ETP Management Strategy for the Pacific Ocean tuna - longline (Fue Shin)

Prepared by Key Traceability

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https://fisheryprogress.org/fip-profile/pacific-ocean-tuna-longline-fue-shin

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Introduction

The fishery being assessed is the *Pacific Longline Tuna Fishery (Fue Shin Fishery)*. The fishery targets albacore (*Thunnus alalunga*) and catches bigeye (*T. obesus*), yellowfin (*T. albacares*) and skipjack (*Katsuwonus pelamis*). The pelagic longline vessels are flagged to Taiwan and fish on the high seas in the Pacific. The fishery is managed regionally by the Western and Central Pacific Fisheries Commission (WCPFC) in the Western and Central Pacific Ocean (WCPO) and by the Inter American Tropical Tuna Commission (IATTC) in the Eastern Pacific Ocean (EPO).

The MSC definition of an ETP species is:

- 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.
        - 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).

This document builds on previous work and details the best practices and management strategy of ETP species within the Pacific Longline Tuna (Fue Shin) FIP using fishery specific catch data (where possible)[1] 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.

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 MSC certification.

[1] It is to be noted that catch data has been provided by the client fishery and third party observer data has been received for cross-checking. However, the Observer data coverage is still limited, so during the FIP, client data collection will be improved, e.g., discard data; alive, dead, etc and opportunities for increasing observer coverage (human or electronic) will be pursued. This will be used to update the ETP management strategy, as necessary.

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 1 November 2021 and shall be verified through both human and electronic observers when available.

For any issues or amendments please contact the author, Charles Horsnell at c.horsnell@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. 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. 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.

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.

ETP Shark species that this fishery are known to or predicted to interact with using the past 3 years of fishery data and data some similar fisheries are as follows. Note some sharks are not explicitly ETP species however, they are possibly landed in designated shark sanctuaries due to the nature of aggregated data received from the fishery a precautionary approach was decided to list them as ETP species:

Table 1 - ETP Shark species that the fishery is known to and predicted to interact with using the past 3 years of fishery data and similar fisheries

Scoring elements	Scientific name	UoAs to which applicable	Justification
Silky shark	*Carcharhinus falciformis*	Both WCPO and EPO UoAs	CMM 2013-08; CMS Appendix II
Oceanic whitetip shark	*Carcharhinus longimanus*	Both WCPO and EPO UoAs	CMM 2011-03; CITES Appendix II
Giant manta	*Mobula (Manta) birostris*	Both WCPO and EPO UoAs	CMS Appendix I; CITES Appendix II
Mobula *nei*	*Mobula* spp.	Both WCPO and EPO UoAs	CMS Appendix I; CITES Appendix II
Longfin mako shark	*Isurus paucus*	Both WCPO and EPO UoAs	CMS Appendix II
Shortfin mako shark	*Isurus oxyrinchus*	Both WCPO and EPO UoAs	CMS Appendix II
Porbeagle shark	*Lamna nasus*	Both WCPO and EPO UoAs	CMS Appendix II
Thresher sharks	*Alopias* spp.	Both WCPO and EPO UoAs	CMS Appendix II

Hammerhead sharks	*Sphyrna* spp.	Both WCPO and EPO UoAs	CMS Appendix II

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 turtle conservation 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 turtle conservation 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

The fishery complies with all national and regional legislation including WCPFC's CMM 2010-07 (which is to be superseded by CMM 2019-04 in November 2020 removing the fin to carcass ratio). WCPFC prohibits this practice under CMM 2010-07 by introducing the concept of a 5% fins-to-carcass ratio and this concept shall be dropped in CMM 2019-04, which the fishery already complies with. In order to facilitate on-board storage, shark fins may be partially sliced through and folded against the shark carcass but shall not be removed from the carcass. Fin to carcass ratios do not apply to this fishery.

Fishers should ensure that the information (discarded/retained) is recorded in the logbooks. This record-keeping can be greatly improved by the deployment of on-board observers. All fishers must align with the FIP Shark Finning and 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)

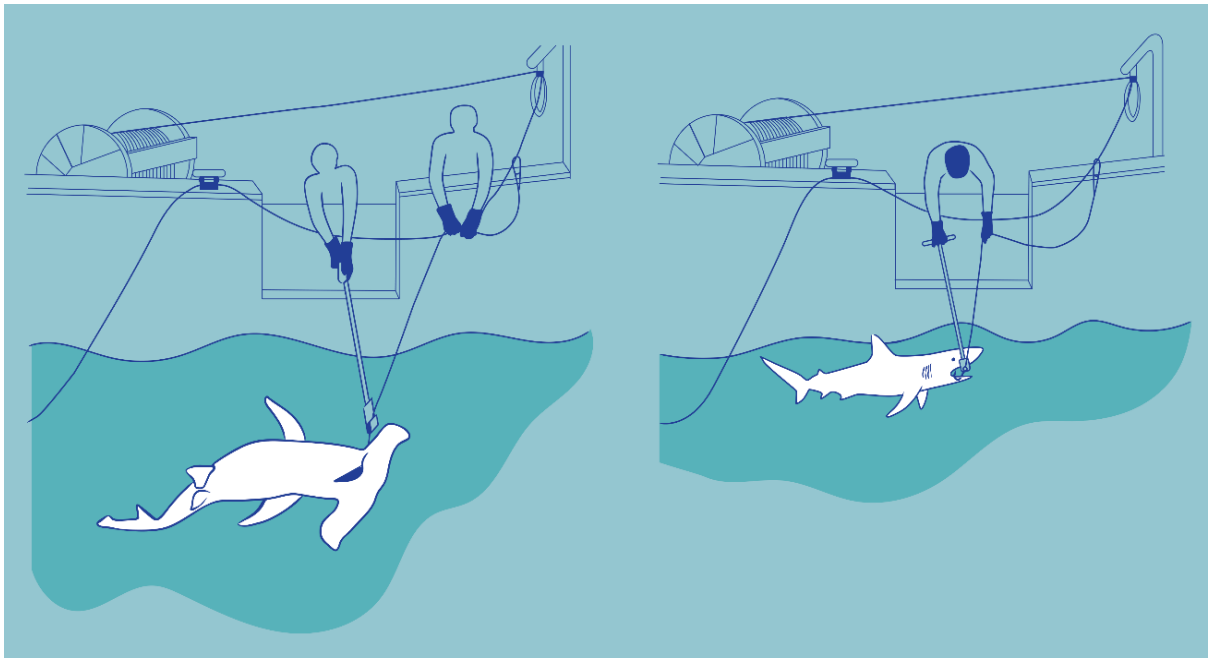

Figure 2 - Example techniques to release sharks while they are in the water by using a long-handled line cutter to cut the gear as close to the hook as possible (left) or by using a long-handled dehooker to remove the hook (right).

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).

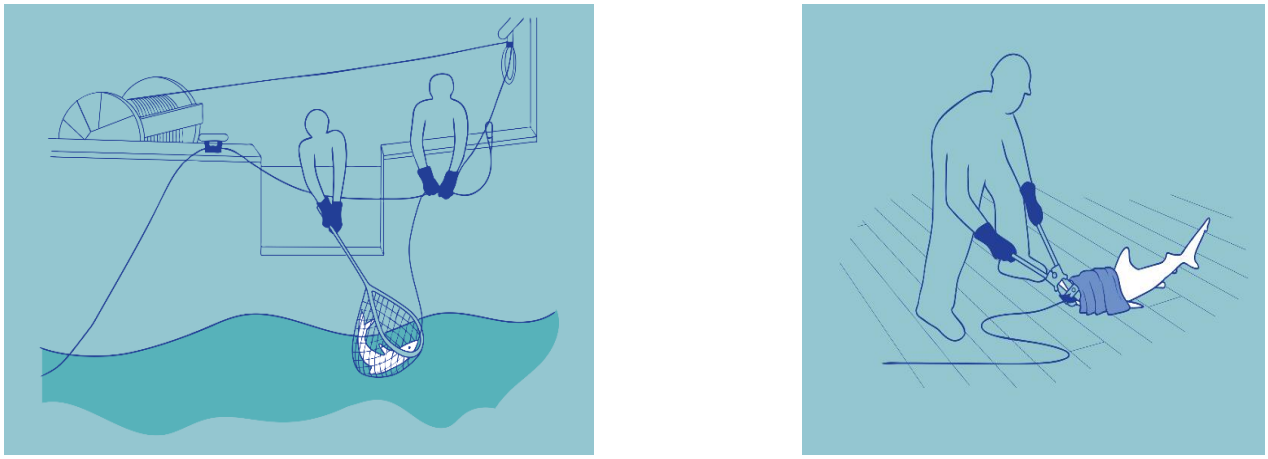

Figure 3 - Example of the use of a dip net to bring the shark on board (left) and example of the use of a bolt cutter to remove the hook.

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)

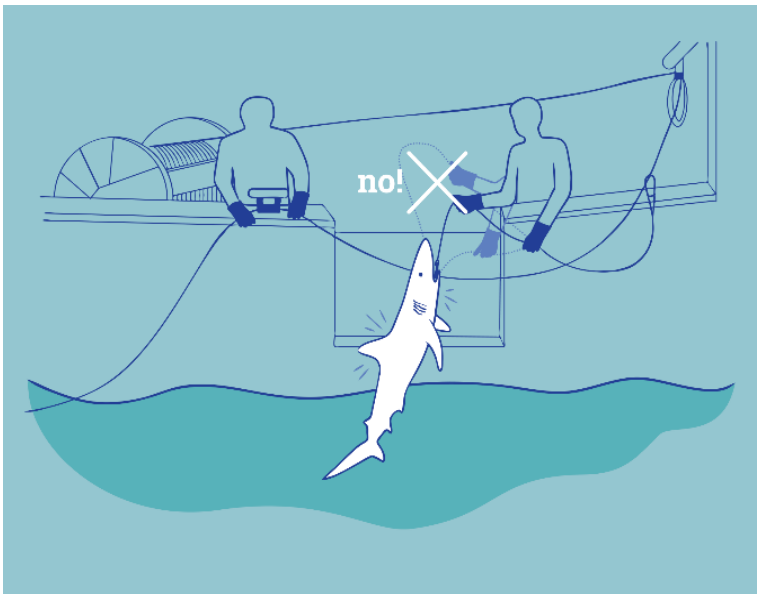

Figure 4 - Do not strike a shark against any surface to remove the animal from the line.

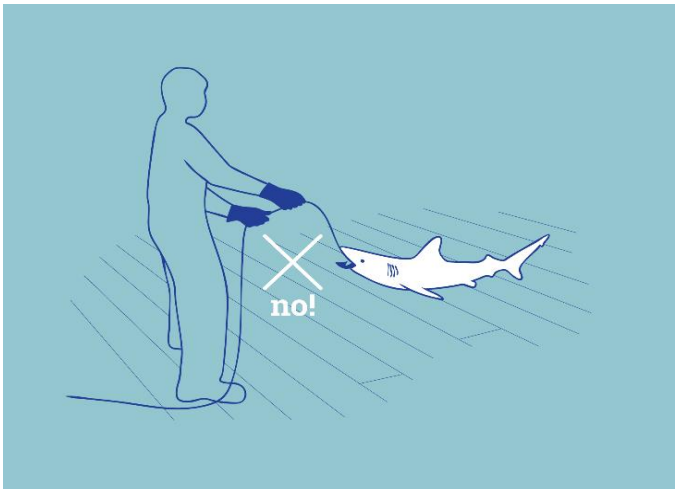

Figure 5 - Do not try to remove a hook by pulling sharply on the branchline.Do not attempt to dislodge a hook that is deeply ingested and not visible or remove a hook by pulling sharply on the branchline.

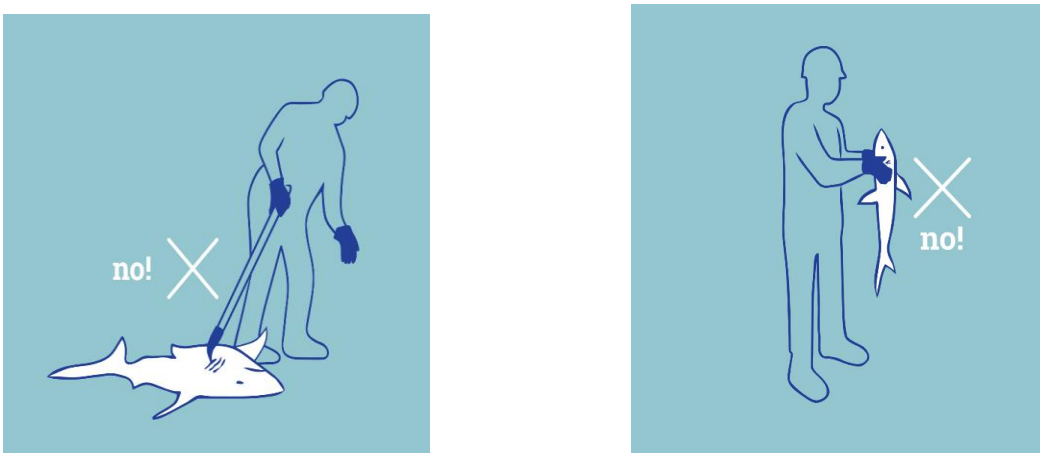

Figure 6 - Do not gaff (left) or insert hands into gill slits (right)

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 sub-populations in the Pacific are listed as Critically Endangered due to population declines of 80% and 97% in the western and eastern Pacific respectively.

ETP Turtle species that the Pacific LL Tuna fishery are known or predicted to interact with using the past 3 years of fishery data and similar fisheries are as follows:

Table 2 - ETP turtle species that the fishery is known to and predicted to interact with using the past 3 years of fishery data and similar fisheries

Scoring elements	Scientific name	UoAs to which applicable	Justification
Olive ridley turtle	*Lepidochelys olivacea*	Both WCPO and EPO UoAs	CMM 2008-03; C-07-03; CMS Appendix I; CITES Appendix I; Vulnerable on IUCN Redlist
Green turtle	*Chelonia mydas*	Both WCPO and EPO UoAs	CMM 2008-03; C-07-03; CMS Appendix I; CITES Appendix I
Hawksbill turtle	*Caretta caretta*	Both WCPO and EPO UoAs	CMM 2008-03; C-07-03; CMS Appendix I; CITES Appendix I
Leatherback turtle	*Dermochelys coriacea*	Both WCPO and EPO UoAs	CMM 2008-03; C-07-03; CMS Appendix I; CITES Appendix I; Critically Endangered on IUCN Redlist

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. There are 7 species of sea turtle, with 4 commonly encountered during tuna longline fishing (Pacific Islands Regional Office, 2010).

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 and ETP Bycatch Mitigation 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. All vessels shall use only fish for bait as per the Shark Finning and ETP 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

ETP cetacean species that the Pacific LL Tuna fishery are known or predicted to interact with using the past 3 years of fishery data and similar fisheries are as follows:

Table 3 - ETP cetacean species that the fishery could interact with based on similar fishery data:

Common Name	Binomial Name	UoAs to which applicable
False Killer Whale	**Pseudorca crassidens**	Both WCPO and EPO UoAs
Sperm Whale	**Physeter macrocephalus**	Both WCPO and EPO UoAs
Short-Finned Pilot Whale	**Globicephala macrorhynchus**	Both WCPO and EPO UoAs
Common Dolphin	**Delphinus capensis**	Both WCPO and EPO UoAs
Melon-Headed Whale	**Peponocephala electra**	Both WCPO and EPO UoAs

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.

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. Observer data of similar fisheries has shown that there are no interactions with seabirds, however Electronic Observer Reporting says there are interactions. These interactions were not able to be designated at a species-specific level but are thought to be mostly gulls. So far no observer data specific to the Pacific Ocean tuna – longline (Fue Shin) shows interactions with seabirds.

Table 4 - Potential ETP seabird Interactions recorded from similar fisheries and flag states country submission to RFMOs

Common Name	Binomial Name
Black-footed Albatross	*Phoebastria nigripes*
Laysan Albatross	*Phoebastria immutabilis*
Short-tailed Albatross	*Phoebastria albatrus*
Wandering Albatross	*Diomedea exulans*
Black-browed Albatross	*Thalassarche melanophrys*
Petrels nei	*Procellariidae*

Issue

Seabird often see baited hooks as a free meal when being set and often become hooked or entangled often resulting in their death, 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 and Northern Pacific oceans, 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.

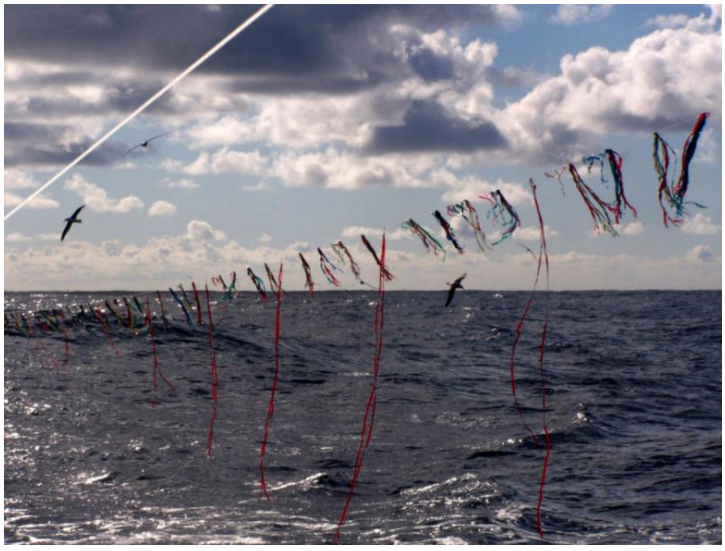

Figure 8 - Successful Tori Line Deployment (ISSF, 2016)

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.

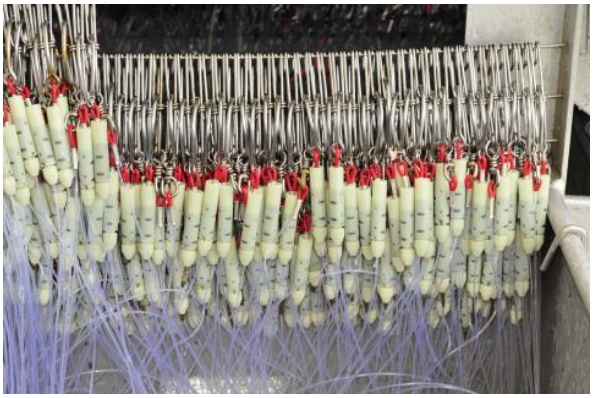

Figure 9 - Safe Leads (ISSF, 2016)

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.

Management of Offal Discharge - In the North WCPFC and IATTC areas, vessels may use offal management as one of the seabird bycatch mitigation measures. Vessels may either ensure no offal discharge during setting or hauling or use strategic offal discharge from the opposite side of the boat to setting/hauling, to actively encourage birds away from baited hooks. Of course, if there are no seabirds present, offal discharge management is not necessary.

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 ETP policies in Appendix B
- Keep abreast of new science and promote research to further develop best practices for handling and safe release
- Improve the low human observer coverage
- 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
Pacific LL Tuna Fishery Catch Data - ETP Species

Table 4 - ETP Interactions Observed from Fishery Specific Catch Data

Species	MSC designation	Justification	RBF anticipated at full assessment?
FALSE KILLER WHALE	ETP	CITES appendix II	No. Observer data is available so the impact of the fishery can be analytically developed
LONGFIN MAKO	ETP	CMS Appendix II; Endangered on IUCN Red List	No. Observer data is available so the impact of the fishery can be analytically developed
PELAGIC THRESHER	ETP	CMS Appendix II, CITES Appendix II; Endangered on IUCN Red List	No. Observer data is available so the impact of the fishery can be analytically developed
BIGEYE THRESHER	ETP	CITES appendix II	No. Observer data is available so the impact of the fishery can be analytically developed
SHORTFIN MAKO	ETP	Regionally protected (CMM 2013-08)	No. Observer data is available so the impact of the fishery can be analytically developed
OCEANIC WHITETIP SHARK	ETP	Regionally protected (2011-04)	No. Observer data is available so the impact of the fishery can be analytically developed
SILKY SHARK	ETP	CMM 2013-08; CMS Appendix II; CITES Appendix II; Vulnerable on IUCN Red List	No. Observer data is available so the impact of the fishery can be analytically developed
BLUE SHARK / *Prionace glauca*	ETP	CMS Appendix II	No. Observer data is available so the impact of the fishery can be analytically developed

Appendix B
Shark Finning and ETP Bycatch Mitigation Policy[2]

As a responsible member of the fishing community we recognise most shark and turtle species are highly susceptible to overfishing, and many are considered threatened or endangered. Furthermore, we understand the wasteful practice of shark finning (the removal and retention of shark fins and discarding at sea of the carcass) contravenes many international rules and regulations, including those of all major tuna Regional Fisheries Management Organisations (RFMOs)

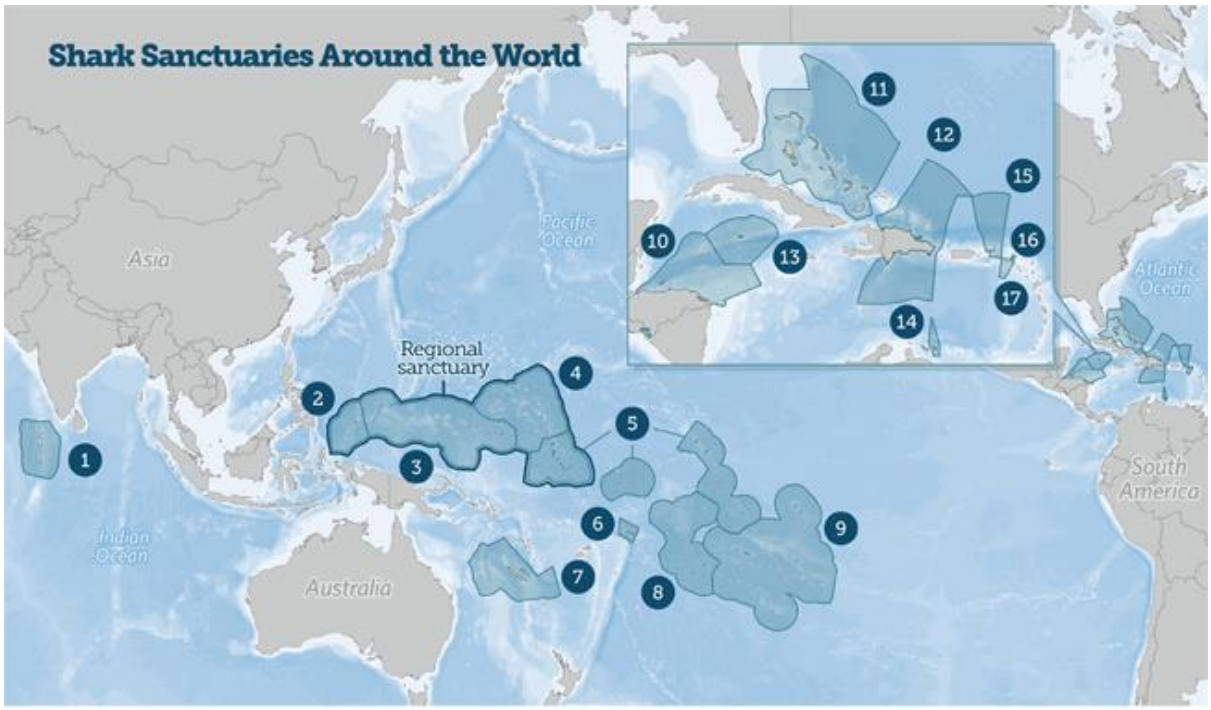
To better protect sharks and turtles, our company and/or vessel(s):

1. Does not actively target sharks
2. Does not set shark lines on buoys
3. Use only circle hooks and monofilament line, and use as wide a hook as possible that maintains acceptable catch rates of market species to reduce hard shelled sea turtle catch rates where necessary
4. Promotes best practices for bycatch handling and release of sharks, turtles, cetaceans, and birds
5. Prohibits the use of wire traces (shark lines)
6. Prohibits the practice of shark finning
7. Promotes the release of sharks that are caught alive
8. Does not retain oceanic whitetip or silky sharks
9. For other sharks that are landed, the carcass is retained with fins attached
10. Records the shark species in the fishing logbook for all sharks that are landed
11. Does not engage in trading with the fishing companies which do not observe the above clauses

Company Name (s)	
Fishing Vessel Name	
Fishing Vessel Flag	
RFMO of Fishing area	
Name of Vessel owner and / or Captain	
Signature of Vessel Owner and / or Captain	
Date	

[2] Note that this shark finning policy has already been signed by all vessels participating in this FIP; this can be viewed upon request.

Appendix C – Map of Shark Sanctuaries



1. Maldives
   916,189 sq. km. (353,742 sq. mi.)
   Established 2010
2. Palau
   604,289 sq. km. (233,317 sq. mi.)
   Established 2009
3. Federated States of Micronesia
   2,992,597 sq. km. (1,155,448 sq. mi.)
   Established 2015
4. Marshall Islands
   1,992,232 sq. km. (769,205 sq. mi.)
   Established 2011
5. Kiribati
   3,437,132 sq. km. (1,327,084 sq. mi.)
   Established 2015
6. Samoa
   128,000 sq.km. (49,421 sq.mi.)
   Established 2018
7. New Caledonia
   1,245,000 sq. km. (480,697 sq. mi.)
   Established 2013
8. Cook Islands
   1,960,135 sq. km. (756,812 sq. mi.)
   Established 2012
9. French Polynesia
   4,767,242 sq. km. (1,840,642 sq. mi.)
   Established 2012
10. Honduras
    240,240 sq. km. (92,757 sq. mi.)
    Established 2011
11. The Bahamas
    629,293 sq. km. (242,971 sq. mi.)
    Established 2011
12. Dominican Republic
    269,489 sq. km. (104,050 sq. mi.)
    Established 2017
13. Cayman Islands
    119,134 sq. km. (45,998 sq. mi.)
    Established 2015
14. Bonaire
    9,706 sq. km. (3,747 sq. mi.)
    Established 2015
15. British Virgin Islands
    80,117 sq. km. (30,933 sq. mi.)
    Established 2014
16. St. Maarten
    499 sq. km. (193 sq. mi.)
    Established 2016
17. Saba
    8,033 sq. km. (3,102 sq. mi.)
    Established 2015