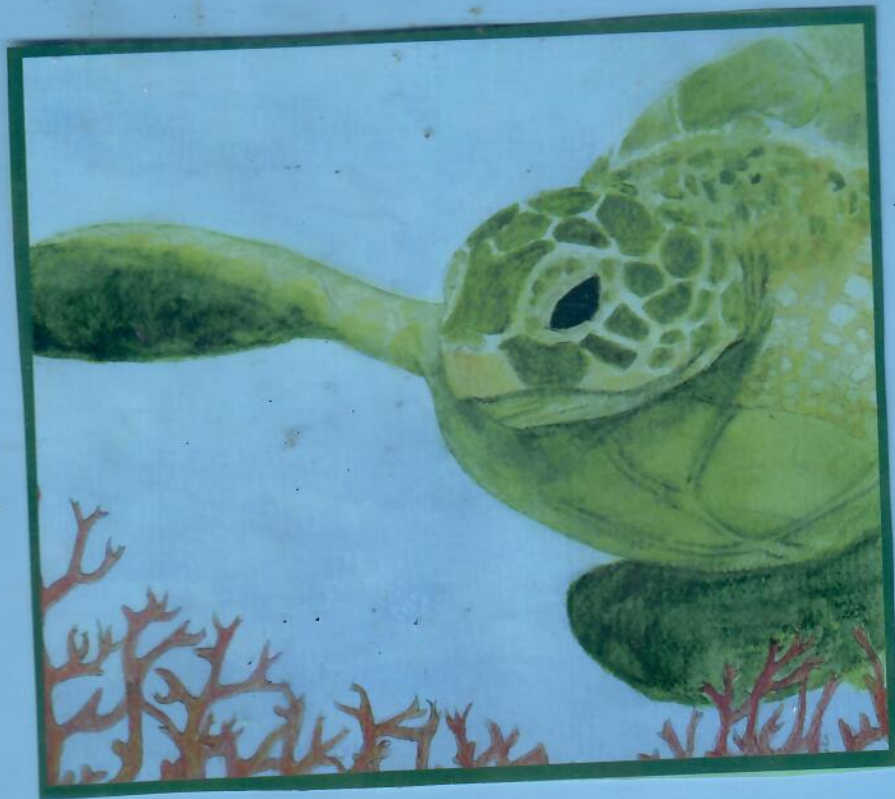


2 of 2



### **ID GUIDE TO LANIAKEA BASKERS**

L-1 ( **BRUTUS** ) ADULT MALE- WHITE "1" ON L & R SHELL; SATELLITE TRANSMITTER ATTACHED FEBRUARY, 2007. LEFT HIND FLIPPER 1/2 AMPUTATED.

L-2 ( **HIWAHIWA** ) ADULT FEMALE- PROMINENT 5 YEAR OLD HEALED INJURY (CRACK) ON TOP OF SHELL.

L-3 ( **SAPPHIRE** ) ADULT FEMALE – VERY FAINT FIBERGLASS REMNANT ON BOTTOM LEFT SIDE OF SHELL. VERY ROUNDED SHELL.

L-4 ( **OLIVIA-DAWN** ) ADULT FEMALE- RECTANGULAR TIME-DEPTH RECORDER (TDR) AND SATELLITE TAG ATTACHED FEBRUARY, 2007

L-5 ( **ISABELLA** ) ADULT FEMALE- RIGHT EYEBALL IS MISSING UNDER EYELID ( OLD INJURY). VERY ROUNDED SHELL.

L-6 ( **OAKLEY** ) SUBADULT-CLEAR PLASTIC DISK GLUED TO LEFT SIDE OF SHELL.

L-7 ( **WOOLEY BULLEY, LOPEKA** ) ADULT MALE- FAINT WHITE "L7" ON SHELL; VERY LONG TAIL. LEFT HIND FLIPPER 1/3 AMPUTATED.

L-8 ( **KUAI** ) "HIBISCUS" GOLDEN DESIGN ON LEFT SIDE OF SHELL. NIGHT BASKER.

L-9 ( ? ) SUBADULT.

L-10 ( **SQUIRT** ) SUBADULT- LEFT AND RIGHT LATERAL SCUTES MISSING AND HEALED ON EITHER SIDE OF TAIL ( DOUBLE SCALLOP)

L-11 ( **T-BOY** ) ADULT MALE- TUMORS ON EYES, MOUTH AND NECK. .TREATED WITH DRUG DERMEX (10/05)

L-12 ( **MISSY** ) ADULT FEMALE- VERY ROUNDED SHELL. SATELLITE TAG ATTACHED FEBRUARY,2007.

L-15 ( **MANAGIRL** ) ADULT FEMALE-NEVER KNOWN TO BASK, BUT COMMONLY SEEN CLOSE TO SHORE FEEDING. REMNANT OF RECTANGULAR TIME DEPTH RECORDER BOX ATTACHED TO LEFT SIDE OF SHELL.

L-18 ( **PUKALANI** ) ADULT FEMALE- FAINT WHITE "L-18" ON L&R SHELL; REMNANT OF OLD FIBERGLASS ON TOP OF SHELL.

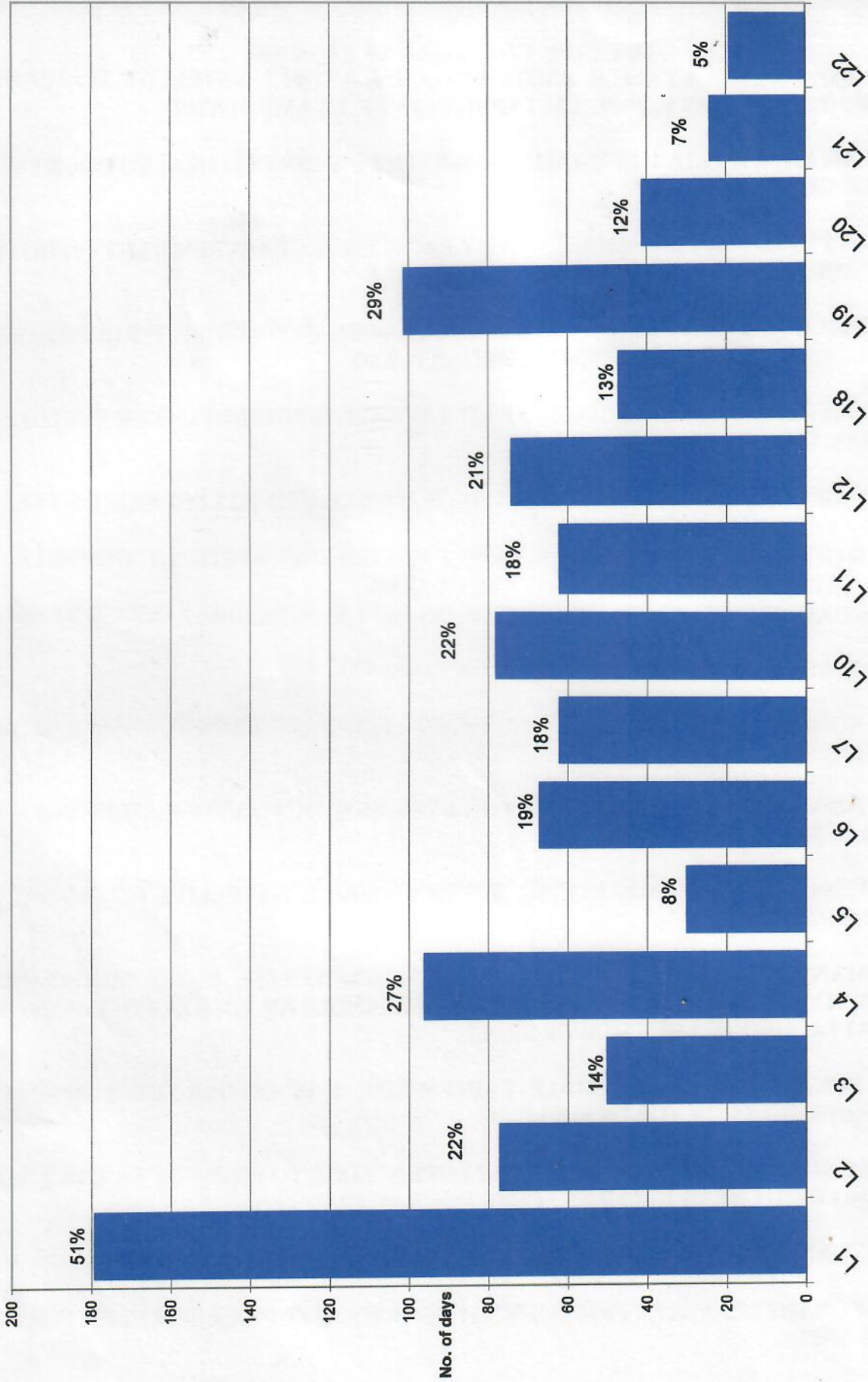
L-19 ( **SCALLOP** ) SUBADULT- HAS "SCALLOPED" EDGE TO RIGHT OF TAIL DUE TO MISSING RIGHT REAR LATERAL SCUTE.

L-20 ( **HONEYGIRL** ) SHELL IS A DISTINCTIVE "HONEY" TORTOISE COLOR.

L-21 ( **PUNAHELE** ) ADULT FEMALE WITH QUARTER SIZE PUKA (HOLE) ON FORWARD RIGHT SHELL.

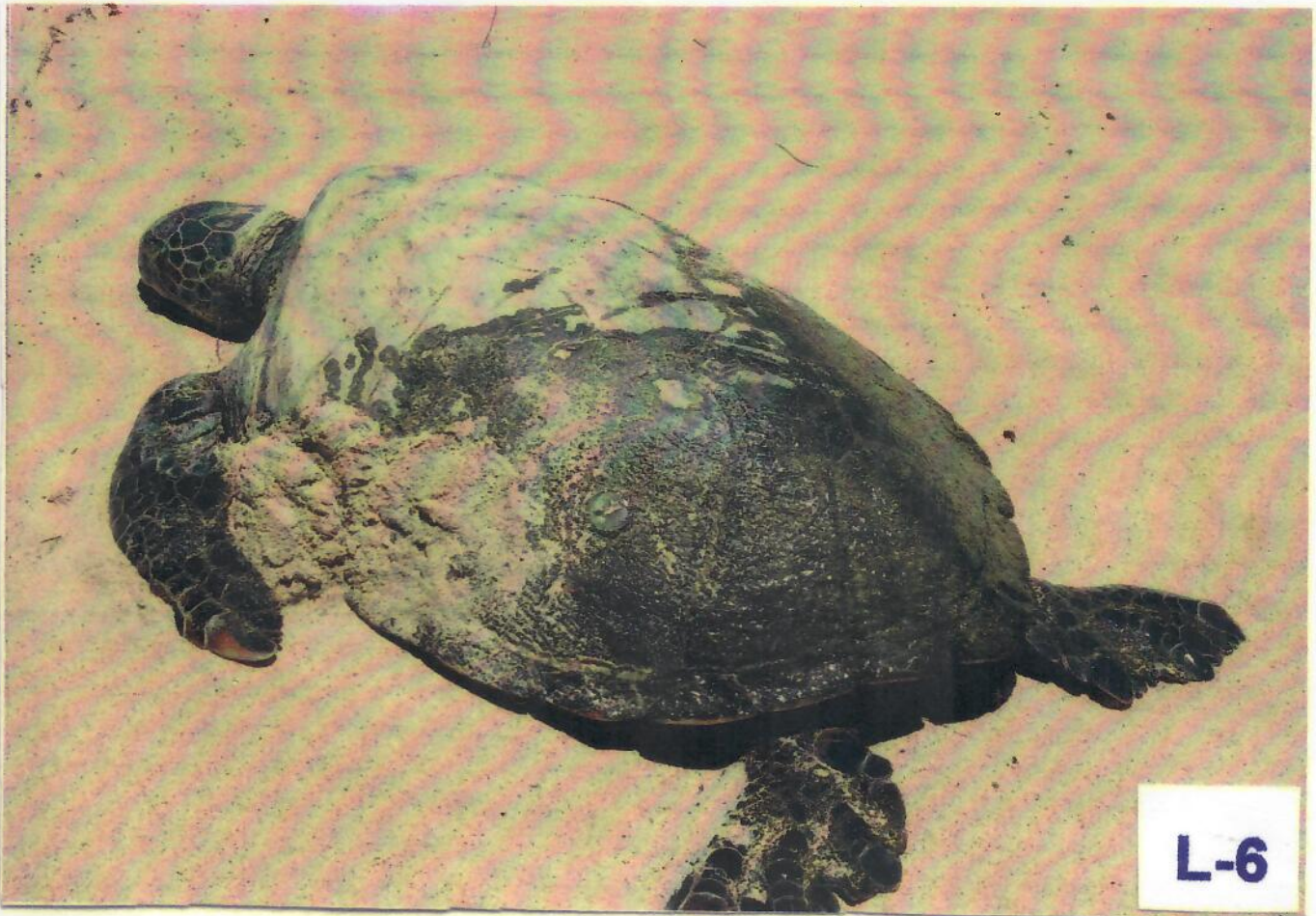
L-22 ( **TRIPOD** ) ADULT MALE- HEALED AND AMPUTATED RIGHT BACK FLIPPER.

# Numbers of days individual turtles were observed basking N= 354 days of observation (July 1, 2006 to June 19, 2007)



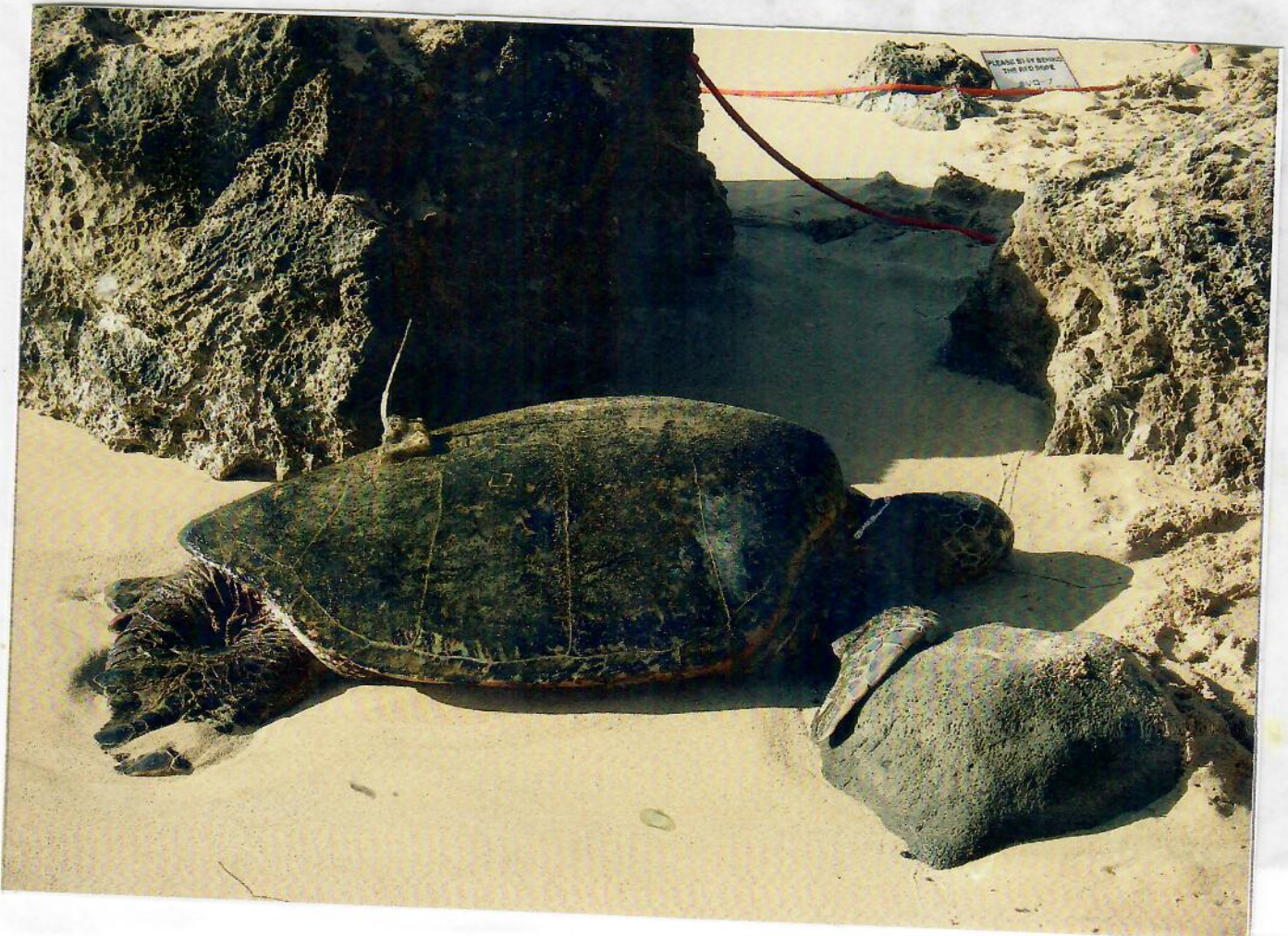
Marine Turtle Research Program  
Pacific Islands Fisheries Science Center  
NOAA National Marine Fisheries Service  
2570 Dole Street  
Honolulu, Hawaii 96822-2396

Laniakea.basking.data.begin.July.2006  
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8-1





L-19

L 21



L 20





L-1





**L1 Adult Male – White "1" on L&R shell;  
Left hind flipper 1/3 amputated but healed.**



**L2 Adult Female – Old healed impact injury (crack)  
to top of shell.**

## **ID Guide to Laniakea's most often recognized turtles – "The Magnificent 15"**

- L1** Adult Male – White "1" on L&R shell; Left hind flipper 1/3 amputated but healed.
- L2** Adult Female – Old healed impact injury (crack) to top of shell.
- L3** Adult Female – Fiberglass remnant bottom of left side of shell.
- L4** Adult Female – Time-Depth computer box glued to left side of shell.
- L5** Adult Female – Right eyeball is missing (concave) under eyelid (old injury).
- L6** Subadult – Clear plastic disk glued to left side of shell.
- L7** Adult Male – White "L7" on L&R shell; Satellite tag with antenna glued to shell.
- L8** Adult Female – Only ever known to bask at night.
- L10** Subadult – Fiberglass remnant bottom left side of shell.
- L11** Adult Male – Modest eye and neck tumors treated with the drug Dermex in October 2005. As of March 06 likely at French Frigate Shoals.
- L12** Adult Female – No distinguishing features.
- L15** Adult Female – Never known to bask, but commonly seen near shore feeding; Remnant of Time-Depth computer box glued to left side of shell. As of May 06 known to be nesting at East Island, French Frigate Shoals.
- L18** Adult Female – White "L18" on L&R shell; Satellite tag with antenna glued to shell.
- L19** Subadult – has "scalloped" edge to right side of shell over hind flipper.
- L20** Adult Female – Shell is a distinctive "honey" color.

### **Note:**

Adult – the largest turtles present at Laniakea.

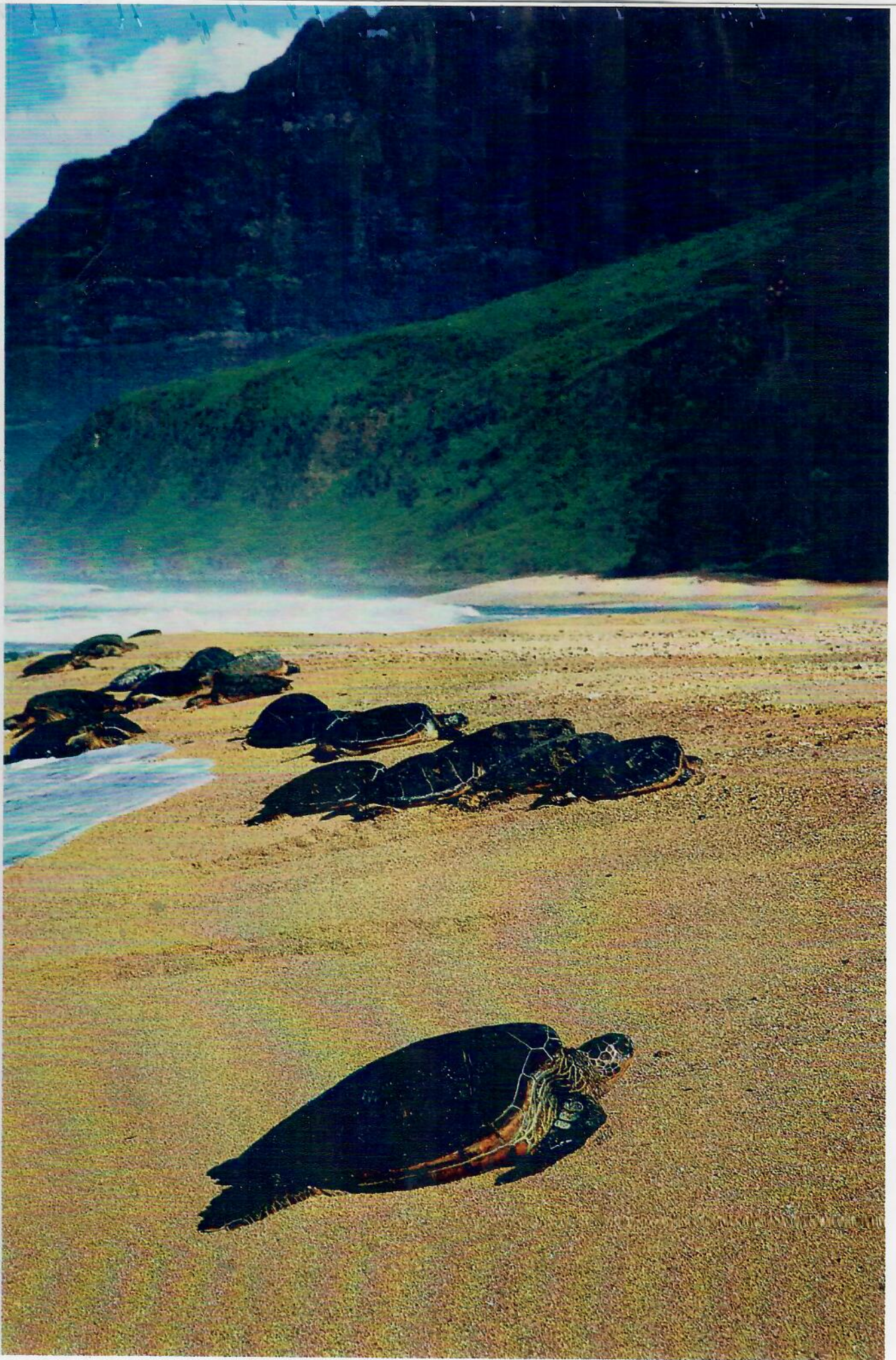
Subadult – turtles about 3/4 the size of adults, sex unknown – all have short tails.

Adult Males – Tails that are very long – extending well past the end of the shell if the tail is stretched out straight (by the turtle, not by you :)

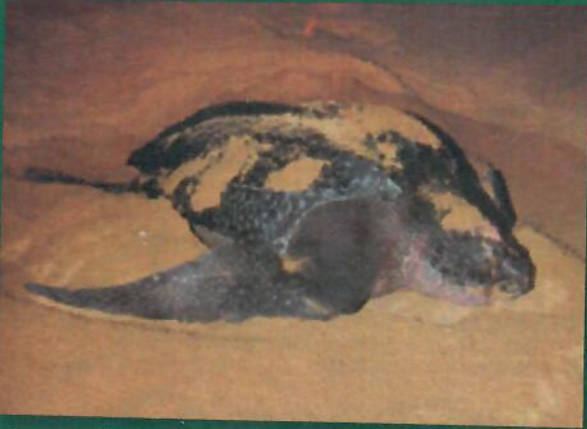
Adult Females – Have short tails that are only about 1/8 the length of the Adult Males.

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Please store in locker at Laniakea.



## Pacific Marine Turtles



*Dermochelys coriacea* (Leatherback turtle)



*Lepidochelys olivacea* (Olive ridley turtle)



*Eretmochelys imbricata* (Hawksbill turtle)



*Caretta caretta* (Loggerhead turtle)



*Natator depressus* (Flatback turtle)

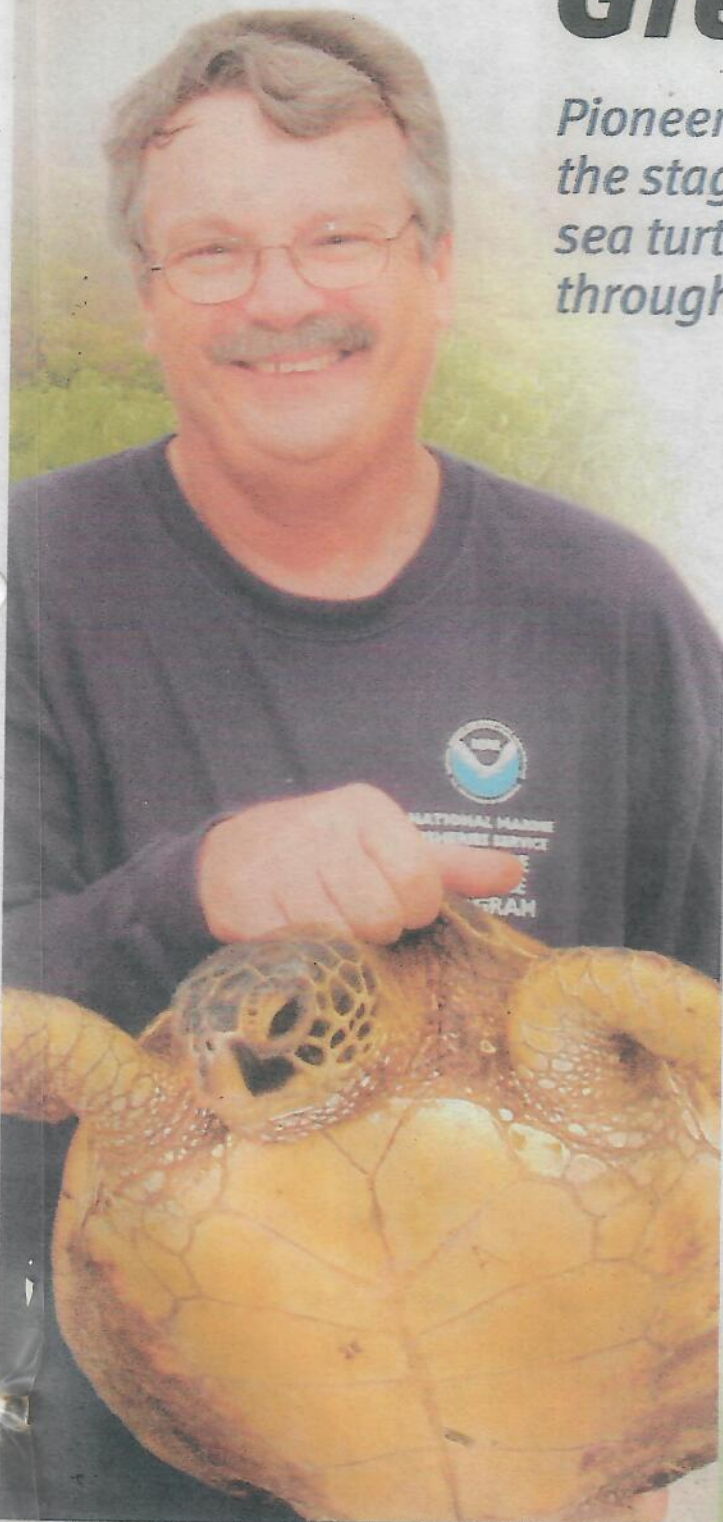


*Chelonia mydas* (Green turtle)

Figure 2. The six marine turtle species occurring in the Pacific Ocean, all but the Flatback are the focus of this workshop. Not pictured is the subpopulation of the Eastern Pacific "black" sea turtle, *Chelonia agassizii* (Photo Source: C. Limpus).

# Green Sea Turtles of the Pacific: ***Saving the Hawaiian Green Turtle***

*Pioneering work on the honu set  
the stage for current science-based  
sea turtle conservation efforts  
throughout the Pacific*



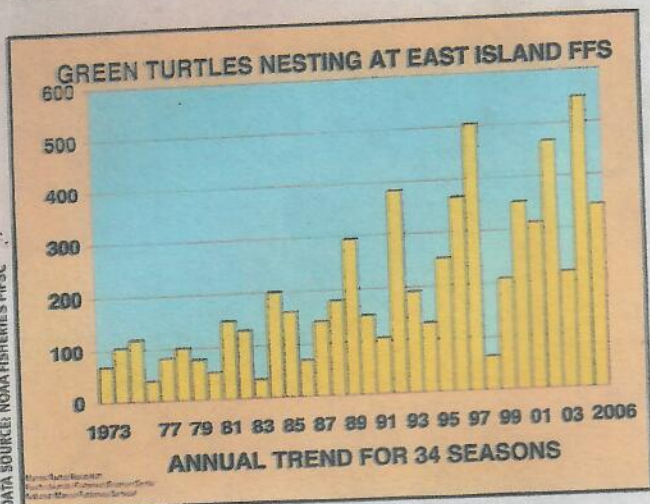
**T**he story of the *honu* (or Hawaiian green turtle) is also the story of man. And prominent among the many involved with the conservation of this species is George Balazs, biologist and leader of the “core” Marine Turtle Research Program at NOAA Fisheries Pacific Islands Fisheries Science Center (PIFSC). His nearly 35-year career has been devoted to the study and survival of the Hawaiian green sea turtle.

In 1973, when Balazs set out to count the Hawaiian green sea turtles in the Northwestern Hawaiian Islands, he found just 67 nesting females at the uninhabited East Island of French Frigate Shoals. Subsequent research confirmed that the fate of the endemic *honu*, throughout the entire Hawaiian Island chain depended on fewer than 150 females nesting each year.

Thirty years later in 2002, on the same island, Balazs’ research team counted 467 females – a nearly 300 percent increase!

“If someone had told me thirty years ago that the *honu* would become so visible and so enjoyed as part of our greater Hawaiian community today, I would not have believed it,” Balazs says.

*George “Keoki” Balazs, universally recognized honu expert, was honored with the National Conservation Achievement Award in March 2005 by the National Wildlife Federation for his work on the recovery of the Hawaiian green sea turtle.*



Estimated number of Hawaiian green sea turtles nesting at East Island, French Frigate Shoals, NWHI, 1973-2006.

Today, the recovering trend of the once nearly depleted Hawaiian green sea turtle is proof positive that a population can recover, given time and appropriate protection. These results have challenged long-held conventional wisdom that a seriously depleted population might take 100 years or more to recover after the cessation of harvesting, in part because of low reproduction rate, late maturity and long life span.

This pioneering work further provides evidence of the importance of a holistic approach to sea turtle recovery efforts. The long-term research on the *honu* concludes that the increase in nesting females could not be attributed solely to protection under the U.S. Endangered Species Act.

The increased abundance of nesting females was helped by both the reduction of nesting beach disturbance at French Frigate Shoals in conjunction with conservation efforts of both adult and juvenile greens in coastal waters around the main Hawaiian Islands.

While special circumstances can be attributed to the current population trends of the *honu*, due to nesting beach isolation in the Northwestern Hawaiian Islands (NWHI) and its relatively small ecosystem confined to the Hawaii Archipelago, Balazs' work has helped set the stage for scientists researching loggerheads, leatherbacks and hawksbills whose migrations across international borders complicates conservation efforts.

"As a scientist, I know that turtles are harvested worldwide for a variety of reasons, including out of necessity for survival," Balazs says. "Here in Hawaii, I want to see the turtle returned to levels of abundance to fulfill their ecological role as part of our Hawaiian community."



American Samoa DMWR staff, Siaifoi Fa'aumu (left), Kate Saili (center), along with the Mayor of Malota, Lisona Leiataua (right), prepare to release a hawksbill turtle with a satellite transmitter in February 2006.

Since 2003, the NOAA Fisheries Service Pacific Islands Regional Office (PIRO) has undertaken sea turtle conservation and management activities geared towards institutional capacity building for sea turtle conservation, management and research in the U.S. flag areas of American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI).

The PIRO is working to build capacity to support assessments of local sea turtle populations. In American Samoa, sea turtle research activities are conducted by the Department of Marine and Wildlife Resources (DMWR). They are trained with skills to deploy satellite transmitters, beach mapping, identification of sea turtle foraging areas and underwater surveys for turtles. The CNMI Division of Fish and Wildlife is conducting nesting beach monitoring and surface and underwater surveys to ascertain turtle distributions and numbers throughout the Marianas archipelago. In Guam, the Division of Agriculture and Wildlife Resources (DAWR) undertakes nesting beach monitoring, aerial surveys and collection of nest inventory data. The Guam DAWR has also initiated a volunteer program, *Haggan Watch*, that now has over 40 members to assist with sea turtle conservation on Guam.

## Hawaii Emerging as a Center for Pacific Sea Turtle Research and Conservation



*Green sea turtle and diver. Ecotourism, is a major industry in Hawaii, and the honu are an important component of this market.*



*George Balazs with assistant Bridget McBride fitting a green sea turtle with a satellite transmitter.*

Balazs first became aware of the plight of the *honu* in 1969 in Lahaina Harbor, where he and wife Linda observed fishermen unloading live sea turtles bound for restaurants along the west coast of Maui. Balazs began to question whether the harvesting of *honu* was going on at a faster rate than the animals could replace themselves. He wondered, "How many turtles can there be out there?"

As he delved into this question, Balazs was astonished to find that biologists knew surprisingly little – even the basics of reproduction, population and ecology – about sea turtles in general. This work, eventually spanning over

three decades, became the basis of the first in-depth, scientifically rigorous population study of the Hawaiian green sea turtle.

Over time, PIFSC's Marine Turtle Research Program expanded to include a strandir program and investigations on fibropapillomatosis, a tumor-forming disease that reached epidemic levels in the 1980s and 1990s. The project also helps build capacity throughout the Pacific region by training researchers on data collection and research methods in the Pacific Islands of American Samoa, Guam, Saipan and Palau among others.

The *honu* is a genetically distinct Hawaiian stock, an "original native Hawaiian," that nest almost exclusively in the French Frigate Shoals and forage around the main Hawaiian Islands. As part of his work, Balazs leads teams of researchers and volunteers to monitor the *honu* at nearly 25 study sites in the main Hawaiian Islands, with the Big Island of Hawaii and Molokai currently providing the most important foraging areas for the *honu*.

Balazs' precedent-setting work confirmed his suspicion that the rate of harvest, if remained unchecked, would result in a devastating, possibly irreversible, decline. In 1963, records showed that 380 pounds of sea turtle meat were sold, but by 1977 that number had jumped to 25,583 pounds. Unregulated harvest was threatening the species survival, and by 1978 the green sea turtle was listed as threatened under the federal Endangered Species Act.

Conservation efforts over the last three decades are the result of many concerned people, including local legislators, resource managers, environmentalists, the local community and fishermen. Among the latter were many seasoned fishermen who early on recognized the *honu's* decline and whose vast knowledge about the *honu* has enriched and inspired research.

A paper Balazs co-authored with Milani Chaloupka in 2004 provides encouraging evidence on how this species is recovering. The study documents the speed of population recovery and that such a large population could have quickly resulted from so few individuals.



## DIEL BEHAVIOR OF TWO ADULT BASKING TURTLES AT LANIAKEA, HAWAII

### INTRODUCTION

Green turtles (*Chelonia mydas*) found in Hawaii primarily belong to a metapopulation that is genetically different from green turtles found elsewhere in the Pacific (Balazs & Chaloupka 2004). One unique behavior of members of this Metapopulation is terrestrial basking, which is unknown in other populations except for occasional basking in the Galápagos, and the Gulf of Carpentaria in Australia (Balazs & Chaloupka 2004). Also there has been a notable increase of basking in the main Hawaiian Islands since 1994 (Rice et al. 2002). Theorists have proposed several possible explanations for basking. Some of the more popular theories are energy conservation (Swimmer & Balazs 2000; Whittow & Balazs 1985), reduced exposure to marine predation (Green, 1998), and thermoregulation (Spotila & Standora, 1985). Basking behavior is most likely exhibited for a combination of reasons and is, for unknown reasons, notably more common in the Hawaiian Islands.

Since 1998, adult green turtles have basked at Laniakea, a white sand beach on the North Shore of Oahu (21° 6'N, 158° 10'W). It is a popular surf spot and frequently visited by tourists and locals. Juveniles and adult are turtles present in the area, but only adults bask on the beach, seemingly, unaffected by humans

(fig 1). Motto-tool numbers were lightly etched into the carapaces of basking turtles to aid in individual identification. In 2003 a remote controlled video camera was placed at the site to allow continuous monitoring of basking behavior. Over the last decade or so dive computers often termed Time Depth Recorders (TDR's), have provided a considerably large amount of information about dive profiles and surfacing intervals of marine animals (Hays et al. 2004). In



Figure 1.

October 2003 TDR's were attached on habitual baskers that had been previously captured and tagged. This paper analyzes data collected from two male habitual baskers at Laniakea that were fitted with TDR's. The aim of this paper is to analyze the basking and resting behavior of these adult turtles and compare it with the behavior of two sub-adult turtles of unknown gender from Kiholo Bay studied in 2002 (Quaintance et al. 2003).

Kiholo Bay lagoon is approximately 150 miles SSE of Laniakea on the Big Island's Kona/Kohala coast, at 19° 52'N, 155° 55'W. Researchers have observed sub-adults to juvenile turtles basking in Kiholo since 1994 (Quaintance et al. 2003). The shoreline of the lagoon consists primarily of basaltic rock and consolidated pahoehoe lava. The south shore, which separates most of the lagoon from the ocean, is made of rounded basaltic rocks, with a small gravel beach called "Turtle Beach". Turtles in Kiholo unlike Laniakea choose to bask on the gravel beach even though there is sand nearby and if they are approached they return to the water. Also there seems to be less food available at Kiholo, which may be limiting the population's growth. Food at Laniakea appears to be more abundant. The turtles were observed in similar ways to the turtles at Laniakea with motto-tool numbers and remote controlled video cameras (Quaintance, In press).

Figure 2. 67x17x17mm.



### MATERIALS & METHODS

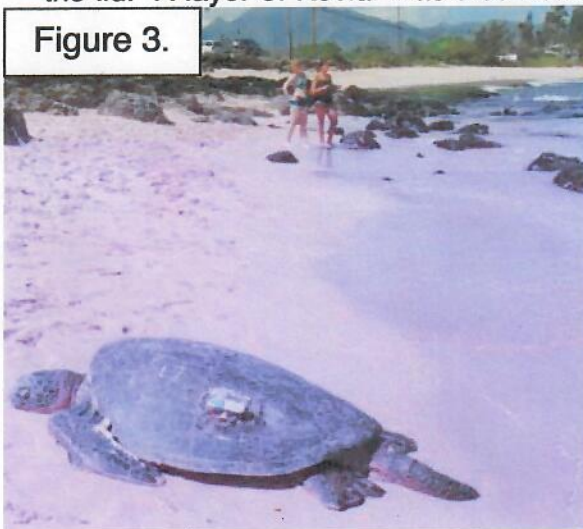
Motto-tool numbers were used to identify habitual baskers; they were labeled with "L" for Laniakea then consecutive numbers. L1 and L7 were fitted with a MK7 and a MK9 respectively (fig 2) because of their habitual basking behavior. The TDR's were programmed to record depth, temperature, and resistance (only on the MK9) every minute. Temperature recorded is external or ambient environmental temperature.

The TDR's were attached to each turtle's carapace with layers of fiberglass on the 2<sup>nd</sup> lateral scute (fig 3). A PVC box with a removable lid served as the container for the TDR. The TDR could easily be exchanged (removed) by taking the lid off, removing the TDR, placing a new TDR in the case and reattaching the lid. A layer of Kevlar was also used on the outside for added

protection. A more detailed description of attachment procedure can be found in Rice et al (2000). This method of attachment has been used in several other studies and has been found to be very safe and secure (Glen et al. 2001, Quaintance et al. 2003, Rice et al 2000).

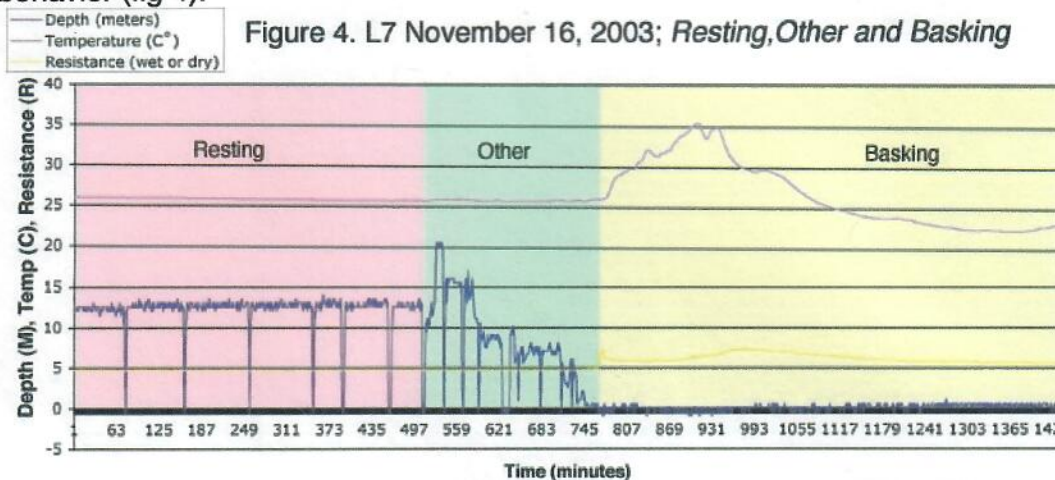
The data examined in this paper runs from December 28, 2003 to March 3, 2004 or 70 days for L1 and October 1, 2003 to February 27, 2004 or 155

Figure 3.



days for L7. This data was recorded when the TDR's were attached until just before they left Laniakea to migrate to the French Fidget Shoals.

Behaviors were divided into three categories basking, resting, and other. In previous papers a foraging category was used (Quaintance et al. 2003) but because these turtles showed deeper non-resting dives that could have been foraging they were included in the same category rather than creating a new one. Behaviors were defined as follows; *Basking* behavior was indicated by a change of the conductivity reading in conjunction with an increase or decrease of 3 or more degree's in temperature for more than 10 minutes at a depth of 0-3m. *Resting* behavior was characterized by flat bottom dives deeper than 3 meters, more than 20 minutes long, and bottom depths varying no more than 3 meters during 90% or more of the dive. *Other* or feeding, diving and non-resting/basking behavior (fig 4).

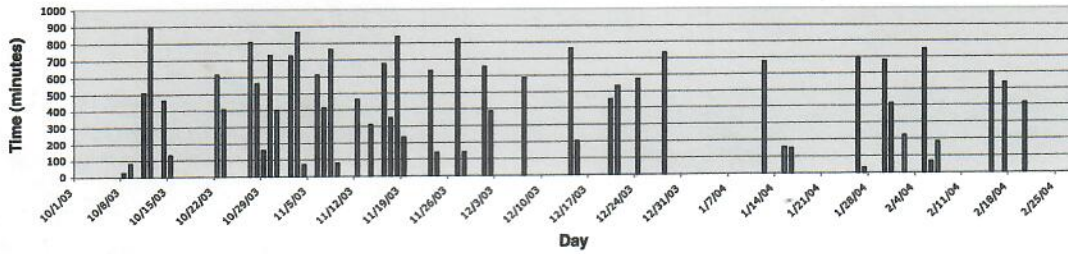


Basking behavior could result in a decrease in temperature if the animal hauled out in the evening, night or when there were high winds. Normally once the turtle's temperature was below ocean temperature it would shortly return to the water.

## RESULTS

Out of 155 days L7 spent a total of 55% resting, 11% basking and 32% doing other behaviors. On 53 of those 155 days L7 hauled out to bask during some part of the day to bask, the maximum duration was 15 hours during 3 episodes in the same day. Figures 5 and 6 show the frequency of basking days.

Figure 5. L7 Basking Frequency over 155 days



Out of 70 days L1 spent a total of 11% of the time resting, 17% basking and 72% doing "other" behaviors. On 38 of those 70 days he hauled out during some part of the day to bask, the maximum duration per day was 13.5 hours during one episode (fig 6).

Figure 6. L1 Basking Frequency over 70 days

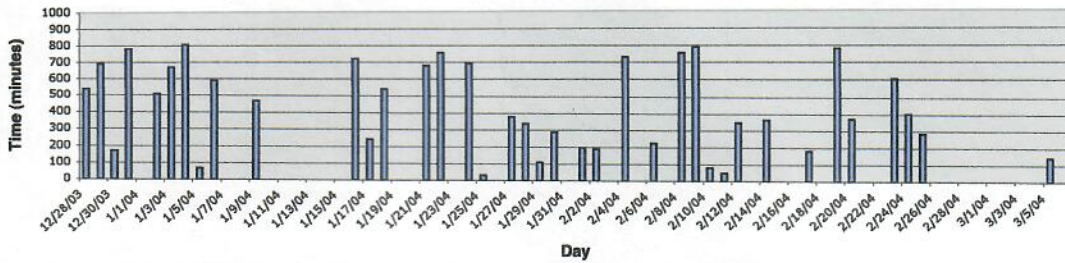
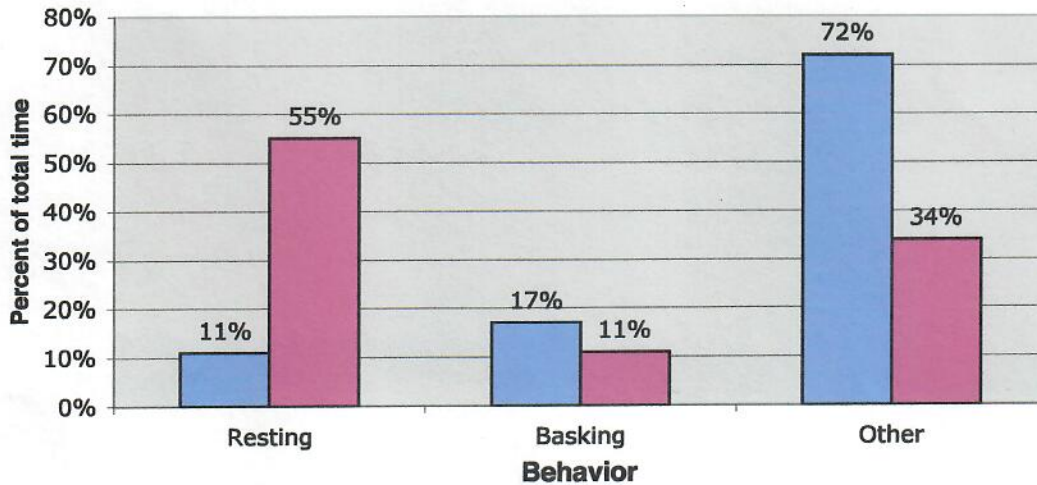


Figure 7 compares the amount of time each turtle spent doing "resting", "basking" and "other" behaviors. Resting dive duration was compared with the dive depth.



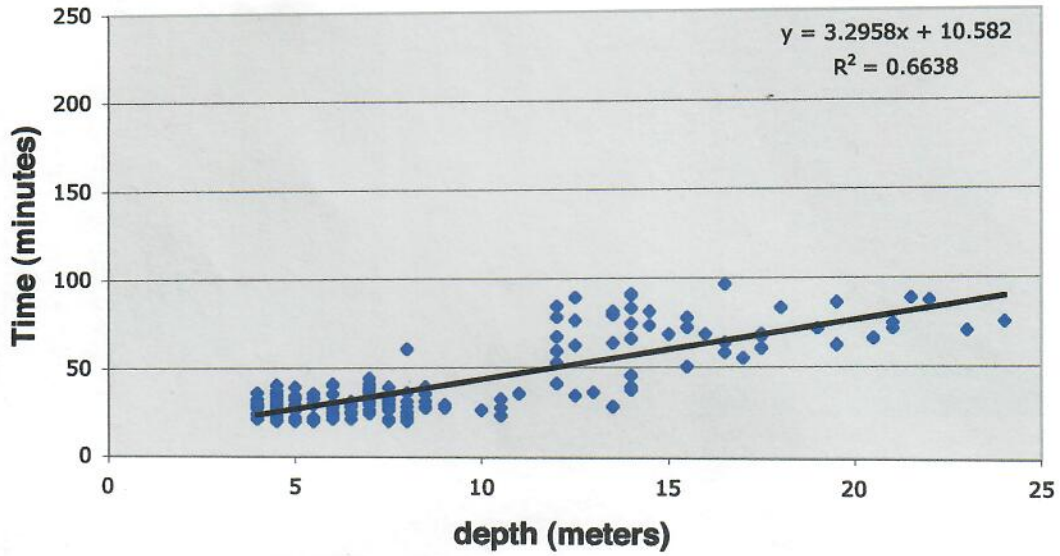
Figure 7. L1 (70 days) vs L7 (155 days) % Diel Behaviors



L7 made 1,652 resting dives with a maximum duration of 202 minutes, and L1 made 225 resting dives with a maximum duration of 96 minutes. 97% and 99% of resting dives for L7 and L1 respectively were above 20 meters.

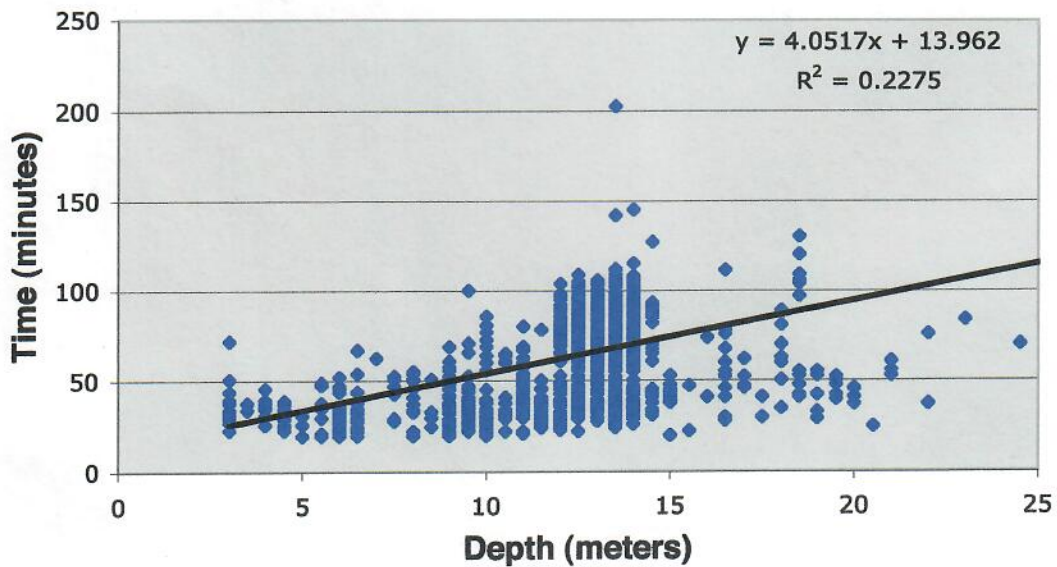
Figures 8 & 9 show the relationship for L1 and L7 respectively between the average depth of each resting dive and duration of the dive.

**Figure 8. L1 Depth vs Time, 70 days**



L1 shows a high correlation because  $r=0.814$  or depth correctly predicts duration 81% of the time.

**Figure 9. L7 Depth vs Time, 155 days**



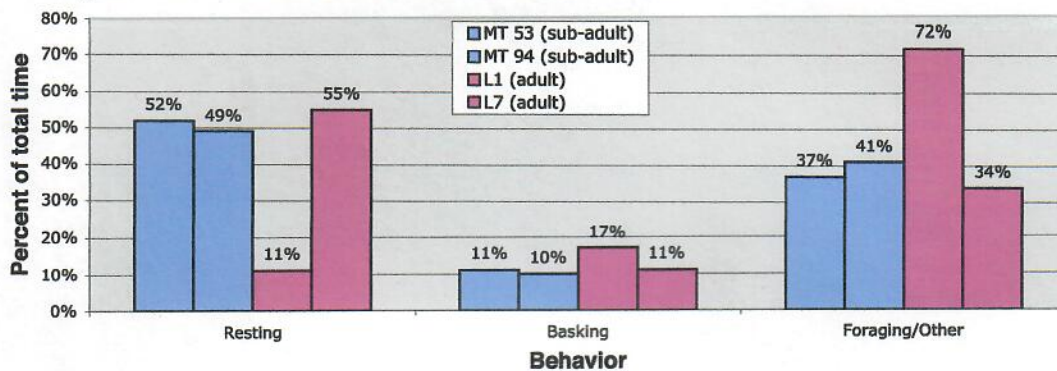
L7 does not show a good correlation with  $r=0.5$  depth predicts duration only half of the time.

DISCUSSION

L1 had a very strong, positive correlation between resting dive duration and depth,  $r=0.81$ . The deeper his resting dives got the longer he rested. However, it is important to note that there is a cluster of points from 4-6 meters that could be acting as one point and throwing the r-value off. Though, this positive correlation has been found by other studies (Hays et al. 2001). Hays also argued that with a full breath of air a turtle would become negatively buoyant deeper than 20 meters. The data from these turtles supports that thought since 97% of the time, the turtles were above 20 meters. The few times that L1 and L7 did rest deeper than 20 meters can be explained by resting on a shelf at that depth.

Figure 10 compares two sub-adult green turtles from Kiholo Bay Lagoon (Quaintance et al. 2002) and the two adult turtles from this study.

**Figure 10. Kiholo Sub-adults vs Laniakea Adults Diel Behavior**



There are no distinct differences besides L1's resting and other behaviors. It is most likely that much of L1's resting behavior was somehow masked by what seemed to be other behavior.

Figures 5 and 6 show that basking was slightly clumped in groups of several days of basking followed by several days of other activities. This would suggest a multiple day cycle of resting and basking or other active behavior. These cycles could be driven by environmental influences such as tides, surf, clouds and/or human impact. All basking episodes were initiated during the day and often extended into the night. This would suggest that thermoregulation and the warming effect of basking is a crucial benefit of basking.

It would be interesting to gather resting dive depth and duration data to more strongly support the correlation. There were also deeper migration dives during each turtle's migration that would make a fascinating comparison. Also, it might be good to look at basking initiation times and durations to see if there are any patterns.

There were no significant differences between the sub-adult turtles of Kiholo and adult turtles of Laniakea. This suggests that reasons for basking are similar to green turtles of all stages of development. This is interesting because the biggest difference between sub-adult and adult turtles is size, in fact that is what it is defined by, and it would seem that basking would affect different sized turtles in different ways. For example, it would take longer for the internal body temperature of a large adult turtle to heat up than it would for a small sub-adult. Because this size difference doesn't seem to make a difference, it would seem that there is another simpler reason of basking common to both stages of development.

#### ACKNOWLEDGEMENTS

I would like to thank George Balazs from the National Marine Fisheries Service for providing data used for the Laniakea turtles as well as his mentoring throughout the project. I would also like to thank Marc Rice from the Hawaii Preparatory Academy for providing most of the pictures seen in this paper as well as his continued guidance and mentoring throughout the project. Lastly, I would like to thank David Booth and the University of Queensland for allowing me to do this summer project.

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Photo tips

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 File: **honuoverswirl.zip** (1043411 bytes) DL Time (719187 bps): < 1 minute  
 Sent from the Internet ([Details](#))

so cool, Joanne... really like your images... you're going to enjoy having the creative juices flowing.

It's neat how you're photographing with a natural setting rather than the old blue/black/red velvet or whatever neutral background. Couple of suggestions... of course, remembering that it's all subjective, amazingly enough some people see things other than the way I see them (but I can handle their imperfection). (JUST KIDDING)

If I have sky in an image, I ttry to have it blue... don't like white sky (cloud) background...

The backlighting with sun shining through from behind will work really well with your etchings, as it did in the honu glass. With the hibisucs, you could even play with a small flashlight shining a beam of light from behind to create a little more definition...

I would have cleaned up the grass a bit, I find little pieces of dead grass, stems etc. distracting.

When you focus, usually you take the nearest edge... so, for example, rather than focusing on the honu etching, you'd focus on the nearest edge of the glass... depth of field becomes important... you might want to get the whole glass focused, but have the background blurry. You control that by controlling the aperture (lens opening). The bigger the number as in f16 or f22, the greater the depth of field... smaller number, lesser depth. When you buy a lens, they have a chart in the instruction booklet that show the exact depth of field measurements if you want to get technical.

Tripod really helps for still life pics like this, but it's not necessary... however, it allows long exposures to be held still... sharper pictures.

Nice work! and cool stamp too.

interesting you should mention swirling waves, was trying to capture that myself, without success.

db

Photo 1019 db

Subj: **more**  
 Date: 1/7/2007 1:58:05 PM Hawaiian Standard Time  
 From: [davidb99@hawaiiantel.net](mailto:davidb99@hawaiiantel.net)  
 To: [Jokaloke@aol.com](mailto:Jokaloke@aol.com)  
 File: **kaenaalbatrosspslo.zip** (198814 bytes) DL Time (719187 bps): < 1 minute  
 Sent from the Internet ([Details](#))

by the by, I usually try to create rather small sized images for e-mailing (100-300 Kb) although sometimes because of photoshopping or whatever (as in taro leaf) the images don't reduce down. There's free google software called Picassa which doesn't do near the quality image-manipulation as photoshop but it's quick and easy, and includes an e-mail setup right there. The glass images were about 1200 or 1400 Kbs.

Not trying to be critical, but you asked for suggestions!!

db

Picassa

Paddler ?



*Annual Symposium on Sea Turtle Biology and Conservation,* Philadelphia PA, USA.

Quaintance, JK, MR Rice & GH Balazs 2002, "Basking, foraging, and resting behavior of two sub-adult green turtles in Kiholo Bay Lagoon, Hawaii," *Proceeding of the 22<sup>nd</sup> Annual Symposium on Sea Turtle Biology and Conservation*, NOAA Tech, Miami Florida USA, pp. 225-226.

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Spotila, JR & EA Standora 1985, "Environmental constraints on the thermal energetics of sea turtles," *Copeia*, pp. 694-702.

Swimmer, JY & GH Balazs 2000, "The biology of basking in the green turtle (*Chelonia mydas*). In: FA Abreu-Grobois, R Briseño-Duenas, R Márquez-Millán & AL Sarti-Martínez, comps. *Proceedings of the 18<sup>th</sup> Annual Symposium on Sea Turtle Biology and Conservation*, NOAA Tech, Memo NMFS-SEFSC-436, pp. 233-234.

Whittow, GC & GH Balazs 1985, "Basking behavior of the Hawaiian green turtle (*Chelonia mydas*)," *Pacific Science*, 36:129-139.

## SONNENDE HAWAIIANISCHE MEERESSCHILKRÖTEN

Die Heimat der grünen Meeresschildkroten ist Hawaii, sie können in den Küstengewässern von unsern Inseln gefunden werden. Die Meeresschildkröten kommen im allgemeinen nahe an das Ufer, um sich von den Meerespflanzen zu ernähren, die auf dem Meeresboden wachsen. Während der letzten Jahre haben die grünen Schildkröten angefangen auf den Sand und die Felsen zu kriechen, um sich zu sonnen und auszuruhen, hauptsächlich während der Tageszeit.

Grüne Schildkröten sind bedrohte Sorten, sie sind geschützt vom Staat und dem Bundesgesetz. Es ist verboten sie zu stören im Meer oder am Strand. Geldstrafen können auferlegt werden. Wenn sie eine grüne Schildkröte an Land sonnen oder schlafen sehen, bitte gehen sie nicht nahe heran. Sie kriechen zurück in das Wasser, wenn sie bereit sind. Geniessen sie die Schönheit dieser wunderschönen Geschöpfe, beides über und unter dem Wasser.

**Subj:** Fw: Laniakea Turtle Concerns/Task Force  
**Date:** 8/22/2006 1:04:22 PM Hawaiian Standard Time  
**From:** [johnn001@hawaii.rr.com](mailto:johnn001@hawaii.rr.com)  
**To:** [johnn001@hawaii.rr.com](mailto:johnn001@hawaii.rr.com), [Jokaloke@aol.com](mailto:Jokaloke@aol.com), [Jennifer.Metz@noaa.gov](mailto:Jennifer.Metz@noaa.gov)  
*Sent from the Internet (Details)*

— Original Message —

**From:** [Denise Antolini](mailto:Denise.Antolini)  
**To:** [Nancy John](mailto:Nancy.John)  
**Sent:** Tuesday, August 15, 2006 7:27 AM  
**Subject:** Fw: Laniakea Turtle Concerns/Task Force

Nancy -

This is the letter I wrote long ago (last summer) about this issue.  
 If you wanted information on "how to start an MLCD" or want to talk about turtle laws,  
 let me know.  
 Best regards,  
 Denise

— Original Message —

**From:** [Denise Antolini](mailto:Denise.Antolini)  
**To:** [repmagaoay@Capitol.hawaii.gov](mailto:repmagaoay@Capitol.hawaii.gov)  
**Cc:** [jill.l.komoto@hawaii.gov](mailto:jill.l.komoto@hawaii.gov); [Melissa Bos](mailto:Melissa.Bos); [Reed Matsuura](mailto:Reed.Matsuura); [Maria Carnevale](mailto:Maria.Carnevale); [Blake McElheny](mailto:Blake.McElheny); [Larry Mcelheny](mailto:Larry.Mcelheny); [sallyyoungblood@hotmail.com](mailto:sallyyoungblood@hotmail.com); [corasanchez@hawaii.rr.com](mailto:corasanchez@hawaii.rr.com); 'The Leinau People'; [mike@conservationpractice.org](mailto:mike@conservationpractice.org); [Scott Atkinson](mailto:Scott.Atkinson); [Debbie Gowensmith](mailto:Debbie.Gowensmith); [meadec001@hawaii.rr.com](mailto:meadec001@hawaii.rr.com); [Antya Miller](mailto:Antya.Miller); 'CASLER, Bruce'; [Doug Cole](mailto:Doug.Cole); 'Jason Philibotte'; [tpartner@audubon.org](mailto:tpartner@audubon.org); [wayneholu@aol.com](mailto:wayneholu@aol.com); [Toni Sickler](mailto:Toni.Sickler); [Athline.M.Clark@hawaii.gov](mailto:Athline.M.Clark@hawaii.gov)  
**Sent:** Sunday, August 07, 2005 10:04 AM  
**Subject:** Laniakea Turtle Concerns/Task Force

Aloha Mike -

It was nice to see you the other night in Haleiwa at the DLNR Marine Managed Areas meeting. I look forward to following this important issue with you in the next Session.

I am writing this letter as a concerned resident of the North Shore and as someone familiar with the laws protecting Hawaii's Green Sea Turtles based on my 17 years of experience working in the environmental law field.

As I mentioned to you after the meeting, I believe that the situation at Laniakea regarding the explosion in tourism around the Green Sea Turtle feeding area, which is essential habitat for the turtles even if not officially designed as such, deserves your immediate attention. Many, many North Shore residents have raised this issue informally (see the last two issues of the North Shore News) and have mentioned it to me over the past several months. In my view, the key concerns are:

1. **Turtles.** The obvious harassment of the turtles, which are listed as a Threatened Species under the federal and state Endangered Species Acts. Harassment of turtles (e.g., by feeding, touching) can be considered illegal "take" under both acts and subject to criminal and civil penalties. Stories abound about tourists feeding turtles lettuce and junk food, riding on their backs, posing for photos by manipulating them or even putting cigarettes in their mouths. These acts are not only deeply offensive but illegal. Even though the Green Sea Turtle is on the rebound in Hawaii, it is still a protected species deserving of our utmost attention. Turtles are an ancient species that are beloved worldwide and clearly are a major attractor for tourists, but more importantly they are culturally important in Hawaii, a source of pride and wonder for residents, and a strong indicator of the health of our oceans. On the North Shore, we are very lucky to have an apparently healthy and growing turtle population. We have a responsibility to protect the turtles. It is our kuleana.

2. **Traffic.** The severe traffic problems along Kamehameha Highway. As you know, the backup along this stretch during the Summer are chronic, and have increased substantially, if not exponentially, in the past two years. The result is not only safety hazards (e.g., rear ends, road rage, breakdowns) but delays for residents trying to reach work and school. Laniakea is now often worse than the traffic backup at Waimea Bay.

Tuesday, August 22, 2006 America Online: Jokaloke

3. **Safety.** The highly risky safety situation for both visitors and tourists who are crossing the highway in unprecedented numbers. In particular, I am deeply concerned about tourists unfamiliar with the traffic and families *with children*. People often dart back and forth across the highway without looking carefully, or leave family members behind on one side while running across, causing even more risks. I've been told that accidents in this area are on the rise, and I fear that a major tragedy may happen soon without immediate safety measures. Residents who are aware of the situation and try to slow down and allow tourists to cross the street are then sometimes at risk for fender-benders and the anger of cars backing up behind. The State Department of Transportation, which is responsible for safe highway design, including shoulders, needs to take even temporary action soon to avoid not only the accident but the liability. At minimum, perhaps unobtrusive, cost-efficient temporary measures can be put in place such a crosswalk and rumble-strips until a the master plan for parking and amenities comes into place.

4. **Tourism.** The uncontrolled tourism, primarily from "eco-tourism" vans and limousines that use this area are problematic from many perspectives.

First, they often park illegally. Please see the Letter to the Editor by Kevin Chong in the most recent (August 3, 2005) issue of the North Shore news for more details, including the license numbers of these vehicles. This creates even more safety problems as they often unload passengers onto the highway and protrude into traffic, or simply are a distraction to drivers.

Second, they are allowing their passengers to overcrowd the beach and harass the turtles. This small end of the beach often has 20-50 people in the water, many snorkeling.

Third, they are using the beach area (the nice, calm end of Laniakea Beach) as a public toilet. Since there are no other options, the tourists are obviously using this area for a illegal pit stop. My guess is that the fecal coliform count in this area is very high. This is unconscionable.

Fourth, their use of the area is unsightly. It is commercializing our public beaches in the most inappropriate way.

Fifth, the problem itself has triggered signs from agencies and signs and trash cans publicizing the turtles by individuals apparently attempting to educate tourists, further attracting people to the area and creating an unsightly mish-mash of commercialism and signs.

There are other concerns, but these are the primary ones from my perspective.

Now, what to do? You are the right person, in my view, to take the lead on this issue not only because it is within your district but also because you have the ability to pull together the diverse set of stakeholders that are critical to resolving the problem and protecting the resource and community. Particular now, off-session, is the time to convene a sensible task force to address the issues in a thoughtful way.

Therefore, I suggest that you convene a Laniakea Beach Task Force that would pull together all the major players on this issue, conduct an immediate site visit to the area during peak visitor hours, hold well-publicized public meetings in Haleiwa and Sunset, and work out some effective solutions as soon as possible. In addition to Senator Bunda and yourself, the players would include, at least:

1. **Federal:** U.S. Fish and Wildlife Service (jurisdiction over turtles on land, and there is basking activity in the area) and the National Marine Fisheries Service (turtles in the ocean), including especially George Balazs.

2. **State:** State Department of Transportation (highway and shoulder); State Department of Land and Natural Resources (because the turtle is a state-listed protected species); State Department of Health (water quality, lack of sanitation); State Attorney General (liability for unsafe highway situation); Hawaii Tourism Authority (to address the marking of Laniakea, which has so obviously pushed up the number of visitors); The University of Hawaii faculty involved in research in the areas of concern.

3. **County:** City Parks and Recreation (beach jurisdiction and upcoming master planning process); Honolulu Police Department (illegal parking, illegal signs); Councilmember Delacruz (I spoke with Reed Matsaura about this yesterday).

4. **Local residents:** North Shore Neighborhood Board, Sunset Beach Community Association, any associations of residents along Papailoa and nearby areas; Meadow Gold Dairy area businesses and residents; Haleiwa Dive Shops. Please also notify our group Hui Malama O Pupukeya-Waimea of any actions as well; even though our focus is currently on Pupukeya-Waimea, many of us are concerned about this issue as well.

5. **Conservation organizations with expertise:** Hawaii Audubon Society, Conservation Council for Hawaii, Sierra

## HONU

The Hawaiian green sea turtle is 1 of 7 species of sea turtles found around the world. 6 of the 7 turtles are found in the Pacific (olive ridley, loggerhead, hawksbill, leatherback, flatback, black and green)

Unlike the humpback whale, which is a mammal, the sea turtle is a reptile, such as the alligator, crocodile, snake and dinosaur. In fact, the sea turtle lived in the ocean 100 million years ago.

### DESCRIPTION

The honu is called the GREEN sea turtle, not because of its shell, which is actually olive, brown, and black, but because of the color of its fat.

**HOW MUCH DO THEY WEIGH?** When the honu is full grown, it weighs anywhere from 125 to 250 lbs.

**HOW BIG ARE THEY?** At birth the baby, called a hatchling, is about 2 ½ inches and at full maturity the honu shell, called a carapace is over 4 ft. long.

### WHERE DO THEY LIVE?

They live offshore in underwater caves, on ledges, and shelves. They bob their heads above the ocean's surface to breathe about every 10 minutes. When they are resting or sleeping they can stay under the water for 2 ½ hours.

### WHY DO WE SEE THEM SWIMMING NEAR SHORE?

The honu is a vegetarian. It eats the seaweed (limu) that grows close to shore.

### WHERE DO THEY LAY THEIR EGGS?

Every 2 to 5 years they swim or migrate over 500 miles to the French Frigate Shoals, part of our state, to dig nests and lay their eggs. On very remote islands, where they will not be disturbed, they dig holes in the sand with their flippers, then deposit a clutch of 100 eggs. They may return 7 times every 2 weeks to lay other clutches. The eggs look like ping pong balls, with a hard leathery shells. After 2 MONTHS, the tiny turtles (hatchlings) hatch from their eggs, dig out of the sandy nest and scurry quickly to the ocean. Unfortunately, only 1 out of 1000 hatchlings will live to become adults. They are preyed upon by frigate birds, crabs, and sharks.

### WHAT IS THREATENING OUR HONU?

#### MAN -

The Hawaiian green sea turtle is threatened by man. Since 1978, the honu has been protected by the ENDANGERED SPECIES ACT. No longer can anyone kill the Hawaiian green sea turtle or bother it dead or alive. Unfortunately, the honu still dies when it becomes entangled in fishing nets and fish lines. I have found 2 turtles on the North Shore that were strangled by fishing lines.

Ocean debris, such as plastic containers and styrofoam also harm the honu. They mistake it for food, and cannot digest it.

**TUMORS** - Mysterious large tumors have appeared on the eyes, flippers and heads of the honu for the past 20 years. It looks like a large cauliflower growth, and it prevents the honu from seeing and swimming. The cause of the tumors is unknown, however, the scientist believe it may be due to a virus or pollution in the ocean.

**HOW ARE SCIENTISTS ABLE TO STUDY THE TURTLES?** The scientists spend time in the French Frigate Shoals watching and recording the habits of the honu. The turtles are now being tagged with small clips on their flippers and with satellite transmitters so their migratory patterns may be monitored.







# Honu Guardian and Naturalist

Questions? Please Ask Me

# CENSUS DATA FOR LANIAKEA

2006

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	PEOPLE		
						No. on beach		No. in ocean
Sept 16	1240 pm	1	far rocks	L-7	5	20	4	
	145 pm	2	shore line	L12?	6+	25	3	white mark above neck on shell
	2:00 pm	3	near	L-1	3+	25	6	Alpha Bruteus!
Migjwa 6/16	3:50 pm	2	mid-near	L1, L12	3	15	7	L7 back into H20
	5:33 pm	1	near	L12	4	6	2	L1 back into H20
	7:00 pm	1	near	L12	3	13	0	
	1230	1	shore line	L-2				
	240	2		L-19				
	330	3		L-2				

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
Sat June 18 Sun	12:30	1	near	L6	3	30	15
	1:30	1	near	H6	2	10	8
	2:00	6	φ	φ	2	few	few
(Carton)	2:30	0	→	→	0	25ish	20ish
	4:00	0	→	→	2	"	"
Monday 6/19 Nancy	12:30	1	middle	L7	8	25ish	6
	1:40	2	North	L9	8	25	4
	2:30-3:15	3	shore		8	25	4
	3:40	4	North		8	35	4
Thurs				L-10 L-12			
Tues 6/20 VOP	1:00 pm	1	MID	L-6			

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES				
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean			

Marine Turtle Research Program  
 NOAA, National Marine Fisheries Service  
 Pacific Islands Fisheries Science Center  
 2570 Dole Street  
 Honolulu, Hawaii 96822-2396

2004

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. on beach	No. in ocean	
2/4	530 PM	3		L1 L2 L6			
2/6	3pm	2		L7 L12			
2/9	6 PM	3		L1 L10			
2/10	2pm	2	L	L2 L3			

Marine Turtle Research Program  
 National Marine Fisheries Service  
 Pacific Islands Fisheries Science Center  
 2570 Dole Street  
 Honolulu, Hawaii 96822-2396

# CENSUS DATA FOR LANIAKEA

J. Pettugrew  
2004

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
2/15/04 Sunday	4 pm	4	Shoreline	L1 L7 L6 L4	0	10	
2/17/04 Tues	650 pm	5	in between rocks	L2 L3 L7 L10 L12			not visible from camera
2/18/04 Wed	850 pm	1	in between rocks	L-12	0	0	turtle dug deep holes w/ forward flippers into sand.
3/03/04 Wed	1245 pm	1	high above shoreline	L-10	0	3	high surf
3/4/04 Thursday	530 pm	1	between far rocks @ shoreline	L-10	0	3	
3/5/04 Friday	435 pm	4	shoreline <del>High up!</del> between far rocks @ shoreline	L-1 L-2 L-10 L-11		13	1st SUNNY DAY turtles are back! /
3/5/04	545 pm	5	far rocks	L-4	?	3	
3/6/04	1140 am	1	hauling out to shoreline	L-11	2	7	full moon

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
3/7 Sunday	1:15 pm	2	shoreline	L-3 L-6	3	10	
3/8 Mon	3:15 pm	2	far rocks shoreline	L-2 L-3		8	
3/8 Mon	4:15 pm	3	shoreline	L-6			
3/9 Tues	2:05 pm	1	shoreline	L-4		10	2
3/10 Wed	3:00 pm	1	shoreline	L-3			
3/10 Wed	3:55 pm	2	between far rocks	L-12 L-3	3	15	1
3/11 Thurs	3:55 pm	3	far rocks shoreline shoreline	L-12 L-3 L-10			
3/12 Fri	11:25 am	1	far rocks	L-12	2	10	1

all turtles covering  
selves w/ sand





# CENSUS DATA FOR LANIAKEA 2004

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean
3/12 Fri	4:40 pm	3	Shoreline farrocks -	L-3 L-11 L-12	1	3	1	
3/13 Sat	4 pm	3	farrocks	L-3 L-11 L-12	2			
3/14 Sun	4:55 pm	1	returning from shore to water	L-12	3	7	2	
3/15 Mon	4 pm	0	0	0	?	15	2	77° Windy partly cloudy
3/16	1 pm	0	0	0	2	20	4	77° Windy partly cloudy
3/16	2 pm	1	Shoreline	L-2	4			
3/16	3:45 pm	2	shoreline	L-2 L-3	3			79° partly cloudy
3/17	1 pm	0	0	0	3	7	2	76° partly cloudy

Marine Turtle Research Program  
 National Marine Fisheries Service  
 Pacific Islands Fisheries Science Center  
 2570 Dole Street  
 Honolulu, Hawaii 96822-2396

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. on beach	No. in ocean	
3/17 Wed	4:10 pm	0	0	0	5	2	77°
3/18 Thurs	11:45 am	1	hauling up to shoreline	L3	8	0	L3 remained on beach over 9 hrs. little wind cloudy
3/18 Thurs	7 pm	1	shoreline	L3	1	0	after sunset 77°
3/18 Thurs	8:15 pm	1	shoreline	L3	0	0	dark 70°
3/19 Fri	11:45 am	0	0	0	15	5-8 feeding turtles	partly cloudy windy 77°
3/19 Fri	3:20 pm	0	0	0	10	3	cloudy 79°
3/19 Fri	5:46 pm	1	between far rocks	L-2	6	1	cloudy windy 78°
3/20 Sat	11:45 am	0	0	0	8	2	cloudy 75°

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean
3/20 Sat	5:30 pm	0	0	0	0	2	0	74° raining
3/21 Sun	12 pm	0	0	0	2	10	2	75° raining
3/21 SUN	5:30 pm	0	0	0	0	5	0	73° raining
3/24 wed	12 pm	0	0	0	0	10	2	
3/25 Thor	5 pm	1	between rocks above shoreline	L-10	?	6	1	
3/26 Fri	12 pm	0	0	0	2	10	2	cloudy
3/26 Fri	4:15 pm	1	shoreline	L-2	1	5	1	raining??
3/27 Sat	12 pm	0	0	0	3	15	3	
	5 pm	1	shoreline	L-6	3?	10	4	

Thank you again Joanne! 6-1-04 SubB

FROM JOANNE

CENSUS DATA FOR LANIAKEA

2004

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
3/28/04 Sunday	4pm	0	6	0	4	25	3 81° breezy clear
3/29 Mon	5pm	1	shoreline	L-6	2	8	3 rainy
3/30 Tues	3pm	1	Shoreline	L-11	2	10	1
3/31 Wed	6:45 pm	3	shoreline far rocks	L-2 L-3 L-10	0	6	0 clear
3/31 Wed	9:45 pm	3	shoreline far rocks	L-3 L-8 L-10	?	1	0 same place dark clear ↑ same place 'loud crickets?
4/1 Thu	1:45 pm	0	0	0	3	10	1
4/1 Thu	3pm	1	shoreline fat rocks	L-10	2	15	2 rainy
4/2	5pm	1	shoreline	L-3	1	5	0

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES				PEOPLE				NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	No. in ocean			
4/5 Mon	11:00 AM	0	0	0	4	10	4			
4/5	5 PM	0	0	0	?	8	2			
4/9	2:20 PM	1	shoreline	L-3	2	10	2			
4/11 Easter Sunday	1 PM	0	0	0	3	15	5			
4/11	2:20 PM	1	shoreline	L-11	3-4	20	0			
4/11	5:50 PM	2	shoreline	L-11 L-6	?	10	0			
4/13 Tues	6 PM	2	shoreline	L-3 L-6	?	4	0			
4/22	1 PM	0	0	0	3	10	5			

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean
4/23	3:30	1	shoreline	L-6	2	10	1	
4/24	noon	0	0	0	0	12	3	
4/26	1pm	1	shoreline	L-10	2	6	1	
4/26	2pm	2	shoreline	L-2 L-10	?	5	0	
4/28	5pm	2	shoreline	L-3 L-6	?	3	0	
4/29	2:45 pm	4	shoreline	L-2 L-3 L-6	3	10	0	1 unmarked hener
5/4	noon	0	0	0	2	8	1	
5/5	noon	0	0	0	2	7	3	

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean
5/6	2:30 pm	1	shoreline	L-10	3	10	2	
5/7	11:15 am	1	Shoreline	L-11	3	15	6	
5/9	11:15 am	0	o	o				
5/9	1:45 pm	1	Shoreline	L-11	4	20	6	
5/9	4:45 pm	2	shoreline	L-6 L-11	2	15	2	
5/10	1:00 pm	1	shoreline	L-2	3	10	2	
5/10	12:15	2	shoreline	L-2 L-6	2	10	2	
5/11	2:45 pm	1	shoreline	L-6	2	12	2	



# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. on beach	No. in ocean	
5/12	noon	1	shoreline L-3		20	0	
5/12	5pm	2	shoreline L-3 L-10		24	2	
5/18	3:30 pm	1	shoreline L-4		10	2	disc
5/19	10:15 am	1	shoreline L-11		1	3	
5/19	NOON	1	shoreline L-5				disc
5/19	3pm	0	0		2	12	very active feeding by rocks in water circle disc
5/19	6:40 pm	2	shoreline L-3 L-6				
5/20	6pm	1	shoreline L-6				

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# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean
11/29	540 pm	4	L-1 L-2 L-3 L-6	Shoreline	?	6	0	
12/7	4 pm	5	L-1 L-2 L-3 L-11 MTK <sup>7</sup>					MT 4453784E23
12/7	550 pm	2	L-1 MTK <sup>9</sup>					4453784E23 Scallop
12/8	5 pm	2	L-1 L-3					
12/11	6 pm	1	L-7					
12/12	130	1	L-10					
12/12	445	2	L-11 L-10					
12/17	715 pm	1	L-11					

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
<u>12/20</u>	3:30 pm	7	Shoreline	L-1 L-3 L-4 L-7	2	5-20	L-4 returns! L-15 in water? 413E195E1C
12/24	3:30 pm	3	Shoreline	L-4 L-7 L-10			
12/26	5:45	3	Shoreline	L-1 L-7 L-3			
12/27	6 pm	2	Shoreline	L-1 L-2			
1/14	5 pm	2	Shoreline	L-6 L-7			
1/15	3 pm	5	Shoreline	L-1 L-2 L-12 L-11	L-3 L-10		
1/18	4:10 pm	1	Shoreline	L-10	?		
1/19	3:30 pm	4	above. Shoreline	L-1 L-4 L-10 L-11			

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			MT ID's	PEOPLE		NOTES
		No. basking	Place on beach	No. in ocean		No. on beach	No. in ocean	
12/18	4pm	2	high up on sand shoredrink		L2 L11			
12/19	4pm	2	high up		L10 L-3			

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Honolulu Iki Tide Pool

Iki

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. on beach	No. in ocean	
3/27 Sat	12pm	8	on coral bank	0	0	0	
3/28 Sub	12pm	8	on coral bank	0	1	0	
3/30	12pm	6	on coral bank	0	0	0	
9/30	6pm	1	on bank	I 1	0	0	many tumors
<del>10/14</del>	<del>4pm</del>	<del>3</del>	<del>st</del>				
10/14	4:30 pm	6	on coral bank	L-17			
10/14	4:30	1	on coral bank	I 1	0	2	0

Iki

JOANNE  
PETTIGREW  
Thanks! Green  
Report

# CENSUS DATA FOR LANIAKEA

☀ Summer Solstice

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean
5/25/04	3:25 pm	1	shoreline	L3	?	20	3	
6/6	4:40	2	shoreline	L6				1 no visible MT markings
6/7	6 pm	1	shoreline	L5	?	2	0	
6/23	5 pm	2	shoreline	L5	3	5	1	1 w/out MT marking
6/24	2:15	3	shoreline	L1-2	5	15		1 w/circular invertebrate markings
6/25	6:50 am	1	shoreline	L7	?	1	0	he's back from PT!
7/05	1 pm	1	shoreline	L7	4	23	5	
7/5	9:30 pm	2	shoreline	L-2	?	1	1	1 w/out MT

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE			NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	No. in ocean	
7/6/04	4pm	4	shoreline	L6 L7	3	20	5	2 turtles w/o MT
7/6	6pm	5	shoreline	L5 L6 L7 2 w/discs	3	10	0	PID tag 4136321865 PID tag reader could not read disc number L3, L6 w/discs
7/6	8:40pm	4	shoreline	L3 L6 L7	?	1	0	
7/7	8pm	4	shoreline	L1	?	2		George removed from L1
7/8	5pm	2	Shoreline	L1				
7/9	5:15 am	1	shoreline	*L8 L8	?	1	0	*433F403720
7/10	5:15 am	3	shoreline	L7 L8 L5				4361476 BT1 433F403720
7/22	4:30 pm	2	Shoreline	L7 L5	4			4361476 BT1





# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
7/22	9pm	2	Shoreline	L7 L5			-871
7/24	5:15 pm	1	shoreline	L3	3	30	-927
7/25	9pm	1	shoreline	L8	?	1	0
8/2	5:30 pm	3	shoreline L-1 L-7 L-3 →		?	15	2
8/3	5:45 pm	3	shoreline	L-3 L-7 L-6	?	17	4
8/6	4:25 pm	2	shoreline	L-1 L-3	?	30	4
8/6	8:30 pm	2	Shoreline	L-1 L-3	0	1	0
8/11	4pm	4	shoreline	L-1 L-2 L-4 L-11?	?	10	

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# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES	
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach		No. in ocean
8/12/04	6pm	1	Shoreline	L-10	4	10	3	
8/13	4:25 pm	3	Shoreline	L-1 L-10 L-3				
8/15	6:30 pm	3	Shoreline	L-1 L-7 L-6				
8/16	6:15 pm	2		L-1 L-3				

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
10/9	12:30	1	shore line	L-3	6-10	45	15
10/9	5pm	3	shore line	L-1 L-3 L-4			
10/10		1	dry sand above shore	L-2			
10/10	3pm	3	shore line	L-2 L-6 L-1			
10/11	5pm	2		L-3			

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
10/16 Sunday	5pm	4	Shore-line	L3 L4 L4 L7			11-1 6 EJ 8 D-1 2
10/23	12:45	1	rocks	L=1			10/51 L=1 L=1
10/24 Mon	2pm	1		L-3			10/51 L=1 L=1
10/24 Mon	5pm	2		L3 L6			
10/25 Tues	5pm	2		L7 L10			

# CENSUS DATA FOR LAINIAKEA


DATE	TIME	NO. OF ADULTS	NO. OF JUVENILES	NO. OF IMMATURES	NO. OF TOTALS	SEX RATIO	REMARKS	SUBSTRATE	VEGETATION
10/24	1245 pm	2	L-1 L-3						Wetland
10/26	6pm	2	L-3 L-4						Wetland
<del>10/27 6am 1 L-1</del>									
<del>10/27 7pm 4 L-1 L-10 L-4 L-3</del>									

# CENSUS DATA FOR LANIAKEA

JP

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE			NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	No. in ocean	
10/11	9pm	3	high sand shore - break	L3 L18 L20				
10/12	6am	4		L-4 L-1 L-2 L18				overnight stay L=1
10/13	10:30 pm	1		L-1				High surf 8 ft
10/14	6am	1		L-1				overnight stay L=1
10/15	6am	2		L-1 L-6				

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES				PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	No. in ocean	
10/20	12:50 pm	4		L-1 L-2 L-6 L-10				
10/30	2:30 pm	5		L-1 L-2 L-6 L-12 L-10				
10/31	3:00 pm	1		L-1				
11/6				L-3 L-10 L-12 L-11 <del>L-18</del>				
11/9	12:00	1		L-18				

2005 ORIGINALS RETURNED TO JAMME 5/16/05 GFB  
 0 RETURNED

JP

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES		PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	
1/30	5:30 pm	2	Shoreline	L-1 L-10	?	
2/5	5:30 pm	2		L-7 L-11		
2/7	9 pm	1	shoreline	Scallop	?	"Scallop" 4453784E23
2/9	8:15 pm	2	dry sand above shoreline	L-3 L-12		
2/10	12:30 pm	2	shoreline	L-7 L-10		
2/10	5 pm	5	shoreline	L-1 L-2 L-4 L-7 L-10	4	
2/13	6 pm	2	shoreline	L-2 L-7		
2/14	3 pm	1	"	L-5		



JP

# CENSUS DATA FOR LANIAKEA

2005

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
2/14	8:00 am	1		L-6			
2/15	9 am	1		L-1			
2/17	12:50 pm	2		L-4			
				L-5			
2/20	5 pm	1		L-6			
2/21	5:30 pm	1		*			* "scallop" 4453784E23
				*			* scallop (E23)
2/22	4:45 pm	4		L-2			
				L-4			
				L-12			
2/28	6 pm	2		L-1			
				L-6			
3/1	11 am - 7 pm	1		L-2			

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# CENSUS DATA FOR LANIAKEA

2005

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
3/2	4pm	1		L-7			
3/3	6:30 pm	3		L-1 L-3 *E 23			*Scallop - MT 4453784E23
3/9	4pm	1	High up in sand	L-2			
3/10	9am	1	Shoreline	L-1			
3/11	5:30 pm	2	Shoreline	L-2 L-3			
3/13	11am	1		L-2			
3/13	12am	1		L-1			
3/14	4pm	3		L-1 L-10 L-11			

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JF

# CENSUS DATA FOR LANIAKEA

2005

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
3/16	3:45 pm	4		L-1 L-4 L-7 L-11	2	15	
3/17	4 pm	3		L-12 *AE23			* Scallop 4453784E23
3/18	5 pm	5		L-1 L-2 L-3 Scallop			4453784E23 * Scallop
3/19	11:15 am	1		L-2			
3/20	6 pm	1		L-4			
3/21	4 pm	1		L-1			

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# CENSUS DATA FOR LANIAKEA

2005

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
3/23/05	3:30 p	4		* E23 L-1 L-5 L-10			* Scallop
3/29	5:30 p	3		L-4 L-7 L-5?			
3/30	5 pm	1		L-6			(ZE) H43A1F1964 over fronting 41-669 Koon Hwy
4/1	5 pm	5		L-1 L-7 * L-5 L-3			* E23 Scallop
4/3	6:30 pm	3		L-1 L-5 L-7			
4/4	6:15 pm	1		L-1			
4/6	4:55	4		L-1 L-2 * E23 L-3			E23 Scallop
4/7	6:20 p	1		L-3			

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on beach

41-669 Kam (H)

3/30

443A IF 1964 (ZE)

- front right flipper missing 3" tip  
↑ swollen

- aft right shell missing small 2" piece

4/7

ZE same location

unmarked

in front of Drones

large

DATE	TIME	LOCATION	MARKING	STATUS	REMARKS
3/30		on beach	443A IF 1964 (ZE)		- front right flipper missing 3" tip ↑ swollen
4/7		same location	ZE		unmarked
					in front of Drones
					large

NOVA SCOTIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 1000 UNIVERSITY AVENUE  
 HALIFAX, NS B3H 2P6  
 TEL: (902) 426-7200  
 FAX: (902) 426-7201

JF

# CENSUS DATA FOR LANIAKEA

2005

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
4/8	1:00 pm	1		L-7			
4/8	6 pm	2		L-1 L-10			
4/11	10 am	1		L-1			
4/14	7 pm	2		L-4 L-4			
4/17	5:30 pm	1		L-12			
4/20	6 pm	4		L-4 L-7 L-3 L-6			
4/21	6:15 pm	2		L-6 L-4 L-6 L-12			43E195E1C
4/23	6 pm	3					

JP

# CENSUS DATA FOR LANIAKEA

2005

DATE/DAY	TIME/HOUR	TURTLES			PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	
4/25	10:15 pm	2	L-8 *EIC				*413E/95EC
4/27	12:15 pm	2	L-2 L-4				
4/27	3:45	4	L-12 L-5 L-6 L-11				
4/27	9 pm	4	L-12 L-5 L-11				??
			435C39116D				
4/28	8:30 am	1	L-5				spent the night
4/28	4:15 pm		L-3 L-4 L-6 L-5				
4/30	7:50 pm	3	*L-4 *L-11				*E25 Scallop





# CENSUS DATA FOR LANIAKEA

JP

2005

DATE/DAY	TIME/HOUR	TURTLES		PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. on beach	
5/1	8:15 pm	2	L-5 L-6			* 43E195EK
5/2	7 pm	4	L-1 L-7 L-3 L-12			
5/4	6 pm	4	L-1 L-6 L-10			* xxx 703?
5/11	8 pm	4	L-1 L-8 L-3 L-12			
5/12	6 pm	5	L-5 L-6 L-12			* x B65?
5/13	4 pm	6	L-3 L-4 L-11			* Scallop



**VOLUNTEER  
Honu Naturalist**



**VOLUNTEER  
Honu Naturalist**



**VOLUNTEER  
Honu Naturalist**



**VOLUNTEER  
Honu Naturalist**



**VOLUNTEER  
Honu Naturalist**



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Honu Naturalist**



**VOLUNTEER  
Honu Naturalist**



## HONU

The Hawaiian green sea turtle is 1 of 7 species of sea turtles found around the world. 6 of the 7 turtles are found in the Pacific (olive ridley, loggerhead, hawksbill, leatherback, flatback, black and green)

Unlike the humpback whale, which is a mammal, the sea turtle is a reptile, such as the alligator, crocodile, snake and dinosaur. In fact, the sea turtle lived in the ocean 100 million years ago.

### DESCRIPTION

The honu is called the GREEN sea turtle, not because of its shell, which is actually olive, brown, and black, but because of the color of its fat.

**HOW MUCH DO THEY WEIGH?** When the honu is full grown, it weighs anywhere from 125 to 250 lbs.

**HOW BIG ARE THEY?** At birth the baby, called a hatchling, is about 2 ½ inches and at full maturity the honu shell, called a carapace is over 4 ft. long.

### WHERE DO THEY LIVE?

They live offshore in underwater caves, on ledges, and shelves. They bob their heads above the ocean's surface to breathe about every 10 minutes. When they are resting or sleeping they can stay under the water for 2 ½ hours.

### WHY DO WE SEE THEM SWIMMING NEAR SHORE?

The honu is a vegetarian. It eats the seaweed (limu) that grows close to shore.

### WHERE DO THEY LAY THEIR EGGS?

Every 2 to 5 years they swim or migrate over 500 miles to the French Frigate Shoals, part of our state, to dig nests and lay their eggs. On very remote islands, where they will not be disturbed, they dig holes in the sand with their flippers, then deposit a clutch of 100 eggs. They may return 7 times every 2 weeks to lay other clutches. The eggs look like ping pong balls, with a hard leathery shells. After 2 MONTHS, the tiny turtles (hatchlings) hatch from their eggs, dig out of the sandy nest and scurry quickly to the ocean. Unfortunately, only 1 out of 1000 hatchlings will live to become adults. They are preyed upon by frigate birds, crabs, and sharks.

### WHAT IS THREATENING OUR HONU?

#### MAN -

The Hawaiian green sea turtle is threatened by man. Since 1978, the honu has been protected by the ENDANGERED SPECIES ACT. No longer can anyone kill the Hawaiian green sea turtle or bother it dead or alive. Unfortunately, the honu still dies when it becomes entangled in fishing nets and fish lines. I have found 2 turtles on the North Shore that were strangled by fishing lines.

Ocean debris, such as plastic containers and styrofoam also harm the honu. They mistake it for food, and cannot digest it.

**TUMORS** - Mysterious large tumors have appeared on the eyes, flippers and heads of the honu for the past 20 years. It looks like a large cauliflower growth, and it prevents the honu from seeing and swimming. The cause of the tumors is unknown, however, the scientist believe it may be due to a virus or pollution in the ocean.

**HOW ARE SCIENTISTS ABLE TO STUDY THE TURTLES?** The scientists spend time in the French Frigate Shoals watching and recording the habits of the honu. The turtles are now being tagged with small clips on their flippers and with satellite transmitters so their migratory patterns may be monitored.

# CENSUS DATA FOR LANIAKEA

DATE/DAY	TIME/HOUR	TURTLES				PEOPLE		NOTES
		No. basking	Place on beach	MT ID's	No. in ocean	No. on beach	No. in ocean	

