In Threat of Extinction: GREEN SEA TURTLES

(Chelonia mydas)

All green sea turtles populations are listed as threatened species. Two extremely vulnerable populations in Florida and Mexico are listed as endangered species. The largest U.S. population of green sea turtles live in the Hawaiian Archipelago, 90% of them breed in the Northwestern Hawaiian Islands.

The green sea turtle was listed as endangered/threatened on July 28, 1978. Their primary source of food is limu (seaweed). The limu makes the turtles' body fat turn a green color, hence the name green sea turtle.

Total population estimates for the green turtle are unavailable, and trends are particularly difficult to assess because of wide year-to-year fluctuations in numbers of nesting females, difficulties of conducting research on early life stages, and long generation time. Present estimates range from 200-1,100 females nesting on U.S. beaches. The number of nests has increased on Hutchinson Island, Florida, over the period 1971 - 1989, although nesting levels have been low on other nesting beaches. Population estimates given are for the number of nesting females in Florida. Populations in Surinam, and Tortuguero, Costa Rica, may be stable, but there is insufficient data for other areas to confirm a trend. The recovery team for the green turtle concluded that the species status has not improved appreciably since listing.

Green Sea Turtle Biology

Adult green turtles may reach a size of 1 m long and 180 kg mass. The carapace is smooth and is colored gray, green, brown and black. The plastron is yellowish white. Hatchlings weigh about 25 g, and are about 50 mm long. Hatchlings are black on top and white on the bottom. Age at sexual maturity is estimated at 20-50 years. The average lifespan of a green sea turtle is 80 years.

Habitat and Nesting

Green sea turtles live throughout the world. In the United States, green turtles are found around the U.S. Virgin Islands, Puerto Rico, the Hawaiian Archipelago, and the continental U.S. from Texas to Massachusetts. Green turtles are found throughout the North Pacific, ranging as far north

as Eliza Harbor, Admiralty Island, Alaska, and Ucluelet, British Columbia. In the eastern North Pacific, green turtles have been sighted from Baja California to southern Alaska. In the central Pacific, green turtles can be found at most tropical islands. In Hawaiian waters, genetically distinct green sea turtles are found around most of the islands in the Hawaiian Archipelago. The primary nesting site is at French Frigate Shoals in the Northwestern Hawaiian Islands.

Green sea turtles mate in March and lay eggs on sandy beaches between April and September. One turtle will lay about 100 eggs in a clutch. Eggs incubate in the sand for about 60 days. The hatchlings work to dig out of the sand and are attracted to the ocean by light reflecting off the water. Many hatchlings do not survive this process because they are easy prey for seabirds and large fish.

Turtle eggs buried in the sand

Human Impacts on Green Sea Turtles

I) Commercial Fishing:

- Incidental catch during commercial shrimp trawling is a continuing source of mortality that adversely affects recovery. Turtles are entangled in fishing gear, which causes them to drown.
- It is estimated that before the implementation of TED requirements, the offshore commercial shrimp fleet captured about 925 green turtles a year, of which approximately 225 would die. Most turtles killed are juveniles and sub-adults. Bluefish, croaker and flounder trawl fishing are also serious threats.
- Turtles are being taken by purse seine fisheries in the Atlantic and Gulf of Mexico, but the magnitude of take is currently not known.
- Several thousand vessels are involved in hook and line fishing for various coastal species. The capturing of turtles is not uncommon, but the number is not known.
- Significant numbers of turtles may be killed by gill and trammel net fisheries off the eastern coast of central Florida. An exact number is not known.
- Pound net fisheries are primarily a problem in waters off of Virginia, where turtles get tangled in the gear and drown. In North Carolina, live turtles are often released from pound nets.
- Over 330 sea turtles of various types (a few of which were green) were captured in the Atlantic and Gulf of Mexico EEZ in the Japanese tuna longline fishery from 1978-1981. Due to expansion of this type of fishing, it may have a significant impact on sea turtle recovery. The number of deaths is unknown.
- Turtles get caught in discarded fishing gear. The number affected is unknown, but is potentially significant.

II) Poaching:

- In the United States, killing of nesting green turtles is infrequent. However, in a number of areas, egg poaching is still a concern.
- Turtle parts are used for leather and jewelry, and small turtles are sometimes stuffed for curios.
- Illegal harvesting of green turtles is uncommon in the U.S. No estimates of take exist. Illegal take of green turtles in the Caribbean, particularly near Puerto Rico, is a significant problem.

III) Impact to nesting activities:

- The most serious threat of nighttime use of a beach is the disturbance of nesting females. Heavy utilization of nesting beaches by humans may also result in lowered hatchling success due to sand compaction.
- Erosion of nesting beaches can result in loss of nesting habitat.
- Development of beachfronts results in fortification to protect property from erosion, resulting in loss of a dry nesting beach by preventing females from getting to nesting sites.
- Beach nourishment during the nesting season buries nests and disturbs nesting turtles.
- Artificial lighting can cause disorientation and misorientation of both adults and hatchlings. Turtle hatchlings are attracted to light, ignoring or coming out of the ocean to go towards a light source, increasing their chances of death or injury. In addition, as nesting females avoid areas with intense lighting, highly developed areas may cause problems for turtles trying to nest.
- Repeated mechanical raking of nesting beaches by heavy machinery can result in compact sand and causes tire ruts which may hinder or trap hatchlings. Rakes can penetrate the surface and disturb or uncover a nest. Disposing of debris on the high beach can cover nests and may alter nest temperature.

- The placement of physical obstacles on a beach can hamper or deter nesting attempts as well as interfere with the incubation of eggs and the emergence of hatchlings.
- The use of off-road vehicles on beaches is a serious problem in many areas. It may result in decreased hatchling success due to sand compaction, or directly kill hatchlings. Tire ruts may also interfere with the ability of hatchlings to get to the ocean.
- The invasion of a nesting site by non-native beach vegetation can lead to increased erosion and destruction of a nesting habitat. Trees shading a beach can also change nest temperatures, altering the natural sex ratio of the hatchlings.

III) Impacts in the marine environment

- Green turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and plastic pellets. Effects of consumption include interference in metabolism or gut function, even at low levels of ingestion, as well as absorption of toxic byproducts. NMFS is currently analyzing stranding data and available necropsy information to determine the magnitude of debris ingestion.
- Up to 50% of green sea turtles in Hawai'i have firbropapilloma – a cancer that causes softball-size tumors to grow around the turtles' eyes, mouth, neck and flippers. Eventually, turtles with FP die because the tumors become large enough to inhibit basic life activities like seeing, breathing, and eating. The cause of FP is not known, but is likely linked to carcinogenetic pollutants like those released by plastic.
- Dredging can result in habitat destruction by disrupting nesting or foraging grounds. Hopper dredges can also kill turtles caught in dragheads.
- In areas where recreational boating and ship traffic is intense, propeller and collision injuries are not uncommon.
- Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.
- Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but their effect is unknown.
- Marina and dock development can cause foraging habitat to be destroyed or damaged. It can also lead to increased boat traffic, increasing the risk of turtle/vessel collisions.
- Turtles have been caught in saltwater intake systems of coastal power plants. The mortality rate of the turtles involved is estimated at 7%.
- Underwater explosions (e.g. gas and oil structure removal and testing using explosives) can kill or injure turtles, and may destroy or damage habitat.

Efforts to Protect the Green Sea Turtle

- Environmentalists, Native Hawaiian groups, and scientists are working to close the Northwestern Hawaiian Islands to commercial fishing, in order to protect rare marine wildlife from the harm of discarded fishing gear and indiscriminate fishing practices – please join efforts in Congress to permanently and completely protect this unique and delicate ecosystem.
- Marine debris clean-up efforts continue to reduce the mortality of all marine wildlife – please do not litter on beaches (especially cigarette butts) and recycle plastic whenever possible.
- Regulation of ocean recreational activities is being improved to minimize disturbances to green sea turtle breeding and nesting – please do not swim close to turtles or disturb while they are ashore.

Credits

The National Oceanic and Atmospheric Association - National Marine Fisheries Service
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