

BALAZS
1982-1984

G. BALAZS

SALVAGE, MISG. RECOVERIES AND RELEASES
NO. 5

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COMPOSITION BOOK

9 3/4 IN. x 7 1/2 IN. (24.8 cm x 19 cm)

AVAILABLE AS:

No. 09-9130 (1130) 60 SHEETS COLLEGE RULED & MARGIN
 No. 09-9132 (1130-P) 60 SHEETS COLLEGE RULED & MARGIN
 No. 09-9134 (1143-X) 100 SHEETS COLLEGE RULED & MARGIN
 No. 09-9132 (1130-P) NUMBERED PAGES

Made in U.S.A.

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 1 NEW - 4961, 62, 63, 64)

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20 JANUARY 84 KAHALA HILTON - 2 ♂ . . . p. 39

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(BLACK SUBSTANCE IN INTESTINE)

EARLY - MAY 1982 MIDWAY IS. MORTALITIES -
2 juvenile green turtles.

Found ~ 5-7-82; Handled in part
by Jim Parrish's students.

Accompanied back to Honolulu
aboard USCG C-130 on 6-3-82 by
NMFS Bill Streete.

Post-mortem exam at HIMB
by me and Miriam Pilho's.

I. First turtle - Curved 44.8 x 40.5

(photos) Head partially cut off by Jan Perry
for her weightite studies.

Left Front Flipper ~ 7/8 off - missing
but healed. Some decomposition
set in. Cause of death

not obvious, or determined.

Internal exam revealed stomach
and intestines distended with
green alga - - stringy like
Enteromorpha. ID needed.

This turtle was found dead
at Midway washed up along the
shoreline.

Nothing saved except stomach sample.

4

EARLY - MAY 1982
MIDWAY (CONTINUED)

2 - Second Turtle -

Found wrapped-up in blue polypropylene fish net - dead - near pier at Midway. Head already cut off and taken by Jan Perry.

(photos)

Curved - 36.5 cm x 35 cm

Right flipper/shoulder has deep rope cut. Turtle fairly fresh. Deep scratches in plastron - moderate in carapace probable shark bites. Stomach and intestines small and shriveled. Pieces of purple shell (Gaucha?) found in esophagus.

Green fat abundant in body cavity. Stomach contained mostly fluid but also 1.) man-made fibers - thread 2.) crabs legs (from blue fish net?)

"Cargo" (fish) net examined by Jerry Jankovich, NMFS NW Center - letter in file.

- Small gonads found - apparently female.
- Carapace and plastron put in formalin bath
- Humeri in freezer.

KANEOTE BAY BARNACLE MORTALITY

found floating ~ 2 June 1982 by
Lester Zuberan. Stored in freezer
for my inspection.

BARNACLES (Chelibonia)

Carapace - 31 large
21 small
52 sub TOTAL

Plastron - 12 large
30 small
42 sub TOTAL

Grand - 94

Bloated - moderate Rot.

(photos) Curved Carapace length - 43.5 cm

Plastron removed while still partly
frozen - stomach and intestines
found to be distended and
full of Halophila sp. sea
grass.

Sample retained -

Nothing else saved.
Cause of death not determined.

2 JULY 1982

Jim Wheeler, Kailua Beach TNR
mortality

Tel. 254-1187

Telephone report from him indicating
that a approx. 23" shell turtle
washed in this morning on Kailua
Beach. No tags present.
many tumors present.

Referred by Tim Sutterfield of State.
DLNR

Not seen by me. Jim indicated
that he will etch shell for
decoration.

He will take photos and save
stomach sample for me. (now in file)

8 JUNE 1982

KAILUA BEACH ROTTING CARCASS

Following message given to me by Gail upon my return from FFS -

"These plates are from a dead turtle reported 8 June 82 (Wilikoki St. - Kailua Beach). Reported by Athlene Clark (friend of Alana). Bill Streete, Meriam and I went to the sight @ 10 a.m. The carcass was badly decomposed. ~~No~~ head, flippers, tail, etc. I took 6 or 8 pictures. Tentatively ID as green - 5 plates (center) 12? side plates (neck area - bad). Most of the back plates had popped off. The ventral plates were still connected. The entire body was soft when touched - the entire shell gave. No obvious cause of death. (No bites, bullet holes, etc). The shell measured approximately 36".

9 JULY 82 LANIKAI TAG RECOVERY

Telephoned to Gene Witham by
a Jim Tate of 1134 Makulua Dr.
Originally found by a visitor from
N.Y., Gordon Lane (Tel. 261-6594) "away
up above the water."

Tag 5630 2nd Scale R

J + small tags 610 Right
910 Left

"spear" hole in right side of head -
right eye swollen - engorged with blood.

Transported by Gene to Kewalo Basin lab.
Alive, but not very active.

(photos)

S-33.6 x 28.2

Very light color to carapace - tan
and light brown - radically different
than remain captive greens from
same original clutches.

Graft is large and apparent on carapace.

This turtle was reared from a
hatchling (Sept 80) at SLP, and released
at Bellow-Jetty #1 - on 15 Sept 1981.

S-29.5 x 26.5 on 17 AUGUST 1981

0
2
8
9
2
6
29
20
8
2
21
Be
6

Photos of this turtle taken on
8 September, 1981 (one week
prior to release)
See also photos taken during release
at Bellows,

16 NESTING AT CAMPBELL NWR IN
KAHUKU

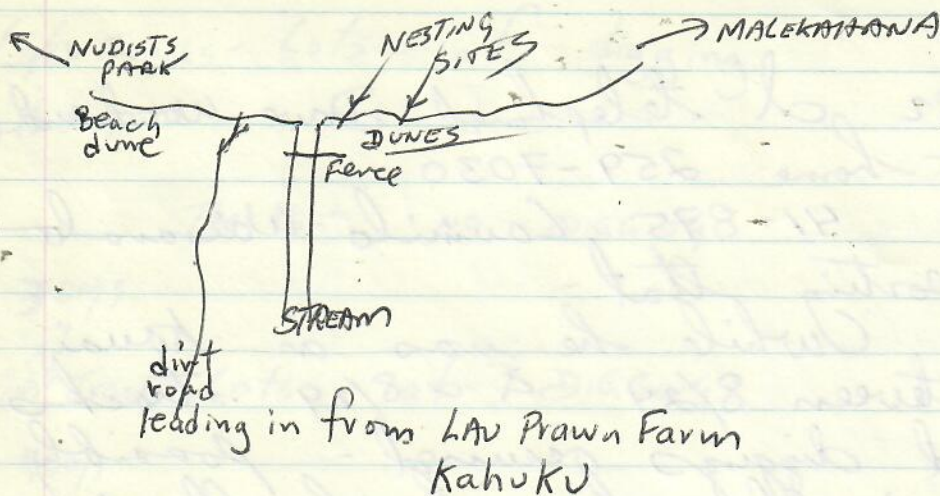
2-3 AUGUST 1982 occurrence

Reported by David Woodside ^{TO ME VIA Rick CoCeman}
I visited the site and talked
to David and his daughters on 5 AUGUST.

At least two "up-down" sets of
tracks were still visible on
the south side of small stream
leading out of Refuge. 3-4
distinct digs were visible. David
dug into one that had "soft"
sand, but no eggs found.
Width of tracks narrow enough
to have been a hawksbill.
Cream ^{Brownish} colored sand beach with
lots of beachrock interspersed.
Seen at high tide. Turtle
may have gone back into ocean
at one point off beachrock on
edge of stream mouth.
This is a favorite place
for KAHUKU people to fish for
Ulua. Fisherman was present
when Dave first saw the
digs - but he apparently didn't
see them.

on
18 AUG

on
24 AUG

Small
isleton
18 AUG 82

Rich Coleman reported that "kukuku" turtle came ashore on Saturday night 8/14 near same previous area. No digging. She was seen by an old Phillipino man who was catching crabs (NOHiki). (Predator control!) Turtle came back on 8/17 Tuesday night and dug a lot. D. Woodside discovers it. No footprints present, or other signs of human disturbance.

on
24 AUG 82^I talked to David Woodside at the airport before leaving for Maui. He said that "turtle was up again" (NO dig?) on Sat 8/21.

on 6 September 82 I telephoned Dave Woodside,
at home 259-7030

41-875 Laumilo-Waimaralo
Reporting that -

While he was on Kauai
between 8/24 & ~ 8/29 tracks
and diggings occurred - possibly 3
day's old when he finally saw it.

Also, on ^{Thursday} 9/2⁰ - ^{Friday} 9/3⁰ the turtles
came up and dug a big area.
Human footprints followed the
tracks down.

9-9-82 Drove to Kahuku because David saw tracks
Thursday of hatchlings - one track last night, many tracks
from the previous night (9/7/82). I dug
into the site and found embryos and shells
from a green turtle. One was a deformed
albino (preserved in formalin). Sand sample taken
and area photos. Results as follows:

62 shells (live hatchlings out)
3 advanced development, but dead
1 early development, but dead
1 Albino (alive)
3 no development apparent
70 total

t. 2 much undersized

8/2-

8/14

8/17

8/21

~ 8/2

9/2

9/7-9

9/9

9/24 APR

"/5

8/2-8/3/82 Tracks - Lots of digging
12 DAYS

8/14 Tracks - NO DIGGING
3 DAYS

8/17 ^{no egg?} Tracks - Lots of DIGGING
4 DAYS

8/21 Tracks - NO DIGGING
6 DAYS

~ 8/27 Tracks - Lots of DIGGING
6 DAYS

9/2 ^{nest?} ^{egg?} Tracks and a large Dig
6 DAYS

9/7-9/8 Hatchling tracks

9/9 I dug it up and found Chelonia embryos

9/24 Approx. Hatchling tracks from site by stream

11/5 I INSPECTED AREA - N. waves up

20 KAHUKU, CONTINUED

9-28-82 TUESDAY Talked to Dave Woodside - he saw hatching tracks, probably from last Friday, at "first" nesting site near the stream. He dug down, but lots of sand slippage occurred. He only found 4 "hatched" shells at ~ 8" of depth.

12-83

10-20-82 WED. Talked to David - nothing more to report. North waves are now up. Rick Coleman has "3" shells David dug up 9-28.

11-5-82 FRIDAY I drove out to kahuku to excavate the "remaining" "first" nest site near the stream. Dirt road was very muddy with water puddles - almost got stuck. At the beach I found "debris" line way up high - lots of sand seems missing. Appears that water has been up over the nest area. Impossible to pick a site where to dig. Saw a small piece of squid gill net washed up on the beach.

LATE NOV. - Rick Coleman sent me 3⁴ eggs shells ~~not~~ determined them to be from green tinged.
ARTICLE by Harry Whitten appeared in the S-B mid-Nov.

12-83 Talk with Woodside, Owa humaine
took lots of sand away. He does know
of any further nesting signs.

6 MAY 82

Kailua Beach - juvenile stranding
 Reported by life guard J.
 Tom Stone - picked up
 by Bill Gilwartin and
 I brought to Kewalo lab
 tank. listless and far
 too buoyant.

18 bands on carapace removed
 7 " " " plastron

healing cut across top of head;
 deeper slash in first segment
 of marginal.

S - 42.5 x 34.3

C - 44.5 x 41.5

Cared for most of the time
 by Paula BORDEN. A.T. my
 suggestion, force fed sand which
 seemed to alleviate buoyancy.

4956RZ Tagged 8/19 - S - 42.7 x 34.1

20 AUG 82 Released by Paula off Waialae
 Park just before Kahala Hilton -
 from a kayak. (3 1/2 MONTHS)

8 DEC 82

LAWRENCE CHUN -
TMR - EWA BEACH

25

On 8 December (Wednesday) night Lawrence Chon
 Address: 94-445 Kiilani St, 623-8471 went
 net fishing with two other friends at Ewa Beach
 (Iroquois Pt. side). Net in the water at 1000, turtle
 caught at 0130 (12/9) ←

6 nets (sugi and linen)

sugi nets 7' wide, linen ~ 15' wide (high)

net 60-70'
from shore
in 7 feet scow

SHORE

Turtle caught by flippers in net, head free, able to
 rise to surface. Mr. Chon concerned about the health
 of the turtle took it home and was able to contact
 NMFS in the morning.

Picked up by kam and taken to Kewalo "J" tank - floating
 high; died during the night and found on the bottom.
 Post mortem - ~~done~~ by me on Friday 12-10. Still looked
 fairly fresh. Ozobranchus egg cases by hind and front flippers
 ventral surface. Stomach - interesting, have moderate food-fill.
 + one live (small) beach.

Left eye completely covered by growth



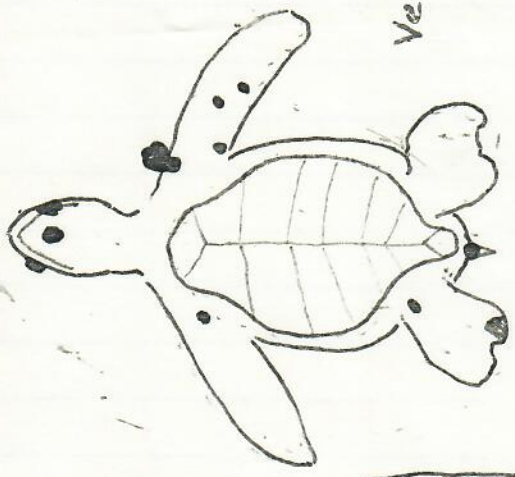
lower left jaw w/ growth

Tomorous growths
R+L eye neck



large one on RFL

tumors
mandibular scute
ventral LFL
at anal orifice
small knobs on R HIND



Ventral view

cut between
4 L HIND 4-5 R HIND

pink coralline on carapace
1 small Chelonibia growing on PL

skin burracles Platyleps on neck and pelvic skin
verte. put in. Keioko tank on 12/9/82 ~ 1000; animal very lethargic

No sample saved. Appeared to be ~ 95% Pterocladia; - 5% Ulva -
+ small amounts of Acanthophora.

S-54.5 x 44.2 PL-43.5 HEAD-8.2

TAIL-8.6 (fall even with the posterior edge of carapace - i.e. end of head)

EA

2

2

8

9

2-3

6

29

20

8

22

21

BELL

6



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

1030 hrs 12/22/82

To : George

From: John Henderson

A guy called to report an entangled & dead 1500 lb leatherback. He was very reluctant to give out details, and was in fact acting "on behalf" of the parties who have the turtle in hand. The only thing I could determine was that the animal apparently got entangled in a "parachute net" of some sort (sea anchor or drogue?).

I told him that we weren't the enforcement types, but that generally accidental entanglements weren't cause for prosecution, and that we were obviously interested both in the documentation of the incident as well as examining the specimen for scientific information (reminding him that turtles were protected).

The reply I got from him on that account was essentially that the "parties involved" were very nervous of being busted, wanted to "get rid of the evidence" and that "1500 lbs is a lot of meat". Sounded as if as long as they had an accidentally killed turtle they wanted to take gastronomic advantage. I told him that that was pretty thin ~~xxx~~ ice legally.

He wouldn't leave name or #, but said he'd call back to talk with you.

(the caller was quite articulate and did not sound like a local fisherman)

12-22-82^v Telephone calls from anonymous
 WEDNESDAY man in Kona. (last night)
 1500 lb \pm 25 lb leatherback entangled
 in parachute anchors - near OTEC
 Buoy 2 miles off Keahole Point.
 Drogged boat for 5 hours - then
 probably "barg-sticked" it in the head.
 Turtle brought in to sell (or eat) -
 weighed at 5:30 am. His informant
 (she) has a lot to loose - so very
 cautious.

No long tail noted.

No tags noted.

Turtle carcass disappeared after they
 found out it was illegal to take.

Boat was a commercial hard liver -
 Ahij were biting good that night.
 Turtle was 8'09" long.

EAK

2J

2J

8J

9J

2-3A

6M

29J

20A

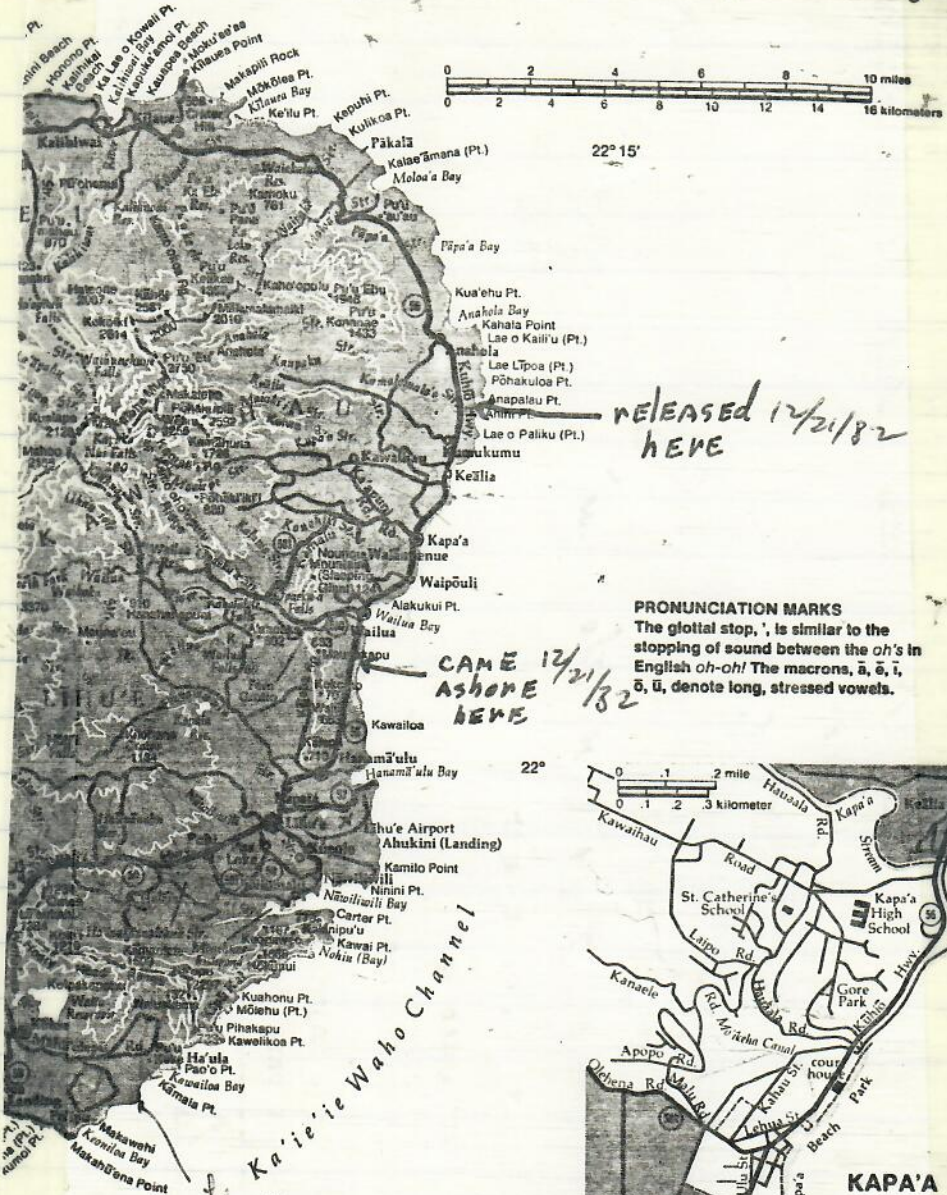
8DE

22J

21D

BELLI

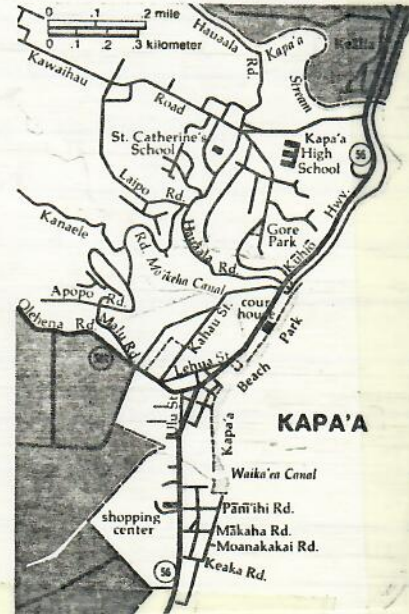
6D



RELEASED 12/21/82
HERE

CAME 12/21/82
ASHORE
HERE

PRONUNCIATION MARKS
The glottal stop, ' , is similar to the
stopping of sound between the oh's in
English oh-oh! The macrons, ā, ē, ī,
ō, ū, denote long, stressed vowels.



Ka'ie'ie Waho Channel

mihi
atua wāhine

KAPA'A

12/22/82 Telephone conversation -
Animal very lethargic -
plastron / sunken-in

found in the back of
a pick-up truck; Don
knows one of the men


SEA TURTLE SIGHTING REPORT

(Please return to: George H. Balazs;
Hawaii Institute of Marine Biology;
P. O. Box 1346; Kaneohe, HI 96744;
Tel. 247-6631)

Observation made by: Don Heacock

Address & Tel. No. (optional): P.O. Box 1671, Lehu'e, Kauai 96766 (243-4444)

Date: 21 Dec '82 Time: 3 PM Location (indicate

on chart): Waialua Golf Course beach 

Observation made from: X shore;

 boat; or while skin SCUBA diving.

Exact
Estimated size (shell length): 37 1/4" (over-the-curve) ^{94.6}

Turtle seen on: surface; or at depth of

approx. ft. Distinguishing

characteristics (species I.D. if known, long (♂, tail nearly 2x length
of rear flippers)

tail, shell color, tags, injuries, etc.):

(Information on turtle parts recovered from fish or sharks would also be greatly
appreciated).

Chelonia mydas ♂; Tumors on rt. eye (possibly blind in that eye);

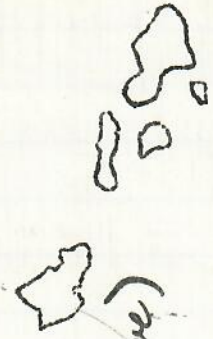
Other comments: left eye appeared OK but some swelling seemed present in
eye lids; left eye (pupil) clear - rt eye pupil opaque (cataract)

tagged twice on

front left flipper with tags 6436 and 6437.

THANK YOU FOR YOUR COOPERATION

ENTER IN GEM DATA BOOK MISC. #5



EA

2J

2J

8J

9J

2-3

6N

29J

20A

8D

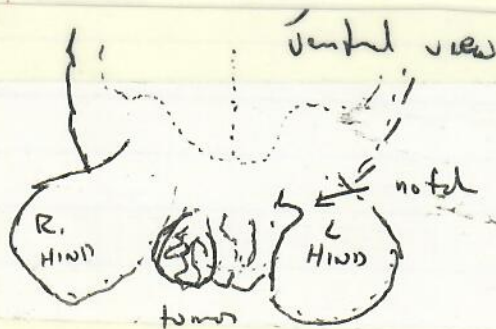
22

21J



MONDAY

TUESDAY



BELL

6J

BELLOW'S EXPEDITION 24

19 SEPT 83

MONDAY

2 sections of new net made
by Alan Kam set off jetty site #1.
MMFS van as camp site.

13 hours
15 MINUTES

NETS IN at 6:30 pm; OUT ~ 7:45 9-20-83

First capture made at 8:15 pm
just before Bill Gilwartin left.

Recovery as follows

2335

2336

3467

4960 new 3-4th web

S-60.3 x 47.3

C-64.5 x 59.6

PL-49.0

HEAD-8.8

TAIL-12.3

Light colored turtle - photos taken -

(NOTE - our 2nd capture ever at Bellows - 1977)

Second Capture made at Tam -

20 Sept (Ceniped bite Alan)

New capture - no old tags or scars.

Ventral photos. TMR ventral right.

(TAG CRIMPING PROBLEMS) (CAUGHT BAD IN NET)

4961 RFL

4962 LFL

4963 LFL 3-4th web4964 RFL 3-4th web

S-74.2 x 59.9

C-80.1 x 79.2

PL-61.3

HEAD-10.6

TAIL-15.0

12-6-83 (Case actually happened Thanksgiving
 Tel. report weekend, as Don called me in Hilo)
 R-6438

L-6439

Curved carapace length - $27\frac{5}{8}$ "

Released just N. of Kealia

Washed ashore on rocks - found
 in Hanapepe River; Concave PL -
 emaciated; no evidence of old tags;
 Tumors the size of fists on each
 eye, +1 on cloaca and 1 on shell.
 No evidence of old tags.

Story subsequently appeared in the
 Sunday Star - Bulletin -Advertiser
 DEC 18, 1983.

20 JANUARY 84 KAHALA HILTON -

FRIDAY

RELEASE OF 2 MALES, previously UNTAGGED,
possibly been at facility 15+ years. pulled
out of POND, taken directly down to the BOATH,
MEASURED, TAGGED, PHOTOED & RELEASED.

7217 RFL

S-86.0 x 67.2

7218 R3-4

no notch

7219 LFL

C-90.0 x 76.8

7220 L3-4

PL-65.8; 69.0 from extra-plastral scale
(Blk stops of pigment in plastron -
see photos)

HEAD-12.5

released 7:55am

TAIL-55 to PL; 51 to extra-PL

FFW^{width}

R 16.0; L 16.3

Hole present in left post. MARGINAL.

7221 RFL

7222 R3-4

S-78.2 x 63.8

7223 LFL

notch 77.7

7224 L3-4

C-81.5 x 72.5

PL-63.9; 66.2 from extra-PL

HEAD-13.0

TAIL-44.0; 41.0

released 8:05am
(MOVED SLOW)

FFW^{width} R 16.0; L 16.2

SCL measurement

NOTE - should be 6 turtles left at kahala - my 5th
(MACE MISSING AT EYE)

18 JAN 1984

4957 L3-4S S-89.3 x 66.8

4958 R3-4S John Santiago, 54-075 MAUOLA Homes Road Rd
Tel. 293-5552, found it in 3-4' of
water 1/17/84, est. 200165, while looking
for Octopus. Turtle was motionless.
Dragged onto boat and put in his yard. Called
Aquarium - referred to me by Red.

PL-69.8

HEAD-12.1

TAIL-22.0

10 photos taken ventral - in back of pick-up.
4-5 dorsal at Sandy Beach when released.

Gross tumors, mostly "flap" area of
of front right. Right eye has pupil partly
showing; left eye is heavily grown
over - pupil can be seen when pulled
back, but clouded - over.

Rod and I picked it up, drove it
back to NMFs lab to show to WPRO
etc. Taken to Sandy Beach for release.
Tie-wraps used to stimulate 5 of the
larger ones; tried to tie eyes, but too
sensitive. Swam through surf seaward
when released.

21 MARCH 1984 Aquarium DONATION

Turned in last Friday; According to "Marty" - man gave his name, but was upset when he wasn't paid. He said he could have taken it to "Dominus" for money.

S - 37.8 x 30.7
(notch - 37.3)

C - 40.1 x 35.7

PL - 30.7

HEAD - 5.8

weight - 6.7 kg (14.7 lbs)

White PL and clean carapace & skin;
vigorous.

photos w/ christina.

Blood attempted, but nothing obtained -
no needle casing.

Released in front of the aquarium 3/21

11/28/84

KANEHOHE BAY DEAD ADULT LFF
MISSING - HEALED

28 November 1984

large turtle found floating in Kaneohe Bay, near Coconut Island. animal drifting on seawall of:

→ Charlie Kimals

45-167 Kahanaohu Circle

AK + R^{WATSON} pickup turtle (1000-1300) drop off at Kewalo

Necropsy ~ 1600 (RM, AK + GHB)

(S) 80.8 x 57.8

(C) 86.0 x 75.4

PL 63.3

HEAD 12.5

TAIL 23.2

Color slides taken of animal

Note: Animal missing its LFL, completely healed
soft skin tissue - 1/2 humerus missing.

Pink coralline algae on carapace

Two large turtle barnacles (1 + 2nd L. Latitudinal and

one small barnacle on PL

No skin barnacles

Good fat content found inside, ++ packed

Sample

- A. vial from pellets
- B. vial from inner portion of Rt. Caecum

BODY

very bloated condition
 gassy
 no external wounds

STOMACH

Lower stomach is empty, first stomach is full.

Codium

Hypnea

Ulva (manure-type)

transparent, slimy matter - animal (fish?) mixed in algae.

Small intestines

About 2' down encountered a black ink coating the intestinal wall
 - water soluble (pancake consistency)

SAMPLE A. tissue of intestinal wall
 B. black liquid in vial

The black substance went on for about 2 feet then cleared up and was replaced by fresh algae, in increasing state of digestion.

Humerus

R. humerus saved
 portion of L. humerus saved
 note: at Kewalo
 in Mark Seal freezer
 labeled

shell - lungs - fat liver ~ 40 lbs

lungs 1251.5

♂

liver 1308.0

FFS

1980

fat 2636.5

True

odd. bits 1753.5
PL - SIX lbs

lbs

shell 22# den



**19^e CONFÉRENCE DU PACIFIQUE SUD
SOUTH PACIFIC CONFERENCE**

Papeete 79

Hawksbills (from Aquarium)

rec'd 19 Nov. 1980

weighed 20 Nov. 1980

LARGER - Tag no. - ?

(S) 15.2 x 12.2

(C) 17.0 x 14.9

PL 12.7

Weight 472 gm.

SMALLER Tag nos. ?

(S) 12.7 x 10.1

(C) 14.5 x 12.7

PL 11.5

WEIGHT 376 gms

returned
12/1/80
to Carlson at
Aquarium



19^e CONFÉRENCE DU PACIFIQUE SUD
SOUTH PACIFIC CONFERENCE

FFS June 1980 ♂
shark mortality

Papeete 79

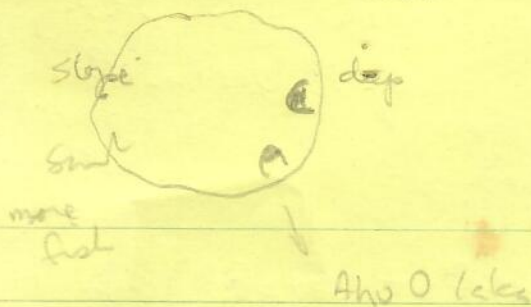
Rt Front Flipper	
tissue weight	7361.5 g
scapula, process, cov.	587.5 g
remains of flipper	
humerus, radius, ulna	1458.5
Heart 200 g	<u>9407.5 g total</u>

Left Front Flipper	
tissue weight	7512.0 g
Scapula, process	
coracoid	638.5 g
Humerus, r-uln., phalange	2287.5 g
	<u>10438.0 g total</u>

20 March
1981

less to 00
laundry path

↑ KUALOA



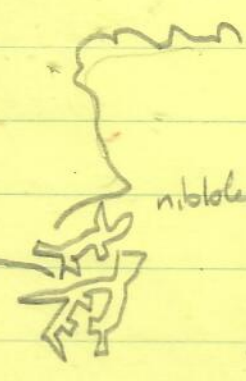
Waka
Polla fish
Eole
Abehdw
Mammi
surgeonfish



birdfish (wrasse)

South

sand



nibbled

seaweed
Eucheuma
closely cropped

P. compressa

Montipora

TORTLES

4 = 3 swim
1 bottom

V.S. > 30'

SW T° = 24.5°c

Wind ~ 10 mph

10% cloud cover
clear

= Cold water

predominantly
Steaps

P. compressa

FRIDAY

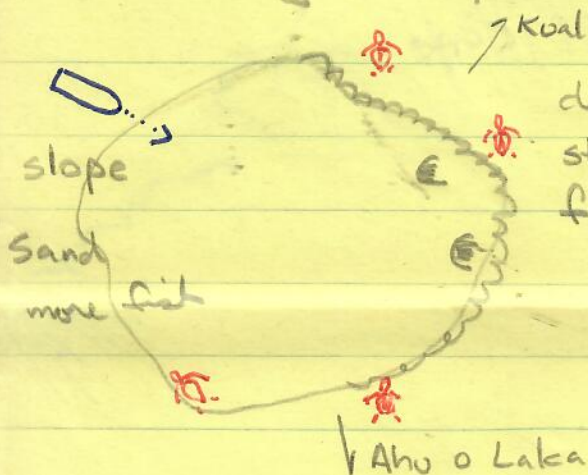
20 MARCH 1981

Survey "Porkchop reef: Reception (Bob Ross study)"

830-1130

First visited Waikole-Waikane reef: 2 turtles spotted on surface, water visibility fair: vis. 10-15 feet unable to see clearly to the bottom, 2 turtles spotted emerging from "resting pads" - barnacled.

Survey of "porkchop reef"



deeper water
steeper profile of patch reef
few no. of "resting pads" - tamped down P. compos

Turtles sighted

3 swimming, 1 heavily barnacled along margins

1 turtle on bottom -
(Coco's side of reef)

~12" resting on coral rubble, unable to catch



4 Turtle total

Vis: ~ 30'

Seawater: 24.5°C

Wind: ~ 10 mph

10% cloud cover - clear

- water relatively cool

← Ahu o Laka



Excheuma - closely cropped
found along depressions
silted over

P. compressa

more slope

Sandier

coral rubble

more fish (during daylight)

P. lobata

SAND

KUALOA →

P. compressa

steeper profile

TESTICES

16 JUNE 1980

East Island; FFS

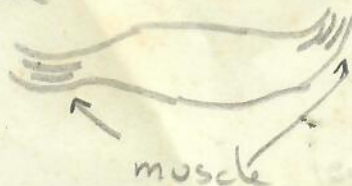
length 9 feet 10 inches



direction of increasing muscle,
no indication of material in gut
longer sections of muscle



vs.



black substance
undetermined

* one sample found, ? solid, possibly a "cut" portion
of the intestinal wall.



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
sq. kilometer	(km ²)	0.3861 sq. miles

WEIGHT

milligram	(mg)	0.015 grains
centigram	(cg)	0.154 grains
decigram	(dg)	1.1543 grains
gram	(g)	0.035 ounces
decagram	(Dg)	0.353 ounces
hectogram	(hg)	3.527 ounces
kilogram	(kg)	2.2046 pounds
quintal		220.46 pounds
metric ton		1.1 tons

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
liter	(l)	0.908 quarts
decaliter	(Dl)	1.14 pecks
hectoliter	(h)	2.84 bushels

CAPACITY, LIQUID

milliliter		0.27 fluidrams
centiliter		0.338 fluidounces
deciliter		0.21 pints
liter		1.057 quarts
decaliter		2.64 gallons

023594

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