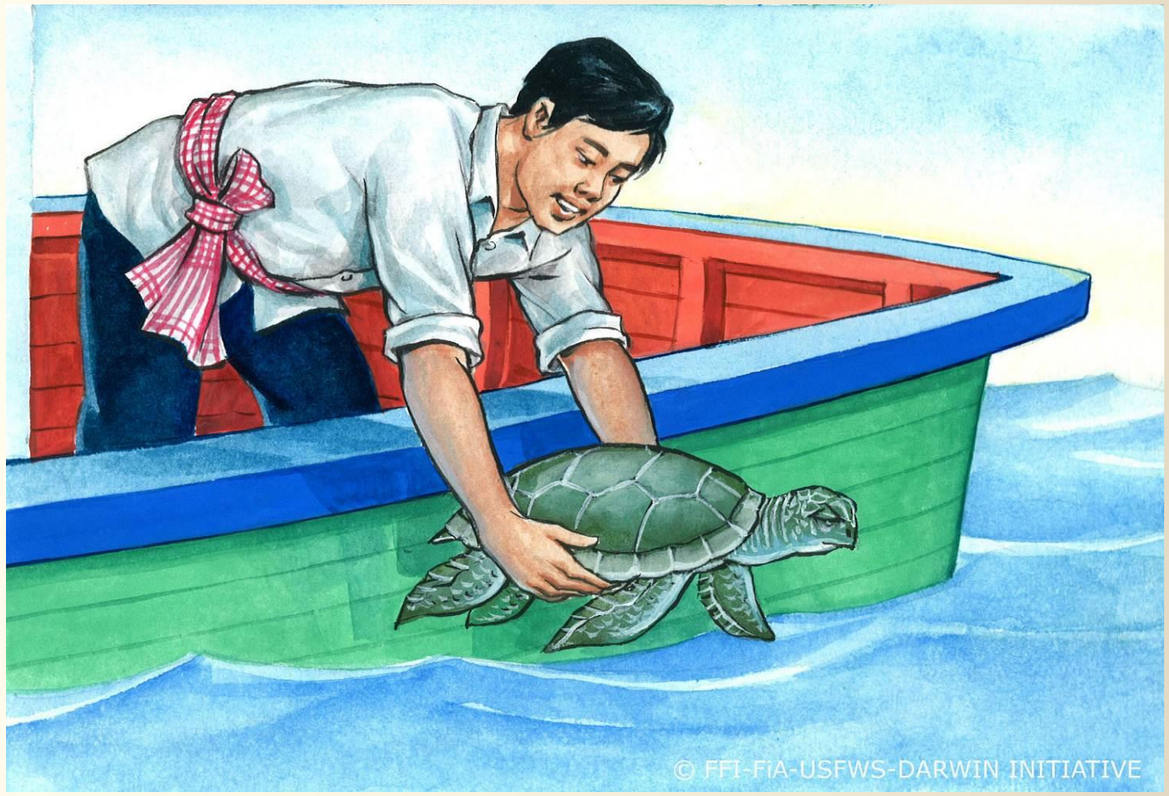
Thank you for helping us to conserve Sea Turtles!

Sea Turtle By-Catch Reduction, Safe Handling & Release Manual



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INTRODUCTION

Cambodia's waters support a rich and abundant marine life including coral reefs, seagrass meadows, extensive mangrove forests and key species such as sea turtles. Five species of turtle have been recorded in Cambodia, under threat of extinction - the Critically Endangered hawksbill and leatherback, Endangered green turtle and Olive Ridley (Vulnerable). Based on Sub-Decree N. 123, dated 12 August 2009, these species are identified as Endagered Fisheries Resource.

This manual has been created to provide useful recommendations to fishers to help to reduce the number of sea turtles that are accidentally caught along the Cambodian coast. Hooks, nets and illegal inshore trawling remain the primary fishing techniques implicated in the turtle by-catch incidents in the area, but there have also been multiple cases of entanglement in plastic waste or discarded fishing gear.

This publication is a partnership initiative of Fisheries Administration (FiA) of the Ministry of Agriculture, Forestry and Fisheries and Fauna & Flora International (FFI).

In 2010, FiA and FFI carried out a rapid coast-wide assessment of sea turtle nesting.. Since 2011, FFI and FiA have implemented site specific interventions to conserve sea turtle populations in the Koh Rong Archipelago. Provincial consultations in 2015 also highlighted significant threats from by-catch, particularly from trawling, gill nets and stingray hooks

We help to teach fishermen how to rescue and safely release turtles found accidentally caught in fishing gear. Such efforts show that fishermen play an important role in marine turtle conservation. We continue to create education and awareness opportunities among such communities.

Looking to the future – FFI and FiA are taking national and community-based actions to protect sea turtles and their foraging grounds along Cambodia’s coast. An over-arching vision and holistic approach is needed to scale-up efforts to protect sea turtles and their habitats throughout Cambodia. Now FiA, community fisheries and environmental NGOs are developing a 10-year National Action Plan for Marine Turtles.

Law and Regulations Related to Sea Turtle Protection and Conservation

1 Law on Fisheries (2006)

2 Sub-decree on Identification of Endangered Fisheries Resource (2009)

3 Proclamation on Protected Measure on Endangered Fisheries Resource (2010)

1, Law on Fisheries

The Law on Fisheries aims to ensure fisheries and fisheries resources management, enhance aquaculture development, production and processing, promote livelihood of people in local communities for the social-economic and environmental benefits, including the conservation of biodiversity and natural culture heritages for sustainability in the Kingdom of Cambodia.

Some articles related to protection of endangered fisheries respurces as follows:

- Fisheries Management Areas comprising inter alia, rapids, deep pools located in rivers, Tonle Sap great lake, lakes, inundated forests, islands, seagrass areas, coral reef area, and mangrove forests which are important for fisheries resources sustainability shall be classified as Fisheries Resources Protected and Conservation Areas. (Article 18) Shall be prohibited:

- Any fishing activities in the fisheries conservation areas, except special permission by the Minister of Agriculture Forestry and Fisheries for research purpose of the Fishery Administration, shall be prohibited (Article 19).

- Electrocuted fishing gear, explosive, explosive stuff or all kind of poison shall be absolutely prohibited in the fishery domain by using the following gears (Article 19)

- Transporting, processing, buying, selling, and stocking endangered fishery resources are permitted under permission

- Trawling in the inshore fisheries area (<20m) shall be forbidden, except for permission from the Ministry of Agriculture, Forestry and Fisheries at the request of the Fisheries Administration to conduct scientific and technical researches (Article 49)

- No fishing vessel with trawl fishing gear and motorized Short-necked clam scraper shall be allowed in the inshore fisheries area unless the gear is stored in a manner that it is not readily available for fishing or is allowed as stated in the article 49 of this law (Article 50)

Shall be prohibited:

- Fishing or any form of exploitation which damages or disturbs the growth of seagrass or coral reef population shall be prohibited (Article 52)
- Catching, selling, buying, transporting, collecting of fisheries products and stocking all types of endangered fisheries products shall be subject to a transactional fine by the Fishery Administration in cash from twice to three times on the market price of the obvious evidence while all evidence shall be returned to the owner. Whoever committing fishery offense as stipulated in this article twice and over shall be fined double cost of this article by the Fishery Administration and the obvious evidence shall be seized as state property (Article 92)

- Fishing with electrocuted fishing gears, explosive and all kinds of poisonous substances in the fisheries domain shall be penalized under the fisheries offences class 1 by imprisoning from three to five years and all evidences confiscated for state property or destroyed (Article 98)

2. **Sub-decree on Identification of Endangered Fisheries Resource**

This Sub-Decree determines the inland and marine fisheries and fisheries products of endangered fisheries resource in the Kingdom of Cambodia for sustainable protection, management and conservation in accordance with the law on fisherie. Seaturtles are classified as Endangered Fisheries Species.

3 Proclamation on Protected Measure on Endangered Fisheries Resource

The Proclamation is to define the measures to protect endangered fishery resources in the Kingdom of Cambodia in order to protect, conserve and restore these resources sustainably.

- In order to effectively implement this proclamation, the Fisheries Administration has the following roles and responsibilities *inter alia*:

- Conduct research on endangered fishery species, abundance and status and its habitat in order to take effective measures for protection, conservation and rehabilitation
- Identify area of natural range, prepare and implement protection and conservation plan and rehabilitate an endangered fishery species
- Set up a number of rescue centers for rescue, care and scientific research on an endangered fishery species
- By all means, widely disseminate an endangered fishery product in order to get local people's participation in protection and conservation work
- Study, research, identify and assess types of fishery product to get baseline to adjust the table on an endangered fishery species based on necessity
- Monitor export, import and transport of aquaculture of exotic and invasive fishery species (Article 2)

- Catching, selling, buying, transporting, collecting, processing and stocking all type of endangered fishery resources from natural water for scientific research purposes shall be permitted by the Director general of the Fisheries Administration (Article 3)

- In case of accidentally catching the endangered fishery product, fishermen must release them urgently back into natural water range without any conditions and shall not make harm or kill them and report to fishery competence or follow instruction of fishery officials. In case of finding dead animals or carcasses, fishermen shall immediately inform or provide dead animals or carcasses to fishery officials (Article 5)

- Person who shall be found of causing harm to endangered fishery product, shall be penalized under the Article 98 of the Law on Fisheries (Article 6)

IMPORTANCE OF SEA TURTLES

Sea turtles play an important role in ocean ecosystems by maintaining healthy sea grass beds and coral reefs, helping to balance marine food webs and facilitating nutrient cycling from water to land. They help keep the ocean healthy, which secures our food source, and creates jobs and income for many people who depend on the fishing industry.
Sea turtles, especially green sea turtles, are one of the very few animals to eat sea grass. Sea grass needs to be constantly cut short to be healthy and help it grow across the sea floor. In turn, the seagrass seed is spread, which makes the seagrass bed a bigger habitat for other species as fishing, crab, shrimp, and squid. Hawksbill turtles help coral reef ecosystems by eating sponges - one turtle can consume over 1,000 pounds (454kg) of sponges/ year. Without the turtles, sponges can overgrow coral and suffocate reefs – which are the best habitat for fish and other species. Sea turtles also attract many tourists from all over the world to the Cambodian beaches through ecotourism and diving. Loggerhead, Green, Hawksbill and Olive Ridley turtles help the ecosystem by eating jelly fish. If jelly fish populations are not controlled, they would be detrimental to the recovery of fish stocks (since jellyfish prey on fish eggs and larvae).

Turtles in Cambodian culture

Returning animals back into the wild is a common Buddhist tradition; a previous incarnation of Buddha was believed to be a turtle. In Cambodia, it is believed that if people release a turtle back to the sea it will bring them good luck. And like the turtle who can live up to more than 80 years plus – they too will have a long life if they release turtles back into the wild. Furthermore, some believe it is a sin to kill turtles because the turtle was the Buddha's method of transport.

THREATS TO SEA TURTLES

The natural obstacles faced by young and adult sea turtles are numerous, but it is the increasing threats caused by humans that are causing global declines, and in some cases local extinction.

In Cambodia, the key threats to sea turtles have been identified as:

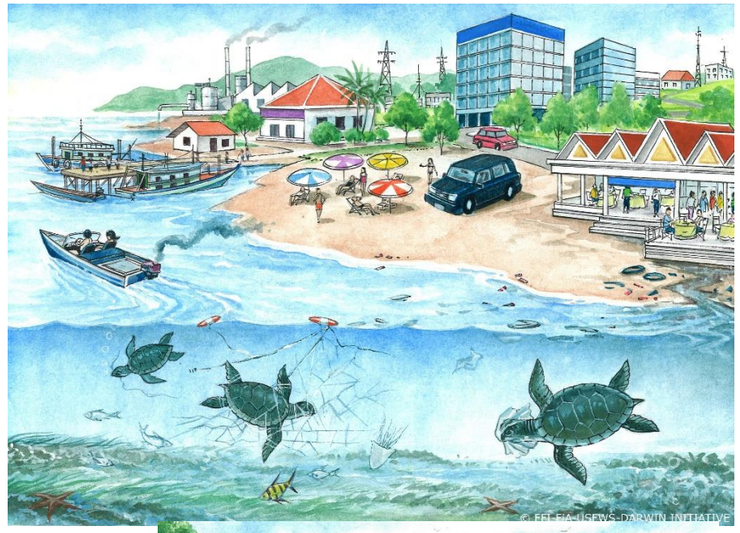
- accidental by-catch (by both local fishers and commercial fisheries)
- coastal development
- destructive fishing practices (inc. dynamite fishing)
- turtles being killed for their meat and shells
- entanglement in discarded fishing gear and ingestion of plastic debris
- (historic) collection of their eggs

Natural threats

Natural threats always happen when female turtles lay their eggs - and their eggs and hatchlings can be eaten by dogs, weasels, birds, crabs, grouper, snapper, rockfish, and barracuda.

Human threats

Human activities threaten sea turtle populations through beach development, habitat declaration, pollution, egg collection, meat eating and fishing practices.



Fishing

Globally thousands of turtles are killed each year from by-catch in trawling boats where they become caught and are unable to escape. In Cambodia, sea turtles are also accidentally caught in hooks and gill nets, which can result in injury and death.

HOW TO REDUCE BY-CATCH

The single greatest threat to most sea turtles is entanglement in fishing gear. Globally hundreds of thousands of turtles are accidentally caught by gillnets, shrimp trawl nets and on longline hooks each year. This book aims help fishermen to reduce the incidences of turtle by-catch. These are the key ways to reduce by-catch:

- Don’t go fishing in sea turtle habitat: seagrass beds or near coral reefs.
- Respect the Fishery Law and don’t trawl in shallow waters
- Try to keep trawl tow time to less than 40mn and check for by-catch in between tows
- Industrial vessels should be fitted with turtle excluding devices where possible

How to reduce by-catch from hooks

Longlining is a commercial fishing method commonly targeting swordfish, tuna and halibut, where hundreds or thousands of baited hooks hang at intervals along a single fishing line. The hooks (commonly called “J hooks”) cause problems for marine turtles when swallowed, usually resulting in death. Long line using ray and horizontal hooks can catch turtles accidently.

By-catch can be reduced by:

- Fishing to a family scale, or traditional community fishing, using only a single fishing gear/family.
- Changing the type of hook use from J to circle hook. These "circle" hooks are much less likely to be swallowed by turtles than traditional J-shaped hooks, which cause suffocation or internal bleeding when swallowed.
- Changing the bait from squid to small fish.
- Reducing the number of hooks.
- Following safe handling release guidelines to release sea turtles.
- (If possible) – if you have caught a turtle that you don’t know how to help, contact your local fishing authority.

How to reduce by-catch from gill nets

HOW YOU CAN HELP SEA TURTLES

1- Read and follow the Cambodian Fisheries Law 1 2 3
2- Read the Sea Turtle By-Catch Reduction, Safe Handling & Release Manual
3- Attend training for Sea Turtle By-Catch Reduction, Safe Handling & Release techniques
4- If a healthy turtle is accidentally caught, release it safely.
5- Clean up rubbish in your community. Sea turtles can become tangled in plastic and trash both on the shore and in the water.
6- Do not drain old oil, and throw plastic, waste, and old nets into the sea – which can poison or en-tangle the turtle. Sometime the turtle eats plastic because they think it is jelly fish
7- Don’t disturb sea turtle nesting area.
8- Report sea turtle activity. If you see any sea turtle activity, report i to FiA as soon as possible.
9- Do not kill sea turtles for meat or for trade.
10- Don't buy products which have been made from sea turtle parts. .
11- Avoid fishing in the conservation zone.
12- Report illegal fishing activities to local authorities.
13- Share conservation information with your family, friends and neighbours

Gillnets are mesh nets that allow fish to pass their heads and gill coverings through a hole in the mesh and then get stuck when they try to back out. They can be several miles long and up to 100 feet deep. Bycatch occurs because the nets also trap everything larger than the net's mesh, which includes juvenile fish, sharks, seabirds, marine turtles and cetaceans (whales, dolphins, porpoises). The nets are very hard to see, blending in perfectly with the water and difficult for cetaceans to detect by echolocation. Gillnets that are lost at sea are rarely recovered and can continue to capture marine animals for many years.

By-catch can be reduced by:

- Adopting fishery law (xx size….)
- Using tie downs to allow turtles to escape more easily.

- Following safe handling release guidelines to release sea turtles.
- (If possible) – if you have caught a turtle that you don't know how to help, contact your local fishing authority.
- Always try to recover gill nets and dispose of damaged nets properly- discarding gill nets at sea can catch many marine animals, including turtles.

How to reduce by-catch from trawlers

With trawling, boats drag large nets along the seabed, catching almost everything in their path. They can damage coral reefs aand seagrass beds and at shallow depths, and catch marine turtles.

By-catch can be reduced by:

- Not trawling in coral reef or seagrass habitat.
- Trawling at depths of 20m or more.
- Shortening time the net is underwater (ideally less than 40min) to prevent sea turtles from drowning.
- Using of turtle excluder devices (TEDs), which allow marine turtles to safely escape from the nets
- Following safe handling release guidelines to release sea turtles.
- (If possible) – if you have caught a turtle that you don't know how to help, contact your local fishing authority.

HOW TO RELEASE SEA TURTLES THAT HAVE BEEN CAUGHT IN FISHING GEAR

When the turtle is caught in hooks

Scan the main line as far ahead as possible in order to sight turtles in advance. Immediately upon sighting the turtle:

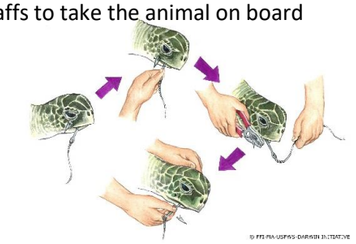
- Reduce both vessel and main line reel speed
- Steer the vessel towards the turtle
- Minimise tension on both the main line and the branch line with the turtle
- Once the branch line containing the turtle is in your hands, put the engine in neutral and pull in the turtle manually until it is brought alongside the vessel.

If the turtle is too large to bring on board:

- Stop the vessel
- If entangled, remove the line to release the turtle
- If hooked, and if the hook is visible, cut the line as close to the eye of the hook as possible
- If hooked internally, cut the line as close to the beak as possible
- Check that the turtle has swam safely away before starting up the vessel

If the turtle can be taken on board:

- Use a dip net or hold the turtle by the side of its carapace or by the flippers.
- Do not use the line to which the turtle is hooked, any sharp objects or gaffs to take the animal on board

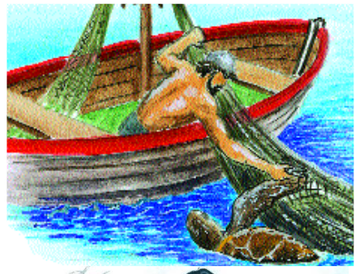


When the turtle is caught in a gill net

- Scan the net as far ahead as possible to spot turtles as early as possible
- Immediately upon sighting the turtle, reduce the speed of the net reel and carefully pull in the net

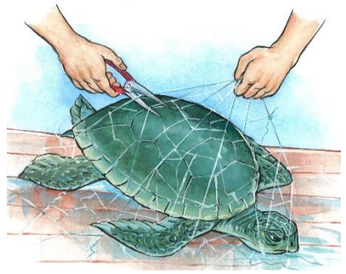
If the turtle is too large to bring on board

- Stop the vessel
- Minimise the tension of the net and carefully remove the entangled turtle. If necessary use clippers to cut the net
- Check that the turtle has swam away safely before starting up the vessel



If the turtle can be taken on board

- Carefully set the turtle free from the net. If necessary use clippers to cut the net
- Hold the turtle by the side of the carapace or by the flippers.
- Do not use any sharp objects or gaffs to retrieve it

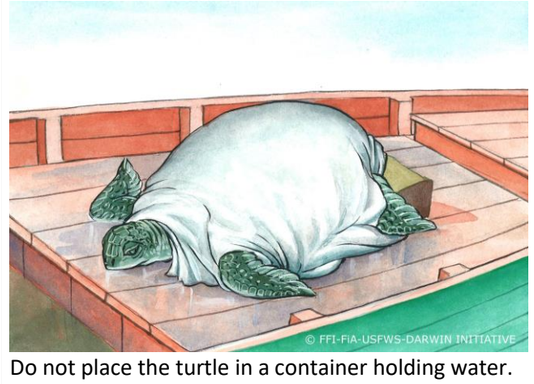


When the turtle is caught in a trawler net

- Once the net is on board, try to spot the turtle in the terminal bag
- Always put the trawl down on the deck before opening and emptying it
- Separate the turtle from the rest of the catch and by-catch

TURTLE HEALTH ASSESSMENT

In order to assess the turtle's condition it is possible to use some techniques which allow the caught animal to be classified as healthy, injured, not active, or dead.

CONDITION	BEHAVIOUR	WHAT TO DO
HEALTHY	• The turtle lifts its head strongly when breathing. • When a flipper is pulled there is a strong withdrawal reaction. • When placed on solid ground, such as a floor, the turtle attempts to make crawling movements. • When the turtle is lifted, it moves as if swimming and it holds its limbs and head above the plane of the ventral surface of its body.	Return the turtle gently to the sea, head first vertically, over the stern of the boat: • with vessel in neutral gear • with the net not trawling • without dropping the turtle on the deck. 
INJURED	• The movements are very erratic or spasmodic and non-directional appearing uncontrolled. • When a flipper is pulled or pressure is applied on the neck, there is only a weak or absent withdrawal reaction. • When the turtle is lifted, it does not move and its limbs and head are held below the plane, of the ventral surface of the body • If the turtle reacts, even with a slight response, to at least one of the recovery techniques	If possible, contact your local fisheries authority. If you can't contact your local authority, return the turtle gently to the sea, head first vertically, over the stern of the boat: • with vessel in neutral gear • with the net not trawling • without dropping the turtle on the deck.
NOT ACTIVE	• Recovery techniques do not produce any response: When a flipper is pulled or pressure is applied on the neck, there is no withdrawal reaction No attempt is made by the turtle to move on solid ground such as a floor. 	Keep the turtle on board and: • place the turtle in a shady and un-obstructed place • raise the hindquarters of the turtle about 20cm off the deck • keep it damp using a water-soaked towel.  Do not place the turtle in a container holding water. • repeat the recovery techniques every two hours until the turtle responds to at least one of them, for up to 24 hours • if the turtle reacts only one recovery technique, it can be considered INJURED. Leave it on board for a few hours, then follow the suggestions for WHAT TO DO with an INJURED turtle. • if there is no response or if the response is undetectable, after 24 hours the turtle can be considered DEAD
DEAD	If you find a turtle with flesh that has begun to	• The best thing to do is to bring the turtle into the harbour,

	rot and that stinks, it means that it is surely dead.	store it in a freezer, and then give it to your local Fisheries Authority. Leave any entangled hooks or line in place. • Need to call to Fisheries officer or hot line number to seek advice. Please don't eat them because it is very dangerous to your health •

SAFE TURTLE TRANSPORTATION

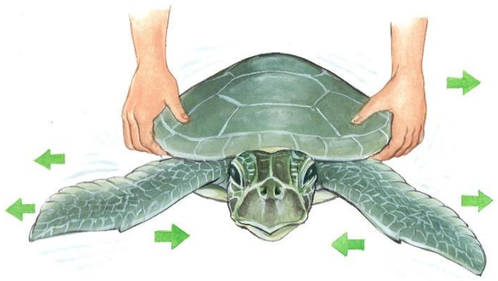
If you need to transport a turtle:

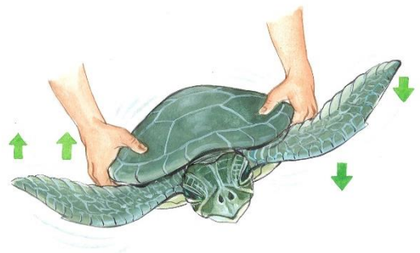
- Cover turtle with a damp towel, and cool frequently.
- Do not put them onto their back unless absolutely necessary.
- If possible keep the turtle in shade.
- Do not store the turtle in the ballast water of the boat- it is dirty and hot.
- Try to have minimal contact with the turtle to avoid distress.

RECOVERY TECHNIQUES FOR NON-TURTLES

Recommendation when using

- While applying the techniques, observe the turtle closely and carefully handle it without injuring or damaging it.
- Techniques can be used quickly but only twice in succession.
- In case of uncertainty of response, a second attempt can be made 10 minutes after the first one.
- Repeat the recovery techniques every two hours until the turtle responds to at least one of them, for up to 24 hours.





ACTIVE

techniques

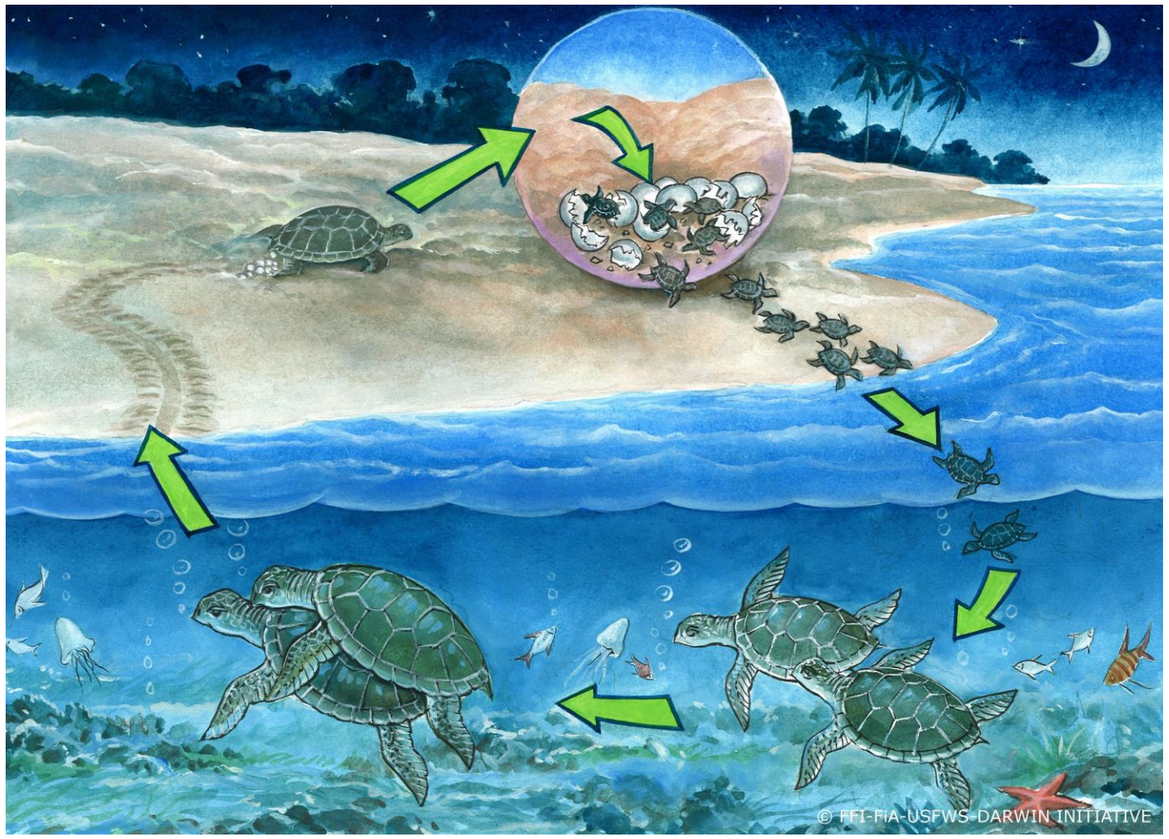
Resuscitation

Holding the turtle by the side of the carapace, lift one side about 10cm then lift the other side and rock it gently form left to right and right to left.

Eye reflex

When you lightly touch the eye or the upper eyelid with your finger, the animal exhibits a flinch response closing its eyes.

LIFECYCLE OF SEA TURTLES

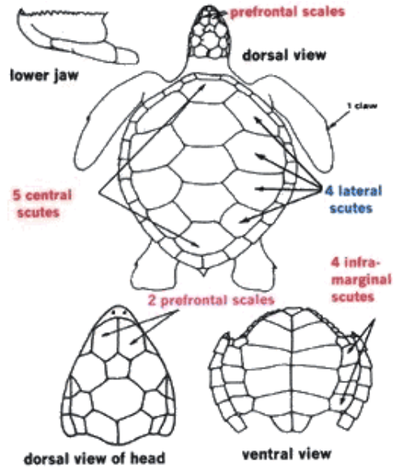


TURTLE IDENTIFICATION

Five species of marine turtles have been recorded in Cambodia are under threats of extinction: hawksbill and leatherback (Critically Endangered); green turtle and loggerhead (Endangered) and Olive Ridley (Vulnerable). This species all have been recorded in Cambodia as in the list of the endangered species.

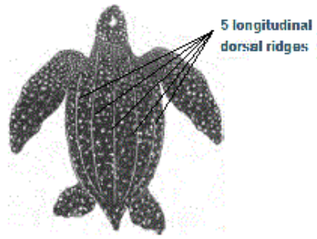
Four of these five species look similar, so this guide will help you identify the different turtles.

Green Turtle



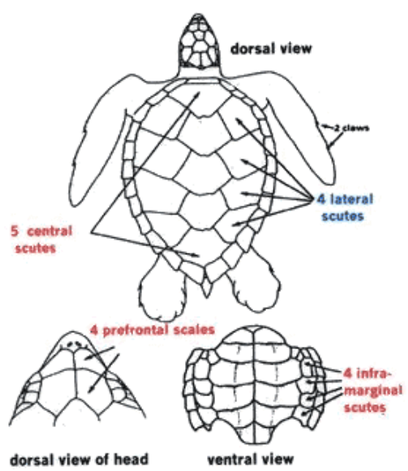
- Smooth oval shell
- Brown/yellow greenish color
- 4 pairs of lateral scutes
- 5 central scutes
- 2 prefrontal scales
- Serrated lower jaw

Leatherback Turtle



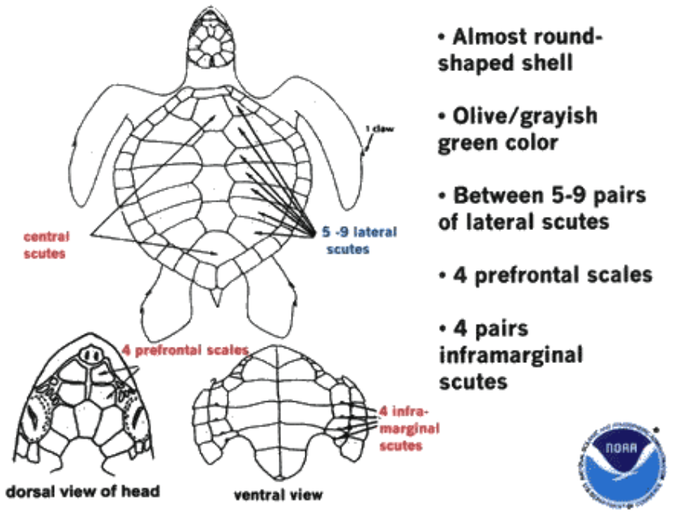
- Leathery, no scutes;
- Longitudinal dorsal ridges
- Dark gray / black with white spots
- Plastron white with dark blotches

Hawksbill Turtle



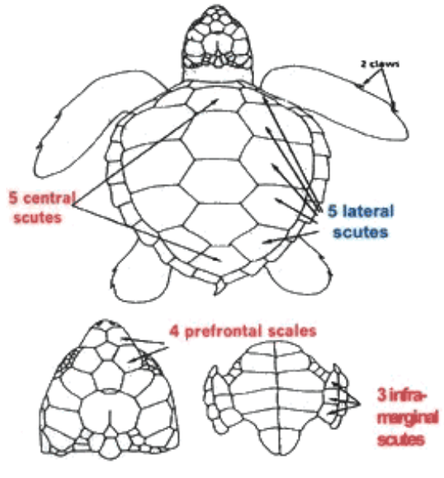
- Overlapping scutes
- Narrow shell
- Hawk-like beak
- 4 pairs of lateral scutes
- 5 central scutes
- 4 prefrontal scales

Olive Ridley Turtle



- Almost round-shaped shell
- Olive/grayish green color
- Between 5-9 pairs of lateral scutes
- 4 prefrontal scales
- 4 pairs inframarginal scutes

Loggerhead Turtle



- Heart shaped shell
- Reddish/orange color
- 5 pairs of lateral scutes
- 5 central scutes
- 4 prefrontal scales
- 3 inframarginal scutes