The Secret Life Of Great White Sharks Essay, Research Paper

Great White Sharks are greatly misinterpreted as vicious man-eaters because of the media, movies, and people?s imaginations, but they are actually large fish who mistake people for seals and other marine life. What is a great white shark? The great white, among the least understood of Earth?s creatures, is an apex predator, meaning that it is at the top of the food chain with no natural predators. This means great whites have their pick of food when it comes to selecting their prey (Klimley 15).

Carcharodon carcharias, better know as the great white shark, have existed as a group for over 350 million years (Long). Its name means ?ragged-toothed? (Gorman 10). The largest white shark on record was 21 feet long and weighed 7302 pounds. Its ancestors, now extinct, were three times this size, with teeth that were six inches long (White Shark). Today sharks are represented by over 600 species (Long). Great whites are part of a grouping know as mackerel sharks, a grouping which includes the salmon, porbeagle, and maco shark (MacGregor 46). Unlike the true fishes, sharks do not have internal bone, but instead have a cartilaginous skeleton (Long). This stiff flexible material is found in the ridge of your nose and in your earlobes. Because cartilage does not leave fossil remains like bones, there are no fossils of ancient sharks- just their teeth (Klimley 56). Little is known about great whites because they are enormous, bulky, and hard to handle. And that?s when they?re dead. Their body temperature is sometimes ten to fifteen degrees [Celsius] warmer than the surrounding water, which makes them efficient predators in cool water (Gorman 15). The back of the shark is a dull gray color and the underside is colored white. The tail is crescent shaped. There are five gill slits on great white sharks. Studying a live great white shark up close and in detail is, for obvious reasons, practically impossible (Sanders 31).

The great white is the only shark that can hold its head above water to see what is happening on the surface (MacGregor 47). It has been said that sharks do not swim through water as much as they ?fly? through it with their torpedo like body (Gorman 25). The fins of a shark serve important roles in this action. As the shark moves the Caudal, back, fin to propel it forward, careful adjustment of the pectoral, side, and dorsal, top, fins keep the shark level and on course, much as the wings and tail of an airplane do. Great whites have a pair of nostrils near the tip of their snout. Since ?breathing? takes place in the gills, the nostrils of a shark are used solely for sniffing out their prey (Gorman 11). The nostrils can smell a drop of blood in 25 gallons of water (All About Sharks). Unusually large olfactory bulbs result in a keener sense of smell than that of nearly all other fish. The pores on the nose are tiny electrical field sensors, connected to nerves via canals filled with receptive jelly, which can detect heartbeats or movement of prey (Martin 55).

?Sharks are drawn to motors by their electrical signals, (on their snout), and have a habit of biting them to see if they?re edible,? said Andy Hartman. ?That is how they decide what and what not to eat- and sometimes they?ll knock out a bunch of their teeth? (Gorman 10).

Much has been made of the infamous jaws of the great white. They have about 3000 teeth arranged in several rows. The first two rows of teeth are used for grabbing and cutting prey, while the teeth in the last rows rotate in place when front teeth are broken, worn down, or fallen out (All About Sharks). Each upper tooth is a marvel of compact engineering with hundreds of tiny serrations. This coupled with their enormous jaw strength enables the great white to cut through just about anything it feels needs cutting. The bottom teeth are not as large as the top, but serve the purpose of skewing the shark?s prey, holding it in place for the upper teeth to remove as much flesh from the victim as possible (Klimley 89). A white can tell the relative fat content of an animal by first mouthing it gently; if the tensile resistance associated with blubber is revealed, the shark goes for a full bite. If not it will save its energy for a more nutritious meal.

?That?s probably why most humans who are bitten are not killed,? says Klimley. ?A human has too much muscle and not enough fat for a great white. The same calculation may factor into the white?s rejection of other potential prey.?

Great whites may favor fat because they burn prodigious amounts of calories (Martin 59). Sharks have excellent eyesight and see well in dim light. In fact, shark?s corneas have been used as transplants for human corneas (MacGregor 45). The cone receptors in the eyes heighten the contrast between dark and light to help distinguish prey from greater distances under water (Martin 59).

Great whites are predatory animals that begin life by feeding on fish, rays, and other sharks, and as they grow, switch to feeding on marine mammals and scavenging on large animal carcasses. Their first mammalian prey are usually the small harbor seals, but as the shark increases in size, they become large enough to eat sea lions, elephant seals, and small toothed whales (Long). Great whites are picky eaters and their favorite prey are pinnipeds, a fancy name for seals and sea lions (Klimley 31). Large great whites will also scavenge on the carcasses of whale sharks, and on the fat-rich blubber layer of dead whales. They will occasionally feed on sea turtles and sea otters and are known to attack, but not eat humans (Long).

?An elephant seal rookery like Ano Nuevo Island is a supermarket for whites,? says Burney Le Boeuf, a University of California at Santa Cruz behavioral ecologist and a leading expert on pinnipeds. ?It?s stationary, it?s open 24 hours a day, and it?s full of things they like to eat.?

It?s difficult to come up with a statistic for the probability of attack because it is hard to estimate how many people go to the beach each day, how many actually enter the water and for how long. Studies indicate that 79-90 percent of all attacks on humans occur at the surface. Mainly because sharks prefer to attack animals at the surface or it may simply result from the fact that humans spend most of their time in the water on the surface (MacGregor 48). Great whites feed infrequently, although their exact time between meals is unknown one study showed that a 15- foot shark can live for 45 days on 66 pounds of whale blubber (Long). The likelihood of an attack increases significantly when the water surface is calm, especially in the evening and early morning when the sharks move closer to the shore in search of food (MacGregor 47). Sharks prefer cloudy water and areas near harbors, docks, jetties, and bays (Long). The probability of drowning to that of being attacked by a shark is 1, 000 per every one-shark attack in the United States (Bowman 76).

Back then, it was generally accepted that great whites were anthropophagous (they ate people) by choice. Now we know that almost every attack on a human is an accident: The shark mistakes the human for its normal prey (Gorman 21). The great white is the second largest shark. It is believed to be territorial, returning to the same location every year. The size of its territory depends on available food and the number of other sharks present to help eat it. They frequently live near seal colonies, often in groups designated by size and sex (MacGregor 49). The great white is found in temperate waters throughout the world?s oceans. The area that extends from Bodega Bay down to the south end of Monterey Bay and out to the Farallon Islands, known as ?the red triangle,? is well known for its abundance of great whites (Long). They can be found in waters as shallow as three feet deep, and as deep as 1280 meters (All About Sharks). A primary attack strategy of the great white is to capture and bite their prey, release it wounded but alive, and then remain near by until the prey is tranquil, indicating death or sever injury. The great white would then be afforded an easy meal. Attack strategies consist of a swift, surprise attack from below, inflicting a large, potentially fatal bite on the prey?s side because attacks to the head are rare. The pinniped often dies from massive trauma or blood loss, but the bites may be superficial on the body, allowing the seal to escape and survive the attack with their scars as witness. Great whites like to attack from a deep 45 to 90 degree angle below the prey. An attack from below is harder to spot and elude. The greater the angle and the further below the shark is from the seal means the seal is going to have a tough time seeing the shark (Long).

?Make sure he knows you?ve seen him, says Rodney Fox, a victim of an attack. ?Great whites are ambushers, and once one knows he can?t surprise you, he’s probably not going to expend a lot of energy to get you. Move slowly to other divers or the boat? (Gorman 12).

Hunting occurs around the clock. Great whites are clearly relentless, and preliminary data suggests they may also be crafty (Martin 60).

Far from being the mindless killing machines of Jaws fame, great whites observe social customs and rituals and appear to be particular about what they eat (Martin 57). Sharks rarely ever eat humans are solitary animals. They either travel alone or in groups of two (All About Sharks). Great white sharks are ovoviviparous, which means that they hold eggs inside of their bodies until the young are ready to hatch. The babies, or pups, are born alive, fully formed and ready to hunt for food. White shark pups may be five feet long at birth and have a full set of teeth (White Sharks). The female may only reproduce twice in her whole life. Media sensationalism and widespread ignorance has given the great white shark a bad rap. Although the species is responsible for an average of two to three non-fatal attacks on swimmers, surfers, and divers each year, its role as a menace is exaggerated. More people are killed in the United States each year by dogs then have by great whites in the last 100 years. Scientific study shows the population of great white sharks is low, with perhaps fewer than 100 adult animals in California?s waters (Long). What could kill an animal with no natural predators? The answer is simple, fishing lines.

?A fisherman had set out a longline to catch snapper, and a female [great white] got caught in it. She got hooked, and it trying to get away, she wrapped herself up in the rope. When it came taut, she couldn?t move. She drowned. Like many sharks, she had to keep moving to flush oxygen-rich water over her gills,? explains John Kessing, chief scientist (Gorman 14).

Great whites are important, though not common, predators in the marine ecosystems of the California coast. In 1992, great whites were placed on the protected species list and are legally protected from unlawful killing or exploitation (Long). Nowadays more people are coming to respect and appreciate sharks for what they are: beautiful, graceful, efficient, and, most of all, integral members of the food chain. The change is due to television and the abundance of films documenting not only the glories of sharks but also the dangers to them from longlines, nets, and the practice of finning- slicing the fins off sharks to sell in Asian markets, then tossing the living animals overboard to die. Gradually governments and individuals are learning that while a dead shark may bring ten or twenty or even fifty dollars to a single fisherman, a live shark can be worth thousands of dollars more in tourist revenue to a community. Great white sharks have survived, virtually unchanged, for millions of years. They are as highly evolved, as perfectly in tune with their environment as any living thing on this planet. For them to be driven to extinction by man, a relative newcomer, would be more than an ecological tragedy; it would be a moral travesty (Gorman 29).

Works CitedAll About Sharks. 5 Feb 2001. .

Bowman, S.C. ?Shark Attacks.? Reader?s Digest July. 1995: 74-8.

Gorman, Jessica. ?Inside the Great White.? National Geographic Apr. 2000: 2-29.

Klimley, A.P, Anderson, S.D, Henderson, R.P, and P. Pyle. Great White Sharks: the biology of Carcharodon carcharias. New York: American Publishing Inc., 1996.

Long, Douglas. The White Shark. 5 Feb 2001 .

MacGregor, Elise. ?Beyond Jaws.? Windsurfing Magazine. Sept/Oct. 1993: 45-9.

Martin, Glen. ?Great White Sharks.? Discover. June. 1999: 54-61.

Sanders, Zack. ?A Great White Shark.? Newsweek. Oct. 1996: 30- 36.

White Sharks. 20 Feb 2001. .