Cow Sharks

History of the Fishery

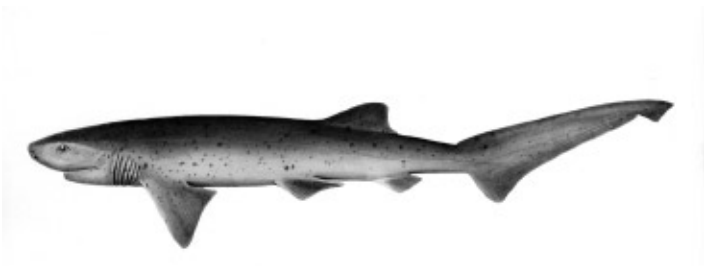
Two species of cow sharks (Family Hexanchidae) occur along the California coast, the sixgill shark (*Hexanchus griseus*) and sevengill shark (*Notorynchus cepedianus*). Sevengill sharks were among the most common species taken during shark fisheries of the 1930s and 1940s. Even after this fishery collapsed, these sharks were taken in considerable numbers during fishing competitions in San Francisco Bay in the 1950s and 1960s. The popularity of *Jaws* movies in the mid-1970s brought renewed interest in shark fishing. Several operators in the San Francisco Bay area targeted their charters on sevengill sharks, and as recently as the mid-1980s, these sharks were still the object of a popular sport fishery in San Francisco Bay. This fishery declined in the late 1980s and early 1990s, as charter boats began to target other species. Although caught primarily by recreational anglers, sevengills are caught incidentally in commercial fisheries for other species.

The sixgill shark is also an incidental catch, especially in trawl and gillnet fisheries. It frequently appears in fish markets and at dining establishments, but exact data on the extent of this fishery is lacking. Both species are typically either discarded or sold as "shark, unidentified," making it difficult to quantify landings.

Status of Biological Knowledge

The sevengill shark is a fairly common coastal species that frequently enters bays and, although rarely occurring below depths of 330 feet, is found occasionally to depths of over 660 feet. It seems to be most abundant where the water temperature lies between 54˚ and 64˚F. It tends to prefer rocky reef habitats where kelp beds thrive, though it is commonly caught over sandy and mud bottoms. Although relatively common at times of the year in Humboldt and San Francisco bays, very little is known about movement patterns along the open coast.

In the eastern North Pacific, sevengill sharks range from southeast Alaska to the Gulf of California, with their distribution becoming sporadic south of San Francisco Bay. The sevengill shark has a worldwide distribution in most temperate seas, the only notable exception being its absence from the temperate waters of the North Atlantic.



Sixgill Cow Shark, *Hexanchus griseus*
Credit: DFG

Sevengill sharks are ovoviviparous, with 80 to 100 young being born per pregnancy. The young are born during the spring following a two-year reproductive cycle. Humboldt Bay and San Francisco Bay serve as important pupping and nursery grounds. The young remain within the vicinity of these nursery grounds for the first few years of life, before ranging afield upon entering adolescence. Males mature between five and six feet, and grow to a maximum size of 8.25 feet. Females mature between 7.25 and 8.25 feet and grow to at about 10 feet. The size at birth is between 14 and 18 inches.

Juvenile sevengills grow quite rapidly during the first two years of life, more than doubling their length. This rapid growth rate by juveniles in the nursery ground enhances their chance of survival since a sevengill over 28 inches has fewer predators than a newborn half its size. In contrast to the rapid growth of juveniles, once maturation begins their growth rate slows down considerably.

The sevengill shark is an active predator that feeds at or near the top of the food chain. The main prey items include other sharks, skates, rays, bony fishes, and marine mammals. Sevengills have been observed to employ a variety of foraging strategies when hunting for food. As a solitary hunter, they will use stealth to ambush smaller prey items, but while hunting larger prey, these sharks will hunt cooperatively in packs to subdue seals, dolphins, other large sharks and rays. White sharks are one of the few known predators on adult sevengill sharks and have been observed to attack them on occasion. In most areas where it occurs, the sevengill shark is displaced only by the white shark and killer whale as the top nearshore marine predator.

The sixgill shark is one of the widest ranging of all shark species, with a circumglobal distribution from northern and temperate areas to the tropics. In the eastern North Pacific, this species occurs from the Aleutian Islands to southern Baja California. This is a deepwater shark; adults are found along the continental shelf and upper slopes down to at least 8,250 feet deep. They are known to move up to a thousand feet off the bottom, occasionally coming to the surface. Juveniles are often caught close inshore, including enclosed bays such as Humboldt and San Francisco, while adults are normally taken in deeper water. These sharks seem to associate themselves with areas of upwelling and high biological productivity.

Sixgill sharks are ovoviviparous with observed litters of 47 to 108. Adult females move onto the continental shelf during the spring to drop their litter following a two-year reproductive cycle. Young sixgills usually remain on the

shelf and uppermost slopes until they reach adolescence, at which time they move further down the slope and into deeper water. It is the newborns and juveniles that typically seem to stray close inshore and occasionally occur in bays and harbors. Adult males typically remain in deeper water, where mating and courtship takes place. Males mature at about 10 feet, while females mature at about 14 feet. This is a large shark with males reaching at least 11.5 feet and females at least 15.8 feet. The size at birth is between 24 and 29 inches. Little is known about their growth rate, although juveniles held in captivity will grow quite rapidly, nearly doubling their size in the first year of life.

The sixgill shark is a large, active, powerful predator that feeds on a wide variety of prey species including other sharks, rays, chimaeras, bony fishes, and marine mammals. Larger sixgills will actively forage on quite large prey items including swordfish, marlin, dolphinfish, seals, and dolphins. They have also been observed to consume whales as carrion. Juveniles held in captivity have a voracious appetite.

Status of the Population

The main concentrations of sevengill shark populations in California appear to be in Humboldt and San Francisco Bays, both of which serve as nursery grounds for newborns and juveniles. Damage to either of these areas could have an adverse effect on the population. Outside these bays there is very little reliable information regarding the status of sevengill shark populations.

There is no information on the population status of the sixgill shark.

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