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LOGGERHEAD TURTLE RECOVERED FROM A TIGER SHARK AT KURE ATOLL

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The loggerhead turtle, *Caretta caretta* has been documented in Hawaiian waters on only two previous occasions, with both records occurring in the main islands at the southeastern portion of the 2600 km archipelago. The first known case involved an immature specimen found in an emaciated condition at a fish market in Honolulu sometime during the late 1930's (Spencer Tinker, personal communication). The second case occurred in February 1978, when a small female measuring 79 cm in straight carapace length was recovered alive, floating at the surface at Penguin Bank off the Island of Molokai (Altonn 1978, McKinney 1978). This specimen had an amputated but healed left front flipper, as well as recent injuries to the head and tail. In addition, the turtle was heavily infested with a piscicolid leech of the genus *Ozobranchus* (see Davies and Chapman 1974 for description), an ectoparasite of sea turtles not previously reported from Hawaiian waters. Recuperation of the turtle subsequently took place in captivity at Sea Life Park on Oahu, where the animal continues to be on public display. It should be noted that two other loggerheads also in captivity at Sea Life Park at the present time (Fig. 1) were originally imported into Hawaii by the Waikiki Aquarium, probably from Florida during 1967 (Charles De Luca, personal communication).

Findings

During a visit to Green Island at Kure Atoll (28°25'N, 178°20'W) in the Northwestern Hawaiian Islands on 26 July 1978, personnel of the U. S. Coast Guard Loran station provided me with the partially digested parts of a sea turtle recovered from the stomach of a large tiger shark (*Galeocerdo cuvier*). I was informed that between 1100-1600 hours on 31

May 1978, station personnel had engaged in recreational shark fishing off the southern end of the island using a hook and line set from a small outboard powered boat. Several 1.5 m gray reef sharks (*Carcharhinus amblyrhynchos*) were initially captured and cut up for bait. This resulted in the capture of a 3.5 m male and a 4.0 m female tiger shark (Fig. 2). Numerous bird bones and feathers that were not retained for identification were the only items found in the stomach of the smaller specimen. Turtle parts were recovered from the larger shark; however some of this material, as well as other food items of an unidentified nature, were regurgitated and lost during the landing process. The turtle parts consisted of an intact mandible,



Figure 1. Adult loggerhead at Sea Life Park. The distinguishing characteristics of this species include a large head, a reddish-brown body, and five lateral laminae on each side of the carapace rather than the four present in *Chelonia* (green turtles) and *Eretmochelys* (hawksbills). Photo by George H. Balazs.

the horny beaks that cover the jaws, and small portions of the cranium, plastron, and carapace. Examination of these items and comparisons with data presented by Carr (1952) and the loggerheads at Sea Life Park resulted in the positive identification of the turtle as a loggerhead. Based on the size of the mandible, the straight carapace length was estimated to have been 55-60 cm, indicative of an immature specimen.

Discussion

Based on the state of digestion of the identified parts, it is reasonable to assume that the shark ingested the turtle while in the vicinity of Kure, or possibly Midway, 90 km to the southeast. This recovery therefore constitutes the first record of a loggerhead in the Northwestern Hawaiian Islands. It is not possible, however, to determine if the turtle was alive or dead at the time of ingestion. Based on the two earlier records, loggerheads found in Hawaiian waters appear to be aberrant individuals originating from distant populations. In the North Pacific Ocean, loggerhead populations occur along the coast of Mexico (Marquez 1969) and off the Japanese islands of Kyushu, Shikoku, and the southern portion of Honshu (Nishimura 1967, Uchida 1973). An individual from any one of these geographic areas could have drifted or moved under its own power to Hawaiian waters. Similar cases of stray turtles crossing considerable distances of open ocean have been described for European waters (Brongersma 1972). In this respect, it is also of interest to note that a drift bottle released near Kogoshima, Kyushu, Japan during March 1976 was found by Coast Guard personnel washed ashore on Green Island in February 1978.

Tiger sharks are known to feed regularly on sea turtles, a fact that has been well documented for Hawaiian green turtles (*Chelona mydas*) throughout much of the Archipelago (Tester 1969, Fujimoto and Sakuda 1972, Taylor and Naftel 1978). The recovery and analysis of turtle parts, such as reported in the present case, therefore offer considerable potential for gathering valuable ecological data on sea turtles that would be difficult, if not impossible, to obtain by other sampling techniques.

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Figure 2. Two tiger sharks (*Galeocerdo cuvier*) captured by Coast Guard personnel at Green Island, Kure Atoll on 31 May 1978. Photo by LTJG Jim Stark.

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