

## The Truth About Sharks

### Chapter 3: Sharks Are Fish

#### Apex Predator...Or Just Top Fish?

It has long been believed that sharks, particularly the great white shark, dominate the ocean food chain. As apex predators, healthy sharks are not preyed upon in the wild. Or are they?

Off the coast of San Francisco, near the Farallon Islands, sharks gather to feed on seals each fall when the seal population is at its highest. Three months of feasting can sustain the sharks for a long time, so they are attracted year after year to this location. Biologists have spent many seasons studying great white sharks, but in 1997 they witnessed an unusual encounter. A killer whale (also known as an orca and technically a dolphin rather than a whale) attacked a great white shark. After the killing, the entire population of great white sharks disappeared, missing their annual feeding frenzy. It appeared that they were scared away from their most important food source by the presence of the killer whales.

#### Killer Whales vs. Sharks

The two top carnivores in the ocean are not closely related. The killer whale is the largest member of the oceanic dolphin family, a group of marine mammals related to whales and porpoises. The great white shark is the world's largest known predatory fish and has been swimming in the world's oceans for millions of years.

Even though they are both large predators, killer whales and sharks don't always compete with each other. Each can find enough food by eating other fish and marine mammals. But the whales clearly bear the proof of their cantankerous relationship with sharks; they often have scars on their dorsal fins and even big chunks bitten out. And although killer whales usually swim at speeds of 3 to 4 miles per hour, much slower than the 15 miles per hour of the great white shark, they have been known to reach short bursts of speeds of up to 30 miles per hour. A hungry or angry killer whale could easily outswim a great white shark. By virtue of their sheer size, killer whales can also overpower a great white shark; while great white sharks can grow to more than 20 feet in length and up to 5,000 pounds in weight, the male killer whale can reach lengths of 32 feet and a weight of 9 tons, making it the largest predator in the ocean.

Killer whales hunt in social groups, unlike the shark that usually swims alone. Because they are also inquisitive and smart, killer whales can learn from each other by imitation. Working together, they teach each other hunting techniques. One of these techniques was observed during the whale attack near the Farallon Islands. A killer whale flipped upside

down, grabbed the shark in its mouth and then turned right side up and held the shark upside down to subdue and then kill it. The large mammal sent the shark into a paralyzed state called tonic immobility and slowly suffocated it. Although the biologists in California were surprised when they witnessed the shark killing, they learned from other biologists that killer whales in other parts of the world regularly attack sharks in this way.

### Further Reading

The most unusual aspect of the Farallon Island shark attack (which was observed again in 2000) was not the act itself, but the immediate disappearance of the sharks from the island waters for the rest of the season. What caused the sharks to leave en masse? Where did they go? What was it that triggered the sharks' flight response? Can an understanding of the cause of the sharks' movement keep sharks out of swimming areas and help protect people at beaches? You can learn more about studies scientists have done since 2000 related to this mass exodus observation by searching the Internet for accounts of the Farallon Island incidents and responses by biologists from around the world. Some of the following websites will get you started:

- [Monterey Bay Aquarium Great White vs Killer Whales](#)
- [BBC Earth: Shark repellent experiment](#)
- [Sharkstopper device scares predators](#)
- [Discovery: Shark Repellent \(Dirty Jobs excerpt\)](#)
- [Public Radio International: Researcher looks for new ways to repel sharks](#)

### Questions for Discussion

1. What are some of the possible reasons that scientists have proposed for the mass exodus of sharks from an area where an attack by a killer whale occurred?
2. Discuss various shark repellent products and ideas:
  - What are some possible ways that people have devised to repel sharks?
  - How are the repellents tested?
  - What are some of the arguments against the testing processes?
  - Which repellents does science support?
3. If you were a member of the investment team in the (ironically named) television show, "Shark Tank," and were presented with a number of companies that manufacture shark repellents, what shark repellent of the types discussed in Question 2 would you decide to back and why?