

RESEARCH ACTIVITIES REPORT

ASSESSMENT OF HAWKSBILL NESTING AT APUA POINT, VOLCANOES NATIONAL PARK  
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On March 21, 1989, a follow-up assessment was carried out of sea turtle nesting at Apua Point in the Hawaii Volcanoes National Park (HVNP) on the Island of Hawaii. This work was conducted on an invitational basis, in cooperation with Larry Katahira and Dan Taylor of the Resource Management branch of HVNP. An initial assessment took place on September 21, 1988 when a low-level aerial survey was made using a small helicopter. The purpose of this work was to identify beaches along the 21-mile HVNP coastline where nesting by sea turtles had recently occurred or where habitat characteristics suggested that it was possible for nesting to occur. Six sites were identified that fell in this latter category, and one site (Apua Point) was found to have evidence of recent nesting. In addition, a site outside the HVNP's southern boundary known as Kamehame was found to have recent nesting. Based on historical knowledge of sea turtle nesting along the east coast of the Island of Hawaii, the hawksbill, Eretmochelys imbricata, is very likely the species of sea turtle involved in these recent events. A biological overview of information on the Hawaiian hawksbill, as well as recommendations for the recovery of this critically endangered species, are given in the draft Hawaiian Sea Turtle Recovery Plan. Efforts to learn more about hawksbills and enhance their management

in the HVNP are in concordance with the Hawaiian Sea Turtle Recovery Plan.

The March 21, 1989 assessment was conducted to excavate and examine the remains of nests following natural incubation and emergence of all hatchlings. The objective of doing this was: 1) to confirm that the species involved was indeed the hawksbill, 2) to estimate productivity of the nests, and 3) possible identification of any evidence of excessive predation or other factors contributing to poor productivity.

The excavation and location of nests at Apua Point proved to be more difficult than originally planned. During the allotted helicopter down-time at Apua Point, several hours of digging and searching resulted in the discovery of four nests. Two of these only consisted of small fragments of egg shells representing a very minor portion of previously laid turtle nests. The nature of these pieces suggested that they were from nests deposited prior to 1988. The other two nests found contained numerous whole egg shells that were likely from nestings that had been detected during the September 1988 visit.

A careful analysis of the egg shells and associated remains from the two nests revealed that an estimated 45 and 56 eggs, respectively, had been present. The diameter of the eggs prior to hatching was estimated to be 35 mm which is consistent with the known average diameter of hawksbill eggs. In contrast, the average diameter of the egg of a green turtle, Chelonia mydas, is 55 mm. Partial skeletal remains of approximately two hatchlings associated with one of the nests reconfirmed the species as the hawksbill. This identification was based mainly on the shape of the lower jaw bone.

The presence of only 45 and 56 eggs in each of the two nests is not in agreement with the average known number of eggs laid by the hawksbill as



reported in the literature. The mean number in the Pacific is 125 according to Witzell 1983 (Synopsis of biological data on the hawksbill turtle Eretmochelys imbricata, FAO Fisheries Synopsis No. 137). There are currently no data for the Hawaiian Islands, so a direct comparison in this regard is not possible. The reason for the very low number of eggs in the Apua Point nests is not known. It is unlikely that a significant number of egg shells would have been missed during excavation, since this was accomplished in a fairly intensive and comprehensive manner. Some possibilities to explain the low counts would include: 1) a nesting turtle was severely disturbed during oviposition causing her to "shut-down" egg laying when only half completed and to return on a subsequent night to lay the other half of her clutch, 2) predation occurred in such a manner as to completely remove many of the eggs at the time they were being laid, 3) excavation of the nest by humans and removal of many of the eggs after nesting, and 4) nests by an atypical hawksbill that are at variance with the reported number of eggs per clutch laid by this species.

During the excavation it was noted that the rootlets of the naupaka shrub, Scaevola, had substantially grown around and into the egg shells. Although in some area (i.e. Florida) the roots of plants can cause mortality to incubating sea turtle eggs, this was deemed not to be the case at Apua Point. Except for the hatchling remains previously mentioned, there was no indication that high embryonic mortality had occurred, at least in the latter stages of development. The thickness and other attributes of the recovered egg shells were consistent with eggs that had reached full term and hatched.

Additional monitoring of the hawksbill nesting situation at Apua Point, and elsewhere along the HVNP coastline and adjacent sites, will be necessary to determine how best to effectively manage this endangered species.