

Sea Turtles (Chelonioidea)

Threats and Conservation

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What can be commonly referred to as turtles is actually an umbrella term for an order of animals which encompasses a great deal of diversity, and an ancient evolutionary history which has been easily dated back to the Cretaceous. (Callaway, Moody 1997) A fossil region referred to as the Black Mesa region, has yielded numerous ancient marine turtle fossils, with similar morphology from carapace and plastron, which make up the shell of modern turtles (Callaway, Elliot 1997) With such a rich and ancient evolutionary history one would expect the diversity in species of turtles to be incredibly large, however only a small amount living species are presently alive today, less than 300. These testudines are found occupying a variety of different habitats, from terrestrial to aquatic environments, each species with its own unique set of evolutionary adaptations to aid in survival. The family of animals I'll be focusing it on in this paper are the Chelonioidae, or the as they're commonly referred to as, the marine turtles, or sea turtles.

This family consists of a relatively small diversity of species, approximately 7 (loggerhead, leatherback, green, hawksbill, flatback, ext.) With the limited amount of diversity within the family, what one might expect concerning the vulnerability of the species to be true, today a large number of marine turtles are on endangered species lists, and subject to environmental protection laws. As a study published in 2014 noted, Australia's coasts are used frequently by flatback marine turtles (Pendoley 2014) Although as destruction of coral reef, and natural occurring marine "corridors" continues, this presents difficulties for the viability of the turtles environment. Often as a result of the habitat destruction, species will migrate to more oceanic areas, to which they are less suited, and the availability of food resources is less abundant. (Pendoley 2015)

Environmental degradation is only one way in which populations of marine turtles are threatened. Factors such as how long a species may take until they reach reproductive maturity, which in the case of the Loggerhead is relatively late, and has had a profound effect on the growth rate of the species. (Scott 2012) Factors such as predation of the species are also a factor, in the case of sea turtles such as: loggerhead and green turtle, nesting can present a variety of threats to the reproduction. Sea Turtles, which make their nests on land, choosing to bury their eggs on land until they hatch. As a result, eggs are subject to predation by wildlife, and other factors, such as human activity. (Olgun 2016) One recorded year the hatching success of the animals was less than half. (Olgun 2016) The distribution of species within throughout the world varies, for say the species of Loggerhead turtles, distribution occurs predictably across the western hemisphere, where male turtles will migrate to find mates, and look for food. (Arendt 2012) Along the Atlantic coast of Florida, sea turtle populations vary according to seasonal changes, a study published in 2015 charted the density and abundance of turtle populations showing that during summer months, the populations were much larger. (Bovery 2015) Being a highly migratory animal, populations of turtles vary greatly in accordance with geographic location and timeframe. Partly this is due to mating and breeding patterns amongst sea turtles, which use "rookeries" or breeding grounds for their mating. Mating and nesting amongst sea

turtles does vary greatly however, species of sea turtles such as the: Olive Ridley and Kemp's Ridley. Published a journal of molecular ecology in 2006 stated:

“Unique to the genus *Lepidochelys* a nesting behaviour where large groups of females emerge synchronously from the sea to lay eggs on sandy beaches. Seven or eight populations of olive ridleys (*Lepidochelys olivacea*), and the single population of the Kemp's ridley (*Lepidochelys kempii*) nesting at Rancho Nuevo in Mexico, display these mass nesting events commonly termed ‘arribada’” (Jensen 2006)

Mating patterns and nesting patterns does vary for sea turtle species, however the distinction between large scale nesting, or arribada nesting exhibited by the Kemp's Ridley is worth noting, as it illustrates a reproductive advantage in comparison to “solitary nesting.” A substantial threat to marine turtle populations come from the process of legal farming, which a study published in 2014 noted, kills up to 42,000 marine turtles each year. (Humber 2014.) As a result declines in the particularly green turtle populations has been seen. Green Turtles make up close to 80% of these catches. The human impact throughout the decades on Marine Turtle populations has been significant, as turtles have often been part of a human diet. Turtles can be traced back in Iroquois oral history, in which the turtle supported the soil, trees, and the material used to the build North America, in a popular creation myth.

However, the interactions between man and sea turtle has very rarely been symbiotic. In a study conducted in the Western Gulf of Mexico, showed the population of Kemp's Ridley and Loggerhead, experience unusually levels of mortality, and isolation and disorientation as a result of human fishery complexes and mechanical extruders. (Lewison 2003) To combat these influences that humans are having on marine turtle, researchers and scientists have been involved in numerous conservation efforts to assure populations remain stable. A species of turtle which is under conservation efforts in the United States includes Green Turtles, the populations of which as often decimated, primarily from overfishing. The Galapagos, Green Turtles were often threatened by human sailors, who fished for the turtles for food. A biologist Patricia Zarate noted that, “By the 1970's, commercial exploitation of sea turtles was common.” (Seminoff 2012) Part of the conservation techniques that are often utilized are centered around finding biological and ecological “hot-spots” in which the sea turtles might congregate to fulfil a variety of behavior, mating and depositing eggs; feeding, taking advantage warmer bodies of water, rich with nutrients and smaller, edible organisms. (Seminoff 2012) Apart from protecting and avoiding threats to natural environments, that are often endangered by human activity, researchers will also engage with activists to ensure that turtle eggs aren't threatened to the point of the extinction. An interest dynamic can be seen in the Philippine Islands, in which a market immerge in the 1950's for sea turtle eggs, which were considered a delicacy throughout Asia. (Lejano 2007) A conservation group emerged on the islands as to aid in the protect of the eggs, and to maintain turtle populations. Protectionist policies are incredibly valuable for turtle

populations are over the last several decades, populations of all 7 species of Sea Turtles have been declining. The non-profit organization, Oceana not ranks al 7 species all endangered, and are critically near extinction. Green Turtle populations have declined up to 70% percent in accord with reckless human activity. (Oceana 2016) The greatest challenge in the coming years will be in educating and organizing around the responsibility of maintaining ocean ecosystems, and by protecting endangered populations of the sea turtles from extinction, which is a very real and present threat to a creature which has had a powerful relationship with humanity, for literally thousands of years.

Citations

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