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Gray Whales and Orcas: Iconic Marine Mammals

According to Bigsurcoastlines.com, Gray Whales are known to have the longest migrations than any other marine mammal on the planet. They are able to migrate 10-14,000 miles from North to South of the Pacific coastline and back. This can stretch from southern Alaska to the end of Baja California. They may also lose a third of their body weight, around 15 tons (30,000 pounds) during their migration. The reason for their migrations in the winter is due to colder temperatures within the coastal waters off the Alaska state and Baja has waters that stay relatively warm annually. They need the warm waters to make sure the newborn calves do not suffer from hypothermia and are safer in these waters from predators because of other marine mammals visiting the Baja coastlines. They also come to the northern shallow waters in Big Sur to make sure that their calves are away from predators and are able to breath, move, as well as feed properly before they reach maturity to live on their own. One of their predators, the pacific orca, will be mentioned in this presentation for they have suffered heavy impacts within their numbers.

The female whales with calves need the shallow waters of Big Sur to protect their young from potential predators such as orcas and great whites. The calves are known to be darker than the adults but will begin to become gray at sexual maturity at around 6 to 13 years of age. They feed on their mother's milk that is 53% fat for 7-8 months. Calving season occurs in between December and March annually, and the peak is mid-January and mid-February(S.G. Allen, J. Mortenson, & S. Webb, pg.177). Reports have also been made that calves are seen as early as december 25 and are found stranded ashore up north within the British Columbia coast due to global and ocean warming. Gray whale females are larger than males and have a gestation period of 11-13 months, but may be as long as 16 months. When calves are born, they can reach 16 feet in length, almost one third of their mother's length, and can weigh as much as a ton (2,000 pounds). Adult Males can reach 43 feet in length, but females can be 46-50 feet long. Both adults can weigh 30 tons (60,000 pounds) Gray whales can live around 40-60 years, but one female was found dead at the age of 75-80 years. But different results show lifespans of 55-70 years.

Gray Whales are also Ecosystem Engineers for their feeding methods which includes being upside down for foraging for amphipods on the ocean bottom by scraping them off the floor to bring them closer to shore and swallow them in large mouth fulls, which leaves tons of sandy debris that fish and crustaceans eat because it exposes other algae and other animals for them to forage on. They can also consume small fish and other crustaceans that it can from planktons to krill. But when they scrape off debris and amphipods off the ocean floor, they are releasing autotrophs, algae and other eatable organisms that attract multiple fish and crustaceans, including other marine animals from birds, to mammals, to other invertebrates like jellyfish, to even seas turtles. But they also serve as a major food source for large carnivores such as orcas, sharks, marine birds, invertebrates, as well as terrestrial animals such as mammals, insects, and birds.

There are two different species of gray Whales, the western and eastern gray whales. They were once in the millions thriving throughout both the Pacific and Atlantic Oceans until whalers and hunters killed most of them into extinction during the 17th and 18th centuries in European coastlines. The western gray whales are found along the eastern coasts of the Asian continent and are fewer than 200 due to whaling, loss of habitat, as well as pollution from large urbanized nations. Noises from large ships are an interference with their echolocations for finding other whale individuals or finding their prey at the ocean floor and surface. Their low frequency sounds resemble click noises to navigate through unclear water and search for others whales, food, as well as predators that could be nearby. Eastern Gray Whales, fortunately, are within a population of 18-23,000 individuals near the western North American coastlines. Surprisingly, eastern gray whales do not use echolocations while they thrive in waters with nearly no visibility. But they are still disturbed by noises from large ships, submarines, or other mechanical sounds that are found along their migration routes because (J.L. Wladichuk, 2008). The reason is that they could lose their sense of direction, get run over by large ships, as well as losing prey availability from fishing boats. They serve as ambassadors for not just whales, but for all marine mammals found today. According to Breck Tyler, former Natural History Field Quarter and Natural History of birds professor, 3-4% of the overall mammal species found in the world are marine mammals.

The bumps and white colorings that may resemble scars are actually parasites that live on the gray whales. There are barnacles that live on the gray whale's skin, but they are less harmful and serve as protection against any predators that may want to hunt it (except humans). They also filter food in the passing water and biologists have called this a commensal relationship between the whales and the barnacles because the whales are not affected by them (T. Danelesko, 2013). They serve as protection from scraping their skins when they attempt to scare out the amphipods from the ocean floor to the surface to be eaten. The second parasite, however, is more repulsive and appears as a mixture of a scorpion and a crab together. These are whale lice, they live on the skin of gray whales and are also known for living in open scars and wounds on the whales, including living next to the barnacles that serve the whales as armor or a repellent for orcas and sharks. These lice are actually crustaceans more than arthropods like lice or ticks, but are much larger than lice that humans get. We may find many adult whales with these parasites during their returns to Big Sur and to many other coastlines in the north. These parasites spread through passing body contact and through water movement. Even the barnacles can spread their eggs in the water to get stuck on the whales skin while the whale lice connect with their legs and can pass on other members to more whales nearby.







These parasites were discovered in the 1800s when whalers and fishermen had hunted some gray and humpback whales to find that there were these large lice looking crustaceans that were coming off their skin. The barnacles, however, stayed attached until whalers began dissecting and collecting every bit of flesh for consumption. Humpbacks have also been found with these whale lice and can be harmful if attached to calves or juvenile gray whales too. On the other hand, whale lice are also good in some ways when they consume infected tissue or wounds on the whales so that they will not become ill or sick from an infection.

One final note is that gray whales are known for their resiliency for coming back from the brink of extinction and thrive in the tens of thousands, which is still a fraction of their original numbers. When an adult gray whale dies, they become a huge source of food for any animal in the ocean and you may witness more than one shark, octopus, crab, or other bottom dwellers eat away on the humungous carcass that could feed nearly hundreds of species of aquatic life. They also can be seen in more of the Pacific than the famous humpback or blue whales because of their longest migrations that they travel at an average speed of 3-6 miles per hour and can be submerged for 15 minutes before taking another breath.

Pacific Orcas, on the other hand, have a different story since they have a population of 50,000 individuals worldwide, but have become less noticeable and abundant in the southern region of the eastern Pacific that is right along the North American coastlines. According to recent studies from Marine Biologists and Wildlife Biologists, in 2018, there are only 75 Pacific Orcas that are found along the state of California due to ocean pollution, climate change, and a shortage of food near the coastlines. They are much smaller than gray whales, reaching 23-32 feet in length and weigh 11 tons (22,000 pounds). Unlike the gray whale that is part of the suborder of baleen whales, meaning they are toothless and have baleens to scrape their food off the ocean bottom and surface, orcas are in the dolphin family and are considered the largest species of dolphin to live. But dolphins, whales, and porpoises are all within the order of Cetacea for mammals. They also have an average 50-90 year lifespan, with the oldest orca dying last year at 120 years of age. Female orcas live 29 years in captivity and males only live 17 years in captivity. Reasons may be due to limited resources, human interference, and technology.

Their diets consist of many fish species, seabirds, sea lions, seals, whale calves, squid, as well as other dolphins. They live together in groups called pods and are pack hunters like lions, dogs, wolves, African hunting dogs, and male cheetahs. They are also aggressive hunters that can hunt whale calves and attack sharks if they come into contact. But the one animal they are not aggressive with is us. Many ocean swimmers may run into killer whales but will not kill them even if they feel threatened. Their behavior resembles much of curious dolphins who may interact with strange looking animals they have never seen before and can only be aggressive during a hunt. Recent discoveries from a website called *The Dodo*, showed that marine biologists, wildlife biologists, and naturalists caught video footage of larger whales protecting seals and sea lions from orcas because killer whales will not take on larger whales such as gray, humpback, and blue whales. Even with their numbers, they could never take on the largest animals to ever claim the oceans for they may suffer casualties or get injured enough to be preyed upon by sharks.



Surprisingly, orcas can have longer gestation periods than gray whales because of their larger mass volume ratio compared to their gray whale relatives who seem thinner than killer whales. Orcas have a 17 month gestation period and females can give birth about every 5 years. Males, on the other hand, can live with their mothers for most of their lives since they are pack animals. Another physical feature that most mammals have is that orca males are larger than the females while gray whales have larger females than males. What they do have that all whales can do is use echolocation for communication and for hunting. All whales consume animals from vertebrates to invertebrates, which may lead to question why there are no herbivorous whales discovered.

Killer Whales are known to be Apex predators for consuming any vertebrate and a few invertebrates they can sink their teeth into, but they do have some downfalls like their larger gray whale relatives too. They suffer from ships making too much noise for them to echolocate other orcas or prey, oil spills are another major issue as they can become sick from ingesting or becoming covered in an artificial fuel used for our machinery, and prey availability. During 2011, Santa Cruz had suffered from an overbloom of invertebrates and algae that resulted from lack of crustaceans and secondary consumers that the orcas preyed upon. Without the secondary consumers, orcas were not as noticeable on the coastlines, including other whales, dolphins, porpoises, sharks, otters, seals, and sea turtles.

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