

# Sea Turtle Fact Sheet

prepared for the World Conference  
on Sea Turtle Conservation by  
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## CONSERVATION PROBLEMS

In this century, no major population of any species of sea turtle has been proved to increase its numbers significantly, either spontaneously or as the result of a conservation effort.

The most serious problems that face sea turtle conservationists are:

The Trade Problem -- how to limit and regulate the world demand for turtle products, and how to prevent the illicit trade in these products.

The Taxonomic Problem -- how to deal with the status of separate populations of the "same" species, especially in the case of the green turtle. Lumping all populations into the same statistic is dangerously misleading because we have not been able to restore extinct populations by transplantation of individuals from other populations. Even if we could, we would be dealing with a biologically different animal.

The Incidental Catch Problem -- partly a technological problem: how to design shrimp trawls that exclude sea turtles but still catch shrimp.

The Subsistence Hunting Problem -- what to do about native peoples that depend for food upon the turtles that they are exterminating.

The Migration Problem -- species that cross international boundaries, as most sea turtles do, require complex and delicate international efforts to protect them.

The Biological Problem -- sea turtles have an elaborate life history, much of it poorly known. We also know less than we should about their growth, metabolism, behavior, population sizes, reproduction, and population dynamics. This makes it difficult to design conservation strategies that work.

The Mariculture Problem -- sea turtle conservationists are sharply divided as to whether commercial mariculture ("farming") of sea turtles, primarily green turtles, helps or hurts the remaining wild populations.

These problems represent the challenge of the World Conference on Sea Turtle Conservation.



## BIOLOGY OF SEA TURTLES

TYPES: There are seven recognized species of sea turtles alive today: the leatherback (trunkback, luth), Dermochelys coriacea; the loggerhead, Caretta caretta; the green turtle (edible turtle, soup turtle, white turtle), Chelonia mydas; the flatback, Chelonia depressa; the hawksbill, Eretmochelys imbricata; the olive (Pacific) ridley, Lepidochelys olivacea; and Kemp's (Atlantic) ridley, Lepidochelys kempii. All have hard shells except the leatherback.

Most of the species have many populations which are often totally isolated from one another. Some of these populations, for example the Ascension Island population of green turtles, may some day be described as separate species when they are better known.

HISTORY: Sea turtles were not among the first turtles which appeared about 200 million years ago. Fossil sea turtles in the same families as the living species date back as far as 75 to 100 million years ago.

DESCRIPTION: The torpedo-shaped, long-flipped leatherbacks are the largest sea turtles; they may weigh more than 1500 lbs., commonly 650-800 lbs. The carapace (upper shell) is black.

Green turtles (so called because of the color of their fat) weigh about 200-500 lbs., depending on the population; but in the past individuals larger than 800 lbs. have been caught. The carapace is mottled light to dark brown streaked with olive. In some populations the shell is unrelieved black. Greens are the most gentle of all sea turtles, rarely attempting to bite, even if provoked. Their fairly long flippers and oval shell make them (like the leatherback) hydrodynamically suited to long-distance swimming.

The large-headed loggerheads usually weigh 300-400 lbs., but have reached about 500 lbs. The carapace is reddish.

The closest relatives of the flatback turtles are the greens, but flatbacks have a flatter carapace, are smaller (commonly 150-180 lbs), and in other characteristics are more like ridleys.

The hawksbill, source of tortoiseshell for jewelry, has a small, narrow-beaked head, overlapping carapace scales, and commonly weighs less than 100 lbs. The biggest hawksbills on record weigh about 300 lbs.

The ridleys are the smallest sea turtles, and Kemp's ridley is probably the most ill-tempered. The outline of their carapace is round like a dinner plate, more so in Kemp's ridley. They usually weigh less than 100 lbs.

Hatchlings of all species are extremely small (one or two ounces) considering the size they can attain as adults. Unlike other turtles, sea turtles cannot retract their heads into their shells.

AGE: The natural longevity of sea turtles is unknown. Green turtles seem to grow very slowly in the wild taking longer than 15 years to reach maturity, perhaps much longer. Considering this, we can guess that individuals of some of all species might reach great age if undisturbed by man.



NATURAL ENEMIES: Adult sea turtles which are both fast and (except for the leatherback) heavily armored have few natural enemies, although sharks can do great damage to them. Young sea turtles have many enemies, especially before and immediately after hatching. These include: beach -- ants, crabs, lizards, birds, dogs, raccoons, pigs, toads, and coatis; offshore -- many kinds of carnivorous fish such as groupers, snappers, and baracudas, and also birds.

HABITAT AND DISTRIBUTION: Sea turtles spend nearly all their lives in the water, although the females of all species must emerge to lay their eggs on a beach. On a few remote, uninhabited Pacific islands in the Hawaiian chain, green turtles of both sexes emerge to bask in the sun.

Some of the carnivorous species spend much of their time near reefs (hawksbills) or rocky shallows (loggerheads). The herbivorous green turtle lives in shallow waters that support a good growth of turtle grass. The leatherback is found in open ocean.

Loggerheads are the only temperate zone sea turtle: for example they can be found in the U.S. waters from the Carolinas to Florida. The leatherback nests in the tropics, but regularly feeds in cold waters such as those around Nova Scotia. All other sea turtles are primarily tropical and sub-tropical, and some, the greens, hawksbills, and olive ridleys, occur around the world.

DIET: All sea turtles eat animals, especially invertebrates such as sponges, marine worms, molluscs, etc. The leatherback lives almost exclusively on jellyfish. Adult green turtles, however, are largely vegetarian, eating underwater grasses and sea weeds. A recent study has shown that green turtles use bacteria in the gut to digest plant cellulose, and, surprisingly for a cold-blooded animal, are about as efficient at this digestion as a cow. Juvenile greens are carnivorous until the age of six months to a year. All sea turtles except leatherbacks prefer meat in captivity.

SENSES: The best-known sea turtle is the green turtle. Green turtles (and other sea turtles) have good vision underwater but are hopelessly nearsighted on land. They have color vision, and unlike humans they can see ultraviolet light; but their sensitivity to red light is very poor.

Sea turtles have no external ears, but green turtles are sensitive to low-frequency sounds up to about 1,000 Hz. This means that, like other turtles, they can hear many of the noises in their environments.

The green turtle has an excellent sense of smell underwater and probably in air as well. It can detect certain organic substances in incredibly minute concentrations.

LEARNING ABILITY: In the laboratory, green turtles have been taught to press underwater keys when they detect specific light and chemical signals. Their performance, in many respects, is as good as that of a rat or pigeon. They do not learn well if they are given any kind of physical punishment for failure.

SLEEP: Sea turtles sleep (at night.) The hatchlings sleep floating at the surface with their flippers tucked back over their carapaces. Adults of some species may wedge themselves into a crevice deep underwater when they are sleeping. Hatchling green turtles swim constantly for 36-48 hours after they first enter the water (the "juvenile frenzy"); then they adopt regular sleeping habits.



BREATHING: All sea turtles breathe air. When they are active they must stay near the surface to breathe every few seconds or minutes. While sleeping or resting they can remain underwater for hours without breathing.

SOUNDS: Most sea turtles are not known to make many noises, although you can sometimes hear the adults when they surface and expel water from their nostrils before taking a breath. The exception is the leatherback which makes loud gurgling and rumbling noises on the nesting beach and is supposed to make a terrible noise when injured.

Mouth  
?  
breathers

MIGRATION: The majority of species and populations of sea turtles make regular migrations from their feeding grounds to their nesting beaches and back. The migration of Kemp's ridley is one of the most striking of these: all adult female Kemp's ridleys assemble to breed at one spot -- a Mexican beach, north of Tampico. The nesting arribada of Kemp's ridley, now sadly diminished, was once one of the most impressive and moving sights in all of Nature.

Green turtles are also great migrants and famous navigators. Many of their nesting journeys, made every 2-4 years, are for hundreds of miles; some are for more than a thousand miles. As in the case of tiny Ascension Island in the South Atlantic Ocean, some of the nesting targets are only a few miles wide in the middle of a vast ocean.

It is not known how sea turtles find their nesting beaches; it has been suggested that the sense of smell and some kind of compass sense play a role. Hatchling sea turtles probably do not actively navigate; they most likely are passively carried by currents to their distant feeding grounds, perhaps somehow "learning" the things they will need to know when they return as adults. One theory relates the Brazil-Ascension migration of green turtles to the drift of continents that occurred millions of years ago.

follow  
adults

MATING: Green turtles generally mate in the waters near their nesting beaches. Females of all species can store male sperm in their oviducts and may remain fertile from matings that took place years earlier. Males are often indiscriminate in their efforts to mate: they will attempt to mount crude wooden decoys, other males, skin divers, and even -- according to some stories -- small rowboats. Among green turtles of Australia's Great Barrier Reef, unreceptive females will bite pursuing males, will assume a vertical "refusal" position, or may even leave the water. There is also a "female reserve," a safe zone underwater, where females can go to escape the advances of sexually aroused males. No one knows how this female reserve is established or why the males honor it.

- or if it  
really exists

NESTING: Sea turtles often come ashore to nest several times in a nesting season, but not necessarily every year. Even the largest turtles may drag themselves hundreds of feet from the water while searching for a suitable site. The egg cavity is flask-shaped and dug only with the hind flippers -- the female never sees it. Some species, such as the green turtle, dig a body pit first, using the front flippers. This body pit can be more than five feet long, four feet wide, and two feet deep; sometimes the turtle uproots trees while digging it. While on land, the female sheds large, sticky tears. These not only help remove excess salt from the body, but also prevent the eyes from being covered by sand. Sea turtles are often frightened away by lights or movement when they are emerging



to nest. But once they have started to lay their eggs, the larger species are oblivious to disturbance, even to pounding on their shells. After nesting, the female covers her nest with sand. Once she has finished covering, she pays no further attention to the nest. - NO

The eggs look like ping pong balls and are leathery. Clutches range from 50-250 eggs. The eggs are not sensitive to handling during the first day or two. Incubation is approximately two months. If the eggs are exposed to salt water during incubation, they are not likely to hatch.

HATCHLINGS: After hatching, it takes the little turtles several days to work their way up to the surface of the sand. In green turtles, this is a group effort involving scraping sand off the roof of the nesting cavity and packing it down on the floor so that the nest "rises". A single turtle, hatching alone, would not be able to reach the surface of the beach. When the topmost hatchlings are an inch or so from the surface they become quiet until the surface temperature falls below a certain point. This happens at night or on a cool rainy day. Then the turtles burst explosively out of the nest and rush to the water.

Both hatchlings and adults find the water by heading toward the brightest horizon. In settled areas, hatchlings may be attracted to the pools of light under highway lamps where they are killed by automobiles.

Recent studies have shown that the sex of hatchling turtles can be influenced by the incubation temperature of the eggs. In the case of loggerheads a higher percentage of females was produced at higher temperatures.

#### POPULATION DECLINE

STATUS: No species of sea turtle can be considered entirely safe at the present time. The flatback turtle occurs entirely in Australian waters and is protected there. Considering whole species it may be the most secure, but even the flatback is threatened by incidental take (see "Other Threats"). The most critically endangered is Kemp's ridley with perhaps fewer than 500 breeding females left alive. Although the subject of a cooperative conservation effort between Mexico and the United States, Kemp's ridley has been further jeopardized this year by the blowout of an offshore oil well upcurrent from one nesting beach.

The hawksbill turtle typically does not nest in large groups, so its numbers cannot be ascertained. But there is no doubt that it is seriously endangered throughout the world and especially in the Caribbean region.

The loggerhead is also declining in many parts of its range, especially in the Mediterranean, where it is nearly extinct. Its world population is probably no more than 100,000 adult females.

The leatherback world population is small, probably fewer than 50,000 adult females. Although this is a comparatively rare creature, paradoxically it may not be as critically endangered as the olive ridley or most populations of green turtles.



The olive ridley numbers several hundred thousand females, but its exploitation is so heavy and poorly controlled that its decline has been precipitous, and it may well go the way of its nearly extinct Atlantic cousin.

The green turtle, economically by far the most valuable reptile to man, has suffered great attrition and is in critical difficulty throughout its range. Within recorded history, green turtles numbered in the tens of millions. It is claimed that Spanish navigators in the Caribbean could find the Cayman Islands in fog by following the noise made by the migrating turtle herds. In the 1800's, catches of several thousand turtles per night could still be made at a single nesting beach. Now some of the largest of the historically recorded green turtle rookeries no longer exist. Those that remain are almost all in great danger and are declining. The world total for all remaining populations of green turtles may be fewer than 500,000.

COMMERCIAL USES: The eggs of all species are eaten and much prized. Sea turtle eggs will not hard boil. Cakes baked with them are moist, tasty, and stay fresh for a very long time. In Latin America especially, sea turtle eggs are prized as an aphrodisiac. This belief may be related to the large size of the male turtle's sexual organ.

The skin of the flippers of most species, especially the olive ridley, is used for leather for shoes and handbags.

The shell of the hawksbill is still much prized for jewelry, especially in the orient. Captive-raised green turtles also provide useable but somewhat inferior shell.

All sea turtles have edible meat, but the leatherback is rarely eaten (although it is used for bait), and the hawksbill is occasionally poisonous depending on its diet. The green turtle is the source of the best turtle meat.

Turtle oil, used in cosmetics, is obtained primarily from green turtles.

Turtle cartilage, or "calipee," used in the manufacture of clear turtle soup, is also obtained primarily from green turtles.

Hatchling turtles are sometimes preserved whole in plastic paperweights. Immature hawksbills and green turtles are frequently stuffed and varnished for sale as wall ornaments.

The great value of the green turtle is only partly based on its many uses. As an efficient herbivore, and as one of the few and most important of the edible animals that graze upon the world's tropical marine grasses, it is potentially capable of turning these grasses into human food on a large scale -- indeed it did so in the not-too-distant past.

U.S. REGULATION OF COMMERCIAL SALE: The <sup>erroneous</sup> sale of any product from any species of sea turtle is now prohibited in the United States, without exceptions. "Farm-raised" products are included in the ban. The civil penalty for a violation is not more than six months imprisonment and a \$10,000 fine. The criminal penalty limits are one year and \$20,000.

OTHER THREATS TO SEA TURTLES: Besides their capture for commerce, sea turtles are endangered for other reasons. The most important of these may be "incidental take," in which turtles, primarily adults, are accidentally captured and frequently drowned in nets used in fishing for other species, especially shrimp.

Also important in the decline of sea turtles is habitat destruction, particularly that associated with beach development, but also related to pollution.

Finally, there is subsistence hunting by native populations, which has not caused the decline of sea turtles in most places, but which can have a devastating effect on an already depleted population.