

SEA TURTLE SURVEY AT OROLUK ATOLL AND MINTO REEF, FEDERATED STATES OF MICRONESIA

An expedition was undertaken to assess the marine and terrestrial resources at Oroluk Atoll (7°32'N, 155°19'E) and Minto Reef (8°10'N, 154°18'E) from November 28 to December 6, 1990. The objective of the expedition was to document the existing conditions of these living resources and their habitats and to provide recommendations to the Government of the Federated State of Micronesia (FSM) and Pohnpei State regarding conservation and preservation of the resources and environments of the two atolls. An important component of these surveys was to document the occurrence of sea turtles at both sites.

OROLUK ATOLL

Oroluk Atoll is well known as an important nesting site for the green turtle (*Chelonia mydas*). Pritchard (1977) noted that Oroluk Atoll was apparently the only nesting ground of importance for the green turtle in Ponape District (Pohnpei State). He estimated that 9-15 turtles nested on Oroluk on an average night during the nesting season, with up to 20 nests on a good night. Nesting turtles were tagged during 1985-86 by the FSM Marine Resources Division. To date, there has been only one long range recovery from the 15 adult female green turtles tagged. An individual of carapace length 99 cm tagged while nesting on Oroluk on 2 June 1986 was recaptured alive in Nan-Way Bay, Taiwan, on 18 April 1987 (Edson and Curren 1987).

Prior to this expedition, little observational work had been done underwater at Oroluk to document the importance of the atoll as foraging habitat for sea turtles. Underwater observations at other sites relatively close to Oroluk (i.e., Pingelap, Mokil, Kosrae, Pohnpei, Nukuoro) indicate some importance of these sites as foraging habitat (Pritchard 1977). Because there is little nesting reported at these other atolls and islands, the populations of green turtles found foraging there may be using Oroluk for nesting purposes.

Underwater surveys were undertaken at Oroluk from November 29 to December 3. A total of 46 stations were selected and surveyed using both scuba and snorkeling gear. Two teams of three or four divers each conducted the surveys with specialists recording on underwater slates those species in major groups for which they were responsible (corals, reef fish, macro invertebrates, benthic algae, sea turtles). Stations were selected in order to sample the major biotopes of the atoll. These included the ocean drop-off, passes, lagoon back reef, lagoon slope, and lagoon pinnacles.

Survey Results

A total of 16 turtles were sighted during underwater surveys and from the vessel at anchor during the five day period at Oroluk Atoll (Table 1). Fifteen of the turtles sighted were green turtles and one was a hawksbill (*Eretmochelys imbricata*). Of the 15 green turtles sighted, 14 were estimated to be juveniles (< 75 cm carapace length) and one was an adult (about 100 cm carapace length). None of the turtles observed had been tagged and all appeared to be free of fibropapilloma, a life-threatening tumor disease which occurs in the Hawaiian green turtle population (see Balazs and Pooley 1991). Ten of the turtle sightings were made at lagoon pinnacle stations, indicating that the lagoon pinnacles probably contain the most desirable foraging and/or resting habitat. *Caulerpa racemosa* is a common benthic algae found on the pinnacles and is a major green turtle food source in other areas (Balazs 1990).

Natural predators of sea turtles were recorded when observed during the surveys. Numerous sharks of four species were observed at most stations. In order of abundance, sharks

Table 1. Sightings of green and hawksbill sea turtles at Oroluk Atoll, 29 November - 3 December 1990. With the exception of one adult green turtle (denoted by an asterisk), all turtles sighted were juveniles.

Station Number	Greens	Hawksbills
05	6	
19	1	
22	1	
27	1	
31	1	
35		1
42	2	
45	1*	
46	1	
From ship at anchor	1	

recorded were the blacktip reef shark (*Carcharhinus melanopterus*), gray reef shark (*C. amblyrhynchos*), whitetip reef shark (*Triaenodon obesus*), and nurse shark (*Nebrius concolor*). Although these four species of sharks are not known predators of sea turtles, they are capable of feeding on hatchlings and small juveniles. No sightings were made of the tiger shark (*Galeocerdo cuvier*), the only known major predator of juvenile, sub-adult, and adult green turtles (Balazs 1980). However, this shark is nocturnal and likely occurs at Oroluk. Several large groupers (*Epinephelus lanceolatus*), well over 100 kg, were observed. They have been known to occasionally take juvenile green turtles (Balazs 1980).

On November 29 the team surveyed the coastline of Oroluk Island. No turtles, tracks on the beach, or nesting pits were seen. However, Typhoon Owen had passed just north of Oroluk about eight days earlier and had caused considerable damage to the island and reefs. Much of the sand and rubble beach on the north and northwest sides of the island had eroded. The most viable nesting beaches occur on the south side of the island close to the small village. Although the sand beach there was intact, pig pens and house platforms severely encroached on the limited turtle nesting habitat. Approximately 25 meters off the southwest shore of Oroluk Island a coral block enclosure had been built. Villagers claimed the enclosure was used for raising turtle hatchlings. Large turtle bones were seen on the bottom both within and outside of the enclosure.

Printed photo
 During the present expedition two interviewers spent several days and nights ashore to assess the use of marine and terrestrial resources by the 13 people from Kapingamarangi now residing on the atoll. Details of the existing level of turtle harvesting will be presented elsewhere. An individual on the island stated that between five and eight turtles haulout (nest or attempt to nest) on Oroluk Island every month, except June and July when they are "too numerous to count." He reported that island residents take every turtle they encounter. Only in the peak summer nesting season are some turtles allowed to return to the sea. The shell from a recently butchered large adult green turtle was observed drying next to a hut in the village.

Discussion

There is little question that Oroluk Atoll is critically important to green turtles in the Caroline Islands, and is probably the most important site for the species in the Eastern Caroline Islands. Nesting activities continue at Oroluk Island, although at a reduced level from that reported in the 1970's by Pritchard (Edson and Curren 1978). In addition to the importance of Oroluk for nesting, survey results from this expedition reveal that juvenile and sub-adult green turtles utilize the lagoon for foraging. Juvenile abundance at prime nesting sites is not always the case in Micronesia. As an example, during a similar expedition to the northern Marshall Islands in September 1988 (Thomas 1989), intensive green turtle nesting activity was recorded at Bikar and Erikub Atolls and Jemo Island; however, virtually no juvenile turtles were sighted during numerous underwater surveys at these sites. Therefore, unlike other turtle nesting islands, Oroluk may be important as a resident area for several life stages of green turtles.

Recommendations

The survey team strongly recommends that harvesting of turtle eggs and nesting female green turtles at Oroluk Island be totally prohibited. In addition, the prime nesting habitat along the south and southwest coastline of Oroluk Island should be allowed to revert to natural conditions. All pig pens and house sites should be removed from the intertidal and supratidal areas as soon as possible.

MINTO REEF

On 4-5 December 1990, the team conducted surveys within 23 underwater stations at Minto Reef. Surveys were conducted by two teams utilizing two small boats, as was done at Oroluk. Stations were conducted both on scuba and using snorkel equipment.

Survey Results

No sea turtles were sighted during the two days of survey work at Minto Reef. Typhoon Owen had hit Minto about eight days prior to the survey and caused extensive damage. Some reef areas were reduced to rubble berms, killing most of the live coral and many of the reef-associated invertebrates. The small islet to the north of Minto atoll (rumored to support limited turtle nesting) had completely disappeared. However, this may have occurred prior to Typhoon Owen. Regardless of the dramatic changes to Minto Reef rendered by Typhoon Owen, it is doubtful that the atoll supported many sea turtles. The team observed only one small pinnacle in the entire lagoon, indicating a greatly reduced area of potential shallow foraging habitat, particularly in comparison to Oroluk Atoll which has numerous pinnacles rising from the lagoon floor. In addition, Minto Reef lagoon encompasses an area less than one quarter the size of Oroluk Atoll lagoon.

Discussion and Recommendations

The lack of turtles and turtle nesting and foraging habitat found by the survey team suggests that preservation status for Minto Reef based on sea turtle conservation and protection is not warranted at this time.

Balazs, G. H. 1980. Synopsis of biological data on the green turtle in the Hawaiian Islands. U.S. Dept. Commerce, NOAA Tech. Memo NMFS-SWFC-7 and University of Hawaii Sea Grant Cooperative Report UNIH-SEAGRANT CR-81-02. 141 p.

Balazs, G. H. and S. G. Pooley (Editors). 1991. Research Plan for Marine Turtle Fibropapilloma. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-SEFSC-156. 113 p.