

# Marine Turtles

## Background

Marine turtles have lived in the oceans for over 100 million years. They are an integral part of the traditional culture of many coastal indigenous peoples throughout the world.

Marine turtles migrate long distances between their feeding grounds and nesting sites. They have a large shell called a carapace, four strong, paddle-like flippers and like all reptiles, lungs for breathing air. The characteristic beak-like mouth is used to shear or crush food.

All marine turtle species are experiencing serious threats to their survival. The main threats are pollution and changes to important turtle habitats, especially coral reefs, seagrass beds, mangrove forests and nesting beaches. Other threats include accidental drowning in fishing gear, over-harvesting of turtles and eggs, and predation of eggs and hatchlings by foxes, feral pigs, dogs and goannas.

There are only a few large nesting populations of the Green, Hawksbill and Loggerhead turtles left in the world. Australia has some of the largest marine turtle nesting areas in the Indo-Pacific region and has the only nesting populations of the Flatback turtle.

Of the seven species of marine turtles in the world, six occur in Australian waters:

Loggerhead turtle	<i>Caretta caretta</i>
Green turtle	<i>Chelonia mydas</i>
Hawksbill turtle	<i>Eretmochelys imbricata</i>
Leatherback turtle	<i>Dermochelys coriacea</i>
Olive Ridley turtle	<i>Lepidochelys olivacea</i>
Flatback turtle	<i>Natator depressus</i>

In Australia, all species of marine turtles are protected under various State and Territory legislation and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999*.

Due to increasing threats to marine turtles, all the six species which occur in Australian waters are listed under the Australian Government's EPBC Act. The loggerhead and olive Ridley turtle are listed as *endangered* under this Act which means that the species may become extinct if the threats to its survival continue. The green, leatherback, hawksbill and Flatback turtles are listed as *vulnerable* which means that they may become endangered if threats continue. The Act identifies the need to prepare a recovery plan and specifies the content of the plan.

Marine turtles are recognised internationally as species of conservation concern. Six of the species found in Australia are listed in the 2000 IUCN (World Conservation Union) Red List of Threatened Animals.

All marine turtle species occurring in Australian waters are listed under the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES). In addition, all marine turtles occurring in the Indo-Pacific region are a priority for conservation under the *Convention on the Conservation of Migratory Species of Wild Animals* (the Bonn Convention or CMS).

## Biology of Marine Turtles

Young marine turtles drift and feed in the open ocean. When they are about dinner plate size, turtles settle near inshore feeding grounds.

Marine turtles grow slowly and take between 30 and 50 years to reach sexual maturity. They live for years in the one place before they are ready to make the long breeding migration of up to 3000 kilometres from the feeding grounds to nesting beaches.

After reaching sexual maturity, marine turtles breed for several decades, although there may be intervals between breeding of two to seven years.



When breeding, nesting females return to the same area, thought to be in the region of their birth. As hatchlings, they become imprinted to the earth's magnetic field and, possibly, the smell of the waters adjacent to the nesting beach which allow them to successfully complete their migration.

Courtship and mating take place in shallow waters near the nesting beach. Females often mate with more than one male. After mating, the males return to the feeding grounds.

Between nesting efforts, female turtles gather adjacent to the nesting beaches. They return to the same beach to lay consecutive clutches. A female green turtle usually lays six clutches of eggs at two weekly intervals.

When ready to lay eggs, the female turtle crawls out of the sea to above the high water mark, usually about one hour before to about two hours after the night high tide.

In preparation for nesting, the female turtle scrapes away loose sand with all four flippers to form a body pit. She then excavates a vertical pear-shaped egg chamber with the hind flippers. Often, the sand is unsuitable for nesting, especially if it is too dry, and the turtle moves on to another site.

For most turtle species, digging the nest takes about 45 minutes. It then takes another 10 to 20 minutes to lay the clutch of leathery shelled eggs. Each clutch contains about 100 white, spherical, "ping-pong" ball sized eggs.

After laying, the turtle fills the egg chamber with sand using the hind flippers, and then fills the body pit using all four flippers. The turtle finally crawls back to sea, entering the surf about one to two hours after emerging. Green turtles may take longer to nest.

While on the beach, fluid hangs from the turtle's eyes. This is a concentrated salt solution which helps to remove excess salt ingested by the turtle from drinking sea water. This solution also washes the eyes free of sand.

Incubation time and sex of the hatchlings depend on the temperature of the sand. Warm, dark sand produces mostly females and the eggs hatch in seven to eight weeks. Eggs laid in cool, white sand mostly result in males and the eggs take longer to hatch.

The hatchlings then take a few days to dig their way through the sand to the surface.

When leaving the nest, usually at night, hatchlings head for the low elevation horizon of the ocean. Hatchlings can be easily disoriented and attracted to bright lights such as street and house lights. This contributes to many hatchling deaths.

Most hatchlings reach the sea although crabs and sea birds attack them on the beach. During their first few hours in the water, these young turtles face heavy predation by sharks and other fishes.

## **Research**

Detailed research, population modelling, and turtle tagging and tracking activities are being carried out in Australia and the Indo-Pacific region to assist with turtle conservation programs.

During summer at selected turtle breeding areas, each nesting marine turtle is tagged with a non-corrosive metal tag carrying an identification number. Later recaptures allow scientists from the conservation agencies and universities to monitor marine turtle populations, migration patterns, breeding activity, growth and mortality factors.

Genetic studies help to identify separate breeding populations and which population a particular turtle comes from, especially those captured in distant feeding grounds. They also provide information on the genetic variability within each population.



## **How to Help with Marine Turtle Conservation and Management**

### **Turtle Care Hints:**

- see and learn about marine turtles and join in the turtle watching and monitoring activities at Mon Repos Conservation Park in Queensland or other organised venues;
- do not discard old fishing lines, nets, plastic or other pollutants on beaches or into the sea;
- when boating, be on the lookout for turtles to avoid injuries to them, especially in shallow waters;
- help to control foxes and pigs near nesting beaches and ensure domestic dogs are kept under control at all times;
- control street and building lighting by appropriate design and landscaping in the vicinity of nesting beaches. Keep outside lights off during the turtle nesting season;
- avoid the use of campfires, torches and vehicle or boat lights near turtle nesting beaches;
- contact local community groups or government departments active in turtle conservation to see how you can help, especially with regular monitoring and recording of turtle activities. Record any sightings of dead turtles and identify the possible causes of death. Send these details with any tags to your state or territory conservation department.

### **Fishing Activities**

Help reduce turtle mortality:

- Check longlines, gillnets and lobster/crab pots frequently to disentangle any turtles caught accidentally;
- Use Turtle Excluder Devices (TEDs) for trawling and other fish netting activities. These devices allow large animals such as turtles to escape from trawl nets without being drowned;
- Avoid trawling near turtle rookeries;
- Avoid collisions with turtles;
- Keep turtles which are in a coma on board, with their belly down and head sloping downwards until they revive.

## **Turtle Watching**

- Keep the use of lights to a minimum;
- Do not approach closely or shine lights or take photos using flash lights when the turtle is leaving the sea;
- Wait until the turtle is laying eggs before shining lights or taking photos;
- Minimise noise and sudden movements;
- Keep dogs away from turtles and turtle nests.

## **Traditional Harvesting by Indigenous Communities**

- Take immature turtles in preference to adult-sized turtles;
- Preferably, take eggs only from nests that are likely to get washed by the tide;
- During the mating and nesting season take male turtles in preference to female turtles;
- Record hunting details such as numbers taken, location, date, species, sex, and size. Record tag numbers and send these to the address provided on the tag.

## **Turtle Monitoring**

- Record date, numbers, locations and species of marine turtles seen at sea or nesting;
- Report all sightings of sick or injured turtles;
- Report any tag numbers sighted on turtles. Include date, location and information about the turtle (do not remove tags from live marine turtles);
- Count turtles using particular nesting beaches or estimate the number by counting turtle tracks (for each set of tracks leading onto the beach and back to the sea, count one turtle) and if possible, identify the species.



## **Marine turtles and Indigenous Culture**

Marine turtles have important cultural and social values for Aborigines and Torres Strait Islanders living in coastal areas of northern Australia. They are an essential food item for some of the island communities in the Torres Strait where there are few other sources of fresh red meat. Eggs of marine turtles are also an important source of protein. Torres Strait Islanders have one of the highest seafood consumption rates in the world.

Green turtles are hunted more regularly than the other species. Hawksbill turtles are rarely hunted because they can be poisonous or unpleasant to eat.

Most turtles are taken in the later part of the year, during the breeding season.

In a few communities, marine turtles are taken in large numbers for traditional feasting.

Harvested turtles and eggs are shared equally among relatives and friends of the hunters. Turtle oil is used as a medicine or tonic.

Indigenous communities promote the results of research carried out in collaboration with a number of research and management organisations. They regulate access to some traditional hunting areas. They also monitor harvesting activities to help them effectively plan for the sustainable use of marine turtles.

<http://www.deh.gov.au/coasts/species/turtles/>