MARINE MAMMAL SCIENCE, 2(4):313–315 (October 1986)

FATAL SHARK ATTACK ON A HAWAIIAN MONK SEAL (*MONACHUS SCHAUINSLANDI*)

We describe here a fatal attack on a Hawaiian monk seal, *Monachus schauinslandi,* apparently initiated by tiger sharks, *Galeocerdo cuvier.* The attack occurred near sunset at 1957 h on 28 May 1982, 15 m off the landing beach on the west side of Laysan Island (25°42'N, 171°44'W), Northwestern Hawaiian Islands. Observations were made from shore at a distance of approximately 33 m.

Predation by sharks on this endangered species is indicated by the presence of monk seal remains in tiger sharks (Taylor and Naftel 1978), tiger sharks seen feeding on dead seals (Balazs and Whittow 1979, Johanos and Kam 1986), a tiger shark seen injuring a seal (Johanos, unpubl. ms.) and apparent shark-inflicted wounds on monk seals (*e.g.,* Wirtz 1968, Kenyon 1973, Johnson and Johnson 1978, Alcorn 1984), but a fatal attack on a live monk seal has not been documented.

First attack—At 1929 h the fins of a large tiger shark were seen about 12 m offshore, near two monk seals. One seal, an adult, appeared by its behavior to be a male; the other seal was the size of a subadult with open pink puncture wounds on its back and sides and shallow tears as long as 8 cm. The wounds were not bleeding and were at least a few days old; we had seen them on this seal 3 d earlier. At that time, the subadult was tentatively identified as a female, based on behavioral responses to an approaching adult male. The wounds were not caused by a shark but were the type inflicted by adult male seals during mating attempts (Johnson and Johnson 1978, E. Shallenberger pers. comm.). Such injuries occur most frequently on adult and subadult females and at geographic locations where adult male seals outnumber adult females.

The subadult rested on the surface and the adult circled it as the two seals drifted towards shore. They were within 6 m of shore when two large sharks approached from the south. The sharks were submerged but visible in the clear, shallow water. One veered seaward when about 30 m from the seals, and the other shark continued to approach at moderate speed. The approaching shark was twice the length of the approximately 2.1 m long adult seal. When the submerged shark had almost reached the seals, the adult ceased circling and rapidly swam between the injured subadult and approaching shark. The three shapes fused. There were a few seconds of violent splashing but no sign of blood. The shark disappeared.

The two seals continued to move towards shore, the adult again circling the subadult. The adult frequently lifted its head high and looked around. Twice it abandoned the subadult to haul out briefly on the beach. Both seals finally reached the shoreline and remained there 2 min. The subadult raised its head but did not haul out. The adult hauled out briefly on the beach but followed the subadult when it moved offshore again.

Second attack—At 1947 h the seals were together about 5 m offshore when a large fin appeared north of them. The fin moved slowly and steadily south directly towards the seals. Again the adult seal rapidly swam between the subadult and approaching shark and the fin disappeared. The adult seal immediately hauled out, then briefly returned to the subadult in the water but stayed on the shoreside and did not circle. The adult hauled out again and remained on the beach.

Fatal attack—At 1957 h, approximately 4 min after the adult seal left it, the subadult rested alone on water 3–6 m deep over sandy bottom, 23–30 m south of where the first attack was observed. A large submerged shark approached from the south. Suddenly there was violent splashing as the subadult was pulled under in a single motion and replaced on the surface by a cloud of blood. The fins of at least 10 small sharks immediately appeared, circling within a 15 m radius. These sharks were an estimated total length of 1.5–1.8 m and were presumed to be gray reef sharks, *Carcharhinus amblyrhynchos,* based on coloration, size and known abundance in the Laysan area. Large fins were not seen. Within 2.5 min after the fatal attack, the blood dissipated and the small fins began to disperse. A few frigate birds, *Fregata minor,* dived into the water 15 min after the attack. Twenty-eight minutes after the attack, the forms of two large sharks and 20 or more small dorsal fins were seen in the immediate vicinity. An adult seal swimming north passed within a meter of the small sharks, and both species appeared to ignore each other. A minute later the dorsal surfaces and dorsal and caudal fins of two large tiger sharks (estimated total lengths 3.5 and 5.0 m) simultaneously surfaced. Observations were terminated by rain and darkness.

There are three aspects of these observations that are of particular interest. First, they confirm that sharks do not merely scavenge or injure monk seals but kill them. Second, the adult seal's "attack" on the large approaching shark exemplifies the aggressiveness of adult male monk seals during the breeding season. Aggressive behavior of adult males towards large tiger sharks has also

been seen on nearby Lisianski Island (T. Loughlin and G. Kooyman, pers. comm., Johanos and Kam 1986). Third, the combined presence of large predators and injured seals (frequently females with adult male inflicted injuries) indicates that females at some locations may be more prone to shark predation. Fatal shark attacks could contribute to the monk seal population decline at these locations, both through direct fatalities and due to reduced natality when females are the victims. This can have dire consequences for this species whose counts since 1958 indicate a low and declining total population (Johnson *et al.* 1982).

Acknowledgments

We thank L. Taylor and T. Loughlin for their comments on the manuscript. We also wish to acknowledge the support of the U.S. Fish and Wildlife Service during the National Marine Fisheries Service 1983 Hawaiian monk seal study on Laysan Island.

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Received: November 28, 1985
Accepted: June 13, 1986