

Shy Sharks Show Their Spots

by Douglass J. Long



People are often surprised to hear that sharks live in San Francisco Bay. In fact, well over a dozen species of sharks have been captured inside the bay, and of these only a few species can be considered to be common. The leopard shark (*Triakis semifasciata*) is perhaps one of the most abundant shark species that inhabits the sloughs and mudflats of San Francisco Bay. With a range that extends from southern Oregon south to southern Baja California, leopard sharks are typically shallow-water coastal species that frequently enters bays and estuaries, and has a higher tolerance for brackish water than most species of sharks. At an adult size of about five to six feet, leopard sharks are relatively small as sharks go, but they are one of the largest species of fish in San Francisco Bay. Their name comes from their beautiful patterns of large blackish or dark brownish saddles on spots on a steel-grey body, and they are one of the most attractive of the California sharks. Some aberrant sharks with have been found with stripes or chains of spots, and even a few pure albino leopard sharks have been captured.

Leopard sharks are bottom-feeders, meaning that they prey on benthic and infaunal species of fishes and invertebrates, especially in the rich muddy habitats in undeveloped areas of the Bay. With a good sense of smell, and highly developed sensory organs that detect both vibrations in the water and the weak electrical signals from their prey, these sharks can capture prey both above and below the sediment. Small sharks have teeth adapted more for crushing, and it's not surprising that they feed predominantly on several species of crabs, shrimp, and clams. Adults eat these types of prey as well, but develop teeth with large serrations that are more adapted for cutting prey like fishes, worms, and octopus. Dietary studies show that a large portion of the prey in adults consists of the siphons of clams. Here, adult sharks prowl the bottom, and seize the necks of clams before they can burrow, cutting them off and leaving the clam to heal and regenerate a new siphon.

Leopard sharks are usually solitary animals, but large numbers may congregate together if food is abundant, and they do not seem to be territorial. In fact, tagging studies show that a single shark may cover many miles of ground in a day. They show no real migratory pattern, but are more abundant in the late summer and fall; this may possibly correspond with their breeding cycle, but that is not known for sure. As with most sharks, their social life is not very complex, little is known of their courtship, and mating is a simple affair with the male grasping the fins of the female in his mouth and inserting his clasper for internal fertilization. The clasper is an organ modified from the pelvic fins, and presence (or absence) of this rod-like appendage on the pelvic fins can quickly identify the gender of the shark.

The female may carry from 5-20 pups that are born alive several months later. Once these pups are born, they are on their own and receive no care from their mother. Fortunately, their teeth are fully functional and begin to find their own prey within days of birth. Many of these young sharks don't survive past their first year, and are eaten by a wide variety of predators ranging from striped bass, to great blue herons, and harbor seals.

As the sharks grow and mature, they have fewer predators, but are sometimes eaten by the larger sevengill sharks in deeper areas of the Bay. Interestingly, studies of the California sea lions at Pier 39 show that sharks, including adult leopard sharks, comprise over 40% of their diet in summer and fall months.

Although some leopard sharks may exceed six feet in length, they are not dangerous. Divers have reported several 'attacks' by leopard sharks, but these are likely provoked, usually by the divers intentionally grabbing the shark by the tail. In all such cases, the wounds are minor. There have been no records of leopard sharks attacking people swimming or wading in California waters and are often considered shy. However, fishermen handling hooked sharks should still be wary of their teeth.

In past years, leopard sharks were considered a 'trash' fish, and were not harvested in large numbers as a marketable food fish. However, in recent years, increased fishing pressure has put the species at risk. With declining stocks of commercially valuable fish species, and with the acceptance of shark as an entrée in fine restaurants, commercial fishermen now target leopard sharks. In addition, the regional growth of cultures where shark flesh has always been regarded as an esteemed dish, especially in Asian and Latin cultures, has increased the numbers of recreational fishermen who are catching more sharks for their own table. Leopard sharks grow very slowly and mature relatively late in life, and produce relatively few offspring compared to other species of fish. As a result, fishing in certain areas is catching more sharks faster than they can breed and grow. In an effort to protect leopard sharks from being over-harvested, the California Department of Fish and Game has imposed a recreational take of only three sharks per day, and has instituted a minimum size limit of 36 inches.

However, some environmentalists, scientists, and public health advocates are alarmed at the increased human consumption of leopard sharks for a very different reason. Because leopard sharks feed on organisms that live in the sediments of the Bay, they can accumulate the toxins, pesticides, and heavy metals that are ingested by their prey. Since the sharks can live a long time (several decades), they can develop large concentrations of these contaminants in their system that are passed on to the people who eat them. While the levels of toxins in the flesh of leopard sharks has not been well-studied in San Francisco Bay, many researchers caution people from eating large quantities of any fish caught in the Bay. With these concerns, it may be advisable, and perhaps more rewarding, to practice catch-and-release with leopard sharks. That way, we can enjoy these sharks and feel comfortable that their populations, and our own health, may be protected for the future.

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