Dear Mr. Balasz,

Enclosed is a preliminary study on the Green Sea Turtles on part of the South Maui Coast.

Please look at it as a rough sketch, and tell me how I can shape it and go on observing in order to be of use to you. Do you have any models of a turtle survey?

I never had anything to write on in the water, so all the bleach marks were remembered and noted when I got home.

Photography is difficult - I used a throw-away Kodak. The parallax through my mask and the lens is strange - I found it hard to even get the turtles in the frame.

I'll be having hip replacement surgery at Palimomi on July 8th. Please, would you call me and come see me? If you could give me direction, it would help my healing by giving me something to look forward to. After about ten days at Palimomi, I'll be at the Rehabilitation Hospital of the Pacific.

You can see I'm really interested in behavior. I've also made friends with 3 turtles and would like to tell you about that.

My strong feeling is that Turtle Reef should be protected.

Sincerely yours,

Charlotte Thomson

Charlotte Thomson July 7, 1994

The map I printed & marked has vanished— I'm on my way to the hospital & can't replace it now. If you send me a map I can mark it for you.

Charlotte Thomson
c/o Dr. Oishi Suite 300
Palimomi Medical Center
98-1079 Moanalua Road
Aiea, HI 96701

808-484-2042

Charlotte Thomson
Rehabilitation Hospital
of the Pacific
225 N. Kuakini
Oahu, HI 96817

808-531-3511

PRELIMANARY SURVEY OF HAWAIIAN GREEN TURTLES ALONG THE WAILEA AND MAKENNA COAST OF MAUI

TO GEORGE H. BALAZS
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES SCIENCE CENTER
HONOLULU LABORATORY
2570 DOLE STREET
HONOLULU, HAWAII 96822-2396

AREA SURVEYED

Along the Maui coastline south of Kihei there is easy access to the ocean at numerous points. What began as recreational snorkeling turned into an informal survey of the Maui Coast between Ulua Reef (the northern border of Ulua Beach) in the north and Puu Olai (350') in the south..

After spending perhaps a hundred and twenty hours snorkeling and observing green turtles at Turtle Reef (the southern border of the beach at the Maui Prince Hotel) it appeared that recreational tourism in that area was likely to affect the unique habitat and the turtles there. At some times there are four or more large boats disgorging kayaks, divers, snorkelers and floatboards. The observer has seen kayakers drop anchors within inches of the turtles, and awkward snorkelers inadvertently kick them with flippers. A boat company put down a chain and underwater mooring within ten feet of the major resting place of the largest male turtle on that reef.

The observer wanted to compile enough data to give the Fisheries Department an indication of what was at stake along this part of the coast.

All areas but Turtle Reef were surveyed very casually, to determine presence, absence and density of turtles. At Turtle Reef the observer was able to swim with the turtles long enough to identify individuals and behavior patterns.

ULUA REEF

There are at least two and probably more turtles living on the sea floor beyond the westermost extension of Ulua Reef. The reef itself is too shallow to provide them habitat. It is exposed at low tide.

IN FRONT OF THE INTERCONTINENTAL HOTEL

There are at least two and probably more turtles making their home in the coral/lava in front of the Intercontinental Hotel. They appear to have regular places of rest, as they are easily found in the same spot.

ON THE REEF TO THE NORTH OF SECRET BEACH

Secret Beach is immediately north of Paipu Beach. Its northern border is formed by a reef at Haku Point. There are two and probably more sea turtles living at that reef.

REEF AT FIVE CAVES, NORTH OF MAKENNA LANDING

To the north of Makenna Landing, three fingers of lava jut out into the sea. This area is known to divers as Five Caves or Five Coves. There is a large population of sea turtles there, including banded turtles (K-ll on silver metal tag on right front flipper) large mature turtles, and also the smallest baby turtles yet seen in these south Maui waters. Scuba divers report seeing metal tags J-12 and J-13 at Five Caves. (Not confirmed.)

TURTLE REEF, JUST SOUTH OF THE PRINCE HOTEL

The sea turtle population is distributed from the beach in front of the Prince Hotel down to the brown cinder cone Pu'u Olai in the south. A yellow catamaran, *Kai Kanani,* is moored over the reef where the northernmost turtles are to be found. At the south end of the beach, lava flows out into the water in front of a golf course. Underwater there is an area with two natural bridges. Seaward from these bridges is the area where most of the turtles seem to rest. It is not uncommon to find six or more turtles at one time resting on the reef. The turtles are more thinly distributed south to Pu'u Olai.

DESIGNATION OF INDIVIDUALS AT TURTLE REEF

The metal survey tag is the prime identifier of individual turtles. No metal survey tags have been observed so far at Turtle Reef. In the absence of survey tags, however, given turtles can be identified by a combination of bleach marks on the carapace, bodily damage such as torn flippers or missing flippers, size of the animal and its resting location. (In addition to the individuals listed, there are others whose distinguishing characteristics have not yet been recorded.)

Long Tail: Old large male Dominant male. Missing since May 15th. (Has he gone to French Frifate Reef on the mating journey?)
Long Tail 2 assymmetrical: Two bleach marks on vertebral scutes, right spot forwardmost . Large male found below mooring of catamaran *Kai Kanani* on the reef directly in front of hotel.
Center 1: Missing left front flipper. (There is a slight stump left which moves as he swims. Shark damage?) Large bleach spot in central vertebral scute. Found on reef below *Kai Kanani.*
3-1 Hump: Female? Three white spots on right at tail end of carapace; dowager's hump . (Is the hump caused by disease?) **
Round, emaciated arms and legs: (Ill?)
Round yellow many: Round carapace, many white spots, soft parts more yellow in color than the other individuals
Green plates: Juvenile , scutes are a bright green color. **
Stars 1-1: Tear in right front flipper Associated with 3-1 Hump - they usually rest near each other. Two marks at tail end of carapace. **
U-second last: Rough open u-shaped white mark on second-last central scute
2 Babies: Perfect round baby, smallest individual, no marks on carapace ** /other baby with white spots
Free Fall: For his behavior, hanging just above the bottom with limbs extended, at an odd angle, being moved around by the currents, as though he is a little too buoyant

NUMBERS

Only a guess. There are 14 individuals identified so far. Perhaps the population of the area is 35 or more.

BEHAVIORS OBSERVED

RESTING: On the bottom, on the reef, often to the side of, or positioned with part of the body protected by a coral head. A given individual often has a particular resting place. Some individuals have a secondary resting spot, where they can reliably be found.

EYES OPEN
EYES CLOSED

YAWNING: The turtles make a yawning movement with the jaws. No air is expelled, in contrast to the air bubble that escapes just before they surface to breathe.

SITTING AT THE READY

FRIGHT: The turtles assume a sitting posture with the front of the body raised about 35%, using the front flippers as support. They have been observed to assume this position in fright, as when a single turtle is surrounded by eight scuba divers. The turtle will stiffen up in the ready position, and will usually flee.

CURIOSITY: Green turtles will also assume this position in curiosity. It usually means they will then come up to the surface.

SWIMMING UP FOR AIR: Coming up from the bottom, at a very steep angle, unless the turtle is wary of activity in the water. The turtles expell the air in their bodies just before surfacing - large bubbles escape just before their heads break the surface. Above water, they breathe out with a sound. They take one to five breaths, putting their heads back under water between breaths.

SCRATCHING UNDER A CORAL LEDGE: The observer has seen one male turtle saw back and forth under a coral ledge for fifteen minutes or more. A few individuals have scratch marks on their carapaces from rubbing on the coral.

USING A FRONT FLIPPER TO WIPE THEIR FACES, OR TO WIPE THE REACHABLE PART OF THE FORWARD CARAPACE.

FEEDING

BOTTOM

JELLYFISH

The turtles tend to browse and crunch on something that grows on coral at the sea bed. On Maui certain winds bring numerous small jellyfish - it seems like the sea is full of jellyfish at that time.The observer has seen a mature turtle eat a four-inch jellyfish in two gulps. The smaller turtles feed on two- to three-inch jellyfish.

NIPPING: The large old male is the animal most likely to nip. It may be his form of greeting. When he cruises by the resting place of another animal, he often nips. One turtle will nip another at the neck, on the face, or at the soft parts under the tail. A turtle may nip another individual if it comes back to its particular resting place and finds another turtle in its spot..

CRUISING: Some individuals will cruise along the sea floor for extended periods of time. They have been followed for more than half an hour. In that time, the turtle will bottom-feed, and will invariably swim by the resting places of other turtles.

MISSING BEHAVIORS

The observer has never seen a turtle excrete anything. (When do they excrete?) The fish are excreting all around them. (Did finally observe excretion as a turtle went to surface.)

RECOMMENDATIONS FOR FURTHER STUDY

The observer would like to refine and expand the present study. Any suggestions as to would be gratefully appreciated.

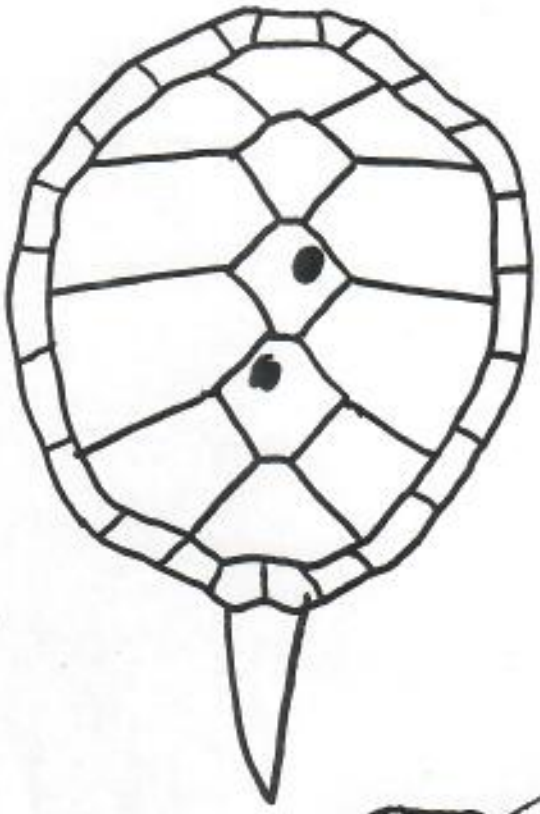
The observer plans to begin using an underwater slate, and clocking observation times. It is hoped to begin using a video camera to record behavior. It would be helpful to be in the water at various times during the day. These observations were made in the morning hours, when there was a lot of recreational traffic on the reef. It would be useful to observe whether behavior and distribution patterns alter at times of day when there isn't heavy traffic.

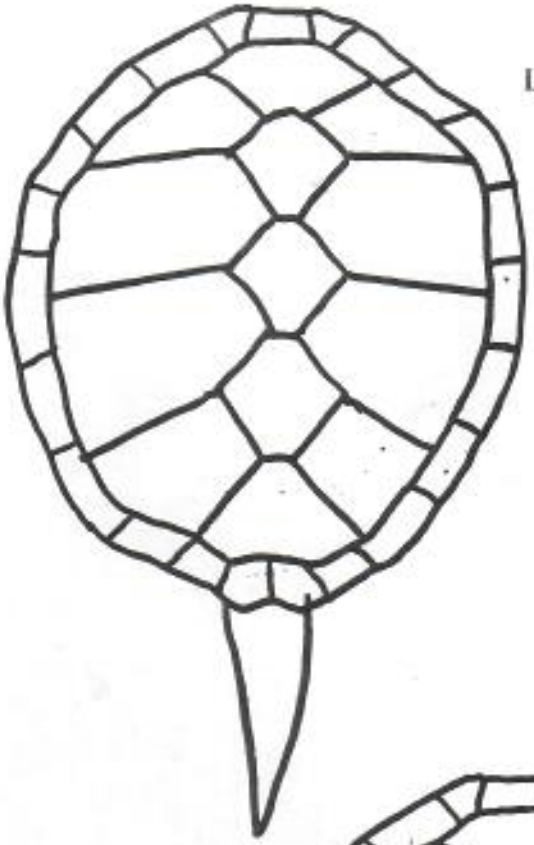
A final rumor: the observer met a woman who says that the turtles surf on big seas in the evening time. They ride in on the waves and then quickly swim out and catch another wave. The woman said she had a video tape of this behavior. Not confirmed!

Charlotte Thomson, Ph. D.
P.O. Box 1872
Makawao, HI 96768
808-572-5940

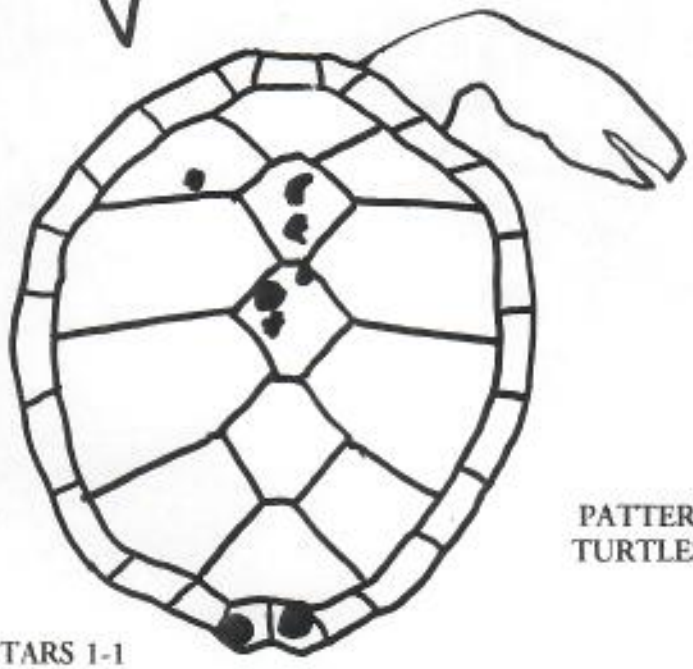
LONG TAIL

LONG TAIL 2 ASYMMETRICAL





3-1 HUMP

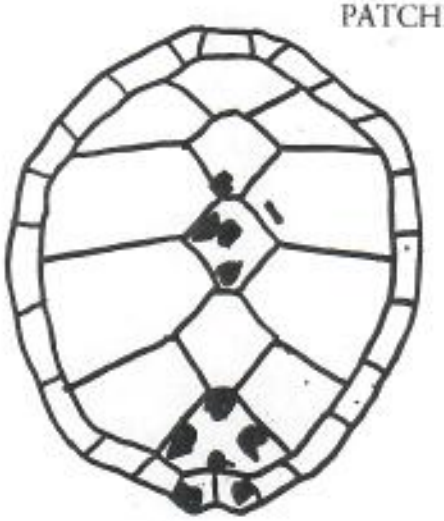


STARS 1-1

PATTERNS OF BLEACH MARKS ON THE TURTLES' CARAPACES (NOT TO SCALE)

PATCHES

U SECOND-LAST

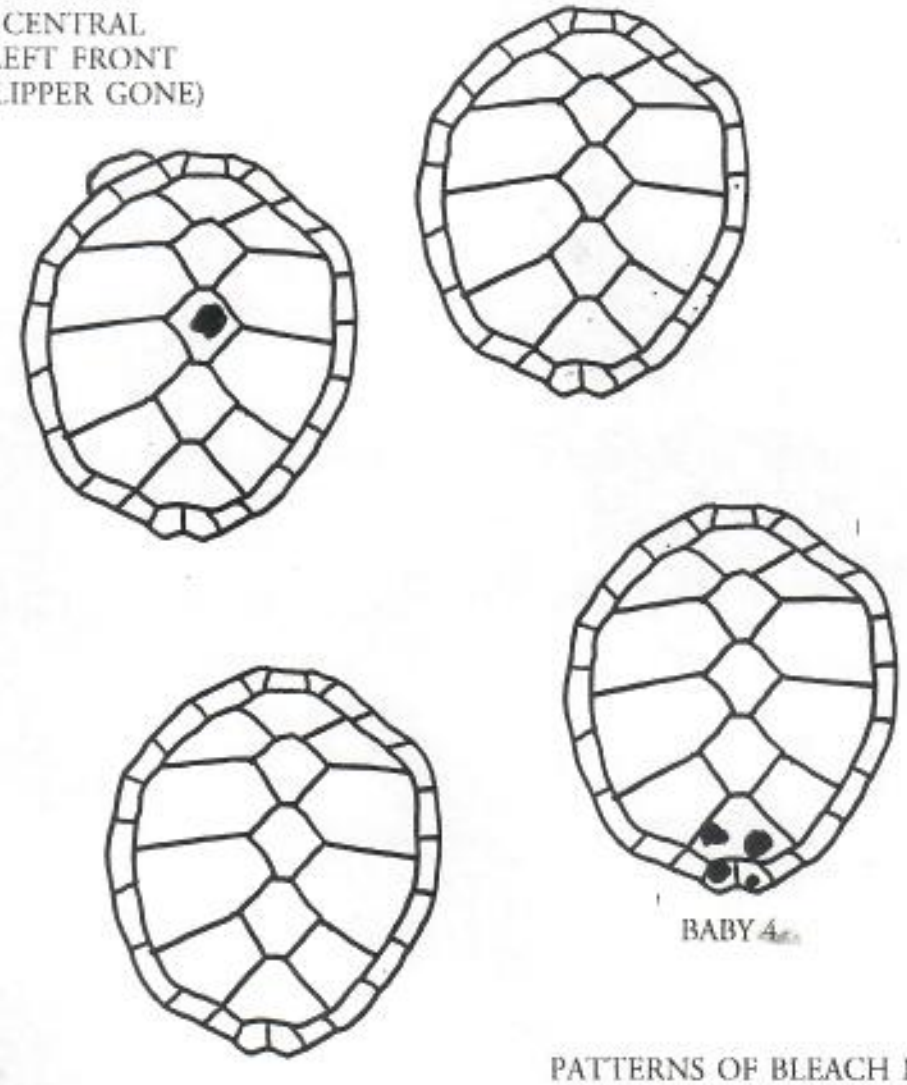


CENTRAL 4

FREE FALL

PATTERNS OF BLEACH MARKS
ON THE TURTLES' CARAPACES
(NOT TO SCALE)

1 CENTRAL
(LEFT FRONT
FLIPPER GONE)



BABY 4

PATTERNS OF BLEACH MARKS
ON THE TURTLES' CARAPACES
(NOT TO SCALE)

TOP TO BOTTOM:
PERFECT BABY, 3-1 HUMP, STARS 1-1

GREEN PLATES (JUVENILE)

George - any interest in getting info from this lady? - let me know.

CHARLOTTE THOMSON, Ph.D.
Certified Hellerwork Practitioner
P.O. BOX 1872
MAKAWAO (MAUI) HAWAII
96768

Sandra
6-1-94

Dear Sandra,

Thank you for the articles, pamphlet and sighting cards. Is there a USGS sheet for Maui? I think the best way to show you where I have seen turtles would be to mark a USGS sheet for you. I have pretty much explored a three to four miles of the Wailea coast, and have seen individuals, pairs and groups of turtles up to five in ~~size~~ number in many places there. I can in some cases identify individuals by the pattern of white barnacles, by size, by tail length and by favorite habitat. I can even go back and photograph individuals if that is needed. Do you have any pattern established for a turtle survey? I would be very happy to do a turtle survey of the Wailea coast.

Sandra, I got stung by a very unusual jellyfish today. I wondered if you had ever seen one or knew what it was. It was small-bodied (3 inches) BRIGHT BL:UE with tentacles or strings about eight feet long. When I first saw the strings in the water I thought it was fish line, the blue was so bright. It was a searing sting, kind of like electricity. When I came out of the water the stings turned red , sore and swollen, but I iced the hand in the supermarket, and it got better quickly. Do you have any idea what such a creature is?

I have seen the green turtles eating a small transparent jellyfish of another sort. On a certain wind the jellyfish are blown to the coast and the turtles actively feed on them. They are transparent four-lobed jellyfish about 3 inches long, though I have seen a turtle eat larger ones.

(green turtles)
I thought they only ate algae & seaweed

Thank you for your kindness.

Sincerely,

Charlotte Thomson

Charlotte Thomson

[IS] From: Shawn Koga 9/21/94 6:58AM (2371 bytes: 40 ln)
To: George Balazs
Subject: Telephone message
---------- Forwarded with Changes ----------
From: George Balazs 9/20/94 5:50PM (502 bytes: 12 ln)
To: Shawn Koga
Subject: Telephone message
---------- Message Contents ----------
Just got off the phone with her. She was happy that we returned her call. I explained to her that you were very busy with working out in the field and that you also have meetings to attend. She had several questions for you. She was wondering about the bleach marks on the turtles. I explained to her that it's probably coralline algae. (She uses this to identify turtles.) She also asked when the turtles go up to FFS to nest. I told her usually from June-September (I hope that's close.) She also wanted to ask you if you could critique her last survey and tell her what types of information you would like her to collect. She would like to provide valuable information that you could use. She would also like to speak with you when you have time. She also asked if a "herd" has a dominant male. She sees 3 "herds" and notices a dominant male in each one. She's been also noticing that these herds are interacting with each other. She sees the turtles eat jellyfish, algae on the coral, and rolling seaweed on the bottom. She would also like to know when the turtle conference is because she would like to attend. She also has some video footage of a shark bumping into a turtle. It didn't attack it, but spun around while the turtle hid in the ledge. She also asked about the possibility of helping out when you tag turtles on Maui or the Big Island. I think that was all she told me. You can reach her at the number below when you have time.

Shawn- Please call her and explain all the field work I'm doing, and meeting attending. Maybe you can take care of why she's calling. Please try. thanks geo.

From Gloria-to ghb

Forgot to send you this message earlier.

Please call Charlotte Thomson on Maui.
Ph: 572-5940
Call her before 7 AM or after 1 PM.

P.O. Box 1872
Makawao, HI 96768
September 30, 1994

George H. Balazs
National Marine Fisheries Service
2570 Dole Street
Honolulu, HI 96822-2396

Dear George,

Thank you very much for the letter when I was in the hospital. It cheered me tremendously.

I got back in the water on the 20th postsurgical day , and have been spending about 20 hours a week observing the green turtles in South Maui. It appears that there are three herds on one mile of coastline, and two rookeries (if I'm using the word correctly) in shallower water where the babies live. It appears that each herd has a dominant old male.

I'd like to meet you and talk to you so that the time is spent for the highest good, and so that information is collected in such a way as to be of use.

In the mean time, I have so many questions to ask you. They appear on the next sheets of paper. If you could even jot answers on these sheets and return them to me, I'd be grateful.

Yours sincerely,

Charlotte Thomson

Charlotte Thomson, Ph.D.

There are perhaps 100 turtles living along one mile of coastline. I have not seen any turtles with a tumor, but I have heard of one with a tumor on the neck who makes a strange sound when he comes up to breathe.

Questions for George Balazs

1. Is there any project where I could help you as a volunteer?

2. Where and when is the next turtle conference? How do I "join?" What organization sponsors the conference?

3. One baby at theTurtle Reef rookery has a clip on the left rear flipper. The marginal scutes have grown out over the clip so that it is impossible to see without being aggressive (taking hold of the animal). The clip may say F --. Should I grab the animal to see the clip? Did you tag some animals on the left rear flipper?

4. Is it your experience that each herd has a dominant male?

5. Is it your experience that the babies live separately in shallow water?

6. Is there a way to meet you in order to refine my working methods and allow my work to contribute to your goals?

Charlotte Thomson
P.O. Box 1872
Makawao, HI 96768

7. Can you tell me how to get into the database on green sea turtles?

8. Has anyone done any work on the behavior of sea turtles?

THANK YOU SO VERY MUCH FOR TAKING THE TIME TO REPLY!

Shawn
FYI &
return TOGETHER

Charlotte Thomson, Ph. D.
Certified Hellerwork Practitioner
P. O. Box 1872
Makawao, HI 96768

Tuesday October 11, 1994

Dear George,

Thank you very much for sending me the Synopsis. What an enormous amount of work that reflects! I wolfed it down like a mystery novel, and am re-reading it, with such great pleasure.

South Maui would be ideal for tagging purposes. There is ready access to the water, and there are plenty of turtles. I have a call in to Donna Liddicote, and will write to you as soon as we have been snorkeling together. MAUI MOP

Last week I got to follow a Spotted Eagle Ray for two hours while it was feeding. Have you ever followed one? It feeds on the same algae attached to coral that the turtles here eat, and it feeds in the same manner. Its whole body convulses when it takes a bite, and it feeds head down with two flipper-like appendages at the tail stabilizing the body while it eats. The humuhumununkununkupuapuaaha follows it, eating broken pieces. The ray expells clouds of sand and coral through its gills. Its back becomes covered with litter from the meal. It ate for such a long time!

I understand that you are busy. I read the new shark book. At tsunami time I am sure you were fully involved.

Thank you so much for your encouragement.

I am working on a small turtle book for tourists. Some 300 people a day on Maui go out on tours to see the turtles. There's nothing for them to read and take home. With you permission, I'll send it to you to look over.

With very best wishes,

Charlotte Thomson

The small tagged turtle has two tags, on on the left rear flipper and one on the right front. I am unable to read them because the carapace has grown out over the tags.

Shawn - FYI

Dear George,

I'm going to send it to you in pieces.

IS this too "flowery?"

Any corrections?

Charlotte

Swimming date with Donna L Sat. Oct. 29

The small turtle with 3 tags could be one of those tagged and released off Lanai?

PREFACE

Maluaka Point in South Maui marks the land's end where the Maluaka lava flow from Haleakala volcano plunged into the sea. In the ocean just off this point, coral reef has grown on the submerged lava, allowing an abundance of life to become established. The slanting flows of sub-sea lava have been undercut by sand and water moving on the ocean floor. There are underwater arches, ledges and caves. A herd of some twenty green sea turtles lives in the protection of these ledges and caves.

The herd of sea turtles is in danger. There is a plan to build a new hotel at Maluaka Point. Debris and chemicals from construction are likely to make their way into the ocean. Night lights from the new hotel may disrupt the life rhythms of the sea turtles. Their world is on the verge of deep change.

A second danger to their habits is the sheer number of tourists brought to the reef daily on snorkeling tours. At times the tour boats disgorge several hundred people into the water in one hour. The boats themselves bring noise, vibrations and fumes.

The initial intention of this study was to count the turtles in order to inform George Balazs at the National Marine Fisheries Service on the number of animals at stake, and to collect enough data to suggest that the area be made a marine sanctuary.

In order to count the turtles, I needed to be able to distinguish them from one another. Swimming with them day after day, I began to see patterns and behaviors that were not spoken of in the literature on sea turtles. It became apparant that I was witnessing the dynamics of the herd, and that this needed to be recorded.

No work of this kind is complete. A year's obeservation is just an eye-blink in the larger scheme of things. One individual's perspective is limited. And there is distortion caused by the very presence of an observer. The sea turtles live much longer than we do. Their life cycles will continue. New animals will hatch and find their way across the vast sea distances to this herd and this grazing place. The turtles may disperse because of environmental pressures.

With these limitations in mind, this work is offered as an invitation into the sea, to swim at the margin of the land with these graceful and gentle creatures. May you be blessed with calm seas and clear vision as you venture onto the reef. May these sweet animals help you to discover and embrace your own peace.

Charlotte Thomson
Maui October 1994