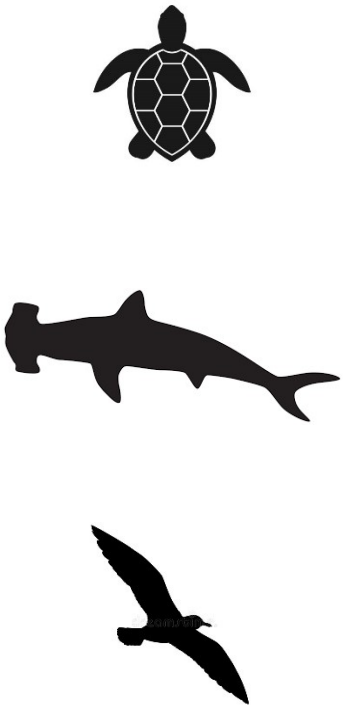
Indian Ocean tuna - longline (Bumble Bee/FCF Co., Ltd) FIP

ETP Management Strategy



Prepared by Key Traceability Asia

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Introduction

The fishery targets albacore (*Thunnus alalunga*), bigeye (*Thunnus obesus*) and yellowfin tuna (*Thunnus albacares*). The pelagic longline vessels are flagged to China, Taiwan, Malaysia, Seychelles and Oman and fish on the high seas of the Indian Ocean and within the EEZ's of Mauritius, Seychelles, and Madagascar. The fishery is managed regionally by the Indian Ocean Tuna Commission (IOTC). The UoA is described in Table 1 below:

Table 1 - UoA of the FIP

Name of the fishery	Indian Ocean tuna - longline (Bumble Bee/FCF Co., Ltd)
Species name	Albacore tuna (*Thunnus alalunga*) Bigeye tuna (*Thunnus obesus*) Yellowfin tuna (*Thunnus albacares*)
FAO Area	51 and 57
The fishing method	Pelagic Longline
Flags	China, Taiwan, Malaysia, Seychelles and Oman
RFMO	IOTC
Ocean	Indian Ocean – High Seas and within the EEZ's of Mauritius, Seychelles, and Madagascar

The MSC definition of an ETP species is[1]:

- Any species that is recognised by national ETP legislation.
- Species listed in the binding international agreements given below:
    - Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacts by the UoA under assessment is not endangered.
    - Binding agreements concluded under the Convention on Migratory Species (CMS), including:
        - Annex 1 of the Agreement on Conversation of Albatross and Petrels (ACAP).
        - Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement (AEWA).
        - Agreement on the Conservation of Small Cetaceans of the Baltic and North Sea (ASCOBANS).
        - Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS).
        - Wadden Sea Seals Agreement; and,
        - Any other binding agreements that list relevant ETP species concluded under this Convention.
- Species classified as 'out of scope' (amphibians, reptiles, birds, and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

[1] Note this definition will change with the updated MSC Standard version 3 to be released in July 2024.

This document builds on previous work and details the best practices and management strategy of ETP species within the FIP using fishery specific catch data and similar MSC certified fisheries.

Scope

This strategy has been created because as a responsible member of the fishing community we recognise ETP species are highly susceptible to overfishing and we endeavour to do our part to reduce the impacts our fishing fleet has on these species by applying best practices. This document acts as a guide for skippers on best practice and the actions they should be taking to reduce interactions with ETP species, and how to deal with any interactions that still occur.

Data was collected from electronic observer programmes. This data was taken from 15 trips from April to September 2023 across the fleet. Please note, total % of catch are incidents and not comments on the fate or life status of these individual ETP species. ETP species contribute 0.84% of the total catch composition by individual.

The intention of this document is to improve Principle 2 Performance Indicator Scores explicitly, PI 2.3 ETP PIs to help us meet SG80 and in turn push us towards of achieving Marine Stewardship Council (MSC) certification.

This policy will be approved by the companies participating in the FIP and all skippers should read this document and have a hard copy accessible on the vessel at all times. Note the electronic English version shall be the master. For any issues in translations please refer back to the English version.

This strategy shall be adopted across the FIP fleet on the end of **April 2024** and shall be verified through both human and electronic observers.

For any issues or amendments please contact the FIP coordinator, Tom Evans at t.evans@keytraceability.com.

Sharks and Rays

Globally, pelagic longlining has the highest rate of shark catch (as a target and nontarget species) of any fishery (ISSF, 2016). Most shark species are quite vulnerable to this practice, since several aspects of their biology make them highly susceptible to overfishing, including:

1. Slow growth rates,
2. Late maturation,
3. Long pregnancies,
4. Low fertility, and
5. Long life spans.

Millions of sharks are caught with longline gear every year (ISSF, 2016), with a proportion of these being sold illegally into the shark finning black market. It is increasingly evident that at least a few of these species are in steep decline because of this intense fishing pressure: fishers are catching fewer of them (despite an increase in effort) and those individuals that they are catching are smaller in size.

There are a few simple actions that can be done to reduce the incidental catch of sharks, and fewer hooked sharks means more open hooks for tuna and less time spent wrestling with sharks during hauling. Here we will briefly review the most commonly encountered sharks, effective ways to avoid catching sharks, and how to handle and release them if they are caught.

Shark species make up the largest proportion of ETP species caught in the Indian ocean LL tuna fishery. ETP shark and ray species contribute 0.75% of the total catch composition. Shark catch still remains very low, with impacts on these species unlikely to occur, but further work is needed to study life status and fate and ensure vessels are using best practices in the release of sharks to reduce post capture mortality. These known interactions are:

Table 2 - Known ETP shark Interactions recorded from observer reports

Species Common Name	Scientific Name	Total % of Catch	Designation and Justification
Shortfin mako	*Isurus oxyrinchus*	0.53%	Resolution 17/05; CMS Appendix II
Various sharks nei	*Selachimorpha (Pleurotremata)*	0.11%	Resolution 17/05; CMS Appendix II
Requiem sharks nei	*Carcharhinidae*	0.09%	Resolution 17/05; CMS Appendix II
Copper shark	*Carcharhinus brachyurus*	0.01%	Resolution 17/05; CMS Appendix II
Silky shark	*Carcharhinus falciformis*	0.01%	Resolution 17/05; CMS Appendix II
Total		**0.75%**	

Issue

Observed Catch

Intense fishing pressure is putting a number of shark species at risk through targeted catch for meat and the black-market fin trade and as a bycatch/unwanted catch species. One of the reasons that data collection about your shark catches is important is that it allows scientists to determine which stocks are healthy and which require additional measures to ensure that they remain a functional part of the marine ecosystem, a reduction of mortality incurred by this fishery can contribute towards global conservation efforts (Gilman *et al* 2008).

Unobserved Mortality due to Poor Handling and Release Practices

Certain actions can increase survivorship further once the shark have been released, reducing the fisheries impact on sharks even more.

In longliners the major contributing factor to unobserved mortality is through not adopting best practices in handling and release.

Shark Finning

Shark finning is the practice of retaining shark fins and discarding the remaining carcass while at sea (FAO, 2009). The practice is against the FAO Code of Conduct for Responsible Fisheries and its International Plan of Action for the Conservation and Management of Sharks, as well as the resolutions of a number of other international marine bodies, all of which call for minimising waste and discards. There are major uncertainties about the total quantity and species of sharks caught, and shark finning has added to this problem.

This practice is not only wasteful, but it also reduces the accuracy of catch statistics (amounts, species identifications) that scientists need in order to accurately assess all impacts of fishing on these shark populations. The use of fins to identify the different shark species and extrapolate shark biomass killed in fishing operations is approximate. Moreover, because fins can be valuable in illegal shark fin black markets, such practices could represent an incentive for fishers to increase bycatch of sharks (e.g., not releasing live sharks)

Mitigation

Observed Catch

Fish Bait - Sharks appear to favour squid over fish as bait, as indicated by both scientific trials and reports from fishers. Using fish bait, such as mackerel, can reduce shark catch rates considerably, particularly for blue sharks (ISSF, 2016). All vessels shall use only fish as bait as per the Shark finning and Longline Vessel Bycatch Mitigation policy in Appendix B.

Circle Hooks - The data on the effect of hook type on shark catch rates are not very clear, but we do know that animals caught using circle hooks are not hooked as deeply, are less likely to suffer internal injury, and therefore have a higher likelihood of survival. Given the higher survival rates, the use of circle hooks—already a technology known to benefit sea turtles and seabirds—may also benefit sharks. All vessels shall use only circle hooks as per the Shark finning and Longline Vessel Bycatch Mitigation policy in Appendix B.

Set Depth - Shark catch rates are significantly higher on shallow-set longlines than deeper-set (deeper than 100 m) longlines (Beverly *et al* 2003 and 2004). Some studies have found shark bycatch with shallow-depth hooks to be 3 to 10 times the rate of bycatch with deeper-set hooks (Ward *et al* 2007). When in known areas of shark hotspots, vessels should endeavour when appropriate to fish outside of these areas or, remove certain hook positions or fish deeper.

Nylon Leaders - It has long been known that the use of metal wire leaders maximises the retention of hooked sharks. This is because sharks are unable to chew through the wire and escape. For this reason, some countries have banned the use of wire leaders in pelagic longlining and require the use of nylon (monofilament and multifilament) leaders instead. Another compelling reason to use nylon over wire leaders is that catch rates of bigeye tuna are significantly higher using nylon leaders. Bigeye tuna have good eyesight, so they likely are able to see wire—but not nylon—leaders (Alfonso *et al* 2012). Even when factoring in the extra cost of replacing lost hooks and nylon leaders, the financial benefit of the additional bigeye tuna catch makes the use of nylon leaders more profitable than the use of wire

leaders (Ward et al., 2007). These are banned in the fishery as explained in the shark finning policy in the Appendix B.

Shark Finning

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This practice is not only wasteful, but it also reduces the accuracy of catch statistics (amounts, species identifications) that scientists need in order to accurately assess all impacts of fishing on these shark populations. The use of fins to identify the different shark species and extrapolate shark biomass killed in fishing operations is approximate. Moreover, because fins can be valuable, such practices could represent an incentive for fishers to increase bycatch of sharks (e.g. not releasing live sharks). All fishers must align with the FIP Shark Finning and Longline Vessel Bycatch Mitigation Turtle Policy found in Appendix B.

Shark Handling and Release

By all appearances, sharks look hardy, and it would be easy to assume that they can sustain long “soak times,” rough handling, or extensive exposure and still survive when returned to the sea. But sharks have a few biological weaknesses that make them susceptible to stress and injury, which can reduce their chances at post-release survival.

Most sharks must swim in order to breathe effectively, so long soak times in the water while attached to a hook could hinder their breathing. This causes stress, and in more extreme cases, suffocation. Unlike other fish, these animals do not have a hard skeleton of bone to protect their internal organs. When out of water, the weight of gravity can tear their connective tissue, resulting in crushed or damaged organs. This same tissue holds the spinal cord in place, and for this reason, animals handled from the head or tail can suffer damage as a result. A shark’s head also holds a number of sensitive and fragile organs used to detect prey, and if handling damages these, then the shark—once released—could be unable to locate prey and starve.

Armed with these facts about shark biology, we can ensure that our handling techniques are minimising further injury to the animal with a preference being to release all sharks still in the water if possible. If cutting the line to remove the shark, it is of utmost importance to cut this line as close to the hook as possible to avoid long trailing lines, to do this the shark needs to be brought as close to the vessel as possible, this also provides opportunity to ID the species successfully. Of course, crew safety is paramount at all times, so the fishery shall employ these best practices only when they can be done safely and securely.

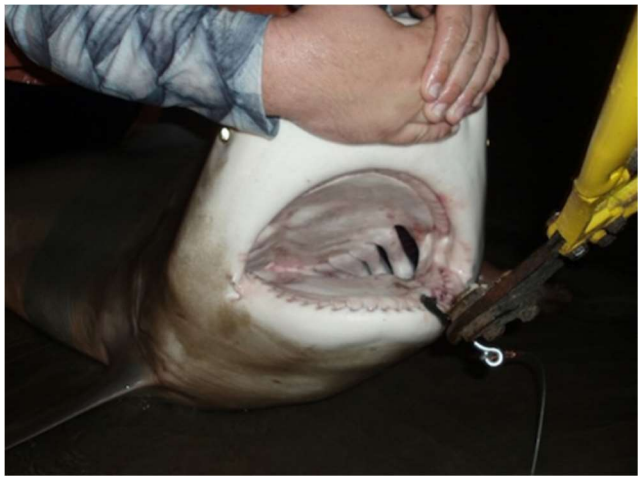

Figure 1 - Bolt cutters, hand tools, and line clippers: for when you cannot or do not need to use a dehooker. Long-nosed ("needle-nosed") pliers are good for removing hooks that are only lightly embedded. Bolt cutters can be used to remove the barb or eye of a hook, so that the remaining metal can be easily pulled out (ISSF, 2016)

Shark Handling Do's (ISSF, 2002)

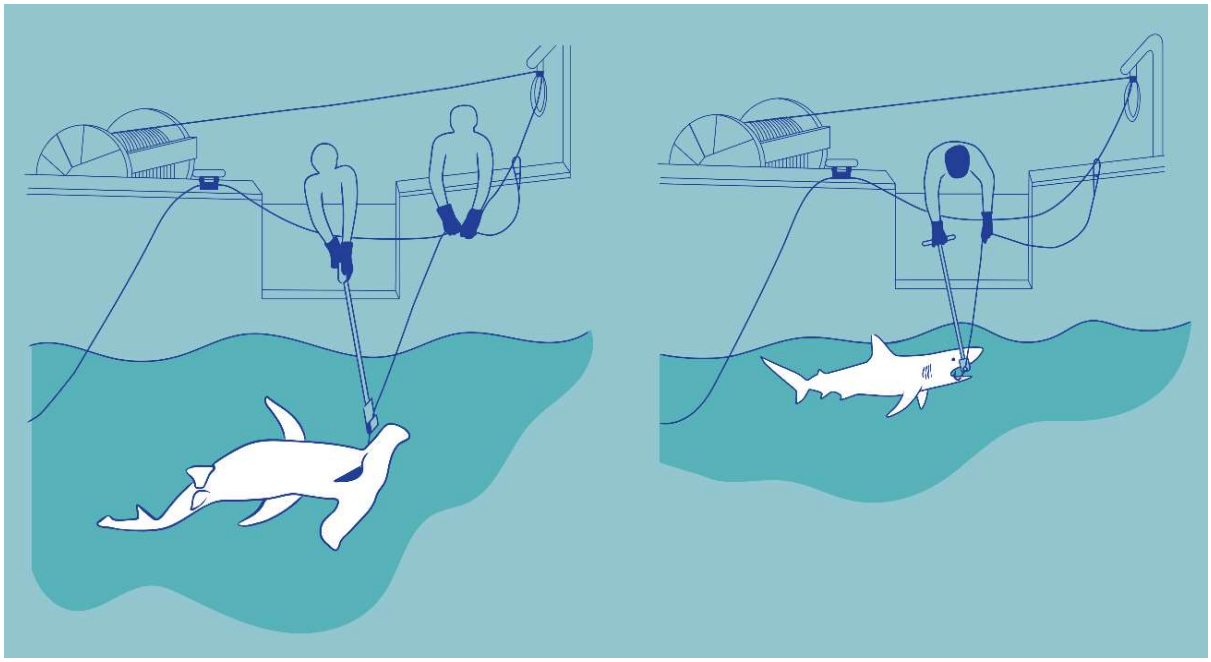

Figure 2 - Example techniques to release sharks while they are in the water by using a long-handled line cutter to cut the gear as close to the hook as possible (left) or by using a long-handled dehooker to remove the hook (right).

The preference is to release all sharks while they are still in the water, if possible. Use a dehooker to remove the hook or a long-handled line cutter to cut the gear as close to the hook as possible (ideally leaving less than 0.5 meters of line attached to the animal).

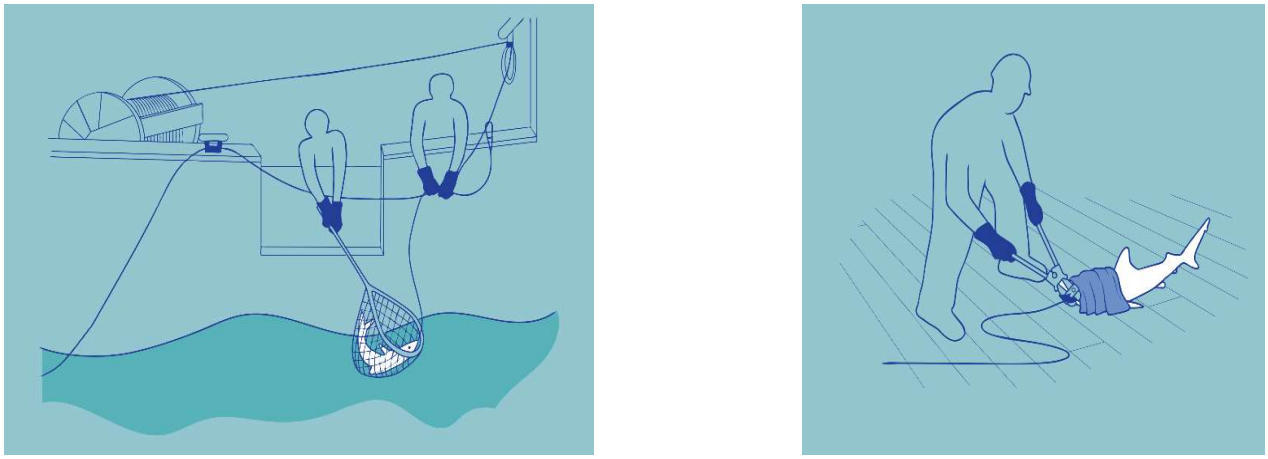

Figure 3 - Example of the use of a dip net to bring the shark on board (left) and example of the use of a bolt cutter to remove the hook.

If de-hooking in the water proves to be difficult, and the shark is small enough to be accommodated in a dip net, bring it on board and remove as much gear as possible by using a dehooker. If hooks are embedded, either cut the hook with bolt cutters or cut the line at the hook and gently return the animal to the sea.

Shark Handling Don'ts (ISSF, 2002)

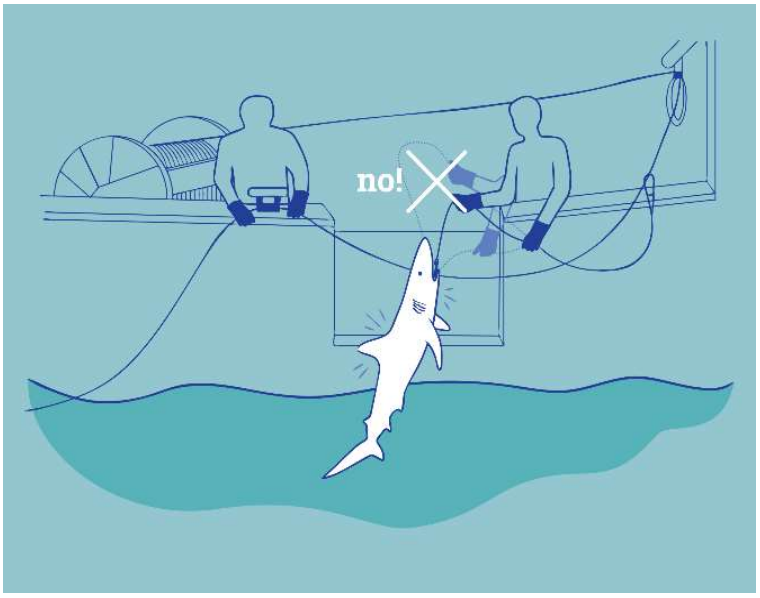

Figure 4 - Do not strike a shark against any surface to remove the animal from the line.

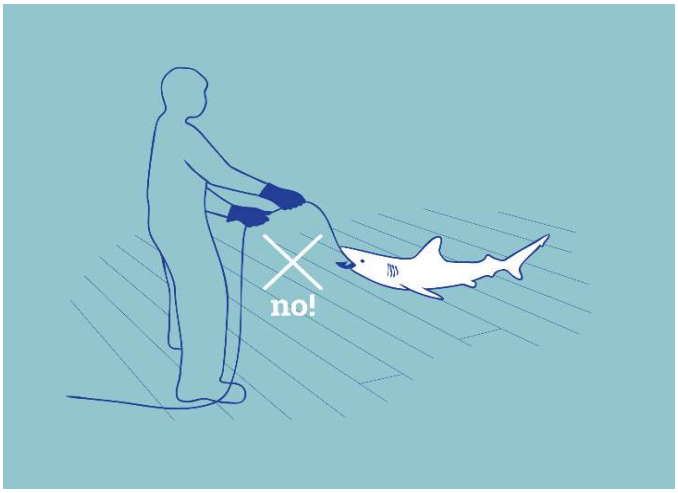

Figure 5 - Do not try to remove a hook by pulling sharply on the branchline.Do not attempt to dislodge a hook that is deeply ingested and not visible or remove a hook by pulling sharply on the branchline.

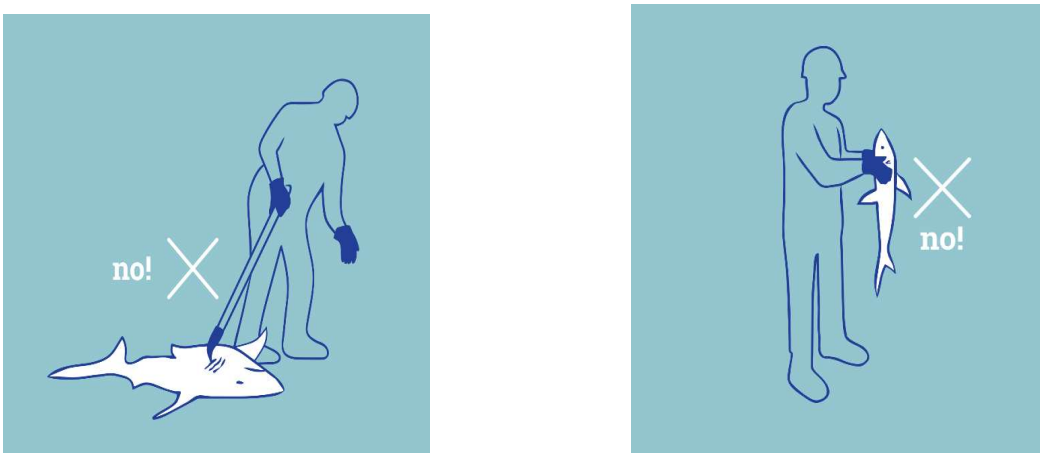

Figure 6 - Do not gaff (left) or insert hands into gill slits (right)

Do not cut the tail or any other body part or gaff, kick or pull a shark, and do not insert hands into the gill slits.

Unobserved Mortality due to Poor Mitigation

Any shark that is too large to be brought safely aboard, for either the crew or the shark, and an attempt to dehook the shark in the water is impossible the crew must cut the line as near to the mouth and hook as possible. The shorter the length of trailing line the greater the chance of shark post release survivorship. Note, if you need to gaff a shark it is recommended to gaff on the underside of their jaw to minimise damage.

Turtles

Sea turtle bycatch is problematic in many longline fisheries throughout the world with turtle bycatch occurring primarily in the tropics and subtropics, particularly in the eastern Pacific Ocean, northwest and southwest Atlantic and Mediterranean regions where these species are commonly found (Wallace et al. 2013, Lewison et al. 2014). Sea turtles with hard shells tend to bite baited longline hooks resulting in their capture. Leatherback turtles, however, rather than ingesting baited hooks, tend to get caught by becoming foul-hooked on the body and entangled. Sea turtles can also become entangled in the float and/or branch lines, which could cause them to drown. Marine turtles have life histories that make them highly vulnerable to fishing. Globally, tens of thousands to hundreds of thousands are estimated to be caught annually with about 25% dead when retrieved (Gilman, 2011). Olive ridley, and loggerhead sea turtles are all listed as vulnerable by the IUCN. Green turtles are listed as Endangered. While leatherback sea turtles are globally listed (IUCN) as Vulnerable.

The fishery has no known interactions with turtle species and unlikely to negatively impact turtle species but due to their ecological importance and known interactions in longline fleets worldwide, this turtle section shall remain in this strategy.

Table 3 - Known ETP turtle Interactions recorded from observer reports

Species Common Name	Scientific Name	Total % of Catch	Designation and Justification
Turtle	*Testudinata spp*	0.00	ETP - CITES Appendix I, Resolution 12/04
Total		**0.00%**	

Issue

Unobserved Mortality due to Entanglement

All sea turtles are protected internationally, as these long-lived animals face a number of environmental challenges (breeding ground destruction, boat collisions, ingestion of marine debris, disease linked to ocean pollution), including interactions with fishers.

Mitigation

Fishing Method Modification - While there are many fishing methods and gear modifications that can reduce sea turtle interactions in longline fisheries, the following practices are known to be highly effective without compromising catch rates of target species:

- Use only circle hooks, that are as wide a hook as possible that maintains acceptable catch rates of market species to reduce hard shelled sea turtle catch rates where necessary

Circle hooks appear to reduce the capture of turtles because they are wider at their narrowest point than J hooks and tuna hooks, making it difficult for the circle hook to fit inside a turtle's mouth. If a turtle does bite a circle hook, they are less likely to be deeply hooked (where the hook is swallowed down the throat or pierces the roof of the mouth), making it easier to dehook the turtle. Lightly hooked turtles also have a greater chance of surviving than deeply hooked turtles (Gilman *et al* 2007, 2010). All vessels shall use only circle hooks as per the Shark finning Policy in Appendix B.

- Use fish, rather than squid, for bait

Turtles eat squid differently than they eat fish. With squid, they tend to swallow the whole animal in one gulp, whereas with fish they take several, smaller bites. For this reason, fishing with squid-baited

hooks captures turtles at a higher rate than fishing using mackerel or other baitfish, where turtles are more likely to eat around the hook instead of ingesting it (Gilman et al. 2010). All vessels shall use only fish for bait as per the Shark finning and Longline Vessel Bycatch Mitigation Policy in Appendix B.

Dehooking or Untangling a Turtle - Though avoiding sea turtles is preferable it is somewhat inevitable that the fishery will encounter some hooked or tangled turtles. With minimal tools, quick action, and some best practice techniques, we can ensure that the turtle has its best chance at survival. As soon as a hooked or entangled turtle is seen, we encourage skippers to slow the boat while releasing tension on the mainline. Using constant pressure, pull the branchline in gently to bring the turtle alongside the vessel. Never use a gaff or other sharp object to handle a turtle. This is the point where a decision must be made whether to bring the turtle on board, which will be influenced by the size of the turtle and the conditions at sea, or dehook the turtle alongside the vessel. Gear removal is easier if a turtle can be brought on board, but if for size or safety reasons it is not practical to bring the turtle on board, assess the placement of the hook and remove the gear using the appropriate long handled dehooking device. Do not pull on the line of a deeply hooked turtle; this will only cause further injury. Often, help from a crew member is needed to manoeuvre the turtle and operate the dehooker.

For an Entangled Turtle Still in the Water:

- Secure the loose hook with a long-handled device, such as a dehooker or gaff (but never gaff the animal itself); and,
- Cut the line with line cutters.

For an Entangled and Hooked Turtle in the Water:

- Use a long-handled dehooker or gaff to pull on the portion of line as close to the hook as possible
- Pull the line into an inverted V-shape
- Remove the hook using a long-handled dehooker
- Cut away excess line to free the turtle

If you are able bring a turtle on board, assess its general health, and determine whether it is deeply or lightly hooked. When handling, do not lift the turtle by its flippers or use sharp objects (e.g., gaffs) to bring it aboard. An active turtle can be placed on a tire or similar platform to immobilise it. For a lightly hooked turtle, use a dehooker and other hand tools like long-nosed pliers. You might also want to use a mouth gag or opener to prop the turtle's mouth open and allow room to remove the hook. If you are holding the line in your left hand and the dehooker in your right, use the following procedures:

- Lay the dehooker on the line with the open end of the pigtail facing up
- Pull the dehooker toward you to engage the line, and then turn the dehooker a quarter turn clockwise
- Slide the dehooker down the leader until it engages the shank of the hook
- Bring your hands together; make sure the line is tight and parallel with the dehooker
- Give a slight thrust downward

- Pull the dehooker out with the hook

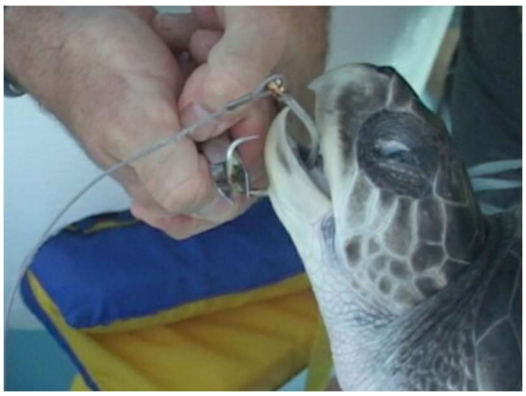

Figure 7 - Turtle being dehooked (ISSF, 2016)

In the following “deep-hooked” situations, do not remove the hook, as doing so could cause more damage to the turtle than allowing the hook to remain in place:

- The hook’s barb is not clearly visible.
- The hook is in the glottis (the opening at the back of the tongue that leads into the windpipe)
- The hook could be in the braincase or roof of the mouth in these situations, use line cutters to cut the line as close to the hook as possible. If you can, use bolt cutters to cut the hook near the barb or the eye and then pull it out.

If the turtle appears unconscious, place the turtle on an angled surface so that its hindquarters are approximately 15cm or 6in above its head, allowing water to drain out of its lungs. Again, keep the turtle wet with a damp towel over its shell and at a temperature above 15°C (60°F). Check the turtle’s reflexes by touching its tail or eyelid every three hours. An unconscious, but live, turtle may not react. If, after 24 hours, the turtle still shows no reflex reaction, it is likely dead. However, if it does recover, release it gently into the water.

Cetaceans

The fishery has known instances of interactions with cetaceans. All species of cetacean are ETP species as they are included in CITES Appendix I and shall remain in this strategy due to their ecological importance.

Table 4 - Known ETP cetacean Interactions recorded from observer reports

Species Common Name	Scientific Name	Total % of Catch	Designation and Justification
Cetacean	*Cetacea spp.*	0.00	ETP - CITES Appendix I, Resolution 13/04
Total		**0.00%**	

Issue

Cetaceans generally are reproductively unproductive with single removals of individuals having large effects on populations.

Fisheries bycatch is considered to be one of the most significant causes of mortality for many marine species, including vulnerable megafauna. Entangled marine mammals can also be an issue for crew safety. They can be extremely dangerous because they are powerful and unpredictable. Entanglement in longliners are rare and interactions generally occur with pilot or sperm whales taking tuna off the lines, they are often not observed doing so. All cetaceans must be released as quickly and as safely as possible.

Mitigation

Disentangling Equipment – The vessels shall have disentangling equipment readily available – somewhere on deck where crew can get it quickly when a whale or dolphin is caught. All disentangling must be done aligned with ISSF protocols and these include:

- Do not enter the water to untangle marine mammals, they are powerful animals and have dehooking and line-cutting equipment ready.
- If whales or dolphins are eating your caught fish, or you catch a marine mammal, consider moving 100 nautical miles or more before making your next set.

For small whales/dolphins:

- Avoid sudden actions, do not use gaffs, and facilitate animal reaching the surface to breathe
- If entangled move vessel close to use a long-handle line cutter and cut as much line as possible.
- Wait for the animal to move away before resuming fishing.
- If hooked move close to vessel but without pulling the line to bring the animal onboard. If superficially hooked use the dehooked if close enough. If you can´t then cut with the long-handled line cutter as close to the hook as possible.

For large whales:

- If the animal poses a threat to the boat or crew, cut the line away from the vessel.
- If it is considered safe, then get the animal as close as possible to the vessel and cut the line with long-handled cutters and wait for the whale to move away.

Reporting – Improving reporting is a vital tool to better understand interactions and mitigate against potential future interactions. Any interactions should be described with a description of the animal and its injuries. Take photos if possible. Use your species ID book to try to identify the animal. Record all required information on your logbook form. When skippers have interacted or observed a cetacean, they should notify other captains in the fleet to prevent the same area to set fishing.

Seabirds

Commonly encountered seabirds in longline fisheries include shearwaters, storm petrels, and boobies, but the birds that are affected most by longline gear are albatrosses and petrels (BirdLife International 2011). Albatrosses and petrels can live for over 60 years and lay only one egg every one to two years. This means that any birds killed have an impact on the population. They also generally mate for life, and one bird's death means that its partner may never reproduce again. There are 22 species of albatross; 17 are threatened with extinction. The fishery, as per electronic observer data, has known interactions with seabirds in the Indian ocean, contributing 0.09% of total catch. Species categorisation has proven to be difficult due to fishing behaviours and similarities in bird species. All bird species must be released as quickly and as safely as possible to ensure a reduction in post release mortality.

Table 5 - Known ETP seabird Interactions recorded from observer reports

Species Common Name	Scientific Name	Total % of Catch	Designation and Justification
Seabirds	*Procellariiformes, Suliformes, Charadriiformes*	0.09%	Resolution 23/07
Total		**0.09%**	

Issue

Seabird often see baited hooks as a free meal when being set and often become hooked or entangled often resulting in their death through drowning, those that survive need to be dehooked and released effectively. Commonly encountered seabirds include shearwaters, storm petrels, and boobies, but the birds that are affected most by longline gear are albatrosses and petrels. Albatrosses and petrels can live for over 60 years and lay only one egg every one to two years. This means that any birds killed have an impact on the population. They also generally mate for life, and one bird's death means that its partner may never reproduce again. There are 22 species of albatross; 17 are threatened with extinction. Albatrosses fly thousands of kilometres on a single feeding trip, mostly in cooler, higher-latitude waters, although many are globally distributed. But other seabirds are in warmer waters or specific to a region.

Hooked bird (Dimas Gianuca, Projeto Albatroz)

Mitigation

All five tuna RFMOs have established requirements for longline fishing vessels to use a combination of bycatch reduction measures in areas overlapping with albatross and petrel distribution to reduce the number killed accidentally as bycatch. In addition to helping reduce the catch of seabirds, these techniques can also help minimise bait loss and ensure that baited hooks are available to the target species (Løkkeborg, 2011).

In the Southern Indian ocean, longline vessels fishing must use two of the following seabird bycatch mitigation measures:

- Bird-scaring lines (also known as bird curtains, streamer, or tori lines)

- Weighted branchlines
- Night setting

And vessels must also use two seabird bycatch mitigation measures from a wider selection that includes:

- Side-setting with bird curtains
- Blue-dyed bait
- Offal management
- Underwater setting chute and line shooter

Avoiding certain areas (possibly at certain times) is also a potential strategy for avoiding the incidental capture of seabirds.

Bird-scaring Lines - A bird scaring line, also known as tori line or bird streamer line, is a line (often 100 meters long) that is towed from a high point near the stern from which streamers are suspended at regular intervals. The streamers flap as the vessel pitches and rolls, and this deters the birds from flying near the stern of the vessel. The bird scaring line is most effective when the streamers are flapping directly above the baited hooks. The wind must be taken into consideration; if crosswinds blow the streamers to the side of the longline, then the baited hooks are exposed to the seabirds. If feasible, the most effective setup is to fly two tori lines, one to port and one to starboard of the baited hooks. These must be used in areas as specified by the RFMOs and is subject to obtaining further information on bird interactions.

Figure 8 - Successful Tori Line Deployment (ISSF, 2016)

Weighted Branch Lines - When weight is added to a branchline, the baited hook sinks faster and reduces the time that seabirds can access it. This is commonly done using weighted swivels on the branchline. The weight should be at least 45g within 1 m of hook, at least 60 g at less than 3.5 m from hook and at least 98 g at less than 4 m from the hook. Some have expressed a reluctance to use leaded swivels due to safety concerns, as weighted swivels could cause serious injury if they recoil back at the crew in the event of a line breakage. By employing “safe leads,” which are designed to slide off the branchline in the event of a breakage, this risk can be minimised.

Figure 9 - Safe Leads (ISSF, 2016)

Night Setting - Since many seabirds, including the vulnerable albatross, do not feed at night, you can minimise interactions by setting gear then. Night setting involves starting to set gear after nautical dusk and finishing setting before nautical dawn. Deck lighting should be kept to a minimum, using only as much vessel light as you need to comply with navigational rules and best safety practices. This is to be done where and when appropriate.

Side Setting - Unlike traditional stern setting, setting off the side of the vessel (at least 1 meter forward of the stern, or more if possible) reduces the time that baited hooks are near the surface and visible to seabirds. By tossing the baited hook forward and close to the hull, under the protection of a bird curtain, the hope is that by the time the baited hook has passed the stern it has sunk beyond the reach of the birds. Another advantage of side setting is that it requires only one work area and eliminates the chore of moving gear and bait between setting and hauling station, however this is not suitable for all vessels and must be decided on a case by case basis.

Handling and Release of Hooked and Entangled Birds - Most seabirds are caught during line setting and are therefore dead by the time gear is hauled. However, in the event that you discover a live seabird on the line, release the tension on your mainline by slowing your vessel to a stop. Ease the bird to the side of the vessel by steadily bringing in the line. Do not make sudden jerks. If available, use a long-handled dip net to bring the bird on board. Seabirds can be quite large and will bite, so gloves, eye protection, long sleeves and the help of a crewmember are all useful to have.

The following are essential tips for the correct way to hold a bird:

- Hold it behind the head at the top of its neck
- Fold the feathers and wings back into their natural position against the body
- Do not accidentally restrict its breathing by covering its nostrils or squeezing the body too tightly
- Cover its body with a towel to protect the bird's feathers from oils and other things that could damage it during handling

If the bird is lightly hooked in the bill, leg, or wing, and you can see the barb of the hook: remove the excess line, cut off the barb with bolt cutters, and then back out the rest of the hook.

How to CORRECTLY hold a bird. (John Paterson, ATF Namibia)

How NOT to hold a bird. (Juliano Cesar, Projeto Albatroz)

If the bird is deeply hooked in the body or throat (i.e. you cannot see the barb), cut the line as close to the hook as possible, leaving the hook in the bird. Removing a deeply embedded hook can cause more harm than good. Never try to pull on the leader to remove a hook.

A bird's feathers must be dry in order for it to fly properly, and it can take between 30 minutes and 4 hours for them to dry if wet. A cardboard box with a dry towel or blanket is a good place for it to rest and recuperate before being released. Do not give the bird food or water. A fully recovered bird can:

- Stand on its feet
- Hold its head up
- React to sound
- Breathe without making noise
- Retract its wings into a normal position against its body

To release a bird, stop the vessel and set the bird on the water's surface. Do not throw it into the air. Wait until the bird is clear of the vessel before reengaging the motor. If you encounter a banded (tagged) bird, record its number, the time and place of its capture, and note the mitigation measures that were employed at the time. This information can help scientists evaluate which mitigation measures are most effective. Remember that seabirds, and albatrosses in particular, are sensitive bycatch species.

Reporting – It is important to at least attempt to identify any seabirds you catch. If you are unable to identify them, consider taking a photograph. Use the provided commonly encountered species posters to help identification.

Non Species Specific

In addition to the species-specific strategies mentioned above, the fishery shall:

- Avoid all known ETP hotspots and communicate effectively between vessels to tell other fishers where these are.
- Comply with both the shark finning and Longline Vessel Bycatch Mitigation Policy in Appendix B
- Keep abreast of new science and promote research to further develop best practices for handling and safe release
- Improve the low observer coverage through human or electronic means
- All skippers shall attend and engage in the Skipper Training program being run through the FIP work plan
- Vessels should accurately record all ETP interactions including reporting interactions and fate of any releases (e.g. released alive; discarded dead, injuries), and collecting any data requested by scientists (e.g., photographs). Including documenting the inventory and use of equipment for the handling and safe release techniques.
- Collaborate with the RFMO to adopt mandatory handling and safe and live release best practices for ETP species.
- Facilitating research that addresses mitigation of ETP species bycatch, and voluntarily adopt best practices when these become known including participating in research programs that reduce mortality of ETP species outside the fishery — for example, ISSF projects
- Collaborating with other fleets to estimate overall interaction of ETP species and research on mitigation measure to reduce the cumulative impacts.
- Follow best practices of live release methods to minimise mortality and document their use of all ETP species and support mandatory adoption of these practices by the flag state and RFMO.
- Estimate, monitor and manage potential sources of unobserved mortality (post release, entanglement, etc).

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Appendix A - Indian Ocean tuna - longline (Bumble Bee/FCF Co., Ltd) - ETP Species

Table 6. ETP Interactions recorded from catch data provided from electronic observers

Species Common Name	Scientific Name	Total % of Catch
Shortfin mako	*Isurus oxyrinchus*	0.53
Various sharks nei	*Selachimorpha (Pleurotremata)*	0.11
Seabirds nei	*Procellariiformes, Suliformes, Charadriiformes*	0.09
Requiem sharks nei	*Carcharhinidae*	0.09
Copper shark	*Carcharhinus brachyurus*	0.01
Silky shark	*Carcharhinus falciformis*	0.01
Cetacean	*Cetacea spp*	0.00
Turtle	*Testudinata spp*	0.00
Total		**0.84%**

Appendix B - Shark finning and Longline Vessel Bycatch Mitigation policy

鯊魚割鰭棄身和鮪釣船混獲改善方針

Shark Finning and Longline Vessel Bycatch Mitigation Policy

(下方填入船隻公司英文名稱)

INSERT VESSEL COMPANY NAME BELOW

同意方：(請填寫公司名稱或船舶所有人姓名)

禁止割鰭棄身(即所謂割下鯊魚鰭，丟棄魚體回海裡)的行為。
Prohibit the practice of shark finning (as defined by retaining fins and discarding carcasses at sea) on company vessels.

為強化鯊魚保育政策，關於留艙鯊魚的管理實踐，將遵守並採以下處置方式：
1. 禁止捕撈國家法律或區域性漁業管理組織規定禁捕的鯊魚。
2. 落實紀錄並申報所有捕獲的鯊魚。
3. 確保鯊魚在上岸時其魚鰭是自然地附著在魚體上，即全魚上岸。

To strengthen the shark finning prevention policy, agree to comply and adopt the following practices with regard to shark retention:
1. Vessel shall not catch shark species that are banned by national law or RFMOs regulation.
2. Company vessels shall record and report all sharks landed.
3. All sharks landed shall have their fins naturally attached (FNA), if retained.

----------船隻須實行以下措施來減少鯊魚、海龜及海鳥的捕獲----------
The following measures to reduce catch of shark, turtle and seabird species are employed on the vessel:

1. 使用圓形鉤及尼龍繩，並禁止使用鋼索。
   Use of circle hooks and monofilament lines and prohibit the use of wire trace.

2. 船員需盡力釋放仍活著的鯊魚、海龜及海鳥，並使用 ISSF Skipper's Guidebook 上所記載最好的永續處理方式
   Use of best efforts by crews to release alive shark, turtle and seabird species through implementation of best practice handling techniques as written in the ISSF Skippers' Guidebook to Sustainable Longline Fishing Practices.

3. 全程禁止使用鯊魚釣線(從浮球或調整繩上延伸出釣鯊魚的支線)
   No use of "shark lines" (the use branch lines running directly off the longline floats or drop lines) at any time.

4. 按照區域作業漁業組織要求，公司船隻需配合實行相關減少海鳥意外捕獲改善措施，相關改善方式如：(a)避鳥繩 (b)支繩加重 (c)夜間投繩 (d) 其他區域性漁業管理組織認可之措施
   Seabird bycatch mitigation measures required by relevant RFMO's in relevant latitudes are employed by company vessels, for instance (a)Bird-scaring lines (also known as bird curtains, streamer or tori lines) (b)Weighted branch lines (c)Night setting (d) Other measures recognized by tuna Regional Fisheries Management Organizations

5. 與釣鉤投放較深(100 米以上)的情況相比，放釣投放較淺時，延繩釣的鯊魚捕獲率較高。
   Shark catch rates are significantly higher on shallow-set longlines than deeper-set (deeper than 100 m) longlines.

6. 處置和放生鯊魚時應特別注意：(a)以濕布輕罩住鯊魚頭部，可使其穩定 (b)如因不可避免的因素無法立即將鯊魚放生，則在鯊魚嘴中塞入一根通海水的軟管，可提高鯊魚的放生存活率 (c)應盡快放生
   Shark Handling and Release: (a)A cool, wet cloth lightly draped over its head can calm an energetic shark.

(b)Inserting a seawater hose in its mouth might improve an animal's chance of survival if, for an unavoidable reason, the shark cannot be released right way. (c)Attempt to release the animal as soon as possible.

7. 以下作法能夠有效地減少海龜誤捕，同時不降低目標物種捕獲率的做法：(a) 用寬的圓鉤 (b)使用全魚餌作釣餌，不使用頭足類作魚餌 (c)下鉤深度超過海龜聚集的深度(40-100 米)
The following practices are known to be highly effective without compromising catch rates of target species but reduce turtle interactions: (a)Use wide/large circle hooks (b)Use whole finish bait, rather than Cephalopoda species for bait (c)Set hooks deeper than turtle-abundant depths (40–100 m).

上述提到了幾點有效地減少混獲物種的最常見措施建議，並集結了不同的區域性漁業管理組織關於使用各種措施的要求，從而對鮪釣漁業及其生態系統進行全面和可持續性的管理。
The section above describes the measures most commonly recommended as effective at reducing bycatch species, and the combinations of measures required by different Regional Fisheries Management Organizations (RFMOs). So that tuna stocks in longline fishery and their ecosystem are managed comprehensively and sustainably.

附錄 1 漁船聲明

Appendix 1 Vessel Statement Regarding to By- catch Mitigation Measures

- **參考資料：鯊魚割鰭棄身和鮪釣船混獲改善方針及 ISSF 永續延繩釣捕撈規範船長指南**
- **Reference: Shark Finning and Longline Vessel ByCatch Mitigation Policy and ISSF Skippers' Guidebook to Sustainable Longline Fishing Practices[2]**

作為以下船隻的負責人，在此聲明本人已詳閱並充分了解鯊魚割鰭棄身和鮪釣船混獲改善方針及 ISSF 永續延繩釣捕撈規範船長指南，並同意會依照其標準及規範作業，且確保船長落實對全體船員進行此政策內容的宣導與訓練，於必要時提供相關訓練證明。

As the owner of the below named fishing vessel, hereby confirms that I have read the contents of the Shark Finning and Longline Vessel Bycatch Mitigation Policy and ISSF Skippers' Guidebook to Sustainable Longline Fishing Practices and agree to comply with the recommended best practice and procedure, and ensure all crews onboard will be aware and trained on the policy by the captain, all records of conducting the training shall be maintained as an evidence.

船隻名稱 (Vessel Name)			
公司名稱 (Company Name)			
負責人簽名 (Owner's Signature)		**簽署日期 (Date)**	

[2] http://www.issfguidebooks.org/downloadable-guides?tag=Longline%20Skipper