

## Status of Sea Turtles in American Samoa in 1991<sup>1</sup>

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**ABSTRACT:** To evaluate the status of green sea turtles (*Chelonia mydas* L.) and hawksbills (*Eretmochelys imbricata* L.) in American Samoa, residents in 58 coastal villages were interviewed, public sightings were monitored, and surveys on remote islands were conducted. We estimate that turtle populations have seriously declined in the Territory, and now total only about 120 nesting females (species combined) per year. Most turtles and eggs encountered by villagers are still harvested.

TWO SPECIES OF sea turtles are found in American Samoa, the green turtle (*Chelonia mydas* Linnaeus) and the hawksbill (*Eretmochelys imbricata* Linnaeus). Although their population status and distribution in American Samoa are not well known, available evidence suggests that turtle numbers have declined significantly from historic levels. It is difficult to assess this apparent decline because population surveys have not been conducted. A nineteenth-century report merely stated that "a great number of turtles" nested on one island [Rose Atoll] in American Samoa (Graeffe 1873). More recently, local fishermen have reported that turtle numbers have declined considerably in recent years (Johannes 1986).

Populations of both sea turtle species have declined worldwide mainly because of overharvest, habitat destruction, and incidental kills in fishing gear. Both species are listed and protected by the U.S. Government under the Endangered Species Act; thus it is illegal to harvest either species in American Samoa. Given the lack of local information concerning these species, the purpose of the study reported here was to examine their current status in the Territory.

The limited information available about turtles in American Samoa has been summarized by several authors (Sachet 1954, Hirth 1971, Balazs 1982*a,b*, Forsyth and Balazs 1989; Balazs, 1991, unpublished ms. in Hono-

lulu Laboratory of NOAA National Marine Fisheries Service, Honolulu, "Historical summary of sea turtles observations at Rose Atoll"). In nearby Western Samoa, a brief headstart project was conducted in 1969–1972 because hawksbill populations had nearly been exterminated there by local residents (Travis 1979, Witzell and Banner 1980). Information about the nesting of hawksbills and the foraging of green turtles in Western Samoa waters was provided by Witzell and Banner (1980) and Witzell (1982).

### Study Area

American Samoa (Figure 1), the only U.S. Territory in the southern hemisphere, consists of five volcanic islands (Tutuila, Aunu'u, Ofu, Olosega, Ta'u) and two remote atolls (Rose, Swains). Three of the islands (Ofu, Olosega, and Ta'u) compose the Manu'a group. The majority of the American Samoa population is located on Tutuila (45,000 people in 1990), with the remainder on the Manu'a group (1,700) and Swains (15). The Territory's population is growing rapidly (3.7%) and is expected to double in only 19 yr. Rose Atoll has two small islands (Rose, Sand) and is an uninhabited National Wildlife Refuge administered jointly by the U.S. Fish and Wildlife Service and the American Samoa Government.

There are about 34 km of potential nesting beaches for sea turtles in the Territory: Tutuila (16 km), Ofu (7 km), Swains (4 km), Olosega (3 km), Ta'u (2 km), Aunu'u (2 km), and Rose (1 km). This equals 21% of the

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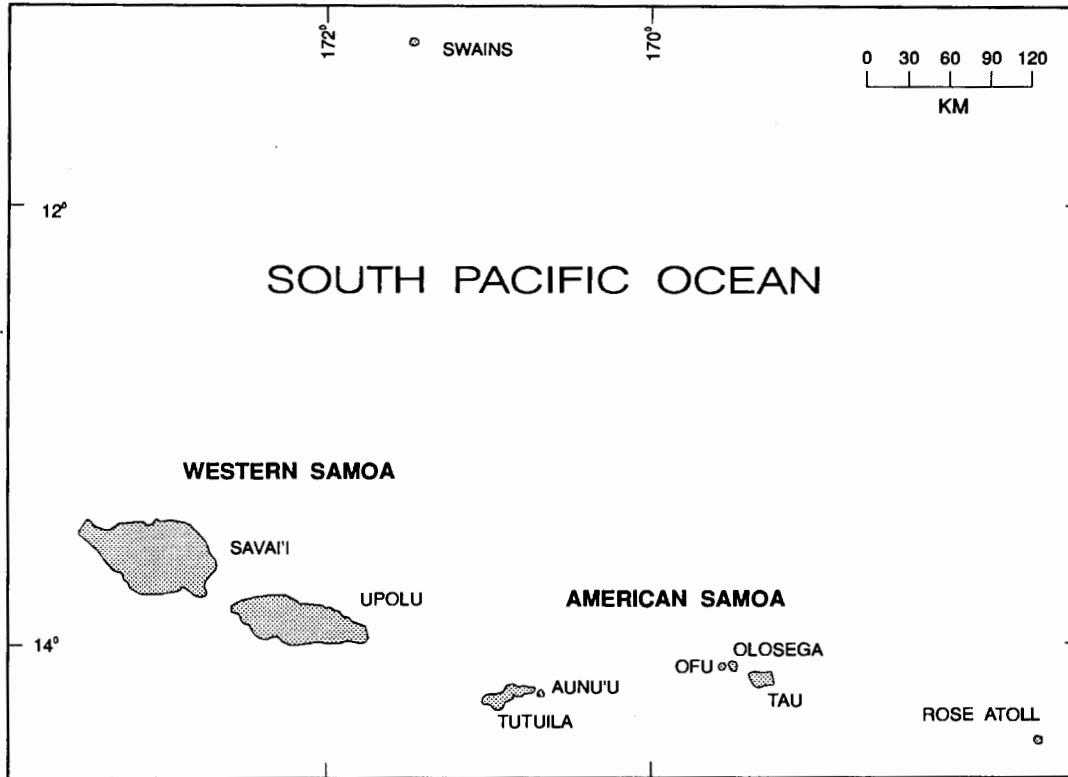


FIGURE 1. The seven islands composing the Territory of American Samoa, and nearby Western Samoa.

coastline in the Territory. Most of the beaches on Tutuila occur on the south side of the islands where the human population is the highest and where turtle usage of many beaches has been preempted by coastal villages and the shoreline highway.

#### METHODS

To gather historical and current information about sea turtle activity on Tutuila and the Manu'a islands, standardized interviews were conducted with 155 local residents in 58 coastal villages between December 1990 and August 1991. All interviews were conducted by a Samoan in the native language. In each village, we interviewed one to six people who had knowledge of past and current turtle

activities in their village. This generally involved interviewing older people and fishermen who had been raised there. Additional information on current turtle activity was gathered by documenting the location of all verifiable turtle sightings reported to our agency.

Turtle activity at Rose Atoll was monitored during three trips there (18 October to 26 November 1990, 25 April to 3 May 1991, and 30 August to 28 September 1991). Nightly surveys were conducted around Rose Island at 2-hr intervals. During these surveys, Sand Island was surveyed intermittently for new tracks and pits. On Swains Island, a local resident was contracted to walk around the entire island once a week (October 1989 to June 1991) and document any turtle tracks and/or activities.

## RESULTS AND DISCUSSION

*Species Identification*

Most villagers interviewed knew of only one turtle species in American Samoa. Only 18% of the 155 respondents distinguished between the hawksbill turtle (in Samoan, *laumei uga*), whose shell is hard and has been used historically to make jewelry and fishing hooks, and the green turtle, whose shell is too thin for making craft items. Respondents were not in agreement regarding a Samoan name for the green turtle (*laumei ena ena*, *laumei leai se uga*, *fou*).

*Nesting*

Based on the interviews, it was difficult to determine what time of year turtles are most active on local beaches. For many Samoans, time is occasionally determined by reference to a major weather event (e.g., hurricane) or biological cycle (e.g., plant flowering), thus many respondents could not pinpoint a specific time of year when they observed nesting turtles. However, six villagers reported seeing turtles year-round on Samoan beaches, and 38 reported seeing turtles during particular months. Together these data indicate the lack of a clearly defined period of nesting activity on Tutuila Island (Figure 2).

Other information indicates, however, that

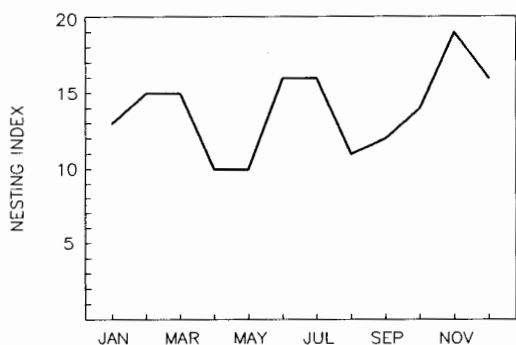


FIGURE 2. Months when villagers reported turtle activity on local beaches on Tutuila and the Manu'a islands. "Nesting index" is the number of respondents who reported observing nesting turtles in a given month.

hawksbill and green turtles nest at different times of the year in Samoa. Graeffe (1873) reported that the peak nesting season for green turtles at Rose Atoll was August and September, and fishermen in Pago Pago concurred with this observation (Balazs 1982a). This nesting period is also similar to that reported by Balazs (1983) for green turtles that nest in the nearby Tokelau Islands (September through November). For hawksbill turtles, Witzell and Banner (1980) reported that the nesting season in Western Samoa extends from September to July, peaking in January and February. Thus, if both turtles nest on Tutuila, their nesting seasons could extend throughout most of the year.

Information obtained during the interviews also indicated a decreasing usage of some Tutuila beaches by nesting turtles. Respondents in 14 (24%) villages reported that turtles no longer occurred on their village beaches that historically had nesting activity (i.e., the respondent could remember nesting turtles as a child).

*Sightings and Mortalities*

During the 8-month study period, we received an average of four turtle sighting reports per month and two turtle mortality reports per month. The sightings included 29 reports of turtles in the ocean (it is not known how many of these were adults), five adult turtles on beaches, and only two groups of hatchlings on beaches.

Sixteen dead turtles (34–83 cm, curved carapace length [CCL]) were reported during this period. Of the reports that we were able to verify, four turtles had been taken alive from the ocean by local fishermen, three were found dead on beaches, and one arrived in American Samoa as a food gift from Western Samoa. We also received five additional reports of eggs being harvested from nests.

One of the turtles found dead on beaches was a 64-cm (CCL) olive ridley (*Lipidochelys olivacea* Eschscholtz). This finding was unusual because olive ridleys do not generally occur in this region. We hypothesize that a foreign commercial fishing boat may have

discarded the turtle before docking in American Samoa for fear of legal action.

#### *Distribution*

The turtle sightings that were identified by species indicate a difference in the distribution of the two turtle species in the Territory. At Rose Atoll, 94% of 68 sightings (from 1971 to 1991) were of green turtles; 83% of the 29 sightings around Tutuila were of hawksbill turtles.

#### *Rose Atoll and Swains Island Surveys*

For its small size, Rose Island (5.2 ha) on Rose Atoll has had considerable turtle activity (Balazs, 1991, unpublished ms.). During our brief surveys there, 14 adult green turtles and nine hatchlings were observed. Altogether, 39 nesting green turtles have been tagged there by various researchers since 1971 (Balazs, 1991, unpublished ms.; and this study). Four have been recovered, two back at Rose Atoll after periods of 4 and 9 yr, and two in Fiji (1400 km to the west of Rose Island) after periods of 4 and 6 yr.

Only small numbers of green and hawksbill turtles have nested on Swains Island (Balazs 1983). Weekly surveys around the island during the past 2 yr tend to confirm this—only 13 tracks and two nests (November 1990) were observed.

#### *Migration Patterns*

Migratory patterns of Samoan turtles are unknown, but limited tagging data collected by others elsewhere in the South Pacific indicate that American Samoa turtle populations should be viewed in a broad regional context (Figure 3). Balazs et al. (1993) reported that 461 nesting green sea turtles were tagged in French Polynesia during 1972–1984, and 13 were recaptured, all to the west of their release site and at distances up to 4000 km away. Some caution in interpreting these recoveries may be warranted because many of these turtles had been held in pens for about 1–2 months, and their westward movements coincided with the prevailing direction of

surface currents in the region. However, the additional recoveries of two previously mentioned green turtles (tagged at Rose Atoll and recovered in Fiji) indicate that the movements mentioned above are probably representative of natural turtle movements in the central South Pacific Ocean. These two nesting turtles were released immediately after tagging, and both moved from east to west over considerable distances.

#### *Abundance*

Based on preliminary estimations, we suggest that the total number of nesting female turtles per year is only about 120 animals (species combined) in the entire Territory. We caution that our population estimates are rough at best, as described below.

Tutuila appears to have the largest turtle nesting population, consisting of about 50 nesting females per year. This estimate was derived by taking the nine villages that reported turtle activity on their beaches during the past year (based on interview data), doubling this number to account for isolated beaches on the north side of the island where there are no villages (hence no interviews), and multiplying this number by the average number of turtles (2.8) that nested on beaches during the past year (according to the interviews). Our population estimate of 30 nesting females per year in the Manu'a islands was made the same way, except that an average of 2.4 nesting turtles were reported on those beaches. On Rose Atoll we observed and tagged 12 turtles during 73 days of surveys there. We assumed that, altogether, we monitored the island for about one-third to one-half of the breeding season, and thereby expanded the number of nesting turtles to 24–36. On Swains Island, we arbitrarily assumed that one to five mature females could be responsible for the very limited activity there.

#### *Conservation Status*

Factors believed to be responsible for the general decline of turtle numbers in American Samoa include habitat loss (particularly because of the construction of roads along the shoreline and the expansion of coastal vil-

lages) and subsistence harvests by local residents. It is also apparent, given the large-scale migrations indicated in Figure 3, that Samoan turtles are impacted by subsistence harvests and incidental catches in commercial fisheries elsewhere in the South Pacific.

Although we lack the multiple-year data needed to estimate population sizes, we believe the status of breeding sea turtles is in jeopardy based on information obtained during the village interviews and the low number of sightings documented during this study. We learned that if a turtle of any age is encountered by locals, the likelihood of it being harvested (which is illegal) is high. Our observations of up to 16 dead turtles during a brief 8-month study period emphasize this

point. Similarly, we learned that villagers collect turtle eggs (also illegal) for consumption whenever a nest is found.

Sea turtles have long been considered a food delicacy, and the shell of the hawksbill was often made into bracelets, combs, rings, and fishing hooks, and was used in the headpiece worn by a Samoan princess during important dance ceremonies. Sea turtles were also incorporated into Samoan songs, folklore, and art (petroglyphs, carved turtles). For example, in Samoan folklore sea turtles are believed to have the power to save fishermen who are lost at sea by bringing them to shore. The Samoan word for sea turtle is *i'a sa*, which translates literally to "sacred fish," presumably because of their power to help fishermen.

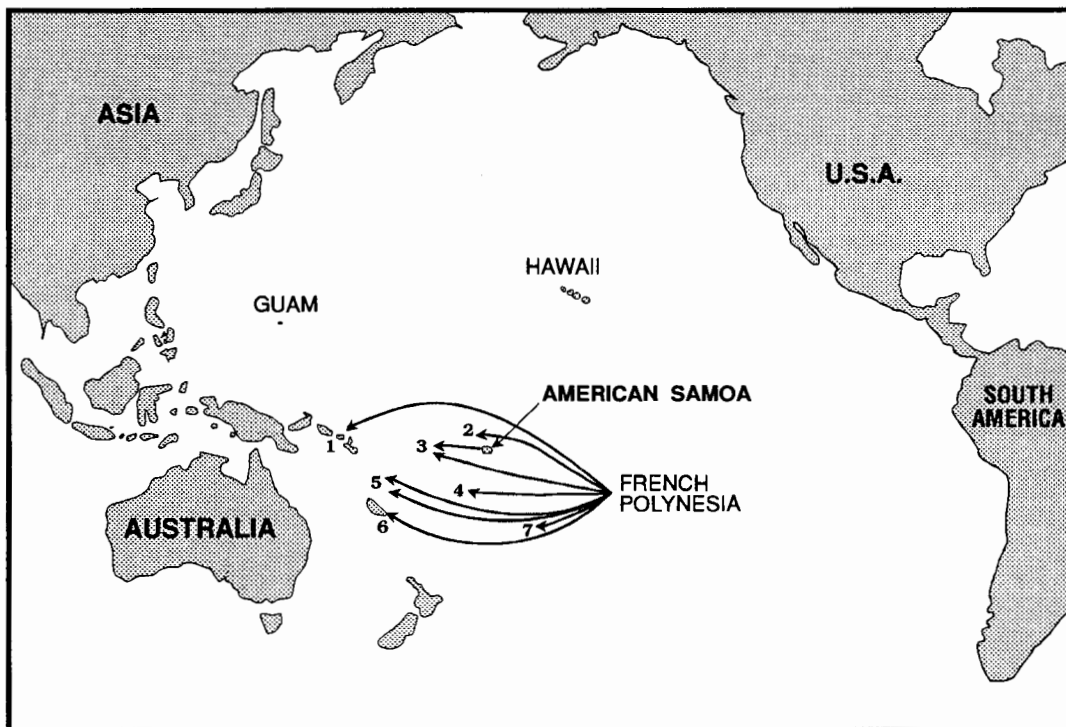


FIGURE 3. Movements of tagged green sea turtles in the central South Pacific Ocean. Tag recovery sites (with the number of recovered turtles indicated in parentheses) are as follows: 1, Solomon Islands (1); 2, Wallis Island (1); 3, Fiji (5); 4, Tonga (1); 5, Vanuatu (3); 6, New Caledonia (2); and 7, Cook Islands (1). Also included are two green turtles that traveled from American Samoa to Fiji. Not included, however, are recoveries of turtles tagged in Australia, because they are generally confined to western areas (i.e., west of New Caledonia and the Solomon Islands). Redrawn from: Balazs (1982b), Forsyth and Balazs (1989), SPREP (1989), Balazs et al. (1993), and S. Geermans (SPREP, pers. comm.).

Historically, many Samoan villages harvested turtles only during special occasions (e.g., when distinguished visitors arrived at the village), and the turtles were most often reserved for the village council or *matai* (chiefs). This type of restrictive hunting system has also been reported on other Pacific Islands and probably did not seriously impact turtle populations in the area (Johannes 1978, 1986, McCoy 1982, Balazs 1983). However, with the erosion of traditional Samoan culture and rapid human population growth, hunting pressure on turtles and habitat degradation has become constant.

The concept of turtle conservation faces several difficulties in contemporary American Samoa. First, most people are unaware that it is illegal to take sea turtles within the Territory, and enforcement of existing laws to protect turtles is lacking. Second, public acceptance of conservation issues is not strong. Although many people we interviewed acknowledged that there were considerably fewer turtles on their beaches than when they were children, few indicated a concern for the future of turtles. Some expressed the opinion that "turtles were placed in the ocean by God for man to take," and therefore all turtles should be taken. Others expressed the thought that if they did not take the turtle, someone else would. Third, there is a lack of public awareness programs to help teach the public about turtles and how they might be protected in American Samoa. Fourth, a high growth rate of the human population in American Samoa presents an increasing impact on turtles and their habitat. It is clear that a concerted campaign in American Samoa is needed to educate the public about the need to conserve sea turtles, identify and protect important habitats, and enforce existing regulations protecting turtles and their habitats.

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