

**A SOCIOLOGICAL STUDY:  
HUMAN INTERACTIONS WITH SEA TURTLES AT  
LANIAKEA, ON THE ISLAND OF OAHU, HAWAII**



By  
Cody Beth Hooven

Marine Option Program  
University of Hawaii at Manoa

Submitted to: Marine Option Program  
May 13, 2004

**Advisors:**

George H. Balazs

Leader, Marine Turtle Research Program of the National  
Marine Fisheries Service (NOAA)

Dr. Sherwood Maynard

Director of the Marine Option Program and the Marine  
Biology Program, University of Hawaii at Manoa

## Introduction

The purpose of this study was to examine the interaction between humans and sea turtles, mainly at Laniakea (158°10'W, 21°6'N), on the north shore of the island of Oahu, Hawaii. Initially, <sup>the</sup> intent was to study the fascination that many people seem to have with sea turtles, and also the difference in attitude and behavior towards and regarding the turtles, if any, between visitors to Hawaii and longtime residents. Another goal was to gain an understanding of the relatively new relationship between humans and sea turtles as the species, once over harvested as a food resource, now thrives as a protected species. Factors significant to whether sea turtles bask or not, and why, also became a point of interest and were briefly examined.

Laniakea is locally known for the presence of green sea turtles, *Cheonia mydas*, some of which are relatively tame and almost always visible in the shallow water or resting on the beach. The basic geography of the beach is a small, sandy cove at the northeast end with scattered boulders and rocks both in the water and on the beach where turtles and humans both frequent. There is another long expanse of sandy beach with a shelf-type rock fronting it that is also part of Laniakea (Figure 3). However, this portion is divided from the cove by a rocky outcropping and turtles do not bask here nor do visitors to the beach generally swim here unless the ocean is exceptionally calm. For this reason, the observations in this project refer to the small cove portion of the beach, and this will be referred to simply as Laniakea for purposes of this report. There are two phenomena regarding the turtles at this beach that make study worthwhile: the turtles at this beach have become accustomed to being hand-fed algae, or *limu*, growing on the nearby rocks, and the turtles commonly haul out of the water and up onto the sand to bask. Both of these behaviors suggest the resident turtles at this beach feel safe enough in the presence of humans to eat from their hands and sleep unharmed on the beach.

Any study of sea turtles can be deemed worthwhile because all species are listed as either endangered or threatened (green sea turtles are threatened) under the Endangered Species Act (ESA) of 1973. Historically, native Hawaiians and other Pacific island inhabitants of areas where sea turtles can be found ate the sea turtles and their

eggs. Many uses were found for the turtles in addition to a food source, including medicinal uses of the fat and functional uses for the carapace and bones. Sea turtles also possessed religious or other traditional significance in Hawaii, and were not eaten or harmed by families believing the animals were their family guardian spirit, or *aumakua*. Improved fishing methods and technologies (e.g. ability to hunt sea turtles at remote nesting grounds) along with habitat destruction, and pollution have contributed to the decline in sea turtle populations. Even with protection from the ESA, sea turtle populations are currently still at risk in Hawaii due to a disease of epidemic levels called fibropapilloma. This disease causes tumors to grow on soft tissues of the turtles, interfering with essential functions such as eating, swimming and seeing (National Marine Fisheries Service, NMFS, and US Fish and Wildlife Service, USFWS, 1998).

Green sea turtles grow slowly and have a documented life span in Hawaii up to almost 50 years of age (Zug et al. 2001) and possibly longer (Ching 2001). Adults can grow to over 100cm in carapace, "shell", length and well over 100kg, hatching from as little as 4.7cm in length. Sexual maturity and distinguishing sexual characteristics are not visibly obvious until a green sea turtle is an adult or near-adult, about 65cm and above in carapace length (NMFS and USFWS 1998). Adult green sea turtles are vegetarians, and feed mainly on algae and sea grasses in Hawaii, depending on what occurs and what is accessible in particular areas. At Laniakea, a variety of algae can be found, including *Ulva spp.*, green algae, and *Melamansia sp.*, a type of red algae. Sea grass occurs at fewer locations than algae in Hawaii and is not known to be present at Laniakea or Haleiwa Alii Beach Park (McDermod et al 2003).

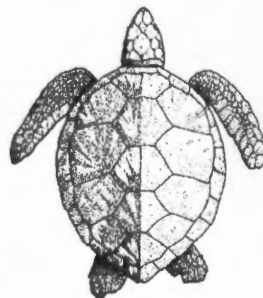


Figure 1: Drawing of a green sea turtle, *Chelonia mydas*, dorsal view (USFWS 2002).

Basking while on land, is unique to *C. mydas*, and occurs in only a few places in the world (Swimmer and Balazs 1998; Whittow and Balazs 1982). Some of the physiological benefits of basking for marine turtles are thought to be thermoregulation and energy conservation (Swimmer and Balazs 1998). In addition, basking in the main Hawaiian Islands was extremely rare behavior for green turtles until recently (Balazs 1996).

In addition to observing human-turtle interactions at Laniakea, another aspect of this study was to increase public awareness and reliable knowledge of sea turtles in Hawaii and encourage concern and appreciation for their preservation and wise use, such as in ecotourism.

While this report is being written, further observations and research are being progressively continued at Laniakea and will result in more detailed results.

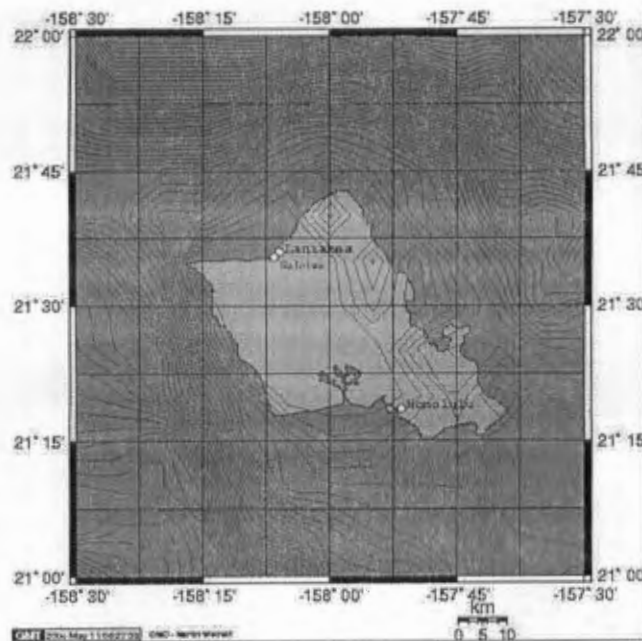


Figure 2: Area map of the island of Oahu, Hawaii. Both Laniakea and Haleiwa Alii Beach Park can be found on the north-northwest facing shore (Wessel and Smith 2004).



Figure 3: Laniakea; cove study area (near) divided from rest of beach by rocky outcropping in front of the trees.

## Methods

As the main part of this project is visual research, observations were made from Laniakea an average of once a week, or as near to this rate as possible. Types of interactions people participated in and attitudes they exhibited towards the turtles were noted. Were the people concerned, interested, protective? Sometimes observations were inconspicuous, made while sitting on the beach. Other times, interaction with the people at the beach who seemed interested in the turtles provided information about them directly. Literature packets regarding sea turtles, stranding contact information, and safe fishing turtle stickers were given out to anyone interested (as provided by the National Marine Fisheries Service Marine Turtle Research Program, MTRP). A survey created to gather personal information about opinions regarding the turtles, and visitor/residency status was initially used but later eliminated from this study when it was found to be redundant to observations made simply visually and using informal interview. One source of information that proved to be insightful was interviews with people who have lived in Hawaii and had some type of interaction with the ocean (fishing, diving, surfing, etc.) for most of their lives. Brief oral histories were obtained from long-time residents about Laniakea documenting what changes have occurred there over the years, especially

regarding turtle populations, using some interview techniques described by Riney (1982) and adapted for these purposes.

Turtles seen at Laniakea were recorded at each visit, both in the water and basking on shore. Approximate size of the turtles were noted as small (<45cm), medium (45-65cm), and large (>65cm) based on estimates of the straight carapace length (SCL). The sexes of estimated-adult turtles observed in this study were noted, when possible, based on the tail extending beyond the rear flippers that is characteristic of a male. Some individual resident turtles of Laniakea were identified, using sex, markings, size, and coloration. During low surf, observing the turtles was easily done while on the beach, standing in shallow water, or snorkeling. In the winter months when the surf was high, observations were taken from shore only. The days and times of observation were intended to be varied in order to avoid sample bias of both people and turtles present, but this was not always possible due to other obligations of the author and distance to the site.

Even though fibropapilloma is a very significant area of research for sea turtles, it was not a focus for this project, and only the presence or absence of tumors and their approximate sizes were noted for the turtles observed. Any presence of tumors aided in individual identifications.

Photos were taken of various representative human-turtle interactions and to aid in turtle identification. Weather was also recorded for each observation day, including surf heights and wind. Surf heights were determined either based on conditions observed or using data reported by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service stationed Honolulu, Hawaii.

Basic sea turtle information was provided to tour (bus and limousine) operators who choose to stop at Laniakea as part of their tours. As these buses can bring large numbers of visitors to the beach for a short amount of time (<20 minutes), the drivers were provided with signs informing mainly that sea turtles are protected, and that basking is a normal behavior, in both Japanese and English, also provided by the MTRP. Japanese text was provided due to the high number of Japanese visitors to Hawaii. Literature for the drivers/tour guides was included so they could learn and share accurate information with their guests. In general, information was given to anyone interested to increase

knowledge and awareness of sea turtles, from lifeguards and police officers passing by, to visitors and local residents, to the hot dog vendor located at Laniakea. There were a few other instances of sea turtle stranding contact information given via email or telephone, or in person.

During the course of this project, signs were placed at Laniakea by the MTRP and the author in various locations in an attempt to be visible, educational, and instructional. The general text of some of the signs gave information on sea turtles and basking behavior, and others were brief phrases that said "Do not touch the turtles".

## **Results**

There were a total of 28 observation days between August 22, 2002 and June 21, 2003 included in this report. This time frame encompassed both a winter and a summer surf season (high and low surf, respectively). For each observation at Laniakea, there was at least one person present, and most often six or more, up to an estimated maximum of 90 people. The average number of people present was 31 (Figure 3). The people were located both on shore and in the water when ocean conditions were calm. Often people were observed to be in shallow water watching or looking for turtles, even when there was small to medium surf present (0-8'). When the surf conditions were any larger, or when the weather was cool, the majority of people remained onshore with the exception of surfers who accessed surf breaks several hundred yards out through the sandy area at Laniakea.

There was at least one turtle visible at Laniakea for 100% of the observations and of this, 89.3% of observations found turtles in the water and 64.3% of observations found one or more basking turtles. As many as 12 turtles were able to be seen in the near shore waters of the beach and the average number of turtles observed was 6 (Figure 4). There were always more turtles seen in the water than basking on shore with the exception of January 7, 2003 when only one turtle was noted and it was basking, and also April 7, 2003 when all 5 turtles observed were on shore.

Several turtles regularly observed were able to be distinguished from others. One turtle, once identified, was noted regularly basking on the beach. This turtle is a large male, with a distinctive flattened, slightly scalloped-edge shell that appears to be shaped this way from age and use. This turtle was later identified as "L1" due to the etched mototool inscription it was given by the MTRP in November of 2001 when it was treated for a hook removal from its flipper (the etching had since faded). Another turtle was distinctive due to the large crack just right of center in its carapace. This large female was later identified as "L2" also due to mototool inscription given by the MTRP in December of 2001 when this turtle was given a dental epoxy patch to repair the crack. A third turtle was identified by a metal tag applied to the front flipper that was able to be read once in calm, shallow water. Prior to identification of this turtle by tag number A-539, this turtle also appeared distinctive by the deep purple coloring just above the eyes, corresponding to a brow-line in humans. Prior to this tag re-sight on October 11, 2002, this turtle had not been <sup>seen</sup> since 1996 when it was nesting in the Northwest Hawaiian Islands, about 400 miles northwest of the Main Hawaiian Island Chain. Aside from various notches or scars, many other turtles observed were non-descript, except for size class and sex if they were adults—even some of those seen on shore were large, robust turtles with no permanent markings or shapes with which to positively identify them unless they were able to be observed up close, usually while on shore. However, all turtles observed on the beach were never determined to be less than a medium to large size, and mostly were large turtles. The only small turtles ever observed were in the water.



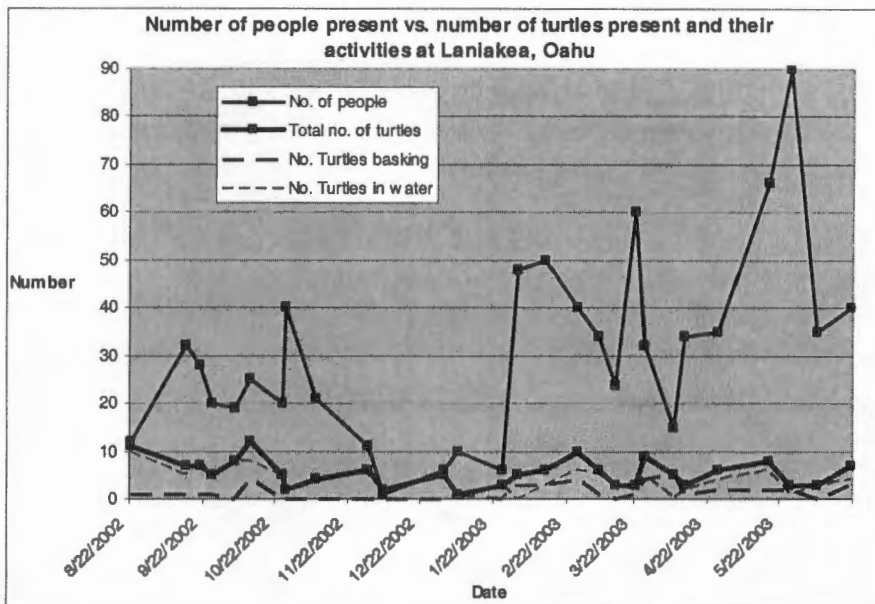


Figure 4: Number of people estimated to be present at Laniakea at the time of observation vs. total number and activities of the turtles.

Other significant findings of this project were the varied reactions and behaviors of people as they interacted with the turtles. There was a general expression of delight at seeing the turtles, whether their presence was a surprise or expected from prior knowledge. General trends noted were that visitors to Hawaii or the island stopped at the beach, and interacted very much with the turtles either by taking photos of the animals, and often with them if they were basking. Residents of Hawaii also seemed to enjoy the turtles, but were naturally less fascinated most likely due to familiarity (Figure 5).

Specifically, of the 28 observation days, nearly 93% of these days people were observed passively interacting with the turtles in some fashion, looking for them, taking photos, etc. 1.4% of these observations showed people being more assertive in their interactions, either feeding the turtles, or touching them (Figure 4 and 5). Only on two occasions were particularly aggressive behaviors noted- once a visiting teenaged boy held on to a swimming turtle to "ride" it, and in another instance a woman who was a resident of Hawaii was using two hands to hold the head of a turtle and shake it. Neither of these behaviors seemed ill-intentioned, although they were most likely bothersome to the turtles. On many other occasions, people would touch the carapace of a basking turtle, or a flipper as the turtles were swimming. Interestingly, on several occasions, assertive

Be pulled

behavior by people was noted in a protective manner towards the turtles. For example, a resident man of Oahu forcefully yelled at two young tourist boys who had repeatedly touched the flipper or carapace of a turtle swimming nearby. In several other instances, people informed others not to touch the turtles, often referencing educational signs on the beach, in varying degrees of politeness, or lack thereof. The number of observations of touching the turtles did not significantly differ before and after the educational “Do Not Touch” signs were placed at Laniakea. Despite a wary attitude by some beachgoers towards the tour groups, these groups generally remained on the beach less than 20 minutes, and often did nothing more than take photos of the turtles.

Surf heights were recorded for each observation. During winter storms, surf heights reached over 20 feet on several occasions. At these extreme heights, the water at Laniakea intermittently covered the entire cove with high-energy waves, making it impossible or unsafe to stand near the waterline. At other times, when the surf was large but not at extreme heights, the water still remained turbulent and difficult to swim in. The sand also became more sparse and the rocks more exposed during this time as compared to calm summer months. The presence of turtles basking was compared to the surf heights and there seems to be a trend showing turtles basking more often when the surf heights are low to moderate, however more observations would be needed to draw complete conclusions about the relationship (Figure 6).

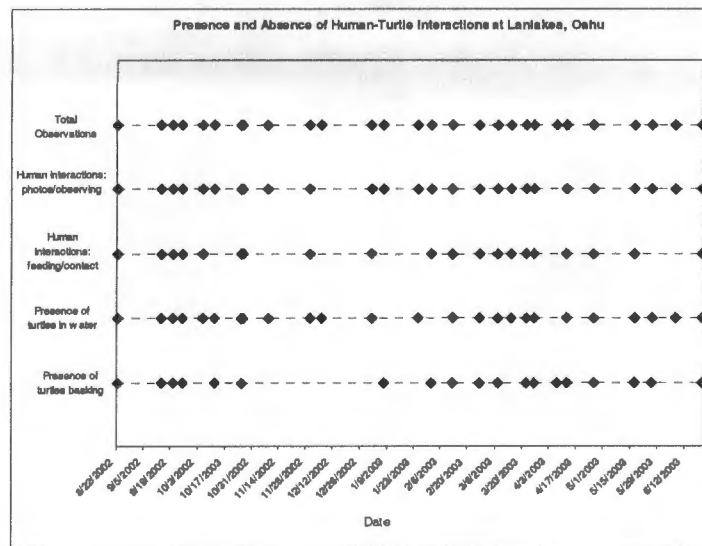


Figure 5: Presence or absence plot of different human and turtle interactions noted at Laniakea, Oahu.

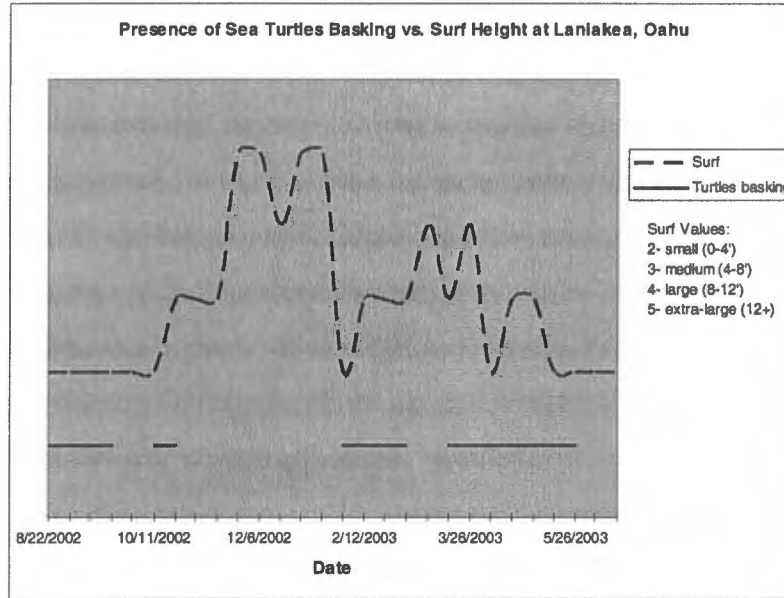


Figure 6: Plot of turtles observed basking (presence/absence) vs. surf heights at Laniakea, Oahu.

Many other interesting anecdotes were collected through informal interview, observation of, and discussion with various people at Laniakea. Interesting examples are listed below:

- The owner of the property adjacent to Laniakea commented on the fact that many tour buses stop at Laniakea regularly and he seemed to be displeased with this. He also mentioned that his children have grown up enjoying the turtles and even would “ride” them when younger.
- A fisherman who has lived on the North Shore of Oahu for 30 years and regularly throws net at Laniakea had noticed an increase in the number of turtles there from when he was younger. He mentioned that he wouldn’t want to touch the turtles that have tumors. He also mentioned that now that since it became illegal to eat them, he has noticed larger turtles than before.
- Laniakea, fronting a popular surf break, is frequented by many surfers. Of all people observed, their behavior was by far the most passive towards the turtles, often giving them nothing more than brief acknowledgement, or steering their surfboards to avoid the animals.

- A Japanese national living on Oahu brought his Japanese visitors to this beach to see turtles. He said there is a children's legend in Japan with a turtle that signifies good luck.
- A man who called himself "Surfer Brian", a resident of the North Shore and a Brazilian national, asked many questions about sea turtles. He then would tell attractive, young women interested in the turtles what he just learned to initiate conversations.
- A family stopped by to take an annual holiday photo with the turtles.
- A woman approximately 25 years old brought her toddler son to Laniakea to see the turtles. She grew up nearby, but had moved away recently and was visiting. She said she had always remembered turtles basking at this location but the tour buses and groups were relatively new.

## **Discussion**

Although touching, teasing, and harassing a turtle is prohibited by law, the types of contact observed did not appear to be particularly irritating to the animals. Even bothersome behaviors did not cause the turtles to become skittish and swim away as if extremely agitated. This shows that they have developed a high tolerance to human interactions at this study site.

The basking and feeding behaviors of the turtles at Laniakea seem to be gained through learning and positive reinforcement. A turtle will presumably bask once unharmed, and return again because it was somehow rewarding for the animal. Similarly, a turtle that swims near to a human and receives food unharmed will most likely repeat this behavior.

It is interesting to note that turtles that bask at Laniakea have been observed to be tumor-free. However, at locations very near to Laniakea, tumored turtles have been observed in the water and basking. This doesn't seem likely due to turtles being home-ranging animals because the areas are in such close proximity that it is unlikely that the turtles are remaining in such specifically delineated areas. It would be worth studying whether basking turtles at Laniakea are promoting their health and tumor-free status by

frequenting this specific cove. It may be that the turtles that have developed the behavior of entering this small cove are healthier for it- they are well-fed and able to bask frequently and possibly thus have a stronger immune system. Therefore, basking can be considered to be for reasons other than to bolster a weakened immune system-- maybe it simply promotes a healthy one.

Another interesting observation seemed to be a trend for smaller turtles to be seen in the shallow water when surf was larger, whereas this area was generally dominated by larger turtles when conditions were calm. Basking could be affected in winter due to high surf eroding away much of the sand on the beach. With a rockier beach, turtles have less of a sandy path available to climb out and rest on and they are too cumbersome to maneuver on dry land over large rocks or around other obstacles. Also, the shallow water becomes much more turbulent and most likely it is treacherous to maneuver into the area from deeper waters over shallow reefs and rocks. Possibly the younger, smaller turtles stay inside of the outer reefs, while larger turtles forage and rest in deeper, calmer water.

The general conclusion about human interactions is that people tend to have good intentions and find encounters with the turtles to be enjoyable. Visitors to Hawaii seemed to be more fascinated and actively involved in interacting with the animals, while residents tended to be more passively enjoying the turtles. A third group, the surfers, tended to be the most reserved around the animals and regarded them respectfully.

While harassment is a judgment to be made by conservation enforcement agencies, it should be within reason. Petting and touching the animals is generally not harmful or malicious, but it can lead to people taking further liberties and disturbing the behavior of the turtle. However, if a person is able to interact closely with a protected marine animal (or any protected species) it makes the experience more memorable, and hopefully this will perpetuate concern for their conservation.

## References

Balazs, G.H. 1995. Behavioral Changes within the Recovering Hawaiian Green Turtle Population. Proceedings of the Fifteenth Annual Symposium on Sea Turtle Biology and Conservation. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-SEFSC-387, pp.16-20.

Ching, P. Sea Turtles of Hawaii. University of Hawaii Press, Hawaii.

McDermid, K.J., Gregoritzza, M.C., and Freshwater, D.W. 2002. A new record of a second seagrass species from the Hawaiian Archipelago: *Halophila decipiens* Ostenfeld. Aquatic Botany 74 (3): 257-262.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). National Marine Fisheries Service, Silver Spring, MD.

Rice, M.R. et al. 2000. Diving, Basking, and Foraging Patterns of a Sub-Adult Green Turtle at Punalu'u, Hawaii. In Abreu-Grobois, F.A., R. Briseno-Duenas, R. Marquez, and L. Sarti (comps.) Proceedings of the Eighteenth International Sea Turtle Symposium. U.S. Dep. Commer. NOAA Tech. Memo. NMFS-SEFSC-436, pp. 229-231.

Riney, T. 1982. Study and management of large mammals. N.Y. Wiley. 552p.

Swimmer, J. Y. B. and G. H. Balazs. 1998. The Biology of Basking in the Green Turtle, Chelonia mydas. Proceedings of the Sixteenth Annual Symposium on Sea Turtle Biology and Conservation. NOAA Tech. Memo. NMFS-SEFSC-412, pp. 128-130.

Weinelt, Martin. 1999. Online Map Creation Using Generic Mapping Tools. Version 4.1.

Whittow, G. C. and G.H. Balazs. 1982. Basking Behavior of the Hawaiian Green Turtle (Chelonia mydas). Pacific Science Vol. 36, No. 2, pp. 129-139.

Zug, R. Z., G.H. Balazs, D.M. Parker, and S.K.K. Murakawa. 2001. Age and Growth of Hawaiian green sea turtles (*Chelonia mydas*): an analysis based on skeletochronology. Fishery Bulletin. 100:117-127.