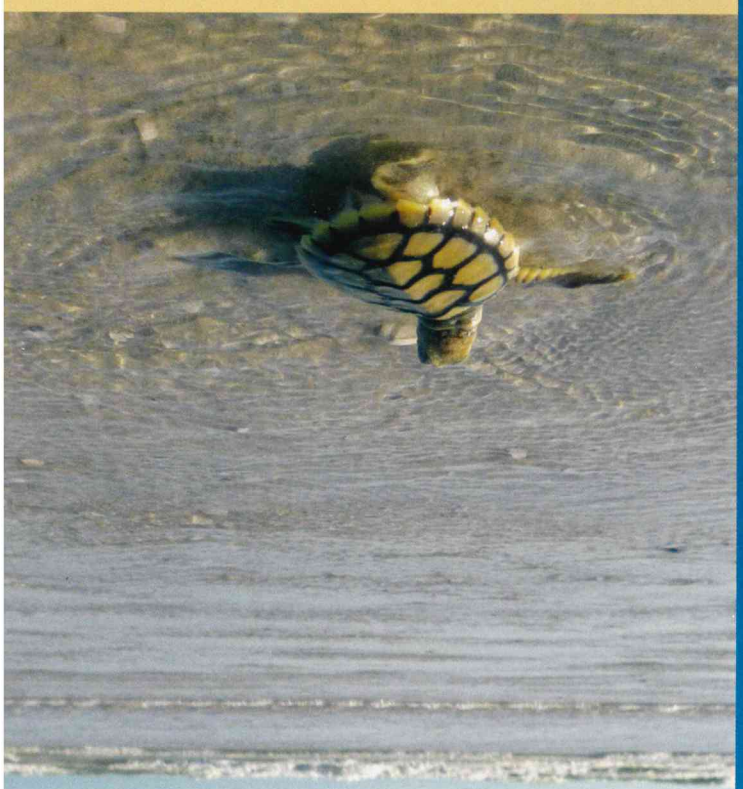
Marine turtles
of the
Kimberley Coast



Visitor guide

Department of Biodiversity,
Conservation and Attractions
PARKS AND WILDLIFE SERVICE
GOVERNMENT OF WESTERN AUSTRALIA

Marine turtles can be seen
in Kimberley coastal waters
all year round.

Department of Biodiversity,
Conservation and Attractions
PARKS AND WILDLIFE SERVICE
GOVERNMENT OF WESTERN AUSTRALIA

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More Information

For more information on marine turtle conservation or to report a dead, sick or injured marine turtle, please contact the local Department of Biodiversity, Conservation and Attractions' Parks and Wildlife Service office:

Kununurra Regional Office
Lot 248 Ivanhoe Road KUNUNURRA
PO Box 942 KUNUNURRA 6743
Phone (08) 9168 4200
Fax (08) 9168 2179

Broome Work Centre
111 Herbert Street BROOME
PO Box 65 BROOME 6725
Phone (08) 9195 5500
Fax (08) 9193 5027
dbca.wa.gov.au

Further Reading

Sea Turtles: An Ecological Guide
David Gulko, Karen Eckert

Sea Turtles: A Complete Guide to Their Biology, Behavior, and Conservation
James R. Spotila

environment.gov.au/marine/marine-species/marine-turtles

ningalooturtles.org.au

seaturtle.org

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Information current at October 2020
This publication is available in other formats on request.

Did you know?

- Six of the world's seven species of sea turtles occur in Kimberley waters however only five species are known to nest here – green, olive ridley, flatback, hawksbill and loggerhead turtles.
- The flatback turtle is endemic to Australia and only nests on northern Australian beaches.
- Marine turtles have survived in the world's oceans for more than 100 million years.
- Marine turtles are reptiles and have lungs so must surface to breathe. Marine turtles can remain submerged and hold their breath for several hours.
- Marine turtles drink seawater and therefore take in large quantities of salt, which they excrete through salt glands near tear ducts in their eyes. It gives the appearance of 'tears' and occurs continuously, both on land and in water.
- Female turtles mate with several males and have the ability to store sperm. Hatchlings from a single nest may have several different fathers.
- Green, hawksbill and olive ridley turtles produce eggs the size of ping-pong balls, whereas flatback turtle eggs are the size of billiard balls. Marine turtle eggs have leathery soft shells that enable them to drop into the nest without breaking.
- Hatchling gender is determined by egg temperature during incubation. This phenomenon is known as Temperature-Dependant Sex Determination. Warmer temperatures produce females while cooler temperatures produce males.
- Nesting occurs at different times in northern and southern Kimberley, most likely a natural adaption to cope with warmer sand temperatures in the north in the wet season.
- Turtle studies have taken place at many locations in the Kimberley including Eighty Mile Beach, Eco Beach, Lacepede Islands, Montgomery Reef, Maret Islands and Cape Domett.
- Turtles tagged while nesting at the Lacepedes have been found in the Northern Territory and Indonesia.
- Turtles tagged in Indonesia have been found in Kimberley waters.
- Tracking studies reveal that some turtles tagged nesting in the Pilbara will forage inshore and offshore in the Kimberley.

How you can help

- Avoid driving on nesting beaches during the nesting/hatching season. Vehicles can crush nests, compact sand making it difficult to nest and create deep tyre ruts, which can trap hatchlings.
- Avoid campfires and using lights on beaches during nesting/hatching season as light sources can attract hatchlings and disturb or disorientate nesting turtles.
- Keep pets away from nesting beaches during the nesting/hatching season because they can dig up nests and kill turtle hatchlings.
- Turn off deck lighting if hatchlings are attracted to your boat to prevent hatchlings becoming exhausted and preyed upon by birds and large fish.
- Drive boats slowly (less than 8 knots) where turtles are present to reduce injury or death caused by boat strike.
- Avoid casting your fishing line where turtles are present; turtles can become hooked or entangled (if this occurs, follow the guidelines in this brochure).
- Take your rubbish with you. Turtles can become entangled in plastics, fishing line, nets and ropes.
- Avoid using plastic bags. Turtles can mistake them for food, which leads to blockages in their intestines and eventually death.
- Do not buy or sell turtle products. Purchasing turtle shell jewellery, souvenirs, meat and eggs overseas creates demand for products that involve the hunting and killing of turtles. It is illegal to import turtle products into Australia.
- Report sick, injured or dead turtles and flipper tag information to the nearest Parks and Wildlife Service office. Do not remove tags from turtles.
- Inform others about how they can help conserve marine turtles for future generations.
- Volunteer with a community group that helps monitor nesting turtle populations and identify local threats to nesting turtles and hatchlings.
- Follow the Turtle Code of Conduct in this brochure.

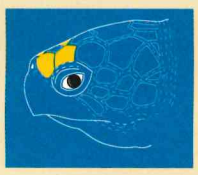
Loggerhead turtle adult, hatchling and track

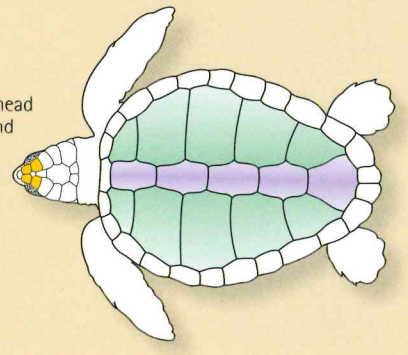
Species identification and characteristics

Loggerhead turtle (*Caretta caretta*)

- Adult loggerhead turtles have red-brown to brown carapace (shell) that measures approximately 1m in length. Their head is large in relation to other marine turtle species.
- Loggerhead turtles have five pairs of large scales on either side of their carapace.
- Loggerhead turtles are carnivorous and mainly feed on shellfish, crabs, sea urchins and jellyfish.
- When on land, loggerhead turtles move diagonal flippers simultaneously, creating and alternate track.
- Loggerheads do not generally nest on the Kimberley coast, but are known to frequent the coastal waters.

Loggerhead turtle shell and head showing number of costal and prefrontal scales



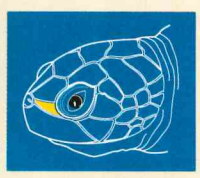


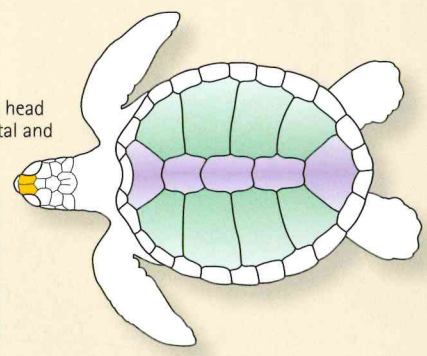
Flatback turtle adult, hatchling and track

Flatback turtle (*Natator depressus*)

- Adult flatback turtles have a low-domed carapace (shell) with upturned edges. The carapace is olive-grey in colour and measures approximately 90cm in length.
- Flatback turtles have four pairs of large scales on either side of their carapace and two prefrontal scales located between their eyes and nostrils.
- Flatback turtles are carnivorous (meat eaters) and mainly feed on soft-bodied prey such as sea cucumbers, sea pens, soft corals and jellyfish.
- When on land to nest, flatback turtles move their flippers simultaneously or alternately (or both) and create a track that can be parallel, alternate or a combination of both.
- Flatback turtles reach sexual maturity around 20 years of age and nest every 2 – 3 years.
- On average they lay three clutches of eggs per nesting season, with each clutch containing around 50 eggs. These nesting events are usually around two weeks apart.
- Nesting occurs from September to March in the southern areas of the Kimberley and from March to September in northern areas.
- The flatback is the only turtle to have a pair of preocular scales.

Flatback turtle shell and head showing number of costal and prefrontal scales



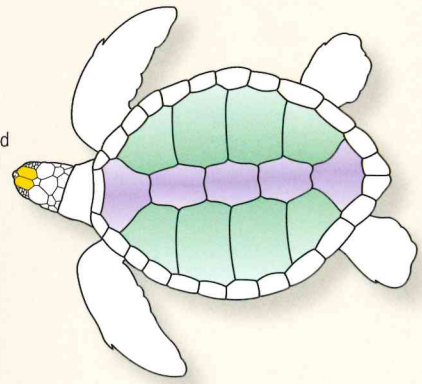


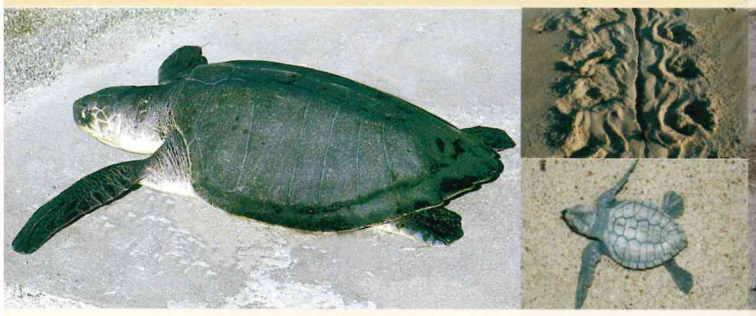
Green turtle adult, hatchling and track

Green turtle (*Chelonia mydas*)

- Adult green turtles have a high-domed carapace (shell) that is light to dark green in colour with dark mottling and measures approximately 100cm in length.
- Green turtles have four pairs of large scales on either side of their carapace and two prefrontal scales located between their eyes and nostrils.
- Green turtles are primarily herbivorous (plant eaters) and mainly feed on seagrass and algae, although they also eat some jellyfish.
- When on land, green turtles move their flippers simultaneously, creating a distinctive, parallel track.
- A green turtle will reach sexual maturity between 20 – 40 years of age and nest every 1– 9 years.
- On average, they lay five clutches of eggs per nesting season, with each clutch containing around 110 eggs. These nesting events are usually around two weeks apart.
- Nesting occurs year-round, but predominantly from November to March at key rookeries in the Kimberley.

Green turtle shell and head showing number of costal and prefrontal scales



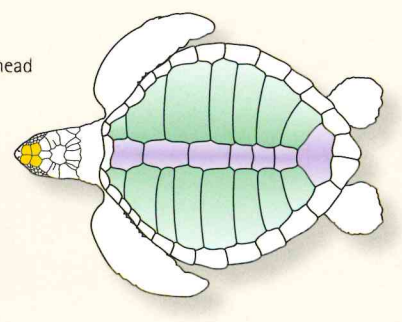


Olive ridley turtle adult, hatchling and track

Olive ridley turtle (*Lepidochelys olivacea*)

- Adult olive ridley turtles are smaller than other sea turtles with a circular, olive green or grey carapace about 70cm in length.
- Olive ridley turtles have 6 – 9 pairs of large scales on either side of their carapace and four prefrontal scales located between their eyes and nostrils.
- When on land, olive ridley turtles move diagonal flippers simultaneously, creating a narrow, alternate track.
- The olive ridley turtle diet consists primarily of crabs, snails, clams, barnacles, algae, fish and jellyfish.
- An olive ridley turtle will reach sexual maturity between 11 - 16 years of age and then nest every 1 – 2 years.
- On average they lay two clutches of eggs per nesting season, with each clutch containing around 110 eggs. In Australia, these nesting events are usually around two weeks apart.
- In central America and India, this species forms huge nesting aggregations, called Arribadas, with tens of thousands nesting in one night.
- In Australia, most nesting occurs in the Northern Territory and western Cape York, Queensland.

Olive ridley turtle shell and head showing number of costal and prefrontal scales

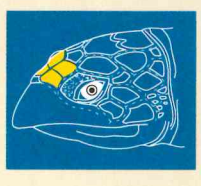


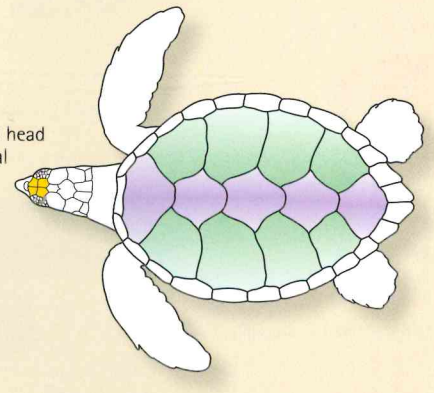
Hawksbill turtle adult, hatchling and track

Hawksbill turtle (*Eretmochelys imbricata*)

- Adult hawksbill turtles have a high-domed carapace (shell) that has thick overlapping scales. Their carapace is brown in colour with reddish-brown, brown or black markings and measures approximately 80cm in length.
- Hawksbill turtles have four pairs of large scales on either side of their carapace, a distinctive parrot-like beak and four prefrontal scales located between their eyes and nostrils.
- Hawksbill turtles are omnivorous (plant and meat eaters) and mainly feed on sponges, although they also eat seagrasses, algae, soft corals and shellfish.
- When on land, hawksbill turtles move diagonal flippers simultaneously, creating a narrow, alternate track.
- A hawksbill turtle will reach sexual maturity between 20 – 25 years of age and then nest approximately every five years.
- On average they lay 2.5 clutches of eggs per nesting season, with each clutch containing around 130 eggs. These nesting events are usually around two weeks apart.
- Nesting occurs year-round but predominantly from October to January throughout the Kimberley.

Hawksbill turtle shell and head showing number of costal and prefrontal scales





Threats to marine turtles

Six of the world's seven species of marine turtle occur along the Western Australian coast. Five species (flatback, green, hawksbill, loggerhead, olive ridley) can be seen feeding and mating in coastal waters or nesting and hatching on the beaches of the Kimberley Coast. All five species are listed on the Western Australian and International Union for Conservation and Nature (IUCN) lists of threatened species. Both natural and human induced impacts at each stage of the marine turtle life cycle have increased their risk of extinction.

Historical pressures such as commercial harvesting (1930s to 1970s), nuclear testing at the Montebello Islands in the 1950s and entanglements in trawl gear have contributed to the decline in marine turtle populations.

Current pressures such as feral animals, including the European red fox, wild dogs and cats, have had a detrimental impact on marine turtle populations throughout the Kimberley. These predators have the ability to dig up nests and prey on eggs and hatchlings.

Continued coastal development is a major threat to the marine turtle's survival causing loss of nesting and foraging habitats.

Climate change is likely to have a number of adverse effects on marine turtles. Rising sea levels and increased storm events will change the location and productivity of beaches, and rising sand temperatures will increase the female sex ratio and may increase mortality of eggs and hatchlings.

Marine turtle populations are particularly susceptible to human impacts because they reach breeding age at 20-50 years old and do not breed every year. Hatchlings naturally have high mortality rates with only one in a thousand hatchlings surviving to adulthood. The future of marine turtle populations depends on appropriate action by people.

Guidelines for unhooking or disentangling turtles

Bait can attract turtles, which may become hooked or entangled in fishing line. If this happens:

- Slowly bring the turtle close to you, keeping a gentle, consistent tension on the line.
- Use a landing net to support the turtle's weight or firmly hold onto the front flippers or shell (be aware that turtles can bite!). **DO NOT** lift the turtle out of the water using the line or sharp objects, such as gaffs.
- Remove the hook if it can be done without further injury to the turtle. Do not attempt to remove hooks that have been swallowed or are deeply embedded. If uncertain, do not remove the hook.
- If the hook cannot be removed, cut the line as close to the hook as possible and remove any line that may entangle the turtle before releasing it.

Turtle Watching Code of Conduct

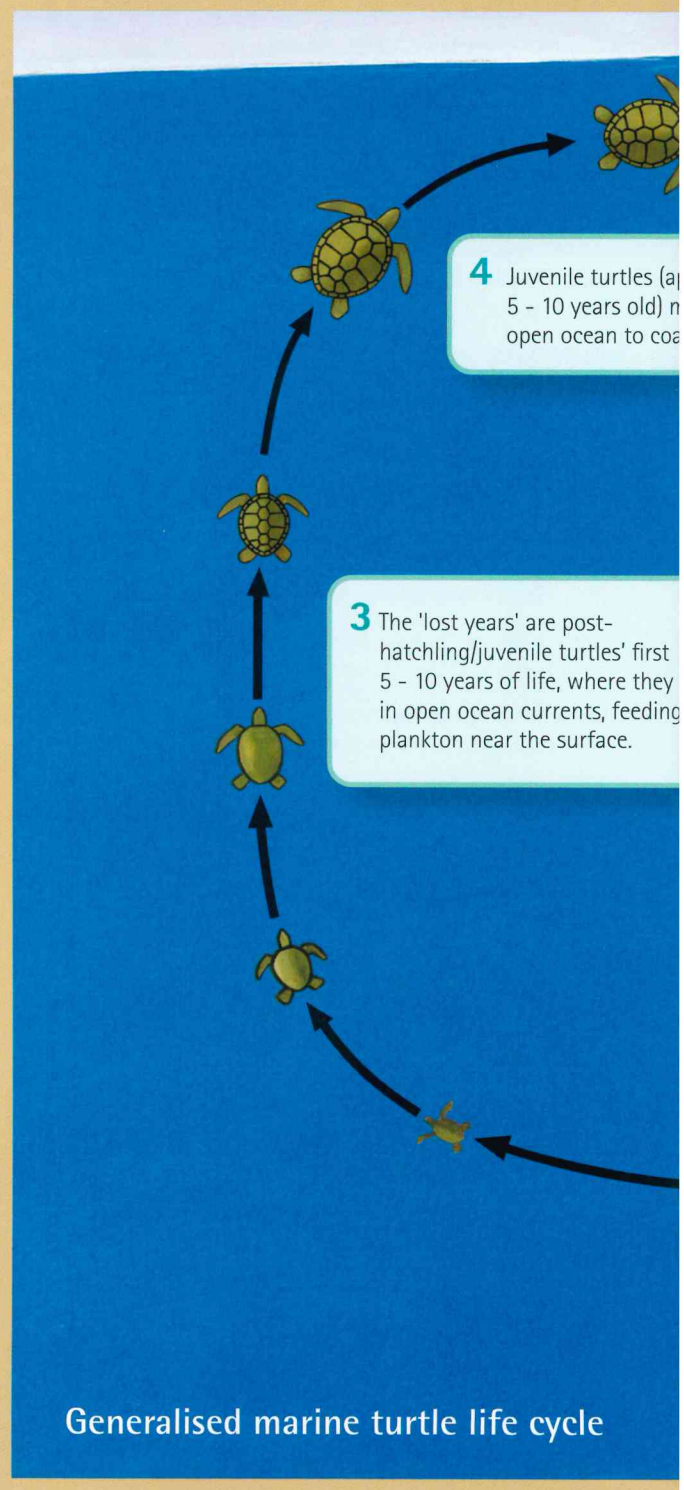
Marine turtles are a threatened species that are protected by law. There are penalties for disturbing or interfering with them. Please do not touch turtles.

Correct observation using Parks and Wildlife Service's Turtle Watching Code of Conduct below minimises disturbance to turtles and increases the chance of a rewarding turtle viewing experience.

In water

Marine turtles can be seen in Kimberley coastal waters all year round. When observing turtles underwater:

- Approach slowly and calmly from the side.
- Always remain at least an arm's length away.
- Do not attempt to touch, chase or feed turtles.

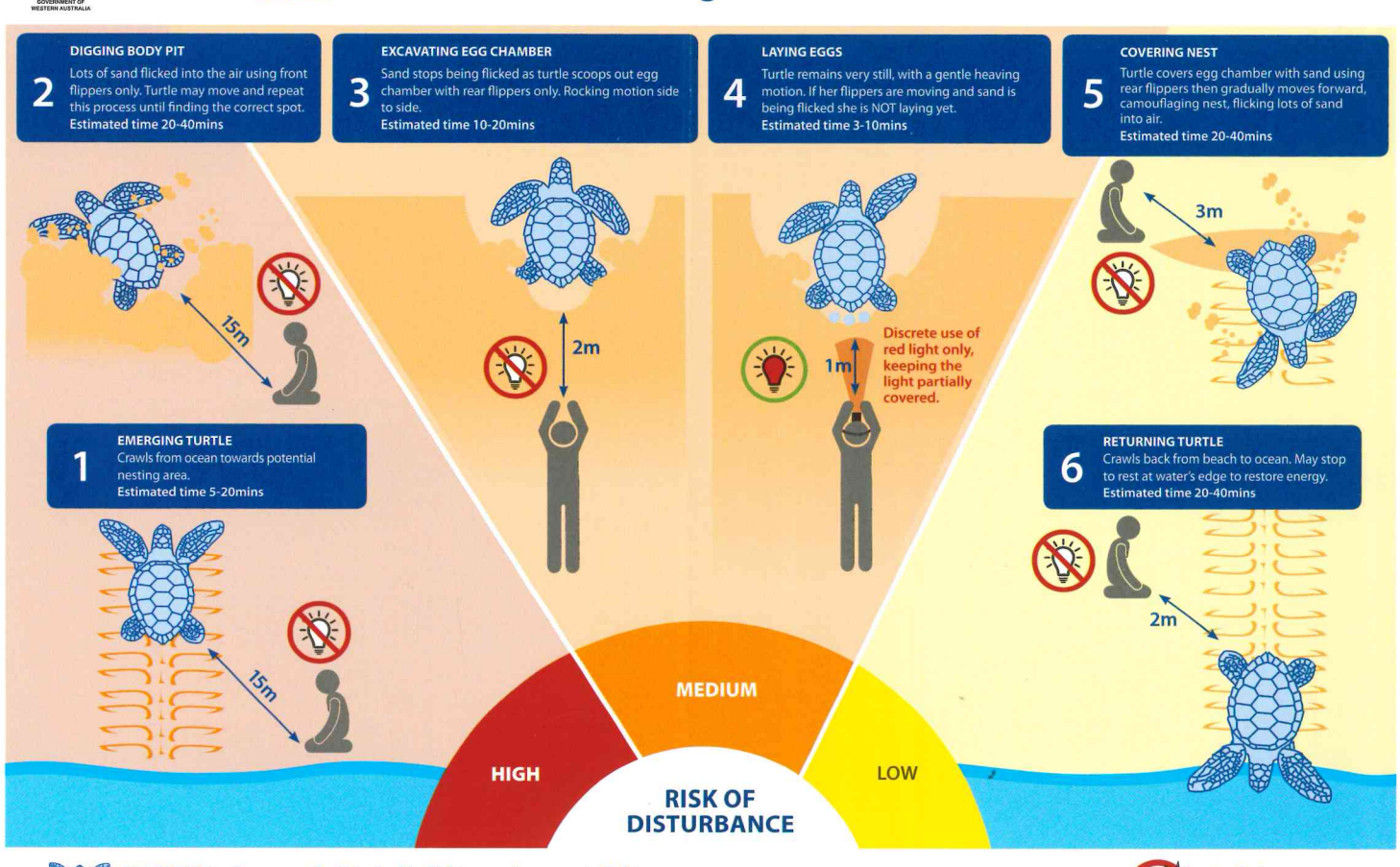


Generalised marine turtle life cycle

Department of **Biodiversity, Conservation and Attractions**

PARKS AND WILDLIFE SERVICE

Turtle Watching Code of Conduct



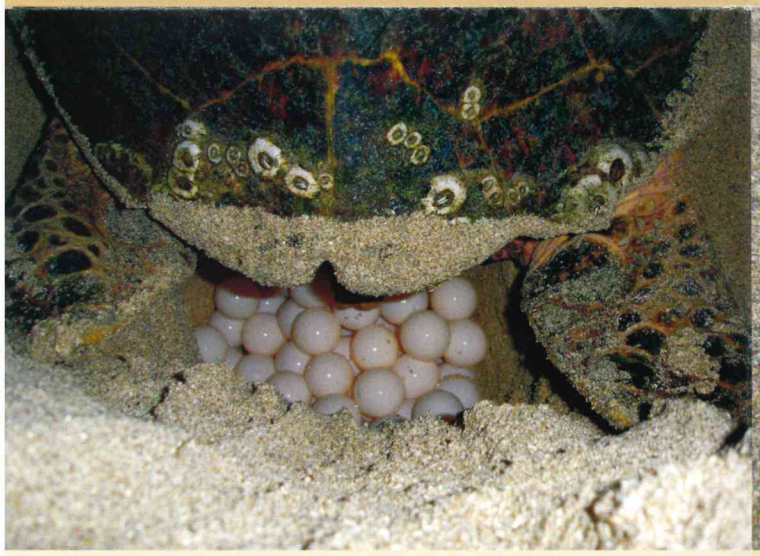
NO GLOW: turtles are easily disturbed by lights, use the moon to light your way.
MOVE SLOW: at all times to avoid disturbing turtles, walk along the water's edge and slowly follow an emerging track.
STAY LOW: out of sight of nesting turtles - sit, crouch or lie in the sand.

No flash photography at any time

Mating

In the Kimberley, mating occurs between September and March in the southern and from March to September in northern areas. Turtles aggregate in shallow water and rest at the water's edge. It is critical that resting turtles are not disrupted.

- Do not take motorised or sailing craft into mating aggregation areas.
- Stay clear of resting turtles (more than 30m away) and do not disturb them.



Nesting

Female turtles usually nest on Kimberley beaches at night Continual disturbance of nesting turtles may affect nesting success. Following the Turtle Watching Code of Conduct minimises your impact on nesting turtles.

- Avoid using torches and camera flashes as these disturb nesting turtles.
- Walk along the water's edge looking for tracks in the wet sand, or emerging/returning turtles.
- If a turtle is seen, always move slowly and avoid excess or sudden movement.
- Keep away while she establishes her nest.
- Be patient. She may abandon the nest and dig another one for a variety of reasons, including hitting an obstacle (roots, rock) or the sand being too dry.
- Once the turtle is laying her eggs, you can slowly move closer to observe but remain out of her line of sight. She will be quite still when laying her eggs – if sand is being thrown or she is using her flippers, she is not laying.
- Always remain behind the turtle, **go slow, stay low and no glow**.
- Give her enough space to camouflage the nest.
- Let her return to the ocean without interference or interruption.
- Depart all beaches by 11pm to allow for a period of undisturbed nesting.

Hatching

Hatching usually occurs seven to eight weeks after the eggs have been laid. The hatchlings usually emerge between dusk and dawn with the cooling sand acting as a trigger. Under natural conditions only one in a thousand hatchlings survives to adulthood. Additional human-induced pressures have further decreased their likelihood of survival. Please follow these guidelines to minimise human impacts on hatchlings.

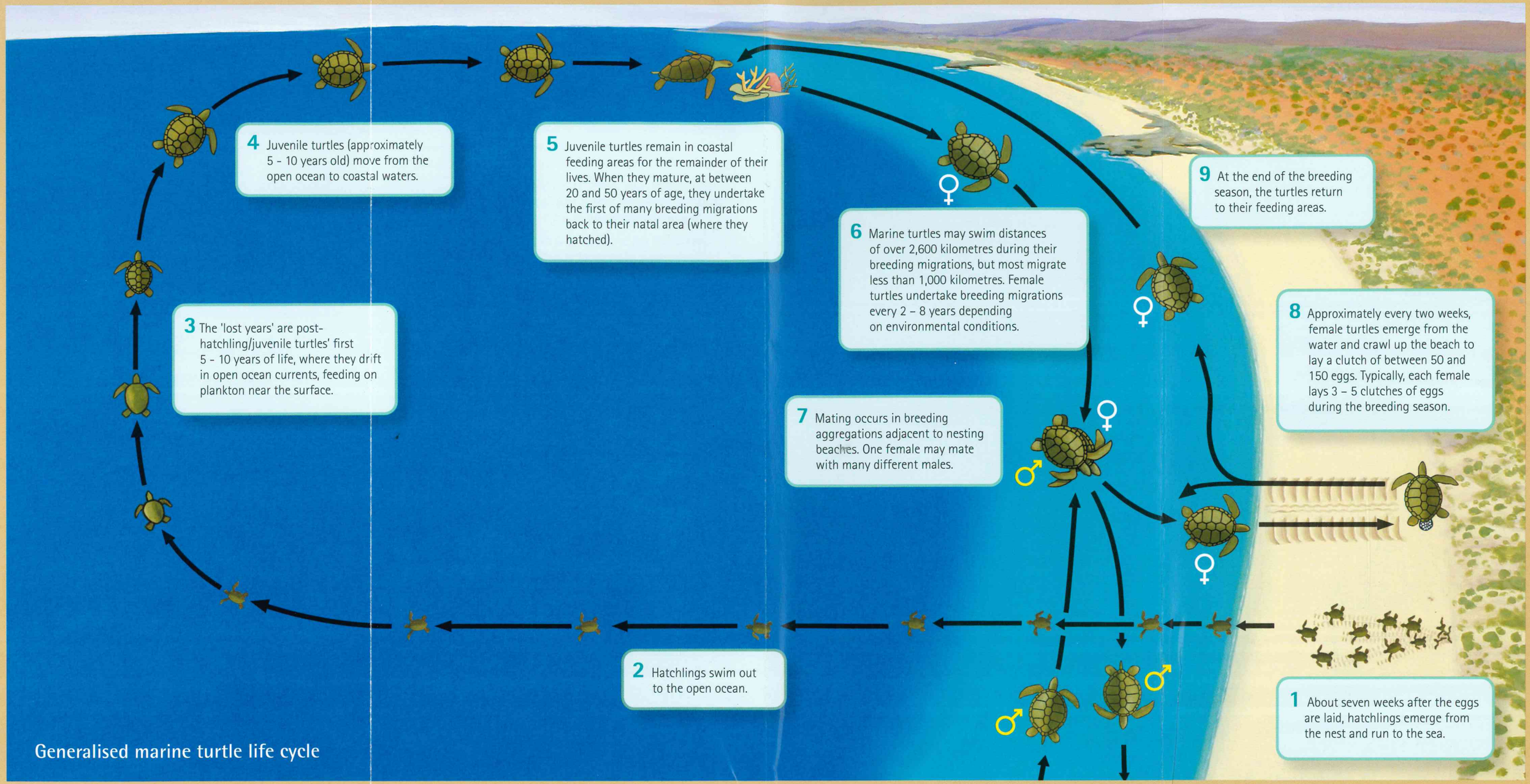
- Do not touch or handle hatchlings.
- Let hatchlings make their own way to the water. Hatchlings imprint cues from their natal beach (where they hatch) that enable them to return years later to mate and nest. It is important not to interfere with this imprinting process.
- Do not use lights or flash photography – this will disorientate hatchlings, making them more prone to exhaustion.
- Stand at least 1m away from the nest to avoid compacting the sand as other hatchlings may still be in the nest waiting to emerge.
- Hatchlings can get stuck in footprints, so stand to the side and avoid getting between hatchlings and the ocean.
- If hatchlings suddenly appear around your feet, stand still and keep any lights turned off until they have all moved away.
- Avoid driving on beach – hatchlings can get stuck in wheel ruts.

Indigenous use of turtles

Marine turtles have cultural, spiritual and economic importance, and feature in many stories, ceremonies, traditions and contemporary activities of coastal Aboriginal Australians. The hunting of marine turtles has traditionally been managed through customary law, with rules dictating those allowed to hunt, process, apportion and eat the catch.

In Western Australia, Aboriginal people, whose diet traditionally included marine turtles and their eggs, may continue to hunt and collect them as a food source for their families. Government agencies, non-government organisations and community groups actively work with Aboriginal people to ensure traditional use of marine turtles is managed at sustainable levels.

Aboriginal rangers undertake research and monitoring of marine turtles in their sea country to provide further science to complement their traditional knowledge.



Generalised marine turtle life cycle