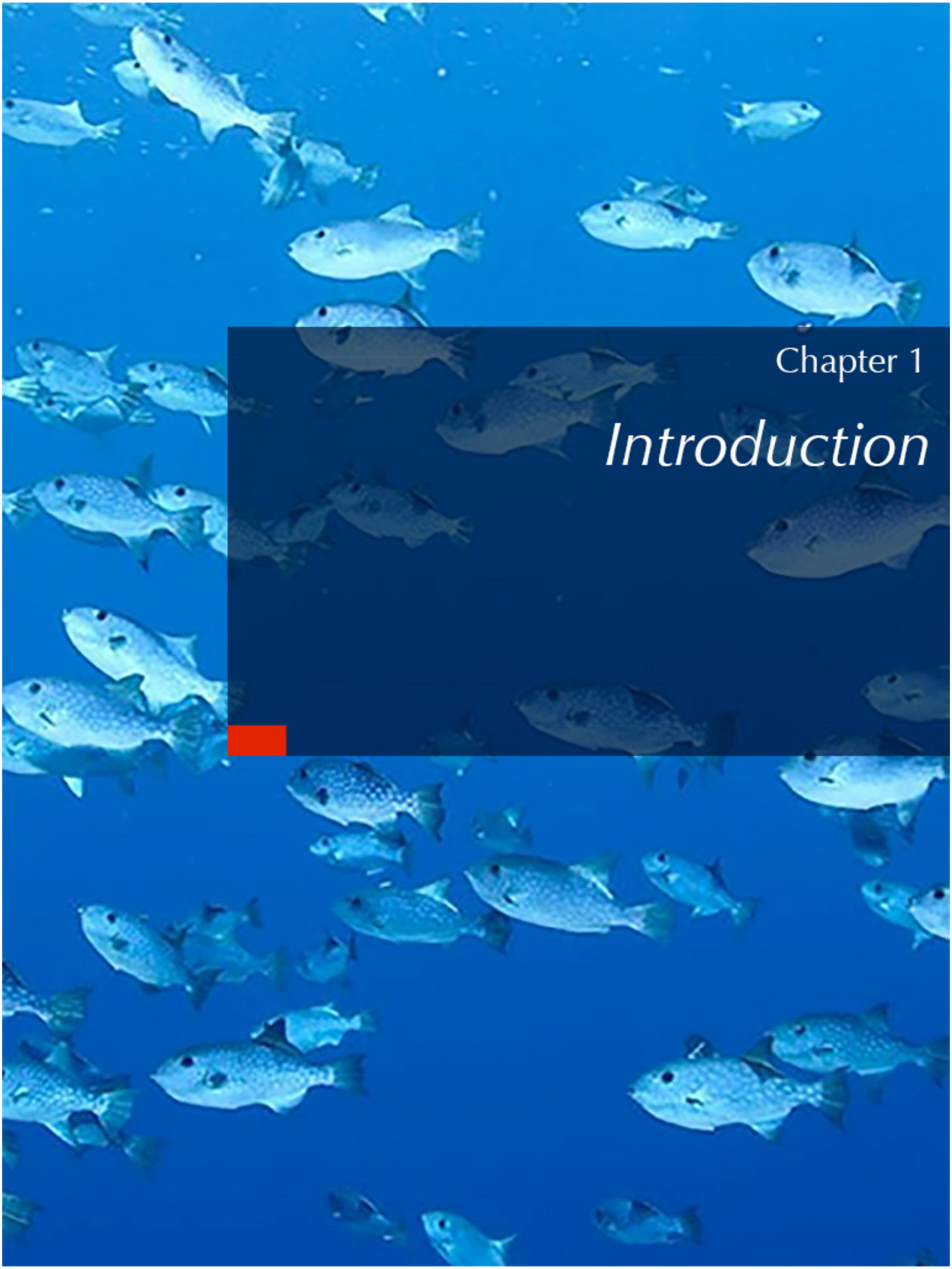
ISSF

Skippers' Guidebook to Sustainable Longline Fishing Practices

Second Edition

AN INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION PUBLICATION

ISSF INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION



Chapter 1

Introduction

Chapter 1: Introduction

Welcome to the International Seafood Sustainability Foundation's guide to best practices in longline tuna fishing. Our goal is to share the state of the art in responsible fishing operations, review the reporting requirements and other obligations to RFMOs, and inform participants about the related ISSF Conservation Measures for the management of tuna and its larger marine ecosystem.

Introduction

Chapter Objectives

1. Introduce ISSF's mission and approach.
2. Provide examples of ISSF's ongoing activities and outreach.
3. Provide information about ISSF's Participating Companies.

About ISSF

In 2008, fisheries scientists, industry leaders, and the World Wildlife Fund (WWF) founded the International Seafood Sustainability Foundation (ISSF) based on shared concerns about the future of tuna fisheries and a desire to do something about it—together. The global coalition launched publicly in March of 2009 and today has partners and supporters working in Europe, Asia, Africa, North America, South America, Australia, and Oceania.

ISSF's mission is to undertake science-based initiatives for the long-term conservation and sustainable use of tuna stocks, reducing bycatch and promoting ecosystem health.

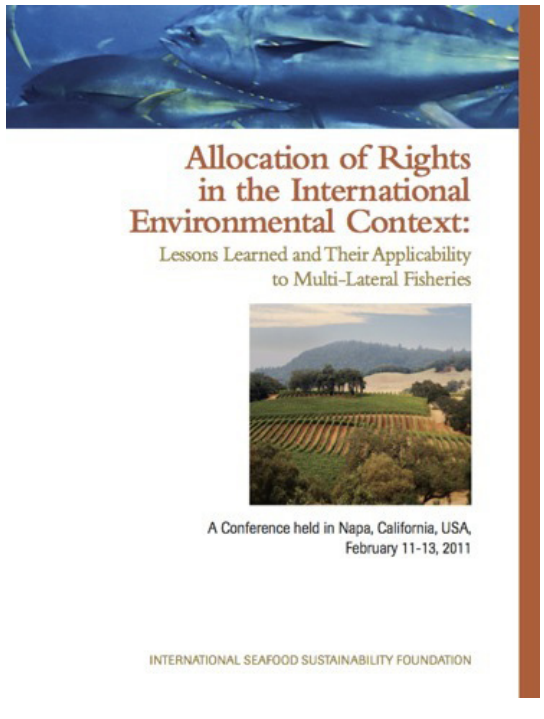
The organization's objective is to improve the sustainability of global tuna stocks by developing and implementing verifiable, science-based practices, commitments, and international management measures that result in tuna fisheries meeting the MSC certification standard without conditions, and becoming the industry standard for vessel owners, traders, processors, and marketers.

ISSF will cooperate with and support Regional Fisheries Management Organizations (RFMOs), and vigorously advocate to RFMO members for the adoption and implementation of science-based management measures so that tuna stocks and their ecosystem are managed comprehensively and sustainably.

ISSF Approaches to Improving Tuna Sustainability

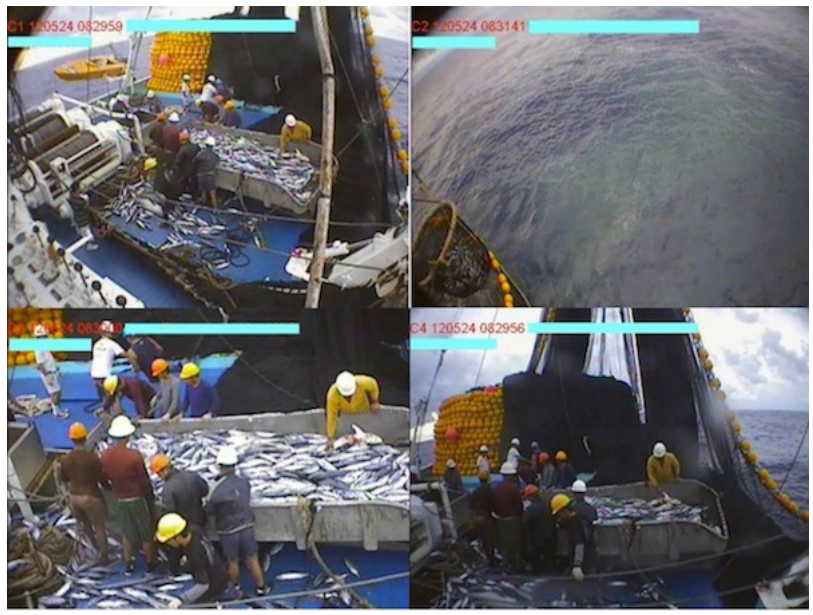
- Working with RFMOs to conserve tuna stocks and their ocean ecosystems through sponsored workshops, direct advocacy, and capacity-building
- Employing sound science to attain maximum sustainable yields of targeted tuna stocks by supporting RFMO science bodies, convening leading scientists to address research challenges, and communicating results
- Striving to eliminate illegal, unregulated, and unreported (IUU) tuna fishing by implementing the use of Unique Vessel Identifiers (UVIs), mandating 100 percent observer coverage for purse seine vessels selling to ISSF Participating Companies, and testing the viability of electronic monitoring systems
- Minimizing bycatch, discards, and abandoned gear through extensive research on fishing strategies and technologies, mandating 100 percent retention of all tuna and bycatch for purse seine vessels selling to ISSF Participating Companies, and other measures
- Collecting and exchanging data to promote better scientific understanding of tuna stocks by sponsoring workshops, side events, and meetings (as well as the individual participation of participants from developing countries) regarding a variety of issues, bringing together scientists, environmentalists, vessel owners, and fishers

Gallery 1.1: ISSF Approaches to Improving Tuna Sustainability



Allocation of Rights Workshop Report

Online Advocacy of Key Issues



Images from ISSF-sponsored electronic monitoring trials

Shark tagging on board an ISSF bycatch research cruise

A Skipper Workshop where ideas about sustainable fishing techniques are shared

ISSF Activities

ISSF conducts educational and advocacy activities, funds major research on fisheries to reduce bycatch (the catching of nontargeted species), and uses direct-market action by its Participating Companies.

Gallery 1.2: ISSF Activities

ISSF-sponsored scientist observing fish behavior during a bycatch research cruise in the Indian Ocean

ISSF-sponsored scientist tagging a tuna during a bycatch research cruise in the Western Pacific Ocean

ISSF Skipper Workshops, where scientists and fishers share ideas to improve the sustainability of tuna purse seine fisheries

Advocating for science-based conservation and management of the tuna stocks and their ecosystems at the meetings of the tuna RFMOs

» Save the date / Call for abstracts

SCIENTIFIC SYMPOSIUM

Mitigating impacts of fishing on pelagic ecosystems: towards ecosystem-based management of tuna fisheries

15-18 October 2012 Montpellier - France

ISSF Skippers' workshop (Tuna purse seine bycatch)

19 October 2012 Montpellier - France

Approximately six million tons of tunas and tuna-like species are captured every year for human consumption. These fisheries are highly complex in nature with multiple target species and fishing gears (e.g. purse seine, longline, pole and line). As such there are several issues that scientists, policy makers and stakeholders are faced with: catches of juvenile target species, bycatch, impacts of FADs, overcapacity, interactions between fisheries, etc. A symposium will be convened to present the most recent findings and provide a platform to exchange ideas and investigate optimal approaches to mitigate impacts and ensure sustainability. We encourage participation from scientists, stakeholders and policy makers from all oceans.

The symposium (15-18 October 2012) will have four main thematic sessions:

- Ecology of target and non target species (e.g. pelagic elasmobranchs) of tuna fisheries
- Mitigation techniques
- Socio-economic challenges
- Ecological-based management of tuna fisheries in the context of global change

Deadline for abstracts is **June 1, 2012**
Registration and submission of abstracts will open soon on http://ebftntuna-2012.sciencesconf.org/

Following the symposium, ISSF will host a workshop (19 October, 2012) where skippers and scientists can interact and discuss bycatch reduction methods in the tuna purse seine floating object fishery.

Both the symposium and skippers' workshop will be held at the Aquarium Mare Nostrum in Montpellier, located in the South of France.

Funders

The EU funded MADE project "Mitigating adverse ecological impacts of open ocean fisheries" Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 212496,
www.made-project.eu

The International Seafood Sustainability Foundation, www.iss-foundation.org

Sponsoring, in addition to Skipper Workshops, symposiums for scientists and fisheries managers to share information on fisheries and bycatch research

Publishing a regularly updated "Status of the Stocks" report, with information on abundance, mortality, and related bycatch issues for every major tuna stock

Working with the tuna industry to encourage the adoption of best fishing practices by tuna fleets through the ISSF ProActive Vessel Register

ISSF ProActive Vessel Register

ISSF recently launched the ProActive Vessel Register (PVR), which is an innovative and effective way for vessel owners to identify themselves as active participants in meaningful sustainability efforts. The PVR provides third-party validated information to tuna purchasers of the positive steps each vessel is taking in implementing a series of commitments designed to bring responsible practices to tuna fishing.

Each vessel that registers on the PVR also needs to ensure that its skippers do one of the following:

1. Attend an ISSF Workshop on bycatch mitigation practices, or
2. Read the relevant ISSF Skippers' Guidebook, which contains information on bycatch handling and mitigation, RFMO requirements, and other useful information about fishing sustainably. Skippers' Guidebooks can be read online at or downloaded from http://issfguidebooks.org

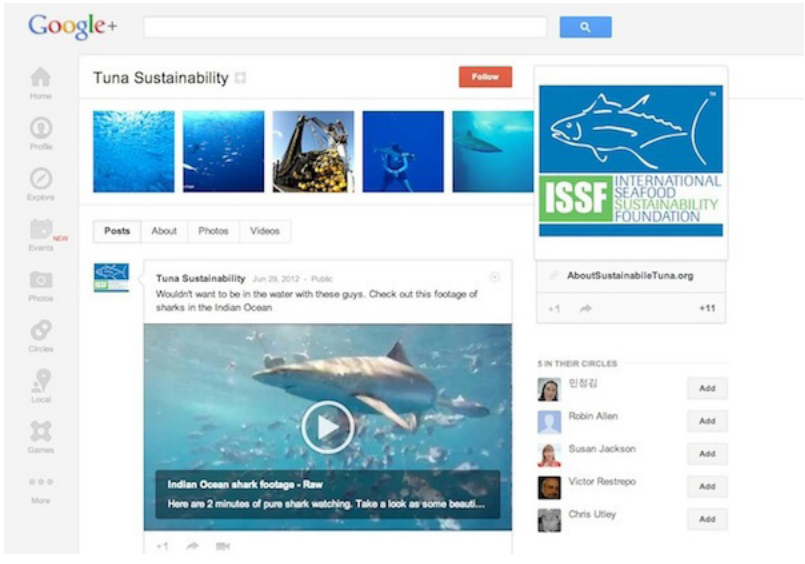
If you are assigned to a vessel on the PVR, the following website will display those actions that the vessel has committed to undertaking as part of joining the PVR: http://iss-foundation.org/resources/databases/pvr/.

These actions, known as ISSF Conservation Measures, are detailed in the following section.

Gallery 1.3: ISSF's Interactive Tools and Online Outreach

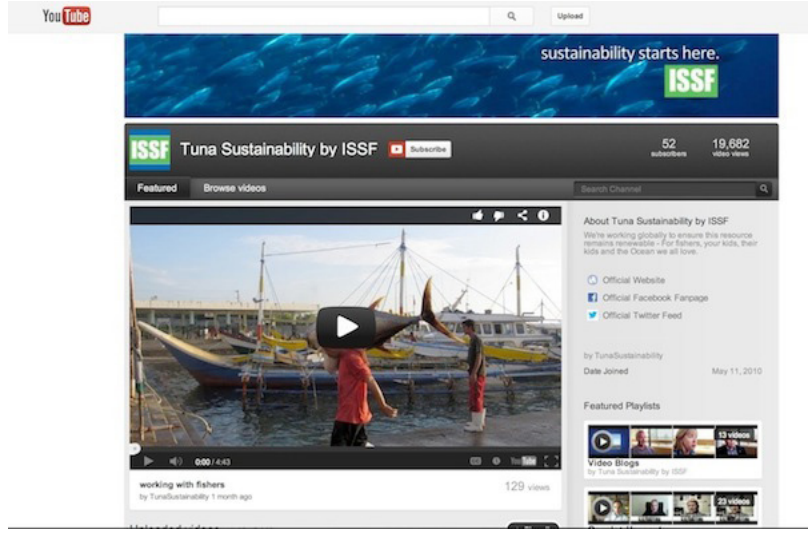
ISSF Website: iss-foundation.org

ISSF Facebook Page: facebook.com/TunaSustainability



ISSF Google+ Page: goo.gl/tgyYHO

ISSF Twitter Page: twitter.com/issf



ISSF YouTube Page: youtube.com/user/TunaSustainability

ISSF Participating Companies

ISSF Participating Companies are tuna processors or traders (primarily purchasers of raw tuna for processing, or purchasers of raw tuna or finished tuna products for resale) that are members and associate members of the International Seafood Sustainability Association (ISSA).

The Participating Companies can purchase tuna only from vessels (and vessel-owning companies) that are compliant with the relevant ISSF Conservation Measures.

Conservation Measures

To be compliant, **all vessels** must:

- Not appear on an IUU List
- Have an IMO number (when meet IMO minimum size)
- Have a company anti-fining policy
- Not have a fining finding within 2 years
- Be on a RFMO authorized record, if required
- Be flagged to a RFMO member or CNM

Chapter 2

Bycatch Mitigation and Handling

Chapter 2: Bycatch Mitigation & Handling

Bycatch and discards in fisheries have become a serious issue in recent years, both because of their very real impact, particularly on sensitive species, and because of consumers' increasing awareness, which creates demand for sustainable seafood choices. In addition to this being a major issue for the tuna-buying public, RFMOs are increasingly concerned with taking an "ecosystem approach" to fisheries management, which includes reducing the mortality of nontarget species.

Chapter Objectives

1. Provide background on those bycatch species of most concern, including turtles, seabirds, and sharks.
2. Summarize best practices for reducing bycatch.
3. Detail techniques for the safe handling and release of bycatch.

Introduction

It is well known that longline gear hooks a number of different species, depending on where and how the gear is deployed. In some cases, many nontarget species (also known as bycatch or incidental catch) are caught. But by using some simple and inexpensive strategies to avoid the capture of nontarget or unwanted species, and knowing the proper techniques to release any that are caught, you can make longlining more sustainable. A healthy ocean benefits us all.

For all of the methods discussed below, be sure to have the crew prepared ahead of time. This includes having the right tools readily available at the time of haul, and instructing them about proper and safe techniques.

Sea Turtles

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 5 commonly encountered during tuna longline fishing.

Sea Turtle Identification

Each species of sea turtle has a few distinguishing features that will help you identify it. Different species have different numbers of prefrontal scales—the small, paired scale found behind a turtle's nostrils and between its eyes. A turtle's top shell (or carapace) can also have a different number of plates (or scutes) arranged in a unique pattern.

Leatherback

Leatherback turtles are the easiest to identify, as they are the only sea turtle that does not have a hard shell. The shell is black with white spotting, and has 5 to 7 ridges that run down its back. They can grow quite large – up to 1.8 m (6 ft) long and 680 kg (1,500 lbs).

Loggerhead (Photo: NOAA)

The **loggerhead** turtle has a wide, blocklike head, and four prefrontal scales (two pairs) between its eyes. Its top shell has 5 central plates going down its back, with 5 lateral plates on each side. They tend to be found in more temperate (subtropical) waters.

Olive Ridley

Olive ridley turtles are the smallest and one of the most commonly encountered sea turtles in pelagic, deep-set tuna longline fisheries. Its shell is gray-green, with 5 central plates, and 5 to 9 pairs of lateral plates (the other turtles will never have more than 5). They are more common in tropical waters.

Hawksbill (Photo: Caroline Rogers, USGS)

The **hawksbill** turtle is the most endangered species of sea turtle. It has a sharp, hawklike beak. This is the only turtle whose plates on its top shell overlap, like shingles on a roof. There are 5 central plates, and 4 side pairs.

Green (Photo: Andy Bruckner, NOAA)

Green sea turtles have just two prefrontal scales between their eyes, unlike the other turtles that have 4 or 5. Despite their name, green sea turtles' smooth oval shells are a mix of colors (brown and yellow-green in younger individuals, and darker green in adults). They have 4 lateral plates on their shell. They are usually found in warmer waters.

Mitigating Turtle Bycatch

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 wide circle hooks (18/0 or larger)
- Use fish (e.g., mackerel/opelu/saba/sanma), rather than squid, for bait
- Set hooks deeper than turtle-abundant depths (40–100 m)

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. And 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.

Hook and circle hook (Photo: Gilman et al., 2007)

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.

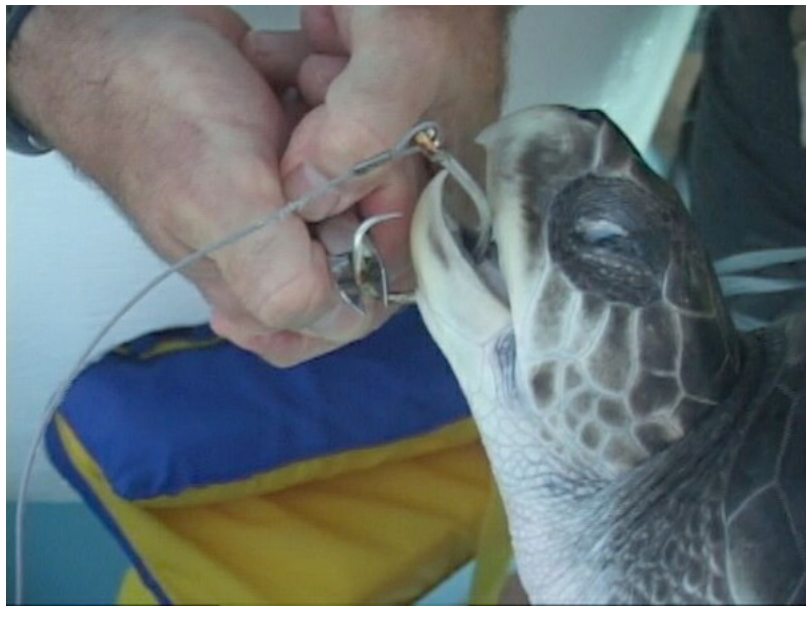
If economically feasible, setting gear deeper than 100 m is a good way to avoid turtle interactions (as turtles tend to prefer shallower water). There are several ways to set gear more deeply:

- Make the branch lines next to buoys longer, as those lines are effectively the shallowest set hooks
- Leave a longer gap on each side of the buoy line before adding branch lines
- Increase the length of buoy lines rather than having short buoy lines and longer branch lines

Gallery 2.1: Examples of Hooked Turtles

(Photo: Pretoma)

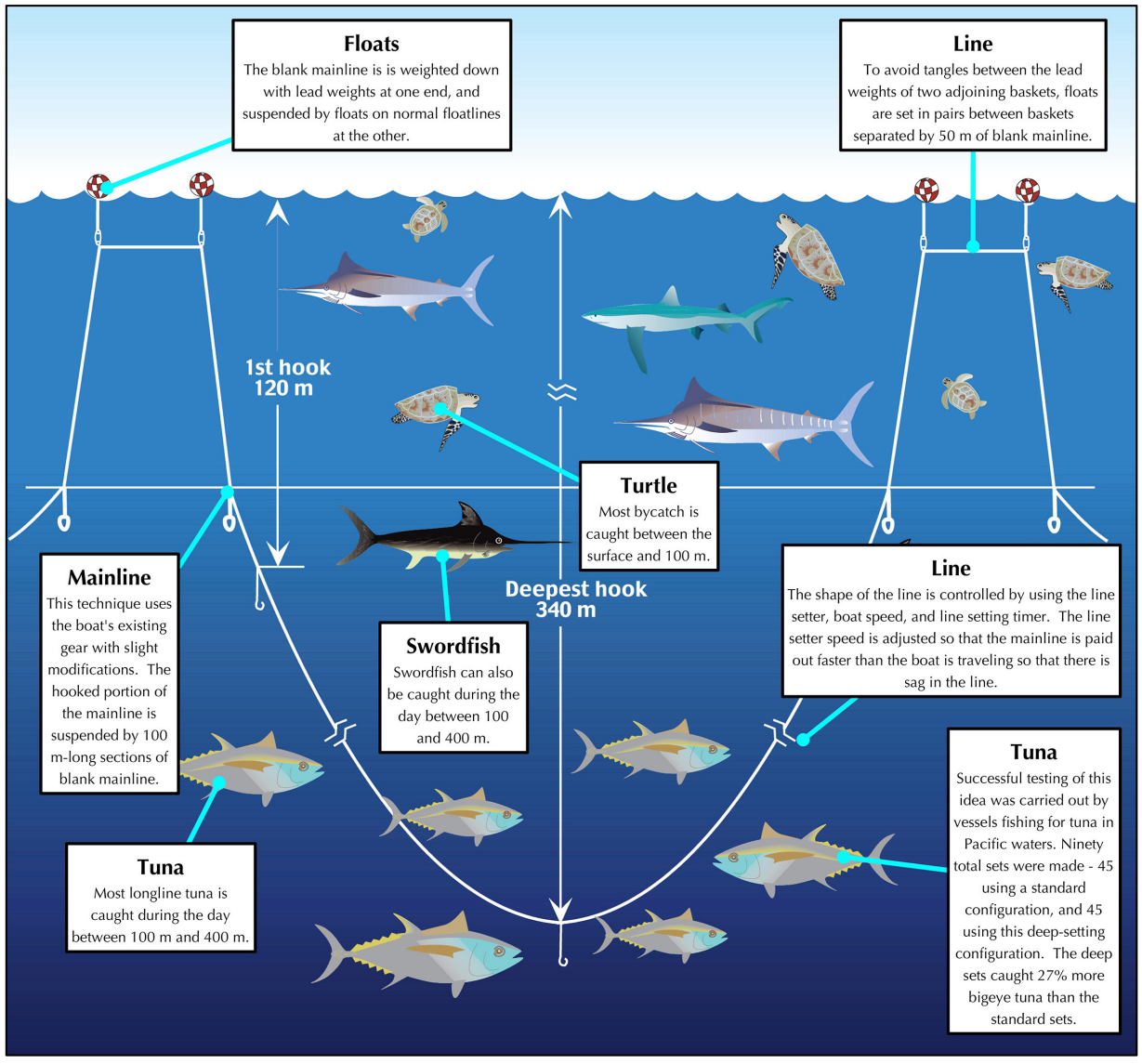
(Photo: NOAA)



Sidebar 2.1: Smart Gear Prize

In 2005, ISSF's partner, WWF, sponsored the first International Smart Gear Competition. This contest is open to fishers, scientists, managers, engineers, inventors, and anyone else interested in reducing the incidental catch of nontarget species while fishing. Contestants submit their ideas for modified gear or procedures, and an expert panel evaluates their originality, effectiveness, practicality, and cost considerations. Prize money exceeds $50,000, and skippers are encouraged to enter the contest, which happens in odd-numbered years. See smartgear.org for more information.

The first Smart Gear prize was awarded for a deep-setting technique designed to minimize the catch of sea turtles, which was developed by a one-time tuna longline fisherman. Though most tuna longliners already set their lines deeply, a significant fraction of hooks (usually the ones closest to the buoys) remain above 100 m depth. The winning design called for a weighted mainline that ensures that hooks remain below 100 m. This gear was successfully tested in the Pacific, where the vessels caught more bigeye and fewer nontarget species. Detailed gear setting instructions are available in English, French, and Spanish.



Smart Gear 2005 Winner: Deep Setting to Reduce Bycatch

Dehooking or Untangling a Turtle

Though avoiding sea turtles is preferable—of course you want to save your bait for tuna and your time for fishing!—you will inevitably encounter some hooked or tangled turtles. With a few tools, quick action, and some helpful techniques, you can ensure that the turtle has its best chance at survival.

As soon as you see a hooked or entangled turtle, bring the boat to a stop (if you are not stopped already) 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.

You must make a decision about whether to bring the turtle on board, which will be influenced by the size of the turtle and the conditions at sea. 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 maneuver the turtle and operate the dehooker.

Gallery 2.2: Tools for Turtle Handling

Long-handled dehookers: for turtles that have lightly ingested a hook or are externally hooked (such as on a flipper) and cannot be brought on board. Dehookers minimize injury to hooked turtles and save you time rerigging your gear. (Photo: ARC)

Short-handled dehookers: to remove lightly ingested gear from a turtle brought on board. (Photo: NOAA)

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.

Dip nets: use to bring smaller turtles on board. (Photo: D. Byron White, SCDNR, NOAA)

Tires: a good platform on which to set the turtle while dehooking, and a place to keep it safe and secure while it recovers on deck. (Photo: Paul Zoeller)

Mouth gags and openers: aid in the removal of lightly ingested hooks. These prop a turtle's mouth open to allow the removal of hooks, line or both. They can include PVC splice couplings, a wooden brush handle, a hank of rope, or even a dog's chew toy.

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)
- 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 immobilize it.

Dehooker in use

For a lightly hooked turtle, use a dehooker and/or 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

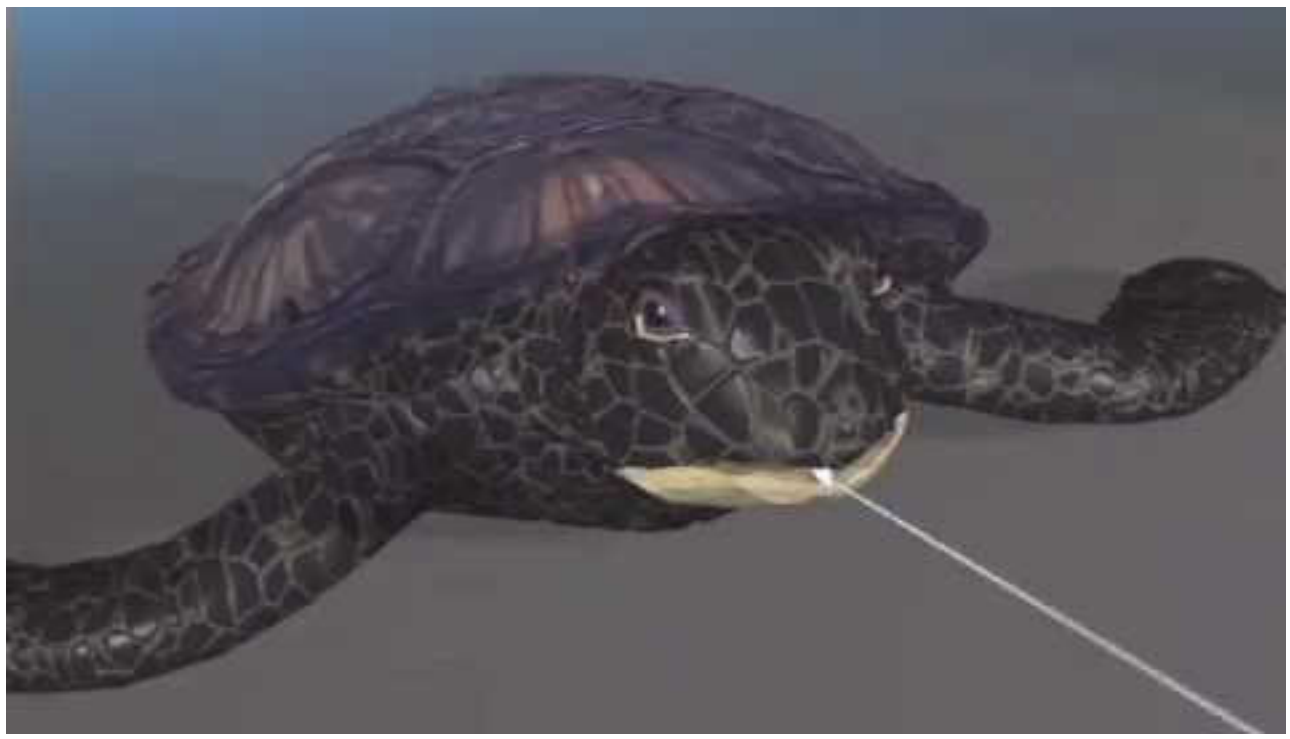
In the following "deep-hooked" situations, do not remove the hook, as doing so could cause more damage to the turtle than allowing the hook to remain in place:

- 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.

Remember—disentanglement at the earliest possible stage maximizes a turtle's chance at survival!

Movie 2.1: Dehooking Demonstration



A video of a dehooking demonstration. Available at http://youtu.be/yWpodG16YoA

Turtle Recovery and Release

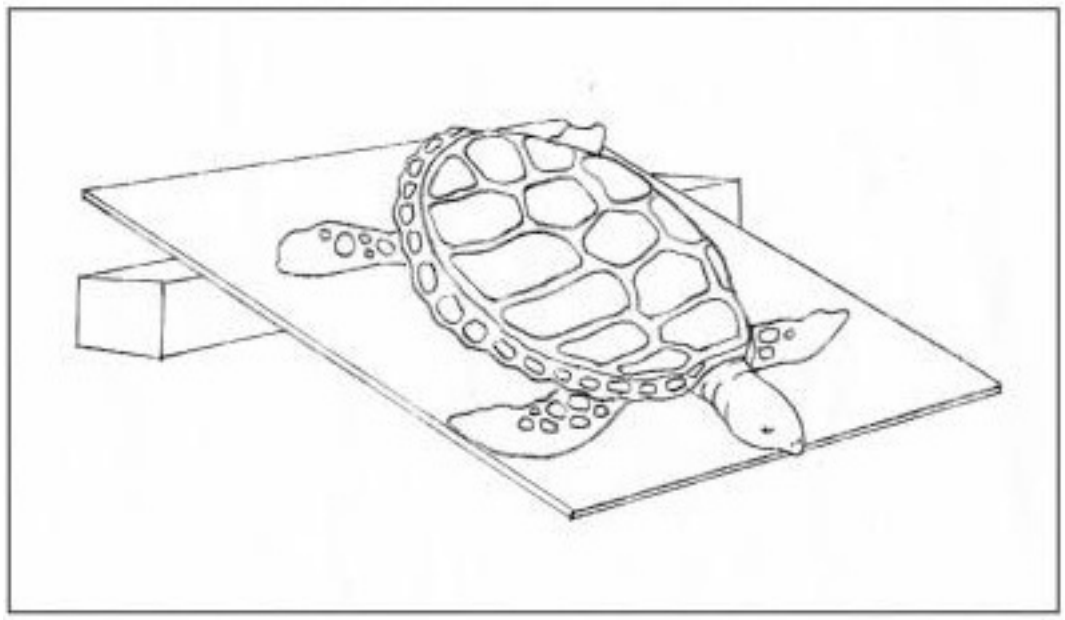
A newly dehooked and/or disentangled turtle may be stressed or exhausted by its ordeal. If possible, allow it to rest (for example, on a tire) for a few hours before releasing it. Keep the animal moist (cover the body—but not nose and mouth—with a wet towel, or spray it periodically with water) and at a temperature above 15°C (60°F). When you are ready to return the turtle to sea, take the following steps:

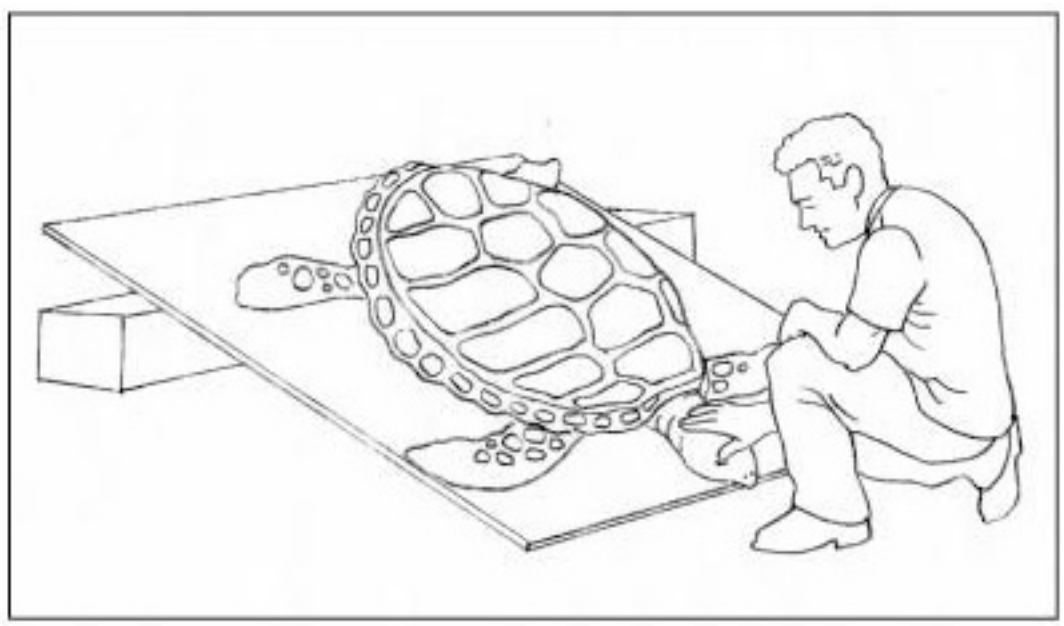
1. Check that there is no fishing gear in the water
2. Bring the vessel to a stop
3. Put the engine in neutral to disengage the propeller
4. Ease the turtle into the water head first while holding it by the sides of its shell. If your vessel has a side door, releasing the turtle from the open door is a good option

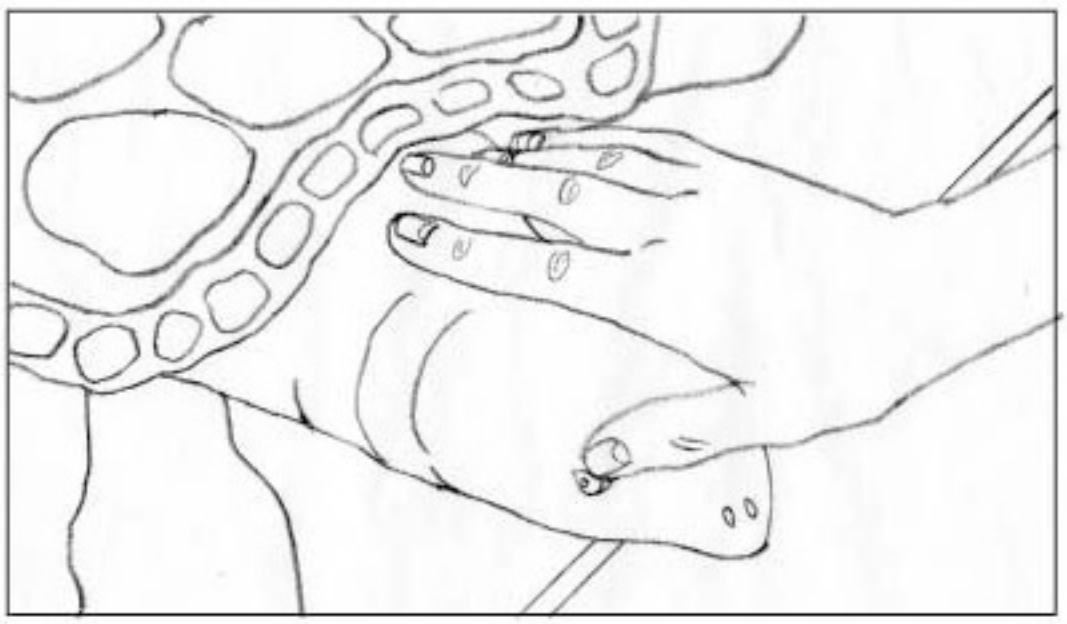
Turtle release in Alcantara, Cebu, Philippines (Photo: Steve De Neef)

Do not drop or throw the turtle from a great height. Make sure the turtle is a safe distance from the boat before you reengage the propeller.

If the turtle appears unconscious (possibly due to entanglement underwater), place the turtle on a tilted surface so that its hindquarters are approximately 15 cm (6 in) higher than its head. This allows water to drain out of its lungs. Again, keep the animal moist (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.







As a skipper, you are already familiar with handling tools and animals. But instead of landing fish, you can use this knowledge to ensure the survival of these vulnerable sea turtles.

Seabirds

As you well know, seabirds see baited hooks as a free meal. Of course you don't want a bird taking bait meant for a tuna. But you should also know that many of the seabirds you encounter are endangered. So those are two good reasons to make an effort to avoid hooking birds!

This section will describe the measures most commonly recommended as effective at reducing seabird bycatch, and the combinations of measures required by different tuna Regional Fisheries Management Organizations (RFMOs), and the areas in which these apply. This section will also briefly cover the types of seabirds, and the best techniques for dehooking and releasing birds.

Commonly Encountered Seabirds

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 kilometers 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. In the next section, we cover the major types of seabirds. It is important to at least attempt to identify any seabirds you catch. If you are unable to identify them, consider taking a photograph.

Great Albatross: The great albatrosses include the largest of all flying birds, the Wandering Albatross. The wingspan of these birds surpasses 3.5 m (11.5 ft) and can weigh over 9 kg (20 lbs). The great albatross are found across the southern oceans, particularly south of 30°S but also farther north in cold water currents off the coast of Chile and south-western Africa. Great albatrosses are typically white birds with black upper-wings. Older birds are generally whiter.

Great albatross (Photo: Dimas Gianuca, ProjetoAlbatroz)

Mollymawks: Though smaller than the great albatrosses, mollymawks and sooty albatrosses are still very large birds with wingspans of around 2 m (6.5 ft) and weigh about 3-4 kg (8 lbs). These species have two small nostrils on the side of the bill. Many species are distributed across the southern seas, with three species in the North Pacific.

Mollymawks (Photo: Oliver Yates, BirdLife International)

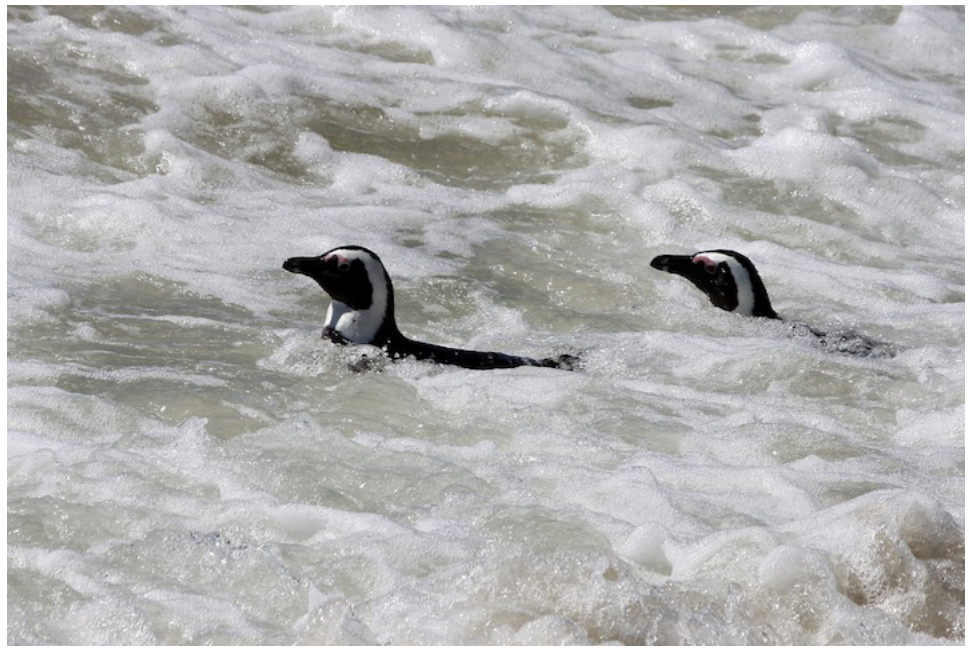
Petrels and Shearwaters: Petrels and shearwaters are a diverse group of seabirds. Many species travel vast distances on annual migrations. In contrast to the albatrosses and petrels, which tend to migrate east and west following air currents in temperate waters, some shearwaters migrate north to south, from pole to pole, such as the short-tailed shearwater in the Pacific. Most species have a wingspan of around 1 m (3.3 ft) and weigh as much as 1.4 kg but typically less than 1 kg (2.2 lbs). All species have a tube along the top of the bill. Many species are totally dark, while others have a mix of gray and white feathers.

Petrels & Shearwaters (Photo: Oliver Yates, BirdLife International)

Giant petrels: Giant petrels are as large as the mollymawks and can weigh as much as 5 kg (11lbs). These large petrels have a prominent, large tube on the top of the bill and are dark-colored, with gradually lighter gray shading as they age. There is a white version found in about 10 percent of the population. Giant petrels are scavengers and will go after offal (fish parts such as heads and guts) discards. They are found in the southern ocean (typically below 30°S).

Giant petrels (Photos: Oliver Yates, BirdLife International)

Penguins: Penguins are flightless seabirds. They are unmistakable at sea, typically surfacing only for short periods before diving again. They are found in the Southern Ocean, and also around South Africa, New Zealand, and the coast of South America.



Penguins (Photo: John Paterson, ATF Namibia)

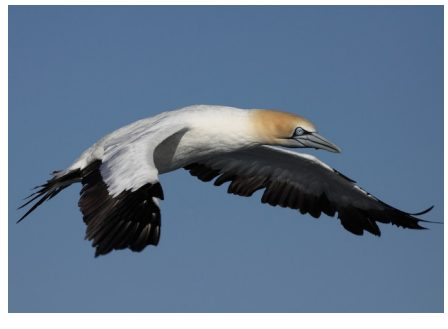
Gulls: Gulls are typically associated with coastal waters and have broader wings than petrels. Gulls lack the tubes on the bill that albatrosses and petrels have.

Gulls (Photo: Luis Cabezas, ATF Chile)

Storm petrels: Storm petrels are the smallest of the seabirds, weighing only 50 g (1 – 2 oz) or so, and can be found across all oceans. Storm petrels have dark coloring above and white or dark below, often with a white rump. These little birds flutter just above the sea surface with their long legs dangling in the water as they filter-feed on small plankton, organic particles, and oil droplets.

Storm Petrels (Photo: JJ Harrison)

Boobies and gannets: Boobies and gannets are medium-sized seabirds with extremely pointed heads and bills, heavy bodies, wedge-shaped tails, stout legs, and long, slender wings. These birds perform impressive plunging dives from great heights to capture small fish near the surface. These birds are found mainly in tropical and subtropical waters.



Boobies and Gannets (Photo: John Paterson, ATF Namibia)

Skuas: Skuas are similar to gulls in appearance, but larger, and have dark feathers with white patches on the wings. These birds can be found far out to sea but typically in lower numbers than the petrels and albatrosses.

Skuas (Photo: Dimas Gianuca, Projeto Albatroz)

Seabird Mitigation Measures

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 minimize bait loss and ensure that baited hooks are available to the target species. In the southern Indian, southern Atlantic and SW 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

In the North Pacific and SE Pacific, longline 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. For further information, contact the RFMO in whose Convention Area you operate. Their staff can provide additional detail.

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 long-line, 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.

Bird scaring lines (Photo: Sebastian Jimenez, Albatross Task Force, Uruguay)

Movie 2.2: Deploying a Bird-Scaring Line

A video about deploying a bird-scaring line. Available at http://youtu.be/9WG6drHNcrk

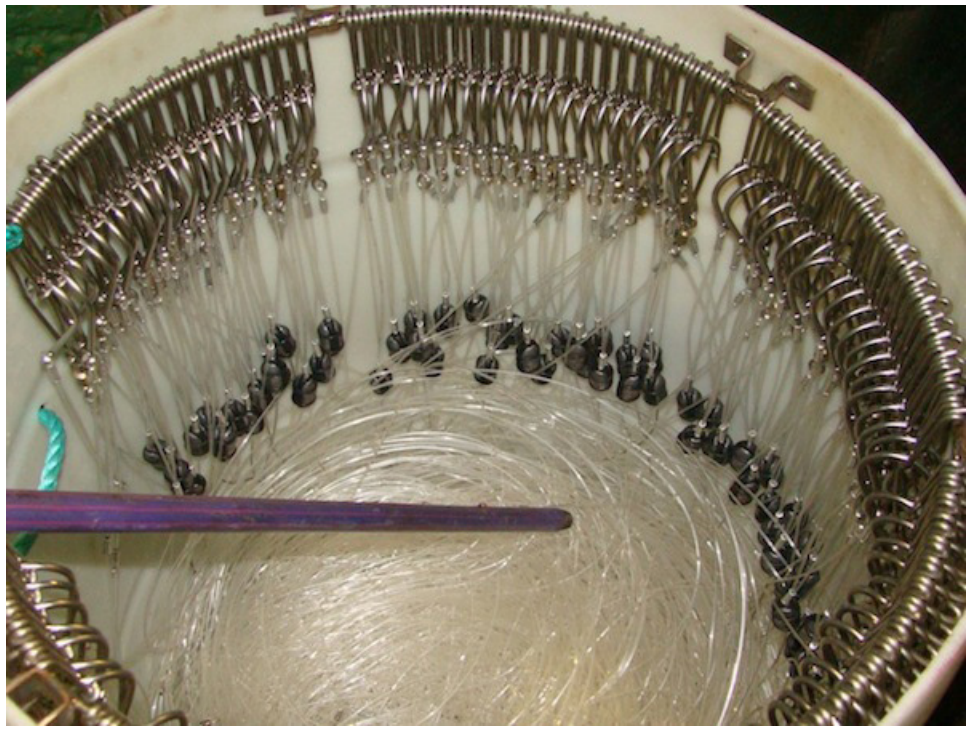
Night Setting

Since many seabirds, including the vulnerable albatross, do not feed at night, you can minimize interactions by setting your 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, use only as much vessel light as you need to comply with navigational rules and best safety practices.

Night setting (Photo: Ricardo Hoinkis, Projeto Albatroz)

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 45 g 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. In the SW Pacific, there is also the option of one weight greater than or equal to 40 g within 50 cm of 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 minimized.



Weighted branchlines (Photo: Sebastian Jimenez, Albatross Task Force, Uruguay)

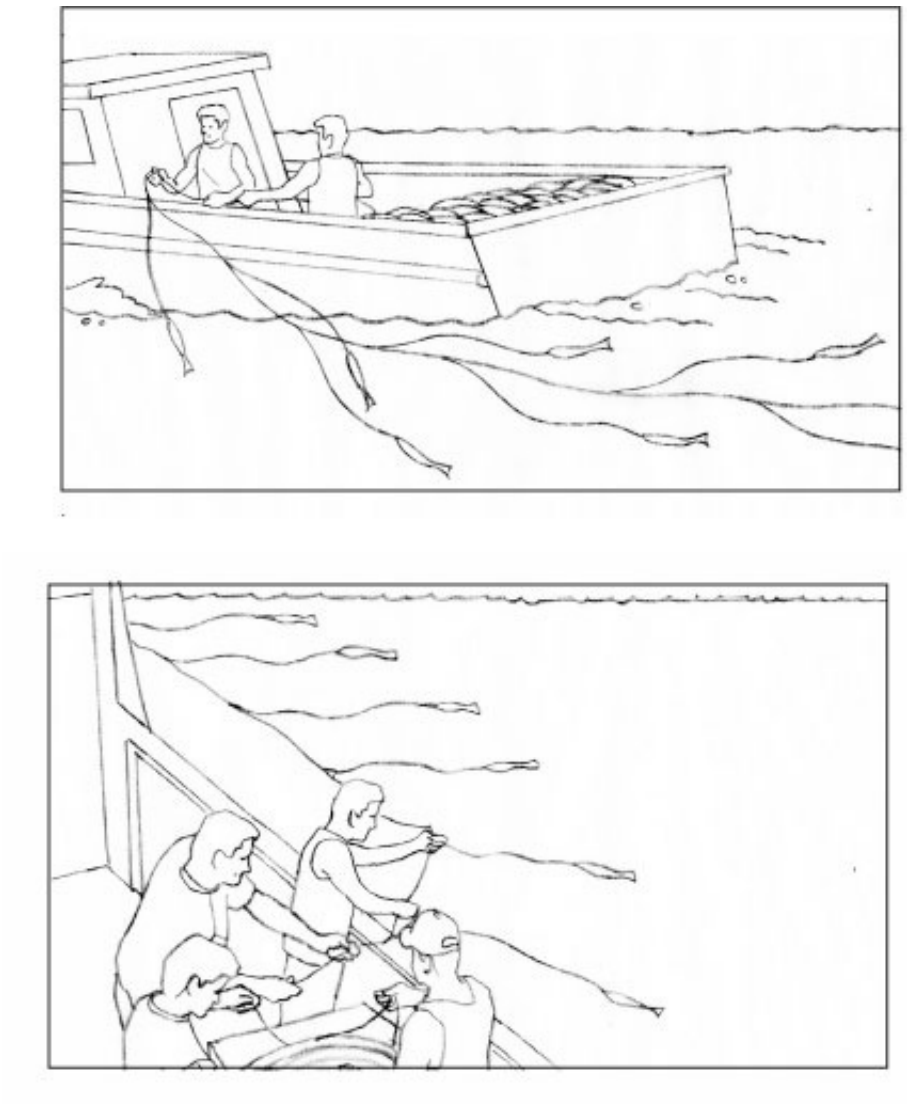
Management of Offal Discharge

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. If you intend to use this technique, remember to keep enough offal on hand between the set and the haul.

Strategic Offal Discharge

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 stations. More side setting information.



Side Setting

Bait Treatments - Blue-dyed bait (Fabiano Peppes, Projeto Albatroz)

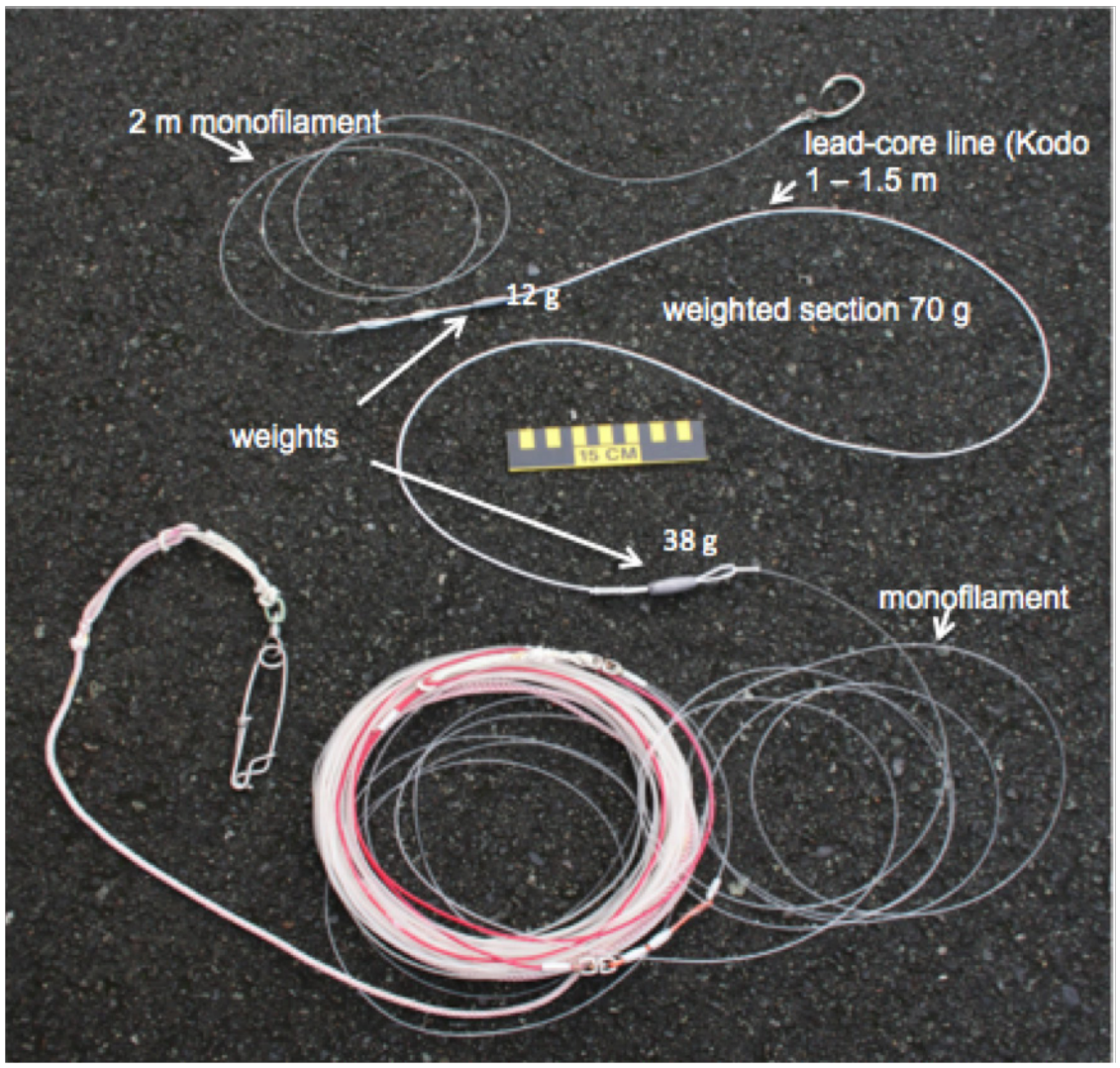
Sidebar 2.2: Line Weighting Smart Gear Prize

Kazuhiro Yamazaki, Fishing Master of the F/V Fukuseki Maru No 5, won the 2011 Smart Gear award for developing an effective way to weight the line while ensuring crew safety in the event that a hook comes free while under tension during landing. When tested against unweighted branchlines, this "double-weighted" configuration reduced the incidental catch of seabirds by 89 percent with no effect on fish catch rates.

Kazuhiro Yamazaki

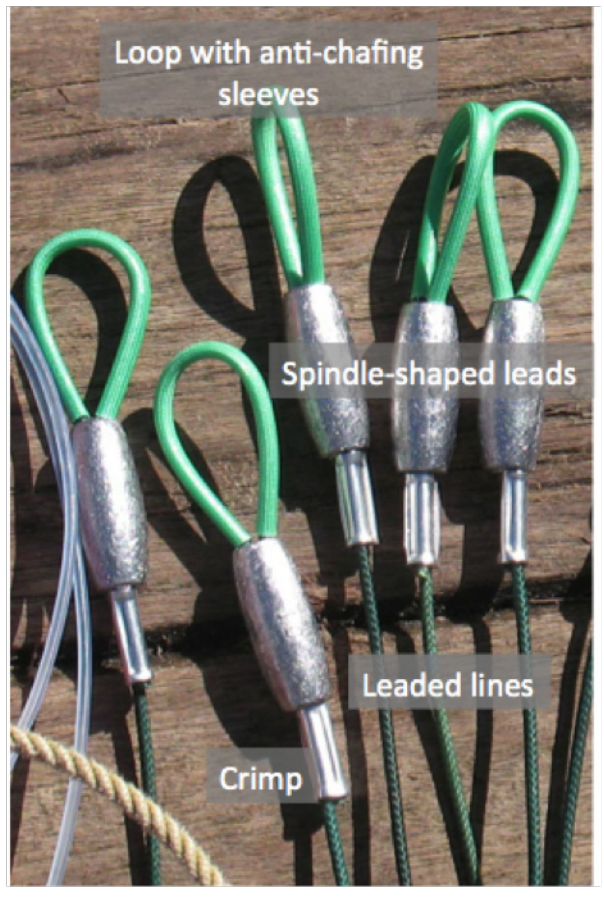
How to Build the Yamazaki Double-Weighted Branchline

The double-weighted branchline is simply a weighted section of line that is inserted into the branchline 2 m above the hook.



Materials

- 2 each spindle-shaped leads per branchline
- Lead core line or wire—as heavy as is practical
- Crimping tool and crimps
- Scissor or knife
- Anti-chafing sleeves matching the diameter of lines used



Creating the Weighted Section

Cut 1 to 1.5 m lengths of weighted line, use either wire or coated, monofilament lead core line (Kodo).

Slide the spindle-shaped lead onto the weighted line and bend the end of the weighted line into a loop. Slide the spindle-shaped lead over the tail of the loop. Note: The hole

running through the spindle-shaped lead should be twice the diameter of the weighted line to allow room for the weighted lines to be inside the lead. Crimp the tail of the loop below the weight. This fixes the position of the weight above the crimp and below the loop.

Repeat this process on the other end of the weighted line, but place the second spindle-shaped lead below the crimp, allowing the spindle-shaped lead to slide the full length of the weighted line.

Inserting the Weighted Section into a Tuna Branchline

Cut the monofilament of an existing branchline 2 m above the hook and create loops using crimps on both ends created by the cut. Insert the weighted section between the cut sections of the branchline using the loops to secure them. Pull knots tight and smooth to minimize tangles with the monofilament.

Tips:

- The loops should be as small as possible to tie the sections together. If the loops are larger than necessary they can be source of tangles.
- The weighted section should weigh a minimum of 60 g. The heavier the weighted section, the faster and closer to the boat it will sink, making bird-scaring lines easier to manage. Fishermen should consider this configuration a starting point for innovation—more than two leads? Heavier leaded line? Or both?
- If using wire for the weighted section, consider placing an anti-chafing sleeve inside the loop to minimize abrasion with monofilament.

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 helpful 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

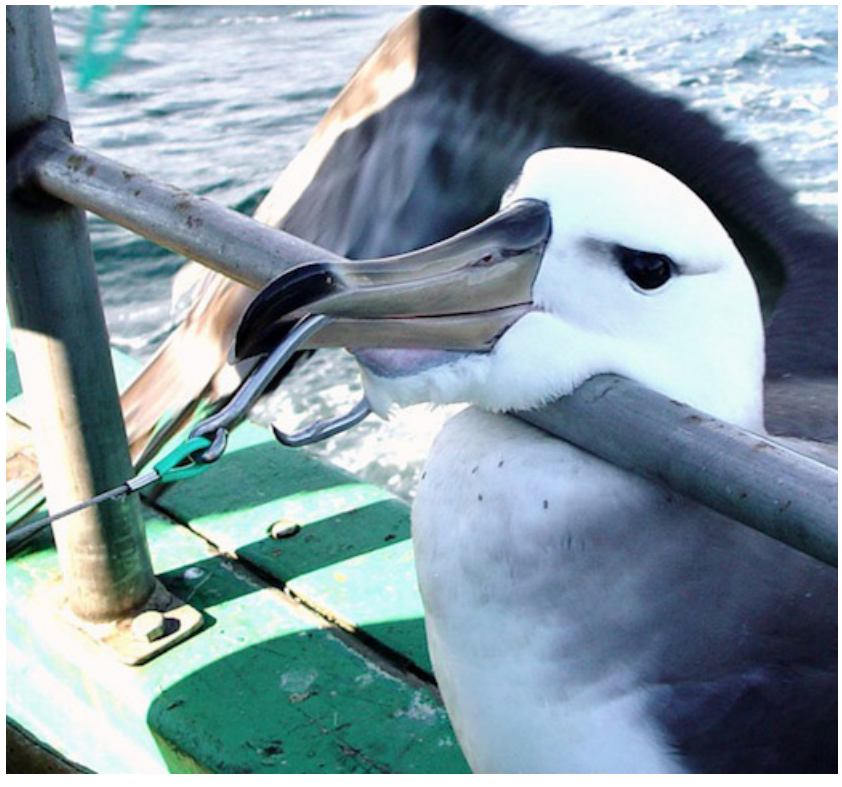
Movie 2.3: Seabird Dehooking Animation

A video about seabird dehooking. Available at http://youtu.be/eLK1BPV_Wic.

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

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

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.



Hooked bird (Dimas Gianuca, Projeto Albatroz)

If the bird is deeply hooked in the body or throat (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

Bird in recovery box (Bronwyn Maree, ATF South Africa/BirdLife South Africa)

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. For albatrosses in particular, the actions you take to avoid their capture and to release them if they are caught are critical to their long-term survival. They mate for life and produce only a single egg every one to two years. If one member of a pair is killed, the other cannot raise the chick alone. The loss of one adult can lead to the loss of a chick and any future chicks from the pair. Take the time to do your part to keep this part of the marine ecosystem healthy.

Sharks

Globally, pelagic longlining has the highest rate of shark catch (as a target and nontarget species) of any fishery. 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 you can take 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.

Commonly Encountered Sharks

Though the species of sharks that are encountered during pelagic longline tuna fishing can depend on your location and the time of year, here we describe some of the most commonly seen sharks.

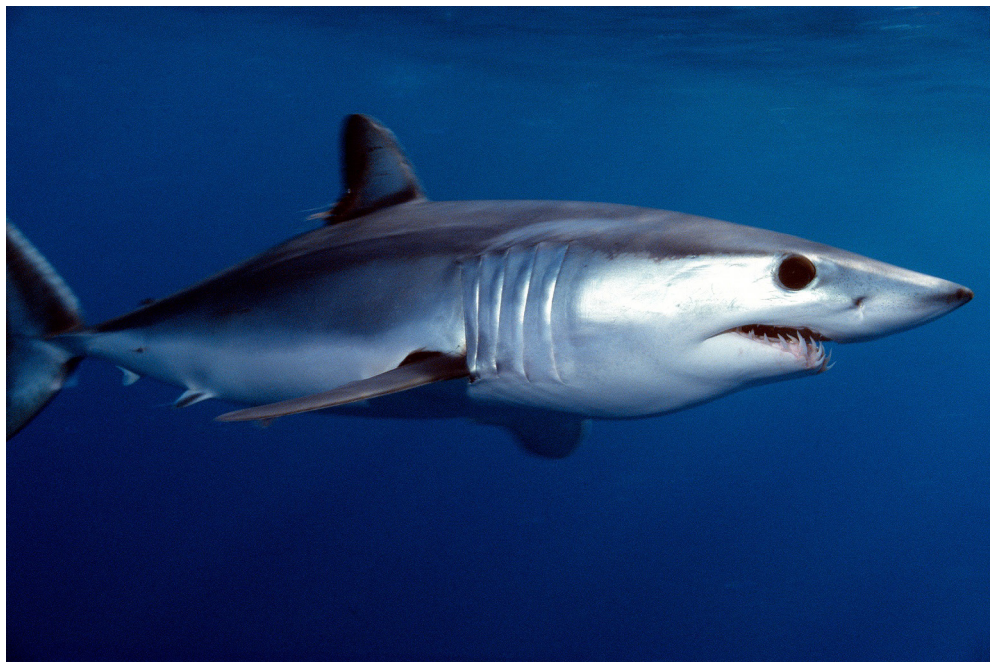
Silky Shark: A smooth brownish body, with a white underside. The pectoral (side) fins are much closer to the head than the dorsal (top) fin, which has a spine at its base. A ridge runs from the dorsal fin to the tail. The underside of the otherwise white pectoral fins has a dark gray tip.

Silky Shark (Fabian Forget, ISSF)

Oceanic Whitetip Shark: Large and rounded dorsal (top) and pectoral (side) fins that are white at the tips. It can have black marks on the ends of its other fins. Its head looks flattened, with a rounded snout. The body is mostly brown with a white underbelly.

Oceanic Whitetip Shark

Shortfin Mako Shark: A pointed, cone-shaped snout with long gill slits behind the head. The teeth are long and exposed, without serrations. The body is a dark, deep blue on the back, with a white belly. The pectoral fins are shorter than the head is long. There is also a longfin mako, and its pectoral fins are as long or longer than the length of its head.



Shortfin Mako Shark (Jeremy Stafford-Deitsch, IUCN)

Blue Shark: The blue shark has a long, slender, soft-looking body, with a long and pointy snout. The top of its body is a deep and pearly blue that fades to white on its sides.

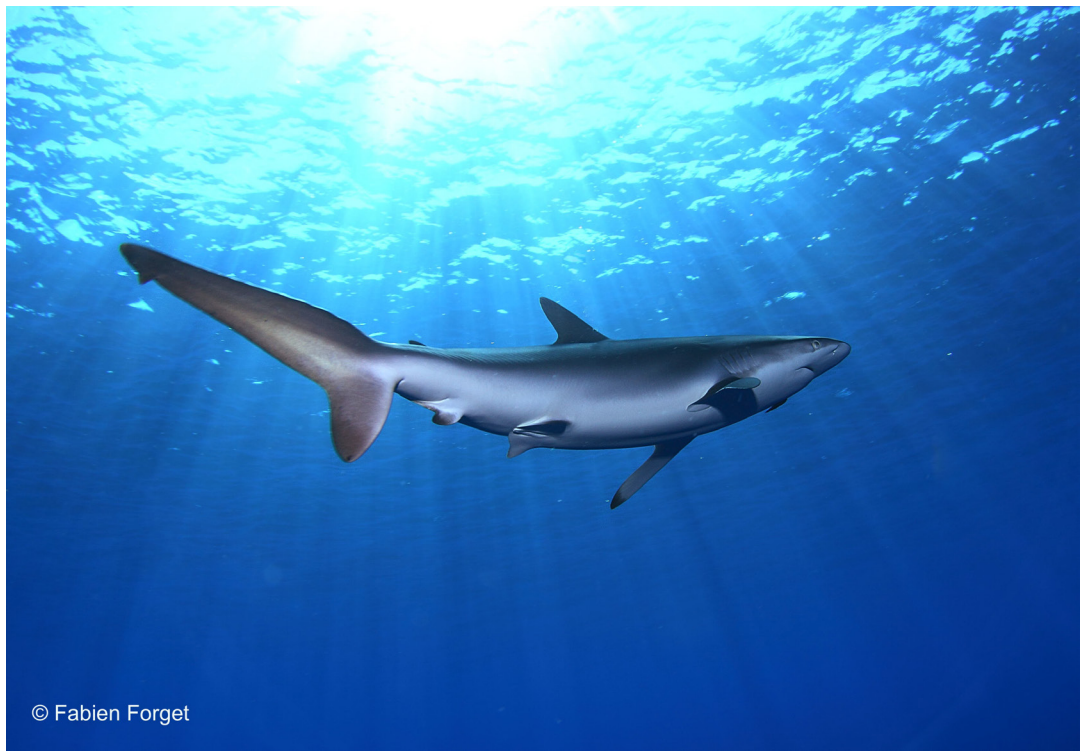
Blue Shark (Jeremy Stafford-Deitsch, IUCN)

Common Thresher Shark: This is the largest and most common of the three thresher shark species, having a length up to 6 m (20 ft), though half of that length is composed of the long upper section of the tail fin. With a streamlined body and short pointed snout, the common thresher resembles (and is often confused with) the pelagic thresher. The common thresher's white belly extends in a band over the bases of its pointed pectoral (side) fins, while the pelagic thresher has a dark blue-gray color at the base of its pectoral fins.

Common Thresher Shark (Pfleger Institute of Environmental Research)

Pelagic Thresher Shark: Though similar in appearance to the common thresher, the pelagic thresher is smaller (3 m/10 ft). The body is an intense dark blue above and white

below; the white does not extend above the pectoral fins. This color rapidly fades to gray after death. The dark coloring above the pectoral fins and the rounded pectoral fin tips distinguish this shark from the common thresher.



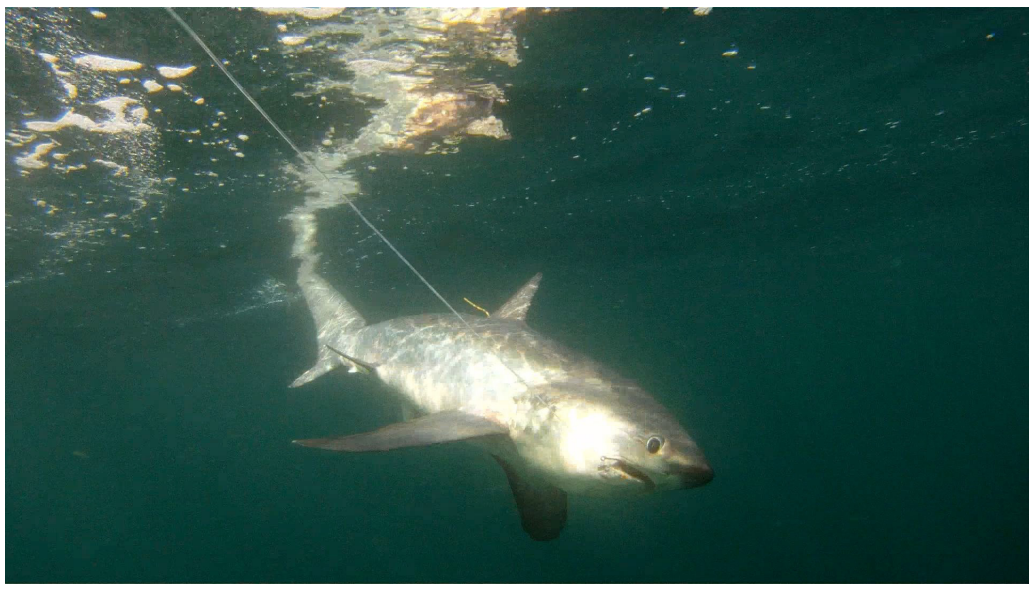
Pelagic Thresher Shark (Fabian Forget, ISSF)

Bigeye Thresher Shark: The body looks similar to the pelagic thresher, though the bigeye thresher's upper tailfin is not as long. Unlike the pelagic thresher however, the bigeye has an unusual groove that runs from the top of the head to above the pectoral fins and its prominent eye socket extends to the top of the head.

Bigeye Thresher Shark (NOAA)

Shark Bycatch Mitigation Measures

While there are several strategies currently being promoted, RFMOs have not mandated the use of one mitigation measure over another. Here we list some of the techniques that have been shown to be effective in reducing the catch of sharks.



Hooked shark (NOAA)

Fish Bait

Sharks appear to favor 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. Remember that to reduce turtle catch, the use of fish bait is also recommended, so now you have two good reasons to consider using fish as your bait.

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.

Set Depth

Shark catch rates are significantly higher on shallow-set longlines than deeper-set (deeper than 100 m) longlines. Some studies have found shark bycatch with shallow-depth hooks to be 3 to 10 times the rate of bycatch with deeper-set hooks.

Nylon Leaders

It has long been known that the use of metal wire leaders maximizes the retention of hooked sharks. This is because sharks are unable to cut 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.

But another 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. 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).

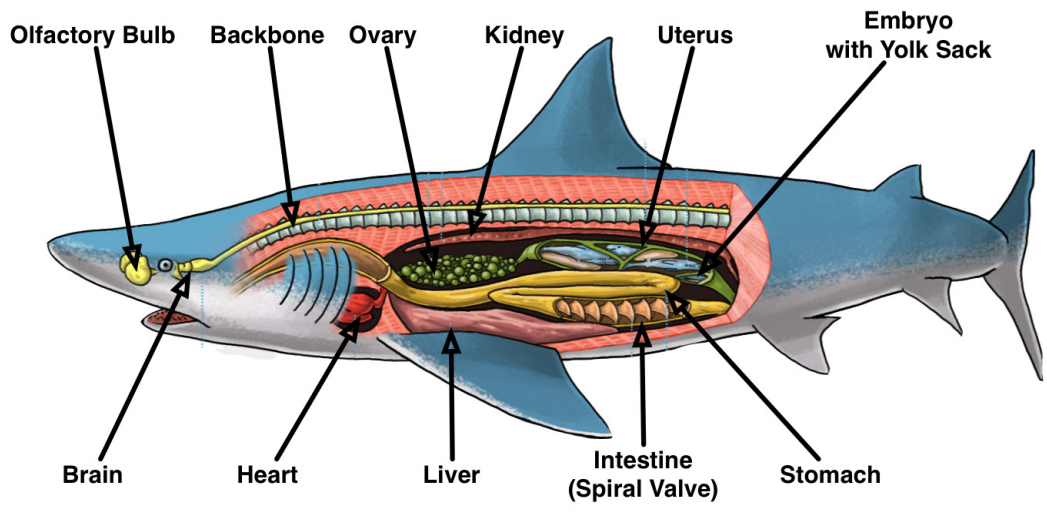
Shark Handling and Release

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.

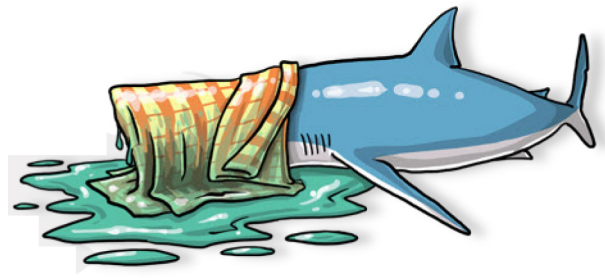
Armed with these facts about shark biology, we can ensure that our handling techniques are minimizing further injury to the animal. Of course, crew safety is paramount at all times, so employ these best practices only when they can be done safely and securely.

For larger sharks that are hooked or entangled, the use of long-handled line cutters and dehookers while the animal remains in the water is recommended. If a smaller hooked shark is safe to bring aboard, do so carefully. As with sea turtles and seabirds, dehookers, bolt, and line cutters can all be used to remove a hook, disentangle an animal or cut a leader if the hook is too deeply embedded. See the following galleries about general dos and don'ts when handling the animal on deck.

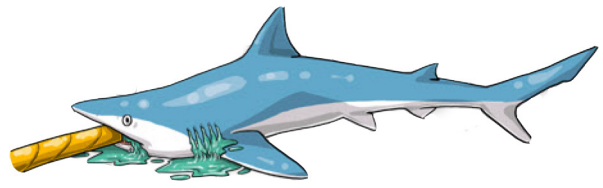


Shark Anatomy

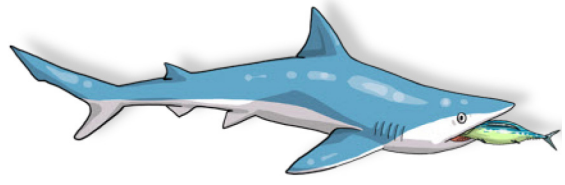
Gallery 2.3: Shark Handling and Release Dos



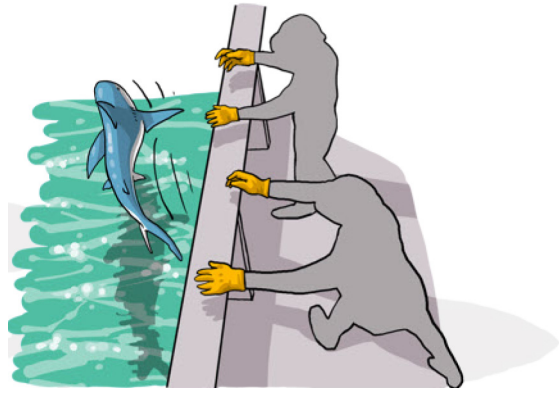
A cool, wet cloth lightly draped over its head can calm an energetic shark. (Poisson et al, 2012)



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. (Poisson et al, 2012)



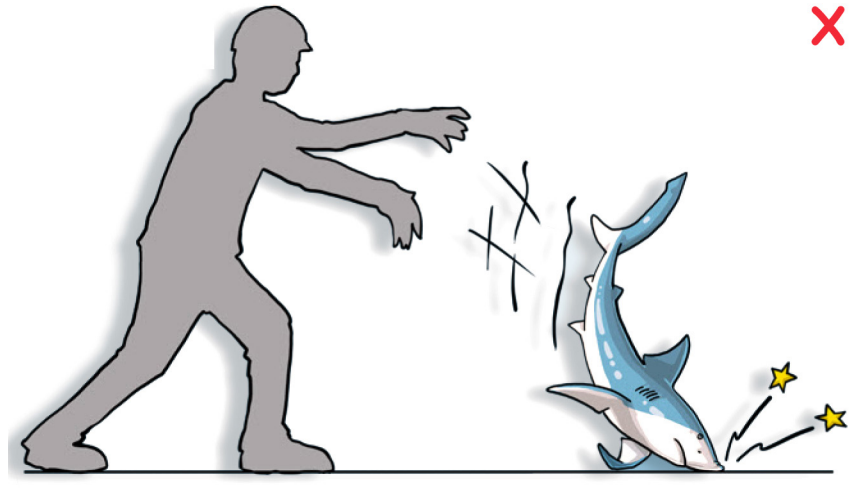
For crew safety, avoid the animal's jaws (some suggest placing a fish in its mouth to prevent bites), and regardless of the animal's state (live or moribund) be cautious at all times. (Poisson et al, 2012)



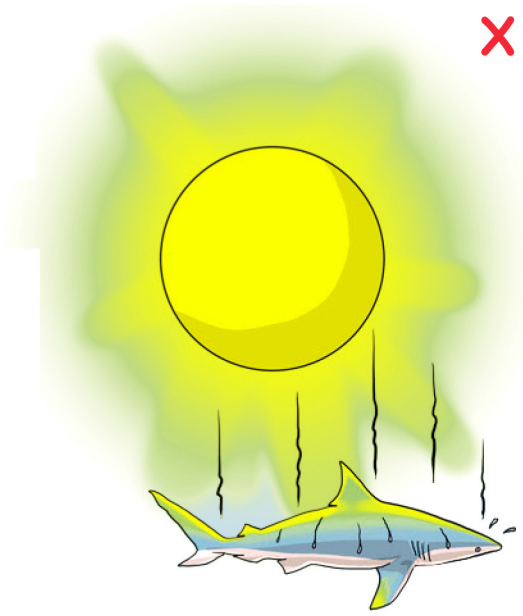
Most importantly, attempt to release the animal AS SOON AS POSSIBLE. (Poisson et al, 2012)

Gallery 2.4: Shark Handling and Release Don'ts

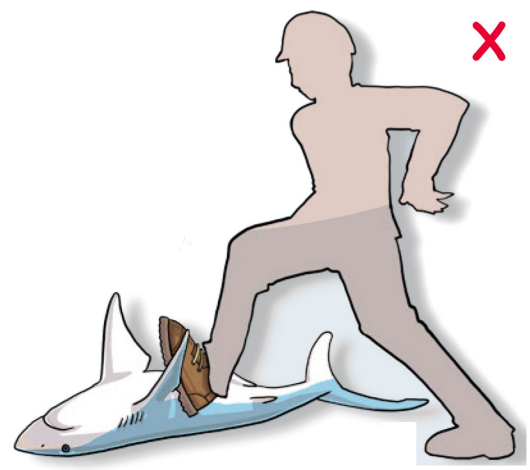
DO NOT lift the animal by its head or tail, as this can severely damage the spinal cord (Poisson et al, 2012)



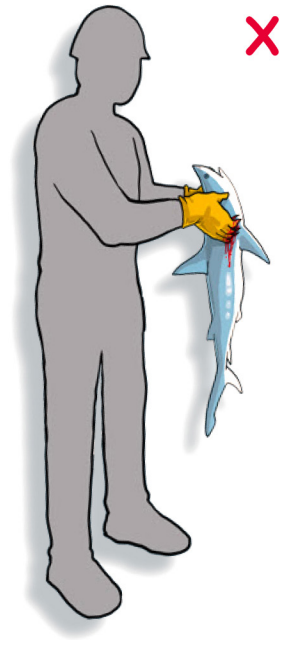
DO NOT throw, hit, or squeeze the animal. Prevent the animal from battering itself against the deck or other hard objects. (Poisson et al, 2012)



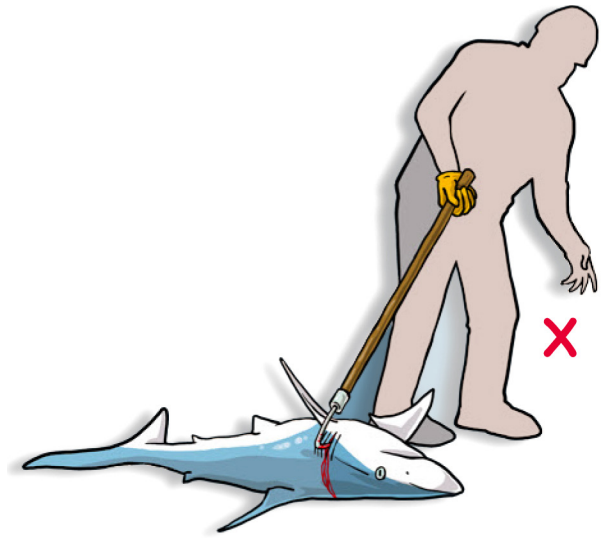
DO NOT leave the animal in the sun. If possible, handle the animal in the shade or otherwise reduce its exposure to the sun. (Poisson et al, 2012)



DO NOT yank or push the animal sharply. (Poisson et al, 2012)

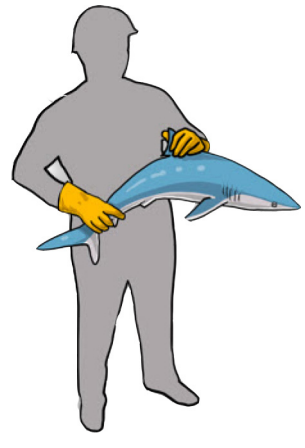


DO NOT insert hands or objects into the gill openings. (Poisson et al, 2012)

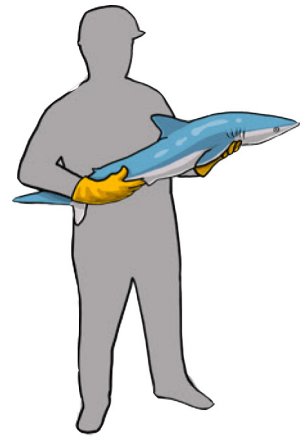


DO NOT insert a gaff, hook, or other pointed object to drag or lift the animal. (Poisson et al, 2012)

Gallery 2.5: Handling Small Sharks (1 Person)

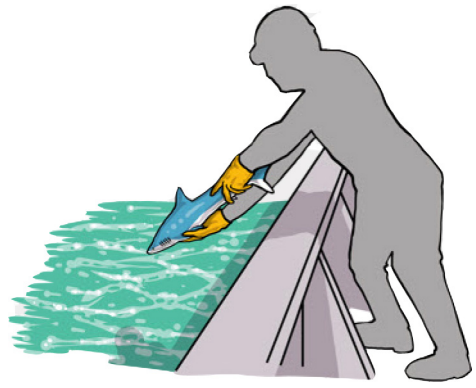


One hand on the dorsal (top) fin and the other holding the body from below (Poisson et al, 2012)



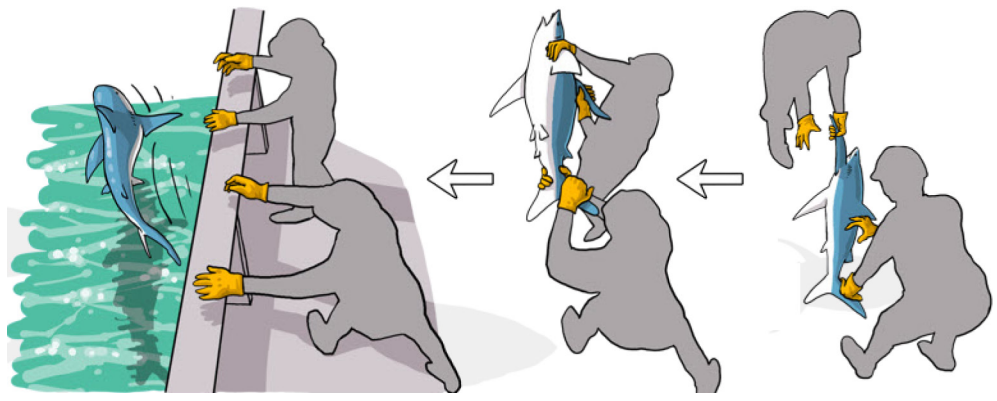
Both hands holding the body (Poisson et al, 2012)

One hand on the pectoral (side) fin and the other holding the tail (Poisson et al, 2012)



Release the fish by pointing its head down toward the water and dropping it in (Poisson et al, 2012)

Handling Medium Sharks (2-3 People)



One or two people should hold the dorsal and pectoral fins, with the other person holding the tail. Release over the side by dropping, not throwing, the animal. (Poisson et al, 2012)

End Wasteful Shark Finning

Shark finning is the practice of retaining shark fins and discarding the remaining carcass while at sea. 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 minimizing waste and discards.

There are major uncertainties about the total quantity and species of sharks caught, and shark finning has added to this problem.

ISSF has called on industry to adopt policies against finning. All tuna fishery operators should prohibit shark finning, and should retain, land, and report all sharks caught, except for species that are prohibited by national law or RFMO regulations, or those individuals that are released alive.

Final Notes

These bycatch mitigation and handling guidelines were developed with the input of scientists, skippers, crew, and fisheries managers. However, best practices are always evolving, and if new information becomes available, ISSF will update this guidance. Also, if your experience as a skipper suggests alternative methods of successful bycatch mitigation and handling, we are always eager to test such techniques during our research cruises. There will be a place to share such information at the end of this module, and ISSF encourages you to do so.

Chapter 3

Fisheries Management

Chapter 3: Fisheries Management

The ability of Regional Fisheries Management Organizations (RFMOs) to manage tuna stocks is only as good as the quality of compliance by its many members. When vessels do their part to meet the RFMO obligations, they make a vital, fundamental contribution to the success and sustainability of the fishery.

Chapter Objectives

1. Summarize the major organizations and instruments responsible for tuna fisheries management at the global, regional, and national levels.
2. Outline the vessel-level actions necessary for compliance with RFMO obligations, including:
    1. Fishing Measures
    2. Data Reporting
    3. Observers
    4. Tag Recovery
3. Identify the ISSF Commitments.

International Organizations and Instruments

Tuna is an international resource: it can be caught in one country by a vessel flagged to another, processed in a third country, and consumed in a fourth. As a result, there are a great variety of organizations that shape the fishing process, from global (the United Nations), to regional (RFMOs), subregional (the parties to the Nauru Agreement in the western Pacific), and national (coastal and flag state) levels.

The United Nations Convention on the Law of the Sea (UNCLOS) established rules for the use of, and operation on, the world's oceans. It governs all aspects of ocean space, such as demarcation, environmental control, marine research, commercial activities, and the settlement of disputes relating to ocean matters.

Here are the aspects of UNCLOS most relevant to tuna fishers:

- Coastal states have sovereign rights to their territorial sea (12 nautical miles), and to the resources in their exclusive economic zone or EEZ (200 nm).
- All states are allowed the traditional freedom of navigation, research, and fishing on the high seas, as well as "innocent passage" of their vessels through other Coastal states' waters.
- All states undertaking activities that affect living marine resources on the high seas are obligated to adopt, or cooperate with other states in adopting measures to manage and conserve those resources.

In order to implement this last point, the United Nations Fish Stocks Agreement (UNFSA) was conceived. Specifically, UNFSA does the following:

- Establishes principles for the conservation and management of highly migratory fish stocks that must be based on the precautionary approach and the best available scientific information
- Requires the management of those other species in the same ecosystem that are affected by fishing activities (i.e., bycatch)
- Requires both coastal and distant water fishing States to ensure compatible conservation measures between EEZs and the high seas
- Specifies the duties of flag States to exert control over their fishing vessels
- Contains rules on the establishment of RFMOs, including the obligation of fishing states to become members and comply with all measures

There is some variation among the RFMOs' conservation and management measures, but the primary mechanisms used are these:

- Catch and/or effort limits
- Catch and/or effort reporting
- Spatial and/or temporal closures, and gear restrictions
- Controls on at-sea transshipments
- Observer and Vessel Monitoring System (VMS) requirements
- Scientific data provisioning, reporting, and handling

Each RFMO has different ways of tackling these subjects, but in all cases, high levels of monitoring and compliance are key to successful management. Without compliance, excess catch drives down fish stocks, poor reporting and data provisioning prevents accurate assessment, and violating closures or observing requirements weakens necessary protections. Decisions about stock assessments, catch limits, and management strategies are only as good as the quality of data received by the RFMOs' scientists, and vessels play a critical role in this process.

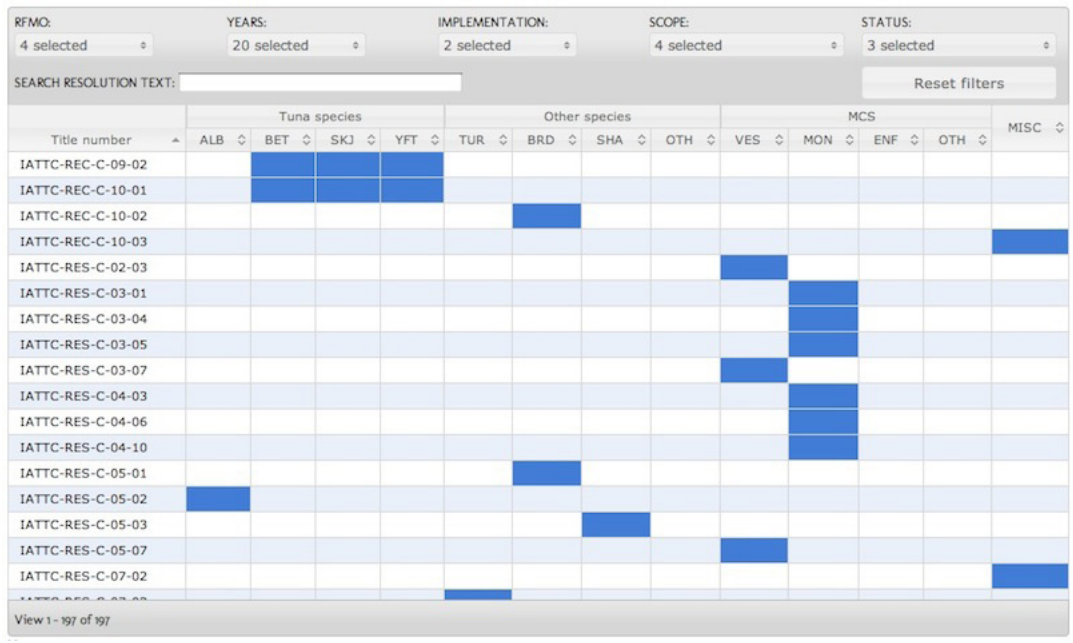
ISSF has compiled an online database that lists all measures for each tuna RFMO. Measures can be sorted by RFMO, keyword, year, or other parameters. Given the dozens of requirements active in any given region, this database is a useful tool for identifying those measures that apply to the vessel's gear type.

For example, longline at-sea transshipment is generally permitted only for large-scale longliners with carrier vessels that participate in a regional observer program. To determine the particular requirements of the RFMO in which the vessel fishes, you can search for the term "transshipment" in the ISSF RFMO database to find the applicable measure. An example for purse seine fishing would be to search the database for RFMO data collection requirements for FADs (fish aggregating devices), which now exist in

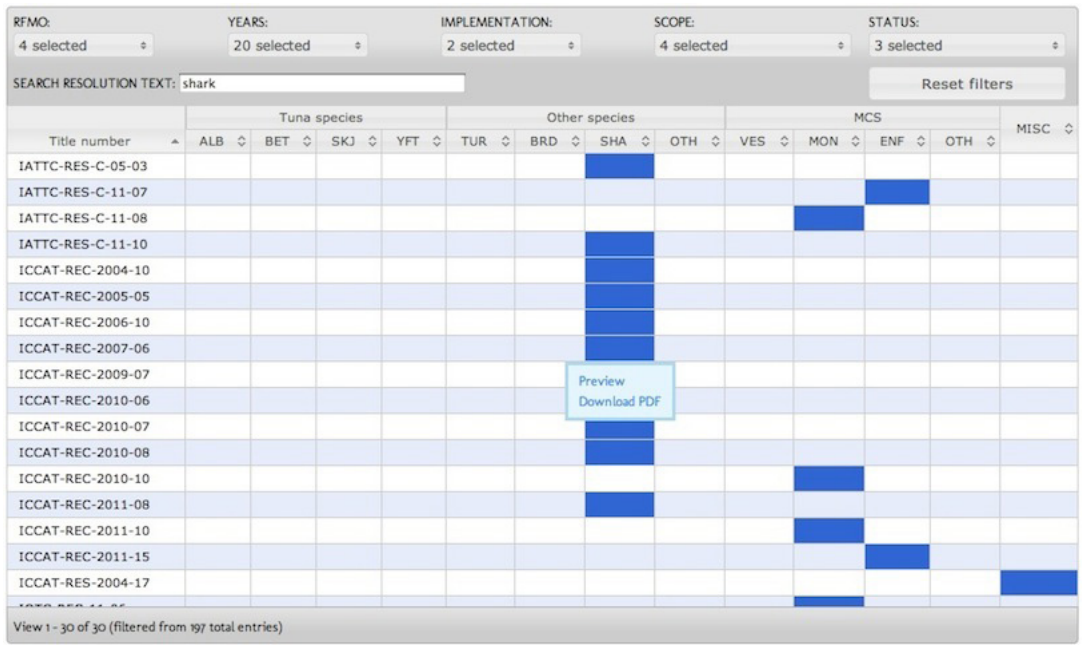
the IOTC, IATTC and ICCAT.

These conservation and management measures are then implemented in the various flag and coastal states' laws and regulations. Fishers must be familiar with both the vessel's flag state's laws and the laws of the coastal state in which they are fishing. Each tuna RFMO's major conservation and managements measures relevant to both purse seine and longlining are noted below. However, the descriptions below are not exhaustive and should be used only as supplemental summary information to the detailed requirements contained in the RFMO conservation and management measures. For instance, some RFMOs require the completion of statistical or catch documentation forms, transshipment declarations, or other kinds of certificates for landing, import and/or re-export of certain tuna species. Fishers are encouraged to contact their flag state for more information on the applicable requirements for the RFMO in which they are fishing, and consult the ISSF RFMO database for the full text of the measures.

ISSF RFMO Database



ISSF has compiled a database that lists all measures for each tuna RFMO. http://iss-foundation.org/rfmo-resolution-database/.



In this example, shark is in the search field http://iss-foundation.org/rfmo-resolution-database/.

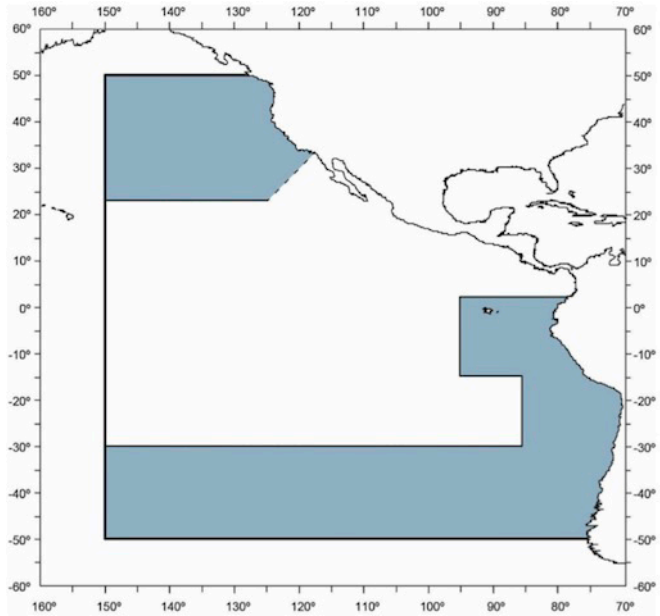
Inter-American Tropical Tuna Commission (iattc.org)

There is one main binding, multiyear conservation measure covering tropical tuna stocks (bigeye, skipjack, and yellowfin) that currently includes, among other things, provisions for a 62-day full closure for purse seine fishing, a two-month closure in a specific area of the Convention Area for purse seine fishing, and bigeye catch limits for longline vessels.

The IATTC has also adopted conservation measures for specific tuna species, including North Pacific albacore and Pacific bluefin tuna. The requirements of these measures vary from limits on increasing fishing effort from current levels to limits on total commercial catches for a set period. If fishing for these species, fishers must become aware of the specific requirements.

Regarding seabirds, IATTC requires the use of two different seabird bycatch mitigation measures, and fishers should also make efforts to ensure that any birds captured are released alive and in the best condition possible. This applies to longline vessels in the shaded area in the following map.

For sea turtles, longline skippers must ensure that their vessel has on board the right equipment to promptly release any incidentally caught animals (e.g., dehookers, line cutters, and scoop nets). Fishermen must also bring aboard, if practicable, any comatose or inactive turtle as soon as possible and foster recovery, including resuscitation, before returning it to the water.



Area Requiring Seabird Bycatch Mitigation Measures. When fishing in the shaded area, IATTC requires vessels to use two different seabird bycatch mitigation measures.

IATTC also discourages shark retention (oceanic whitetip retention is prohibited), while requiring "full utilization" of those sharks that are retained (keeping onboard all parts except the head, guts, and skins to the point of first landing). In addition, no more than 5 percent of total landed shark weight can be composed of fins.

IATTC also requires full retention of bigeye, yellowfin, and skipjack tunas caught by purse seine vessels.

Western and Central Pacific Fisheries Commission (wcpfc.int)

There is one main binding conservation measure covering tropical tuna stocks (bigeye, yellowfin, and skipjack) that currently includes, among other things, provisions for FAD closures and FAD set limits, purse seine effort limits, longline catch limits for bigeye tuna, capacity limits for developed nations' large-scale purse seine and longline vessels, and the prospect of a FAD set prohibition on the high seas in 2017 unless the Commission agrees to alternative measures.

The WCPFC has also adopted conservation measures for specific tuna species, including North Pacific albacore, South Pacific Albacore and Pacific bluefin tuna. The requirements of these measures vary from limits on increasing fishing effort from current levels, limits on the number of vessels targeting the species, or a combination of limits on total effort and catches of juveniles. If fishing for these species, fishers must become aware of the specific requirements.

Regarding bycatch, the WCPFC:

- Requires implementation of the FAO guidelines for reducing sea turtle mortality and to disentangle/release them when caught alive
- Caps (by country) the catch of striped marlin
- Requires specified seabird bycatch mitigation measures depending on gear and location (like ICCAT and IOTC, south of 30° S fishers must use two of the following three measures: night setting, weighted branchlines, and tori lines)
- Mandates reporting of shark catches and discards by gear type and species
- Prohibits retention of oceanic white tip sharks and silky sharks
- Prohibits intentional purse seine setting on whale sharks and cetaceans
- Enforces a 5 percent limit on the ratio of shark fins to total shark weight that can be retained onboard fishing vessels, and encourages the release of live sharks

The WCPFC also requires full retention of bigeye, yellowfin, and skipjack tunas caught by purse seine vessels.

International Commission for the Conservation of Atlantic Tunas (iccat.int)

There is one main binding conservation measure covering tropical tuna stocks (bigeye, yellowfin) that amends previous recommendations, and sets out a multiyear management plan. The main provisions are summarized below.

Bigeye:

- Total allowable catch (TAC) with catch limits given to members. The measure includes detailed provisions for countries to be penalized with lower quotas if their limits are exceeded
- A capacity limitation (country-specific) for the number of longline and purse seine vessels over 20 m in length
- The establishment of a record of vessels actively fishing for bigeye

Yellowfin:

- An overall yellowfin TAC (not allocated by country)
- The establishment of a record of vessels actively fishing for yellowfin

ICCAT has also adopted conservation measures for specific albacore tuna species, including North Atlantic, South Atlantic, and Mediterranean. The requirements of the measures for the northern and southern stocks include an established TAC, catch reporting, and placing a cap on vessel numbers by country. There are also applicable fishing capacity limits for some of these stocks. If fishing for these species, fishers must become aware of the specific requirements.

The Atlantic bluefin tuna is found in the north Atlantic and the Mediterranean Sea, and is composed of two stocks: western Atlantic, and eastern Atlantic and Mediterranean (these stocks do mix as well). Because of past overexploitation, the stocks—particularly the eastern stock—are highly managed, with many regulations in place. For the western stock, the primary conservation measures are a TAC, a minimum size requirement, and a prohibition on directed fishing in the Gulf of Mexico and transshipment at sea.

The eastern stock has a TAC and other measures to ensure that this rebuilding stock continues to improve, such as:

- Management of fishing fleet capacity
- Seasonal closures (6 months for longliners)
- Minimum sizes (8 and 30 kg, depending on the fishery)
- A record of authorized fishing vessels
- Weekly catch reporting by ICCAT members
- Vessel Monitoring Systems (VMS) for all vessels over 15 m
- Required catch documents
- Boarding and inspection activities

Bycatch Measures:

- No more than 5 percent of total shark weight can be shark fins
- Encourages the release of live sharks in fisheries that do not target sharks
- Limits mortality on porbeagle and North Atlantic shortfin mako
- Prohibits the retention of bigeye thresher, oceanic whitetip, several species of hammerhead sharks, and silky sharks. All of these measures have a reporting requirement associated with them
- Prohibits the retention of shortfin mako on board vessels flagged to countries that do not report catches for this species
- Requires the use of safe-handling practices, such as the use of line cutters and dehooking devices for sea turtles
- Specific reporting requirements for sharks, sea turtles and seabirds
- Catch limits (by country) on blue and white marlin
- Requires longline vessels fishing south of 25° S to use two measures from a choice of bird-scaring line, night setting, and line weighting. Between 20°– 25° S, vessels are required to use a bird-scaring line.

ICCAT has also established penalties for Members that do not report annual catch data (including zero catches) by prohibiting them from retaining such species in the following year.

Indian Ocean Tuna Commission (iotc.org)

For tropical tunas, there is one main binding conservation measure that covers vessels greater than 24 m as well as smaller vessels fishing on the high seas. This measure calls for a one-month closure for longliners and purse seiners in a specified area.

IOTC has also adopted conservation measures for albacore tuna. The requirements include limiting fishing vessel capacity to the amount that existed in 2007 for all vessels greater than 24 m, and those under 24 m that fish outside their EEZ. If fishing for this species, fishers must become aware of the specific requirements.

IOTC also requires full retention of bigeye, yellowfin, and skipjack tunas caught by purse seine vessels.

Bycatch Measures:

- No more than 5 percent of total shark weight can be shark fin
- Encourages the release of live sharks in fisheries that do not target sharks
- Prohibits retention of all species of thresher sharks and oceanic whitetip sharks
- Requires shark data reporting, especially in fisheries that target sharks
- Requires longline vessels fishing south of 25° S to use two seabird bycatch mitigation measures from a choice of bird-scaring lines, night setting, and line weighting
- Requires members to mitigate sea turtle mortality and to provide data on turtle bycatch to the IOTC
- Prohibits intentional purse seine setting on whale sharks and cetaceans

Further Notes on Data Reporting and Compliance

Observers and Port Samplers

Longline Observer Requirements:

For longline vessels, though the details of the programs vary, most tuna RFMOs require an observer coverage level of at least 5 percent for longline vessels over 24 meters, and, in some cases, for smaller vessels operating in the high seas or in EEZs other than their flag state EEZ.

Purse Seine Observer Requirements:

For purse seine vessels, though the details of the programs vary, in the WCPFC, IATTC, and ICCAT there are a 100 percent coverage requirements (at least for certain geographical areas and/or times of the year and certain vessel sizes). In the IOTC, there is a 5 percent observer coverage requirement for vessels 24 m and greater in length overall operating on the high seas and for vessel less than 24 m if they fish in EEZs and on the high seas. Fishers operating purse seine vessels in these RFMO Convention Areas must become aware of the specific applicable observer requirements.

Observers collect and report data on tuna catch, bycatch, and discards, among other things, through observer program worksheets and/or logbooks. In addition, some regions have port samplers that collect catch data as well. These data are an essential part of the scientific evaluation of the tuna fisheries and the ecosystem in which they live. Skippers should ensure that observers and port samplers are given the access necessary to carry out these important duties.

Please note these are brief summaries. For full text of the gear-specific observer requirements in force in each RFMO, visit ISSF's RFMO database.

Tag Recovery and Reporting

Tuna (and other fish) tagging programs have a number of uses, but almost all tagging programs share a common goal: gathering data about fish. Most tagging programs seek information on fish movements, growth, behavior, and mortality. This data is critical to our understanding of fish biology and for the creation of accurate models for stock assessments. You might also encounter tagged seabirds, with small bands on their legs.

Simple tags have printed information and instructions on how to return the tag. These tags remain attached to the fish until it is landed. Some high-tech tags monitor and record data. Some fish tags even pop off the fish at an appointed time, float to the surface, and transmit information via satellite. If the vessel's crew lands a tagged animal, please take the time to remove the tag, note the time and location of the landing and ensure that the tag is returned to its owner. Often there are rewards for the return of tags—another reason to help contribute to the good management of your fishery. Fishermen must not remove the tags from live birds.

In Conclusion

By completing this online module, you are ensuring that the vessels you skipper are compliant with the skipper training measure. The ISSF Skipper Training Conservation Measure requires that ISSF Participating Companies transact business only with vessels whose skippers have completed this online module or attended one of the in-person ISSF Skipper Workshops.

This guidebook to best practices in sustainable tuna fishing is a living document that will continue to be updated to reflect the state of the art. ISSF welcomes suggestions to improve the guidebook or ideas for further fisheries research.

Feedback Form

You have now completed review of the *ISSF Sustainable Tuna Fishing Guidebook*. In order for ISSF to record this activity and ensure that the vessel(s) you skipper are credited as meeting the related ISSF Conservation Measure, you MUST complete this short online form. If you do not currently have Internet (wi-fi) access, please return to this page and follow this link once wi-fi becomes available.

Feedback Form Link - Click Here

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