YEAR 2000 NESTING OF A CAPTIVE-REARED HAWAIIAN GREEN TURTLE TAGGED AND RELEASED AS A YEARLING

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THE AMAZING STORY OF 5690 - First Known Nesting of a Headstarted Green Turtle: During September of 1980, 235 newly emerged and vigorous hatchling green turtles (*Chelonia mydas*) were collected at French Frigate Shoals in the northwestern segment of the Hawaiian Archipelago (Figure 1). Located at 24°N, 166°W, this remote site hosts the principal breeding colony for the discrete population of green turtles inhabiting the 1500 mile long Hawaiian chain (Balazs, 1976, 1980; Bowen et al., 1992; Niethammer et al., 1997). Within a few days of capture, the hatchlings were flown by chartered aircraft 500 miles to Honolulu for an experiment to evaluate the use of "living tags" as a permanent and safe means of identification. Living tags on hatchlings involve tiny grafts of contrasting pigmented tissues, exchanged between the carapace and plastron, that will hopefully grow with the animal and be visible for life. The originators of this novel idea for sea turtles, Lupe and John Hendrickson, conducted the pioneering living tag research in Hawaii

under contract to the Honolulu Laboratory of the National Marine Fisheries Service (Hendrickson and Hendrickson, 1980). The hatchlings were subsequently reared for 12 months in seawater tanks on a diet of squid and fish under contract to a commercial oceanarium, Sea Life Park on Oahu. At the conclusion of the evaluation period there were 175 or 75% surviving yearling turtles. The mortality that occurred in captivity was not statistically related to the graft tests when compared to a control group of non-grafted hatchlings incorporated into the study. Overall, about 80% of the turtles grafted resulted in a living tag that was recognizable at the end of one year.

During August and September 1981 the turtles were weighed, measured, determined to be in good health, and tagged with a single Inconel alloy 681C tag (Balazs, 1999) applied through a proximal scale on the trailing edge of a front flipper. The turtles were released at several coastal locations on the islands of Oahu, Kauai, Maui, and Hawaii. In addition, 10 of the turtles were returned for release at French Frigate Shoals. The 25 turtles taken to the island of Hawaii by U.S. Coast Guard aircraft were released by Balazs on September 11, 1981 at the Richardson Ocean Center, Hilo Bay (Fig. 1). One of these turtles had the flipper tag 5690, but no living tag. This turtle weighed 2.7 kg and measured 22.0 cm in straight carapace length.

Nineteen years later, during the summer of 2000, turtle 5690 was identified by a confirmed tag resighting while nesting on Maui, about 125 miles from the release site of Hilo Bay. Three of the turtle's four known nestings were clustered at a location in West Maui next to the Lahaina Shores Beach Resort (Fig. 2). These nestings took place on August 7, 23 and September 9, 2000. Another nesting, presumably 5690's first for the season, occurred on July 17, 2000 at Kihei, Maui, about 15 miles east of the Lahaina location. The nest at Kihei contained 94 eggs, of which only 14% resulted in hatchlings, possibly due to very dry sand conditions. The three nests at Lahaina contained 76, 76 and 88 eggs, respectively, of which 63%, 57% and 55% resulted in live hatchlings. All nests were left in place and estimates of success were calculated from the excavation of clutch remains after natural incubation, hatching and emergence. Tag 5690 was read on August 23 by co-author Mary Jane Grady and verified by another beach observer. The tag was clean, legible and securely attached to the flipper. The turtle was described as large, maybe 200 lbs., and healthy looking with no tumors. Assuming 5690 had a carapace length of 85-90 cm, she would have grown a robust 3.3 cm/year or more during her 19-year life in the wild. This estimated rate of growth generally exceeds that of naturally occurring green turtles tagged and recaptured throughout the Hawaiian Islands (see Balazs et al., 1998, In press).

A few hawksbills (*Eretmochelys imbricata*) have been recorded nesting on Maui during recent years (Mangel et al. 2000). However, similar documentations of nesting on this island are not known for green turtles. The year 2000 nestings on Maui by 5690 may be the first for this species in modern times. In June 1981, the following statement appeared in a report outlining the anticipated ocean release of the 175 green turtles (Balazs, 1981):

"No turtle from a headstarting project has as yet been recovered as an adult, but this may be due in part to the loss of identification tags placed on the turtles at the time of release. The recovery of such a turtle as a breeding adult will be an encouraging sign. However, in order to be considered a valid and proven conservation technique, headstarting must (in the author's view) be shown to 1) result in the recruitment of adults to an established breeding colony at a significantly higher rate than would occur under natural conditions or in the absence of head starting, or 2) create a new breeding colony without significantly reducing the established colony where hatchlings were originally obtained for headstarting."

Confirmed nesting during coming years of other headstarted green turtles in the Hawaiian Islands, and additional nestings by 5690, will provide further insight into the potential value of headstarting as a means to establish new nesting sites. It should be noted that the amazing part of this story is not that a headstarted green turtle successfully nested in the wild. There's no reason to believe one wouldn't, if it survived to grow to maturity and eventually mated. What is amazing is that a single flipper tag applied to such a small turtle stayed on for so many years making it possible for the success of 5690 to become known.

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Figure 1. Hawaiian Islands showing, from left to right: the green turtle nesting colony where hatchlings including 5690 were collected in 1980; Maui where 5690 nested in the summer of 2000; and Hilo Bay, Hawaii, where 5690 was released in 1981 as a 22cm yearling.

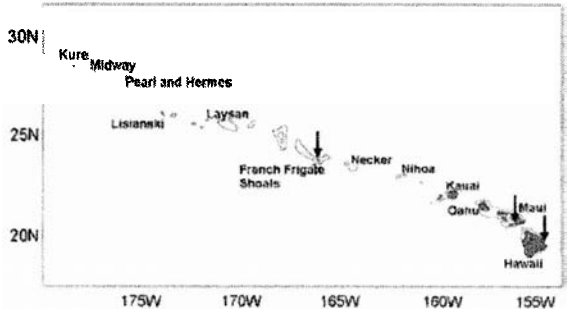

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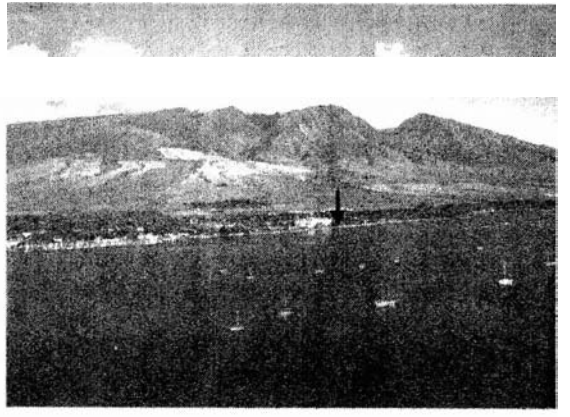
Figure 2. Location on Maui near the Lahaina Shores Beach Resort where 5690 successfully nested on August 7, 23 and September 9, 2000.



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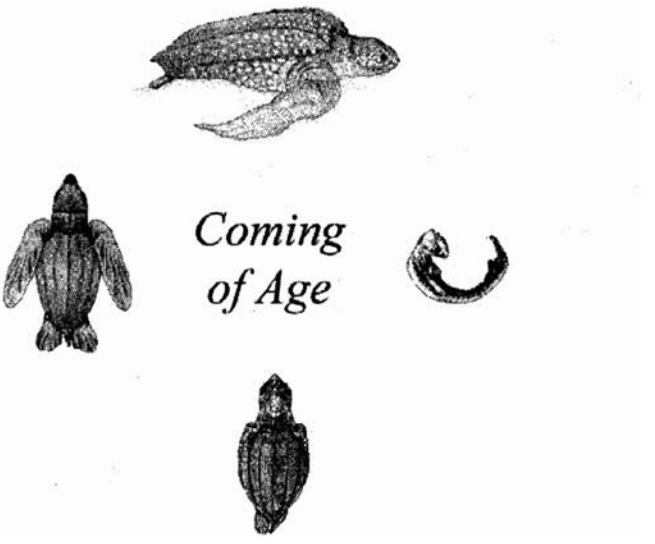

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