

**A Conservation Report On The Whale Shark, Natures Gentle Giant**  
By Jack Hamilton

## **The Magnificent Whale Shark**

Whale Sharks, or *Rhincodon typus*, are among some of the most enormous sea creatures known. Although not whales, they are the planet's largest fish, growing up to 40 feet in length, and potentially living to be 150 years old (1). With the size of a whale, they do not look like your average shark, boasting a grey-blue hide covered with white spots that act like a unique fingerprint, they have a broad flat head with a huge mouth. With their titanic size and gaping mouth, people will often fear Whale Sharks, but they will be surprised to know that they are very passive creatures whose only business is feeding on plankton (1). This does not mean you can swim up beside them, creatures this large are often not aware of their size and could end up hitting you with their tail or bumping into someone on accident. Found in all temperate and tropical oceans throughout the globe (with the exception of the Mediterranean Sea), Whale Sharks migrate all around the globe in the name of finding food and a mate (1). Whale Sharks are filter feeders, which means they feed on small oceanic creatures by swimming with their mouths wide open passing more than 1500 gallons of water over their gills an hour while filtering the food found within it (1). Plankton alone takes up 85% of a Whale Sharks diet, meaning that they rank among some of the best and largest filter feeders in the world (3). Some other small ocean species like jellyfish, squid, or small fish spawn can also be found in a Whale Sharks diet but due to their enormous size, they are driven by prey density and do not exhibit hunting behaviors, thus filter feeding is the best option (3). Little is known about Whale Shark reproduction as it is very rarely observed and studied even less, what we do know is that Whale Sharks are ovoviviparous, meaning that eggs hatch within the uterus and “live” birth is done (4). Sadly, it is suspected that less than 10% of a Whale Sharks litter will survive till adulthood (4). This is due to a wide variety of factors that will be explored in the next segment of this paper. So what do Whale Sharks do for the environment? In short, Whale Sharks are known to be a sort of “ocean recycler”. Relating to how whale sharks tend to be in areas of high prey density, Whale Sharks will go to areas exhibiting high production to feed. This contributes to a phenomenon called the “Whale Pump”, in which lots of food is consumed in these high-production areas, and due to their migration patterns of traveling the globe, they release nutrient-dense feces to areas of lower production, essentially spreading the nutrient wealth of one area around the world (5). This feeding method also plays a major role in keeping plankton populations regulated and preventing harmful algal blooms (5).

### **Why Are We Talking About Whale Sharks?**

As of March 18th, 2016, Whale Sharks were considered to be an endangered species on a global scale according to the IUNC Redlist union (6). The IUNC Redlist lists shipping lanes, and fishing, as the two major threats to Whale sharks' well-being (6). Hsu and others (2012) describe a situation in Taiwan where Whale Sharks were allowed to be caught, starting at 80 individuals a year in 2001, lowering down to 30 in 2007. This is not the only case of this happening though. Similar situations have been recorded in Oman, India, the Philippines, and the Maldives (6). The

worst case of this takes place in southern China, where it was last updated in 2012, that Whale Sharks were routinely captured and retained when spotted (7). These areas alone were zones where catching the Whale Shark was specifically allowed and not even as a byproduct of commercial fishing. Capietto et al (2014) investigate how megafauna mortality has increased with the development of the fishing industry. Through the sampling of the logbooks in 65 industrial fishing vessels, it was discovered that 145 whale sharks were captured by nets, resulting in the death of 2 of them. Two may not seem like many, but this does not take into consideration any who may have died from an injury in the net entanglements as well as any debilitating injuries sustained in these accidents (8). It was discovered that fisheries actively pursue large marine animals like Whale Sharks or other marine mammals due to Tuna aggregating underneath large floating objects like driftwood, and fish aggregation devices (8). Capietto et al (2014) also discovered that the average Whale Shark sighting through various recorded activities was a mere 0.1%, while the sighting during fishing events extend to 1.12% as well as an accidental capture rate of 0.88%, indicating that there is an increase between Whale Sharks and fishing zones, as well as pointing towards an increase in accidental capture due to the fishing industry (8).

Due to the nature of plankton, they are often found in the shallowest area of the ocean so they can soak up as much sunlight as possible while remaining in the warmest area of the water (9). Due to plankton being found in high densities in these zones and plankton being the main food source of Whale Sharks, they are often found very close to the surface, and while feeding, Whale Sharks have about 15% of their mouth open above the water exposing them to anything above the water (9). This feeding habit leads to a high risk of vessel strikes while foraging. Due to the biology of sharks, their skin is often quite thick, with an average whale shark's skin and the underlying connective tissue reaching up to 4 inches thick providing a thick layer of protective armor (10). Throughout evolution, this attribute has led them to develop a sense of fearlessness, this is both good as they back down from none, but bad as they would not back down from incoming ships (10). Gudger (1941) noted that numerous vessel strikes have been reported throughout the east and west pacific with the fate of the sharks being unknown. It has also been reported that upon death, Whale Sharks sink, meaning their fate, alive or dead, after a strike would be difficult to determine (6).

### **The Solution**

Endangered, hunted, and injured through human development, Whale Sharks suffer quite a bit despite being very passive and minding their own business. This raises the question as to why we still continue on this path despite their diminishing population. The IUNC Redlist union noted that the Whale Shark population has largely diminished, and due to their long life span and lack of knowledge on their developmental stage, waiting a 10 to 30-year period would be insufficient to assess their recovery (6). Despite this, it is believed that within 10 years of reduced targeted fishing and accidental catches the population should be able to recover to about 55% (0% being extinct, 100% being fully functional) from a current 29% (6). Whale Sharks have

been recognized enough to be put underneath the United Nations Convention on the Law of the Sea, meaning that the UN is currently placing frameworks for the conservation of the species and the management of them in all countries involved (6). This is very important due to the migratory nature of Whale Sharks, they continuously change different ocean boundaries for various nations meaning that a conservation practice in only one or two countries will do little for the general benefit of the species. Through raising awareness of the current state of Whale Sharks, many countries have gone back on the regulations they had for catching them. For example, Taiwan as of 2012 has banned the catching of all Whale Sharks and has instead switched to a sort of ecotourism (11). Due to the nature of Whale Sharks' growing involvement in the fishing industry, solutions have been found to help minimize the amount of injury when bycatches occur. Capietto et al (2014) have spoken about how the best practices as of late have been to educate fishermen on the safe release of Whale Sharks when bycatches inevitably occur. This would greatly reduce the chance of injury or death when they get tangled in nets (8). The Indian Ocean Tuna Committee have made these practices mandatory when a whale shark is captured thus ensuring their safety, it also speculated that these released Whale Sharks should be tracked to assess health so future practices can be altered for their betterment (8). Capietto et al (2014) also recommend tracking of primary productivity to predict the potential feeding areas of Whale Sharks so these areas may be avoided during the fishing season. Further research must be done on the migration and health of Whale Sharks so conservation efforts can be refined. Despite these efforts, the population trend of Whale Sharks is still decreasing, but the population is still stable enough to recover as some time is still left (6). I believe further research into tracking the feeding of Whale Sharks will aid in avoiding bycatches and vessel strikes as these areas can be marked to avoid. We will not know the effects of the conservation on these beautiful creatures until many years in the future when they reach adulthood, but hopes are high and the best we can do on an individual scale is to raise awareness.

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