



## Green Turtles Basking on Tern Island, French Frigate Shoals

by Elizabeth A. Sheekey

### INTRODUCTION

The green sea turtle (*Chelonia mydas*) was formally listed in the Threatened category under the U.S. Endangered Species Act in September 1978 and is currently afforded full legal protection. The State of Hawaii gave full protection to green turtles in the Northwestern Hawaiian Islands in May 1974. Green turtles are present throughout the entire Hawaiian Archipelago but come ashore only at select undisturbed sites in the Northwestern Hawaiian islands (Balazs 1980). Green turtle reproduction does not take place within the main Hawaiian Islands. Ninety percent of all reproduction of the Hawaiian population occurs at French Frigate Shoals (Balazs 1980). French Frigate Shoals is a coral atoll with eleven small sand islands and is located within the Hawaiian Islands National Wildlife Refuge, which is administered by the U.S. Fish and Wildlife Service. Green turtles utilize French Frigate Shoals year-round, but an influx of adult turtles arrive during late March and early April each year to breed. Nesting begins in May and most turtles depart during late July and August. The annual breeding population at French Frigate Shoals is estimated at 200-500 adults (Balazs 1980). This represents the largest green turtle rookery in the United States.

Basking on land by green turtles is common in the Northwestern Hawaiian Islands, but is rare elsewhere throughout the world. Although basking occurs year-round at French Frigate Shoals, the incidence of basking is highest during the breeding season (Balazs 1980). Turtles may bask for thermoregulatory purposes or to decrease predation by tiger sharks at a time when a large number of turtles are present (Whittow and Balazs in press). The turtles are extremely sensitive to human disturbance while basking and are likely to leave the beach if they see a human (Manta Corporation 1979, Balazs 1980).

### STUDY AREA

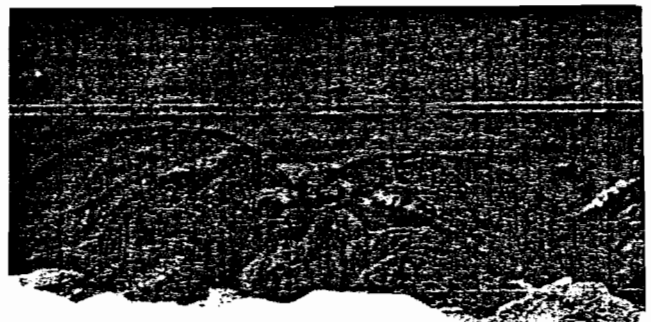
Tern Island is an island within French Frigate Shoals. In 1942 the U.S. Navy constructed an airstrip on Tern Island to support naval operations during World War II, increasing the size of the island from 11 acres to 57. From 1942 to 1952, the island was intermittently inhabited by up to 100 military personnel. During the Coast Guard's 1952 to 1979 administration, approximately 20 people (and a few dogs) lived on the island, and recreational use of the beach and surrounding inshore waters was common. Since 1979 the U.S. Fish and Wildlife Service has maintained a small

research station with limited personnel (approximately 4). Current use of Tern Island is restricted by a permit system administered by the U.S. Fish and Wildlife Service and strict rules apply to the use of the beach and near shore waters.

Historical evidence shows that the green turtle population has declined in numbers since the 19th century (Balazs 1980). Prior records of turtles basking on Tern Island are sporadic. Amerson (1971) reported three observations of a turtle basking on the island during the breeding season, during 95 days of observations between 1959 and 1969. He also reported nesting pits on the island's south shore every year between 1964 and 1969. Under the Coast Guard's administration few basking turtles were seen on the island, but they reported yearly occurrences of nesting pits (Balazs pers comm.). Since 1979, observations of basking turtles have been recorded, but no daily surveys were made. In 1979 one turtle was seen basking on July 14. In 1980, 25 surveys of the beach were made between April 1 and June 7, but no turtles were seen (R. and S. Schulmeister pers. comm.). Nesting pits were present in 1979 and 1980.

### METHODS

Between 15 April and 5 June, 1981, daily surveys of the Tern Island beach were made and observations of basking green turtles were noted and mapped. The length of time that an individual turtle basked was recorded when possible. The sexes and sizes of the turtles were also recorded whenever possible, without disturbing the basking turtles. Size was



Green Turtle.

Photo by George Balazs

used as the basis to categorize a turtle as an adult (straight carapace length greater than 81 cm.) or a subadult (straight carapace length between 65 cm. and 81 cm.). Observations of the use of the near shore habitat of Tern Island were also made.

RESULTS AND DISCUSSION

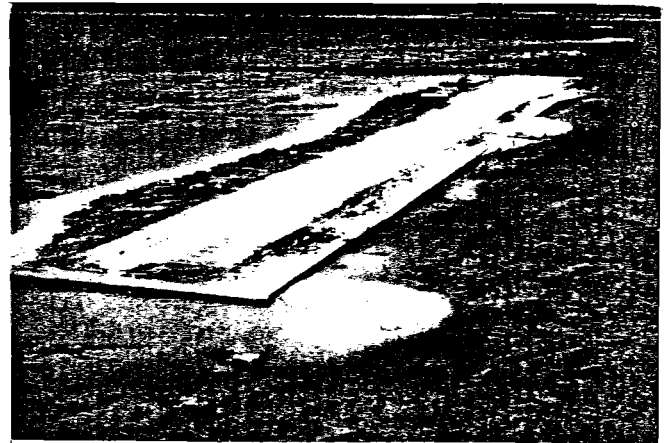
Between 5 April and 5 June 1981, 68 sightings of turtles basking on Tern Island were made. On 36 days (68%), one or more turtles were found basking (Figure 1). This is a marked increase from the number of basking turtles seen in the past. A concurrent study conducted on East Island (located within French Frigate Shoals) did not show a marked increase in the number of turtles basking (G. Balazs pers. comm.) and suggests that the increase on Tern Island was not a result of an atoll-wide increase in population. The increase on Tern Island may be related to a decrease in disturbance since fewer people now live on the island.

Most turtles (88%) were seen on the long, sandy south shore. Eleven percent were seen on the small rubble north beach and one percent was seen on the east beach, an intermittent sand bar. In the past, basking turtles were occasionally seen on the north beach, which was not used as heavily for recreational purposes by Tern Island residents (Balazs pers. comm.). Current recreational use of the beach has been virtually eliminated.

Twenty-nine turtles (43%) basked for more than four hours and two (3%) for more than two hours. Basking time for 37 turtles (54%) was not determined. The fact that many turtles basked for more than four hours indicates that the turtles were exhibiting true basking behavior and were not casually wandering onto the beach.

Fifty-four (79%) observations were of adults and 14 (21%) were of subadults. No juveniles were seen basking. Of the 31 sexed adults, 15 were males and 16 were females. This sex ratio is consistent with other studies (Balazs 1980). The high number of adults seen is an indication that breeding turtles used the island during the 1981 season.

Eleven individual turtles could be identified by carapace markings and irregularities. The eleven individuals accounted for 33 (49%) of the sightings. Repeated observations of the



Tern Island, French Frigate Shoals, Northwestern Hawaiian Islands

Photo by George Balazs

same basking individuals may represent the beginning of an adult population which will continue to use the island in the future. Balazs (1980) reported that turtles repeatedly bask and nest on a particular island and to some extent at the same site on the island.

In 1981, nesting pits first occurred on the south shore of the island on May 29. Six nesting pits were seen on the island before my departure on June 5.

The near shore habitat of Tern Island is also used by turtles. Thirteen sightings of turtles swimming near shore were made. Six observations of turtles copulating in near shore waters were made, the first was on April 26 and the last on May 23, 1981.

The importance of French Frigate Shoals as the largest breeding concentration of the threatened Hawaiian green turtle is well documented (Balazs 1980). Tern Island represents a very suitable habitat within French Frigate Shoals for basking and breeding turtles. The relationship between basking and nesting suggests that for Tern Island to increase its potential as a viable nesting area, basking will also have to increase. The marked increase in basking turtles in the 1981 season may be attributed to the low number of people now inhabiting the island and the regulated use of the beach and near shore waters.

The endangered Hawaiian Monk Seal (*Monachus schauinslandi*) also uses the Tern Island beach for basking. Seal use of the beach for basking has dramatically increased since 1979 (Schulmeister 1980) and it is quite possible that the green turtle will show the same trend. Continued monitoring of turtle use of Tern Island is necessary to determine if the 1981 season is the beginning of a new trend or represents a unique year. If human use of Tern Island remains low, this increase in use of the island by the turtles can be expected to continue.

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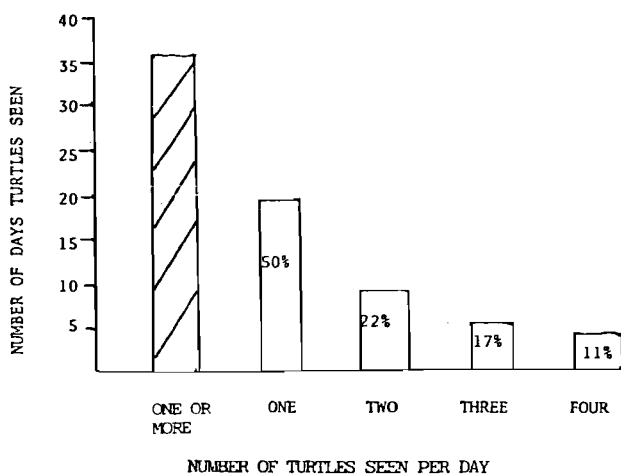


Figure 1: Number of days different numbers of basking turtles were seen on Tern Island between 15 April and 5 June 1981.

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## 'ALALA REPORTED FROM THE AHUPUA'A OF MANUKA, SOUTH KONA, HAWAII

by Samuel M. Gon, III

The 'Alalā, or Hawaiian Crow (*Corvus tropicus* Kerr) is an endangered species endemic to the island of Hawaii. It has been estimated (U.S. Fish and Wildlife Surveys, unpublished data) that as few as 30 to 150 wild birds remain in sites such as Pu'u Wa'a-wa'a (Tomich, 1971), Palani, Hualalai, Captain Cook Ranch and McCandless Ranch (Giffin, 1976, 1980), Hōnau-nau Forest Reserve and Ka'ū (Sakai and Ralph, 1980). Any opportunities to study the bird in a natural situation are valuable.

During 15 to 18 August, 1982, Suzan Harada and I conducted an arachnological study at an established study site approximately 1 km. upslope of the Manukā State Park in South Kona, Hawaii (c. 600 m. elev.). On 16 August, at about 1815 hr., a lone 'Alalā was heard flying noisily through the overstory vegetation. It was observed as it moved clumsily through the canopy trees and landed in an emergent 'ohi'a tree (*Metrosideros collina*). It remained at its perch, emitting soft croaks and fairly loud caws intermittently in the fading ambient light. Approaching dusk ended the observation.

On the following evening, we again heard a crow landing in the canopy trees approximately 70 m. downslope of our campsite. After about 20 sec. of fumbling through the canopy vegetation, the bird settled, called loudly twice and fell silent.

During the previous year, while conducting my research alone, on 15 August, 1981, at late dusk (1918 hr.) I had heard a large bird moving through the upper vegetation at the same campsite. Dead twigs and leaves showered to the ground as a result of its progress. Although the failing light and the dense vegetation allowed me only incomplete silhouettes of the bird, I suspected at the time that it was an 'Alalā. On that occasion, the vocalizations were not the "cawk" or "ca-wak" commonly reported (Tomich, 1971; Berger, 1981), but instead were dominated by indistinct croakings and raspy murmurings, occasionally escalating to include a louder, raspy "haw". Due to poor lighting conditions both years, it was not discerned whether the bird was banded or marked in any way.

The two years' sightings differ in location by less than 100 m. map distance. Also, judging from the clumsy movements noted during both years' sightings, I suspect that both observations are possibly of one individual. Although juvenile 'Alalā have been described as clumsy (Sakai and Ralph, 1980), the two subsequent years of observation of this bird's blundering movements might indicate advancing age or chronic injury, rather than immaturity. Furthermore, the clumsy flights of juveniles are typically accompanied by one or both parents (Sakai and Ralph, 1980), while each of the Manukā sightings involved a single, unaccompanied bird.

The vegetation at the site is a mixed closed canopy of alahe'a (*Canthium odoratum*), lama (*Diospyros ferrea*), olopua (*Osmanthus sandwicensis*), papala kēpau (*Pisonia inermis*), kopiko (*Psychotria hawaiiensis*), and ho'awa (*Pittosporum hosmeri*) under emergent 'ohi'a lehu'a (*Metrosideros collina*). The fruit of both *Diospyros* and *Pittosporum* have been noted as forage plants of the 'Alalā (Tomich, 1971; Berger, 1981). However, no feeding behavior was noted during the Manukā sightings.

The significance of the sightings lies in the documented rarity of the 'Alalā in the southern portion of the South Kona District during the past three decades, and the lack of recorded sightings in the Kapu'a-Manukā Forest Reserve since the 1950's (Banko and Banko, 1980). This report serves to re-establish the presence of 'Alalā in Manukā.

The 'Alalā was once common in Kona (Perkins, 1903; Munro, 1960), but has disap-