

FIRST RECORD OF A TIGER SHARK OBSERVED FEEDING ON A HAWAIIAN MONK SEAL

by George H. Balazs and G. Causey Whittow

Although large sharks (Fig. 1) are known to be predators of certain pinnipeds (Nishiwaki 1975, Ellis 1976), the extent and significance of such predation on the endangered Hawaiian monk seal, *Monachus schauinslandi*, have not been well established. Scars (Fig. 2 and 3) and, to a lesser extent, wounds (Fig. 4) suggestive of shark attacks have for a number of years been noted on monk seals in the Northwestern Hawaiian Islands (Kenyon and Rice 1959, Wirtz 1968, and numerous observations of other workers, including our own). However, the first documented recovery of monk seal parts from the stomach of a shark (tiger shark, *Galeocerdo cuvier*) was only recently made during predator-prey studies of these two species at French Frigate Shoals (Taylor and Naftel 1977, 1978).

Few direct observations have been reported of interactions between Hawaiian monk seals and sharks. Wallace (1973), during a visit to Southeast Island at Pearl and Hermes Reef, observed an adult seal and shark "thrashing in shallow water," after which "the shark turned tail and swam off, beaten." A short time later the seal came ashore with no visible signs of injury. In June 1974 one of us (GHB) watched a subadult seal and a large tiger shark pass within six meters of one another while traveling in opposite

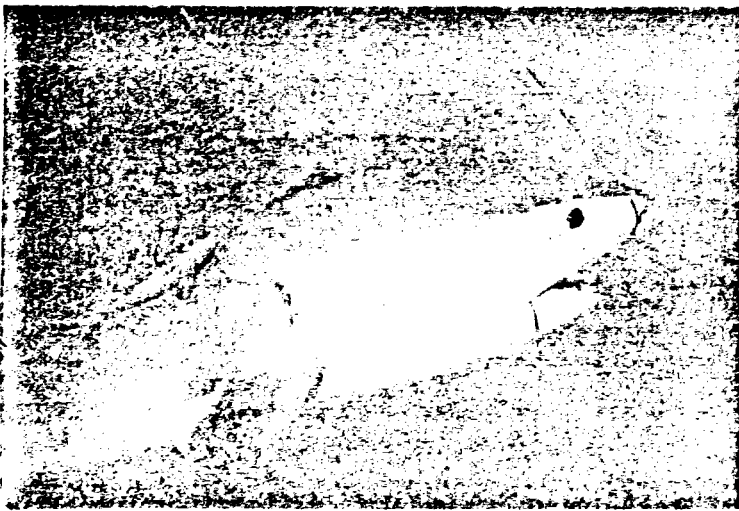


Fig. 1. Large tiger shark captured at French Frigate Shoals during investigations of predation on the Hawaiian Monk Seal conducted by Taylor and Naftel (1978).

Photo by Leighton R. Taylor

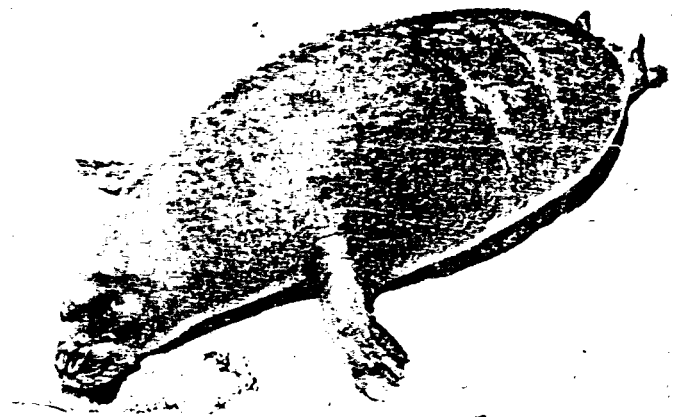


Fig. 2. Adult female Hawaiian Monk Seal at French Frigate Shoals with a scar suggestive of an attack by a large shark.

Photo by George H. Balazs

directions off East Island at French Frigate Shoals. Neither animal exhibited a change in course nor appeared to display interest in the other. Rice (1964), Taylor (1973), and Johnson and Johnson (1978) reported similar circumstances of seemingly unaltered behavior when sharks and monk seals were seen swimming in proximity. Coleman (1977) and Skillman (1977) observed an interesting reversal of traditional roles at Maro Reef when a weak and presumably sick adult monk seal consumed the protruding internal organs of a dead gray reef shark (*Carcharhinus amblyrhynchos*) left hanging from the stern of the research vessel *Townsend Cromwell*.

On 6 December 1977, during the course of field studies of the thermal ecology of basking green turtles (*Chelonia mydas*) at French Frigate Shoals, we made the first direct observations known to us of a shark feeding on a Hawaiian monk seal. At 1600 hours of that date, we arrived at Whale-Skate Island by small boat and observed a tiger shark approximately three meters in length exhibiting violent undulations in water not over 2.5 meters deep immediately off the west shore. Turbid water conditions commonly present in this area prevented a clear view of what was transpiring beneath the surface. Thrashing activity continued to take place at 5-10 minute intervals, at which time the tail of the shark frequently

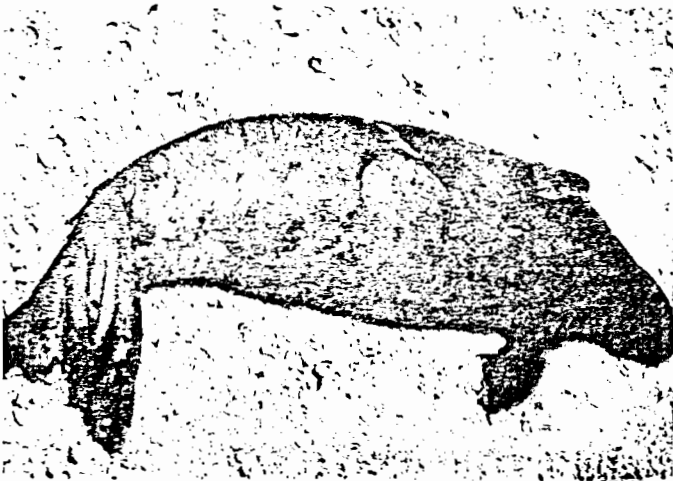


Fig. 3. Adult male Hawaiian Monk Seal at French Frigate Shoals with a scar suggestive of an attack by a large shark.

Photo by George H. Balazs

came well out of the water. During one of these high activity periods, the shark's entire head also emerged and we saw the body of a monk seal with brown pelage clenched in the shark's jaws. There were no indications that the seal was still alive, and no signs existed of water discoloration from blood loss which would be indicative of a recent shark attack. Several severed sections of intestine were, however, seen floating in the vicinity. Inspection of these pieces revealed that putrefaction had not yet taken place. During the non-thrashing periods, the shark was seen slowly swimming away from the feeding site for distances of up to approximately 100 meters. Subsequent observations from the boat at close range revealed that the seal was not being transported by the shark during these movements. The shark's repeated return to the feeding site did not appear to be affected by the boat's presence. Cyclic periods of high activity, when the shark was apparently tearing pieces from the seal, and movement away from and back to the feeding site, were observed until 1645 hours when we had to leave the area. Two days later, on 8 December, Coast Guard personnel from the French Frigate Shoals Loran Station on Tern Island made a brief visit (authorized by the Fish and Wildlife Service) to Whale-Skate Island. No signs of the shark or remains of the monk seal were found at that time (CWO T. Harris, personal communication).

One of the several important unanswered questions resulting from our observations is whether the seal was actually killed by the shark or only served as food after death

resulted from other causes. It is not uncommon to find a small number of dead seals on the beaches at French Frigate Shoals. Severely emaciated animals in which death seemed imminent have also been occasionally noted. The ingestion by sharks of moribund seals or dead seals washed back into the ocean by high tides and waves must therefore be considered a distinct possibility. It would also be of value to know the length of time the observed feeding activity continued before satiation occurred or the seal was totally devoured, either by the single shark or additional sharks that may have frequented the area following our departure.

Further information on the interactions of monk seals and sharks is necessary. We therefore encourage researchers of all disciplines working in the Northwestern Hawaiian Islands to publish or make known through other means any such observations that may be made.

Acknowledgements

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Fig. 4. Recently weaned Hawaiian Monk Seal at French Frigate Shoals with a fresh wound suggestive of a shark attack.

Photo by George H. Balazs

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