Endangered, threatened, and protected (ETP) species management strategy for the Panama large pelagics longline FIP (Marpesca Fishing)

Prepared by Key Traceability and Marpesca Fishing

September 2023

Key Traceability Ltd.
+44 7505 122728
Info@keytraceability.com
England Registered Company 09730288
70 Londesborough Road, Portsmouth, PO4 0EX

Table of Contents

1. Introduction 3
2. ETP species in Panama 5
3. National and regional management measure for participating IATTC states 8
4. Fishery-specific ETP bycatch management strategy 11

References 14

1. Introduction

This fishery is the Panama large pelagics longline FIP (Marpesca). All five vessels are flagged to Panama and operate within the country's exclusive economic zone (EEZ) and on the high seas of the Eastern Pacific Ocean (EPO). The fishery aims to improve its standard by working towards the following objectives:

- **Sustainable Fish Stocks:** To ensure the catches of tuna, mahi mahi, and swordfish and other primary species across the Panama EEZ do not exceed sustainable levels by 2027.
- **Minimizing Environmental Impacts:** To support the implementation of the ecosystem-based approach to fisheries management by 2027.
- **Effective Management:** To strengthen governance systems in Panama, regional governing bodies (ARAP), and the fishery by 2027.
- Be ready to enter MSC certification and meet the above objectives by 2027.

A key element of meeting the requirements set by the MSC Fisheries Standard (v3.0) is within Principle 2 (Minimising environmental impacts), and more specifically, identifying the impacts and risk associated with endangered, threatened, and protected (ETP) and/or out-of-scope (OOS) species.

The MSC definition of an ETP species is:

a. Species impacted by the UoA that are classified as amphibians, reptiles, birds, or mammals (hereafter known as OOS species).

b. Species impacted by the UoA that are classified as fish or invertebrates and are listed in any of the following:

    - Appendix 1 of the Convention on International Trade in Endangered Species (CITES).
    - Appendix 2 of CITES.
    - Appendix 1 of the Convention on the Conservation of Migratory Species of Wild Animals (CMS).
    - Appendix 2 of CMS.
    - The International Union for Conservation of Nature (IUCN) Red List of Threatened Species and classified globally as "Critically Endangered (Cr)".
    - The IUCN Red List of Threatened Species and classified globally as "Endangered (En)".
    - National ETP legislation.

Under version 3.0 of the Fisheries Standard, there is a decision tree diagram used by assessors when determining if a species should be listed as "in-scope" or "ETP" and this can be found below (Figure 1). The details of this decision tree are too complex to discuss in this report, but more information about species designation can be found in section SA3.1.4 of the MSC Fisheries Standard v3.0.

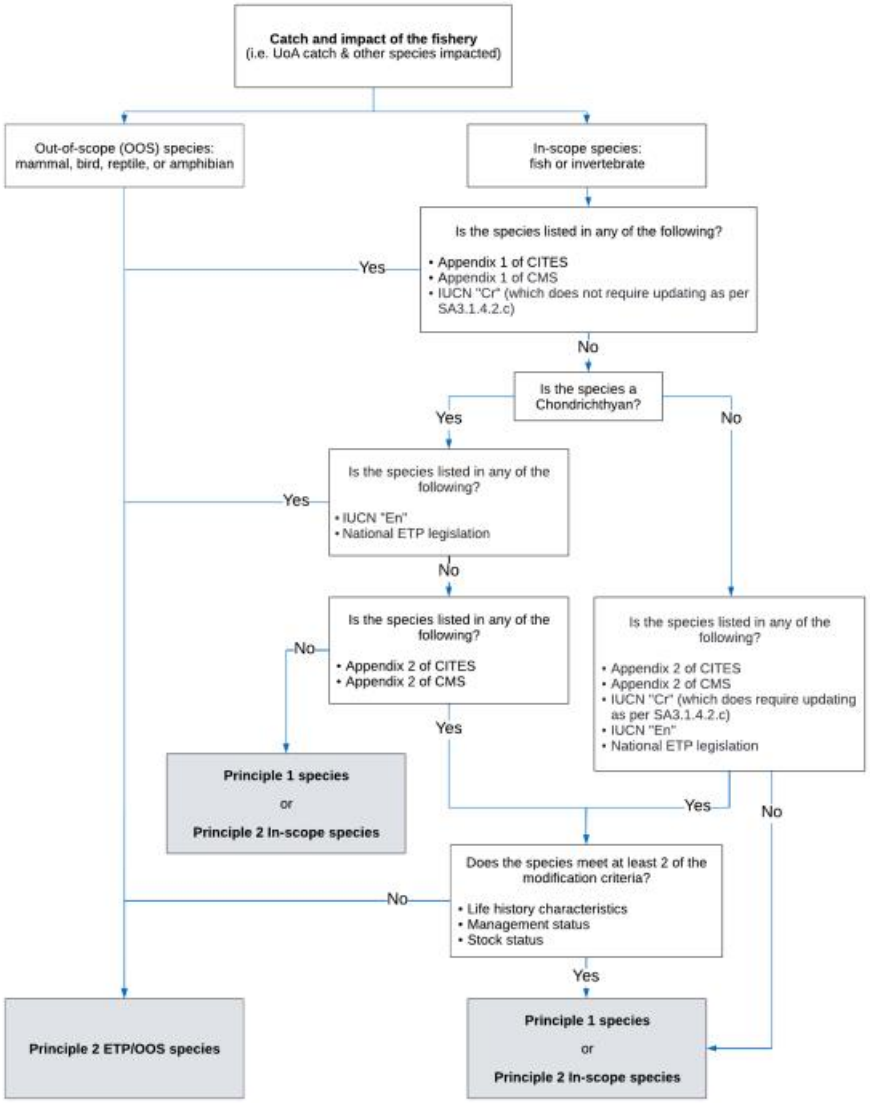

Figure 1: MSC Fisheries Standard (v3.0) decision tree to determine if a species is "in-scope" or "ETP".

2. ETP species in Panama

Longline fishing is largely unselective by nature due to the placement of the line in the water column and the baited hooks which attract a range of different species. As a result, there is a high risk of non-target species bycatch. In Panama, there are a number of ETP sharks, turtles, and OOS cetaceans that could be at risk of capture by longline fisheries (Swimmer, et al., 2010; Andraka, et al., 2013; Clarke, et al., 2014; Parga, et al., 2015). At the time of writing this ETP management strategy, there has been no fishery-specific information made available about the type of species that it interacts with. Therefore, the following section of the report uses ETP species that are expected to be in the operational area of the fishery and could come into contact with the longline gears. The species list has been mostly obtained from the Panama Pacific mahi-mahi and yellowfin tuna longline FIP (see full details here) as well as other research conducted on longline fisheries operating within the Pacific Panama EEZ and the EPO (BirdLife International, 2023).

Table 1: ETP species list obtained from examples of ETP species found in the same operational area as the fishery.

Common name	*Scientific name*	MSC designation	Rationale	Source
Loggerhead turtle	*Caretta caretta*	ETP	CMS Appendix I	Inter-American Convention for the Protection and Conservation of Turtles (NOAA, 2022) (Swimmer, et al., 2010; Parga, et al., 2015)
Green turtle	*Chelonia mydas*	ETP	CMS Appendix I; CITES Appendix I	Inter-American Convention for the Protection and Conservation of Turtles (Blanco, et al., 2012) (Swimmer, et al., 2010)
Leatherback turtle	*Dermochelys coriacea*	ETP	CMS Appendix I; CITES Appendix I	Inter-American Convention for the Protection and Conservation of Turtles (NOAA, 2022) (Ortiz-Alvarez, et al., 2020)
Hawksbill turtle	*Eretmochelys imbricata*	ETP	CMS Appendix I	Inter-American Convention for the Protection and Conservation of Turtles (Llamas, et al., 2017)
Kemp's ridley turtle	*Lepidochelys kempii*	ETP	CMS Appendix I	Inter-American Convention for the Protection and Conservation of Turtles (NOAA, 2022)
Olive ridley turtle	*Lepidochelys olivacea*	ETP	CMS Appendix I	Inter-American Convention for the Protection and Conservation of Turtles (Guzman, et al., 2019) (Swimmer, et al., 2010)
Scalloped hammerhead shark	*Sphyrna lewini*	ETP	CMS Appendix II; CITES Appendix II; IUCN "CR"	(Swimmer, et al., 2010; Clarke, et al., 2016)
Silky shark	*Carcharhinus falciformis*	ETP	CMS Appendix II; CITES Appendix II; IUCN "VU"	(Guzman, et al., 2019; Duffy, et al., 2019)
Oceanic whitetip	*Carcharhinus longimanus*	ETP	CMS Appendix I; CITES Appendix II	(Swimmer, et al., 2010)
Bull shark	*Carcharhinus leucas*	ETP	CMS Appendix II; CITES Appendix II; IUCN "VU"	(Guzman, et al., 2019)

Tiger shark	*Galeocerdo cuvier*	ETP	CMS Appendix II; CITES Appendix II	(Guzman, et al., 2019)
Smooth hammerhead	*Sphyrna zygaena*	ETP	CMS Appendix II; CITES Appendix II; IUCN "VU"	(Guzman, et al., 2019)
Pelagic thresher shark	*Alopias pelagicus*	ETP	CMS Appendix II; CITES Appendix II; IUCN "EN"	(Swimmer, et al., 2010; Guzman, et al., 2019)
Manta ray	*Mobula spp.*	ETP	CMS Appendix I; CITES Appendix II	(Swimmer, et al., 2010)
Common dolphin	*Delphinus delphin*	OOS	N/a mammal	(May-Collado, et al., 2005)
Bottlenose dolphin	*Tursiops truncactus*	OOS	N/a mammal	(Swimmer, et al., 2010; May-Collado, et al., 2018)
Spotted dolphin	*Stenella attenuata*	OOS	N/a mammal	(Garcia & Dawson, 2003)
Storm petrel spp.	Hydrobatidae	OOS	N/a birds	(BirdLife International, 2023)
Tern spp.	Laridae	OOS	N/a birds	(BirdLife International, 2023)
Petrel spp.	Procellariidae	OOS	N/a birds	(BirdLife International, 2023)

Sharks and rays

There are several species of shark that inhabit coastal Panamanian waters and migrate through the EPO, including silky sharks (*Carcharhinus falciformis*), thresher sharks (*Alopias spp.*), oceanic whitetip sharks (*Carcharhinus longimanus*). As with turtles, the location and depth that the longlines are set in the water column overlap with the shark's habitats. Compounded with their life history traits, including slow growth, low fecundity, late maturity, and long-life, shark populations in Panama are considered to be vulnerable to fishing mortality (Guzman, et al., 2019). As keystone species, sharks are pivotal to the broader ecosystem function and so perturbations to their populations can be detrimental to the wider food web (Giovos, et al., 2021).

As with sharks, there are many different skates and ray species that inhabit the Panamanian EEZ, and have also been shown to dominate longline fisheries bycatch composition in the EPO (Gilman , et al., 2006).

Marine turtles

There is an array of studies conducted from around the world that researched the impacts of fisheries bycatch on marine turtle species. In the EPO, many of these studies are based on longline fisheries due to the overlap with the gears and the highly productive zones of the water column. Longline fishing gears are typically set between 100-400 m deep and are baited with squid to attract tunas and other large pelagic species like mahi mahi (*Coryphaena hippurus*) and swordfish (*Xiphias gladius*). However, the use of squid and the shallow zones that the lines are set in also attract marine turtle species, including many that are ETP (Andraka, et al., 2013; Parga, et al., 2015). For air-breathing turtles, becoming hooked on a longline can result in drowning and large mortality rates for the fishery (Gilman , et al., 2006).

There is a leatherback turtle Dermochelys coriacea population that nests on the Panama coastline and means that their interaction with the longline fishery is likely (Ortiz-Alvarez, et al., 2020). This population is listed as critical according to the IUCN RedList and is featured in both CITES and CMS Appendices.

Green turtles (*Chelonia mydas*) have been tracked moving from their nesting grounds into the Gulf of Panama to feed, so are a common occurrence in the operational areas of the fishery (Blanco, et al., 2012). Green turtles are listed as endangered on the IUCN RedList and is feature in both CITES and CMS Appendices.

Loggerhead (*Caretta caretta*), olive Ridley (*Lepidochelys olivacea*), Kemp's Ridley (*Lepidochelys kempii*), and hawksbill turtles (*Eretmochelys imbricata*) have also been documented in the EPO and surrounding waters of the Panama EEZ (Swimmer, et al., 2010; Llamas, et al., 2017; NOAA, 2022).

Marine mammals (cetaceans)

Marine mammals (for this fishery, the only marine mammals that will overlap with the operations will be cetaceans) are predominant in the EPO and within the Panama EEZ. As the hooks are baited on longline gears, smaller cetaceans like dolphins, may be attracted and risk getting caught on the hooks. Likewise, incidents of depredation (wherein a dolphin is attracted to the tuna already hooked on the line) can lead to the dolphin itself becomes hooked (Gilman , et al., 2006). As they are mammals and air-breathers, any hooked dolphins will likely die from drowning if they are not released soon after being caught (Gilman , et al., 2006).

Seabirds

The main seabirds that will be found within the Panama EEZ are petrels and shearwaters (Garcia & Dawson, 2003; BirdLife International, 2023). Whilst these are largely least concern animals under the IUCN RedList designation, there are some other seabird species, including albatross that may overlap with the high seas' fisheries (BirdLife International, 2023). Some petrels and most albatross species adopt pair-bonding techniques which means that a pair of reproducing birds will remain loyal to their mate. There are incidents of extra-pair copulation (EPC) (Birkhead & Moller, 1995) that occurs between individuals; however, the loss of a bonded partner can result in the survived partner never reproducing again. Therefore, removals of individuals from a population through fisheries bycatch can have detrimental consequences on the sustainability of the population (Sun, et al., 2022).

3. National and regional management measure for participating IATTC states

Sharks and rays

In Panama, the Autoridad de los Recursos Acuaticos de Panama (ARAP) banned the capture of sharks for the sole purpose of obtaining and marketing their fins (Finning law no.9, March 2006). As of 2006, shark finning is prohibited in all Panamanian waters. Industrial fishers must land sharks with fins attached naturally Artisanal fishers may land the fins separately, but the weight ratio must be no more than 5% fins to whole weight of sharks. In 2010, a National Plan for the Conservation of Sharks was implemented across Panama to prevent illegal, unreported, and unregulated (IUU) fishing, and was amended in 2017 to include rays in the management initiatives.

In the recent Annual meeting of the IATTC, held in August 2023, a new Resolution (C-23-07) was established for the protection and sustainable management of sharks. The Resolution recommended that all members and cooperating non-members (CPCs) should implement a national plan of action for conservation and management of sharks. The Resolution also required:

1. CPCs shall require that any caught sharks are fully utilised (except for the species that are banned by IATTC)
2. CPCs shall prohibit shark finning.
3. CPCs shall ensure that any sharks landed have their fins naturally attached to the body.
4. Until the end of 2026, and other provisions in this Resolution, CPCs may take alternative measures to ensure that individual shark carcasses and their corresponding fins can be easily identified on board the vessel at any time, using one of the following methods:
    a. Each individual shark carcass and its corresponding fins are stored in the same bag, preferably a biodegradable one.
    b. Each individual shark carcass is bound to the corresponding shark fins using rope or wire; or,
    c. The shark fins and the corresponding shark are identically, uniquely, and numerically tagged in a manner that an authorized inspector can readily identify the matching of the shark fins to the corresponding shark.
5. Fishing vessels are prohibited from retaining on board, transshipping, landing or trading of any fins harvested or that have been removed on board in contravention of this Resolution.
6. CPCs shall prohibit vessels targeting tuna and/or swordfish from using buoy lines.
7. All sharks (alive or dead) that are not retained must be promptly released unharmed, to the extent practicable, as soon as they are seen on the line, taking due consideration of the safety of any persons using the following procedures:
    a. Leave the shark in the water, where possible
    b. Use a line cutter to cut the branchline as close to the hook as possible, and so that less than 1 meter remains on the animal, to the extent practicable

Other measures from the Resolution can be found here.

In 2023, the IATTC developed Resolution C-23-08 which outlines the specific management measures required for all CPCs to implement for silky sharks specifically. Specific measures can be found here, but this report wished to highlight those specifically designed for longline fisheries:

3. CPCs shall require all longline vessels whose fishing licenses do not include sharks as a fishing target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20% of the total catch by fishing trip in weight. The 20% limit is set as an interim limit in the absence of data and scientific analysis on which to base conservation and management measures, and will be revised, based on recommendations by the scientific staff, once improved species-level catch, and composition data are available.

4. CPCs shall require their multi-species fisheries using surface longlines1 to limit the catch of silky sharks of less than 100 cm total length to 20% of the total number of silky sharks caught during the trip.
5. CPCs that allow retention of silky sharks by their longline vessels, shall ensure compliance with the measures established in paragraphs 3 and 4 by means of control and inspection mechanisms, for Port CPCs and Flag CPCs, as applicable. At a minimum, such mechanisms shall require effective inspections at the time of first unloading in port or the submission of catch logbooks that will allow for species identification, verification of size when caught, and enforcement of applicable sanctions such as prevention of entry into markets of product caught in violation of this measure. Where applicable, internationally recognized certification and reporting procedures for the conservation of silky sharks may be used for fulfilling the obligations of this paragraph. CPCs shall inform the IATTC Secretariat of the use of said certification procedures. Data derived from these control and inspection measures shall be communicated to the Secretariat, in accordance with IATTC data submission requirements.

For rays, Resolution C-15-04 outlines the specific requirements of all CPCs regarding mobulid rays and includes:

1. CPCs prohibiting the retention onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of mobulid rays (Manta and mobula rays).
2. Release all mobulid rays alive (where possible).
3. Immediate release from the hook, when seen, on all longline vessels operating within the IATTC convention area.
4. Record and report all incidents of mobulid ray bycatch using logbooks and observer data.

Turtles

There are no longline-specific requirements made by Panama for the conservation of turtles that could be found online.

Resolution C-19-04 from the Inter-American Convention for the Protection and Conservation of Turtles details the comprehensive management measures in place to reduce the impact that Panama is having on turtles in the coastal state. The convention stresses the responsibilities of fishing activities to reduce the incidental capture, retention, damage, and death of sea turtles during fishing activities, through the appropriate regulation of fishing, including the improvement and implementation of mitigation techniques, such as the use of circle hooks rather than 'J' hooks. The circle hooks work by reducing the hooking rates on turtles, and also how deep the hooks can possibly go if they are swallowed (Andraka, et al., 2013). Being larger than the traditional 'J' hooks, the circle hooks cannot be swallowed as effectively and therefore this reduces the potential for deep hooking incidents which are more challenging to remove and cause more damage to the turtle.

C-19-04 also requires that all longline vessels and crew are educated in the best practice handling and release techniques when incidents of turtle hooking occurs. This includes demonstrating the employment of de-hookers, line cutters, and dip nets). All incidents of turtle bycatch are required to be reported in logbooks, including the date of the incident, the location (Latitude and longitude), fishing gear type, species identification, size, and the capture and release condition (alive/dead). Additional information, including the anatomical hooking location (flipper, mouth/jaw, swallowed, entangled etc.), any remaining gear left on the individual, and any associated photographs. The reports should be made available to the IATTC on an annual basis.

Cetaceans

There are no longline-specific requirements made by Panama for the conservation of cetaceans that could be found online.

Within the IATTC, the Agreement on the International Dolphin Conservation Program (AIDCP) was established in 1998 and intends to "reduce the incidental dolphin mortalities in the tuna fishery of eastern Pacific Ocean". In September 2023, Panama (along with other CPCs) ratified the agreement. The agreement requires the implementation of observers onboard the vessels using the IATTC observer program or from the CPC national program. This Agreement is largely for purse seine fisheries.

Seabirds

The IATTC has a number of recommendations and requirements for longline fisheries operating within the Resolution C-11-02 established in 2011, including:

1. Longline vessels of more than 20 m in length that use hydraulic, mechanical, or electrical systems that fish for species covered by the IATTC in the EPO north of 23oN and south of 30oS, plus the area bounded by the coastline at 2°N, west to 2°N-95°W, south to 15°S-95°W, east to 15°S-85°W, and south to 30°S, to use at least two of the following mitigation measures:

Table 2: Mitigation measures to be used by longline fisheries that meet the requirements described in (1.)

Column A	Column B
Side-setting with bird curtains and weighted branch lines[2]	*Tori* line[3]
Night setting with minimum deck lighting	Weighted branch lines
Tori line	Blue-dyed bait
Weighted branch lines	Deep-setting line shooter
	Underwater setting chute
	Management of offal discharge

2. CPCs with longline vessels fishing in the EPO other than the area mentioned in 1., are encouraged to voluntarily employ at least one of the mitigation measures included in Table 2.
3. CPCs shall provide annually to the IATTC any available information regarding interactions with seabirds involving their flag vessels in the fishery, including bycatches of seabirds and details of seabird species and all relevant information available from observer or other monitoring programs.

4. Fishery-specific ETP bycatch management strategy

The Panama large pelagics longline FIP complies with the national and regional management measures imposed by the relevant authorities described above. As well as this, the fishery has a demonstrated its commitment to implementing more measures to reduce the risk of interaction with ETP species and improve the post-release survival during incidents that take place. The following section of the strategy will outline the species-specific management strategies in place within the fishery, as well as the generic measures to ensure post-release survival of any ETP bycatch incidents.

The line is deployed and set for an hour in the water before the vessels circle back to collect it. Each hook is hauled onto the deck of the boat where the target species are removed and placed into the hold. For non-target (and ETP) catch, they crew utilise the best practice handling techniques required by the IATTC to ensure all are returned to the sea safely and quickly.

Sharks and rays

Shark finning

Shark finning practices have been outlawed by Panamanian government since 2006, and in 2017 rays were added to this management measure to ensure that no finning takes place on board any vessel operating within the EEZ. All of the vessels within the Panama large pelagics longline FIP are complicit with the requirements from the Panama authority.

In 2022, the FIP implemented a fishery-specific shark finning policy into the management:

“Marpesca is declaring in this public policy to prohibit shark finning aboard all vessels and to demonstrate that this does not currently occur. Marpesca adopts the “fins naturally attached” rule for sharks and any sharks that are retained will be landed whole and reported. Species of sharks that are prohibited from being retained by national law or RFMO regulations, will be released alive to the best of the crew’s ability”.

Handling

Any sharks seen on the line are brought carefully to the side of the boat. Here a custom-made sling is used to scoop the animal out of the water to prevent further injury/damage to the animal at the point where the hook is attached. The crew will then use cutters to cut the line. Ideally, the line will be cut as close to the hook as possible, however, crew safety is the highest priority and if cutting the line endangers the crew, it will be cut further from the hook.

Turtles

Circle hooks

All hooks used onboard the vessels are circle hooks as they can reduce the detrimental impact on turtle health if an animal is caught.

Disentangling Equipment

The fishery also has gaffs onboard to ensure the line can be brought to the side of the vessel and the caught turtle can be disentangled from the line.

Handling

When a turtle is caught on the line, the line will be pulled close to the side of the boat and the custom-made sling will be used to haul the animal out of the water to reduce further damage inflicted by the

hook. Once onboard, the crew will attempt to de-hook the turtle, under the best practice handling guidelines. If it cannot be removed, the crew will cut the line attached to the hook as the metal hook will eventually rust out of the animal.

Following the release of the hook and/or line, the crew will ensure the turtle is alive and conscious before returning carefully into the sea. If the turtle is not conscious, efforts to re-circulate the turtle will be made by placing its head lower than its body by use of a makeshift prop. Once conscious, the crew will carefully return it to the sea.

Cetaceans

Avoidance

If a pod of dolphins or other small whale is seen near the fishing area, avoid or wait for them to pass before attempting to conduct operations. This is an effective way of making sure that there is reduced possibility that these animals will become bycatch.

Disentangling Equipment

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 the vessel before deploying another 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.

Seabirds

Setting practices

The FIP leaves the line in the water for only one hour at a time and during setting, all the crew are aware of the seabirds that are attracted to the bait on the hooks. If the crew notice that a bird has been caught on the hook, the boat ceases the setting and the crew pull the line up to the boat to safely release the bird.

Handling

As with turtles, any seabirds that are still alive on the line are brought to the side of the boat where a sling is used to lift the animal safely and securely to the deck. Once onboard, the crew will work to remove the hook or cut the line at the base of the hook.

Tori lines and side setting

All vessels use Tori lines on board to reduce seabird interactions and the line is set from the side of the boat, rather than from the stern. This has been demonstrated to reduce the number of seabirds being incidentally hooked when predating on the line.

Non-species-specific measures

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

- Avoid all ETP hotspots and communicate effectively between vessels to tell other fishers where these are.
- Keep abreast of new science and promote research to further develop best practices for handling and safe release.
- Implement observers onboard to conduct third-party records of non-target incidents.
- All skippers shall attend and engage in the Skipper Training program being run through the FIP work plan.
- 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 ARAP 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 UoA and 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 Panama and ARAP.

References

Andraka, S. y otros, 2013. Circle hooks: Developing better fishing practices in the artisanal longline fisheries of the Eastern Pacific Ocean. *Biological Conservation,* Volumen 160, pp. 214-224.

BirdLife International, 2023. *BirdLife International: Data Zone.* [En línea]
Available at: http://datazone.birdlife.org/country/panama/marine
[Último acceso: 13 September 2023].

Birkhead, T. & Moller, A., 1995. Extra-pair copulation and extra-pair paternity in birds. *Animal behaviour,* 49(3), pp. 843-848.

Blanco, G. S. y otros, 2012. Post-nesting movements and feeding grounds of a resident East Pacific green turtle Chelonia mydas population from Costa Rica. *Endangered Species Research,* Volumen 18, pp. 233-245.

Clarke, S. y otros, 2014. *Bycatch in longline fisheries for tuna and tuna-like species: a global review of status and mitigation measures,* Majuro: Western and Central Pacific Fisheries Commission.

Duffy, L. M. y otros, 2019. Assessing vulnerability of bycatch species in the tuna purse seine fisheries of the eastern Pacific Ocean. *Fisheries Research,* Volumen 219, p. e105316.

Garcia, C. & Dawson, S. M., 2003. Distribution of pantropical spotted dolphins in Pacific coastal waters of Panama. *The Latin American Journal of Aquatic Mammals,* 2(1).

Gilman , E. y otros, 2006. Reducing sea turtle by-catch in pelagic longline fisheries. *Fish and Fisheries,* Volumen 7, pp. 2-23.

Giovos, I. y otros, 2021. Understanding the public attitude towards sharks for improving their conservation. *Marine Policy,* Volumen 134, p. e104811.

Gray, C. A. & Kennelly, S. J., 2018. Bycatches of endangered, threatened and protected species in marine fisheries. *Reviews in fish biology and fisheries ,* Volumen 28, pp. 521-541.

Guzman, H. M., Cipriani, R., Vega, A. J. & Morales-Saldaña, J. M., 2019. Fisheries and conservation assessment of sharks in Pacific Panama. *Aquatic conservation: Marine and Freshwater Ecosystems,* Volumen 30, pp. 315-330.

Guzman, H. M., Rogers, G. & Gomez, C., 2019. Behavioural states related to environmental conditions and fisheries during olive Ridley turtle migration from Pacific Panama. *Frontiers in Marine Science,* Volumen 6.

Lewison, R. L., Crowder, L. B. & Shaver, D. J., 2003. The Impact of Turtle Excluder Devices and Fisheries Closures on Loggerhead and Kemp's Ridley Strandings in the Western Gulf of Mexico. *Conservation Biology,* 17(4), pp. 1089-1097.

Llamas, I. y otros, 2017. Distribution, size range and growth rates of hawksbill turtles at a major foraging ground in the eastern Pacific Ocean. *Latin American Journal of Aquatic Research,* 45(3).

May-Collado, L. y otros, 2005. Patterns of cetacean sighting distribution in the Pacific Exclusive Economic Zone of Costa Rica based on data collected from 1979-2001. *Revista de Biolofia Tropical,* Volumen 53.

May-Collado, L. J. y otros, 2018. Ecology and Conservation of Cetaceans in Costa Rica and Panama. En: M. R. Rossi-Santos & C. Finkl, edits. *Advances in Marine Vertebrate Research in Latin America.* s.l.:Springer International Publishing, pp. 293-319.

NOAA, 2022. *NOAA Fisheries.* [En línea]
Available at: https://www.fisheries.noaa.gov/species/leatherback-turtle#overview
[Último acceso: 27 January 2022].

Ortiz-Alvarez, C. y otros, 2020. Rapid assessments of leatherback small scale fishery bycatch in internesting areas in the eastern Pacific Ocean. *Frontiers in Marine Science,* Volumen 6.

Parga, M. y otros, 2015. Hooking locations in sea turtles incidentally captured by artisanal longline fisheries in the Eastern Pacific Ocean. *Fisheries Research,* Volumen 164, pp. 231-237.

Riaz-Torres, E. D. y otros, 2022. Influence of environmental variability on the distribution and abundance of pantropical spotted dolphin (Stenella attenuata) in the Mexican Central Pacific. *Ciencia Marinas,* Volumen 48, p. e3215.

Sun, R. y otros, 2022. Causes and consequences of pair-bond disruption in a sex-skewered population of a long-lived monogamous seabird. *Ecological Monographs,* 92(3), p. e1522.

Swimmer, Y. y otros, 2010. Comparing the effects of offset and non-offset circle hooks on catch rates of fish and sea turtles in a shallow longline fishery. *Aquatic Conservation: Marine and Freshawater Ecosystems,* 20(4), pp. 445-451.

Appendix:

Marpesca Fishing shark finning policy (see below)

MARPESCA GROUP FISHING VESSELS

PUBLIC POLICY ON SHARK FINNING

In the MARPESCA GROUP fishing fleet we are aware that unintentional bycatch represents a significant danger to non-target marine life. We recognize that most shark species are highly susceptible to overfishing and many are considered threatened or endangered. We understand that the wasteful practice of shark finning contravenes many international rules and regulat ions; including those of the major regional fisheries management organizations (RFMOs).

Shark finning is the practice of retaining shark fins and disposing of the rest of the carcass while at sea. It is a lucrative operation due to the high price charged by consumers around the world (Carr, et al., 2013). The practice goes 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 several other international marine bodies, all of which call for minimizing waste and the discard. The MARPESCA GROUP recognizes the Guide to Sustainable Longline Fishing Practices of the ISSF skippers and recognizes the best practices to mitigate bycatch, management an d release of sharks. All handling and release will be carried out under the supervision of trained crew members who have undergone extensive training.

Public politics

The MARPESCA GROUP declares in this public policy, to prohibit shark finning on board all vessels and demonstrate that this does not currently occur.

The MARPESCA GROUP fleet adopts the "fins naturally attached" rule for sharks and any sharks retained will be landed whole and reported. Shark species whose retention is prohibited by national legislation or RFMO regulations will be released alive to the best of the crew's ability. Our company adheres to the following best practices, at a minimum:

1. Does not actively target sharks;
2. Do not cast shark lines on buoys;
3. Prohibit the use of wire traces;
4. Prohibit the practice of shark finning and our policy is posted on the boat for the crew to be aware of;
5. Do not retain oceanic whitetip sharks or silky sharks;
6. For other sharks that are landed, the carcass is retained with the fins attached naturally or partially cut off and tied to the shark;
7. Record the species in the fishing log of all sharks that are landed;
8. Promote best practices for shark bycatch and release management and the fishery makes every effort to release these individuals alive.

This Public Policy on shark finning is part of the commitments adopted by the senior management of GRUPO MARPESCA, therefore, they are faithfully fulfilled by those who make up the same.

_____

General manager

The MARPESCA GROUP Socializes politics with the crew members of our vessels through posters in communal areas and training with the aim of making known the commitments made by the group.

Passed: 10-10-2021