

The population of marine species is affected by some natural and human factors including, but not limited to, the destruction of their habitat, chemical and sonar pollutions, climatic changes, human activities like fishing expansion and safety of food provision. Any increase in sea exploitation, will cause the number of marine species to diminish drastically. So it is possible to state that fishermen as the stakeholders are commissioned to protect these invaluable marine resources.

**Fishing gears in Iran**

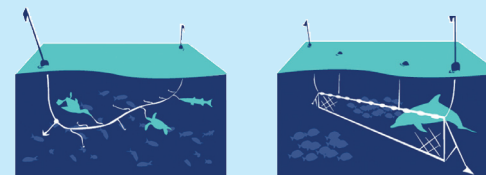
Depending on the target species, Iranian fishermen use different gears including, gill net, longline, and purse seine.

- Gill net: Based on the species of the fish, gill net is set in a fixed, vertical position in various depths of the sea. It is usually made of different mesh size and materials.
- Longline: It is set near the surface with thousands of hooks and preys. Its length varies between 10 and 100 km.
- Purse seine: It has purse net for encircling and catching of school of fish.

By these methods, it is likely that some other marine species like small and large marine mammals (dolphins, porpoises and whales), marine turtles and seabirds are caught as fishing by-catch. It is a major factor in their population decline and other ecosystem changes. It is, unfortunately, a global problem, not limited to only Iran.

**Entanglement of marine mammals (dolphins and porpoises) in fishing gears**

Sometimes, marine mammals are accidentally entangled in fishing gears when they are eating either baits or caught fish.



**Effects of fishing gears on marine mammals**

**Direct effects:**

- Being drowned
- Starvation
- Infection and amputation of body members
- Impacting on their ability to swim, movement and breeding

**Indirect effects**

- Increasing their vulnerability to natural predators
- Impact on their habitats
- Impact on marine species which are food source for marine mammals

**Evidences for entanglements of marine mammals in fishing gears**

Depending on the species of the marine mammals and the kind of gears used, the evidences left by fishing gears on their body are diverse. It is impossible to diagnose the level of injury on the ones which are dead for a long period of time.

**In gill net**

Gill nets make the marine mammals to be fully or partially entangled in a way that they cannot come up to the surface to breathe, which leads to their death by suffocation. Fortunately the large marine mammals, like whales, are hardly ever entangled or even dead by being entangled in these gears because once entangled, they are capable of moving to the surface of the sea for breathing.

Gill net makes some abrasions round the head, dorsal fin, pectoral fin and tail flukes of the dolphins and porpoises. Based on the material of the net with which it is woven, the intensity of the injury differs. The marks left by the monofilament nets are usually in the form of linear lacerations on the skin.



**In longline**

While taking bait or fish from hook which entangled in the longline hooks, small marine mammals like dolphins and porpoise may swallow the hooks and hooks may attach fiercely lodged into their mouth. It causes some injuries in their mouth, snout, throat, stomach; as well as intense bleeding, body infection, starvation which may result in delayed death. Hooked animals may be unable to reach the surface to breath, which results in a more immediate death by drowning.

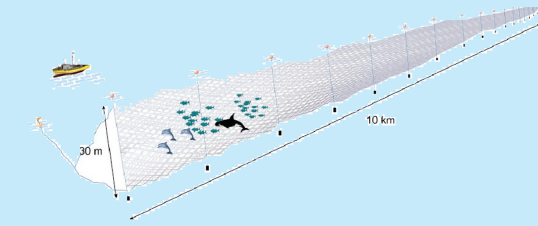


**In purse seine**

The marine mammals entangled in purse seine are always suffocated; therefore, there are no external marks from the net on their body.

**By gill net**

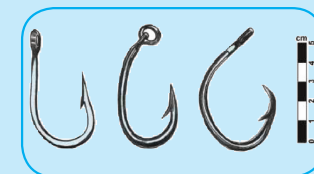
- It must be set in a way that it is fully firm in order to prevent marine mammals from being entangled in them.



- While using pelagic gill net the holding ropes over the net must be placed a bit under water surface, connected to buoys by shorter cords. In this way, the entangled animal can rescue itself.
- Since monofilament nets fully entangle the fish, it is advised not to use them.
- It is recommended to generate sonar waves by an electronic device called Pinger which is attached to fishing net to deterring marine mammals from approaching Fishing gear.
- In order to mitigate by-catch, it is recommended that the nets to be inspected in every two hours.

**By longline**

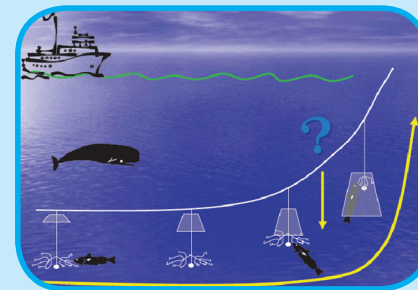
- The line attaching the hooks to the longline rope must be long enough to let the marine mammals to come to the surface after they are accidentally entangled
- It is recommended that Japanese and circular hooks to be used instead of old, J-shape ones. The new circular hooks are less likely to be swallowed than the old, J-shape ones. It is also easier to remove the hook out of the animal mouth. The new hooks have no negative effect on the fishing level of tuna fish and sword fish.



- It is better to install some sonar system to generate some pulse to distort the fishing ability of mammals.

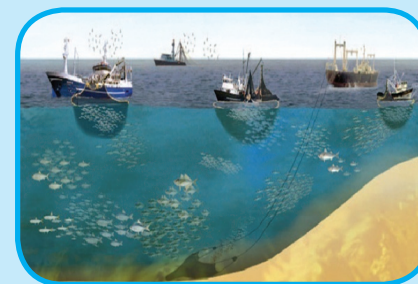
- It is a good idea to attach some weights to the rope to make it go down fast with the hooks (funnel net) and preys attached to them in order to remove the entire fishing portion of the line out of the range of marine mammals. (It is also useful in decreasing the likelihood of birds' entanglement).

In this method each branch line attached to main line are sent to desired depth by 4-10 kg weight, to catch target species. After fish entangled, attempt to flee, top of the net sleeve falls on hooks, baits and captive fish.



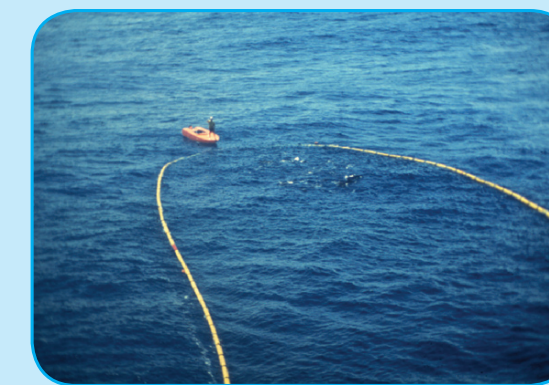
**By purse seine**

- Inform the other fishing vessels working near you of their movement routes as soon as observation of marine mammals.
- On locations where there is a shoal of fish it is probable that marine mammals are present too. So, take cautious measures to prevent them from being entangled.
- It is possible to see marine mammals by polarized sunglasses from afar. So you can switch your fishing site.
- The marine mammals usually go underwater for 20 minutes to feed. Therefore when a whale is seen round fishing vessels it is possible that there are other ones round or under the vessels.



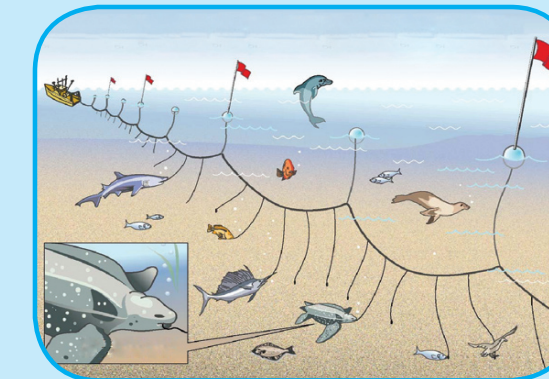
**Out of longline**

- When you find an entangled marine mammal, never do try sudden moves.
- When near marine mammals slow down and cut the engine.
- Never pull the rope or the net in which the marine mammal is entangled because it creates more injuries. You can use its fin instead.
- If the hook is not deeply penetrated into the body or the mouth of the sea creature, pull it gently out.
- If the hook is deeply penetrated, don't pull it out because it makes the injury infection, leading to its gradual death. In this case, just cut the cord and other fishing gears, from most possible short distance attached to its body.
- When disentangle the animal, release it on the ship side away from the propeller.



**Out of gill nets**

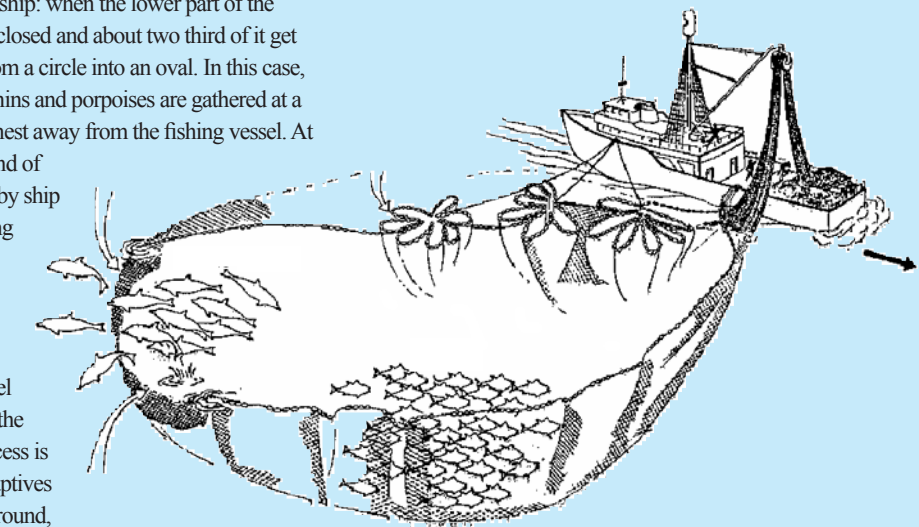
- When you find some animals which are entangled in gill nets, never use the net ropes to get the animal near the ship.
- If the animal is too big to get it near the fishing vessel, it is better to control the animal by a suitable instrument and then pull it near the ship to cut the rope by a pair of scissors.
- Never do use spear or any other sharp point tools to pull the animal up on the ship deck.
- If it is impossible to set the animal free, cut the net.
- To cut the rope or the net, it is better to use scissors instead of knife.
- To quickly set the animal free, try to cut the main cord.



**Out of purse seine:**

- If the rescue operation is carried properly out, 99.9% of the dolphins and porpoises entangled in purse seine nets are set free without any harm or injury to their body. The likely reasons of their death are: stress, disability to come to the surface to breathe, their unpredictable behaviors, collisions with the propeller, low skills of the captain, bad weather condition, oceanic currents, and darkness during the rescue operation.

1. Backing down the ship: when the lower part of the fishing net is fully closed and about two third of it get tight, it changes from a circle into an oval. In this case, the ensnarled dolphins and porpoises are gathered at a place which is farthest away from the fishing vessel. At this moment, the end of the net goes down by ship movements, making it possible for captive creatures to set themselves free. During the operation, the vessel speed is critical. If the backing down process is done slowly, the captives will start playing around, refusing to jump out.
2. Creating a safety space by Medina Panel: when the marine mammals are ensnarled in the net, they behave normally before the net is closed down so they easily swim and come to the surface. As soon as the net is closed, however, they go to the end of the net to find a refuge. In this case, they go dead because their snout or fins are stuck in the net. In order to solve the problem, the mesh size of net has been reduced from 10.8 cm (4, 1/4 inches) to 5 cm (2 inches).



**Releasing large marine mammals out of fishing gears**

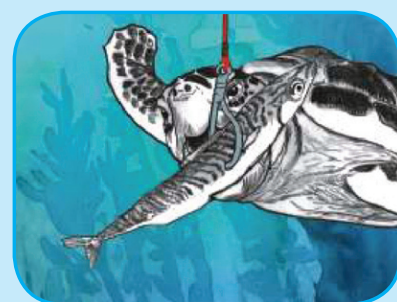
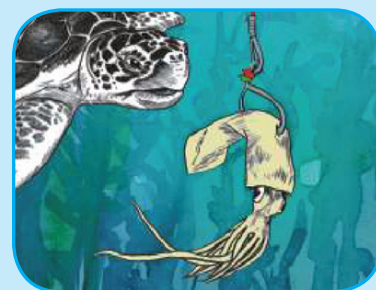
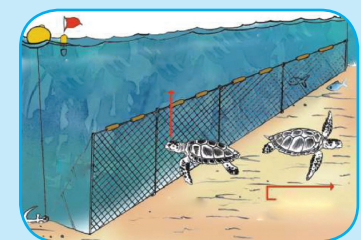
- When there is a pack of buoy near each other or floating ropes, it is a sign of a sea creature being entangled.
- It is very dangerous to approach and rescue big marine mammals ensnarled in fishing instrument without proper training. It is strongly advised not to save them by small boats or even swim toward them.
- During saving them, the most dangerous measure is to hold them or set them free from the net in a short distance.
- Never do try to catch the entangled creature or to encircle and chase it.
- Never do pull the animal by the vessel to rescue it later.



**Mitigation methods of sea turtle by-catch**

**By gill net**

- The gill net should be set in a way that it is firm enough to prevent it from entangling the turtles. As it can be seen in the pictures, there are some changes in some gill net Lines that are shorter than the fishing height of the net and connect the float and lead lines at regular intervals along the entire length of the net. In this case there is a bag of slack webbing instead of a fixed, vertical one that entangling rather than gilling. Unfortunately, in this method more turtles are entangled.



**By longline**

Turtles are easily entangled in ropes and hooks of longline nets.



**By purse seine**

Sea turtle catch rates in purse seine fisheries are low when compared with interaction rates in gillnet and pelagic longline fisheries.

- Avoid the encirclement of sea turtle, where abundant.
- When captured in the purse seine, Released turtle unharmed

In order to save the turtles, the first step is to assess the turtle size

- If it is too large to bring it on board, it is better to bring it as close as possible to the fishing vessel and then cut the
- Line as close to the turtle as practical.
- If it is small, approach it carefully and bring it up to the deck. Use a dip net to lift the animal on board. Neither does use the line or net in which the turtle is entangled nor gaff or any other sharp objects.
- If the hook has beak and flippers, use long-handled dehooker to remove the hook.
- If the hook is in the turtle mouth, place a piece of wood in the turtle mouth to prevent it from biting you. Then cut the line and the hook. If the hooks barb is visible, you can use bolt cutter to cut the end of the hook and then Remove the two part



- If the hook is not visible, Remove as much line as possible without pulling too hard on the line, and cut it as close to turtle as practical.



Sea Turtles entangled or hooked in longline may be stressed. In most cases, when released, they are conscious and able to swim. If they appear tired or lifeless do the followings:

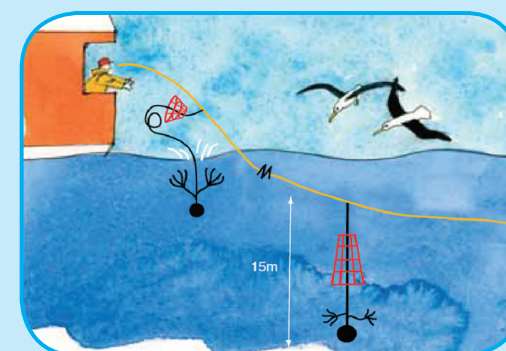
- Leave them on a soft surface on board.
- Leave them on their breast in a way that rear flipper is about 15 cm higher to let the water in their lungs follow out.
- While on deck, cover their body by a wet towel. Never cover their head.



- When come to, leave the turtle in a place where there is no fishing activity.
- Record the data related to the turtle specifications, the location it was tangled or hooked, and where it was released.

**Methods for decreasing the likelihood of entangling sea bird in longline**

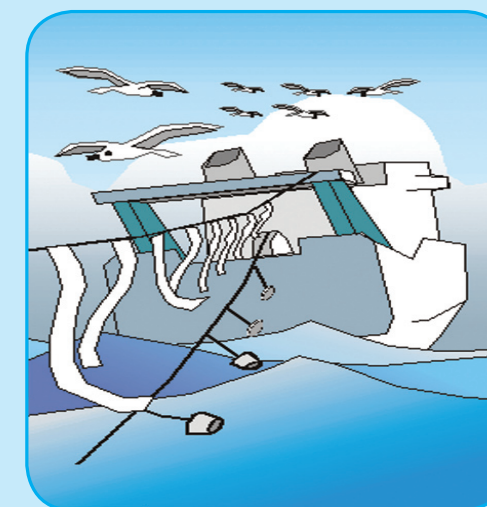
- Attach some weights to pull the ropes and preys down the sea level in order to make them inaccessible for the sea birds. In this method, in order to stop entanglement of the marine mammals as well as sea birds, the preys attached to the hooks are kept away from marine mammals by a technique explained earlier.



- Never discarding offal during line setting to keep birds away from the baited hook.
- Dying of the bait (blue) to make it less visible (e.g. when using artificial preys).
- Night setting to reduce the by-catch, using minimum of ship lights.
- Don't set the fish nets where the birds nourish.

**It is not possible to predict sea animals' entanglement in fishing gears. Take care when rescuing them. Your safety is a top priority.**

- Attach some birds scaring devices, such as line with suspended steamers mounted on a pole at the vessel stern.



**Method of reporting the entanglement of the marine species which are endangered**

Fishermen are required to report the sighting of entangled marine mammals (dead or alive) according to the following steps:

- Date, time, and location coordination
- The animal features like its approximate length, body color, head form, back fin, etc.
- Type of the fishing net in which it is ensnared
- The fishing gears left on their body (instrument type, attachment location on the body, color and size)
- Injuries and damage
- Status of the dead body

If there is a sea animal entangled in a fishing gears, never set up again a fishing gears at the same place. Inform the other fishermen who are working on the vicinity of the entanglement location. Postpone the setting up for 2 days (Or at least go away from the sighting spot).

- If there is a marine mammal or turtle or even a sea bird entangled in your fishing nets, record the data precisely and present it to the nearest fishing port or any other fishing bureau.
- If possible, take some photos or record the event on film.

**Approaching sustainable development in fishing activities, observing the rules and principles of ecosystem management, developing the executive procedures according to national and international law and notification of them, Iranian Fishery Organization manages responsible fisheries in Persian Gulf, Oman Sea and Indian Ocean to protect the endangered sea species.**



Published by Iranian Fishery Organization

Employer: Office of Protection and Improvement of Marine Resources

Executive Agent: Sea-oriented Sustainable Development Society

Author: Fattaneh Barati

email: ll\_barati@yahoo.com

Address: No. 250 West Fatemi St. Tehran, Iran

Phone No. 0098 21 6694444

Summer 2011

Visit us at: <http://fisheries.ir/portal/home>

