

**Title: Safe Handling & release for Gillnet Fisheries for Whale Shark, Manta & Devil Rays and Sea Turtles.**

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**Abstract:** Pakistan is an important gillnet coastal state with the well know marine biodiversity. Around 709 tuna fishing vessels are operating in Pakistani waters. These boats have high of ETP/ CITES-listed bycatch species such as whale shark, mobulids and sea turtles. these bycatch animals protected by several national and international instruments and encouraged their safe releases to ensure the survivability of these protected species. the data of the crew-based observer programme help into the development of guidebook for safe handling and release of these bycatch species in tuna gillnet fisheries. This guidebook focuses on three main possible levels of entanglement of animals in fishing operations. It follows and guides the target group to follow 'key' of different precautionary and handling and steps for every situation. The guidebook also encourages the user for the collection of the information and reporting of the entangled animal including the recording of the whole process of operation. This guidebook can be served and adopted by conservation institutes and organization as best practices of safe handling and release of bycatch animals in ghost nets/ gillnet fisheries.

**Background**

In Pakistan, there are around 709<sup>1</sup> wooden gillnet vessels primarily targeting tuna and tuna-like species operating within the Exclusive Economic Zone. These vessels target yellowfin and skipjack tuna but also catch neritic tunas, such as longtail, kawakawa, frigate and bullet tuna. The gillnet fisheries have high bycatch as it is not very selective, however, species composition varies from the area of operations. Bycatch of sea turtles, whale sharks and mobulid rays are extremely common<sup>2</sup>. These bycatch species are considered as endangered, threatened and protected (ETP) in addition to being listed under Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Laws.

The Indian Ocean Tuna Commission (IOTC) resolution 12/04<sup>3</sup> on the conservation of marine turtle identifies the need for safe handling and release, in addition to resolution 13/05<sup>4</sup> and 19/03<sup>5</sup> on whale sharks and mobulids also calls for action on releasing alive, having non-retention measures and ensuring the safe release of these species. While all target catches are retained including bycatch of sharks, other species such as cetaceans, sea turtles, sunfish, sea snakes are discarded back into the sea<sup>6</sup>. Pakistani waters are well known for its rich marine biodiversity and comprise of around 134 species of shark and rays, 19 species of cetaceans and five species of sea turtles.

In this regard, WWF has trained fishers for data collection which has been pivotal in outlining methods for ensuring safe handling and release of whale sharks, sea turtles and mobulids rays.

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<sup>1</sup> IOTC-2019-SC22-NR20

<sup>2</sup> Moazzam, M., 2012. Status report on bycatch of tuna gillnet operations in Pakistan. IOTC-2012-WPEB08-13

<sup>3</sup> Resolution 12/04 on the conservation of marine turtles

<sup>4</sup> Resolution 13/05 on the conservation of whale sharks

<sup>5</sup> Resolution 19/03 on the conservation of mobulid rays

<sup>6</sup> Moazzam, M., Nawaz, R., By-catch of tuna gillnet fisheries of Pakistan: a serious threat to non-target, endangered and threatened species. J. Mar. Biol. Ass. India, 56(1), 85-90, January- June 2014.

## **Methodology**

WWF-Pakistan initiated the crew-based observer program, which is inviting skippers or captains of the gillnet vessel to record data<sup>7</sup>. WWF-Pakistan trained skippers for the data collection and monitoring of target catch and bycatch in tuna gillnet fisheries in Pakistan. The skippers followed a data log sheet for recording all their fishing/non-fishing activities such as sailing toward the fishing/ port and / engine repair, recording of the sighting of megafauna and oceanographic conditions. The observers were provided with handheld cameras for capturing photographic evidence of the target catch and bycatch species. The entanglement of the bycatch species such as whale shark, mobulids, and sea turtles was recorded into the cameras of all events. All the datasheet and photographic evidence were reported back to WWF-Pakistan office right after return from each fishing trip. The films of the handling and releases from observers were analysed to sensitise the fisher about the safe handling and releases of the ETP/ CITES-listed species. Ultimately, the need for guidebook was realized for the best practices in gillnet fisheries to be developed in communication with fishers.

## **Approach**

The recorded films from the observers about the handling and releases of animals helped indicate the challenges associated onboard fishing vessels. During the consultation with fishers, it was broadly identified that most of the animals were either, a) entangled completely with full body in the gillnet, b) half-body or c) partially/ tail entangled into the gillnet during fishing operations. In this manner, the stepwise approach was developed in addition to explaining each step in detail using a flow chart to allow and guide the fishers to follow guidelines. The illustration of each step and the possible level of entanglement is demonstrated for the better and easy understandings of the situations. The guidebook also focuses on the collection of the information, which are illustrated at the end of each step for different circumstances for each animal. The guidebook was designed and developed by considering i) the safety of the crew as the utmost priority during the handling and release operations, ii) all three steps of the possible entanglement of the animals in the ghost nets/ gillnets including the situation of the entanglement of small animals, iii) as 'read to follow and quick to react' for the targeted groups such as gillnet fishers, managers, divers/ tourists and law enforcement agencies such as coast guards and maritime patrolling teams, iv) support conservation organizations, scientific communities and fisheries departments for the collecting and reporting of the entanglement information of the animals and v) ensuring the conservation, safe handling and release of the ETP/ CITES-listed species back into the sea, and vi) what the target group should not do is provided as 'donts' for each section of the animal.

## **Discussion**

The crew-based observer programme of WWF-Pakistan has recognised by IOTC as alternative data collection mechanism in small scale tuna fisheries in the northern Indian Ocean. This established data collection and monitoring and reporting mechanism of observers had provided evidence of the entanglement and mortalities of the bycatches of species, It was found that marine ETP species such as sea turtles and cetaceans are frequently enmeshed during the tuna gillnet fishing operations, but most of them were either dead on hauling or mistreated resulting in their death. WWF-Pakistan started a programme to create awareness about the protection of these species by international binding, because of their dwelling populations globally. Additionally, the fishermen were motivated on the safe handling and releases of the entangled ETP/ CITES species in the gillnet operations. Ultimately, a training programme was started for the fishermen for safe handling and safe releases

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<sup>7</sup> IOTC-2018-WPDCS14-32

whale shark, mobulids and marine turtles. A tangible change in behaviour and practices has borne fruitful results. Since 2012, this has resulted in the form of safe releases of 110 whale sharks, 90 Mobulids, and thousands of sea turtle back into the sea.

Currently, the government's determination to address shark management, national fisheries legislation<sup>8</sup> now contains protection references covered under CITES and IOTC resolutions. This provides legal coverage to work towards the protection of ETP species including whale sharks and mobulids among and sea turtles among other ETP/ CITES-listed marine wildlife species. The safe releases of these animals caught in association with fisheries are encouraged by IOTC resolutions from fishing operations in the Indian ocean.

There was a need for developing a guidebook for best practices to avoid the mortality and ensure the survivability of the ETP/ CITES-listed marine species during tuna gillnet fishing operations. Ultimately, the present guidebook was developed to guide mainly the gillnet fisher communities and fisheries managers for the safe handling and release of the bycatch species. this guidebook was also focused for guiding the divers, coast guards and for tourists who could encounter entanglement in either fishing operations or the ghost nets in the sea.

### **Conclusion**

WWF believes that all the ETP / CITES-listed marine wildlife species need to be protected. The efforts should be done to ensuring the safe handling and release to increase the survivability of the bycatch species entangled in the fishing nets.

This guidebook, developed with the consultation of the fishermen and based on learning experiences, is practically adaptive to be used by the fishermen in the field. IOTC may evaluate the gaps in the guidebook and recommend its adaptation/ translation etc for gillnet fisheries in the Indian Ocean.

### **Acknowledgement**

We are thankful to the ABNJ tuna Project also known as “Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction” (ABNJ) for supporting the crew-based observer Program for data collection and monitoring in Pakistani waters. We are indebted to Shark Conservation Fund (SCF) for funding and enable us for developing this guidebook. We are also thankful to Mr. Ammar Khan for all the graphics and illustrations of this guidebook.

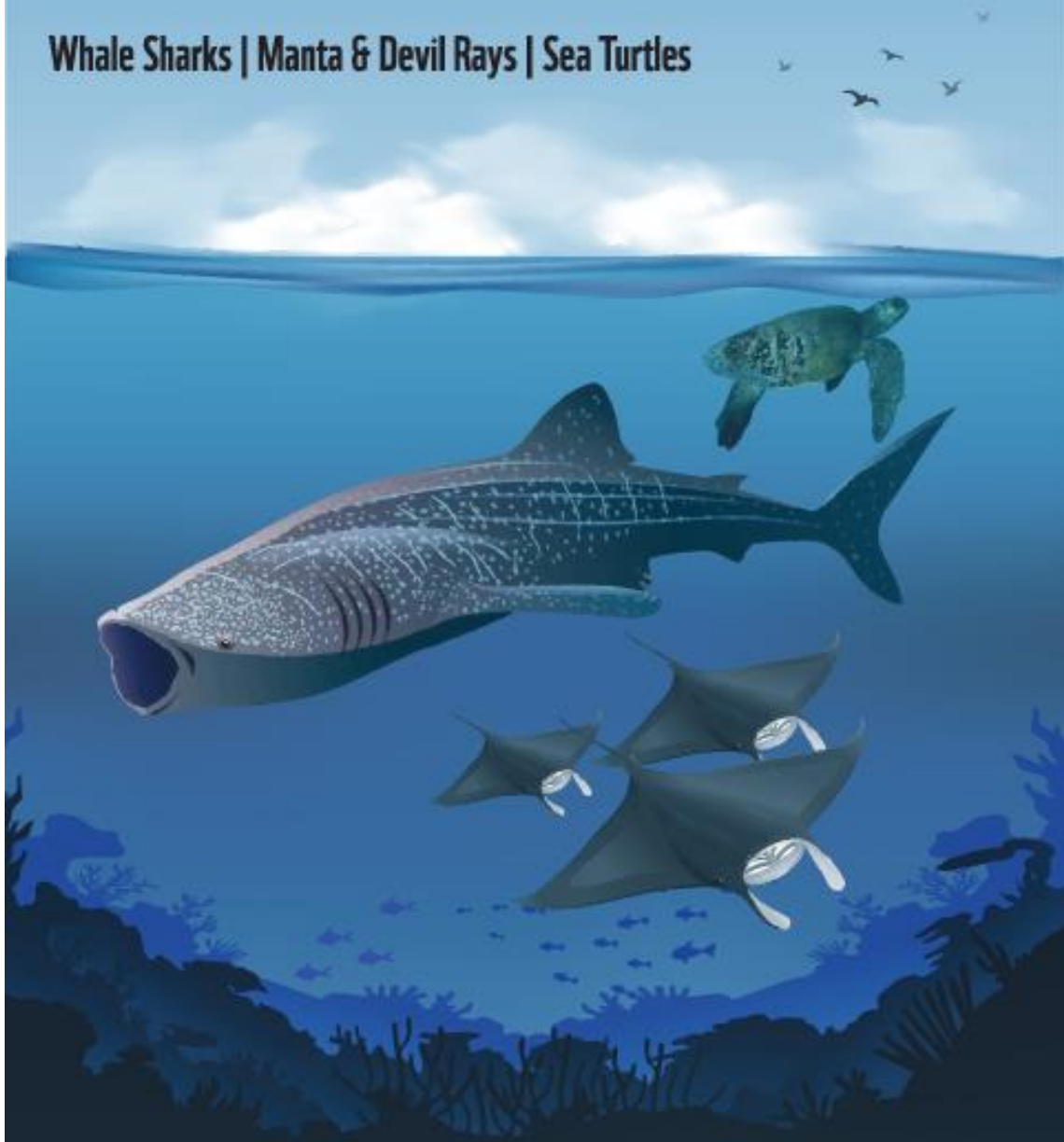
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<sup>8</sup> No. 5 (3) SO (FISH)/ L&F/ of the Sindh Fisheries ordinance 1980, & No: SO (Coord:) Fish/ 2-1/ 2013/ 3148-54 of the Balochistan Sea Fisheries Ordinance 1971



# Safe Handling & Release Guide for Gillnet Fisheries

**Whale Sharks | Manta & Devil Rays | Sea Turtles**



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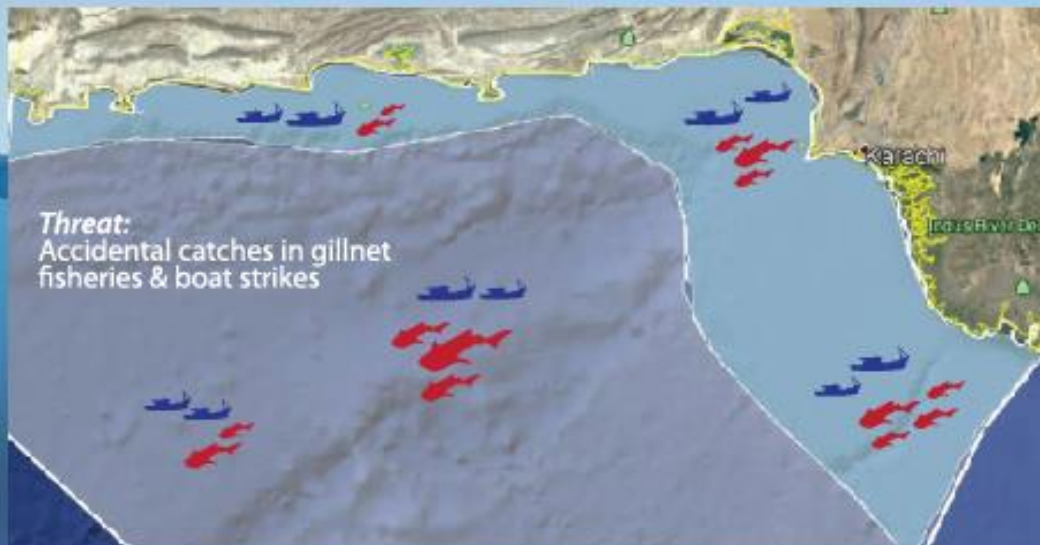
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# Guidelines for safe handling and release of Whale Sharks

## Whale Shark (*Rhincodon Typus*)



Diet: Planktons  
Population: Decline  
Protection: CITES, CMS - Appendix - II  
Pakistan: National Fisheries Laws



### How to use this guide?

Use the following flowcharts to learn how you can safely release entangled whale sharks from gillnets. Depending on the degree of entanglement and animal's size, different steps need to be followed. Remember that safety of the crew is most important – all steps in this guide will ensure safety of the crew as a priority.



## First Steps

Entangled whale shark found in gillnet.



Stop fishing operation.



Estimate the degree of entanglement, size of the whale shark, and position in the net. One crew member should film the release operation on his phone.



Large individual over 2 metres long.



Whole body entangled.



Go to  
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Image - 1



Half of the  
body  
entangled.



Go to  
Page - 5,  
Image - 2



Only tail  
entangled.



Go to  
Page - 7,  
Image - 3

Small, juvenile  
individual up to 2  
metres long.



Go to  
Page - 9,  
Image - 4

## Large whale shark (>2m) - whole body entangled

A fisherman should jump into the water to access the middle of the whale shark body, behind the head and near pectoral fins. It might be safe to hold on to the fishing gear between the winch / boat and the entangled whale shark.

Remember to avoid direct physical contact with the whale shark - stay at least 1 metre away from the whale shark.



Cut the fishing gear at the surface where the whale shark is entangled - start cutting near the pectoral fins and move towards the head. This would help to reduce the pressure on whale shark and minimize level of entanglement.



Keep pulling the net up and down to help the whale shark move forward and give it a chance to escape. This should help to release the whale shark especially if by now it's only partially entangled.



Whale shark is freed from the net and swims away safely.



Mark the GPS location



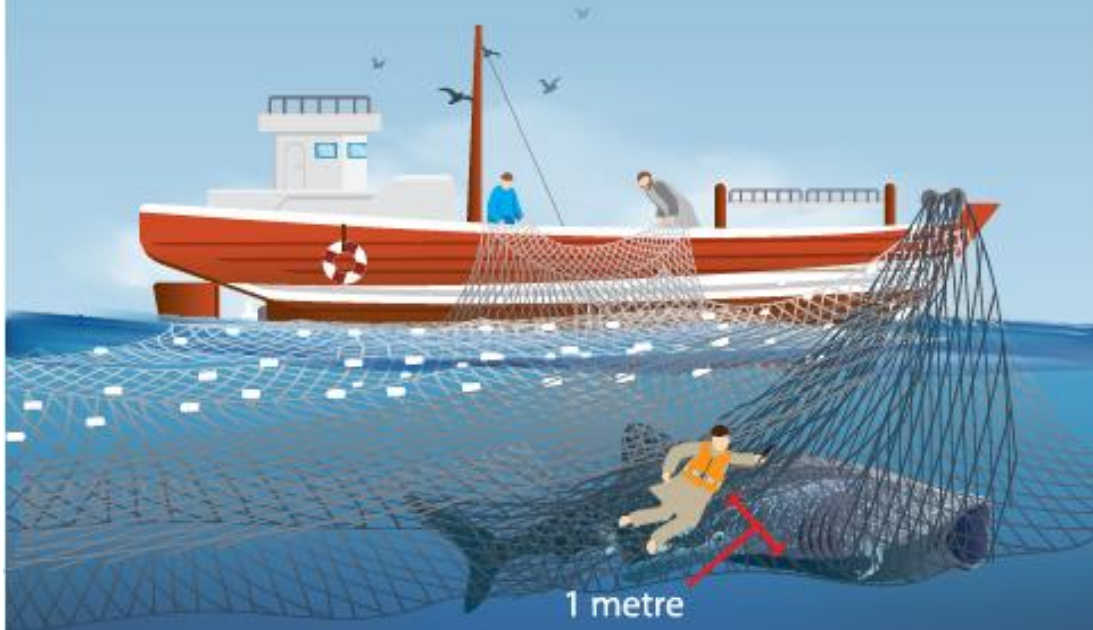
Note the size of the whale shark



Capture the process of release



Image-1  
Large whale shark (>2m) - whole body entangled



## Large whale shark (>2m) - half body entangled

Maneuver the ropes and net to release the whale shark - this will loosen the net and should allow the whale shark to escape.



Whale shark is freed from the net and swims away safely.

Lessening the rope / net is not helping and you cannot release the whale shark.



Mark the GPS location

Go to Page 3, Image - 1  
[same as whole body entangled].



Note the size of the whale shark



Capture the process of release

**Image-2**  
**Large whale shark (>2m) - half-body entangled**



## Large whale shark (>2m)- only tail entangled

Carefully haul the whale shark partially with the help of net hauler.



Cut the rope / net and watch out for the tail. It can flick its tail and accidentally causes injury to the crew trying to release the whale shark.



Whale shark is freed from the net and swims away safely.



Mark the GPS location



Note the size of the whale shark



Capture the process of release

Image-3  
Large whale shark (>2m)- only tail entangled



## Small whale shark (<2m)

Carefully haul the whale shark on-board to disentangle it on the deck. Make sure you do not heave / haul the whale shark through the net hauler and don't expose the animal to direct sunlight for long time.



Cut or maneuver the net / rope to disentangle the whale shark.



Carefully handle the disentangled whale shark - do not hold it by its tail, fins or gill slits as that can injure it.



Bring the whale shark to the gunwale and lower it as much as you can over the edge to release it back into the sea.



Whale shark is freed from the net and swims away safely.



Mark the GPS location



Note the size of the whale shark

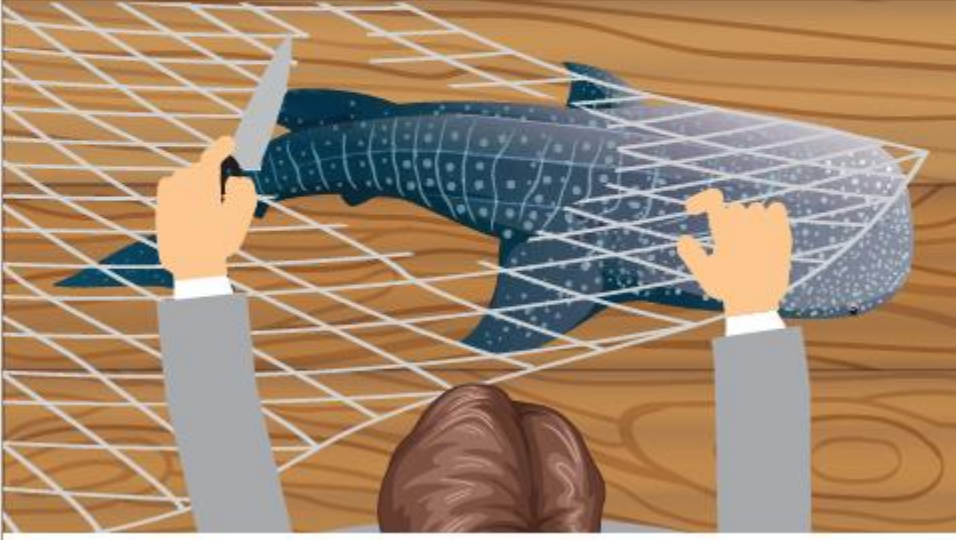


Capture the process of release

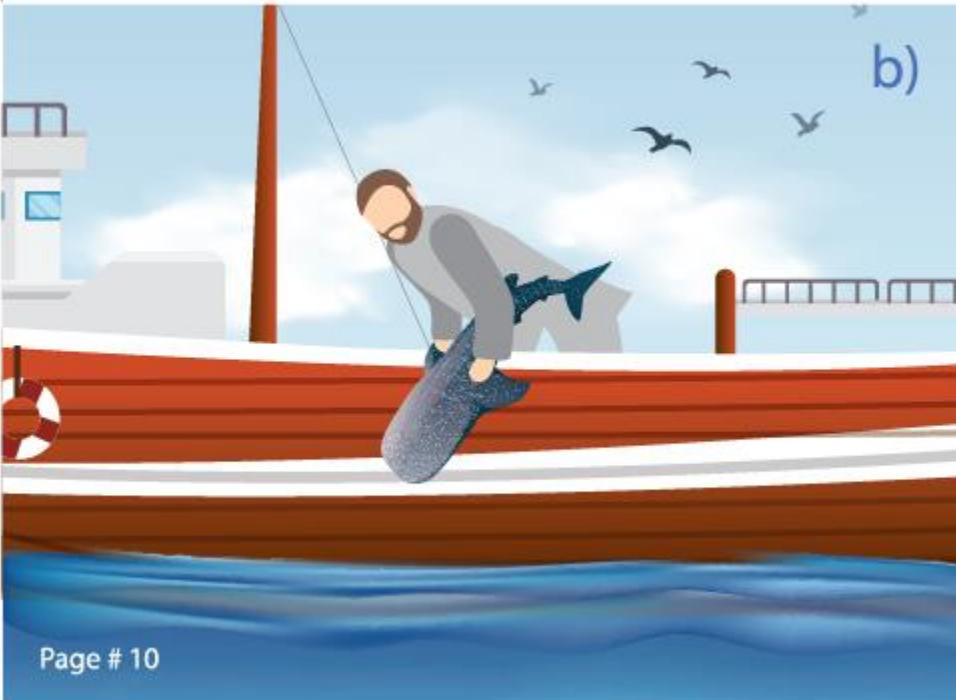


Image-4  
Small whale shark (<2m)

a)



b)



## Dont's



Do not handle the whale shark upside down vertically or by its tail.



Do not hold or handle the whale shark at or by inserting your hands in its gill slits.



Do not step on the small whale shark accidentally once it's on the deck. As juvenile whale sharks are very fragile, this could damage their internal organs and even lead to death.



Do not leave the whale shark on the deck exposed to sun light for a long time. Release the animal as soon as possible.

## Guidelines for safe handling and release of Mobulids

### Mobulids-Manta and Devil Rays (Mobulidae)

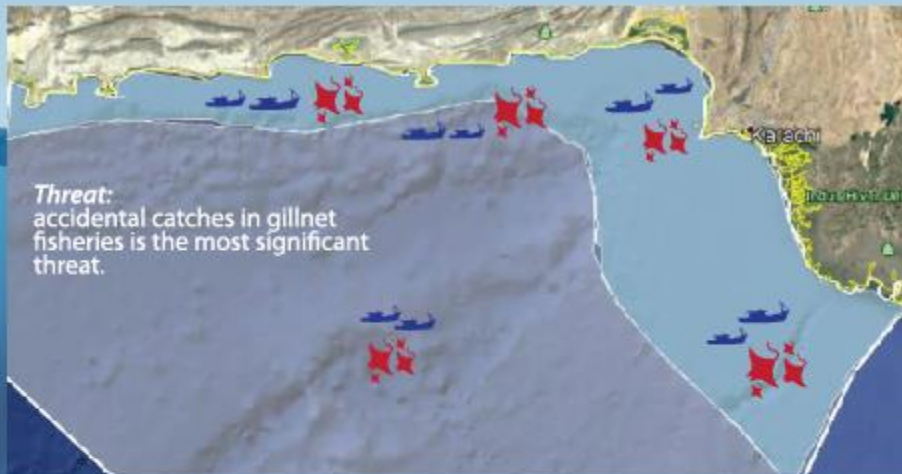


Diet: Planktons  
Population: Decline  
Protection: CITES, CMS - Appendix - II  
Pakistan: National Fisheries Laws

Least  
Concern

Threatened

Extinct



#### How to use this guide?

Use the following flowcharts to learn how you can safely release entangled Mobulids from gillnets. Depending on the degree of entanglement and animal's size, different steps need to be followed. Remember that safety of the crew is most important – all steps in this guide will ensure safety of the crew as a priority.

## First Steps

Entangled mobulid found in the net.



Stop fishing operation.



Estimate the degree of entanglement, size of the mobulid, and position in the net. One crew member should film the release operation on his phone.



The mobulid is only partially entangled.



The mobulid is fully entangled with the whole body covered.



Go to Page - 14, Image -1



large individual that cannot be hauled on board safely.



Go to Page - 16, Image - 2



Small individual that can be hauled on board safely.



Go to Page - 18, Image - 3

## Partially entangled mobulid

Lessen the rope / net from the boat to release the mobulid – this will loosen the fishing gear and allow space for the mobulid to escape.

Lessening the rope / net is not helping and you cannot release the mobulid.

Large individual that can not be hauled on-board safely.

Small individual that can be hauled on-board safely.

Go to Page 16

Go to Page 18

Mobulid manages to escape from the net and swims away safely.



Mark the GPS location

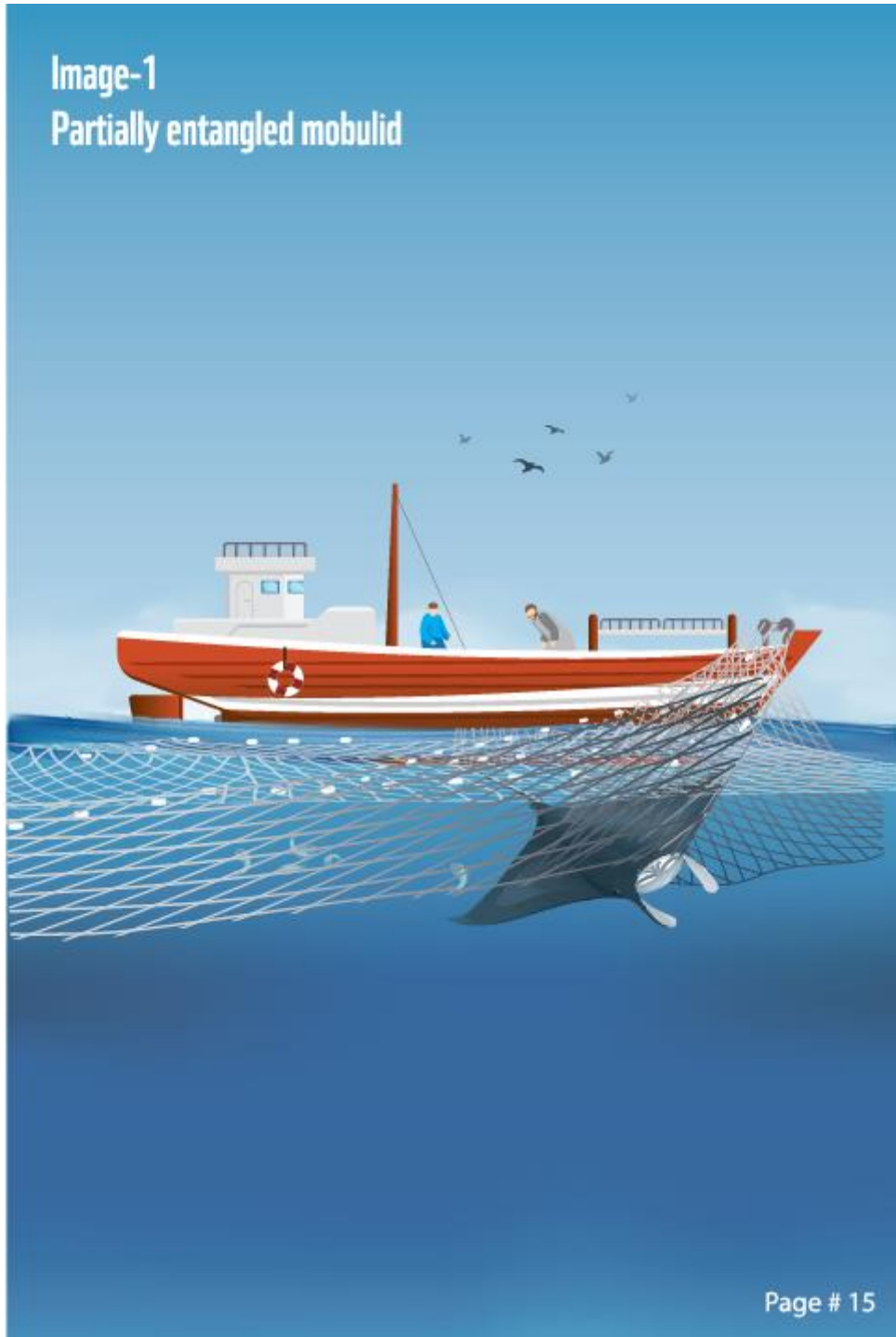


Note the size of the mobulid



Capture the process of release

**Image-1**  
**Partially entangled mobulid**





## Large, fully entangled mobulid

A fisherman should jump into the water to help free the mobulid – remember not to come into direct, physical contact with the mobulid. It might be safe to hold onto the area between the winch / boat and the mobulid.



Cut the fishing gear at the surface where the mobulid is entangled. Start cutting near the pectoral fins and move towards the head. This would help reduce the pressure on mobulid and minimize the level of the entanglement. Remember to stay at least 1 meter away from the mobulid at all times.



Mobulid is freed by cutting the net / rope and manages to swim away safely.



Mark the GPS location

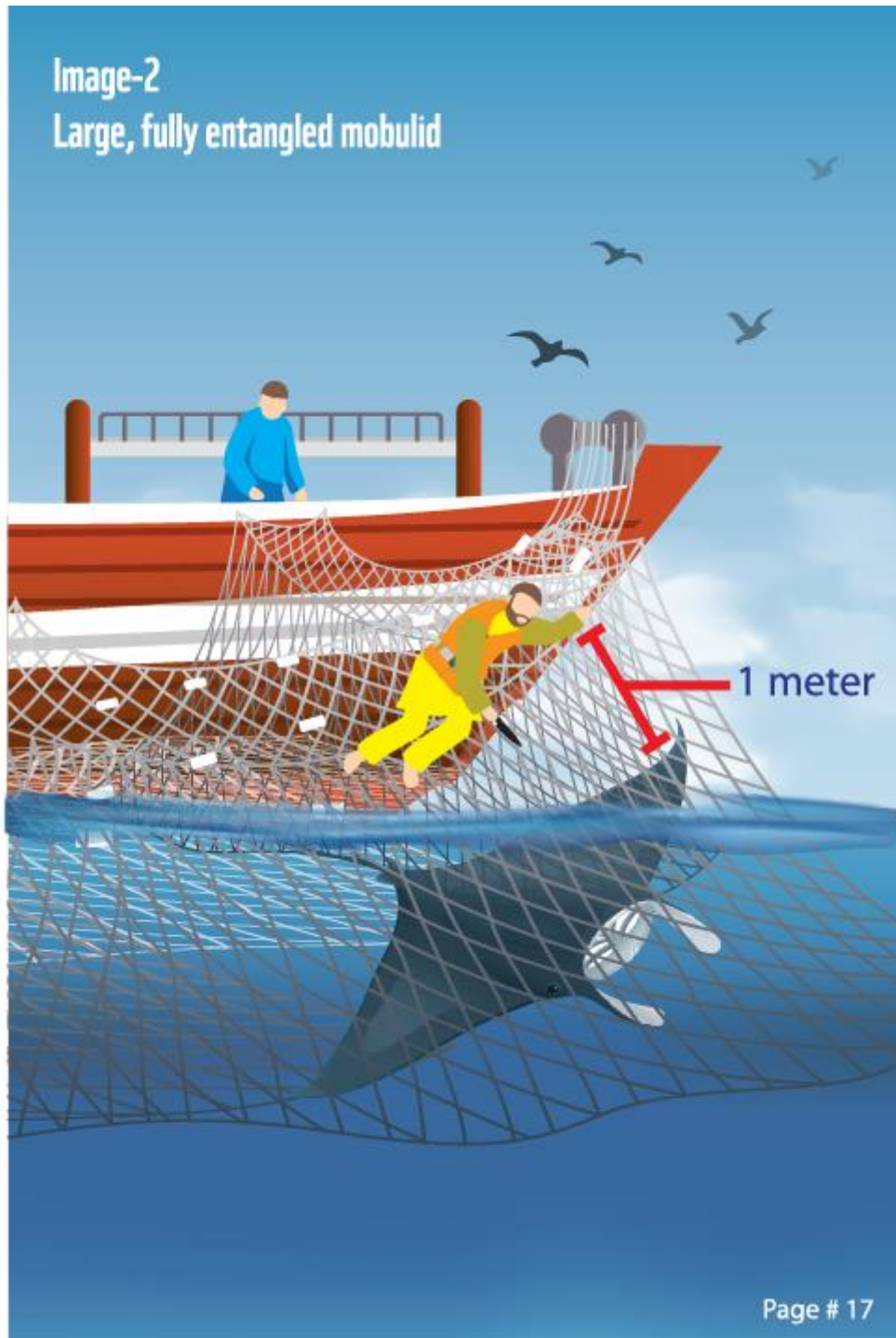


Note the size of the mobulid



Capture the process of release

Image-2  
Large, fully entangled mobulid



## Small, fully entangled mobulid

Manually haul the mobulid on-board carefully. Make sure the mobulid is not heaved through the net hauler. 2-3 fishermen should handle the mobulid grabbing it by its wings. Avoid pulling by its tail and cephalic lobes.



Disentangle the mobulid by either cutting or manoeuvring the net / rope.



Place the disentangled mobulid on a large flat object (e.g. net, blanket, or tarpaulin). Remember not to grab the mobulid by its cephalic lobes, gills or tail. This can injure the mobulid and decreases its chances of survival after the release.



Three fishermen should grab the corners of the tarpaulin and carry the mobulid to the upper edge of the boat's side. Carefully lower the tarpaulin to release the mobulid.



Mobulid is released and swims away safely.



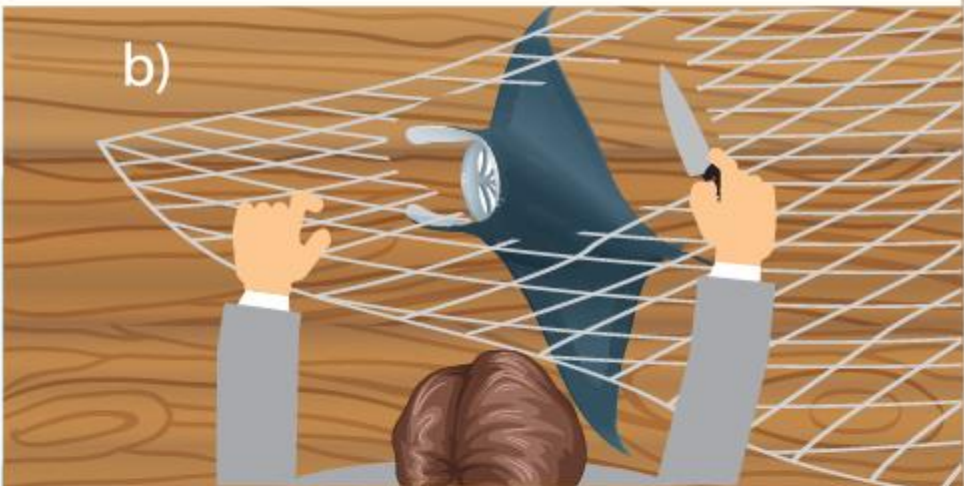
Mark the GPS location



Note the size of the moublid



Capture the process of release



## Don'ts



Do not handle / hold mobulid by its tail.



Do not handle / hold a mobulid by its cephalic lobes. This can cause internal injuries.



Do not use a gaff / rod / rope to handle / pull the mobulid. And do not insert your fingers / hook into spiracles and gill slits.



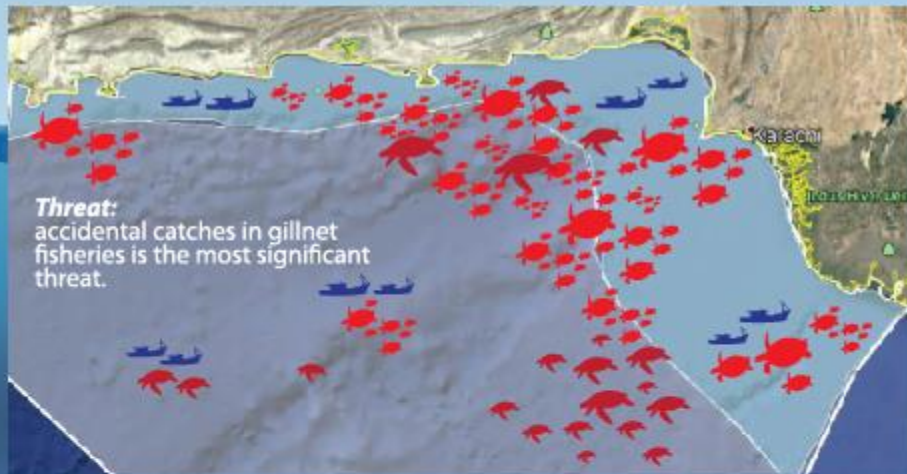
Do not leave the mobulid on the deck exposed to sun light for a long time. Release the mobulid as soon as possible.



## Guidelines for safe handling & release of Sea Turtles

**Sea Turtles** (Cheloniidae)

Diet: Seaweed, crustaceans, sponges, soft corals and jelly fish  
Population: Dwindling  
Protection: CITES, CMS - Appendix - I  
Pakistan: National Wildlife and Fisheries laws



### How to use this guide?

Use the following flowcharts to learn how you can safely release entangled sea turtles from gillnets. Depending on the degree of entanglement and animal's size, different steps need to be followed. Remember the safety of the crew is most important- all steps in this guide will ensure safety of the crew as a priority.



## First Steps

Entangled sea turtle found in the net.



Stop fishing operation.



Estimate the degree of the entanglement, size of the sea turtle and position in the net. One crew member should film the release operation on his phone.



The sea turtle is partially entangled.



The sea turtle is fully entangled with the whole body covered.



Large individual that cannot be hauled on board safely.



Go to Page - 24, Image - 2



Large individual that can be hauled on board safely.

Small individual that can be hauled on board safely.

Go to Page - 26, Image - 3



Go to Page - 28, Image - 4



Go to Page - 32, Image - 6

Image- 1  
Entangled sea turtle found in the gillnet



## Large Sea turtle partially entangled

Lessen the rope / net from on-board to release the turtle.  
This will allow the turtle to disentangle.

Turtle manages to escape from the net and swims away safely.

Lessening the rope / net is not helping and you cannot release the turtle.



Mark the GPS location

Large individual that cannot be hauled on board safely.

Small individual that can be hauled on board safely.



Note the size of the turtle

Go to Page - 26,  
Image - 3

Go to Page - 32,  
Image - 6



Capture the process of release



Record the flipper tag number (if any)

Image- 2  
Large Sea turtle partially entangled



## Large sea turtle that cannot be hauled on board safely

One fisherman should jump into the water to help free the turtle. It might be safe to hold onto the area of the fishing net between the winch / boat and entangled turtle.



Cut the fishing gear / ropes from mid-part of the turtle towards its head. Make sure the flippers of the turtle are also free from the fishing net / ropes.



Turtle is freed by cutting the net / rope and manages to swim away and dive safely.



Mark the GPS location



Capture the process of release



Note the size of the turtle



Record the flipper tag number (if any)

Image- 3

Large sea turtle that cannot be hauled on board safely





## Large sea turtle that can be hauled on board safely

Manually haul the sea turtle and fishing net onto the boat carefully. Make sure the turtle is not heaved through the net hauler. 2 - 3 fishermen should handle the turtle by the edges of its shell.



Disentangle the sea turtle by cutting net / rope from the mid-part of the shell moving towards the head of sea turtle.



Place the disentangled sea turtle on a large object (ropes / tire) with its fins hanging down. The head of the turtle should be in a lower position than the back of the turtle.



Place your fingers on the nostrils of the sea turtle to open its mouth. Check the turtle's mouth and remove the plastic or pieces of ropes.

Image- 4

Large sea turtle that can be hauled on board safely



## Large sea turtle that can be hauled on board safely

To calm the sea turtle, cover the head of the sea turtle gently with your hands or with a wet blanket / tarpaulin for a while (minimum 30 mins).



One fisherman should grab the turtle by the edges of its shell. Carefully lower it from the gunwale at the angle of 45 degrees while its head faces the water.



Turtle is released and swims away safely.



Mark the GPS location



Capture the process of release



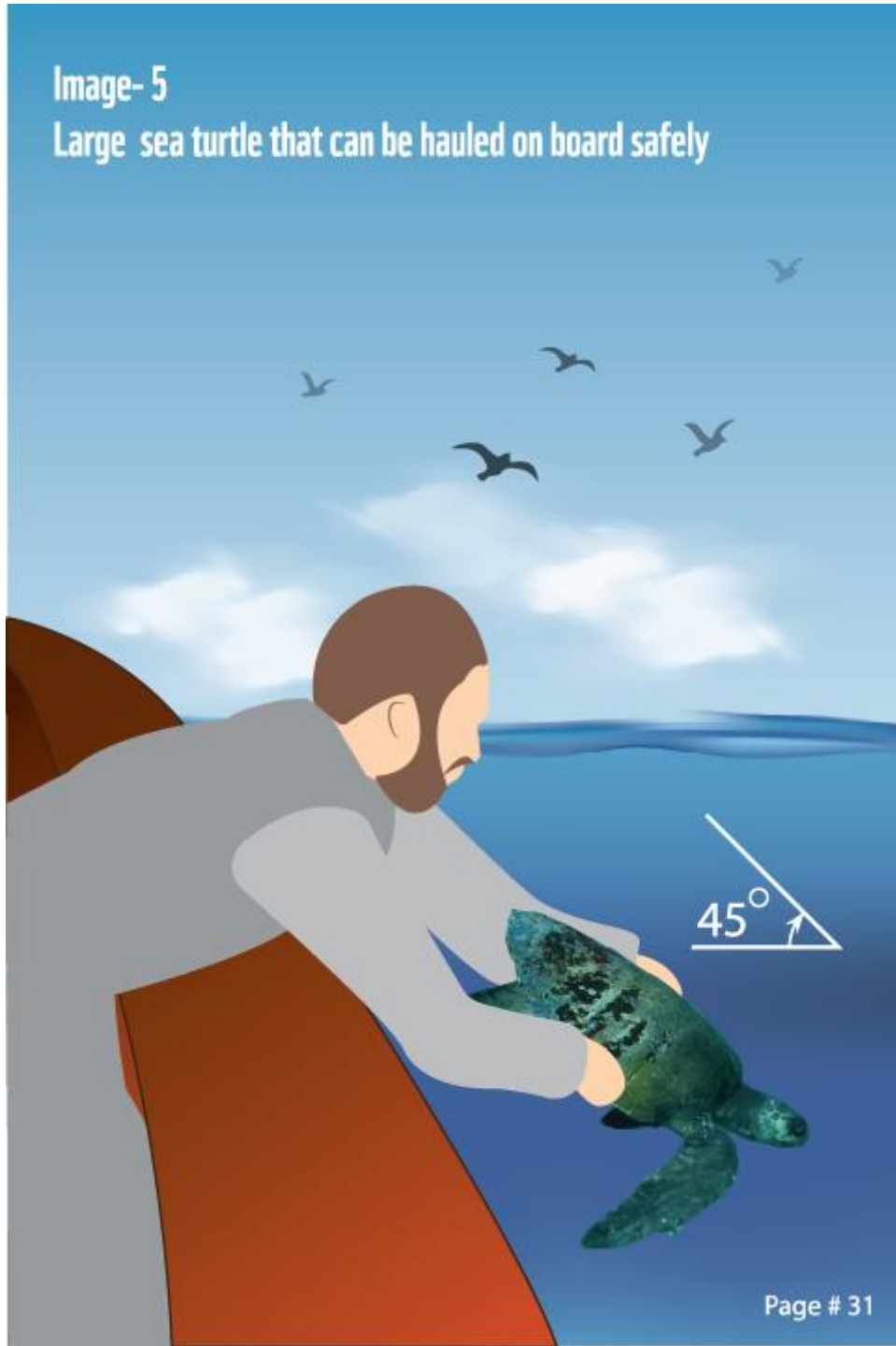
Note the size of the turtle



Record the flipper tag number (if any)

Image- 5

Large sea turtle that can be hauled on board safely



## Small sea turtle that can be hauled on board safely

If the sea turtle size is more than one foot.



Go to Page - 28,  
Image - 4

If the turtle size is less than one foot.



Stop fishing activities.  
Rescue the turtle from the deck with the help of a bucket.



Lower the bucket at the surface of the water to rescue the turtle and pull the bucket on board. Remove any plastic or rope around the turtle's body.



After fishing activities, place the turtle in the bucket full of water. Lower the bucket from the boat on the water's surface and tilt the bucket to release the turtle.



Turtle is released and swims away safely.



Mark the GPS location



Note the size of the turtle



Capture the process of release

Image- 6  
Small sea turtle that can be hauled on board safely





## Don'ts



Do not handle or pick the sea turtle by its flippers.



Do not release the sea turtle by throwing it overboard.



Do not leave the sea turtle on the deck exposed to sun light for a long time.



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## Safe Handling & Release Guide for Gillnet Fisheries

Whale Sharks | Manta & Devil Rays | Sea Turtles

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Safe Handling and Release Guide was developed the support of Shark Conservation Fund (SCF) to guide fishermen and fisheries authorities on proper handling and safe release of entangled whale sharks, mobulids (manta and devil rays) and sea turtles accidentally caught in the gillnet fisheries. Through this guide, we urge its users to report on all safely released whale sharks, mobulids and sea turtles to marine team of WWF-Pakistan. For further details about the guidelines and safe release training opportunities, please contact WWF-Pakistan. Design and graphics of these guidelines are the copyright of WWF-Pakistan.



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