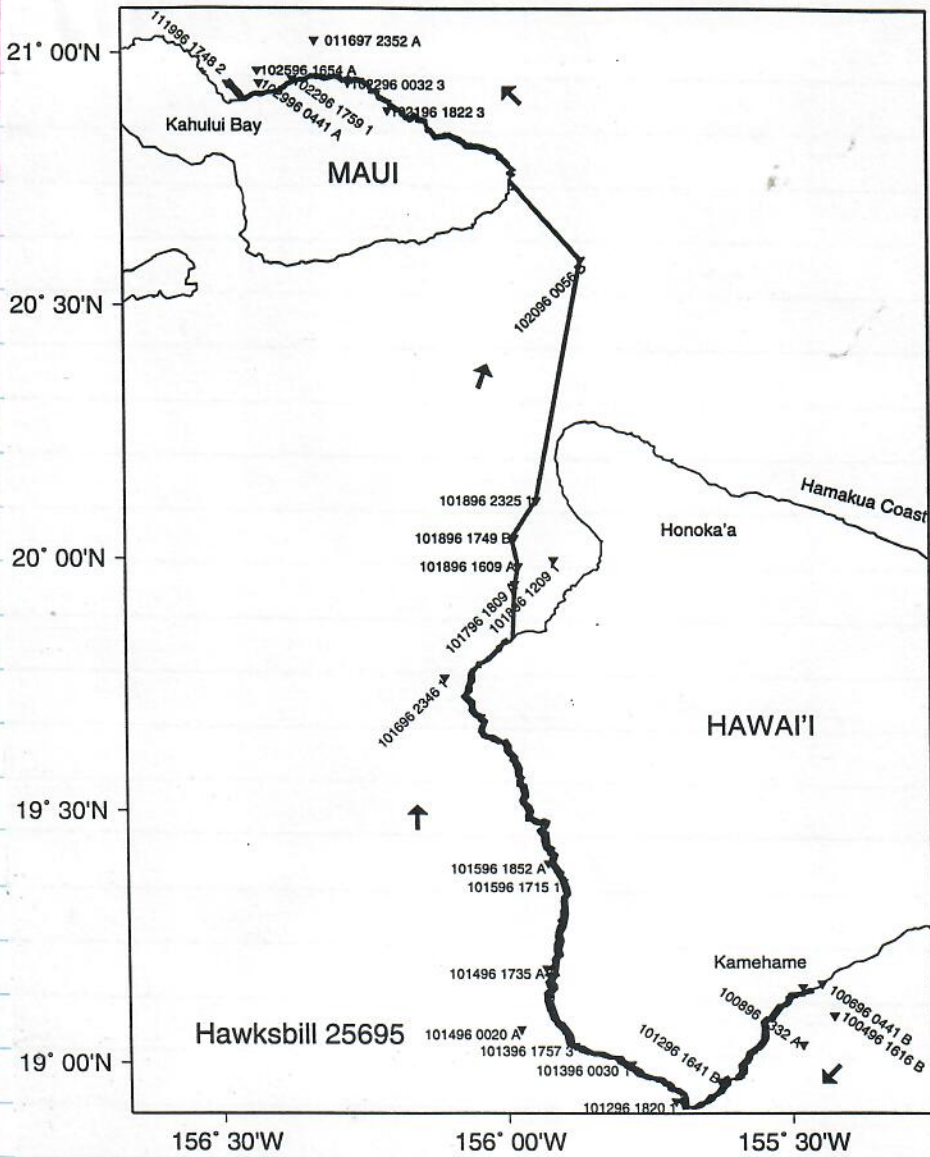


Figure 4. Post-nesting migration of hawksbill 25695 from Kamehame to Kahului Bay, Maui, a distance of approximately 315 km.

25695
AUGUST
1996
315 km

F A X
.....

Date (7/10/97)

To: George Barozz

Fax #: 808/413-1290

From: Larry Katakawa

Pages: 2

Subject: Transmitter,

Reduce

Department of the Interior
National Park Service
Hawaii Volcanoes National Park/
Resources Management Division
Mail: P.O. Box 82, Hawaii National Park, HI 96718-0082
Location: Hawaii Volcanoes National Park, Building 222
Voice: (808) 985-0096 Fax: (808) 985-4023

Reduce

Denise
with down -
word

Hi George,
Something is wrong w/ my e-mail system...
could be the modem or ??? Any way,
your message to me was received today.

Concerning the transmitter turtle, the
transmitter is still on - there were problems
w/ physically holding/handling the turtle.
As the volunteers get more experienced,
they will feel more comfortable & be able to get
the transmitter off. Usually only 2 female volunteers
are on the beach - Any way, we hope to receive
the transmitter soon. Do you have written protocols
on how to remove it? I've described the process but
it may be of your written instructions -
Larry

Larry

Here's the latest on nesting:

byna 2 nests
Kamehame 7 confirmed &
3 possible

Kawa - 2 possible ???
only tracks observed on 6/23 & 7/6
nesting sites unknown

Punah - tracks observed
on 7/4

As in past years, probably the best
time to attach transmitters is last week
of August -

See you,
Larry



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

Hawaii Volcanoes National Park

P.O. Box 52

Hawaii 96718-0052

7/16/97

Hi George,

Mooha! here is the transmitter from N439/N440. She was a turtle first tagged Sept. 3, 1991. She has since returned 1993, 1995, and this year, nested (observed nesting) on 6/14/97, 6/29/97, and last observed 7/14/97 when her transmitter was taken off.

No sightings of the other transmittered turtle B-774/B773 yet - she may be a 3 year nester - we'll see.

Hope to see you in August!

-ANNMAYEN

We Accept Your Apology. The Turtles, Alas, Do Not.

When 222 baby hawksbill turtles poked their heads out of the sand at Hawaii Volcanoes National Park last September, they were intent on doing what chelonian hatchlings do best: bumbling down the beach and into the sea to join their brethren, only a few thousand of whom survive (a statistic that ranks the hawksbill as one of the world's most endangered marine species). Sadly, a number of them never got that far. Seven weeks earlier, a group of earnest volunteers had covered the fragile eggs with wire mesh to shield them from predators—and then failed to remove the protective cage before the hatch, which began a day earlier than anticipated. By the following afternoon, 37 of the newborns had been toasted to death by the Hawaiian sun—a potentially debilitating blunder for volcanoes's underfunded turtle-protection program. "We all have our screwups," sighs Tim Tunison, the park's resource management chief, who has launched a search for turtle-friendly fencing. "But this is the most lamentable one to date."

—JAKE BROOKS, KIMBERLY LISAGOR, AND ANDREW TILIN (WITH ALBX SALKEVER)

JAN 1999 Vol. XXIX No. 1 P. 34

OUTSIDE MAGAZINE

Rede



NESTING HAWKSBILL TURTLES ON THE ISLAND OF HAWAII

July 29, 1998 UPDATE

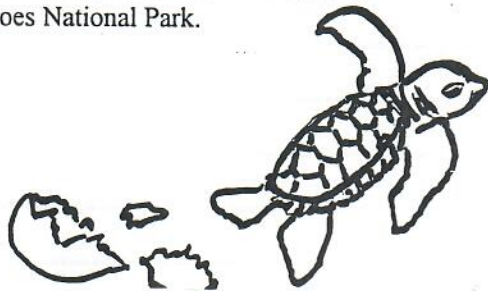
Aloha honu'ea friends! The Hawksbill Monitoring Project is once again well under way. Turtle Project volunteers are here in full force spending long nights watching, tagging, measuring turtles, and controlling mongooses and feral cats.

The 1998 season began in late May with severely drought damaged vegetation at Puu Kamehame, the most popular nesting beach. Fences have been constructed, beaches cleaned, and many flat tires changed--now we are ready for the honu'ea nesters! So far this year we have seen 12 turtles at Puu Kamehame, 8 are returnees and 4 newly tagged this season. Each of these turtles is expected to nest 4-6 times this year. We have already seen more turtles in June and July than any other season since the project began in 1989. However, they seem to be nesting later than in previous years.

Apua has escaped the drought damaged vegetation plaguing Kamehame; however, only 3 turtles have been seen at Apua, 2 of which have nested.












Exciting news! We discovered a nest at Halape on July 13. We caged the nest to protect the eggs from the many egg-eating mongooses. Hopefully, there will be many more nests at Halape from our mystery nester. Also, at Punaluu Black Sand Beach we found hawksbill tracks and false nests. Unfortunately, the habitat is impacted by a beach road. Pohue beach has possible nests and even possible monk seal tracks! We are watching closely for the return of hawksbills to Keauhou and Kawa.







Soon we will be immersed in hatchling season. The nests take approximately 2 months to hatch, each containing 125-230 eggs. Our staff will be very busy tagging mama turtles and monitoring nests as well as watching for hatchlings. In addition, volunteers will excavate hatched nests to estimate egg counts and rescue stranded hatchlings. If you are interested in helping with the honu'ea program, please contact Ali Ainsworth 985-6090 or Larry Katahira 985-6088 at Hawaii Volcanoes National Park.



**NESTING HAWKSBILL TURTLES
ON THE ISLAND OF HAWAII**

July 29, 1998 UPDATE

PUU KAMEHAME	TAG NUMBERS				NEST DATE
	LFF	RFF	LRF	RRF	
	B757/	B755	B767	B766	10-Jul NEST!!
	tagged 95				
	expect renest (25-Jul to 1-Aug)				
	N411/	B760			false nest
	tagged 92 returned 95				
	B768/	R183			29-Jun NEST!!
	tagged 93 returned 95				24-Jul NEST!!
	R194/	R195			6-Jul NEST!!
	tagged 94				
	expect renest (21-Jul to 28-Jul)				
	B770, B769/	N467			24-Jul NEST!!
	tagged 92 returned 95				
	B778/	89D			1-Jul NEST!!
	tagged 95				
	expect renest (16-Jul to 23-Jul)				
	98D/	97D (new turtle!)			2-Jul NEST!!
	expect renest (17-Jul to 24-Jul)				
	95D/	93D (new turtle!)			false nest
	65D/64D (new turtle!)				false nest
	B561/	62D			false nest
	tagged 94				
	61D/	B773			false nest
	tagged 95				
	Q827/Q828 (new turtle!)				23-Jul NEST!!

<i>1998</i>		
APUA		
	N443 N444 tagged in 94 returned in 96	false nest
	N454, B585/ Q179 tagged in 91 returned in 93 and 96	23-Jun NESTII
	R129/ R130 tagged in 93 returned in 96	3-Jul NESTII
HALAPE		
	?/?	12-Jul NESTII
POHUE		
	?/?	13-Jul Observed signs of nesting activity
PUNALUU		
	?/?	27-Jul false nest

Date: Mon, 17 Aug 1998 11:46:12 -1000
 From: Casey Jarman <jarman@aloha.net>
 To: George Balazs <gbalazs@honlab.nmfs.hawaii.edu>
 Subject: Turtle transmitter application data

[The following text is in the "ISO-8859-1" character set]
 [Your display is set for the "US-ASCII" character set]
 [Some characters may be displayed incorrectly]

*Moui
Pedure*

Info for your permit report:

Kihei hawkbill turtle:

7/18-19/98 "Sasha", tags applied: RFF: H328, LFF: H329 (under our permit)
 CCL: 89.0cm, CCW: 87.0cm
 Restraint: 12:00-01:49: 1hr, 49min.
 Applied Radio tag #411206A (148.6904mhz)

8/8-9/98 "Sasha" --turtle nested this night (5th nest of season)
 Restraint: 22:18-23:59: 1hr., 41min.
 Removed radio tag #411206A
 Applied: Sat. Transmitter #403727A - 4801 (tag turned on at 1430, 8/8)
 and Radio tag#411201A (148.6204mhz)

Kamehame turtles:

8/12-13/98 "Pahoehoe": tags: RFF: Q827, LFF: Q828 (NPS previously tagged)
 CCL: 82.0cm., CCW: 75.5cm.
 Restraint: 21:27-23:00, 1hr., 33min.
 Applied Radio tag#411202A (148.6408mhz)

8/12-13/98 "A'a": tags: RFF: Q849, LFF: 97D (NPS previously tagged)
 CCL: 87.0cm., CCW: 86.0cm.
 Restraint: 23:10-00:30, 1hr., 20min.
 Applied Radio tag#411203A (148.6606mhz)

575 9487

ID = 22134



United States Department of the Interior

NATIONAL PARK SERVICE

HAWAII VOLCANOES NATIONAL PARK

P. O. BOX 52

HAWAII 96718-0052

IN REPLY REFER TO:

11/198

B774/B773

Hi George,

Thanks for the Punaluu visitor
info sheet and the reprint.

Here's the transmitter from B774/B773
She false nested at Punaluu several
times in early Aug but nested
at Kamehame on Aug 24. The
transmitter was removed on Sept 14.

This season we confirmed only 31 nests
for all the beaches. There are still
10 nests to hatch -

I'm in a rush to go to Channel Islands for I need to assist in developing a feral pig control program.

How's everything w/ your programs?

Do you allow outsiders (myself & turtle tech or vip) to observe turtle necropsies? If so, we are very interested in learning more turtle anatomy & necropsy in general (we're not planning to do necropsies)

See ya George
Larry D.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
 Pacific Islands Ecoregion
 300 Ala Moana Boulevard, Room 3-122
 Box 50088
 Honolulu, Hawaii 96850

Big
 I.B.
 H.V.N.P.
 SEP 25 1998

1998

In Reply Refer to: KAJ

MEMORANDUM

To: Jim Martin, Superintendent, Hawaii Volcanoes National Park, Volcano, Hawaii

From: Robert P. Smith, Pacific Islands Manager, Pacific Islands Ecoregion, U.S. Fish and Wildlife Service, Honolulu, Hawaii

Subject: Dead Hawksbill Turtle Hatchlings at Halape Beach

This responds to two letters received by our office within the last week: One letter received on September 18, 1998, from Larry Katahira of your staff, and one on September 22, 1998, by a Mr. Carl Waldbauer. These letters both describe an unfortunate incident at Halape Beach in which 51 hawksbill turtle hatchlings were found dead, trapped within a predator enclosure (nest screen) surrounding the nest.

The U.S. Fish and Wildlife Service (Service) recently distributed copies of the Marine Turtle Conservation Guidelines, published by the Florida Department of Environmental Protection. The State of Florida has standardized their management techniques, with respect to sea turtle nesting activities, including appropriate nest screening. It's time for us to do so for hawksbill nesting activities in Hawaii. The Service is committed to working with the National Park Service and others to avoid and/or minimize the incidental take of hawksbill turtles. Resolving these issues and standardizing management techniques shall be the primary topic of discussion at the next Hawksbill Turtle Research Coordination meeting in November.

If you have any questions, please contact Fish and Wildlife Biologist Karen "Kitti" Jensen at 808/541-344 (fax: 808/541-3470).

cc: Carl Waldbauer
 Steve Williams
 Larry Katahira, NPS
 George Balazs, NMFS
 Hannah Bernard, HWF
 Margaret Dupree & Eugene Nitti, NMFS
 Emily Gardner, DAR
 Bill Gilmartin, HWF
 Skippy Hau, DAR
 Glynnis Nakai, FWS
 Bill Puleloa, DAR

Barbara A. Mayfield, Acting

Date: Tue, 26 Jan 1999 13:21:38 -0500
From: Larry Katahira <Larry.Katahira@ccmail.itd.nps.gov>
To: gbalazs@honlab.nmfs.hawaii.edu

Need

Hi George,

I finally got the names of those who removed the transmitter last season. Also, found out that it took several attempts because the saw was too small initially.

Summer 1998

On July 23 Tyson Trautz 802/652-9889; email ttrautz@zoo.uvm.edu, attempted to remove the transmitter but the saw was too small.

On Sept 14 the transmitter was removed by: Ivonne Budianto, email ivonne@ucla.edu and Randee Tubal 14341 Valona Dr. Baldwin Park, CA 91706.

By the way, it was nice to see you on the Big Island.

Larry

Temperature Loggers 1998

Kamehame-

#1 Installed June 14th at 0845 hrs, 45cm below the surface at the naupaka and sand interface of the main beach.
Removed December 9th at 1100 hrs.

#2 Installed June 14th at 0845 hrs, 45cm below the surface in the cave area.
Removed December 9th at 1100 hrs.

Apua-

#3 Installed July 2nd in the afternoon, 45cm below the surface near nest #1.
Removed December 16th at 1330 hrs.

Temperature loggers were not disturbed by turtles or humans to our knowledge.

Thanks George, hope to gain some good data from these.

Larry

Date: Tue, 26 Jan 1999 13:21:38 -0500
From: Larry Katahira <Larry.Katahira@ccmail.itd.nps.gov>
To: gbalazs@honlab.nmfs.hawaii.edu

Hi George, *duplicate*
GIVE

I finally got the names of those who removed the transmitter last season. Also, found out that it took several attempts because the saw was too small initially.

On July 23 Tyson Trautz 802/652-9889; email ttrautz@zoo.uvm.edu, attempted to remove the transmitter but the saw was too small.

On Sept 14 the transmitter was removed by: Ivonne Budianto, email ivonne@ucla.edu and Rande Tubal 14341 Valona Dr. Baldwin Park, CA 91706.

By the way, it was nice to see you on the Big Island.

Date: Wed, 29 Mar 2000 09:33:32 -1000
From: Casey Jarman <jarman@aloha.net>
To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
Subject: Re: In San Fran

[The following text is in the "ISO-8859-1" character set]
[Your display is set for the "US-ASCII" character set]
[Some characters may be displayed incorrectly]

Kanehawe greens

Hi Geo...

No word from Larry to me, but he doesn't know we are going to there. I have been 3x evenings, first reported to you, second and third, no turtles on the beach. We will be going a few more times and will send you a report at end of April. Atlantis will stay thru the night a couple of nights during the next 3 weeks that I will be gone, to see if any "late" comers are arriving. Received the PO, so all OK. We'll be putting in extra observ's than P.O> calls for but that's no problem at this end, wanna get a good idea of use there by greens. Potential confounding problem is that basking in winter may be different than summer!

I'm off on Thurs a.m. to mainland, till 4/20 p.m. return to Oahu, I'll be on Oahu 4/21, let's try to get together if nothing else on your schedule.

I will be getting phone reports from Atlantis (she's a great assistant), and will pass anything new on to you.

hope you had a good trip.....Bill

Date: Tue, 1 Jun 1999 11:41:32 -1000
 From: Casey Jarman <jarman@aloha.net>
 To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
 Subject: Re: away now

[The following text is in the "ISO-8859-1" character set]
 [Your display is set for the "US-ASCII" character set]
 [Some characters may be displayed incorrectly]

Geo: one turtle's signal was "lost" within 2 weeks after deployment. the other has been relocated on Hamakua coast by the Coast Guard, off shore between Paauilo and Honokaa.--we've yet to confirm this position. -Bill

> From: George H. Balazs <gbalazs@honlab.nmfs.hawaii.edu>
 > To: Bill Gilmartin <jarman@aloha.net>
 > Subject: away now
 > Date: Wednesday, May 19, 1999 3:49 PM

> I think you said you're away now. So the answer to this question will
 > have to wait your return. I'm not holding up my hawk report though
 > because of it, will just submit and make no mention of what I'm asking
 > here below.

> Your message to me 4.30 99, forwarding what you sent to Larry 8/18 98 re
 > vhf two tagged. you said there that on the 8/15 both were listened for
 > and found within 1/2 mile of Kamehame. But what about thereafter? Heard
 > anywhere, checked again at Kamehame, or ? Mahalo, Geo.

July 27, 1999

To: George Balazs

From: Hawksbill Turtle Monitoring Program

Subject: Satellite transmitter

This is the satellite transmitter removed from a hawksbill turtle at Pu'u Kamehame on July 13, 1999.

Hawksbill 24191

Thanks,

Randee Tubal
 Turtle Technician

** a Federal Express was sent to you with the transmitter enclosed. This note was ~~note~~ included in the package.

Date: Mon, 2 Aug 1999 17:26:13 -0400
 From: Larry Katahira <Larry_Katahira@ccmail.itd.nps.gov>
 To: gbalazs@honlab.nmfs.hawaii.edu, jarman@aloha.net
 Subject: Hawksbill 25695

Hawksbill 25695 returned to Kamehame on Friday July 30. Both the satellite and VHF transmitters were retrieved with no problem. This is the turtle that went to Maui three years ago. George, we will be sending the transmitter to you.

Date: Tue, 21 Sep 1999 17:36:57 -1000
From: Casey Jarman <jarman@aloha.net>
To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
Subject: Re: leaving for Midway

[The following text is in the "ISO-8859-1" character set]
[Your display is set for the "US-ASCII" character set]
[Some characters may be displayed incorrectly]

aloha.....!

Thanks for arranging for passing the positions on to me....critical time now with a possible migration to? just ahead of us.

Sent you a cy of note to Maui folks (addressees will forward it to dawn patrol, others) which I've been going to do for a while, adding the sat tag precipitated a need to send note to all anyway so did it then.

I'll be going to kamehame tomorrow with Suzanne. Our Kahului turtle is about due to renest and we;d really like to get her again.....have 2 other radio tags and will get them out there also. LK is "cooperating" in usual fashion!! He knows so little about what is going on on the beaches, it's almost hard to say this project has a "leader".

Skippy attempted an excavation of nest #2 Kihei on Monday, but apparently could not locate the nest.

Have a good/productive/safe trip. -Bill

**Report of dead *Eretmochelys imbricata* N451/N452
Apua Point, Hawai'i Volcanoes National Park, Hawai'i
By William Seitz, Turtle Technician**

On October 21, 1999, Kyle Moyer and I arrived at Apua Point around 1630. We met three backpackers who were at our camp. As we were taking off our packs, they informed us they had seen a dead turtle. We all proceeded to hike from camp out to the rocky point. The skies were overcast with passing showers and moderate winds. At 1645 we found a dead adult hawksbill *Eretmochelys imbricata* wedged between some rocks. We positively identified her as LFF N451 / RFF N452 by the tags on her flippers. Upon immediate observation, we saw no sign of blood or other external injury. Several of the scutes had come off and were on the nearby rocks. We headed back to camp as it got dark.

The next day, October 22, Kyle and I went back to the point to document and further investigate the incident. We arrived at the carcass at 1100. There was no sign of blood or any sign that the turtle had previously crawled over any of the surrounding rocks. The turtle was located approximately 75-100 meters NNE of the southern tip of Apua Point, 40-50 meters W of the eastern shoreline of the point, and 150-200 meters ESE of the typical nesting area. We observed the turtle's anterior end to be facing NNW and wedged between two rocks. It's posterior end was elevated at an approximated 45 degree angle.

We examined the dorsal side of the turtle and saw no signs of damage. Approximately 80% of the scutes had fallen off. There was visible signs of maggots and insect decay apparent on the turtle's left ventral plastron, eyes, and mouth. We prepared to bag the turtle for airlift and observed the ventral side. The plastron was weak from decay. The left front flipper, head, and neck were rotting and fluid was draining from the appendages. The appendages were stiff.

At 1245, we placed the carcass in black plastic bags. The scutes that had fallen off were placed in a separate bag and both loaded into a helicopter. They were flown to HAVO rainshed and received by Aubrey Kelly. The turtle is currently in the RM freezer awaiting necropsy.

It is my speculation that this death was a result of unusually large south swells that swept the south facing shores of Hawai'i on or around October 5th. These swells may have stranded the turtle between the rocks, where it was killed from the impact or suffered from dehydration. It is also possible the turtle may have already been dead from some other cause and was washed ashore. We determined from the amount of decay and the foul stench that the turtle had probably been dead for several weeks corresponding with the high surf during the first week in October. There was no sign of any crawling attempts.

As a result of this find, I am going to instruct future turtle monitors to thoroughly check the point on every trip for stranded turtles.

N451/N452 had a long history of nesting at Apua Point. Tagged on July 19, 1991, she came back every two years to nest. Since 1991, the Hawksbill Turtle Monitoring Program has documented a total of 18 nests by N451/N452: 1 in 1991, 4 in 93, 4 in 95, 5 in 97, and 4 in 99. She was the only consistent nester at Apua this year, and will be missed. The incident was documented with slides awaiting development.

Date: Tue, 27 Jun 2000 14:24:34 -1000
From: Casey Jarman <jarman@aloha.net>
To: George Balazs <gbalazs@honlab.nmfs.hawaii.edu>
Subject: more on kamehame

[The following text is in the "ISO-8859-1" character set]
[Your display is set for the "US-ASCII" character set]
[Some characters may be displayed incorrectly]

Forgot.....

more info of importance from Will this morning:

1. 3 nests at Kamehame to date, one previously untagged nesting turtle was tagged (presumably...since their tag loss rate is so high, i'm not sure they'd recognize an "untagged" turtle!!)
2. One night this month 7 greens were on the beach at the same time!!!...wow!...would have been a great night for tumor checking, eh?
3. He showed me a recent night's green basker tumor data sheet, which showed 2 turtles were on the beach but they were not closely examined for tumors by the volunteers -- he asked me if they should be looking harder. I told him "no", since you were coming for sure in a couple of weeks, no reason now to start spooking the turtles now and have them not come ashore later, possibly when you are there.

--Bill

Kamehame
6/23/00
708

Forward Header

Subject: Re: Kamehame green turtles with tumors
Author: Larry Katakira at NP-HAVO
Date: 06/23/2000 1:57 PM

Need Give

George,

Are you planning on staying overnight on July 9 and 10 at Kamehame or driving in and out the same night? We can arrange to loan you the gate key. Could we meet you at Punaluu or at the National Park?

There are at least three basking greens, one with a large tumor on the head. The other two might have small tumors or tumors located on the underside or in the mouth. Our workers are instructed not to get close so they are unable to note all tumors. This month three hawksbill turtles nested at Kamehame. One is newly tagged and the other two are returnees. See ya next month.

Larry

Reply Separator

Subject: Kamehame green turtles with tumors
Author: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu> at np--internet
Date: 06/17/2000 11:26 PM

Date: Mon, 20 Mar 2000 11:02:20 -1000
From: Casey Jarman <jarman@aloha.net>
To: George Balazs <gbalazs@honlab.nmfs.hawaii.edu>
Subject: tumor stuff

Reduce
handy book

[The following text is in the "ISO-8859-1" character set]
[Your display is set for the "US-ASCII" character set]
[Some characters may be displayed incorrectly]

At Kamehame evening of 3/18:

Two basking turtles observed:

#1 about 50cm SCL - small tumors on both eyelids, small tumors on both left flippers, several small tumors on neck -- largest tumors (neck/flippers were 2-3 cm)

#2 about 65cm SCL - single large (10-12cm) tumor on right neck.

Hawaii Wildlife Fund: IRS Identification Number 99-0326669

Geo.....add me back on as your volunteer?? or somehow cover my access to these greens in the contract, can you authorize me to "harass"?? -Bill

Date: Wed, 15 Mar 2000 21:37:57 -1000 (HST)
From: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
To: Larry Katahira <larry_katahira@nps.gov>
Subject: Phone message

FAXED
11:00 / 11:06
SKKIM

Larry, thanks for your phone message, I decided not to phone you back and leave a message on your recorder as asked. The 'phone tag' avenue just isn't any fun for me. That's why the God Lord made email and postal mail. Could you just send me a summary, or copies, of your data and information. Also, the names and phone numbers of the people you'll permit me to contact that made the sightings. You said that basking greens were recorded 65 nights of this past season. And that 20 of those nights there were turtles with tumors. Why did you wait until now to tell me? Also, what's the range of the number of greens recorded basking every night?

As I mentioned, I need to follow up on this, better late than never, so I look forward to receiving the facts and your contact persons. Lest you think it's not likely that hawksbills can get fibropapillomas, I want you to know that I just reviewed a manuscript giving histo documentation of a hawkbill with the disease in Brazil. George

Date: Thu, 23 Dec 1999 13:14:37 -0500
From: Larry Katahira <Larry.Katahira@nps.gov>
To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
Cc: Bill Gilmartin <jarman@aloha.net>
Subject: Re: Nests at Punaluu

Hi George,

I've been on vacation the past two weeks and will be in the office for only a couple of hours today.

One nest at Punaluu failed...most were infertile. The second nest is overdue and we will probe within the next few days.

Yes, we have discussed the problem with the pond and the possibility of hatchlings entering the pond. Thanks for your concern.

I asked the volunteers to send the data loggers with info to you. I will find out the status (tried calling them and no one is in today).

Happy Holidays,
Larry



Reply Separator

Subject: Nests at Punaluu
Author: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu> at np--internet
Date: 12/11/1999 9:36 AM

Larry, Have the two nests at Punaluu that your folks were watching hatched out as yet (emerged)? I recall them saying on 16-17 November that quite a few days had gone by for one of them. I also expressed some concern about the hatchlings going in to the pond since the nest was on the pond's downslope side of the berm. I made some suggestions and asked them to pass to you for consideration.

Best regards, George

PS Temperature loggers from hatched nest?

HACKS write protocol

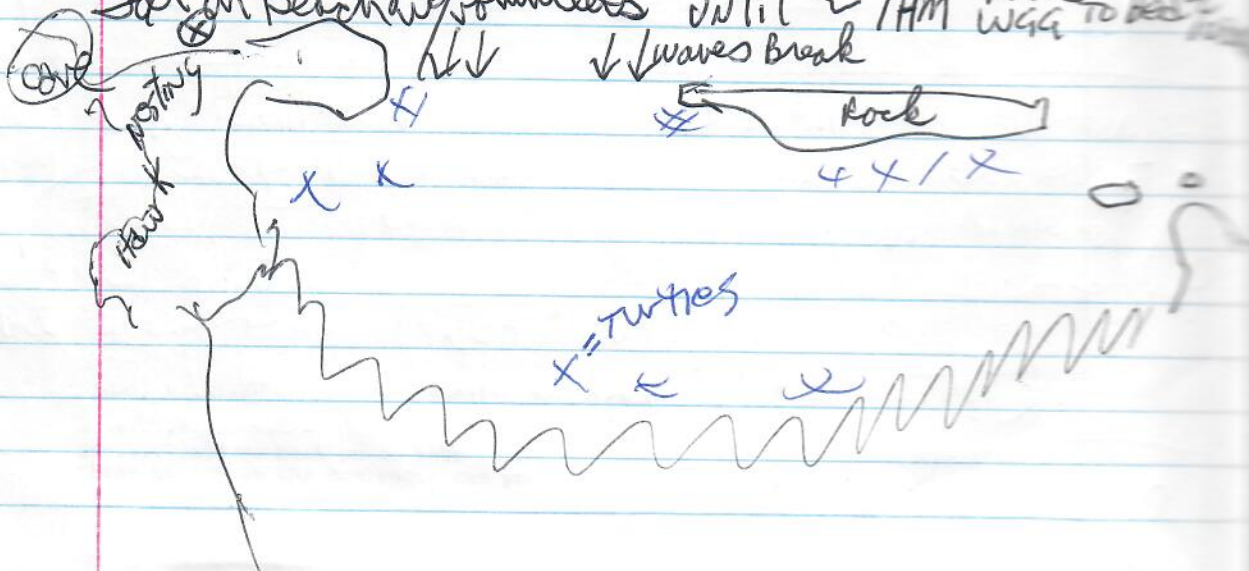
Tag Number	Date Tagged	Tag Type	Tag Position
7715	05/14/84	I681	RFL
7716	05/14/84	I681	LFL
B440	07/05/95	I681	RHF
B441	07/05/95	I681	LHF

Historical information--

Date	Type of Encounter	Location	Tumor Score	Nesting Activity	Straight Length	Since Last Encounter				Overall			
						Interval Month	Year	Growth-rates cm/mon	cm/yr	Interval Month	Growth-rates cm/mon		
05/14/84	Near Shore	Hawaii, Punaluu Bay, Horseshoe	0	-	39.8	---	---	---	---	---	---		
07/05/95	Near Shore	Hawaii, Punaluu Bay	0	-	63.4	133	11.1	0.2	2.1	133	11.1	0.2	2.1

~~Kamehame Basking 4/6/96 by WGG~~

9 July 00 ALDHA Fl. 248 130pm to HILO
 Sunday Met Marc Rice (alone) at HIA - purchase car
 #80 proceeded to Volcanoe picked up Bill's
 first left after 26 mile marker (Pearl Ave) right on 6th
 2nd house on right. TO Pahala Hospital - parked
 car at Bill's house. Down Pahala road,
 just past mile mark 53. 2 locked gates, VNP
 HP 10 waiting to guide us down. Arrived ~ 6pm
 30-40 min to drive down pipe owing w/ 10 cuts.
 Sat on Kamehame Beach > 730pm, 4-5 turtles
 in bay presumably foraging. Near dark Turtle
 w/ tumor right head seen near shore.
 Sat on Beach w/ volunteers until ~ 1AM ^{MARC} WGG to bed



Reduce trench 9/10
with report

Seaweed release 1999 X-100

SE Mike Show

7-9/00 new tagged 3332 emerged -
Sunday false start - volunteers ran to it
Monday to hold and read tag identity - At
waters edge - they got wet.
AM MAVICA digital off their data field book.

I woke up at 4:15 AM - no moon - moon had set,
Low tide - walked same home beach - no baskets.
W&G checked at 2:53 am - no baskets.

10 July 2 9:30 AM set up chairs on beach to watch
Monday for turtles. MARC - Seawater 24°C. Black
dry sand 50°C.

9:55 PM Turtle at surface - middle of channel.
Walked to core to left, no turtles seen
for foraging possibilities here seem good.

~ 10:15 AM turtle seen @ edge of rocks -
floating at surface, then dove.

10:30 AM - 12:15 PM Turtle seen close to
shore - by our sitting site. Small < 60cm stays down
a long time(?) or goes out and in(?). Turtle

(2) seen along a wash rocks each side of
channel - presumed foraging.

1-106 PM Right channel edge wave wash

1-110 PM left channel edge " "

occasional white water waves breaking all
the way across channel - more with
increasing tide

Bill
threw out
7:10 PM
Mary saw
MARC
threw in.

5-7 PM many more showed up ~ 20 - many inside
protection of rock island to the right -
Volunteers start watching at 7 PM

quit at 2 AM, basket w/ head light came up
MARC & I rolled on MARC's UHF ~ 8 PM. CAPTURE EASY. See p. 40

Freshwater
seeps to
night
14.5°C

90 INTO ANIMAL Carrier N474, N475
#2 (small) glottal + #4 Right head.
7/11 w/ w/g Palaha House HLARF
7/12 w/g shipped to KAMEHANE CREW 7/10/00

608 SCL
66.0 CCL
73/65 (Alaka'i Camp)

~~Hack
Saw Jeff
at Kamehane~~

Cheryl Gregory
In Michigan! is Tongue
Pierced girl
e-mail: cdgregor@umich.edu
or cdgregor@hotmail.com

Will
oversee
volunteers

(2) Laura Slater
email: lslater@hpu.edu or brad.kindt@juno.com

(3) Mark Jessop
email - jessopm@ucs.orst.edu
11136 W. Tufts dr.
Littleton, CO 80127

(4) Katherine Burke
kburke@vt.edu

Mari
was
HWF
w/g

Mary Jane Grady
maryjanegrady@hotmail.com
(800) 665-1873

20 Ave F Rd. N
Lahaina,
Hawaii
96761

7/11/00 A.M. ^{Volunteer} Team came back to camp 2 AM - no turtles seen. I
Tuesday woke up and checked at 4:15 AM, basket present -
turned in over and dropped up ferns. Returned up
at first light to tag/record data (p.91). Drove up
dirt road ~ 7 AM (35 minutes).
To w/g Palaha house (O'Hia Street).
MARC left for HPA,
Mary Jane & I drove to Punaluu [see
other book

Kamehame, BIG Island 91

7-11-00 4:52 am BASH
green turtle

CCL 72.0

SCL 65.3
N 65.3

6-7th battered abrasion

43 LIQ

UH ^{new}

41356A307E



^{new}

RH



500E12450F

PL 53.6

PPS - Y

TAIL T-14 C-9.5

HEAD - 10.1
RFF 13.0

90 lbs

Left JH 2 suspicious smooth bumps

24.7 DB

24 Radiometer

"

K 1"

nototool ^{new}

No live PL BARRS on 2nd lat LHR

Blood Sample for T. Work

Frank Wiener
150 Loomis Court
Princeton, New Jersey 08540

Wienerfr@aol.com

George H. Balazs
National Marine Fisheries Service
Honolulu Laboratory
Southwest Fisheries Science Center
2570 Dole Street
Honolulu, Hawaii 96822-2396

July 28, 2000

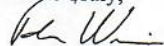
Dear George:

Thank you very much for the wealth of information that you sent us on Hawaiian sea turtles. It is truly encouraging that there is so much interest in the well being of these fascinating creatures. We admire very much your work with the sea turtles. In fact, my wife saw you on TV this week during the PBS special about Hawaii's sharks. It's not every day that we receive personal letters from television personalities.

I just wanted to make one very important point about the situation that we observed in March and about which we earlier wrote to you concerning the sea turtles at Punaluu County Park on the Big Island. Our experience with people, mostly tourists, who repeatedly harassed the turtles on the beach near the concession at Punaluu did not involve tour busses or tour drivers but rather people who were arriving at the beach in private cars, probably rented cars. During our hour-long visit, we did not observe any tour busses. While a "tour bus driver education program" is an excellent idea, we still believe very strongly that the signs advising of the protected status of the turtles are entirely inadequate at Punaluu. There must be more of the signs and they must be more easily readable by the visiting public. In addition, while we realize that the issue of public access to beaches in Hawaii is a very sensitive subject, our feeling is that the sea turtle habitat at Punaluu is just too easily accessible to automobiles. At a minimum, the concession stand needs to be moved away from the turtles' habitat and cars should be prohibited from coming anywhere near the turtle habitat.

Again, we very much appreciate all of the work that you are doing for marine wildlife in and around Hawaii. We will also send a letter to the director of Hawaii County Parks with our suggestions. Thank you again for your concern and your work.

Yours Truly,



Frank Wiener

Date: Sat, 8 Jul 2000 12:15:52 -1000 (HST)
 From: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
 To: Hawksbills Hawaiian -- Bill Gilmartin <jarman@aloha.net>, Bill Puleloa <puleloa@aloha.net>, Allen Tom <allen.tom@noaa.gov>, Glynnis Nakai <glynnis_nakai@fws.gov>, Bob Morris <gturtle@aloha.net>, Thierry Work <thierry_work@usgs.gov>, Craig Rowland <Craig_Rowland@r1.fws.gov>, Marc-HPA Rice <mrice@hpa.edu>, Hannah Bernard <wild@aloha.net>, John Lindelow <cybernet@lava.net>, Barbara Schroeder <Barbara.Schroeder@noaa.gov>, Sandy MacPherson <sandy_macpherson@fws.gov>, Karen Rosa <karen_rosa@r1.fws.gov>, Walter Dudley <Dudley@hawaii.edu>, John Coney <jconey@hawaii.edu>, "Peter H. Dutton" <peterd@caliban.ucsd.edu>, Leon Hallacher <leonh@hawaii.edu>, Marilet Zablan <marilet_zablan@r1.fws.gov>, Therese Conant <therese.conant@noaa.gov>, Kitti Jensen <kitti_jensen@r1.fws.gov>, Larry Katahira <larry_katahira@nps.gov>, Laura Sasaki <tubalesn@pixi.com>, Roz Rapozo <infinity@lava.net>, Van Dacanay <van_ess_p_dacanay@exec.state.hi.us>, Margaret Dupree <margaret.dupree@noaa.gov>, Russell Sparks <russell_t_sparks@exec.state.hi.us>, Skippy Hau <skippy_hau@exec.state.hi.us>, Steve Williams <williams@mauigateway.com>
 Subject: Disease Transmission Threat

Hello, I apologize for the long address list, but this is important. I'm writing to make all of you aware that starting tomorrow several of us will be traveling to Kamehame to do a first-hand assessment of the tumored green turtles that have been hauling out to rest (strand?) at night on this beach. Apparently this has been occurring for over a year. Those of you that have visited the vital (to hawksbills) Kamehame beach know how really small it is.

To date, no hawksbills in Hawaii have been found with fibropapilloma tumors. However, over the past year the occurrence of this disease has been histologically confirmed (for the first time) in hawksbills, in Queensland and in Brazil. The presence of tumored greens in proximity to emerging nesting hawksbills at Kamehame, and hatchlings scurrying into the sea, makes us very uncomfortable with respect to potential disease transmission. Feces, urine, eye secretions, ulcerated bloody tumors, flaking of skin, and other routes, both terrestrial and in near shore waters of Kamehame, could represent very potential and even real threats to Hawaiian hawksbills. Clearly the situation needs to be appraised. I'll write to you again in about a week to tell you the outcome. George

Without causing disturbance and without a means of easily identifying individual turtles from a distance at night, it is not possible with these data to determine the total number of individual animals these basking numbers represent. Likewise, it is not possible to estimate the number of turtles with tumors. If the frequency of basking by tumored turtles is the same as that of non-tumored animals, then we can only conclude that about half of the observed basking turtles have fibropapilloma tumors.

Green Turtle Observations at Kamehame

March 18 - April 9, 2000

Contract Report
for
Marine Turtle Research Program
National Marine Fisheries Service
Honolulu Laboratory

Submitted By
Hawaii'i Wildlife Fund
P.O. Box 70
Volcano, HI 96785

May 17, 2000

Green Turtle Observations at Kamehame

March 18 - April 9, 2000

Hawaii Wildlife Fund conducted observations on the beach at Kamehame, Hawaii Island on seven nights between March 18 and April 9, 2000 looking for basking green turtles on the full length of the beach. Turtles observed on the beach during the observation periods were examined for the presence of fibropapilloma tumors. Turtles were usually approached from behind and observed as close as possible using red filtered light.

The dates and times of our observations, number of turtles seen, and tumor findings are presented in Table 1. Our usual attendance on the beach was from sunset until 2100h because anecdotal information we had obtained on green turtle basking at Kamehame suggested the turtles usually came ashore soon after sunset. The one night (4/8/00) that we stayed and observed the beach throughout the night, the only two turtles that came ashore that night arrived at about 2000h.

During our seven nights, we believe we saw only one turtle return to the beach - a turtle observed on 3/30/00 and 4/6/00. All but one basking green turtle we observed were in the area of beach below the naupaka shrubs where the hawksbill turtle nesting occurs. The single exception was on 4/3/00 -- this turtle hauled at the Punalu'u end of the beach, below the southwestern slope of the Kamehame cindercone.

In Table 2, we present a comparison of our 2000 data with that of the National Park Service (NPS) collected in 1998 and 1999. Our number of observations is small, but the fraction of turtles observed with tumors is similar to the NPS data (HWF: 50%, NPS: 42%). Other problems with comparing these two data sets is that the HWF observations were directed at detecting basking green turtles and examining them as closely as possible (without disturbance) for presence of tumors, the NPS observers were monitoring hawksbill nesting activity and the degree of effort they may have dedicated to looking for the basking greens or identifying tumor presence is unknown. Additionally, the NPS observers were not trained in tumor identification and may not have detected small tumors, such as those we saw on turtles on the evenings of 3/18 and 4/06. The attention of the NPS observers to hawksbill nesting may have precluded them detecting green turtles basking at the Punalu'u end of the beach, where we observed one of our six turtles. The seasons of data collection are also different, the HWF data was collected in March and April, the NPS data later in the year, during the hawksbill nesting season.

The NPS data show that greens coming ashore may arrive after 2100h, as late as 0400h. NPS notes reveal that 44 of their 71 turtle arrivals were before 2100h and 27 after this time. Of those after 2100h, about half arrived before 2400h, the balance by 0400h.

Table 1

Green Turtle Observations at Kamehame

March-April, 2000

Date	Time	No. Turtles	Tumors Observed	Comments
3/18/00	1830-2030	1	Y	50cm SCL, small tumors on eyelids, both left flippers, neck.
		1	Y	65cm SCL, single 10-12cm tumor on neck
3/21/00	1900-2100	0		
3/26/00	1815-2100	0		
3/30/00	1915-2100	1	not examined	At water line, could not approach
4/3/00	1900-2100	1	N	60cm SCL
4/06/00	1900-0700	1	Y	60cm SCL, Tags: 7715, 7716, small tumor probable on left eyelid - may be same turtle seen on 3/30/00.
4/9/00	1900-2100	0	N	90-95cm SCL

Table 2

Green Turtle Observations at Kamehame

Summary Comparison 1998 -- 2000

Rough comparison of HWF and NPS tumor observations (turtle numbers do not reflect possible repeat baskings by some individuals)

Hawaii Wildlife Fund (3/18 -- 4/9/00)

Total Nights	Nights w/ Turtles	Total Turtles	Turtles w/ Tumors
7	4	6	3 (50%)

National Park Service (1998 -- 1999)

Total Nights*	Nights w/ Turtles	Total Turtles	Turtles w/ Tumors**
Unknown	37	71	30 (42%)

* NPS green turtle data sheets received appear to have been completed only for nights when turtles were observed basking, so number of total nights is not available.

** The number 30 noted here is total from the NPS data sheets where a "Y" or "yes" appears in tumor column. From the NPS data sheets, we counted 41 turtles with "no tumors present" based on 12 turtles where a "no" was recorded as well as 10 where a "N/A" appeared in the column and 19 where no entry appeared in the tumor column.



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Hawaii Volcanoes National Park
P.O. Box 52
Hawaii 96718-0052

7/16/97

Hi George,

Aloha! here is the transmitter from N439/N440. She was a turtle first tagged Sept. 3, 1991. She has since returned 1993, 1995, and this year, nested (observed nesting) on 6/14/97, 6/29/97, and last observed 7/14/97 when her transmitter was taken off.

No sightings of the other transmittered turtle B-774/B773 yet - she may be a 3 year nester - we'll see.

Hope to see you in August!

-ANNE YEN

102

Date: Mon, 30 Jun 1997 12:51:08 -0400
From: larry katahira <larry_katahira@nps.gov>
To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
Subject: Re[2]: Tags for your project

George-

This is just to let you know the Hawksbill transmitter turtle from 1995 (tags N439 / N440) nested last night, June 29, for the second time this season. The first time was on June 14.

-Larry

Recovered

see p. 101

→ 7/14/97 Sent to me by
ANNE YEN
ID: 22126
Syst. 208555

I am posting this on behalf of a student seeking help. Please send replies to myself or the server and I will forward them to him. Thanks in advance.
Annette

During the forthcoming summer I will be carrying out a project on insect infestation on turtle nests. I would be most grateful to anybody who has carried out any similar work, or has any relevant information, to send me the appropriate references as I am having difficulty acquiring sufficient literature at the present moment.
Thank you,

Annette Broderick

Braham Kerr Building
Division of Environmental & Evolutionary Biology
B Glasgow University
G12 8QQ
U.K.

Tel: 0141 330 6013
Fax: 0141 330 5971
Tel: 00 44 (0)141 330 6013 drop 0 outside UK
Fax: 00 44 (0)141 330 5971 drop 0 outside UK

James K. Wetterer
Assistant Professor

Center for Environmental Research and Conservation (CERC)
Mail Code 5557
1200 Amsterdam Avenue
Columbia University
New York, New York 10027

Phone: (212) 854-8060; FAX: (212) 854-8188; e-mail: jw272@columbia.edu
http://www.columbia.edu/cu/cerc/faculty/wetterer.html

The same thing happens if the raccoon gets in at hatching time. The fire ants are only a secondary in those instances. Many of the establishments on the beach are trapping the coons so their predation is declining, but the ants aren't. I will have to get the data from work and let you know the percentage of our nests that were affected by fire ants. If you have any ideas of what we should specifically be taking note of on the beaches, let me know. I have made up a fire ant data form that staff fills out for me, but I'm just guessing on what will be useful data. I have no guidelines.

We have had our ants identified on several occasions, they are the "lovable" RIFA's. We had one instance of another black ant that was found predated a nest, but I'll have to check at work on the species name. I am very interested in "collaborating on the impact of ants on sea turtles". Please keep in touch and share the information you find out.
Good luck.
-kim

Date: Thu, 3 Apr 1997 09:09:27 -0500
From: Leroy Humphries <humphrie@belle.baruch.sc.edu>

I worked with sea turtle nests on the Waites Island, the northern-most barrier island in SC for the past two summers. We had problems with fire ants invading our nests. They never attacked whole eggs, and we never found where they had attacked healthy hatchlings, but the nests were infested with them. We had several that were dead for no apparent reason, however. Although I will be unable to work with them very much this summer, I will try to monitor the situation and will let you know if anything develops.
Leroy Humphries
humphrie@belle.baruch.sc.edu

Date: Thu, 03 Apr 1997 09:34:50 -0500
From: Craig Allen <craig@ENV.UFL.EDU>

James:

Beth and I found it humorous that we both independently responded to you (we are easily amused). We have for some time been planning to submit a grant that will seek to document invicta on SE US beaches in relation to nesting sea turtle density and other variables, and explore potential impacts in the wild. Our lab work documents the possibility of severe impacts, but field reports remain wholly anecdotal. During beach sampling, we will document other ant species as well.

I wouldn't be surprised if *Solenopsis geminata* - a fire ant native to the SE - were a problem on beaches of Hawaii as well. While *geminata* is handily outcompeted and displaced by *invicta*, *geminata* also has been introduced to a wide range of sites, where it has become problematic.

I think that your method of involving the folks on site around the world is probably the most efficient for sampling of that scope. Observed interactions between ants and other fauna would be useful.

Beth and I have been successful in our research into *invicta*-native fauna interactions because we always sought collaborative efforts, thus we would be interested in collaboration with you if mutually beneficial.
Craig Allen

Date: Thu, 24 Apr 1997 11:52:55 +0100
From: Annette Broderick <893617br@UDCF.GIA.AC.UK>

Meg Lamont

Date: 01 Apr 1997 14:29:54 -0500

From: Kathy Moore <Kathy.Moore@noaa.gov>

Jim -- I have seen this happen to loggerhead hatchlings on Melbourne Beach, FL. The ant involved was our regular fire ant which is common in the Southeast US (sorry, don't know the species). Earlier in the evening, the nest showed signs of hatching (usually, a depression in the sand over the nest cavity), and I saw ants in the vicinity. I came by a short while later, and noticed the ants were significantly more numerous. When I investigated closely, I discovered that two hatchlings which had been waiting to emerge and were just below the surface of the sand had been killed, and had ants crawling in their eye sockets. They were very lightweight, having had most of their internal organs consumed. Live hatchlings were also near the top of the nest, and some had ants on them. I brushed them off and set them on their way down the beach. The ants clung to the tenaciously, and the hatchlings seemed to feel the bites (this may not seem like news, but in general, I have not found sea turtles to always be sensitive to things that would be painful to us). -- Kathy

Kathy Moore
NMFS-Charleston Laboratory
219 Fort Johnson Road
Charleston, SC 29412

From: JKamp2@aol.com

Date: Wed, 2 Apr 1997 23:01:58 -0500 (EST)

My name is Kim, I work on the sea turtle program for the Collier County Natural Resources Department in Naples, Florida. I monitor a 3 mile stretch of beach during turtle season. At FSU I worked in Dr. Tschinkel's lab with carpenter ants and fire ants, so I have a baseline knowledge of them. I have been looking for published information on their involvement with sea turtle nests as well, but with little luck. Last season I had our staff take notes and fill out a form on when they saw the ants and how many eggs/hatchlings were affected by them. But I would not say the ants are the leading cause of mortality for the hatchlings on our beaches. My situation has been that the ants are not a threat until the nest hatches. The permit guidelines states that we cannot excavate the nest until 3 days after hatching to allow all the turtles to emerge on their own, then we can dig them up to count the egg shells. Many times the ants find the emergence hole the day following the first hatch. Quite often hatchlings get snagged on roots and will struggle to get free allowing sand to slip around them and bring ants with them. I've found hatchlings with just their head sticking out of the cavity and covered with ants, followed by a few others beneath them, also tangled in roots. But the ants are only on the surface, often below these upper hatchlings are others waiting to get out, but have not yet been found by the ants. I've even pulled free the entangled hatchlings and scooped down as far as the ants go to clear the area and then smooth over the cavity to continue waiting out the 3 days before excavation. I've found that the ants don't get back into the cavity, (unless more hatchlings get snagged and struggle at the surface) and I still am in compliance with the guidelines. Another thing that happens is that we have raccoon predation. The raccoons like the freshly laid eggs or the freshly hatched ones. They don't seem to like the embryo stages. They dig up the nest just after its laid and leave the cavity open and the eggshells strewn everywhere, then the ants clean it all up.

Hi Jim,

I am a Sea Turtle volunteer on Ocean Isle Beach, NC. Last year I responded to a Research Coordinator with the University of Georgia, Mr. Stan Diffie. I had explained our experiences with fire ants and emerging Loggerhead hatchlings. It was our experience that fire ants did not attack the egg until it started to crack, then they swarmed in and attacked the eyes first then proceed to other soft parts of the hatchling. The eyes were clouded over and there were multiple raised bumps were they were stung. These turtles exhibited a kind of paralysis and were extremely lethargic. Most of the hatchlings died from the infestation. I originally responded to Mr. Diffie explaining our solution to this problem. I heard about this tactic from an elderly gentleman that had attended our St. Sea Turtle Workshop when I posed the question of what we could do to kill the ants without harming the hatchlings. Here is what we did: As a new laying season was upon us, I supplied each of our walkers with a canister of GRITS. They were instructed to sprinkle these grits around the perimeter of each nest, at least every other day and especially after a rain. The ants would eat the grits and their body fluid would cause them to swell and thus kill the ants. We had great success with this method. Mr. Diffie was compiling a manual for Sea Turtle volunteers and was looking for information of this kind. Perhaps he can help you. His address was: Stan Diffie, Dept. of Entomology, University of Georgia, Tifton, Georgia 31794, diffie@tifton.cpes.peachnet.edu.

As I said, this took place 2 yrs. ago, I hope the address is still available. This past nesting season we had a different problem (other than hurricanes), it was fox. Prior to this year, we had no problem with fox, which could account for our ease in discouraging them. The problem only occurred on the western end of our island, as there is a heavy undergrowth of trees, brambles and grass. The problem started midway through our nesting season and only occurred at nests that had started hatching. The fox would come in the night and dig out the remaining eggs/hatchlings. They destroyed four nests in one night and continued several other times as the nests began to hatch. We figured it would be just a matter of time before the fox caught on that all these nice little screened off places contained food, so my husband came up with the idea of sprinkling cayenne pepper around the nests after we closed them up for the night. He read it in the book "Cool Hand Luke", apparently "Luke" used it to throw off the bloodhounds that were chasing him. I wish we could have seen the fox that night. The day after putting the pepper down, we went out to check the nest and found fox tracks going right up to the ring of pepper and an abrupt about face as it left. We were never bothered with fox again as long as we remembered to put the pepper down after we closed up an active nest. Hope these suggestion are of some help to others.

Judy Simmons
Sea Turtle Volunteer

Date: Mon, 01 Apr 1996 08:53:21 -0500
From: "Margaret M. Lamont" <mmlam@GNV.IFAS.UFL.EDU>

Dr. Wetterer:
There is a Ph.D. candidate at the University of Florida that is the local expert on red imported fire ants. His name is Craig Allen and his phone number is (352) 846-0638. Sorry...I don't know his e-mail. He's investigated fire ant predation on several species including sea turtles (white-tail deer and quail also). I conduct sea turtle research along the Florida Panhandle and have had a few instances of fire ant predation on hatchlings, but nothing serious, although ants are prevelant in the area. I hope that helps...

nesting by hawksbill turtles. Not more than 10-15 turtles use in in the very best of years. The ants swarm over the turtles, their eggs, and the resulting hatchlings. But... there has never been any evidence of attack or injury.

My reason for telling you is that if your study moves ahead you may want to have a "control" where ants are introduced and abundant but as near as we can tell harmless (though they drive me crazy when camping there)

When I get back next week I'll write to you again and provide species, etc. Fact is, is this moment (I'm at home) I've forgotten.
Aloha, George

* George H. Balazs, Leader *
* Marine Turtle Research Program *
* National Marine Fisheries Service *
* Honolulu Laboratory *
* 2570 Dole Street *
* Honolulu, Hawaii 96822-2396 USA *
* Tel: (808) 943-1240 *
* Fax: (808) 943-1290 *
Email: gbalazs@honlab.nmfs.hawaii.edu

Date: Mon, 31 Mar 1997 13:11:14 +0100 (BST)
From: BRENDAN GODLEY <8741061g@udcf.gla.ac.uk>

Dear James

We work in Cyprus, E. Med. and have found cases of ants invading nests. Will collect if we find any this field season. After the holiday weekend you are likely to get replies from american colleagues as there have been at least a couple of published accounts of fire-ants in the annual sea turtle symposia. if you get nor replies the contact me again in the middle of the week.

Brendan
Brendan J. Godley<b.godley@udcf.gla.ac.uk>
Glasgow University Turtle Project
Graham Kerr Building
Division of Environmental & Evolutionary Biology
University of Glasgow
G12 8QQ

tel: 00 44 (0)141 330 3533 drop 0 outside UK
fax: 00 44 (0)141 330 5971 drop 0 outside UK
email: 8741061g@udcf.gla.ac.uk

Date: Mon, 31 Mar 1997 11:36:05 -0500
From: PJE@zoo.ufl.edu (Peter Eliazar)

Dear Dr. Wetterer, Welcome to the list. For further background on ants attacking sea turtle nests and hatchlings, try searching the Sea Turtle Online Bibliography. I am attaching instructions for accessing the bibliography below. Good luck! Sincerely, Peter Eliazar

(NOTE: I checked this and there were no articles on ants attacking sea turtles.)

Date: Mon, 31 Mar 1997 17:08:48 -0500
From: "Judy R. Simmons" <JSimmons@INFOAVE.NET>

any knowledge of the degree of impact, is lacking. Recently I documented 70% mortality of *Pseudomys nelsoni* hatching in the presence of *S. invicta* (*P. nelsoni* as a surrogate for sea turtles) (unpub data; presented at turtle mtg), and indirect impacts on alligators stung non-lethally while hatching - i.e., reduced wt gain (J. Herp 31:In Press). Given the overlap of US sea turtle nesting beaches and *S. invicta*, the possibility of negative effects is real, and includes death while hatching/pipping, reduced wt gain of stung hatchlings, secondary infections from stings, and loss of flippers due to the necrotic action of the venom. The current practice of excavating turtle nests greater than 48 hrs after turtle emergence makes it impossible to judge the impacts of *S. invicta*, as no trace of consumed hatchlings may be left. We continue to monitor *S. invicta* occurrence on nesting beaches in FL, and continue to discuss implementation of an experimental protocol to determine population level impacts - especially important because it is safely possible to control *S. invicta* in limited areas if it is biologically warranted.

Craig R. Allen

 Date: Mon, 31 Mar 1997 00:00:34 -0500 (EST)
 From: Jeanette Wyneken <jwyneken@ACC.FAU.EDU>

Greetings!
 While I haven't watched the attack behavior of ants, I have experienced fire ant killing large numbers of hatchlings that were alive (so we are not talking about ants cleaning up after some other sources of mortality). I have experienced what I believe are two species of fire ants killing parts of clutches. On the east coast of Florida I had two nests attacked after a diurnal nest emergence at Canaveral National Seashore (Brevard County FL). In Boca Raton, FL (southern Palm Beach County) fire ants are a major problem on some sections of beach, though not the entire section. On Long Baot Key Florida (Sarasota, FL) a different larger, darker colored fire ant get's into the nests prior to hatchling emergences and can kill major portions of the clutches). My experience with that ant is it's bite is more severe (I still have scars from rescuing hatchlings on Long Boat Key (Florida's west coast) 3.5 years ago). I encounter the east coast fire ants fairly regularly; they don't leave long term scars, but do kill hatchlings. I'd be more than happy to pickle some of those ants for you. Perhaps the quickest way to get some ants from Florida's west coast beaches is to contact Jerris Foote, at the Mote Marine Lab (jerris@marinelab.sarasota.fl.us) She runs their sea turtle program and is a great contact.
 I hope this is of some help.
 Sincerely,

+	Jeanette Wyneken, Ph.D.	+	Ph. 561-367-2747	+
+	Dept. of Biological Sciences	+	Fax:561-367-2749	+
+	Florida Atlantic University	+	e-mail: jwyneken@acc.fau.edu	+
+	777 Glades Road	+		+
+	Boca Raton, FL 33431-0991	+		+
+	USA	+		+

 Date: Sun, 30 Mar 1997 18:55:01 -1000 (HST)
 From: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>

Jim- I'm on a trip in just a few hours, but wanted to write about your listing on cturtle. We have an introduced species here in Hawaii that is absolutely overwhelming in numbers in certain areas of the Kau District on the Big Island of Hawaii. One of the black sand beaches there is used for

Date: Mon, 31 Mar 1997 09:49:03 -0500 (EST)
 From: "Elizabeth A. Forys" <foryse@acasun.eckerd.edu>

Hi, I am currently studying the impact of imported fire ants on pipping sea turtles in North America and the Caribbean in conjunction with the USDA pest ant lab in Gainesville, FL. Most of the "ants on turtle hatchlings" incidences have been *Solenopsis invicta*. I have a few grants to study the impact of this fire ant on pipping sea turtles. I'm interested in what type of pest ant/island work you do.
 Sincerely your,

Elizabeth Forys
 Asst. Prof. of Envi. Science
 Eckerd College
 St. Petersburg, FL
 813-864-7880

Date: Mon, 31 Mar 1997 0:03:45 -0500
 From: "LOHMANN, KEN" <klohmann.wilson@mhs.unc.edu>
 (I edited Ken Lohman's responses, because most had little to do with ants... we were grad students together.)

Dear Ant Boy,

If you want ants eating turtles, I can point you in the right direction, as can a bunch of people. We've been working in south Florida, but the story seems to be pretty much the same throughout the southeast. Fire ants are the trouble-makers. I don't know if there is only one species or several, but they sometimes get into the nests.... The hatchlings try to come out and if it is daytime, then the turtles dig in the sand, and the ants gorge themselves.

As with many things in the world of sea turtles, I don't know if the ant stuff has been written down and published in peer-reviewed journals. It is, however, part of the spoken folklore. If no one can find anything in a reputable journal for you, I can check a bit of the gray literature. There is an annual sea turtle symposium with a proceedings volume in which people "publish" their results, so there probably is something in there if you are desperate. Good luck with the mega-grant. Since the damn fire ants ARE eating everything, it shouldn't be too hard to convince people that they need to be stopped. You'll need a collaborator, for certain.

Best regards,
 Ken

Date: Mon, 31 Mar 1997 09:37:35 -0500
 From: Craig Allen <craigr@GNV.IFAS.UFL.EDU>

James: I work with the impact of red imported fire ants on sea turtles (and on other organisms, as well as with the ecological impacts and causes of biological invasions in general). The red imported fire ant (*S. invicta*) is a non-indigenous sp. from South America common on U.S. mainland beaches. The impact of this species on native vertebrates is just beginning to be documented, with lots of unanswered questions. The sea-turtle question is a big one. *S. invicta* occurs even on isolated beaches with little anthropogenic impact - e.g., in FL, Cape San Blas, Ten Thousand Islands, Marquessas Keys, etc., and has been found foraging in sea turtle nests. Also, reports of ants stinging eyes and otherwise attacking turtles in the SE of US, are likely this species. However, population level impacts, or

Date: Sat, 3 May 1997 17:33:22 +0100
 From: "James K. Wetterer" <jw272@columbia.edu>
 To: forysea@acasun.eckerd.edu, klohmann.wilson@mhs.unc.edu,
 craigr@GNV.IFAS.UFL.EDU, jwyneken@ACC.FAU.EDU,
 gbalazs@honlab.nmfs.hawaii.edu, 8741061g@udcf.gla.ac.uk,
 PJE@zoo.ufl.edu, JSimmons@INFOAVE.NET, mmlam@GNV.IFAS.UFL.EDU,
 Kathy.Moore@noaa.gov, JKamp2@aol.com, humphrie@belle.baruch.sc.edu,
 893617br@udcf.gla.ac.uk
 Subject: ants attacking Cturtles - thanks

Dear sea turtle folks,
 Thank you so much for your responses on ants attacking sea turtles. What follows is a compilation of responses (I hope none of you mind). Sorry that I have taken so long to respond. Academic duties were taking up all my time. Now I am back to grant writing. In my proposal, I plan to quote a few of your responses. I will send you that section of the grant in a few weeks when it is ready.
 Please send me any ants you see attacking sea turtles, or attacking any other native vertebrates. If you need collecting vials, I will send them.

As I mentioned before, I study ants on islands and I am particularly interested in the distribution, impact, and control on non-indigenous pest ants. I've been working in Polynesia, but I plan to spread out. I have not done any work on the impact of ants on vertebrates, but here is a section from a paper of mine coming out in Pacific Science on this topic:

Pest ants in the lowlands of Hawaiian islands have been implicated in the extermination of much endemic fauna (Reimer et al. 1990, Reimer 1994). Zimmerman (1948) reported that the "voracious immigrant ant," *Ph. megacephala*, eliminates most endemic insects throughout its range. Similarly, Hardy (1979) implicated *A. longipes* in the loss of most of the insect fauna at a lowland site on the island of Maui. On the beaches of Hawaii, *A. longipes* commonly swarm over hatching sea turtles, blinding and devouring them (J. Klavitter, pers. comm.). On the island of Niuafo'ou in Tonga, *A. longipes* kills the hatchlings of the endemic incubator bird (*Megapodius pritchardii*) in a similar way, first attacking the birds' eyes (Swaney 1994). *Anoplolepis longipes* are also known to prey upon newborn pigs, dogs, cats, rabbits, rats, and chickens (Haines et al. 1994). Ants also may have an important indirect impact on native vertebrate populations by eliminating key invertebrate prey species (Banko & Banko 1976). In particular, breeding passerine birds often depend heavily on feeding insects to their nestlings. Such competitive exclusion may be, in part, responsible for the disappearance of most native Hawaiian forest birds from the lowlands, even in areas where the forest has remained relatively intact (Banko & Banko 1976, Scott et al. 1986).

Linepithema humile, an important pest ant of subtropical and temperate regions (Holway 1995) was first found in Hawaii at an army base near Honolulu (Zimmerman 1941), but quickly spread to other locales (Wilson & Taylor 1967). This species is now considered the primary ant pest of the higher elevations (above 900 m) in the Hawaiian Islands (Cole et al. 1992, Reimer 1994). Cole et al. (1992) documented the extreme destructive power of *L. humile* in the highlands of Maui. They found drastic reductions in the populations of native invertebrate species directly attributable to the presence of *L. humile*. *Linepithema humile* is also a threat to native vertebrate populations. Newell and Barber (1913) described how *L. humile* attacks birds: "the workers swarm over young chicks in such numbers as to cause their death ... nests of many birds are frequented by the ants in the same way, and the number of young birds destroyed in this manner must be considerable."

MAY-15-1997 16:47 FROM RESOURCES MGMT-HHUU TO 918869431290 P.01



United States Department of the Interior

NATIONAL PARK SERVICE
Hawaii Volcanoes National Park
P.O. Box 52
Hawaii 96718-0052

IN REPLY REFER TO:

May 13, 1997

To: James Wetterer, Columbia University, New York
Fax 212/854-8188

From: Larry Kanahira, Hawaii Volcanoes National Park
808/985-6088, fax 808/985-6029

Last week George Balazs from the National Marine Fisheries Service informed me of your article about the introduced long-legged ants, *Anoplolepis longipes*, devouring sea turtle hatchlings in Hawaii.

Since 1989, one of my primary responsibilities at Hawaii Volcanoes National has been the overall supervision of the Hawksbill turtle recovery program. I supervised John Klavitter who had reported to you about the impacts of ants on hatchlings. John is an excellent worker, however, I would like to clarify his statement.

The long-legged ants are ubiquitous in the lowlands and a nuisance because of their presence. However, we have not observed them attacking or devouring any hatchlings. We have observed these ants entering nests hours prior to hatching emergencies but have not observed any impact on these hatchlings. The hawksbill turtle nests and hatchlings are very successful in Hawaii, exceeding a 70% success rate. The main limiting factor is predation from mongooses.

Probably what Mr. Klavitter had observed was the long-legged ants scavenging on stranded dead hatchlings.

If you have any questions, please contact me at (808) 985-6088.

Sincerely,
Larry Kanahira

Larry Kanahira
Resource Management Specialist

cc: Balazs

Date: Mon, 5 May 1997 22:59:57 +0100
From: "James K. Wetterer" <jw272@columbia.edu>
To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
Subject: Re: ants attacking- Your cturtle posting

Dr. Balazs,

Thank you for your e-mail message. John Klavitter worked with the National Biological Survey on the Big Island when I was there in 1994. His descriptions of the ants attacking the eyes of the hatching turtles was quite vivid and he approved of the personal communication I wrote in his name. It is possible that he got the species of ant wrong, but, if I remember right, he made these observations on a beach I knew to be densely covered with extremely high densities of *Anoplolepis*. I had no reason to disbelieve John's observations, particularly because the same thing happens with hatching incubator birds in Tonga. In addition, "*Anoplolepis longipes* are also known to prey upon newborn pigs, dogs, cats, rabbits, rats, and chickens (Haines et al. 1994)." I have no doubts about the predaceous capabilities of this ant. I think it is perfectly possible that under different circumstances, turtles are sometimes attacked and other times they are not. If I took a guess, I would say that hatchlings still wet from birth may be very vulnerable while dry hatchling may be safe. If you would like a copy of my entire manuscript, I would be happy to send it to you. Please feel free to contact John. I do not know his whereabouts at this time.

James K. Wetterer
Assistant Professor

Center for Environmental Research and Conservation (CERC)
Mail Code 5557
1200 Amsterdam Avenue
Columbia University
New York, New York 10027

Phone: (212) 854-8060; FAX: (212) 854-8188; e-mail: jw272@columbia.edu
<http://www.columbia.edu/cu/cerc/faculty/wetterer.html>

John

Date: Wed, 7 May 1997 00:16:44 +0100
From: "James K. Wetterer" <jw272@columbia.edu>
To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
Subject: Re: ants attacking- Your cturtle posting

x232
Reduce

111

George,

I appreciate your interest in the impact of ants on sea turtles. I too have never been bite by Anoplolepis, though they are certainly vicious with other ants. I have seen them attacking insects and I have many photos of them in tremendous swarms tearing apart tuna. Here are two citations on Anoplolepis predation on vertebrates.

Haines, I.H., Haines, J.B., and Cherrett, J.M. 1994. The impact and control of the crazy ant, Anoplolepis longipes (Jerd.), in the Seychelles. Pages 206-218 in D. F. Williams, editor. Exotic ants. biology, impact, and control of introduced species. Westview Press, Boulder, Colorado.

Haines et al. say such things as "killed chickens, mostly chicks when moist from the egg."

Swaney, D. 1994. Tonga. A Lonely Planet Travel Survival Kit. Lonely Planet Publications, Hawthorn, Australia.

To quote Swaney: "On there way to daylight, they are at risk from the long-legged ants, which prey on newly hatched chicks by first going for their eyes."

When I read these, I was struck by how they matched John's descriptions, which he gave me before I knew of either of the above references. I can't imagine how he could make up details like the ants attacking their eyes. As I said before, it may be that the ants only attack the turtles just as they are coming out of their eggs.

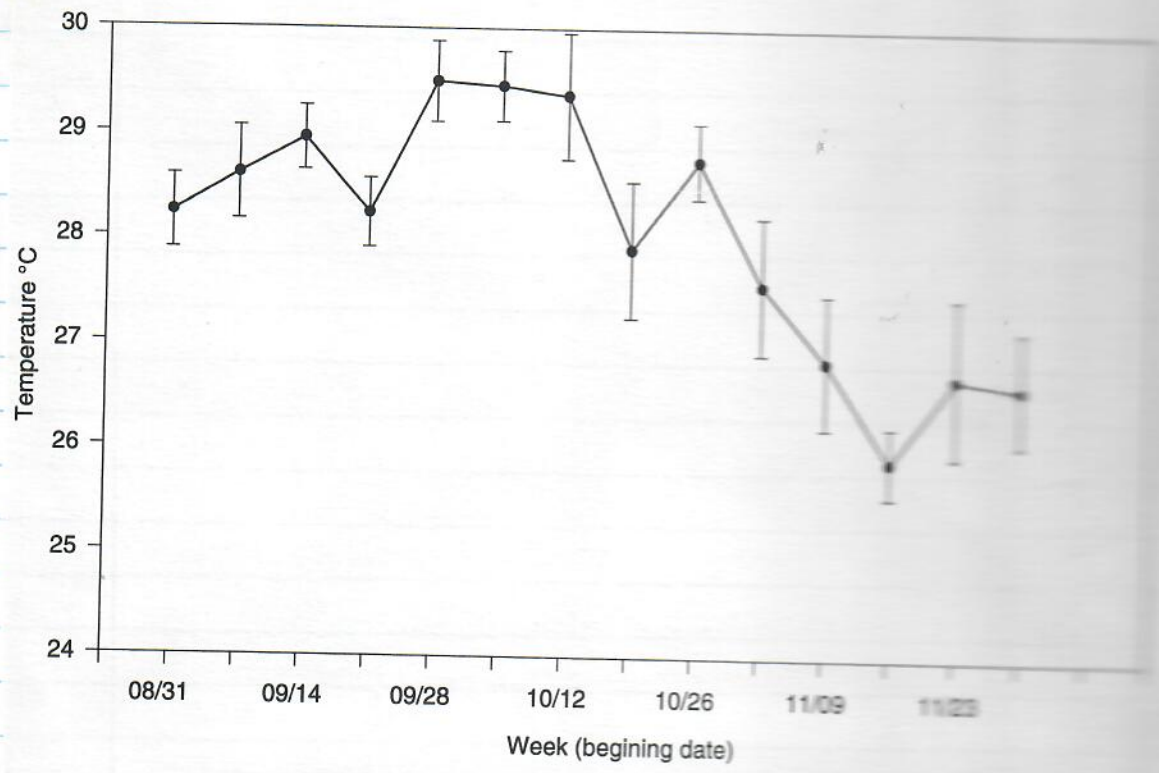
If you feel strongly about defending the ants reputation against possible slander, I could remove the sentence from my paper. Alternatively, I could publish it and that would give you an opportunity to write a rebuttal or to do a short study on this topic. I certainly hope this ant has no impact on the turtles, because it is spreading fast.
Jim

James K. Wetterer
Assistant Professor

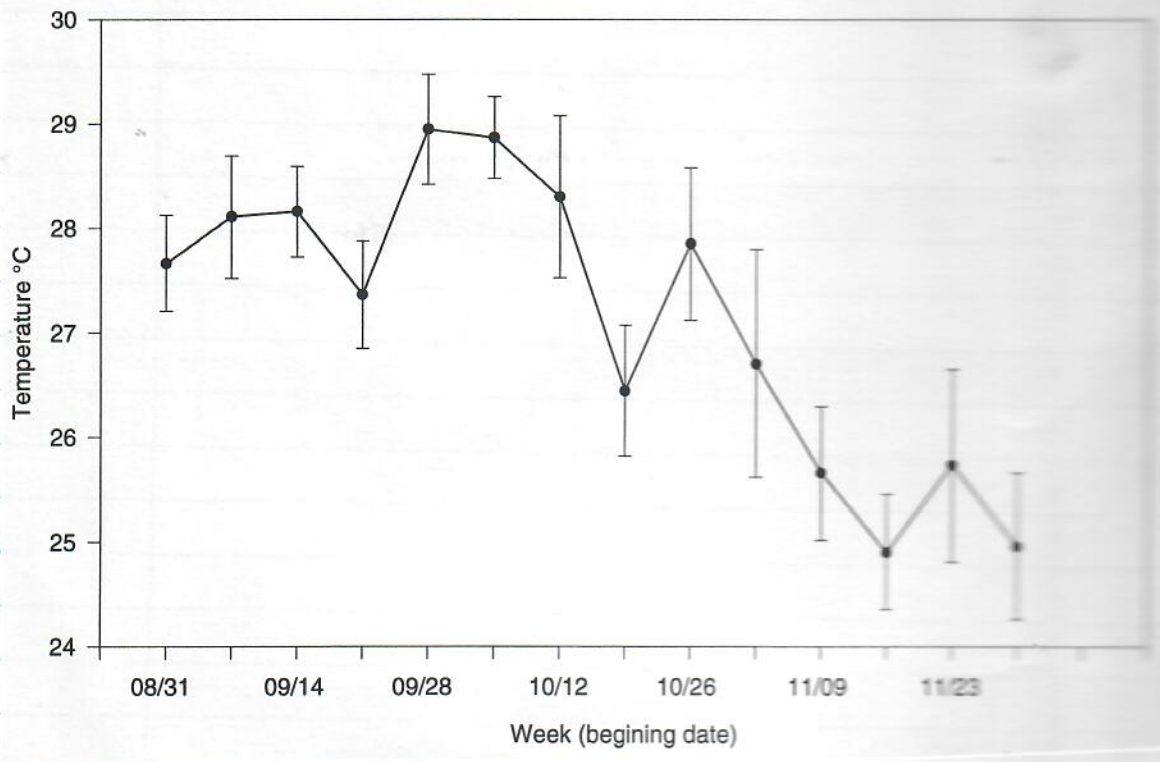
Center for Environmental Research and Conservation (CERC)
Mail Code 5557
1200 Amsterdam Avenue
Columbia University
New York, New York 10027

Phone: (212) 854-8060; FAX: (212) 854-8188; e-mail: jw272@columbia.edu
<http://www.columbia.edu/cu/cerc/faculty/wetterer.html>

Weekly means for Kamehame data S/N 0500, 1996



Weekly means for Kamehame data S/N 0498, 1996





IN REPLY REFER TO.

United States Department of the Interior

NATIONAL PARK SERVICE

Hawaii Volcanoes National Park

P.O. Box 52

Hawaii 96718-0052

Feb. 28, 1997

Hi George,

I don't have any formal summary for the 96 season. Here are some of the highlights:

Kamehame: 45 nests, 5 returnees and 4 tagged in 1996 = 9

Apua: 21 nests, 4 returnees and other possible undetected nester

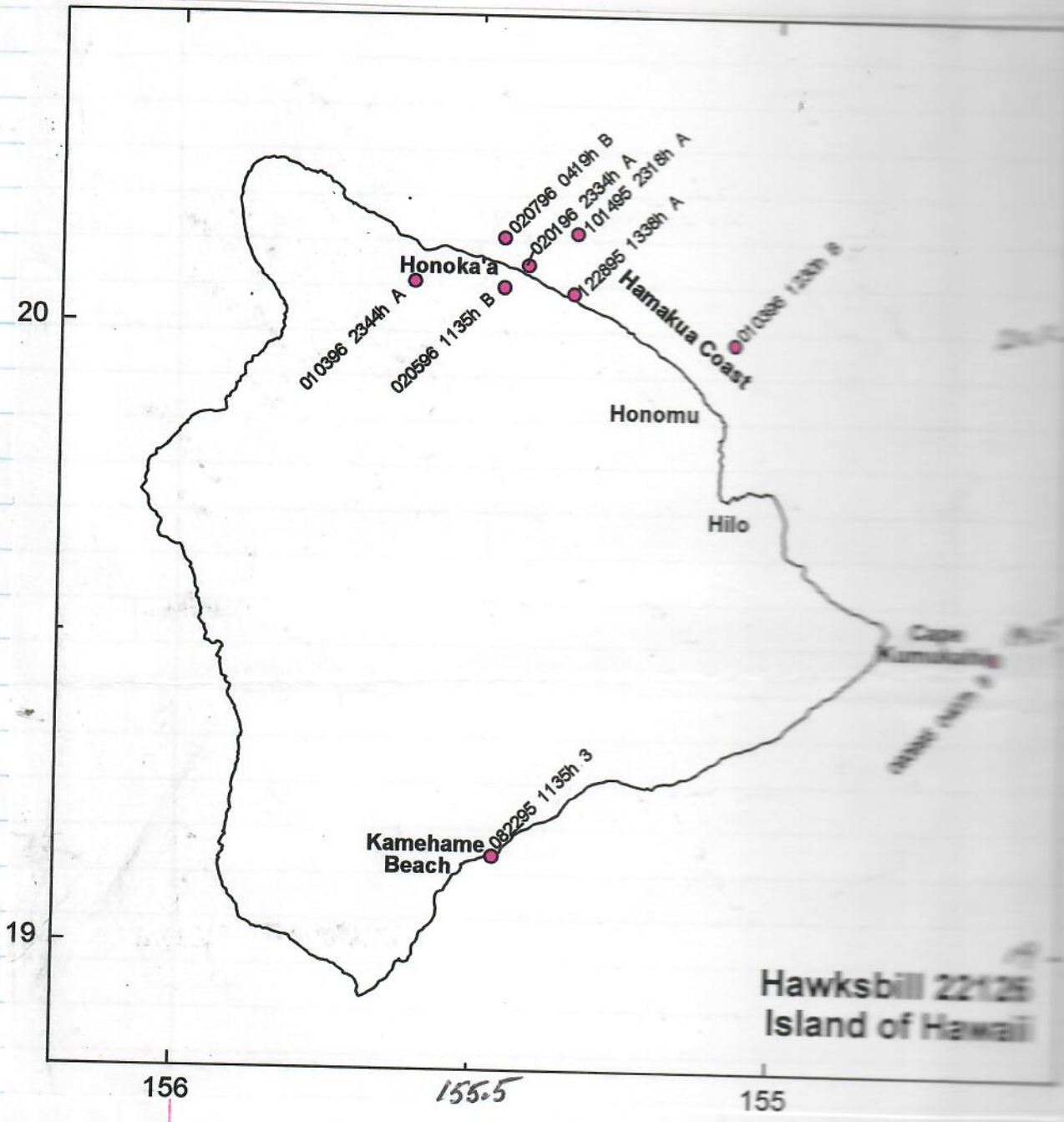
Punaluu: 1 nest, unknown female

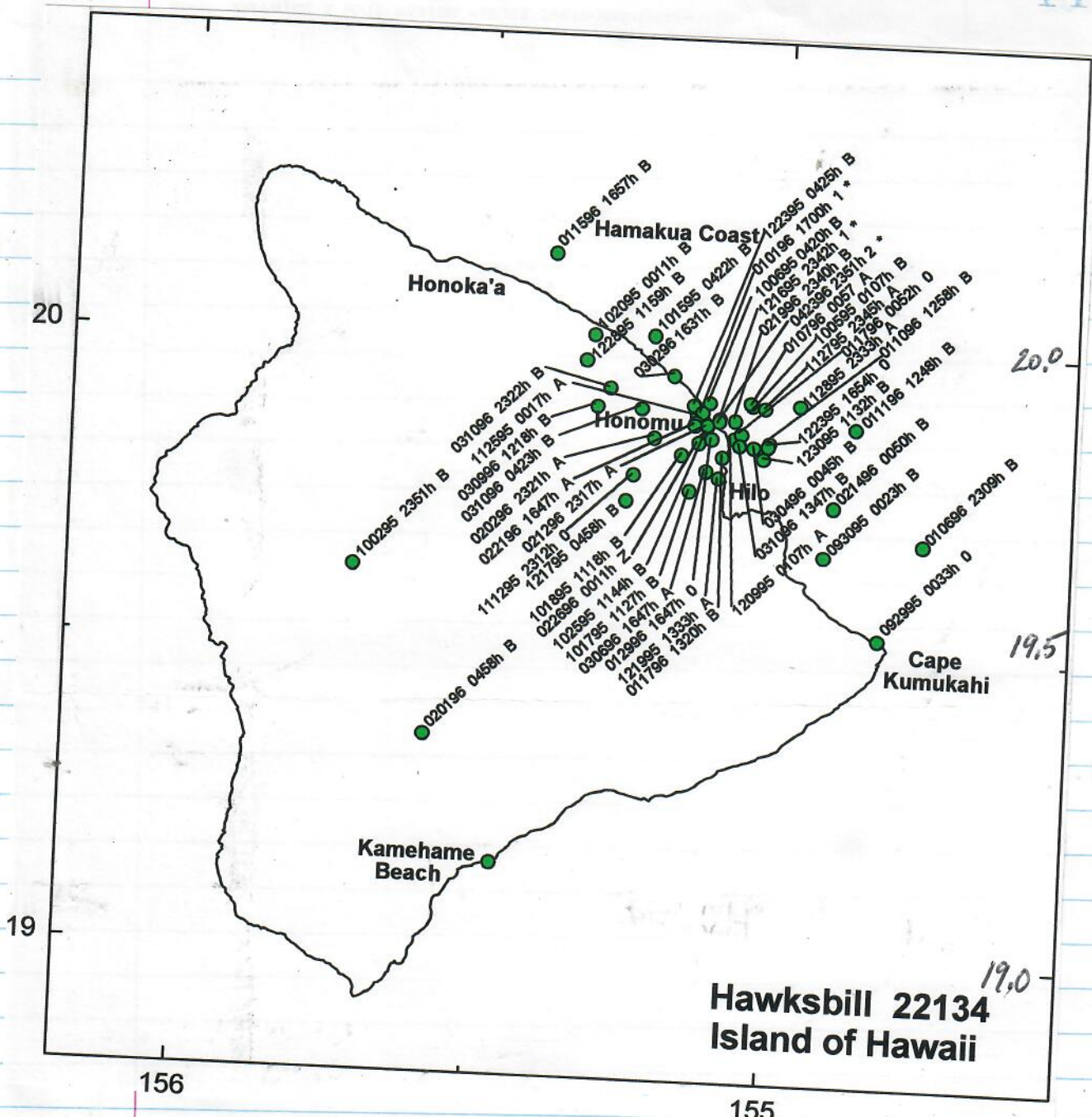
Other beaches: Occasional checks were conducted at Kawa, Ninole, Horse shoe, Halape, and Pohue, however no nesting activity observed.

Overall, the 1996 season was one of the most successful seasons. We were very impressed with the high quality work from the first all volunteer program. In fact, many volunteers are requesting to return this season.

I hope to get a final summary out by next month and I'll mail you a copy. Do you have any hawksbill summary (such as the tagging program at Kiholo, etc.) for the past couple years? By the way, our budget won't allow me to attend the turtle symposium again.

When you have a chance, let's talk about the upcoming hawksbill season. Are you planning to do more telemetry work? What about Gilmartin? Good data to get again this year.





Hawksbill 22134
Island of Hawaii

156

155

20.0

19.5

19.0

20

19

18-07
e X Hawaii Vector Control Branch Manual 1982

University of Hawaii at Manoa
College of Tropical Agriculture and Human Resource
Agricultural Diagnostic Service Center
INSECT DIAGNOSIS RESULTS
16-Dec-96

CLIENT:

Mr. George H. Balazs
NMFS, Marine Turtle Research
2570 Dole Street
Honolulu, HI 96822

JC# 97-019747
Sample No: 97-019747-001
Lab No: 97-038

PHONE: Business: (808) 943-1276 Home: (808)

Recv'd by ADSC: 06-Dec-96 Recv'd by Clinic: 11-Dec-96 Completion: 11-Dec-96

Coll. Site: Kamehame Island Hawaii

HOST: Code: UM Name: ground, landscape

Sample Description/ Symptoms:

Received 3 dead ants (workers) in vial. Collected from large swarm of foraging ants at Kamehame.

Pest Identification:

Scientific Name: *Anoplolepis longipes* (Jerdon)
Common Name: longlegged ant

Results/Recommendation

The longlegged ant was first recorded on Oahu in 1952. Subsequently, it was recovered on the big island in 1954, and Maui in 1973. It also occurs on Kauai, but date of establishment is unknown

According to Wilson & Taylor (1967), Ants of Polynesia, *Pao Ins Monog V. 14*, *A. longipes* is native to Africa and has been spread by human commerce throughout most of the Old World tropics. It prefers moist habitats, nesting under large rocks, in rotting logs, rock walls, etc. It is often the dominant ant in disturbed habitats. It is readily attracted to either protein or sugar baits. Gary Toyama, head of Vector Control Branch, State Public Health Dept, is considered the expert on the longlegged ants based on his quest since 1969, to control this nuisance pest.

- Current facts are:
 - 1) sugar and protein baits do not work effectively. (Extensive work was also done in the Seychelles by Hansen (1978) resulting in same conclusion)
 - 2) Breaching the nest area is the only effective control measure.
- In breaching the nest, one needs to put out hot liquids (sugar solution) to establish ant trails that one can follow back. Ingestion and desiccation are effective control measures.

Ant Bait with Ants. Use 1/2 cup (120 ml) water. Add 1/2 cup of dry mix to 1/2 cup of water, and 1/2 cup of sugar. Place liquid bait in small amount of plastic bag.

Their life cycle takes about 10 to 12 weeks: the eggs hatch in about 20 days, the larvae grows for about 28 days, and they pupate for about 22 days. They feed on honeydew, other insects, and household foods. They are known to tend mealybugs and aphids.

The long-legged ant (*Anoplolepis longipes*, Jerdon) is an extremely active and fast moving ant. It is a medium large ant (4.0 mm.) and reddish-yellow in color. The abdomen is often darker in color than the head or thorax. The long, slender body has a single node on the pedicel and the long antennae has 11 segments. They do not bite or sting but use a defensive spray which is also toxic to themselves. If a colony is placed in a plastic bag with an antagonistic species, the defensive spray will kill both colonies. No ill effects of this defensive spray have been reported on humans or animals.

On Mahe in the Seychelles Islands, off the coast of Africa in the Indian Ocean, this ant was found to have close to 700 nests per hectar (2.47 acres) in some areas. The average number of ants per nest was about 4,000. The total number of ants in some of the heavily populated areas may exceed 10 million per hectar. The average nest contained 40 queens and 50 males although half of the nests had no males. The largest nest contained up to 300 queens, 1,000 males, 36,000 workers, and 23,000 brood. All the nests in an area are essentially a single nest because of their communal nesting habit. Ant trails with nests along the way have been found in Kaneohe, Oahu to extend up to over a hundred yards. The population size is influenced most probably by the availability of food.

Fluker and Meardsley found that it took *A. longipes* about 76 to 84 days to mature at 68 to 71 degrees F. in Hawaii. The eggs take about 20 days to hatch, larvae take about 20 days to develop, and the pupae take about 20 days but the pupae to the queens take about 34 days.

They feed on sweets obtained from fruits, plant juices, and honeydew-producing insects. They also feed on dead or dying insects. Corpses of other species of ants and of their own species are collected by them and it is common to find great mounds of corpses piled along their trails. They are not good predators and do not protect the honeydew-producing insects from their parasites.

This ant is a relatively recent arrival in Hawaii and is found on Oahu and Maui. It is rapidly becoming a pest on the windward coast of Oahu and on Maui. They appear to great numbers and although they are not a vector, they destroy other insects by dragging them away. They are especially destructive to mealybugs and aphids. They are also known to kill the eggs of other insects on the surface of plants and soil.

Date: 30 Aug 96 17:37:03 EDT
From: TELONICS E MAIL SYSTEM <75052.1563@CompuServe.COM>
To: gbalazs@honlab.nmfs.hawaii.edu
Subject: fail safe function

TO: INTERNET:gbalazs@honlab.nmfs.hawaii.edu
(George Balazs)
DATE: 1996.08.30
FROM: Brenda Milam
(75052.1563@compuserve.com)
SUBJ: Fail-safe function

Dear George:

Thank you for your email of 21 August 1996. The transmitter goes into the fail-safe mode after the consecutive hours (number of hours you have specified) have elapsed and have not received any interrupts from the saltwater switch (SWS). When an interrupt finally does arrive from the SWS, the fail-safe mode is terminated and the fail-safe time-out counters are reset.

The fail-safe flag is set to 00 for normal transmissions, and 11 for fail-safe transmissions.

I hope this answers your question. If not, or if you have any further questions, please don't hesitate to drop me a line.

Sincerely,

Brenda Milam
Telemetry Systems Manager
TELONICS email: 75052.1563@compuserve.com
932 East Impala Avenue phone: (1-602) 892-4444
Mesa, Arizona 85204 USA fax: (1-602) 892-9139

Author: Denise Ellis at ~NMFS-HONO
Date: 11/25/96 11:07 AM
Priority: Normal
TO: George Balazs
Subject: Ants from Big Is.

Called Ag. Diagnostic Services ph: 956-6706 or 956-7980 (couldn't find Ag. Extension Service in UH phonebook) re: ants. They said to bring down to Sherman lab Room 134 (Sherman lab is 2nd building past 3 way stop on E-W road). There will be people there to help you fill out the paper work for the test. The cost is \$5 per test (cash or check).

Kamehame
8/29-8/30/96 Volunteers (See also P. 14)

need

Linda Lenz
50 Crownview Lane
Sequim, WA 98382

Ceci Pérez
6193 BONAVENTURE Ct.
SARASOTA, FL 34243

Shannon Tribble
8373 Sugarman Dr.
La Bolla, CA 92037

Gillian Hadley
4378 VINEGAR HILL RD.
SKANEATELES, NY 13152

→ Dary HU - Forest Bird project HVNP
DARY_HU@NPS.GOV

METRIC SYSTEM WITH U.S. EQUIVALENTS

METRIC UNIT (1) U.S. EQUIVALENT

LENGTH

millimeter	(mm)	0.04 inches
centimeter	(cm)	0.39 inches
decimeter	(dm)	3.94 inches
meter	(m)	39.37 inches
decameter	(Dm)	32.81 feet
hectometer	(hm)	109.36 yards
kilometer	(km)	0.62 miles
myriameter		6.2 miles

AREA

square centimeter	(cm ²)	0.155 sq. inches
square meter	(m ²)	1.196 sq. yards
are	(a)	119.60 sq. yards
hectare	(ha)	2.47 acres

Date **19 AUGUST 1997**

WEIGHT

To: **GEORGE BALAZS**

Fax #: **(808) 943-1290**

From: **LARRY KATAHURA**

Pages: **1 INC. COVER**

Subject: **TURTLE BOX MEASUREMENTS:**

LENGTH: **40 ~~cm~~ inches**
 WIDTH: **25 ~~cm~~ inches**
 HEIGHT: **24 ~~cm~~ inches**

METRIC UNIT (1) U.S. EQUIVALENT

VOLUME

cubic centimeter	(cm ³)	0.061 cubic inches
cubic decimeter	(dm ³)	0.0353 cubic feet
cubic meter	(m ³)	1.31 cubic yards
cubic decameter	(Dm ³)	13.10 cubic yards

CAPACITY, CUBIC

milliliter	(ml)	0.06 cubic inches
centiliter	(cl)	0.6 cubic inches
deciliter	(dl)	6.1 cubic inches
liter	(l)	61.02 cubic inches
decaliter	(Dl)	0.35 cubic feet
hectoliter	(hl)	3.53 cubic feet
kiloliter		1.31 cubic yards

CAPACITY, DRY

deciliter	(dl)	0.18 pints
	(l)	0.908 quarts
	(Dl)	1.14 pecks
	(h)	2.84 bushels

CAPACITY, LIQUID

	0.27 fluidrams
	0.338 fluidounces
	0.21 pints
	1.057 quarts
	2.64 gallons

