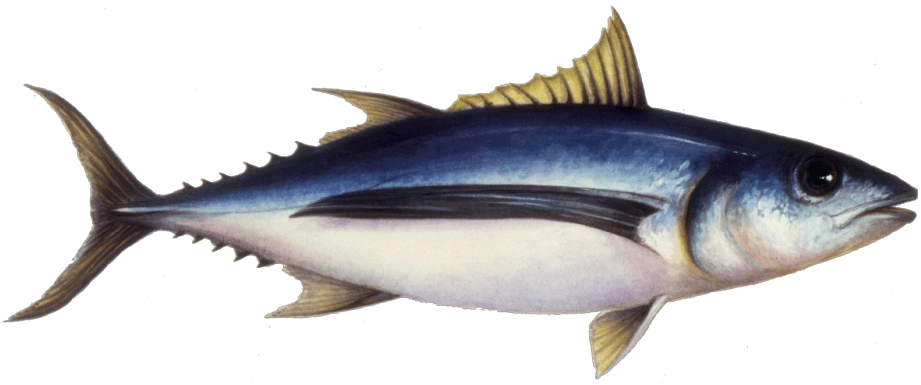
Monterey Bay Aquarium
Seafood Watch

Environmental sustainability assessment of wild-caught tuna and large pelagic species from the Indian Ocean caught using handlines, gillnets, longlines, purse seines, and trolling lines



Species:	Albacore (*Thunnus alalunga*), Bigeye tuna (*Thunnus obesus*), Blue shark (*Prionace glauca*), Dolphinfish (*Coryphaena hippurus*), Shortfin mako shark (*Isurus oxyrinchus*), Skipjack tuna (*Katsuwonus pelamis*), Southern bluefin tuna (*Thunnus maccoyii*), Swordfish (*Xiphias gladius*), Yellowfin tuna (*Thunnus albacares*)
Location:	Indian Ocean
Gear:	Mechanized lines and pole-and-lines, Handlines and hand-operated pole-and-lines, Gillnets and entangling nets, Trolling lines, Floating object purse seine (FAD), Drifting longlines, Unassociated purse seine (non-FAD)
Type:	Wild Caught
Author:	Seafood Watch
Published:	April 6, 2026
Report ID:	28116 Assessed using Seafood Watch Fisheries Standard v4

Table of Contents

About the Monterey Bay Aquarium Seafood Watch program

The mission of the Monterey Bay Aquarium is to inspire conservation of the ocean and enable a future where the ocean flourishes and people thrive in a just and equitable world. To do this, the Aquarium is focused on creating extraordinary experiences that inspire awe and wonder, championing science-based solutions, and connecting people across the planet to protect and restore the ocean. We know that healthy ocean ecosystems are critical to enabling life on Earth to exist, and that our very survival depends on them. As such, our conservation objectives are to mobilize climate action, improve the sustainability of global fisheries and aquaculture, reduce sources of plastic pollution, and restore and protect ocean wildlife and ecosystems.

The aquarium is focused on improving the sustainability of fisheries and aquaculture given the role seafood plays in providing essential nutrition for 3 billion people globally, and in supporting hundreds of millions of livelihoods. Approximately 180 million metric tons of wild and farmed seafood is harvested each year (excluding seaweeds). Unfortunately, not all current harvest practices are sustainable and poorly managed fisheries and aquaculture pose the greatest immediate threat to the health of the ocean and the economic survival and food security of billions of people.

The Seafood Watch program was started 25 years ago as a small exhibit in the Monterey Bay Aquarium highlighting better fishing practices and grew into one of the leading sources of information on seafood sustainability, harnessing the power of consumer choice to mobilize change. The program's comprehensive open-source information and public outreach raises awareness about global sustainability issues, identifies areas for improvement, recognizes and rewards best practices and empowers individuals and businesses to make informed decisions when purchasing seafood.

We define sustainable seafood as seafood from sources, whether fished or farmed, that can maintain or increase production without jeopardizing the structure and function of affected ecosystems, minimize harmful environmental impacts, assure good and fair working conditions, and support livelihoods and economic benefits throughout the entire supply chain. As one aspect of this vision, Seafood Watch has developed trusted, rigorous standards for assessing the environmental impacts of fishing and aquaculture practices worldwide. Built on a solid foundation of science and collaboration, our standards reflect our guiding principles for defining environmental sustainability in seafood.

Seafood Watch Ratings

The Seafood Watch Standard for Fisheries is used to produce assessments for wild-capture fisheries resulting in a Seafood Watch rating of green, yellow, or red. Seafood Watch uses the assessment criteria to determine a final numerical score as well as numerical subscores and colors for each criterion. These scores are translated to a final Seafood Watch color rating according to the methodology described in the table below. The table also describes how Seafood Watch defines each of these categories. The narrative descriptions of each Seafood Watch rating, and the guiding principles listed below, compose the framework on which the criteria are based.

Green	Final Score >3.2, and either criterion 1 or criterion 3 (or both) is green, and no red criteria, and no critical scores	Wild-caught and farm-raised seafood rated green are environmentally sustainable, well managed and caught or farmed in ways that cause little or no harm to habitats or other wildlife. These operations align with all of our guiding principles.
Yellow	Final score >2.2, and no more than one red criterion, and no critical scores, and does not meet the criteria for green (above)	Wild-caught and farm-raised seafood rated yellow cannot be considered fully environmentally sustainable at this time. They align with most of our guiding principles, but there is either one conservation concern needing substantial improvement, or there is significant uncertainty associated with the impacts of the fishery or aquaculture operations.
Red	Final Score ≤2.2, or two or more red criteria, or one or more critical scores.	Wild-caught and farm-raised seafood rated red are caught or farmed in ways that have a high risk of causing significant harm to the environment. They do not align with our guiding principles and are considered environmentally unsustainable due to either a critical conservation concern, or multiple areas where improvement is needed.

Recommended Citation: Seafood Watch (2026) Environmental sustainability assessment of wild-caught tuna and large pelagic species from the Indian Ocean caught using handlines, gillnets, longlines, purse seines, and trolling lines Monterey Bay Aquarium

Guiding principles

Monterey Bay Aquarium defines sustainable seafood as seafood from sources, whether fished or farmed, that can maintain or increase production without jeopardizing the structure and function of affected ecosystems, minimize harmful environmental impacts, assure good and fair working conditions, and support livelihoods and economic benefits throughout the entire supply chain.

As one aspect of this vision, Seafood Watch has developed trusted, rigorous standards for assessing the environmental impacts of fishing and aquaculture practices worldwide. Environmentally sustainable wild capture fisheries:

1. **Follow the principles of ecosystem-based fisheries management**

   The fishery is managed to ensure the integrity of the entire ecosystem, rather than solely focusing on maintenance of single species stock productivity. To the extent allowed by the current state of the science, ecological interactions affected by the fishery are understood and protected, and the structure and function of the ecosystem is maintained.

2. **Ensure all affected stocks[1] are healthy and abundant**

   Abundance, size, sex, age and genetic structure of the main species affected by the fishery (not limited to target species) is maintained at levels that do not impair recruitment or long-term productivity of the stocks or fulfillment of their role in the ecosystem and food web.

   Abundance of the main species affected by the fishery should be at, above, or fluctuating around levels that allow for the long-term production of maximum sustainable yield. Higher abundances are necessary in the case of forage species, in order to allow the species to fulfill its ecological role.

3. **Fish all affected stocks at sustainable levels**

   Fishing mortality for the main species affected by the fishery should be appropriate given current abundance and inherent resilience to fishing while accounting for scientific uncertainty, management uncertainty, and non-fishery impacts such as habitat degradation.

---

[1]"Affected" stocks include all stocks affected by the fishery, no matter whether target or bycatch, or whether they are ultimately retained or discarded.

The cumulative fishing mortality experienced by affected species must be at or below the level that produces maximum sustainable yield for single-species fisheries on typical species that are at target levels.

Fishing mortality may need to be lower than the level that produces maximum sustainable yield in certain cases such as forage species, multispecies fisheries, highly vulnerable species, or fisheries with high uncertainty.

For species that are depleted below target levels, fishing mortality must be at or below a level that allows the species to recover to its target abundance.

4. **Minimize bycatch**

   Seafood Watch defines bycatch as all fisheries-related mortality or injury other than the retained catch. Examples include discards, endangered or threatened species catch, pre-catch mortality and ghost fishing. All discards, including those released alive, are considered bycatch unless there is valid scientific evidence of high post-release survival and there is no documented evidence of negative impacts at the population level.

   The fishery optimizes the utilization of marine and freshwater resources by minimizing post-harvest loss and by efficiently using marine and freshwater resources as bait.

5. **Have no more than a negligible impact on any threatened, endangered or protected species**

   The fishery avoids catch of any threatened, endangered or protected (ETP) species. If any ETP species are inadvertently caught, the fishery ensures and can demonstrate that it has no more than a negligible impact on these populations.

6. **Are managed to sustain the long-term productivity of all affected species**

   Management should be appropriate for the inherent resilience of affected marine and freshwater life and should incorporate data sufficient to assess the affected species and manage fishing mortality to ensure little risk of depletion. Measures should be implemented and enforced to ensure that fishery mortality does not threaten the long term productivity or ecological role of any species in the future.

   The management strategy has a high chance of preventing declines in stock productivity by taking into account the level of uncertainty, other impacts on the stock, and the potential for increased pressure in the future.

   The management strategy effectively prevents negative population impacts on bycatch species, particularly species of concern.

7. **Avoid negative impacts on the structure, function or associated biota of aquatic habitats where fishing occurs**

The fishery does not adversely affect the physical structure of the seafloor or associated biological communities.

If high-impact gears (e.g. trawls, dredges) are used, vulnerable seafloor habitats (e.g. corals, seamounts) are not fished, and potential damage to the seafloor is mitigated through substantial spatial protection, gear modifications and/or other highly effective methods.

8. **Maintain the trophic role of all aquatic life**

   All stocks are maintained at levels that allow them to fulfill their ecological role and to maintain a functioning ecosystem and food web, as informed by the best available science.

9. **Do not result in harmful ecological changes such as reduction of dependent predator populations, trophic cascades, or phase shifts**

   Fishing activities must not result in harmful changes such as depletion of dependent predators, trophic cascades, or phase shifts.

   This may require fishing certain species (e.g., forage species) well below maximum sustainable yield and maintaining populations of these species well above the biomass that produces maximum sustainable yield.

10. **Ensure that any enhancement activities and fishing activities on enhanced stocks do not negatively affect the diversity, abundance, productivity, or genetic integrity of wild stocks**

    Any enhancement activities are conducted at levels that do not negatively affect wild stocks by reducing diversity, abundance or genetic integrity.

    Management of fisheries targeting enhanced stocks ensures that there are no negative impacts on the wild stocks, in line with the guiding principles described above, as a result of the fisheries.

    Enhancement activities do not negatively affect the ecosystem through density dependent competition or any other means, as informed by the best available science.

Final Ratings

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Albacore Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	5.000	1.000	1.000	3.162	Red (1.994)
Albacore Indian Ocean Stock - Indian Ocean - Handlines	5.000	1.732	1.000	3.162	Red (2.288)
Albacore Indian Ocean Stock - Indian Ocean - Trolling lines	5.000	1.732	1.000	3.162	Red (2.288)
Bigeye tuna Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines	1.916	1.000	1.000	3.162	Red (1.569)
Bigeye tuna Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	1.916	1.000	1.000	3.873	Red (1.650)
Bigeye tuna Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	1.916	1.000	3.000	3.873	Red (2.172)
Blue shark Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	4.284	1.000	1.000	3.162	Red (1.918)
Dolphinfish Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western	2.644	1.000	1.000	3.162	Red (1.700)
Shortfin mako shark Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	1.916	1.000	1.000	3.162	Red (1.569)

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Shortfin mako shark Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western	1.916	1.000	1.000	3.162	Red (1.569)
Skipjack tuna Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine	5.000	1.526	1.000	3.873	Red (2.332)
Skipjack tuna Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	5.000	1.000	1.000	3.873	Red (2.098)
Skipjack tuna Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets	5.000	1.000	1.000	3.162	Red (1.994)
Skipjack tuna Indian Ocean Stock - Indian Ocean - Handlines	5.000	1.732	1.000	3.162	Red (2.288)
Skipjack tuna Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines	5.000	3.413	1.000	3.873	Yellow (2.851)
Skipjack tuna Indian Ocean Stock - Indian Ocean - Trolling lines	5.000	1.732	1.000	3.162	Red (2.288)
Skipjack tuna Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	5.000	1.000	3.000	3.873	Yellow (2.761)
Skipjack tuna Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western	5.000	5.000	4.000	3.873	Green (4.436)
Southern bluefin tuna Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	4.284	1.000	1.000	3.162	Red (1.918)

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Swordfish Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	5.000	1.000	1.000	3.162	Red (1.994)
Yellowfin tuna Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines	5.000	1.000	1.000	3.162	Red (1.994)
Yellowfin tuna Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine	5.000	1.526	1.000	3.873	Red (2.332)
Yellowfin tuna Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	5.000	1.000	1.000	3.873	Red (2.098)
Yellowfin tuna Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets	5.000	1.000	1.000	3.162	Red (1.994)
Yellowfin tuna Indian Ocean Stock - Indian Ocean - Handlines	5.000	1.732	1.000	3.162	Red (2.288)
Yellowfin tuna Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines	5.000	3.413	1.000	3.873	Yellow (2.851)
Yellowfin tuna Indian Ocean Stock - Indian Ocean - Trolling lines	5.000	1.732	1.000	3.162	Red (2.288)
Yellowfin tuna Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	5.000	1.000	3.000	3.873	Yellow (2.761)
Yellowfin tuna Indian Ocean Stock - Maldives - Western Indian Ocean - Handlines - Maldives	5.000	5.000	4.000	3.873	Green (4.436)
Yellowfin tuna Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives	5.000	5.000	4.000	3.873	Green (4.436)

Abbreviations

Table 1:

Abbreviation	Description
SBT	southern bluefin tuna
IOTC	Indian Ocean Tuna Commission
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
MT	metric tons
MSY	maximum sustainable yield
SB	spawning biomass
CPUE	catch per unit effort
TRO	total reproductive output
UBM	Unknown Bycatch Matrices
FAD	fish aggregating device
IUCN	International Union for Conservation of Nature
PSA	productivity-susceptibility analysis
CITES	Convention on International Trade of Endangered Species
RFMO	Regional Fisheries Management Organization
EEZ	exclusive economic zone
TAC	total allowable catch
HCR	harvest control rule
MP	management procedure
CMM	conservation and management measure
CPC	Contracting Party and Cooperating Non-Contracting Party
ETP	Endangered, Threatened, and Protected

SFW	Seafood Watch
FAO	Food and Agriculture Organization of the United Nations

Summary

Scope of Assessment

This Seafood Watch assessment evaluates the environmental sustainability of fisheries in the Indian Ocean for albacore tuna, southern bluefin tuna, bigeye tuna, skipjack tuna, yellowfin tuna, and swordfish caught using purse seines, longlines, gillnets, handlines, hand-operated pole-and-lines, and trolling lines, as well as for blue shark and shortfin mako shark caught in drifting longlines. A rating is also provided for dolphinfish caught with drifting longlines.

Seafood Watch maintains rigorous, science-based standards for fisheries and aquaculture based on the U.N. Code of Conduct for Responsible Fisheries. Using those standards, Seafood Watch assesses fisheries or aquaculture products found in North American markets. Seafood sources are rated green, yellow, or red, based on factors such as stock health, fishing impacts on other species, the effectiveness of management policy and implementation, and environmental impacts on habitat and the food web.

All these fisheries operate throughout the Indian Ocean (East and West), except for the longline fishery that targets southern bluefin tuna alongside albacore and swordfish, which operates in more southern waters (southern Indian Ocean). Seafood Watch ratings reflect the performance of fisheries at the Regional Fisheries Management Organization (RFMO) level—in this case, the Indian Ocean Tuna Commission (IOTC). Individual countries (member states of IOTC) are responsible for implementing IOTC management measures and/or additional measures within their national waters.

This assessment includes ratings that cover the Maldives fisheries independently from the overall ratings for the Indian Ocean. The Maldives captures a significant amount of tuna using handlines and pole-and-line, has additional research results, and is instituting policies that are different than the rest of the region. These findings warrant a separate rating.

The overall ratings are separated by gear type and target species as follows:

- At the RFMO level, gillnets, longlines, handlines, trolls, and purse seines associated with fish-aggregating devices (FAD) are rated red for albacore tuna, bigeye tuna, blue shark, dolphinfish, shortfin mako shark, skipjack tuna, southern bluefin tuna, swordfish, and yellowfin tuna.
- Pole-and-line and purse seines not using FADs (unassociated purse seines) to catch skipjack and yellowfin are rated yellow.
- Unassociated purse seines targeting bigeye tuna are rated red.
- The Maldives' fisheries (handline and pole-and-line) for yellowfin and skipjack tunas are rated green.

Detailed fishery descriptions are provided in the Introduction.

This Seafood Watch assessment found that, overall, the health of fisheries for Indian Ocean tunas and large pelagic species is generally of low concern, except for bigeye tuna and shortfin

mako shark, which have higher mortality rates, and dolphinfish, which is unassessed. Bycatch of several species is a key sustainability concern, particularly for longline, gillnet, and FAD-set purse seine fisheries. Further, longlines, gillnets, handlines, trolls, and smaller FAD fisheries lack management measures for some of their retained species. Although unassociated purse seines have less impact than FAD-set purse seines, they also have some bycatch concerns—namely, with sharks and rays. Assessment highlights for each criterion are summarized as follows, while more details about scoring can be found in each criterion.

Assessment Highlights

Criterion 1: Impacts on the Species under Assessment

Populations of the major tuna species (albacore, skipjack, bigeye, and yellowfin) as well as swordfish, shortfin mako shark, and blue shark are all estimated to be healthy (biomass is at least 75% of the respective sustainable reference levels).

Fishing mortality rates for swordfish, skipjack tuna, and blue shark are of low concern, but bigeye tuna is considered subject to overfishing. Yellowfin tuna is no longer considered overfished, but the stock assessment has significant uncertainty and is being reviewed by the IOTC scientific committee. The southern bluefin tuna stock is estimated to be at low levels, with small but steady increases in population size, and fishing mortality rates have decreased and are currently considered sustainable. The shortfin mako shark population in the Indian Ocean is considered subject to overfishing.

Criterion 2: Impacts on Other Species

Several of the gear types used in the Indian Ocean have significant concerns related to unintended catch of other species, or bycatch:

- Longline and gillnet fisheries capture a number of secondary target and bycatch species, including other billfish, associated pelagic finfish, sharks, seabirds, and sea turtles.
- Fish-aggregating devices (FAD) are artificial devices used to attract fish, and often attract other nontargeted marine life. In the Indian Ocean, purse seine fisheries that operate around aggregating devices (FAD-set) result in bycatch of other finfish (primarily in the smaller, coastal fleet) and shark species, as well as some sea turtles. Unassociated purse seines—those not using FADs—have lower encounter rates for sharks and sea turtles; however, they have higher encounter rates for rays.
- Highly selective gears such as handlines, pole-and-lines, and trolling lines tend to have little bycatch. But some of these line fisheries rely on live baitfish, and the effect on the ecosystem by that baitfish removal is unknown. Few baitfish fisheries are managed, except in the Maldives, which has a live bait management plan in place.
- Troll and handline fisheries in the Indian Ocean also land some non-tuna species—namely, finfish and shark species (IOTC 2025a)—but at lower levels than in other fisheries such as longlines.
- In the Maldives, pole and handline fisheries target and catch yellowfin and skipjack tunas almost exclusively with minimal bycatch.

Criterion 3: Management Effectiveness

Two tuna Regional Fisheries Management Organizations manage these fisheries. The Indian Ocean Tuna Commission (IOTC) manages most Indian Ocean tuna fisheries and stocks of tuna and tuna-like species (marlins, neritic tunas, and mackerels). The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) manages the southern bluefin tuna (SBT) stock.

Although the IOTC has management systems in place for primary target tuna species, management is lacking for many other retained species under IOTC's mandate. The levels of bycatch in Indian Ocean fisheries call for improvements, such as increased mitigation and catch reductions. In the southern bluefin tuna stock, CCSBT management has enabled strong rebuilding progress.

Compliance varies across relevant member states for both the CCSBT and IOTC. The IOTC has more noted compliance issues, partly because of a larger number of members and broader management scope. At the nation level, fisheries in the Maldives are managed by the Ministry of Fisheries and Ocean Resource (MoFOR), which has its own fisheries management plans. Its regulations maintain catch well within IOTC-stipulated limits.

Criterion 4: Impacts on the Habitat and Ecosystem

All fishing gears in this report target pelagic species and largely do not negatively affect habitats on the seafloor (benthic). In general, all ratings reflect relatively strong scores for Criterion 4; however, the ecological roles of tunas and sharks are important, and strong management measures are needed to protect ecosystem functioning and food webs.

Introduction

Scope of the analysis and ensuing rating

This report focuses on fisheries in the Indian Ocean for albacore tuna (*Thunnus alalunga*), southern bluefin tuna (*Thunnus maccoyii*), bigeye tuna (*Thunnus obesus*), skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), and swordfish (*Xiphias gladius*) caught in purse seines, longlines, gillnets, handlines, pole-and-lines, and trolling lines, as well as blue shark (*Prionace glauca*) and shortfin mako shark (*Isurus oxyrinchus*) caught in drifting longlines and dolphinfish (*Coryphaena hippurus*) caught with drifting longlines. All fisheries operate throughout the Indian Ocean (East and West), except the longline fishery that primarily targets southern bluefin tuna, which operates in more southern waters (southern Indian Ocean). Ratings are produced at the RFMO level, with notable contributing countries listed as follows. The Maldives capture a significant amount of tuna using handlines and pole-and-lines, and these fisheries are assessed separately in this report.

In the following descriptions, "primary" contributing countries are defined as those responsible for at least 5% of the catch of the primary target species (typically, large tunas). Catch composition data were obtained from (IOTC 2025a) for the years 2019 to 2023.

Fisheries

Temperate (southern) longline

This drifting (pelagic) longline fishery primarily targets albacore, swordfish, and blue shark, as well as southern bluefin tuna (SBT), so it operates farther south than the tropical longline fishery (in the southern Indian Ocean). A few countries contribute to the catch of SBT and other target species with longlines in the Indian Ocean: Australia, Japan, South Korea, Indonesia, and Taiwan (China). The fishery follows regulations from both the Indian Ocean Tuna Commission (IOTC) and the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). This fishery also catches shortfin mako shark. Relevant IOTC gears include coastal longline, longline, longline fresh, longline targeting sharks, and longline targeting swordfish.

Tropical longline

This second drifting longline fishery operates throughout the Indian Ocean's tropical waters (more central; farther north than the temperate fishery), targeting tropical tunas. It operates under the purview of the Indian Ocean Tuna Commission. Primary contributing countries to tropical longline operations in the Indian Ocean are China, Taiwan (China), Japan, Indonesia, Seychelles, India, and Sri Lanka, although ratings for this fishery may extend to other IOTC members (IOTC 2025a). Relevant IOTC gears include coastal longline, longline, and longline fresh.

Purse seines

In the Indian Ocean, purse seine effort comprises a smaller, more coastal, anchored FAD fishery

and more industrial fleets using drifting FADs and unassociated purse seine sets. This assessment covers two industrial purse seine fisheries in the Indian Ocean: unassociated purse seines and drifting FAD-set purse seines. These fisheries primarily target tropical tunas (bigeye, skipjack, and yellowfin). Purse seine data and information from the IOTC are largely not separated by set type; thus, without more clarifying information, the catch composition is considered similar between these two fisheries, though skipjack is primarily caught in FAD sets. Primary operators of industrial purse seine fisheries are the European Union (EU) (Spain and France), Seychelles, Mauritius, and South Korea (IOTC 2025a). Relevant IOTC gears include purse seines.

Smaller purse seines operating in more coastal waters and catching skipjack and yellowfin are primarily flagged to Indonesia and Thailand. These fleets tend to use anchored FADs and are assessed as a separate FAD fishery in this report. Small purse seine is the primary relevant gear type, although Indonesia also reports some catch under "purse seines." The smaller purse seine fishery also lands smaller tuna species.

Handlines

This fishery uses both handlines and offshore handlines, such that fishing occurs in and beyond EEZs. Primary contributing IOTC members are Indonesia, India, Oman, and Yemen, but this list is not representative of all members whose catch may be covered under these ratings. Yellowfin is the primary target of this fishery, though skipjack may also be targeted. Relevant IOTC gears include hand line and hand line (offshore).

Maldives handlines

This fishery operates in the waters of the EEZ in the Maldives and targets yellowfin tuna. Relevant IOTC gears include hand line and hand line (offshore).

Pole-and-lines

This fishery covers bait boat catch in the IOTC area of competence. Primary contributing countries are India and Indonesia, though Sri Lanka also captures a small amount of skipjack using this gear. Skipjack is the primary target of this fishery, but yellowfin may also be targeted. Relevant IOTC gears include bait boat, bait boat (offshore), bait boat mechanized, and bait boat nonmechanized.

Maldives pole-and-lines

This fishery operates in the waters of the EEZ in the Maldives and primarily targets skipjack tuna, though yellowfin are also landed. Relevant IOTC gears include bait boat, bait boat (offshore), bait boat mechanized, and bait boat nonmechanized.

Gillnets

The Indian Ocean is one of the few areas where gillnets still significantly contribute to tuna and billfish catch. This fishery consists of drifting gillnets of various sizes targeting primarily

skipjack and yellowfin tuna. Iran reports the greatest amount of tuna catch using gillnets, but other significant contributors to this fishery include India, Indonesia, Oman, Sri Lanka, and Pakistan (although this list is not exhaustive). Relevant IOTC gears include gillnet and offshore gillnet.

Species Overview

Bigeye, skipjack, and yellowfin tuna are found in tropical and subtropical waters worldwide, including the Indian Ocean. Each species is assessed as a single population in the Indian Ocean. In the Pacific Ocean, there are two separately assessed stocks each for bigeye, skipjack, and yellowfin: Eastern Pacific, and Western and Central Pacific. In the Atlantic Ocean, there is one assessed stock of yellowfin and two assessed stocks of skipjack (Eastern and Western). Bigeye, skipjack, and yellowfin tuna are highly migratory species and are commonly found as juveniles schooling together below floating objects (IOTC 2022j; IOTC 2018d; IOTC 2018a).

Albacore tuna is primarily distributed in temperate waters in the Indian Ocean. Albacore tuna biology is not well understood in the Indian Ocean. In other oceans, there are two assessed stocks (northern and southern) of albacore tuna, but in the Indian Ocean, only one stock is assessed. Albacore tuna migrate long distances, and it is possible that they move between the Indian and Atlantic Oceans (IOTC 2017f). Longlines capture the majority of albacore in the Indian Ocean (IOTC 2023a).

Southern bluefin tuna is only found in the Southern Hemisphere, primarily in the Indian, Atlantic, and Western Pacific Oceans, and it is uncommonly found in the Eastern Pacific Ocean. Southern bluefin migrate from the southern coast of Australia and the central Indian Ocean as juveniles and remain in offshore waters as adults. There is only one known spawning location, southeast of Java, Indonesia in the Indian Ocean (CCSBT 2019e).

Swordfish is a highly migratory species found in all oceans and throughout the Indian Ocean. Juveniles inhabit mostly tropical and subtropical waters, moving to higher latitudes later in life. Swordfish remain in surface waters during the night and move deeper (800–1,000 m) during the day. Swordfish is not typically found in schools like tuna but can be found in larger densities around seamounts and oceanic fronts (IOTC 2017d).

Blue shark is highly migratory and found throughout the world's oceans in epipelagic and mesopelagic waters. It is considered the most widely distributed shark species and the most abundant, with abundance increasing with latitude. It is an apex predator, consuming a variety of fish and squid species (IOTC 2018g; Rice 2017; IOTC 2018m). Blue shark is viviparous: it gives birth to live young, with a gestation period of 9–12 months. Litter sizes in the Indian Ocean average 38 pups (IOTC 2018m). The minimum age of reproduction ranges from 4 to 7 years, and males in the Indian Ocean can live up to 25 years (IOTC 2018m).

Like blue shark, shortfin mako shark is highly migratory and gives birth to live young (9–14 pups per litter), but it has a longer gestation of 15–18 months and higher ages of maturity (7–15 years) and lifespans ranging from 29–32 years (Brunel et al. 2019; IOTC 2018l; IOTC 2016i).

Shortfin mako shark is fairly solitary and follows warm water masses (> 16 °C) toward the poles in the summer.

Dolphinfish is another highly migratory pelagic species distributed in tropical and subtropical waters (Froese and Pauly 2019). This species is not under the mandate of the IOTC, and little is known about its stock in the Indian Ocean.

In the Indian Ocean, tuna and tuna-like species are managed by the Indian Ocean Tuna Commission (IOTC). Southern bluefin tuna is managed by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT).

Production Statistics

Historically, the pole-and-line and trolling fisheries captured the majority of skipjack tuna in the Indian Ocean until the mid-1980s, when purse seining was introduced. Since then, both fisheries have contributed far less to the overall catches in the region, and purse seines are the current largest contributor to skipjack catch (Figure 1) (IOTC 2024a). Total catches of skipjack tuna peaked in 2006 at around 600,000 MT and again in 2021 at 655,000 MT (Fu 2023d).

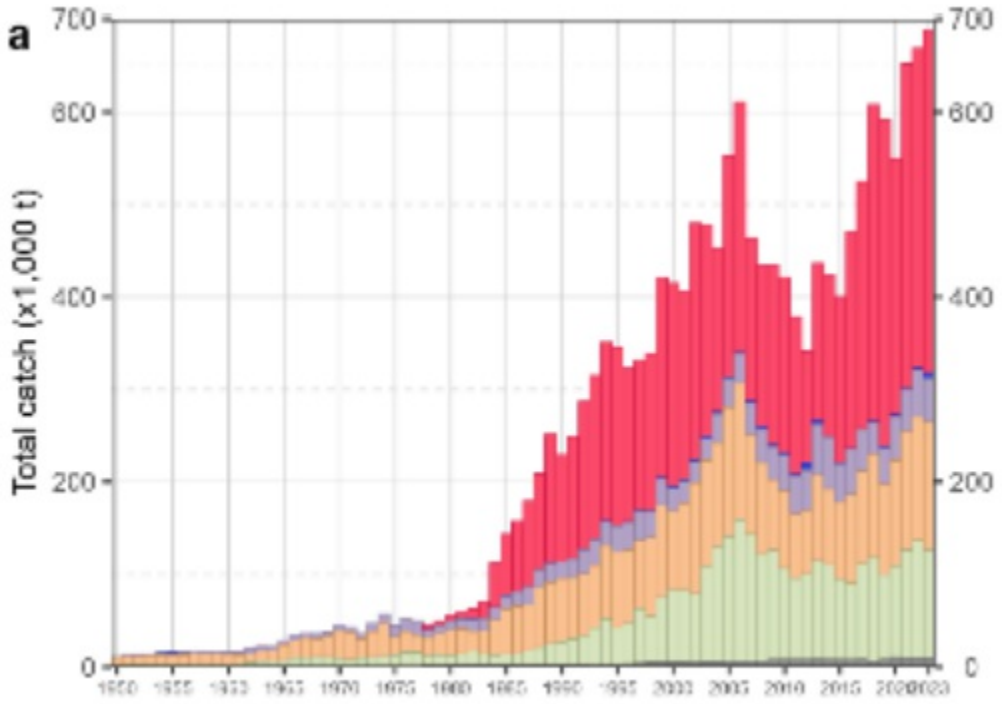


Figure 1: Cumulative nominal catches of skipjack tuna (MT) by gear type from 1950 to 2023. Red: purse seine; blue: longline; purple: line; orange: bait boat; green: gillnet; gray: other. Source: (IOTC 2024a).

Total annual catches of yellowfin tuna have increased significantly since the 1980s from the expansion of the purse seine, gillnet, and troll and handline fisheries (Figure 2). Total catches

peaked in 2004 at 528,797 MT. The stock was overfished and subject to overfishing for several years, but the latest stock assessment suggests that the stock is now healthier after recent high recruitment (IOTC 2024a). Purse seines, handlines, and gillnets contribute the most to yellowfin catch (IOTC 2024a).

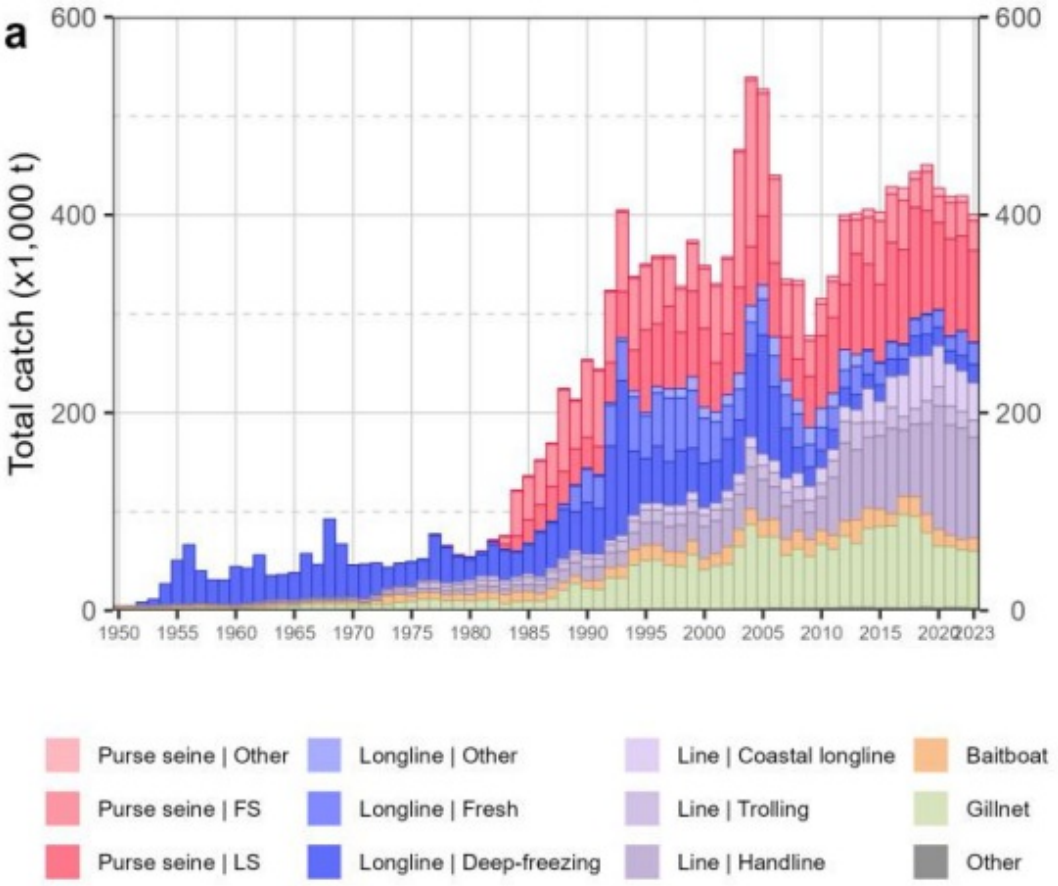


Figure 2: Cumulative nominal catches of yellowfin tuna (1,000 t) by gear type from 1950 to 2023. Source: (IOTC 2024a).

Albacore tuna is primarily caught with longlines in the Indian Ocean (87.1% from 2016 to 2020), with a small percentage of the catch coming from other lines, purse seine, and other fishing gears (Figure 3). After a stable trend in catches, total catches (all gears) increased during the 1980s, peaking at around 30,000 t. But this increase was largely from the large drift gillnet fishery, a gear type that was banned in the high seas by the United Nations in 1992 (IOTC 2017f). Catches initially decreased after this ban but increased again between 1993 and 2001, when they peaked at 46,000 t (all gears; longline represented around 40,000 t).

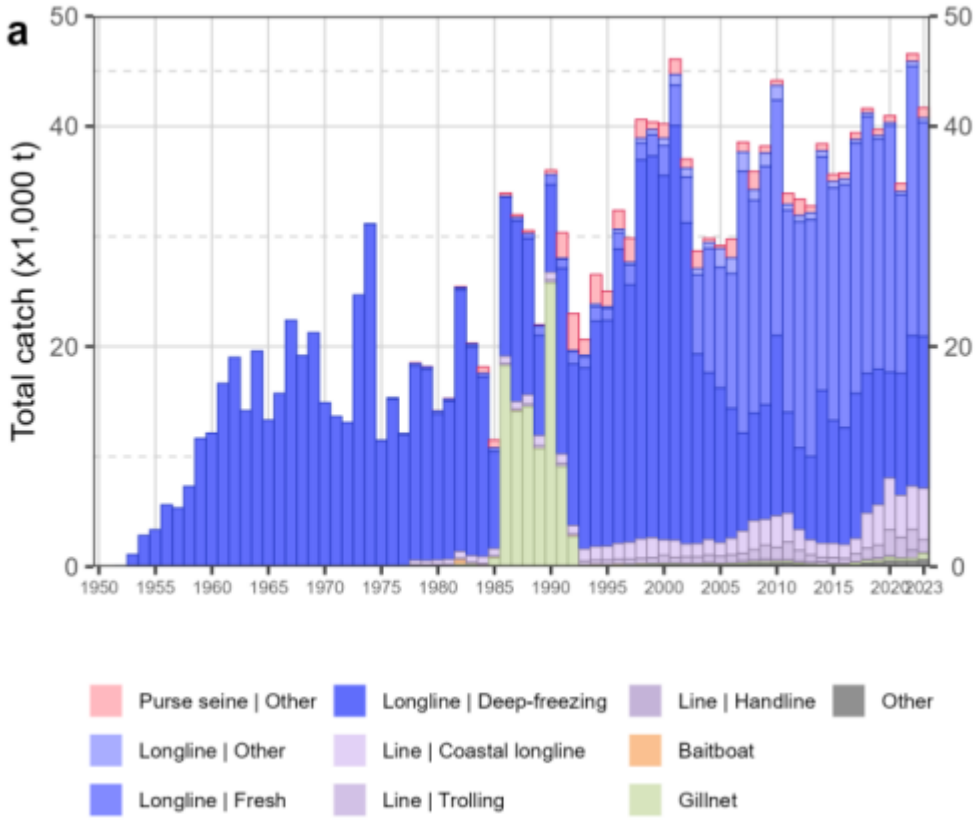


Figure 3: Cumulative nominal catches of albacore tuna (1,000 t) by gear type from 1950 to 2023. Source: (IOTC 2024a).

Most bigeye tuna is caught with purse seines (primarily FADs) and longlines, which together compose > 70% of all catches (Figure 4) (IOTC 2024a). Between 2017 and 2021, line gear accounted for 13.5% of the total catch, while other fisheries combined accounted for 7.8% of the total catch {IOTC 2022j. Catches peaked in 2012 at nearly 125,000 MT. In 2021, 94,803 MT of bigeye tuna were caught in the Indian Ocean.

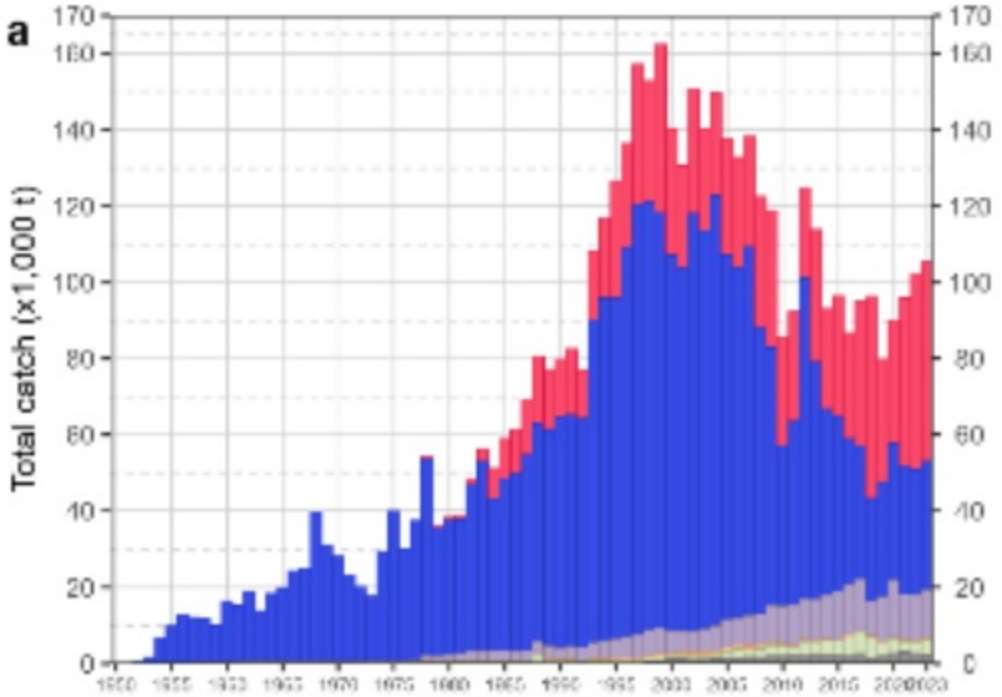


Figure 4: Cumulative nominal catches of bigeye tuna (1,000 t) by gear type from 1950 to 2023. Red: purse seine; blue: longline; purple: line; orange: baitboat; green: gillnet; gray: other. Source: (IOTC 2024a).

Southern bluefin tuna is primarily caught using longlines, with a smaller amount caught by purse seine fisheries, which support tuna ranching operations in Australia and are outside the scope of this report. Total catches peaked in the 1960s at around 82,000 t, with 67% of catches from 1952 to 2022 coming from longlines (Figure 5) (CCSBT 2023b). Catches have declined significantly since the 1960s, to 17,139 t in 2022 (CCSBT 2023b). Southern bluefin tuna is caught in the Indian, Atlantic, and Western Pacific Oceans, but the majority is caught in the Indian Ocean (Figure 6) (CCSBT 2023b).

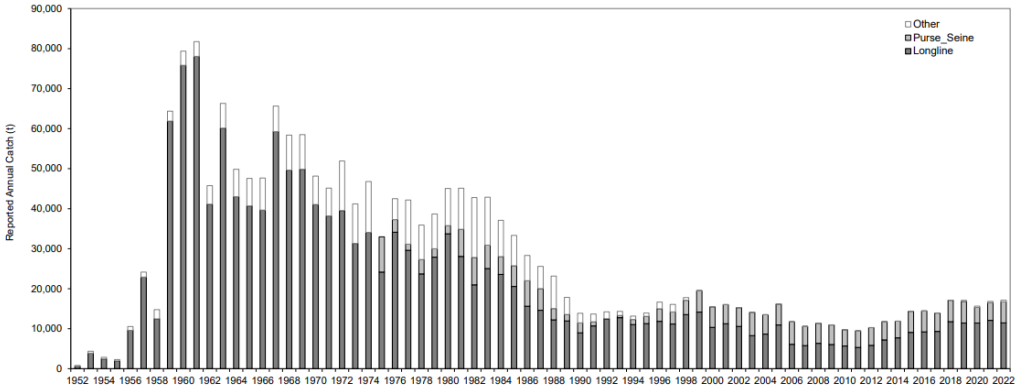


Figure 5: Southern bluefin tuna catch (t) by gear type, 1952 to 2022. Source: (CCSBT 2023b).

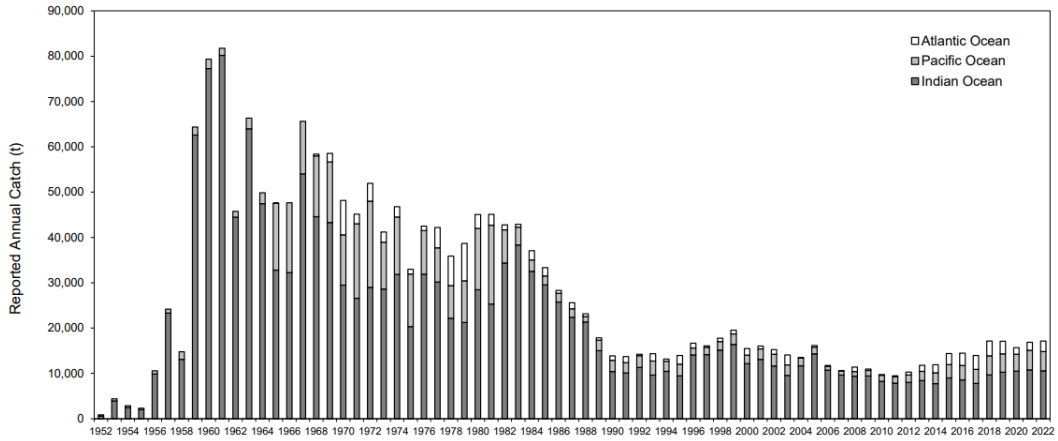


Figure 6: Southern bluefin tuna catch (t) by ocean, 1952 to 2022. Source: (CCSBT 2023b).

From 2017 to 2021, 53.9% of swordfish in the Indian Ocean were caught with longlines (Figure 7) (IOTC 2022g). Between 2008 and 2017, the highest catches were recorded in 2016 at 39,777 MT (IOTC 2017d). Catches decreased slightly in 2017 to 33,352 MT and have remained in that range since then (IOTC 2019e; IOTC 2022g). Nearly 60% of the catch is caught by four fleets: Sri Lanka, Taiwan, China, and Spain (IOTC 2022g).

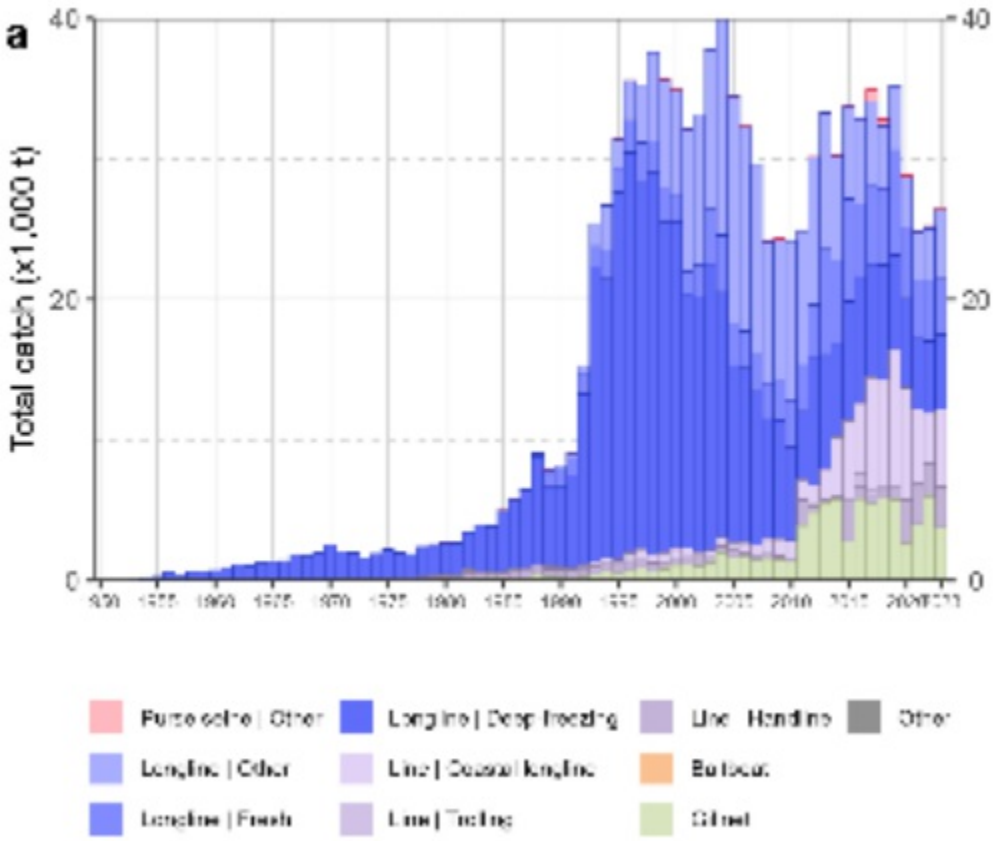


Figure 7: Cumulative nominal catches of swordfish (1,000 t) by gear type from 1950 to 2023. Source: (IOTC 2024a).

Catches of blue shark in the Indian Ocean are often unreported or underreported (IOTC 2018m). When catch statistics are reported, they are often of dressed weight, not live weights. Therefore, information on total blue shark removals contains uncertainty, which prompted the creation of catch reconstructions for the 2017 stock assessment (IOTC 2018m). Although further catch reconstructions in 2021 included some improvements, major uncertainties still exist. Mean annual catch estimates for 2011 to 2015 ranged from 30,000 to 55,000 t, depending on the model (IOTC 2018m). The estimated catch in 2019 was 43,240 t, while the reported catch in the same year was only 25,001 t (IOTC 2021o; IOTC 2022m).

Similar to blue shark, catches of shortfin mako shark may be unreported or underreported. The reported catch in 2023 was 831 t, but there is some uncertainty in the reported catch from earlier years and after 2018 (IOTC 2024a). The reported catches after 2018 may be underestimates because of a lack of reporting on discarded sharks (ibid).

Importance to the US/North American market

In 2021, the United States imported the majority of its albacore tuna from Thailand, followed

by Vietnam and Indonesia. The majority of bigeye tuna imported into the United States came from outside of the Indian Ocean; but within IOTC member countries, South Africa and Australia were the largest contributors to U.S. imports. Australia provided the majority of southern bluefin tuna imports into the United States, and The Philippines and Taiwan contributed the most to skipjack tuna imports. The majority of yellowfin tuna was imported from waters outside of the Indian Ocean; but within IOTC member countries, South Africa, Seychelles, and Australia were the largest contributors to U.S. imports. Finally, most swordfish was imported from non-IOTC countries; but within IOTC member countries, Indonesia and South Africa contributed the most to U.S. imports in 2021 (NOAA Fisheries 2023).

Common and market names

In Hawaii, bigeye and yellowfin tuna are known as ahi, and skipjack as aku. Skipjack tuna, often together with smaller amounts of bigeye and yellowfin tuna, is canned as “light” tuna. Swordfish is also known as broadbilled swordfish, broadbill, espadon, and emperador. Southern bluefin tuna is also known as southern tunny or tunny. Albacore tuna is known as longfinned tuna, germon, or albecor.

Primary product forms

These species are sold canned, in fresh and frozen form, and for the sushi and sashimi markets.

Assessments

This section assesses the sustainability of the fishery(s) relative to the Seafood Watch Standard for Fisheries, available at www.seafoodwatch.org. The specific standard used is referenced on the title page of all Seafood Watch assessments.

Criterion 1: Impacts on the Species Under Assessment

This criterion evaluates the impact of fishing mortality on the species, given its current abundance. When abundance is unknown, abundance is scored based on the species' inherent vulnerability, which is calculated using a Productivity-Susceptibility Analysis. The final Criterion 1 score is determined by taking the geometric mean of the abundance and fishing mortality scores. The Criterion 1 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Rating is Critical if Factor 1.3 (Fishing Mortality) is Critical.

Guiding principles

- *Ensure all affected stocks are healthy and abundant.*
- *Fish all affected stocks at sustainable level*

Criterion 1 Summary

Albacore			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Handlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Bigeye tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines	3.670 Low Concern	1.000 High Concern	**Red (1.916)**
Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	3.670 Low Concern	1.000 High Concern	**Red (1.916)**
Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	3.670 Low Concern	1.000 High Concern	**Red (1.916)**

Blue shark			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**

Dolphinfish			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**

Shortfin mako shark			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	3.670 Low Concern	1.000 High Concern	**Red (1.916)**
Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western	3.670 Low Concern	1.000 High Concern	**Red (1.916)**

Skipjack tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Handlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Southern bluefin tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**

Swordfish			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Yellowfin tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Handlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Maldives - Western Indian Ocean - Handlines - Maldives	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Criterion 1 Assessment

Scoring Guidelines

Factor 1.1 - Abundance

Goal: Stock abundance and size structure of native species is maintained at a level that does not impair recruitment or productivity.

- *5 (Very Low Concern) — Strong evidence exists that the population is above an appropriate target abundance level (given the species' ecological role), or near virgin biomass.*

- *3.67 (Low Concern) — Population may be below target abundance level, but is at least 75% of the target level, OR data-limited assessments suggest population is healthy and species is not highly vulnerable.*
- *2.33 (Moderate Concern) — Population is not overfished but may be below 75% of the target abundance level, OR abundance is unknown and the species is not highly vulnerable.*
- *1 (High Concern) — Population is considered overfished/depleted, a species of concern, threatened or endangered, OR abundance is unknown and species is highly vulnerable.*

Factor 1.2 - Fishing Mortality

Goal: Fishing mortality is appropriate for current state of the stock.

- *5 (Low Concern) — Probable (>50%) that fishing mortality from all sources is at or below a sustainable level, given the species ecological role, OR fishery does not target species and fishing mortality is low enough to not adversely affect its population.*
- *3 (Moderate Concern) — Fishing mortality is fluctuating around sustainable levels, OR fishing mortality relative to a sustainable level is uncertain.*
- *1 (High Concern) — Probable that fishing mortality from all source is above a sustainable level.*

Albacore *(Thunnus alalunga)*

1.1 Abundance

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean Stock - Indian Ocean - Handlines

Indian Ocean Stock - Indian Ocean - Trolling lines

Very Low Concern

The most recent stock assessment (2022) for albacore tuna in the Indian Ocean indicated that the 2020 stock biomass was well above both reference points (SB_{2020}/SB_{MSY} = 1.56; limit reference point = 0.4 × F_{MSY}) (IOTC 2022f). The assessment also found that there was an 85% chance that the stock was not overfished and not subject to overfishing in 2020. Because the latest stock assessment uses data that are not > 5 years old and indicates that both reference points are exceeded, abundance is considered a "very low concern" (per lines 1.a-b in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

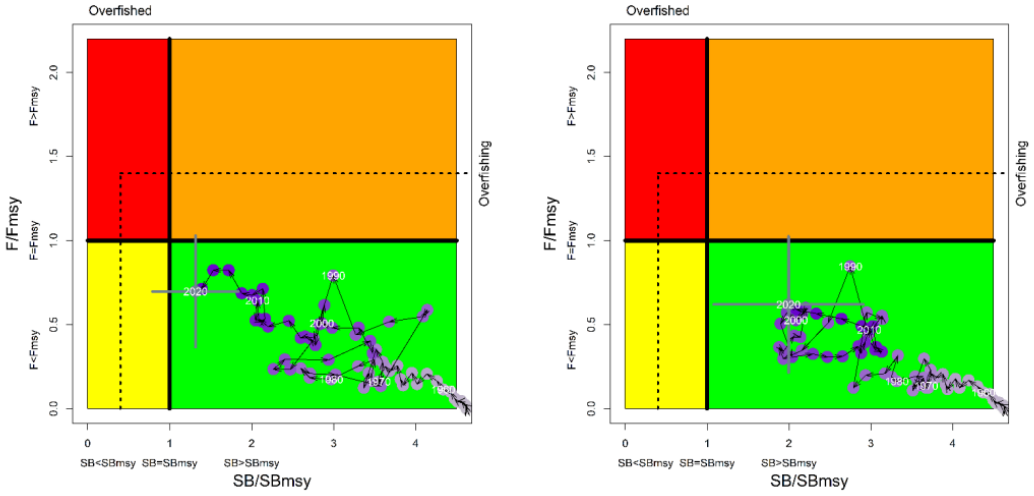


Figure 8: Kobe plot of the stock status of albacore in the Indian Ocean, from the 2022 stock assessment. Left: the model used was fitted to data using northwest Indian Ocean CPUE; right: using southwest Indian Ocean CPUE. Source: (IOTC 2022f).

1.2 Fishing Mortality

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean Stock - Indian Ocean - Handlines

Indian Ocean Stock - Indian Ocean - Trolling lines

Low Concern

In the 2022 assessment for Indian Ocean albacore tuna, fishing mortality rates in 2020 were estimated to be below the target reference point (F_{2020}/F_{MSY} = 0.68) (IOTC 2022f). According to models used in the latest (< 10 years old) stock assessment, there is an 85% chance that the stock is not overfished and no overfishing is occurring, so fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Bigeye tuna *(Thunnus obesus)*

1.1 Abundance

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines

Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)

Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)

Low Concern

The most recent assessment for bigeye tuna in the Indian Ocean was conducted in 2022 (IOTC 2022j). According to the model used in that assessment, the ratio of the biomass in 2021 to the target reference point (the biomass level at MSY) was estimated to be below the provisional target level of 1 (SB_{2021}/SB_{MSY} = 0.90). The spawning biomass in 2021 was also estimated to be at 25% of unfished levels (IOTC 2022j). The ratio of 0.90 suggests that the 2021 biomass was above 75% of the target reference point. The limit reference point is 0.5 × SB_{MSY}; thus, 2021 biomass exceeded the limit reference point. Based on a stock assessment using data < 10 years old indicating that the biomass is above an appropriate limit reference point and at least 75% of an appropriate target reference point, abundance is considered a "low concern" (per line 1.a in table 1.1.1 of the Seafood Watch Standard).

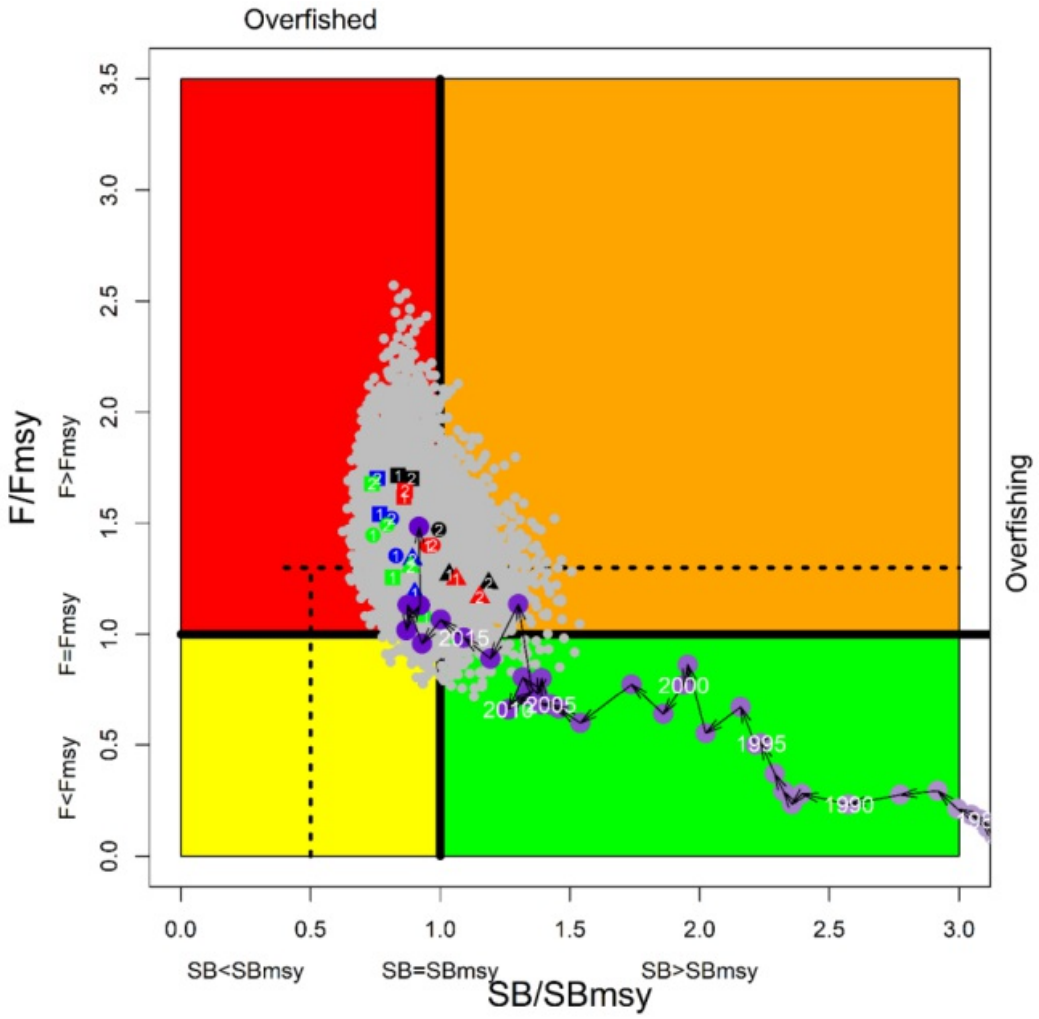


Figure 9: Bigeye tuna stock assessment Kobe plot based on 24 models to estimate stock status. Dashed lines represent limit reference points, and grey dots represent uncertainty in models. Source: (IOTC 2022j).

The probability of the stock being in the "red" quadrant (overfished and undergoing overfishing) of the Kobe plot in 2021 was estimated to be 79%. Bigeye tuna is overfished by the definition used by the IOTC, where the current stock status relative to SB_{MSY} is below 1 (IOTC 2022j). But the Seafood Watch Standard requires scoring to be based on biomass relative to an appropriate reference point (i.e., B_{MSY} or proxy), rather than management classification. Thus, the Seafood Watch score is based only on 2021 biomass relative to the target and limit reference points.

1.2 Fishing Mortality

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines

Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)

Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)

High Concern

Fishing mortality rates for bigeye tuna are estimated to be above the levels needed to produce the maximum sustainable yield (F_{2021}/F_{MSY} = 1.43) (IOTC 2022j). The limit reference point for fishing mortality, set at 1.4 × F_{MSY}, is also exceeded by the 2021 fishing level. Based on the results of an assessment that is < 10 years old, this population is subject to overfishing, with both fishing mortality reference points exceeded in 2021, so fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Blue shark *(Prionace glauca)*

1.1 Abundance

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

An assessment of blue shark in the Indian Ocean was conducted in 2021 using the Stock Synthesis model, which is age and spatially structured (Rice 2021a). All model runs resulted in similar results. The assessment found that spawning biomass in 2019 was above the MSY level for the stock (SB_{2019}/SB_{MSY} = 1.39) (IOTC 2024a). The stock is not estimated to be overfished; however, model trajectories indicated a trend toward an overfished status, because biomass has recently decreased while fishing mortality has increased (Rice 2021a). Because a stock assessment between 5 and 10 years old indicates that biomass is above the MSY level, abundance is considered a "low concern" (per lines 1.a-b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing Mortality

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Fishing mortality rates for blue shark in the Indian Ocean were estimated during the 2021

assessment to be below the level needed to produce the maximum sustainable yield (F_{2019}/F_{MSY} = 0.64) (Rice 2021a). According to the assessment results, fishing mortality rates are sustainable, and overfishing is not occurring (Rice 2021a). Because a stock assessment < 10 years old indicates that fishing mortality rates are sustainable, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Dolphinfish *(Coryphaena hippurus)*

1.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Data are limited for dolphinfish (also known as mahi mahi and dorado) in the Indian Ocean. The International Union for Conservation of Nature (IUCN) has assessed dolphinfish as a species of "Least Concern," but this assessment is > 10 years old (Collette et al. 2011e). Therefore, a productivity-susceptibility analysis (PSA) was performed, resulting in a score of 3.10 (medium vulnerability). Based on the PSA results indicating that dorado has a medium vulnerability, abundance is considered a "moderate concern" (per line 2.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

PSA for dorado in the Indian Ocean (see Seafood Watch Fisheries Standard Version 4 for methodology details).

Table 2:

Productivity Attribute	High productivity (score = 1)	Medium productivity (score = 2)	Low productivity (score = 3)	Score	Value; {Reference(s)}
Average age at maturity (yrs)	< 5	5-15	> 15	1	< 1 year (Froese and Pauly 2020; Collette et al. 2011e)

Average maximum age (yrs) (do not use if max size is available)	< 10	10-25	> 25	N/A	11 years {Sun et al. 2015a}
Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15-0.25	< 0.15	1	0.4 (Froese and Pauly 2020)
Fecundity (eggs/yr)	> 20,000	100-20,000	< 100	1	85,000 (Froese and Pauly 2020)
Average maximum size (cm)	< 100	100-300	> 300	2	210 cm (Froese and Pauly 2020)
Average size at maturity (cm)	< 40	40-200	> 200	2	55.8 cm (Froese and Pauly 2020)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Froese and Pauly 2020)
Productivity score (mean of attribute scores)				**1.33**	

Table 3:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value /notes; {Reference(s)}**

Areal overlap (all fisheries)	> 90% of species concentration is unfished	70-90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33-66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	
Seasonal availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3-6 months/year	**Fisheries overlap with species > 6 months/year**	3	Unknown; Default (bolded) scores selected
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33-66% individuals survive post-capture	**Retained species, or > 66% do not survive post-capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 4:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.10**

Vulnerability Rating: < 2.64 = Low vulnerability; > or = 2.64 and < or = 3.18 = Medium vulnerability; > 3.18 = High vulnerability	Medium

1.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Fishing mortality rates for dolphinfish in the Indian Ocean are unknown, so fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Shortfin mako shark *(Isurus oxyrinchus)*

1.1 Abundance

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

The status of shortfin mako shark in the Indian Ocean was last assessed in 2024, using data up to 2022. The 2024 assessment found that biomass in 2022 was just below the MSY level ($B_{current}/B_{MSY}$ = 0.96) (IOTC 2024a). Although the IOTC classifies the stock as overfished, biomass is above a limit reference point and above 75% of the MSY level, so abundance is considered a "low concern" (per line 1.a in Table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing Mortality

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The 2024 shortfin mako stock assessment concluded that the stock is experiencing overfishing ($F_{current}/F_{MSY}$ = 1.53), with a probability of 73.7% (IOTC 2024a). Based on a stock assessment < 10 years old indicating a > 50% chance that overfishing is occurring, fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Skipjack tuna *(Katsuwonus pelamis)*

1.1 Abundance

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine

Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)

Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets

Indian Ocean Stock - Indian Ocean - Handlines

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines

Indian Ocean Stock - Indian Ocean - Trolling lines

Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)

Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Very Low Concern

The 2023 stock assessment for skipjack tuna in the Indian Ocean indicates that the stock biomass is above the target reference point, 0.4 × B_0 (SB_{2022}/SB_0 = 0.53) (Fu 2023d). According to the assessment, there is a 98% chance that the stock is not overfished and no overfishing is occurring. The authors note some uncertainty in the SB estimate, which was addressed by running 36 total models, with one model run indicating that the SB_{2022}/SB_0 ratio could be as low as 0.36 (ibid). The 2023 assessment also provides an estimate of stock biomass relative to MSY, finding that biomass in 2022 was well above the MSY level (SB_{2022}/SB_{MSY} = 2.30; CI = 1.57–3.40) (Fu 2023d). A stock assessment < 5 years old indicates that biomass is above the target reference point, so abundance is considered a "very low concern" (per lines 1.a-b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing Mortality

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine

Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)

Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets

Indian Ocean Stock - Indian Ocean - Handlines

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines

Indian Ocean Stock - Indian Ocean - Trolling lines

Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)

Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Low Concern

Catch limits for skipjack tuna in the Indian Ocean are determined using a harvest control rule based on estimates of $B_{current}$, B_0, and the equilibrium exploitation rate, E_{targ}, which sustains the stock at B_{targ} (IOTC 2023b). When biomass is at or above its target reference point, the catch limit/target yield is set at $C_{40\%SB}$. In 2021 and 2022, catch exceeded the limit that was in place for 2021 through 2023 (Fu 2023d). But the fishing mortality level at MSY was not exceeded in 2022 (F_{2022}/F_{MSY} = 0.49) (Fu 2023d). According to a stock assessment < 10 years old, the catch in 2021 and 2022 exceeded the limit dictated by the harvest control rule, but fishing mortality in 2022 remained below its target, so fishing mortality is considered a “low concern” (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

Before 2023, MSY-based reference points could not be calculated for skipjack fishing mortality, so B_0-based reference points were used (Fu 2023d). The 2023 stock assessment found that F relative to the previously used virgin biomass reference point was also below the target level ($F_{2022}/F_{40\%SSB}$ = 0.90) (IOTC 2024a). The previous stock assessment for skipjack, from 2021, found similar results for 2019, using the exploitation rate in place of fishing mortality ($E_{2019}/E_{40\%SB0}$ = 0.92) (IOTC 2021e). Though F_{MSY} was not calculated or used for the 2021 assessment, E_{MSY} was, and the assessment found that E was below the MSY level (E_{2019}/E_{MSY} = 0.49) (ibid).

Southern bluefin tuna *(Thunnus maccoyii)*

1.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Southern bluefin tuna abundance is assessed using total reproductive output (TRO) rather than the more traditional stock biomass (SSB) used for other tunas. CCSBT's 2023 stock assessment indicates that the TRO in 2023 was below the target reference/rebuilding point for the stock, which is 30% of unfished TRO (TRO_{2023}/TRO_0 = 0.23; CI = 0.21-0.29) (CCSBT 2023b). It was further found that TRO in 2023 was above 75% but below 100% of the MSY level (TRO_{2023}/TRO_{MSY} = 0.85) (ibid). The previous 2022 interim update noted that TRO relative to TRO_0 increased by 0.02 from 2020 to 2021, and the 2023 full assessment shows an increase of 0.01, indicating that the stock is still slowly rebuilding (CCSBT 2022a; CCSBT 2023b). A previous rebuilding target of 20% of TRO_0 was met in 2020, and the new rebuilding target of 30% of TRO_0 has been set with a rebuilding deadline of 2035 (CCSBT 2022a). CCSBT has further noted that the stock has been rebuilding at a rate of 5% per year since 2009 (CCSBT 2022b). Although there is no defined limit reference point, the TRO is just above 75% of the target reference point and is above 75% of the MSY level, so abundance is considered a "low concern" (per line 1.a in table 1.2.1 of the Seafood Watch Standard).

1.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Fishing mortality rates have decreased for southern bluefin tuna and continue to be below the target reference point for fishing mortality (F_{2023}/F_{MSY} = 0.46) {CCSBT2023}. In addition, reported catches are below the MSY, and current exploitation rates are considered moderate {CCSBT 20231}. Fishing Mortality is considered a "low concern" because a stock assessment using data <10 years old indicates that fishing mortality rates are below the target reference point and the MSY level (per line 1 in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

Please note that purse seine catches supply aquaculture operations that are outside of the scope of this assessment.

Swordfish *(Xiphias gladius)*

1.1 Abundance

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Very Low Concern

Swordfish in the Indian Ocean was last assessed in 2023, using data up to 2021. The 2021 biomass of swordfish has been reduced to around 35% of the unfished biomass ($SB_{2021}/SB_0 = 0.35$) and is well above the levels needed to produce the maximum sustainable yield ($SB_{2021}/SB_{MSY} = 1.39$) (Fu 2023e). According to the 2023 assessment, there is a > 95% chance that the stock is not overfished. Because the latest stock assessment is < 5 years old and indicates that the stock biomass is above both the MSY level and the limit reference point, abundance is considered a "very low concern" (per lines 1.a-b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing Mortality

Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

The 2023 assessment indicated that fishing mortality rates for swordfish in the Indian Ocean are well below the target fishing mortality reference point ($F_{2021}/F_{MSY} = 0.60$) (Fu 2023e). Fishing levels are also below the provisional limit reference point ($1.4 \times F_{MSY}$). Therefore, overfishing is not occurring (Fu 2023e). Because a stock assessment < 10 years old indicates that F is below both reference points, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Yellowfin tuna *(Thunnus albacares)*

1.1 Abundance

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine

Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)

Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets

Indian Ocean Stock - Indian Ocean - Handlines

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines

Indian Ocean Stock - Indian Ocean - Trolling lines

Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)

Indian Ocean Stock - Maldives - Western Indian Ocean - Handlines - Maldives

Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives

Very Low Concern

Indian Ocean yellowfin tuna was last assessed in 2024 using data up to 2023, but the assessment contained enough uncertainty that it was further refined in 2025 (IOTC 2024a). Concerns were raised about the differences in the CPUE indices used in 2024 versus the previous yellowfin assessment, so the CPUE indices were recalculated and the assessment model re-run in 2025. The 2025 results confirmed the stock status indicated by the original 2024 assessment, though with slightly different numbers: the stock is no longer overfished and is above the MSY level ($SSB_{2023}/SSB_{MSY} = 1.18$) (Correa et al. 2025). Because a stock assessment < 5 years old indicates that biomass is above the MSY level, abundance is considered a "very low concern" (per lines 1.a-b in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

The authors of the 2024 assessment previously noted serious uncertainties in the new CPUE index, which looks significantly different from the previous assessment, and suggested that management not use the results of the assessment for official catch advice until these uncertainties were resolved (IOTC 2024a). It was also noted that much of the improvement of the stock relies on improved recruitment in recent years, but the assessment's estimates for 2024 recruitment have a wide range (ibid). In 2025, the Scientific Committee reviewed udpated longline CPUE indices and the resulting updated model results, concluding that the new results were sufficient to provide management advice in 2026 and 2027 and removing the need for a new yellowfin stock assessment during this timeframe.

1.2 Fishing Mortality

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine

Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)

Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets

Indian Ocean Stock - Indian Ocean - Handlines

Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines

Indian Ocean Stock - Indian Ocean - Trolling lines

Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)

Indian Ocean Stock - Maldives - Western Indian Ocean - Handlines - Maldives

Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives

Low Concern

The 2025 update to the 2024 yellowfin assessment found that fishing mortality in 2023 was below the MSY level (F_{2023}/F_{MSY} = 0.83), with an 76.6% chance that the stock is not overfished and not undergoing overfishing, as exhibited in the associated Kobe plot (Correa et al. 2025). Based on a stock assessment that is < 10 years old, indicating a > 50% chance that the stock is not undergoing overfishing, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Criterion 2: Impacts on Other Species

All main retained and bycatch species in the fishery are evaluated under Criterion 2. Seafood Watch defines bycatch as all fisheries-related mortality or injury to species other than the retained catch. Examples include discards, endangered or threatened species catch, and ghost fishing. Species are evaluated using the same guidelines as in Criterion 1. When information on other species caught in the fishery is unavailable, the fishery's potential impacts on other species is scored according to the Unknown Bycatch Matrices, which are based on a synthesis of peer-reviewed literature and expert opinion on the bycatch impacts of each gear type. The fishery is also scored for the amount of non-retained catch (discards) and bait use relative to the retained catch. To determine the final Criterion 2 score, the score for the lowest scoring retained/bycatch species is multiplied by the discard/bait score. The Criterion 2 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Rating is Critical if Factor 2.3 (Fishing Mortality) is Crtitical

Guiding principles

- *Ensure all affected stocks are healthy and abundant.*
- *Fish all affected stocks at sustainable level.*
- *Minimize bycatch.*

Criterion 2 Summary

Criterion 2 score(s) overview

This table(s) provides an overview of the Criterion 2 subscore, discards+bait modifier, and final Criterion 2 score for each fishery. A separate table is provided for each species/stock that we want an overall rating for.

Albacore			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Handlines	1.732	1.000: < 100%	**Red (1.732)**
Indian Ocean Stock - Indian Ocean - Trolling lines	1.732	1.000: < 100%	**Red (1.732)**

Bigeye tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	1.000	1.000: < 100%	**Red (1.000)**

Blue shark			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	1.000	1.000: < 100%	**Red (1.000)**

Dolphinfish			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western	1.000	1.000: < 100%	**Red (1.000)**

Shortfin mako shark			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western	1.000	1.000: < 100%	**Red (1.000)**

Skipjack tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine	1.526	1.000: < 100%	**Red (1.526)**
Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Handlines	1.732	1.000: < 100%	**Red (1.732)**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines	3.413	1.000: < 100%	**Green (3.413)**
Indian Ocean Stock - Indian Ocean - Trolling lines	1.732	1.000: < 100%	**Red (1.732)**
Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western	5.000	1.000: < 100%	**Green (5.000)**

Southern bluefin tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	1.000	1.000: < 100%	**Red (1.000)**

Swordfish			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Indian Ocean Stock - Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	1.000	1.000: < 100%	**Red (1.000)**

Yellowfin tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Small purse seine	1.526	1.000: < 100%	**Red (1.526)**
Indian Ocean Stock - Indian Ocean - Floating object purse seine (FAD)	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Gillnets and entangling nets	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Indian Ocean - Handlines	1.732	1.000: < 100%	**Red (1.732)**
Indian Ocean Stock - Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines	3.413	1.000: < 100%	**Green (3.413)**
Indian Ocean Stock - Indian Ocean - Trolling lines	1.732	1.000: < 100%	**Red (1.732)**
Indian Ocean Stock - Indian Ocean - Unassociated purse seine (non-FAD)	1.000	1.000: < 100%	**Red (1.000)**
Indian Ocean Stock - Maldives - Western Indian Ocean - Handlines - Maldives	5.000	1.000: < 100%	**Green (5.000)**
Indian Ocean Stock - Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives	5.000	1.000: < 100%	**Green (5.000)**

Criterion 2 main assessed species/stocks table(s)

This table(s) provides a list of all species/stocks included in this assessment for each 'fishery' (as defined by a region/method combination). The text following this table(s) provides an explanation of the reasons the listed species were selected for inclusion in the assessment.

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Albatross unspecified	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Giant petrels	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Rays and skates (unspecified)	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Sharks	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Blue marlin	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Finfish	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Porbeagle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Tiger shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Blue shark	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Southern bluefin tuna	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Albacore	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Swordfish	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Marine mammals	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Sharks	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Stingrays (unspecified)	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Blue marlin	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Finfish	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Leatherback turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Loggerhead turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Olive Ridley turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Silky shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Tiger shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Bigeye tuna	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Dogtooth tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Green turtle	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Oilfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine			
Sub Score: 1.526	**Discard Rate: 1.000**		**Score: 1.526**
Species	**Abundance**	**Fishing Mortality**	**Score**
Finfish	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Hawksbill turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Loggerhead turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Olive Ridley turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Bullet tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Frigate tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Green turtle	2.330: Moderate Concern	5.000: Low Concern	**Green (3.413)**
Kawakawa	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 3.413	**Discard Rate: 1.000**		**Score: 3.413**
Species	**Abundance**	**Fishing Mortality**	**Score**
Frigate tuna	2.330: Moderate Concern	5.000: Low Concern	**Green (3.413)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Sharks	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Bigeye tuna	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Hawksbill turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Loggerhead turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Olive Ridley turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Green turtle	2.330: Moderate Concern	5.000: Low Concern	**Green (3.413)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Sea turtles	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Striped marlin	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Marine mammals	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Manta rays and devil rays	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Sharks	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Blue marlin	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Finfish	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Pelagic thresher shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Scalloped hammerhead	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Silky shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Whitecheek shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Milk shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Sliteye shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Smooth hammerhead	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Hardnose shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Graceful shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Spinetail mobula	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Spot-tail shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Blacktip shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Blacktail reef shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Narrow-barred Spanish mackerel	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Longtail tuna	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Shortfin mako shark	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Black marlin	5.000: Very Low Concern	1.000: High Concern	**Yellow (2.236)**
Frigate tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Dolphinfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Striped bonito	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Dogtooth tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Wahoo	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Shortbill spearfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Sailfish	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Kawakawa	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Indo-Pacific king mackerel	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.732	**Discard Rate: 1.000**		**Score: 1.732**
Species	**Abundance**	**Fishing Mortality**	**Score**
Blacktip shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Graceful shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Greater amberjack	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Hardnose shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Smooth hammerhead	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Longtail tuna	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Silky shark	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Dogtooth tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Dolphinfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Finfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Albacore	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.732	**Discard Rate: 1.000**		**Score: 1.732**
Species	**Abundance**	**Fishing Mortality**	**Score**
Silky shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Longtail tuna	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Narrow-barred Spanish mackerel	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Milk shark	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Frigate tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Kawakawa	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Albacore	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Manta rays and devil rays	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Bigeye tuna	3.670: Low Concern	1.000: High Concern	**Red (1.916)**
Hawksbill turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Loggerhead turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Olive Ridley turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Green turtle	2.330: Moderate Concern	5.000: Low Concern	**Green (3.413)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western			
Sub Score: 5.000	**Discard Rate: 1.000**		**Score: 5.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western			
Sub Score: 5.000	**Discard Rate: 1.000**		**Score: 5.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Determining which species to include in the assessment of each fishery

Per version 4 of the Standard for Fisheries {Seafood Watch 2020}, the Criterion 2 score for the stock being rated is the lowest score of all the other main species caught with it (including both target and nontarget, retained, and discarded species), multiplied by the discard + bait use rate. A species is a main species if it meets any of the following conditions ("catch" here includes landings plus discards):

1. A common component of the catch (as guidance, > 5% of the catch in most cases), or
2. Overfished, endangered, threatened, undergoing overfishing, or otherwise a species of concern (hereafter termed "ETP species"), where catch occurs regularly and may significantly contribute to the conservation concern (i.e., more than a negligible and/or

sporadic level of catch). As guidance, the mortality of the species caused by this fishery is > 5% of a sustainable level, or

3. Fishery under assessment is one of the main sources of fishing mortality for the species, including bait species if known (as guidance, approximately 20% or more of total fishing mortality), and

4. In fisheries that use bait, the bait species should be treated as a bycatch species if it meets the main species criteria outlined previously. If the species used as bait are unknown but together account for > 5% of the catch and no other main species have been identified, then add "unknown finfish" with abundance and fishing mortality both scored as a "moderate concern."

Condition 3 is also met in cases where total fishing mortality is unknown, and thus the fishery's contribution to total mortality is unknown. For this Seafood Watch assessment, condition 2 is considered met if mortality is not negligible or sporadic and a sustainable level of catch is unknown. Here, the percent of mortality contributed by a single fishery to one stock is calculated by comparing the stock's catch in that single fishery to the stock's catch across all IOTC fisheries. In some cases, additional data from the FAO were available to provide a wider picture of total mortality. Some ETP species with unknown sustainable mortality levels were excluded from the assessment because their catch in individual fisheries can be considered sporadic. In cases where the data indicated that multiple groups of sharks (i.e., not specified to the species level) warranted inclusion in a fishery, these groups were added to a general "sharks" group that already existed based on landings data.

Data Sources

The primary data source used in this assessment was the IOTC's collection of nominal retained catch for all species, including species that IOTC considers to be bycatch but that are still landed {IOTC 2025a}. While there is a small observer program in place, data from this program are not publicly available, so discards data are largely lacking. CCSBT data for southern bluefin tuna catch were used to determine which IOTC members fish for this species in the Indian Ocean, and CCSBT bycatch data were used to determine some Criterion 2 species for the southern bluefin tuna longline fishery {CCSBT 2025c} {CCSBT 2025d}. For full catch composition data, see the Appendices.

While landings data are available for all IOTC fisheries, and bycatch data are available for the southern longline fishery, no complete record of discard data is available for IOTC's fisheries. But IOTC publishes annual bycatch data reviews, and the 2023 and 2024 reviews were used to fill in gaps around ETP species interactions {IOTC 2023n} {IOTC WPEB 2024}. Additional information from the Marine Stewardship Council (MSC) was used to help characterize the risks to ETP species in the small purse seine fleet using anchored FADS (aFADs) {Fishery Progress 2024} {Harlyan et al. 2024}. Two studies using observer data from the industrial EU purse seine fleets were used to further inform bycatch risks in the industrial FAD and unassociated purse seine (uPS) fisheries {Ruiz et al. 2018} {Acevedo-Iglesias et al. 2025}.

Although the available data from IOTC do not provide a complete picture of bycatch, they have been used here to identify species groups that are known to interact with IOTC fisheries: namely, longlines, gillnets, and purse seines. Sharks are the most widely reported bycatch species, though sharks are already included in longline and gillnet fisheries based on landings data. Limited observer data indicate that sharks/rays, sea turtles, seabirds, and cetaceans are caught in longlines (sea turtles in tropical longlines and seabirds in southern longlines), while observer data indicate that only sharks/rays and sea turtles are caught in purse seines. Gillnets, though lacking in observer data, are known to interact with sea turtles and cetaceans. Other literature sources also confirm cetacean interactions to be significant in Indian Ocean gillnet fisheries {Kiszka et al. 2017} {Anderson et al. 2020} {Kiszka et al. 2021}. Finally, IOTC landings data were used alongside external research and information from MSC's programs to characterize the tuna fisheries of the Maldives {Miller et al. 2017b} {Jaujaree et al. 2023}.

In addition, the Seafood Watch Unknown Bycatch Matrices (UBM) (Appendix 2 of the Seafood Watch Standard) can be used when a) catch composition is incomplete for a fishery, b) there are no catch composition data available for a fishery, or c) when catch composition data point to species groups; e.g., "sharks nei." The UBM is a tool that identifies which taxonomic groups are susceptible to fishing activities across the world's oceans (compiled from the best available scientific literature), and provides scores for species groups' vulnerability to different gear types. The landings data for IOTC fisheries, as well as the 2024 IOTC bycatch summary report, included several species groups that the UBM was used to score in factor 2.2: sharks/rays, marine mammals, and finfish in pelagic longlines in the East and West Indian Ocean, sharks and finfish in FAD-set and unassociated purse seines in the East and West Indian Ocean, sharks in troll lines in the East and West Indian Ocean, sharks/rays in handlines and pole-and-lines in the East and West Indian Ocean, and sharks/rays, marine mammals, sea turtles, and finfish in gillnets in the East and West Indian Ocean.

Main Species in Each Fishery

Drifting longlines (tropical)

- > 5% of catch: Yellowfin, bigeye, finfish
- ETP species
    - where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: Sharks (including unspecified mako, thresher, and hammerhead), silky shark, tiger shark, stingrays
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: Blue marlin, oilfish, dogtooth tuna
- Species identified through external literature: Sea turtles, marine mammals, loggerhead turtle, olive ridley turtle, leatherback turtle, green turtle
- Main species limiting the Criterion 2 score (lowest-scoring species): Marine mammals, sharks, stingrays

Seabirds are thought to only significantly interact with IOTC fisheries operating in southern

waters (south of lat. 25º S.), so seabirds are only considered bycatch species in the temperate/southern (Antarctic) longline fishery {IOTC WPEB 2024}. Conversely, sea turtles are thought to only significantly interact with IOTC tropical fisheries, so sea turtle species are only considered in the tropical longline fishery (ibid). Dolphinfish is not a main species but is included in Criterion 1 to produce a rating.

Drifting longlines (temperate/southern)

- > 5% of catch: Albacore, finfish, blue shark
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: Sharks (including unidentified thresher and mako), tiger shark
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: Swordfish, southern bluefin tuna, blue marlin
- Species identified through external literature: Giant petrels,* albatrosses nei,* rays nei,* shortfin mako,* porbeagle*
- Main species limiting the Criterion 2 score (lowest-scoring species): Albatrosses nei, giant petrel, rays and skates, sharks

* These species were identified through CCSBT data rather than IOTC data. While IOTC's bycatch data summary notes that cetaceans interact with longlines, it is not fully specified where these longlines are operating. CCSBT notes no whale interactions with the southern longline fishery, and IOTC regional observer scheme (ROS) data only note observed interactions in a tropical longline fleet, so marine mammals are not included here {IOTC WPEB 2024} {CCSBT 2025}.

FAD-set purse seines (industrial)

- > 5% of catch: Skipjack, yellowfin, bigeye
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: None
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: None
- Species identified through external literature: Olive ridley turtle, green turtle, hawksbill turtle, loggerhead turtle, sharks
- Main species limiting the Criterion 2 score (lowest-scoring species): Sharks

Unassociated purse seines (industrial)

- > 5% of catch: Skipjack, yellowfin
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: None
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: None
- Species identified through external literature: Olive ridley turtle, green turtle, hawksbill turtle, loggerhead turtle, sharks, rays (*Mobula*)

- Main species limiting the Criterion 2 score (lowest-scoring species): *Mobula*

Note that bigeye is primarily caught in FAD sets, so is not included as a main species in the unassociated sector of the industrial purse seine fishery.

IOTC's bycatch data summary notes that it is expected that marine mammal interactions with purse seines are minimal, and none have been recorded via the ROS, so marine mammals are not included in this fishery {IOTC WPEB 2024}. This finding is also confirmed via the additional voluntary observer program, which only noted sporadic incidences of cetacean interactions {Acevedo-Iglesias et al. 2025}. Research also suggests that > 90% of observed bycatch (shark, sea turtle) events in purse seines occur in FAD sets rather than unassociated sets {Ruiz et al. 2018}. But the same data suggest that, though rays make up a small percent of overall catch in purse seines, they are more often captured in unassociated sets than FAD sets (a trend also seen in other ocean basins), and the impact of unassociated purse seines on these species is not fully known or quanitifed (ibid) {Acevedo-Iglesias et al. 2025}. Rays are not retained and, when possible, are released alive. Based on data from the additional voluntary observer program in the industrial purse seine fisheries, neritic tunas and other bony fish are caught in purse seines (primarily FAD sets) but are increasingly retained {Acevedo-Iglesias et al. 2025}. Retention data from IOTC do not suggest that these species meet main species thresholds in these fisheries. Sharks—primarily silky shark—are also known bycatch in these fisheries, with higher incidental catch rates in FAD sets than unassociated sets (ibid). These data, like IOTC data, also suggest that turtle interactions primarily occur in FAD sets.

FAD-set purse seines (coastal/nonindustrial)

- > 5% of catch: Skipjack, yellowfin, finfish, kawakawa, bullet tuna, frigate tuna
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: None
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: None
- Species identified through external literature: Olive ridley turtle, green turtle, hawksbill turtle, loggerhead turtle, sharks
- Main species limiting the Criterion 2 score (lowest-scoring species): Finfish

Trolling lines

- > 5% of catch: Skipjack, yellowfin, narrow-barred Spanish mackerel, sharks, longtail tuna, frigate tuna, kawakawa
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: Silky shark, milk shark
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: None
- Main species limiting the Criterion 2 score (lowest-scoring species): Silky shark

Hand-operated pole-and-lines

- > 5% of catch: Skipjack, yellowfin, frigate tuna
- ETP species: None
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: None
- Main species limiting the Criterion 2 score (lowest-scoring species): Frigate tuna

Handlines

- > 5% of catch: Yellowfin, skipjack, longtail tuna, finfish
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: Sharks (including unidentified mako), silky shark, blacktip shark, smooth hammerhead, graceful shark, hardnose shark
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: Greater amberjack, common dolphinfish, dogtooth tuna
- Main species limiting the Criterion 2 score (lowest-scoring species): Greater amberjack, hardnose shark, smooth hammerhead, blacktip shark, graceful shark

Handlines: Maldives

- > 5% of catch: Yellowfin
- ETP species: None
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: None
- Main species limiting the Criterion 2 score (lowest-scoring species): None

Pole-and-lines: Maldives

- > 5% of catch: Skipjack, yellowfin
- ETP species: None
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: None
- Main species limiting the Criterion 2 score (lowest-scoring species): Yellowfin

Gillnets

- > 5% of catch: Skipjack, longtail tuna, narrow-barred Spanish mackerel, kawakawa, yellowfin, frigate tuna
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: Sharks (including unidentified mako and thresher sharks), milk shark, silky shark, hardnose shark, spottail shark, whitecheek shark, shortfin mako, smooth hammerhead, blacktip shark, pelagic

thresher shark, sliteye shark, manta and devil rays, graceful shark, blacktail reef shark, stingrays

- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: Indo-Pacific king mackerel, Indo-Pacific sailfish, dolphinfish, black marlin, striped marlin, finfish, striped bonito, blue marlin, wahoo, shortbill spearfish
- Species identified through external literature: Sea turtles, marine mammals
- Main species limiting the Criterion 2 score (lowest-scoring species): Manta rays, marine mammals, sea turtles, sharks, striped marlin

Criterion 2 Assessment

Scoring Guidelines

Factor 2.1 - Abundance

(same as Factor 1.1 above)

Factor 2.2 - Fishing Mortality

(same as Factor 1.2 above)

Factor 2.3 - Modifying Factor: Discards and Bait Use

Goal: Fishery optimizes the utilization of marine and freshwater resources by minimizing post-harvest loss. For fisheries that use bait, bait is used efficiently.

Scoring Guidelines: The discard rate is the sum of all dead discards (i.e. non-retained catch) plus bait use divided by the total retained catch.

Ratio of bait + discards/landings	**Factor 2.3 score**
<100%	1
>=100	0.75

Albatross unspecified *(Diomedeidae)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Seabird bycatch data are available for southern-operating longlines via IOTC and CCSBT. While IOTC notes species that are known to have interacted with longline fisheries, IOTC longline coverage is sparse, and species are not given in CCSBT data (IOTC WPEB 2024) (CCSBT 2025). An overarching albatross category is used to represent some of the seabird species that are known to interact with longlines, which may include Indian yellow-nosed albatross, grey-headed albatross, light-mantled sooty albatross, unidentified albatross, dark-colored albatross, large albatross, and other albatross (though this list is not exhaustive). Many albatross species are endangered; e.g., see (BirdLife International 2018a; BirdLife International 2018e). Seafood Watch also considers seabirds to be an inherently vulnerable taxon. Based on IUCN statuses < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

While IOTC notes some seabird species that have been observed interacting with longlines, their list is not exhaustive, and CCSBT data lack specific species of albatrosses. Therefore, based on the presence of large groupings such as "unidentified albatross" in the available data, the Unknown Bycatch Matrix (UBM) is used to describe fishing mortality for this group. The UBM points to a score of "2" for pelagic longlines operating in the East and West Indian Ocean (and "1" in the Southern Ocean; thus, it is unlikely that risks to seabirds are minimized by fishing in waters farther south), so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Black marlin *(Istiompax indica)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Very Low Concern

Black marlin in the Indian Ocean was last assessed in 2024, using data up to 2022. Although previous assessments resulted in an uncertain stock status, the latest assessment has improved uncertainties in the modeling process via better, more recent input data, with results indicating that the stock is above the MSY level (B_{2022}/B_{MSY} = 1.35) (IOTC 2024c). Based on a stock assessment < 5 years old indicating that biomass is above the MSY level, abundance is considered a "very low concern" (per lines 1.a-b in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

According to the 2024 stock assessment, fishing mortality in 2022 was above the MSY level (F_{2022}/F_{MSY} = 1.39), with a 62.2% chance that the stock is not overfished with overfishing occurring and a 12.5% chance that the stock is overfished with overfishing occurring (IOTC 2024c). Based on a stock assessment < 10 years old indicating with > 50% certainty that the stock is undergoing overfishing, fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Blacktail reef shark *(Carcharhinus amblyrhychos)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Blacktail reef shark, or grey reef shark, is not assessed in the Indian Ocean, but it is considered "Endangered" on a global scale by the IUCN (Simpfendorfer et al. 2020). Based on an IUCN listing that is < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Fishing rates for blacktip reef shark have not been calculated, so fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Blacktip shark *(Carcharhinus limbatus)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The Indian Ocean blacktip shark population has not been formally assessed. The species is listed globally as “Vulnerable” on the IUCN Red List, and this listing was last updated in 2020 (Rigby et al. 2021). Based on the IUCN listing that is < 10 years old and a lack of a regional stock assessment, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Without a formal stock assessment, fishing mortality data are lacking for blacktip shark. Fishing mortality is considered a “moderate concern” based on unknown fishing rates (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Blue marlin *(Makaira nigricans)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Blue marlin in the Indian Ocean was last assessed in 2022, using data up to the 2020 fishing year. This assessment indicated that 2020 biomass was below the MSY level (B_{2020}/B_{MSY} = 0.73; CI = 0.51–0.99) (IOTC 2022p). IOTC has not adopted reference points for blue marlin. While a target reference point of the MSY level was used for biomass in this assessment, no limit reference point was set. The assessment notes that there is a 72% chance that the stock is overfished, with the MSY level being the overfishing limit (ibid). Though there is no limit reference point, the stock is just below 75% of the assessment's target reference point, so abundance is considered a "moderate concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

As with biomass, no reference points have been adopted for fishing mortality for blue marlin, but an MSY-based target reference point was used during the latest assessment. The 2022 stock status assessment found that fishing mortality in 2020 exceeded the MSY level (F_{2020}/F_{MSY} = 1.13) (IOTC 2022p). Based on a stock assessment < 5 years old indicating that fishing mortality is above the sustainable level, fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Bullet tuna *(Auxis rochei)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Moderate Concern

A formal stock assessment for bullet tuna in the Indian Ocean is not available, but the IUCN assessed the species as “Least Concern” on a global scale in 2022 (Collette et al. 2023h). Based on the IUCN listing that is > 10 years old, abundance is considered a “moderate concern” (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Moderate Concern

Fishing rates for Indian Ocean bullet tuna are unknown, so fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Dogtooth tuna *(Gymnosarda unicolor)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

There is no formal stock assessment for dogtooth tuna in the Indian Ocean. The IUCN lists the species as “Least Concern,” with the last assessment completed in 2022 (Collette et al. 2023c). Based on the IUCN listing that is < 10 years old, abundance is considered a “moderate concern” (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Fishing rates are unknown for dogtooth tuna in the Indian Ocean, so fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Dolphinfish *(Coryphaena hippurus)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets

Indian Ocean - Handlines

Moderate Concern

Data are limited for dolphinfish (also known as mahi mahi and dorado) in the Indian Ocean. The International Union for Conservation of Nature (IUCN) has assessed dolphinfish as a species of "Least Concern," but this assessment is > 10 years old (Collette et al. 2011e). Therefore, a productivity-susceptibility analysis (PSA) was performed, resulting in a score of 3.10 (medium vulnerability). Based on the PSA results indicating that dorado has a medium vulnerability, abundance is considered a "moderate concern" (per line 2.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

PSA for dorado in the Indian Ocean (see Seafood Watch Fisheries Standard Version 4 for methodology details).

Table 2:

Productivity Attribute	High productivity (score = 1)	Medium productivity (score = 2)	Low productivity (score = 3)	Score	Value; {Reference(s)}
Average age at maturity (yrs)	< 5	5-15	> 15	1	< 1 year (Froese and Pauly 2020; Collette et al. 2011e)
Average maximum age (yrs) (do not use if max size is available)	< 10	10-25	> 25	N/A	11 years {Sun et al. 2015a}

Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15-0.25	< 0.15	1	0.4 (Froese and Pauly 2020)
Fecundity (eggs/yr)	> 20,000	100-20,000	< 100	1	85,000 (Froese and Pauly 2020)
Average maximum size (cm)	< 100	100-300	> 300	2	210 cm (Froese and Pauly 2020)
Average size at maturity (cm)	< 40	40-200	> 200	2	55.8 cm (Froese and Pauly 2020)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Froese and Pauly 2020)
Productivity score (mean of attribute scores)				**1.33**	

Table 3:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value /notes; {Reference(s)}**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70-90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33-66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	

Seasonal availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3-6 months/year	**Fisheries overlap with species > 6 months/year**	3	Unknown; Default (bolded) scores selected
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33-66% individuals survive post-capture	**Retained species, or > 66% do not survive post-capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 4:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.10**
Vulnerability Rating: < 2.64 = Low vulnerability; > or = 2.64 and < or = 3.18 = Medium vulnerability; > 3.18 = High vulnerability	Medium

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets

Indian Ocean - Handlines

Moderate Concern

Fishing mortality rates for dolphinfish in the Indian Ocean are unknown, so fishing

mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Finfish *(Unknown finfish spp.)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Finfish noted in landings data for IOTC longlines include marine fishes nei and other non-tuna-like fishes nei. Because specific species cannot be identified from these groups, stock statuses are unknown. Seafood Watch considers unknown finfish to have an abundance of “moderate concern” (per pages 18 and 52 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Moderate Concern

Finfish noted in landings data for Indian Ocean purse seines include other non-tuna-like fishes nei and other bony fish nei. Because specific species cannot be identified from all these groups, stock statuses are unknown. Seafood Watch considers unknown finfish to have an abundance of “moderate concern” (per pages 18 and 52 of the Seafood Watch Standard).

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Finfish noted in landings data for Indian Ocean gillnets include tunas nei, tuna-like fishes nei, seerfishes nei, marlins and sailfish and spearfish nei, billfish nei, mackerels nei, and tuna nei. Because specific species cannot be identified from all these groups, stock statuses are unknown. Seafood Watch considers unknown finfish to have an abundance of “moderate concern” (per pages 18 and 52 of the Seafood Watch Standard).

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Finfish noted in landings data for IOTC handlines include other non-tuna-like fishes nei. Because specific species cannot be identified from this group, stock statuses are unknown. Seafood Watch considers unknown finfish to have an abundance of “moderate concern” (per pages 18 and 52 of the Seafood Watch Standard).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

According to the UBM, finfish caught in pelagic longlines score a “2” for impact, so fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

High Concern

According to the UBM, finfish caught in FAD-set purse seines score a “2” for impact, so fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

According to the UBM, finfish caught in midwater gillnets score a “1” for impact, so fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

According to the UBM, finfish caught in troll, handline, and pole fisheries score a “3” for impact, so fishing mortality is considered a “moderate concern” (per table 2.2.2 of the Seafood Watch Standard).

Frigate tuna *(Auxis thazard)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

There are no stock assessments for frigate tuna in the Indian Ocean. The IUCN Red List assessed the species in 2022, resulting in a “Least Concern” finding (Collette et al. 2023). Based on this IUCN listing that is < 10 years old, abundance is considered a “moderate concern" (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Fishing mortality rates for frigate tuna in the Indian Ocean are unavailable because of a lack of data (IOTC 2018c). Because fishing mortality is unknown, it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Fishing mortality rates are unavailable for frigate tuna in the Indian Ocean. Based on landings data, pole-and-lines contribute only a small percent to total frigate tuna landings in the Indian Ocean, so this fishery is unlikely to be a substantial contributor to mortality

(IOTC 2025a). Therefore, fishing mortality is considered a “low concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Giant petrels *(Procellaria)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

CCSBT does not separate seabird species in its bycatch reporting, but groups them taxonomically. Bycatch of giant petrels (*Procellaria* and *Ardena* spp.) reported by CCSBT can include white-chinned petrel, grey petrel, and flesh-footed shearwater, among others. All three of these species are listed on the IUCN Red List of threatened species as “Near Threatened” with decreasing population trends (BirdLife International 2018c; BirdLife International 2018d; BirdLife International 2020). Based on IUCN assessments < 10 years old, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

While CCSBT notes some species that make up the “giant petrels” data category, not all potentially relevant species are listed. Therefore, the UBM was used to characterize fishing mortality for this seabird group. The UBM points to a score of “2” for seabirds caught in longline fisheries in the East and West Indian Ocean (and “1” for those caught in the Southern Ocean; thus, it is unlikely that risks to seabirds are reduced by fishing in waters farther south), so fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard) .

Supplementary Information

CCSBT observer data indicate that, from 2019 to 2023, 498 giant petrels—of which 476 died—were captured in longlines operated in CCSBT’s Indian Ocean statistical areas.

Graceful shark *(Carcharhinus amblyrhynchoides)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Graceful shark has not been assessed in the Indian Ocean, but it is considered "Vulnerable" globally by the IUCN (Simpfendorfer et al. 2021). Based on an IUCN status < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because there is no stock assessment for graceful shark in the Indian Ocean, fishing rates are unknown, so fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Greater amberjack *(Seriola dumerili)*

2.1 Abundance

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Greater amberjack has not been formally assessed in the Indian Ocean, so a PSA was performed, resulting in a score of 3.22. This indicates high vulnerability, so abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

Productivity-Susceptibility Analysis for greater amberjack in the Indian Ocean.

Table 5:

Productivity Attribute	High productivity (score=1)	Medium productivity (score = 2)	Low productivity (Score=3)	Score	Value; {Reference(s)}

Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15–0.25	< 0.15	2	0.18 (Froese and Pauly 2024b)
Fecundity (eggs/yr)	> 20,000	100–20,000	< 100	1	18–59 million eggs (Smith-Vaniz et al. 2015b)
Average maximum size (cm)	< 100	100–300	> 300	2	188 cm (Smith-Vaniz et al. 2015b)
Average size at maturity (cm)	< 40	40–200	> 200	2	64.6 cm (males); 73.3 cm (females) (Smith-Vaniz et al. 2015b)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Smith-Vaniz et al. 2015b)
Productivity score (mean of attribute scores)				**1.67**	

Note that average age at maturity is unknown, so it was not included in scoring productivity.

Table 6:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; (reference)**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Default (bolded) scores selected

Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	
Seasonal availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33–66% individuals survive post-capture	**Retained species, or > 66% do not survive post capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 7:

Productivity-Susceptibility Score ($V=\sqrt{(P^2 + S^2)}$)	**3.22**
Vulnerability Rating: < 2.64 = Low vulnerability, ≥ 2.64 and ≤ 3.18 = Medium vulnerability, > 3.18 = High vulnerability	High

2.2 Fishing Mortality

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Fishing rates for greater amberjack in the Indian Ocean are unknown, so abundance is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Green turtle *(Chelonia mydas)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

The IUCN has most recently classified green sea turtles as Least Concern on a global scale (Wallace and Broderick 2025). Based on the IUCN listing, Abundance is considered “moderate concern” (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Based on IOTC observer data, green sea turtle is known to interact with tropical longlines and purse seines, though data are limited for all sea turtle species. Green sea turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggest that sea turtle survival rates in longline fisheries are about 70%, though this is based on limited observer percentages and does not represent all relevant longline fleets. Because fishing mortality is unknown, it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Based on IOTC observer data, green sea turtle is known to interact with tropical longlines and purse seines, though data are limited for all sea turtle species. Green sea turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggest that sea turtle survival rates in purse seine fisheries are over 95%, though this is based on limited observer percentages, so it cannot be used to exclude sea turtles as main species. But this information can be used to improve scoring, because it is unlikely that purse seine fisheries are substantially contributing to sea turtle mortality in the Indian Ocean. Because purse seines are nonsubstantial contributors to mortality, fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

IOTC observer data further suggest that FAD-set purse seines represent more sea turtle interactions than unassociated purse seines, but available observer data are not separated by set type.

Hardnose shark *(Carcharhinus macloti)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Hardnose shark is not assessed in the Indian Ocean, but the species is considered "Near Threatened" globally by the IUCN (Rigby et al. 2021c). Based on an IUCN listing < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Without a stock assessment, the extent of fishing pressure on hardnose shark in the Indian Ocean is unknown. Therefore, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Hawksbill turtle *(Eretmochelys imbricata)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The IUCN has classified hawksbill turtle as "Critically Endangered" with a decreasing global population trend (Mortimer and Donnelly 2008). Hawksbill turtle has been listed on CITES since 1977 and is currently listed on CITES Appendix 1, meaning that it is threatened with extinction, and international trade is prohibited. Information on its status in the Indian Ocean is lacking (IOTC 2018h). Although the status in the Indian Ocean specifically is unknown, abundance is considered a "high concern" based on the IUCN and CITES designations (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Based on IOTC observer data, hawksbill sea turtle is known to interact with purse seines, though data are limited for all sea turtle species. Hawksbill turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggest that sea

turtle survival rates in purse seine fisheries are over 95%, though this is based on limited observer percentages, so it cannot be used to exclude sea turtles as main species. But this information can be used to improve scoring, because it is unlikely that purse seine fisheries are substantially contributing to sea turtle mortality in the Indian Ocean. Because purse seines are nonsubstantial contributors to mortality, fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

IOTC observer data further suggest that FAD-set purse seines represent more sea turtle interactions than unassociated purse seines, but available observer data are not separated by set type.

Indo-Pacific king mackerel *(Scomberomorus guttatus)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Indo-Pacific king mackerel in the Indian Ocean was last assessed in 2024 using data-limited techniques and data up to 2022. The assessment found that biomass was just above, but quite close to, the MSY level ($B_{current}/B_{MSY}$ = 1.02; CI = 0.46-1.19) (IOTC 2024e). These results are highly similar to the previous (2020) assessment results, though the probability that the stock is not overfished with no overfishing occurring has decreased from 35% to 27% (IOTC 2022l; IOTC 2024e). Based on a data-limited assessment < 10 years old indicating that biomass is likely above the MSY level, abundance is considered a "low concern" (per line 2 in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

The authors of the 2024 assessment also note some uncertainty around the resilience of the stock, which, for modeling purposes, was assumed to be fairly high, as well as uncertainty around catch estimates. Though the confidence interval range introduces some uncertainty around the finding that B > B_{MSY}, no conflicting indicators are presented in the stock assessment. Further, there is a > 50% combined chance, via the associated Kobe plot, that the stock is not overfished relative to the MSY level.

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

The 2024 Indo-Pacific king mackerel assessment suggests that fishing mortality is quite close to, but below, the MSY level ($F_{current}/F_{MSY}$ = 0.95), with a combined 52% probability, via the associated Kobe plot, that the stock is not undergoing overfishing (IOTC 2024e). Although the confidence interval for this estimate is quite wide (0.82 to 2.13), the probability of no overfishing allows for improved confidence in these results. Based on a stock assessment < 10 years old indicating a > 50% chance that overfishing is not occurring, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Kawakawa *(Euthynnus affinis)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Several data-limited stock assessments were carried out for kawakawa in 2023. No target or reference points are defined for the species, so stand-in reference points used for other IOTC species were estimated for each assessment's model. The assessments for kawakawa provided conclusions ranging from a biomass hovering around the MSY level to a depleted/overfished stock (Fu 2023a). The IOTC Scientific Committee used one of the four models to determine a stock status, finding that biomass was just below the MSY level ($B_{current}/B_{MSY}$ = 0.99) (IOTC 2023k). While this result differs slightly from the results of the other four models, all models indicated that biomass was above 75% of the target level, so abundance is considered a "low concern" (per line 1.a in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

Four preliminary assessments were carried out for kawakawa in 2023. Two assessments found that biomass was at or above a sustainable level, and two found that biomass was below a sustainable level (IOTC 2023k). The first assessment, which found biomass to be around the MSY level, was further explored by the Scientific Committee to determine a final stock status.

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Each of the four data-limited assessments examined both stock abundance and fishing mortality levels for kawakawa. As with the biomass results, the conclusions for fishing mortality were mixed (Fu 2023a). The IOTC Scientific Committee further explored one of the four methods to determine stock status, finding that fishing mortality was just below the MSY level ($F_{current}/F_{MSY}$ = 0.98; 80% CI = 0.82–2.20) (IOTC 2023k). Further, there is a 27% chance that the stock was overfished with no overfishing occurring, and a 25% chance the stock is not overfished with no overfishing occurring, and there is significant uncertainty associated with the stock assessment methodology (ibid). The assessment also notes that 55.6% of catches were partly or fully estimated in 2021 due to data limitations, and that catches in recent years have been above the MSY level. Although there is uncertainty in the point estimate and the input data, there is a > 50% chance the stock is not undergoing overfishing, so fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Leatherback turtle *(Dermochelys coriacea)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The IUCN classified leatherback turtle as "Vulnerable" with a decreasing global population trend in 2000, but the stock is considered "Critically Endangered" in the southwest Indian Ocean (Wallace et al. 2013a); however, these classifications are now outdated. Leatherback turtle has been listed by CITES since 1975 and is currently listed on CITES Appendix 1, meaning that it is threatened with extinction, and international trade is prohibited. Seafood Watch also considers sea turtles to be an inherently vulnerable taxon. Because of the CITES listing and the SFW general classification for leatherback turtle, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Based on IOTC observer data, leatherback sea turtle is known to interact with tropical longlines, though data are limited for all sea turtle species. Leatherback turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggest that sea turtle survival rates in longline fisheries are about 70%, though this is based on limited observer percentages and does not represent all relevant longline fleets. Because fishing mortality is unknown, it is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Loggerhead turtle *(Caretta caretta)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The IUCN classified loggerhead turtle in the past 10 years as "Vulnerable" with a decreasing global population trend, but "Critically Endangered" in the northern Indian Ocean and "Near Threatened" in the southern Indian Ocean (Casale and Tucker 2017). Loggerhead turtle is also listed on Appendix 1 of CITES. Based on the IUCN and CITES listings, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Based on IOTC observer data, loggerhead sea turtle is known to interact with tropical longlines and purse seines, though data are limited for all sea turtle species. Loggerhead turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggests that sea turtle survival rates in longline fisheries are about 70%, though this is based on limited observer percentages and does not represent all relevant longline fleets. Because fishing mortality is unknown, it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Based on IOTC observer data, loggerhead sea turtle is known to interact with tropical longlines and purse seines, though data are limited for all sea turtle species. Loggerhead turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggests that sea turtle survival rates in purse seine fisheries are over 95%, though this is based on limited observer percentages. so it cannot be used to exclude sea turtles as main species. But this information can be used to improve scoring, because it is unlikely that purse seine fisheries are substantially contributing to sea turtle mortality in the Indian Ocean. Because purse seines are nonsubstantial contributors to mortality, fishing mortality is considered a “low concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

IOTC observer data further suggest that FAD-set purse seines represent more sea turtle interactions than unassociated purse seines, but the available observer data are not separated by set type.

Longtail tuna *(Thunnus tonggol)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Several data-limited stock assessments were carried out for longtail tuna in 2023. No target or reference points are defined for the species, so stand-in reference points used for other IOTC species were estimated for each assessment's model. The assessments for longtail tuna provided conclusions ranging from a biomass hovering around the MSY level to a depleted/overfished stock (Fu 2023b). The IOTC Scientific Committee used one of these assessments to determine stock status, finding that biomass in 2021 was below the MSY level ($B_{current}/B_{MSY}$ = 0.96) (IOTC 2023k). Each of the separate assessments concluded that biomass was above 75% of the MSY level, so abundance is considered a "low concern" (per line 1.a in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

Four preliminary assessments were carried out for longtail tuna in 2023. Three of the four assessments indicated that biomass was below a sustainable level. The Scientific Committee used the first assessment, which indicated that biomass was just below the MSY level, to determine the official stock status.

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Each of the four data-limited assessments examined both stock abundance and fishing mortality levels for longtail tuna. As with the biomass results, the conclusions for fishing mortality were mixed (Fu 2023a). The official stock status determined by the Scientific Committee notes that 2021 fishing mortality was above the MSY level ($F_{current}/F_{MSY}$ = 1.05; 80% CI = 0.84–2.31) (IOTC 2023k). Although the catch in 2022 was above MSY, the average catch from 2018 to 2022 was not (ibid). Because the adopted stock status suggests that fishing mortality is above a sustainable level and the adopted overfishing level, fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

For the most recent stock status determination, 30.4% of the longtail tuna catch had to be fully or partly estimated due to data limitations (IOTC 2023k). The Kobe plot from the assessment model used to determine the 2023 stock status found that there was a 34.7% chance that the stock was overfished and subject to overfishing and a 25% chance that the stock was not overfished but was subject to overfishing, indicating a > 50% probability that overfishing is occurring (ibid).

Manta rays and devil rays *(Mobula spp.)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Two categories of mantas (not specified to the species level) are landed in IOTC gillnets, including “mantas, devil rays nei” and “devil ray.” The IUCN Red List denotes oceanic manta rays, as an example capture species, as “Endangered” (Marshall et al. 2019b). No devil rays are listed as “Least Concern” by the IUCN. Based on IUCN statuses < 10 years old for representative species, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Manta rays are the predominant species of rays caught in unassociated purse seine sets in the Indian Ocean (Ruiz et al. 2018) (Acevedo-Iglesias et al. 2025). There are no population assessments of these species in the Indian Ocean. The IUCN has listed oceanic manta ray and devil ray as “Endangered” with a decreasing global population trend (Marshall et al. 2019a) (Marshall et al. 2019b). Because of the “Endangered” IUCN listings that are < 10 years old, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Because multiple species of rays, which are not identified to the species level, are indicated in landings data for IOTC gillnets, the UBM is used to score fishing mortality. According to the UBM, sharks and rays caught in the Eastern and Western Indian Ocean receive scores of "2" and "1," respectively. Thus, manta rays' fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Although rays make up a small percentage of the overall observed bycatch in the industrial purse seine fishery, they are more commonly caught in unassociated sets than in FAD sets (Ruiz et al. 2018) (Acevedo-Iglesias et al. 2025). The impact of this fishery on ray species is unknown, so the UBM is used for scoring. The UBM points to a score of "2" for unassociated purse seines in the Eastern and Western Indian Ocean, so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Marine mammals *(Mammalia)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

There is limited reporting on cetacean interactions in IOTC longlines; some observer data exist, but they only cover three fleets at a low percentage. Some specific marine mammal species have been identified in observer data, but this list is not exhaustive and includes unspecified groupings (e.g., toothed whales nei), and species beyond the existing dataset may also interact with longlines (IOTC WPEB 2024). Therefore, a general marine mammals category is used to represent longline bycatch of cetaceans. Potential species within this category include Risso's dolphin and toothed whale species. Seafood Watch considers marine mammals to be an inherently vulnerable taxonomic group, so abundance is considered a "high concern" (per line 2.a on page 20 of the Seafood Watch Standard).

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Although IOTC observer data exist for marine mammal interactions with some longline

fleets, no observer data are available for gillnet fleets. But it is thought that gillnets are responsible for the primary cetacean mortality in the Indian Ocean, particularly from entanglements (IOTC WPEB 2024). External literature also confirms that gillnets pose a large threat to Indian Ocean cetacean populations, though the affected stocks are more uncertain (Kiszka et al. 2017) (Anderson et al. 2020) (Kiszka et al. 2021). Therefore, a general marine mammals category is used to encompass all potential cetaceans interacting with gillnets. Seafood Watch considers marine mammals to be an inherently vulnerable taxon, so abundance is considered a "high concern" (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Mortality rates for marine mammals in IOTC fisheries are unknown, because observer coverage is limited and cetacean interaction data are sparse. Therefore, the UBM was used to characterize this fishery. The UBM points to a score of "2" in the East Indian Ocean and "3" in the West Indian Ocean, and the more precautionary score is applied; thus, fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Gillnets are thought to pose the highest risk to cetaceans in the Indian Ocean, but data are lacking to show which stocks are affected and the extent to which they are affected (Anderson et al. 2020) (IOTC WPEB 2024). Therefore, the UBM is used to characterize this fishery's impact. The UBM points to a score of "1" for gillnets in the East and West Indian Ocean, so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Milk shark *(Rhizoprionodon acutus)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Milk shark has not been assessed in the Indian Ocean, but the species is considered "Vulnerable" globally by the IUCN (Rigby et al. 2020). Based on an IUCN assessment < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because there is no stock assessment for milk shark, fishing rates are unknown; thus, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Fishing rates for milk shark are unknown relative to a sustainable level, but landings data suggest that troll fisheries are not a substantial contributor to milk shark catch (IOTC 2025a). Therefore, fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Narrow-barred Spanish mackerel *(Scomberomorus commerson)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Several data-limited stock assessments were carried out for narrow-barred Spanish mackerel in 2023. No target or reference points are defined for the species, so stand-in reference points used for other IOTC species were estimated for each assessment's model. The assessments for narrow-barred Spanish mackerel provided conclusions

ranging from a biomass exceeding the MSY level to a depleted/overfished stock (according to IOTC standards) (Fu 2023c). The IOTC Scientific Committee further explored one of the methods used in the 2023 stock assessment, concluding that the stock biomass in 2021 was just below the MSY level ($B_{current}/B_{MSY}$ = 0.98) (IOTC 2023k). The committee further noted that there was a 31% chance that the stock was overfished with overfishing occurring, though there is a high amount of uncertainty in the assessment (ibid). The final assessment, as well as the initial three others, all found that biomass was above 75% of the MSY level, so abundance is considered a "low concern" (per line 1.a in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

Four assessments were carried out for narrow-barred Spanish mackerel in 2023. The first assessment, which built upon the 2020 stock assessment, found that the 2023 biomass is just below the MSY level (B_{2021}/B_{MSY} = 0.98; CI = 0.44–1.19) and is just under half of the virgin biomass level (B_{2021}/B_0 = 0.49; CI = 0.22–0.60) (Fu 2023c). The second assessment found that biomass in 2021 was below the MSY level (B_{2021}/B_{MSY} = 0.84), and the third assessment found that biomass in 2021 was above the MSY level (B_{2021}/B_{MSY} = 1.26). The final assessment looked at the spawning potential ratio (SPR) rather than biomass, finding that SPR was below the typical SPR target level of 0.4. The Scientific Committee expanded upon the first assessment to define the overall stock status.

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Each of the four data-limited assessments examined both stock abundance and fishing mortality levels for narrow-barred Spanish mackerel. As with the biomass results, the conclusions for fishing mortality were mixed (Fu 2023c). The Scientific Committee used one of the assessments to determine fishing mortality status, finding that the 2021 fishing mortality was above the MSY level ($F_{current}/F_{MSY}$ = 1.07) (IOTC 2023k). Further, both the catch in 2022 and average catch from 2018 to 2022 were above the estimated catch at MSY, with the 2022 catch being almost 11% higher than MSY (ibid). The Kobe plot from the final assessment noted a 59% probability that the stock was experiencing overfishing ($F > F_{MSY}$). Given that there is a > 50% chance that fishing mortality exceeds IOTC's overfishing threshold, and that the 2022 catch was above MSY, fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Oilfish *(Ruvettus pretiosus)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Oilfish has not been assessed in the Indian Ocean, and though it is considered "Least Concern" globally by the IUCN, this listing is > 10 years old (Collette et al. 2015). In addition, this species is not well studied, so information regarding the attributes to produce a PSA score are lacking. Therefore, because this is an unassessed finfish, SFW considers its abundance a "moderate concern" (per line 3 on page 20 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because oilfish has not been assessed in the Indian Ocean, fishing rates are unknown; thus, fishing mortality is considered a “moderate concern.”

Olive Ridley turtle *(Lepidochelys olivacea)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The IUCN considers olive ridley turtle to be “Vulnerable” with a decreasing global population trend, though this listing is > 10 years old (Abreu-Grobois and Plotkin 2008). Seafood Watch considers sea turtles to be a taxon with inherent vulnerability, so

abundance is considered a “high concern” (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Based on IOTC observer data, olive ridley turtle is known to interact with tropical longlines and purse seines, though data are limited for all sea turtle species. Olive ridley turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggest that sea turtle survival rates in longline fisheries are about 70%, though this is based on limited observer percentages and does not represent all relevant longline fleets. Because fishing mortality is unknown, it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Based on IOTC observer data, olive ridley turtle is known to interact with tropical longlines and purse seines, though data are limited for all sea turtle species. Olive ridley turtle has not been assessed in the Indian Ocean, and total fishing rates are unknown. Observer data suggest that sea turtle survival rates in purse seine fisheries are over 95%, though this is based on limited observer percentages, so it cannot be used to exclude sea turtles as main species. But this information can be used to improve scoring, because it is unlikely that purse seine fisheries are substantially contributing to sea turtle mortality in the Indian Ocean. Because purse seines are nonsubstantial contributors to mortality, fishing mortality is considered a “low concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

IOTC observer data further suggests that FAD-set purse seines represent more sea turtle interactions than unassociated purse seines, but available observer data is not separated by set type.

Pelagic thresher shark *(Alopias pelagicus)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Pelagic thresher shark has not been assessed in the Indian Ocean, but the species is considered "Endangered" on a global scale by the IUCN (Rigby et al. 2019e). Based on an IUCN assessment < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because pelagic thresher shark has not been assessed in the Indian Ocean, fishing rates are unknown; thus, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Porbeagle *(Lamna nasus)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Porbeagle shark is a noted common bycatch species in Indian Ocean longline ecologically related species (ERS) data from CCSBT. Multiple assessments of porbeagle in the Southern Hemisphere are inconclusive about the species' abundance, but they do indicate that the Southern Hemisphere stock is not as depleted as the North Atlantic Ocean stock (Hoyle et al. 2017). According to the IUCN, abundance of the Southern Hemisphere stock of porbeagle has declined by less than 20% over three generations, and much higher declines in the North Atlantic Ocean have occurred during the same period. The global population is listed as "Vulnerable" on the IUCN Red List (Rigby et al. 2019d). A 2017 stock risk and status assessment indicates that porbeagle in the Southern Hemisphere is not experiencing overfishing, but the assessment did not estimate biomass (Hoyle et al. 2017).

Porbeagle has also been listed under Appendix II of CITES since 2014 (Rigby et al. 2019d). The stock status of porbeagle is unknown, but because of the IUCN and CITES designations for the species, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

The most recent assessment for porbeagle in the Southern Hemisphere did find that relative CPUE was generally stable in both the Western and Eastern Indian Ocean from the early 1990s until 2015, suggesting a potential population stability during the same period (Clarke 2017). An abundance trend suggesting population stability (or growth) over three generations may score a "low concern" under Seafood Watch standards. But this stability is representative of less than one full generation for the species (IUCN estimates three generations for the Southern Hemisphere stock at 114.9 years) (Rigby et al. 2019d).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

A 2017 stock status and risk assessment for Southern Hemisphere porbeagle calculated several F reference points, but the data used in the assessment are now > 10 years old (Hoyle et al. 2017). In the absence of another, more recent assessment, fishing mortality is unknown and therefore is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

According to CCSBT observer data, from 2019 to 2023, 6,300 porbeagle sharks were caught, of which 2,507 were killed, in longlines operating in CCSBT's Indian Ocean statistical areas. Porbeagle numbers from the IOTC are much lower, because the species is a bycatch species that is rarely landed. But it is unknown how these numbers compare to a sustainable level of catch.

Rays and skates (unspecified) *(Rajidae spp.)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Although IOTC data do not indicate that unspecified rays and skates are landed in the southern longline fishery, ecologically related species data from CCSBT indicate that Indian Ocean longlines capture "skates and rays." Specific species are not noted in CCSBT data. Elasmobranchs are generally considered by Seafood Watch to be a vulnerable taxon, so abundance is considered a "high concern" (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Because the individual species of skates and rays caught in southern longlines are unknown, the UBM is used to describe fishing mortality. According to the UBM, sharks and rays caught in East and West Indian Ocean longlines score "3" and "2," respectively. The more precautionary score is used, so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Sailfish *(Istiophorus platypterus)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

The IOTC last carried out a data-limited stock assessment for the Indian Ocean stock in 2022, using data up to 2019. This stock assessment estimated biomass to be above the MSY level (B_{2019}/B_{MSY} = 1.17) (IOTC 2023k). But the input catch data for this assessment were highly uncertain, so the authors also included methods to estimate SPR. This helped create a more certain estimate of stock status, and there was found to be a 54% chance that the stock was not overfished and not subject to overfishing (ibid). Although there is some uncertainty, the incorporation of SPR estimates helped to minimize it, so abundance is considered a "low concern" based on a data-limited assessment that is < 10 years old (per line 1.b in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

According to the 2022 IOTC data-limited stock assessment, fishing mortality is just below the MSY level (F_{2019}/F_{MSY} = 0.98) (IOTC 2023k). The assessment estimated a 54% chance that the stock is not overfished and not subject to overfishing, but it also estimated a 39% chance that the stock is not overfished but is subject to overfishing and a 7% chance that the stock is overfished and subject to overfishing (ibid). Therefore, there is a < 50% chance that the stock is experiencing overfishing, so fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Supplementary Information

Although the assessment was supplemented with SPR estimates to remediate abundance uncertainty, catch data remain highly uncertain. Existing catch data also show that catch limits were exceeded in 2020, 2021, and 2022.

Scalloped hammerhead *(Sphyrna lewini)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Scalloped hammerhead shark is listed as "Critically Endangered" with a decreasing population trend by the IUCN (Rigby et al. 2019c). No stock assessment has been conducted in the Indian Ocean because of a lack of data (IOTC 2019h), but the IUCN analysis suggests some reductions in population from areas such as South Africa (Rigby et al. 2019c). The current status in the Indian Ocean is considered unknown. Because of the IUCN listing that is < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Information on fishing mortality rates of scalloped hammerhead in the Indian Ocean is not

available because of a lack of data (IOTC 2019h). The current status of this species is unknown in the Indian Ocean, but it is considered to be highly vulnerable to gillnet capture (IOTC 2019h). Because fishing mortality rates are unknown, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Sea turtles *(Dermochelyidae, Cheloniidae)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Gillnets operating in Indian Ocean coastal waters and high seas are known to interact with sea turtles, but observer or fisher-submitted data are lacking to indicate the specific species/stocks interacted with (IOTC WPEB 2024). Therefore, a general sea turtles category is used to represent sea turtle catch in gillnet fisheries. Seafood Watch considers sea turtles to be a taxon with inherent vulnerability, so abundance is considered a "high concern" (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The impact of gillnets on sea turtle species, and the specific species that are most affected, is unknown. Therefore, the UBM is used to characterize this fishery. The UBM points to a score of "1" for sea turtles in East and West Indian Ocean gillnets, so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Sharks *(Selachimorpha)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Several shark species are found in the Indian Ocean and caught in IOTC fisheries, though the stock status of almost all IOTC-managed sharks is unknown. But the global status of these shark species ranges from “Near Threatened” to “Critically Endangered” according to the IUCN Red List. Further, Seafood Watch considers sharks to be a taxon with high natural vulnerability. Therefore, combined with the IUCN statuses of shark species in the Indian Ocean, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Because multiple species of sharks, not all of which are identified to the species level in landings data, are captured in IOTC fisheries, the Seafood Watch Unknown Bycatch Matrix was used to score fishing mortality. According to the UBM, sharks captured in the East and West Indian Ocean pelagic longlines score “3” and “2,” respectively, and the more precautionary number is used for final scoring; thus, fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Low Concern

Sharks are noted bycatch species in IOTC purse seines (IOTC 2023n; IOTC WPEB 2024). Research on Indian Ocean purse seine fleets suggests that FAD-set purse seines are responsible for the majority of bycatch, with much lower bycatch numbers in free school purse seines (Ruiz et al. 2018). But this finding is based on observations taken on industrial FAD vessels, and IOTC observer data are not available for the smaller, coastal fleets. Information from a similar fishery (Indonesia's skipjack and yellowfin purse seine fleet in the WCPO) and from some vessels operating in this fishery in the Indian Ocean suggest that interactions with ETP species, including sharks, are not likely to create significant risks to these stocks (Fishery Progress 2024) (Harlyan et al. 2024). Based on this, it is unlikely that the smaller, aFAD purse seines significantly contribute to shark catch in the Indian Ocean, so fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Because multiple species of sharks, not all of which are identified to the species level in landings data, are captured in IOTC fisheries, the Seafood Watch UBM was used to score fishing mortality. According to the UBM, sharks captured in the East and West Indian Ocean FAD-set purse seines score "1," so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Because multiple species of sharks, not all of which are identified to the species level in landings data, are captured in IOTC fisheries, the Seafood Watch UBM was used to score fishing mortality. According to the UBM, sharks captured in the East and West Indian Ocean gillnets score "2" and "1," respectively, so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Because multiple species of sharks, not all of which are identified to the species level in

landings data, are captured in IOTC fisheries, the Seafood Watch UBM was used to score fishing mortality. According to the UBM, sharks captured in the East and West Indian Ocean troll lines and handlines score “3.5,” so fishing mortality is considered a “low concern” (per table 2.2.2 of the Seafood Watch Standard).

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Sharks are a noted bycatch species in IOTC purse seines (IOTC 2023n; IOTC WPEB 2024). But research on Indian Ocean purse seine fleets suggests that FAD-set purse seines are responsible for the majority of bycatch, with much lower bycatch numbers in free school purse seines (Ruiz et al. 2018). Based on this, it is unlikely that unassociated purse seines significantly contribute to shark catch in the Indian Ocean, so fishing mortality is considered a “low concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Shortbill spearfish *(Tetrapturus angustirostris)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

There are no stock assessments for shortbill spearfish. The species is categorized as "Data Deficient" by the IUCN (Collette et al. 2023g). In lieu of better information, a productivity-susceptibility analysis (see Justification) suggests a medium vulnerability, so abundance is considered a "moderate concern" (per line 2.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary Information

PSA for shortbill spearfish in the Indian Ocean (see Seafood Watch Fisheries Standard Version 4 for methodology details).

Table 8:

Productivity Attribute	High productivity (score = 1)	Medium productivity (score = 2)	Low productivity (score = 3)	Score	Value; {Reference(s)}

Average age at maturity (yrs)	< 5	5-15	> 15	1	3 yrs (Froese and Pauly 2020)
Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15-0.25	< 0.15	1	0.5 (Salcedo-Bojorquez and Arreguin-Sanchez 2011)
Average maximum size (cm)	< 100	100-300	> 300	2	230 cm total length (Salcedo-Bojorquez and Arreguin-Sanchez 2011)
Average size at maturity (cm)	< 40	40-200	> 200	2	132 cm (Salcedo-Bojorquez and Arreguin-Sanchez 2011)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Froese and Pauly 2020)
Productivity score (mean of attribute scores)				**1.4**	

Note that fecundity is unknown and thus not included in this PSA.

Table 9:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; {Reference(s)}**

Areal overlap (all fisheries)	> 90% of species concentration is unfished	70%-90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Default (bolded) scores selected
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33%-66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	
Seasonal availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3-6 months/year	**Fisheries overlap with species > 6 months/year**	3	
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33%-66% individuals survive post-capture	**Retained species, or > 66% do not survive post-capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 10:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.13**
Vulnerability Rating: < 2.64 = Low vulnerability; >= 2.64 and <= 3.18 = Medium vulnerability; > 3.18 = High vulnerability	Moderate

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because a formal stock assessment is lacking, fishing mortality for shortbill spearfish in the Indian Ocean is unknown, so fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Silky shark *(Carcharhinus falciformis)*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The current status of silky shark in the Indian Ocean is unknown, though some anecdotal evidence indicates decreases in abundance in recent decades (IOTC 2018i). The IOTC conducted a preliminary stock assessment in 2018, but the results were too uncertain to assign an official status to the stock (Urbina et al. 2019). This assessment has not been updated since. In the Eastern and Western Indian Ocean, and globally, silky shark is considered “Vulnerable” by the IUCN (Rigby et al. 2017). Because the only existing assessment has too much uncertainty to denote stock status, the IUCN listing is used for scoring, and abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Silky shark is caught in a number of fisheries in the Indian Ocean, including longline, other line, and gillnet fisheries. A full stock assessment has not been conducted in the Indian Ocean, and there is substantial uncertainty surrounding total catch estimates (IOTC 2018i). A preliminary assessment was conducted in 2018, but its results are considered highly uncertain (Urbina et al. 2019). Fishing mortality levels are ultimately unknown, so fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Low Concern

Although fishing mortality is unknown for silky shark in the Indian Ocean, handline landings of this species make up roughly 5% of total silky shark landings across IOTC fisheries (IOTC 2025a). Therefore, handlines are unlikely to be a substantial contributor to silky shark mortality, and fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Sliteye shark *(Loxodon macrorhinus)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Sliteye shark has not been assessed in the Indian Ocean, but the species is considered "Near Threatened" by the IUCN (Rigby et al. 2021d). Based on an IUCN assessment < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Without a stock assessment in the Indian Ocean, fishing mortality for sliteye shark is unknown; therefore, it is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Smooth hammerhead *(Sphyrna zygaena)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The status of smooth hammerhead shark in the Indian Ocean is unknown. On a global scale, the IUCN Red List has assessed the species as “Vulnerable” (Rigby et al. 2019). Based on this listing that is < 10 years old, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because there are no formal stock assessments of smooth hammerhead shark in the Indian Ocean, fishing mortality is unknown and is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Spinetail mobula *(Mobula japanica)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Spinetail mobula has not been assessed in the Indian Ocean but is considered “Endangered” on a global scale by the IUCN (Marshall et al. 2022). Based on an IUCN listing < 10 years old, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because there is no assessment for spinetail mobula in the Indian Ocean, fishing mortality is unknown and is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Spot-tail shark *(Carcharhinus sorrah)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Spot-tail shark has not been assessed in the Indian Ocean but is considered “Near Threatened” by the IUCN (Simpfendorfer et al. 2021b). Based on an IUCN listing < 10 years old, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because there is no assessment for spot-tail shark in the Indian Ocean, fishing mortality is unknown and is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Stingrays (unspecified) *(Stingrays (unspecified))*

2.1 Abundance

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

According to landings data from IOTC, “rays and stingrays and mantas nei” (considered

here as unspecified stingrays) are caught in Indian Ocean longlines. Because the species caught are not noted in the data, and Seafood Watch considers elasmobranchs in general to be a vulnerable taxon, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Because this is a grouped category in landings data without specific species noted, the UBM is used to describe fishing mortality. According to the UBM, sharks and rays caught in East and West Indian Ocean pelagic longlines score "3" and "1." The more precautionary score is used, so fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Striped bonito *(Sarda orientalis)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Striped bonito (or oriental bonito) has not been recently assessed in the Indian Ocean. Globally, the species is assessed as "Least Concern" by the IUCN Red List (Collette et al. 2023e). Based on this listing that is < 10 years old, abundance is considered a "moderate concern" (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because the Indian Ocean stock is not formally assessed, fishing rates are unknown, so fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Striped marlin *(Kajikia audax)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Striped marlin in the Indian Ocean was last assessed in 2024, using data up to 2022. As indicated in previous assessments for this stock, the 2024 assessment reconfirms that the stock is overfished and has been for over a decade. Across two different model types, abundance was found to be far below the MSY level (JABBA: B_{2022}/B_{MSY} = 0.17; SS3: SB_{2022}/SB_{MSY} = 0.27) and below common limit reference points (JABBA: B_{2022}/B_0 = 0.06; SS3: SB_{2022}/SB_0 = 0.036) (IOTC 2024d). Based on a stock assessment < 5 years old indicating that the stock is below MSY and below commonly used LRPs (e.g., 50% MSY, 20% virgin biomass), abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The 2024 assessment concluded with a 100% probability that Indian Ocean striped marlin was overfished with overfishing occurring in 2022 (JABBA: F_{2022}/F_{MSY} = 3.95; SS3: F_{2022}/F_{MSY} = 9.26) (IOTC 2024d). Based on a stock assessment < 10 years old indicating that overfishing is taking place (with > 50% certainty), fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Tiger shark *(Galeocerdo cuvier)*

2.1 Abundance

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Tiger shark is unassessed in the Indian Ocean but is considered "Near Threatened" by the IUCN (Ferreira and Simpfendorfer 2019). Based on an IUCN listing that is < 10 years old,

abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Without a stock assessment, fishing mortality for Indian Ocean tiger shark is unknown, so it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Wahoo *(Acanthocybium solandri)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Wahoo has not been formally assessed in the Indian Ocean. Globally, the IUCN has assessed the species as “Least Concern” (Collette et al. 2023f). Based on this listing that is < 10 years old, abundance is considered a “moderate concern” (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Because a formal assessment for wahoo in the Indian Ocean is lacking, fishing rates are unknown, so fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Whitecheek shark *(Carcharhinus dussumieri)*

2.1 Abundance

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Whitecheek shark has not been assessed in the Indian Ocean, but the species is considered “Endangered” on a global scale by the IUCN (Simpfendorfer et al. 2019). Based on an IUCN listing < 10 years old, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing Mortality

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Without a stock assessment in the Indian Ocean, fishing rates on whitecheek shark are unknown. Therefore, fishing mortality is unknown and considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

2.3 Discard Rate/Landings

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

< 100%

Tuna longline fisheries have an average discard rate of 28.5%, although discard rates can range from 0% to 40% (Kelleher 2005). The most recent analysis of global discards suggests that fisheries targeting tuna (and other pelagics) have lower discard rates globally than fisheries targeting all other species, and longline fisheries for all target species have a global discard rate of 7.4% (Perez et al. 2019). Observer records from the Indian Ocean indicate slightly lower discard rates of 14% of the total catch and 17% of the retained catch (Adrill et al. 2012). Given these figures, discards are well under 100% of landings in tuna longline fisheries.

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

< 100%

According to the most recent analysis of global discards, purse seines (all target species considered) have a low discard rate of 3.9% (Perez et al. 2019). Analysis of Indian Ocean tuna fisheries specifically found that purse seine fisheries averaged a 3.55% bycatch rate compared to landings, and bycatch may be kept, discarded alive, or discarded dead, depending on the species (Adrill et al. 2012). But bycatch rates do differ between FADs and unassociated purse seine sets, though rates are still quite low (3.6% vs. 0.8%, respectively) (Dagorn et al. 2013). According to observer data from French and Spanish tuna purse seine fleets, the highest discard rates were for bony fish and sharks, which typically make up the majority of bycatch in these fisheries (Adrill et al. 2012). These bycatch and discard figures show that discards are well under 100% of landings in both FAD and unassociated tuna purse seine fisheries.

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

< 100%

Globally, gillnet fisheries for all target species have a discard rate of about 10.1%, though most gillnet discards stem from bottom gillnet fisheries (Perez et al. 2019). In pelagic gillnet fisheries (driftnet fisheries), discard rates average 11.7% (95% C.I. = 7.4–19%) (Perez et al. 2019). But information on discard rates specific to Indian Ocean gillnet fisheries is lacking (Aranda 2017). The little data that do exist from drift gillnet fisheries in the Indian Ocean suggest that this gear type has higher bycatch and discard rates than other gears, but previous research caps the discard estimates from gillnets at 66% (Kelleher 2005) (Adrill et al. 2012). Thus, it is likely that discard rates, though higher in gillnets, are below 100% of landings.

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

< 100%

Troll and pole fisheries globally typically have low discard rates. Globally, for all target

species, pole-and-line fisheries have estimated discard levels of 9.4%, handlines have estimated discard levels of 9.5%, and trolling lines have estimated discard levels of 19.9% (Perez et al. 2019). The bycatch rate of baitfish in the Indian Ocean pole-and-line fishery is estimated at 11.6% of tuna catch rates (Adrill et al. 2012). Baitfish make up the majority of bycatch in this fishery and are consumed locally, so discard rates from their bycatch are presumably low (ibid). An estimate from the Maldivian pole-and-line fishery, which has a typical tuna catch to bait use ratio of 8.6 to 1, suggests that bycatch of non-tuna was 0.65% of the total catch, with only 0.02% of that being discarded (Adrill et al. 2012; Miller et al. 2017).

Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western

< 100%

Tuna fisheries in the Maldives (handline and pole-and-line) are livebait fisheries: tuna vessels catch both bait and tuna. Common bait species included scads, trigger fish, and mackerels (Hough Associated Ltd 2021) (Lebechnech et al. 2024). The Maldives has a National Livebait Management Plan in place, and bait catch in the tuna fisheries, collectively across multiple species, is about 6–8% of the total tuna catch (Lebechnech et al. 2024). Because bycatch is minimal in both fisheries, discard rates are also low. Therefore, the ratio of bait + discards to landings is < 100% (per table 2.3.1 of the Seafood Watch Standard).

Criterion 3: Management Effectiveness

Five factors are evaluated in Criterion 3: Management Strategy and Implementation, Bycatch Strategy, Scientific Research/Monitoring, Enforcement of Regulations, and Inclusion of Stakeholders. Each is scored as either 'highly effective', 'moderately effective', 'ineffective,' or 'critical'. The final Criterion 3 score is determined as follows:

- *5 (Very Low Concern) — Meets the standards of 'highly effective' for all five factors considered.*
- *4 (Low Concern) — Meets the standards of 'highly effective' for 'management strategy and implementation' and at least 'moderately effective' for all other factors.*
- *3 (Moderate Concern) — Meets the standards for at least 'moderately effective' for all five factors.*
- *2 (High Concern) — At a minimum, meets standards for 'moderately effective' for Management Strategy and Implementation and Bycatch Strategy, but at least one other factor is rated 'ineffective.'*
- *1 (Very High Concern) — Management Strategy and Implementation and/or Bycatch Management are 'ineffective.'*
- *0 (Critical) — Management Strategy and Implementation is 'critical'.*

The Criterion 3 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Rating is Critical if Management Strategy and Implementation is Critical.

Guiding principle

- The fishery is managed to sustain the long-term productivity of all impacted species.

Five factors are evaluated in Criterion 3: Management Strategy and Implementation, Bycatch Strategy, Scientific Research/Monitoring, Enforcement of Regulations, and Inclusion of Stakeholders. Each is scored as either 'highly effective', 'moderately effective', 'ineffective,' or 'critical'. The final Criterion 3 score is determined as follows:

Criterion 3 summary

Fishery	Management Strategy And Implementation	Bycatch Strategy	Scientific Data Collection and Analysis	Enforcement of and Compliance with Management Regulations	Stakeholder Inclusion	Score
Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	Ineffective	Ineffective	Ineffective	Moderately Effective	Highly effective	**Red (1.000)**
Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western	Ineffective	Ineffective	Ineffective	Moderately Effective	Highly effective	**Red (1.000)**
Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine	Ineffective	Moderately Effective	Ineffective	Ineffective	Highly effective	**Red (1.000)**
Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western	Ineffective	Highly effective	Moderately Effective	Moderately Effective	Highly effective	**Red (1.000)**
Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western	Moderately Effective	Ineffective	Moderately Effective	Moderately Effective	Highly effective	**Red (1.000)**
Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western	Ineffective	Ineffective	Ineffective	Moderately Effective	Highly effective	**Red (1.000)**
Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western	Ineffective	Moderately Effective	Moderately Effective	Moderately Effective	Highly effective	**Red (1.000)**

Fishery	Management Strategy And Implementation	Bycatch Strategy	Scientific Data Collection and Analysis	Enforcement of and Compliance with Management Regulations	Stakeholder Inclusion	Score
Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western	Ineffective	Moderately Effective	Moderately Effective	Moderately Effective	Highly effective	Red (1.000)
Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective	Highly effective	Yellow (3.000)
Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western	Highly effective	Highly effective	Moderately Effective	Moderately Effective	Highly effective	Green (4.000)
Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western	Highly effective	Highly effective	Moderately Effective	Moderately Effective	Highly effective	Green (4.000)

The United Nations Straddling and Highly Migratory Fish Stocks Agreement (1995) indicated that the management of straddling and highly migratory fish stocks should be carried out through Regional Fisheries Management Organizations (RFMOs). RFMOs are the only legally mandated fishery management body on the high seas and within EEZ waters. There are currently 18 RFMOs (www.fao.org) that cover nearly all the world's waters. Member countries must abide by the management measures set forth by individual RFMOs in order to fish in their waters {Cullis-Suzuki and Pauly 2010}. Some RFMOs manage all marine living resources within their authority (e.g., General Fisheries Commission for the Mediterranean [GFCM]), while others manage a group of species such as tunas (e.g., Inter-American Tropical Tuna Commission [IATTC]). In addition to the IOTC, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) is the intergovernmental organization tasked with the management of southern bluefin tuna throughout its distribution (Atlantic, Pacific, and Indian Oceans).

The following countries are current members of the IOTC: Australia, Bangladesh, China, Comoros, European Union, France, India, Indonesia, Iran, Japan, Kenya, Republic of Korea, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Oman, Pakistan, Philippines, Seychelles, Somalia, South Africa, Sri Lanka, Sudan, Tanzania, Thailand, United Kingdom, and Yemen. In addition, Liberia and Panama are Cooperating Non-Contracting Parties. For this

report, we have scored this section for IOTC and CCSBT management. The following countries are current members of the CCSBT: Australia, EU (extended commission), Fishing entity of Taiwan (extended commission), Indonesia, Japan, Republic of Korea, New Zealand, and South Africa.

The species listed in the following table are under the management mandate of the IOTC. In addition, the Commission's Secretariat collates data on nontarget, associated, and dependent species affected by tuna fishing operations; i.e. marine turtles, marine mammals, seabirds, sharks, and fish species caught incidentally (bycatch).

FAO English name	FAO French name	Scientific name	FAO Code
Yellowfin tuna	Albacore	*Thunnus albacares*	YFT
Skipjack	Listao; Bonite à ventre rayé	*Katsuwonus pelamis*	SKJ
Bigeye tuna	Patudo; Thon obèse	*Thunnus obesus*	BET
Albacore tuna	Germon	*Thunnus alalunga*	ALB
Southern bluefin tuna	Thon rouge du sud	*Thunnus maccoyii*	SBT
Longtail tuna	Thon mignon	*Thunnus tonggol*	LOT
Kawakawa	Thonine orientale	*Euthynnus affinis*	KAW
Frigate tuna	Auxide	*Auxis thazard*	FRI
Bullet tuna	Bonitou	*Auxis rochei*	BLT
Narrow-barred Spanish mackerel	Thazard rayé	*Scomberomorus commerson*	COM
Indo-Pacific king mackerel	Thazard ponctué	*Scomberomorus guttatus*	GUT
Blue marlin	Makaire bleu	*Makaira nigricans*	BUM
Black marlin	Makaire noir	*Istiompax indica*	BLM
Striped marlin	Marlin rayé	*Kajikia audax*	MLS
Indo-Pacific ailfish	Voilier de l'Indo-Pacifique	*Istiophorus platypterus*	SFA
Swordfish	Espadon	*Xiphias gladius*	SWO

Criterion 3 Assessment

Scoring Guidelines

Factor 3.1 - Management Strategy and Implementation

Considerations: What type of management measures are in place? Are there appropriate management goals, and is there evidence that management goals are being met? Do managers follow scientific advice? To achieve a highly effective rating, there must be appropriately defined management goals, precautionary policies that are based on scientific advice, and evidence that the measures in place have been successful at maintaining/rebuilding species.

Factor 3.2 - Bycatch Strategy

Considerations: What type of management strategy/measures are in place to reduce the impacts of the fishery on bycatch species and when applicable, to minimize ghost fishing? How successful are these management measures? To achieve a Highly Effective rating, the fishery must have no or low bycatch, or if there are bycatch or ghost fishing concerns, there must be effective measures in place to minimize impacts.

Factor 3.3 - Scientific Research and Monitoring

Considerations: How much and what types of data are collected to evaluate the fishery's impact on the species? Is there adequate monitoring of bycatch? To achieve a Highly Effective rating, regular, robust population assessments must be conducted for target or retained species, and an adequate bycatch data collection program must be in place to ensure bycatch management goals are met.

Factor 3.4 - Enforcement of Management Regulations

Considerations: Do fishermen comply with regulations, and how is this monitored? To achieve a Highly Effective rating, there must be regular enforcement of regulations and verification of compliance.

Factor 3.5 - Stakeholder Inclusion

Considerations: Are stakeholders involved/included in the decision-making process? Stakeholders are individuals/groups/organizations that have an interest in the fishery or that may be affected by the management of the fishery (e.g., fishermen, conservation groups, etc.). A Highly Effective rating is given if the management process is transparent, if high participation by all stakeholders is encouraged, and if there a mechanism to effectively address user conflicts.

3.1 Management Strategy And Implementation

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

The majority of main, retained species in this assessment are managed by the IOTC, except southern bluefin tuna (SBT), which is managed by the CCSBT. The temperate/southern longline fishery captures and retains multiple shark and tuna species, along with swordfish. No IOTC reference points or harvest control rules/strategies have been adopted for any shark species, though blue shark has been assessed by IOTC. Management for SBT has resulted in slow but steady population growth, and the stock reached its initial rebuilding point ahead of schedule. A management procedure (MP) was implemented for swordfish in 2024, which sets reference points and will be used to set a TAC beginning in 2026 (IOTC 2025e). An MP is being developed for albacore tuna. Other retained species include blue marlin and unspecified finfish, which also lack reference points and harvest control rules. Based on the lack of reference points and harvest control rules and strategies for more than 30% of the main, retained species (sharks, finfish, blue marlin), management strategy and implementation is considered "ineffective" (per lines 1 and 3 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. CCSBT operates similarly, adopting management procedures and resolutions for its Members and Cooperating Non-Members (CNMs) to use in their fisheries targeting SBT. In this fishery, multiple tuna species, several shark species, swordfish, and related pelagic finfish are caught and retained. For a full list, see the Criterion 2 Summary and catch composition tables in the Appendices; note that all species from IOTC data are retained species (i.e., IOTC data do not include discards).

General Management

In 2012, the IOTC implemented a measure to apply the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been implemented that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting information

(IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

The CCSBT has adopted a number of resolutions and measures focusing on fishery monitoring, southern bluefin tuna TAC setting and management procedure details, and protecting incidentally captured species (CCSBT 2017b; CCSBT 2017c; CCSBT 2022c).

Stock-Specific Management

Southern bluefin tuna

Stock assessments for SBT are performed every 3 years, and the 2023 assessment suggests that, although the population is below CCSBT's target reference point, its growth remains stable and no overfishing is occurring (CCSBT 2023b). Further, the current plan for SBT has a goal of reaching the stock's TRP in 2035, so the stock is not expected to have reached this reference point yet. There is no defined limit reference point for SBT. A management procedure is used to set a global TAC and harvest control rules for SBT, via a model using CPUE data, gene-tagging juvenile abundance estimates, and adult abundance estimates from a mark-recapture program. Declines in either abundance input result in a lower TAC being set. TACs are in place for 3-year periods, and are allocated across Members and Cooperating Non-Members (CCSBT 2023d). Under the previous MP, CCSBT's interim rebuilding goal for SBT was achieved, and the latest MP has been in place since 2021 (CCSBT 2023b). This MP was set with a goal of reaching the new rebuilding target (30% of virgin TRO) by 2035, with a 50% likelihood of success. Thus far, TRO has increased by 2% under the new MP and the 2021–23 global TAC.

Albacore tuna

The IOTC has adopted MSY-based reference points for albacore, and the species was last assessed in 2022, with findings that stock biomass was above the MSY level and fishing mortality was below the MSY level (IOTC 2022f). The current model used in assessing albacore suggests that there is little risk of violating target and limit reference points in the short term if catch levels are maintained at current levels or moderately increased. But there is no current TAC or other harvest control rule in place to ensure that catch levels do not rise significantly. A management strategy evaluation analysis is ongoing for the species, with a new operating model that was expected to be ready for use in developing a management procedure (that sets a TAC) in 2024 or later (Mosquiera and Hillary 2023). As of 2025, management procedure work for the stock is still ongoing (Murua and Robertson 2025).

Blue shark

The IOTC has not developed reference points for any shark species. A stock assessment was carried out for blue shark in 2021, which indicates that population abundance and

fishing mortality are both at sustainable levels (Rice 2021a). But the data used in the assessment show that the population is trending toward being overfished with overfishing occurring. Though the Science Committee has suggested that the IOTC use caution for this species and improve compliance with its reporting requirements, no harvest strategy or harvest control rules are in place. Resolution 18/02 called for improvements on blue shark reporting requirements and gave the Scientific Committee the option to create reference points and management measures for blue shark, but these have not been proposed or adopted at Commission meetings since the resolution was passed (IOTC 2022m; IOTC 2023b). There are currently no management procedures in place to allow the IOTC to react to changes in blue shark biomass or to limit fishing pressure on the species, but an MSE for the species was discussed at the Committee's 2025 meeting.

Swordfish

The IOTC has developed MSY-based target and limit reference points for swordfish. The stock was last assessed in 2023, with findings that biomass is above its target reference point and fishing mortality is below its target reference point (Fu 2023e). Although the latest assessment suggests that there is a relatively low risk that fishing mortality exceeds its reference point by 2024–31 (assuming catches are maintained at the 2021 level), there is a larger amount of depletion in the stock's southern range, creating localized depletion there (IOTC 2022g; Fu 2023e). A management strategy evaluation was performed in 2022, resulting in the development of two candidate management procedures for swordfish, and a final MP was adopted in 2024. This MP operates via goals relating to stock health relative to reference points and will be used to set 3-year TACs, but it currently lacks a mechanism for constraining catch to the MP-derived level, and this must be developed in 2025 before the new TAC is in place {IOTC 2024F}. The MP will be reviewed in 2031.

Blue marlin

Blue marlin is an overfished species with overfishing occurring (based on IOTC's definitions), but no reference points or harvest control rules have been developed for the stock. MSY reference points were used for the 2022 stock assessment, but these have not been officially adopted by the IOTC (IOTC 2022p). Although catches are below the limit stipulated in Resolution 18/05, fishing levels in 2020 were still above the MSY level for fishing mortality. The Commission has a goal of reducing fishing mortality to below the MSY level and increasing biomass to above the MSY level by 2027, with a 60% or higher chance, but no strategies or measures are in place to ensure that catch is reduced enough to achieve this goal (ibid).

Other pelagics

Unspecified teleosts are captured in IOTC fisheries ("other non-tuna-like fishes nei" in IOTC landings data), but no reference points or harvest control rules exist for non-tuna-like species because they do not fall under IOTC's mandate.

Ineffective

All main, retained species in this fishery are managed by the IOTC. No IOTC reference points or harvest control rules/strategies exist for any shark species. Bigeye tuna is in its second cycle of its MP, but it is unclear if the MP's control rules are successfully controlling fishing pressure. Yellowfin tuna is no longer overfished; though rebuilding efforts had not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. Other retained species include pelagic teleosts (blue marlin, oilfish, and unidentified species), which also lack reference points and harvest control rules. Based on the lack of reference points and effective harvest control rules and strategies for more than 30% of the main, retained species, management strategy and implementation is considered "ineffective" (per lines 1 and 3 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the tropical longline fishery, several tunas, sharks, swordfish, blue marlin, and associated pelagic teleosts are retained (IOTC 2025a).

General Management

In 2012, the IOTC implemented a measure to implement the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

Stock-Specific Management

Bigeye tuna

The IOTC performs consistent stock assessments for bigeye tuna, with the most recent assessment carried out in 2022. The latest assessment indicates that bigeye abundance is below the target reference point but above the limit reference point, and fishing mortality is above its target reference point (IOTC 2022j). Reference points set by the IOTC for the species are MSY-based. The IOTC developed a management procedure for bigeye tuna in 2022, which set the TAC for 2024–25 (ibid). The model for the MP was developed under a scenario with a 60% chance that the bigeye population reaches its target reference point by 2034–38 and with a high probability that it does not fall below its limit reference point (Hillary et al. 2022). In its 2025 meeting, the Commission adopted amendments to bigeye management that apply a new TAC under the MP and allocate catch to IOTC members (CPCs) (IOTC 2025e; Murua and Robertson 2025). Although two CPCs objected to the measure, they are not part of the primary contributing CPCs to the TAC. This is the second cycle of the bigeye tuna MP, but the stock's biomass status has decreased since the 2019 assessment and overfishing is still occurring, so it is unclear if the MP is successful.

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution after its adoption, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in the catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that now it is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

Sharks

The IOTC has not developed reference points for any shark species because they are outside of the RFMO's mandate. No harvest control rules or harvest strategies are in place for shark populations.

Blue marlin

Blue marlin is an overfished species with overfishing occurring, but no reference points or harvest control rules have been developed for the stock. MSY reference points were used for the 2022 stock assessment, but these have not been officially adopted by the IOTC (IOTC 2022p). Although catches are below the limit stipulated in Resolution 18/05, fishing levels in 2020 were still above the MSY level for fishing mortality. The Commission has a goal of reducing fishing mortality to below the MSY level and increasing biomass to above the MSY level by 2027, with a 60% or higher chance, but no strategies or measures are in place to ensure that the catch is reduced enough to achieve this goal (ibid). No formal reference points have been adopted for this or other billfish species.

Other Pelagic

Other teleosts (e.g., oilfish) lack reference points and management measures. Most of these species (non-neritic tunas, non-mackerels) are not formally managed by IOTC because they are outside of the Commission's mandate.

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Ineffective

Main, retained species in the small purse seine fishery include skipjack and yellowfin, both of which are managed by IOTC, as well as a number of other pelagic species. Skipjack tuna has reference points and a harvest control rule to limit fishing in place, but the catch across all IOTC members in recent years has exceeded the limit in the HCR. A skipjack management procedure was developed in 2024 to replace this HCR, but a catch allocation scheme for the HCR and the MP was not established until 2025, so its effectiveness is unknown. Yellowfin tuna is no longer overfished; though rebuilding efforts have not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. Other species (kawakawa, frigate and bullet tunas, other non-tuna-like fishes) are unmanaged. Because there is no management for > 30% of retained species but it is unlikely the fishery is negatively affecting these unmanaged stocks, management strategy and implementation is considered "ineffective" (per line 3 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the handline fishery, skipjack, yellowfin, related smaller pelagic species, and shark species are retained (IOTC 2025a). For a full list, see the Criterion 2 Summary and the catch

composition tables in the Appendices; note that all species from IOTC data are landed (retained) species.

General Management

In 2012, the IOTC adopted a measure to implement the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

Stock-Specific Management

Skipjack tuna

Though Resolution 15/10 set out MSY-based interim reference points for skipjack, Resolution 16/02, passed the following year, shifted skipjack management to virgin biomass-based reference points. This resolution also created an HCR for skipjack, and stipulated that stock assessments should be carried out every 3 years and that a TAC should be put in place based on stock status and other indicators. The HCR was reviewed and a new HCR, via Resolution 21/03, was put into place to set catch limits for 2021 through 2023. The latest assessment in 2023 found that the stock biomass was above its limit and target reference points, and fishing exploitation was below its limit and target reference points, using virgin biomass reference points for stock abundance and MSY reference points for fishing mortality (Fu 2023d). But catches under the previous HCR exceeded catch limits set for 2018 to 2019, and catch in 2021 and 2022 exceeded the 2021–23 catch limit. The HCR was replaced by an MP in 2024, which confirms the virgin biomass-based reference points and creates achievable goals around stock health and TAC changes {IOTC 2024F}. The MP will be run in 2025 to set a 3-year TAC beginning in 2027, and it will be reviewed in 2032. At the 2025 Commission meeting, this TAC (stemming from the MP) was agreed on, but some provisions are in place that could result in the TAC continuing to be exceeded (Murua and Robertson 2025). But importantly, the 2025 meeting led to the passing of an allocation scheme for the current TAC (HCR-derived) and future TACs (MP-derived) (IOTC 2025d). Two of the nine CPCs contributing most to skipjack catch in the Indian Ocean objected to the catch allocation scheme, which could sway its effectiveness if their catch is not constrained in the future (ibid).

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that it now is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

Tuna-like species

Although kawakawa, bullet, and frigate tunas fall under the mandate of the IOTC, no reference points or management control rules have been developed for these species (IOTC 2022c). Kawakawa has been assessed using MSY reference points, but these have not been adopted by the Commission for this stock. Non-tuna-like species are not under the management mandate of the IOTC but are retained in this fishery (IOTC 2025a).

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

Main, retained species in this fishery include skipjack, yellowfin, and frigate tunas, all of which are managed by IOTC. Skipjack and yellowfin have management measures in place, but frigate tuna lacks control rules and reference points. Skipjack tuna has reference points and a harvest control rule to limit fishing in place, but the catch in recent years has exceeded the limit in the HCR. A skipjack management procedure was developed in 2024 to replace this HCR, but the new MP was first used to set a TAC in 2025, so its effectiveness is unknown. Yellowfin tuna is no longer overfished; though rebuilding efforts have not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. Based on the lack of reference points and effective harvest control rules and strategies for more than 30% of the main, retained species, and the unlikelihood that the fishery is negatively affecting the unmanaged frigate tuna stock, management strategy and implementation is considered

"ineffective" (per line 3 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the pole-and-line fishery, skipjack, yellowfin, and frigate tunas are retained (IOTC 2025a). For a full list, see the Criterion 2 Summary and the catch composition tables in the Appendices; note that all species from IOTC data are landed (retained) species.

General Management

In 2012, the IOTC adopted a measure to implement the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013I). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

Stock-Specific Management

Skipjack tuna

Though Resolution 15/10 set out MSY-based interim reference points for skipjack, Resolution 16/02, passed the following year, shifted skipjack management to virgin biomass-based reference points. This resolution also created an HCR for skipjack, and stipulated that stock assessments should be carried out every 3 years and that a TAC should be put in place based on stock status and other indicators. The HCR was reviewed and a new HCR, via Resolution 21/03, was put in place to set catch limits for 2021 through 2023. The latest assessment in 2023 found that the stock biomass was above its limit and target reference points, and fishing exploitation was below its limit and target reference points, using virgin biomass reference points for stock abundance and MSY reference points for fishing mortality (Fu 2023d). But the catches under the previous HCR exceeded catch limits set for 2018 to 2019, and the catches in 2021 and 2022 exceeded the 2021–23 catch limit. The HCR was replaced by an MP in 2024, which confirms the virgin biomass-based reference points and creates achievable goals around stock health and TAC changes {IOTC 2024F}. The MP was run in 2025 to set a 3-year TAC beginning in 2027, and it will

be reviewed in 2032. But the MP currently lacks a mechanism for constraining catch to the MP-derived level, and this must be developed by 2026 before the new TAC is in place (ibid). At the 2025 Commission meeting, this TAC (stemming from the MP) was agreed on, but some provisions are in place that could result in the TAC continuing to be exceeded (Murua and Robertson 2025).

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution after its adoption, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that it is now comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

Frigate tuna

Smaller tunas, while under the purview of IOTC, lack reference points and management measures, and frigate tuna is unassessed in the Indian Ocean.

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

Tropical tunas are the main, retained species in the industrial purse seine fisheries and are managed by IOTC. Management procedures have been adopted for skipjack and bigeye tunas, and a rebuilding plan is in place for yellowfin tuna. A catch allocation scheme was recently approved for skipjack but has not been in place long enough to determine its effectiveness. Bigeye is in its second cycle of its MP, but it is unclear if the MP's control

rules are successfully controlling fishing pressure. Yellowfin tuna is no longer overfished; though rebuilding efforts have not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. Though control rules and management measures are in place for the tropical tunas, the effectiveness of these measures is uncertain, so management strategy and implementation is considered "moderately effective" (per lines 1 and 2.b-c in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the purse seine fisheries, several tunas, sharks (unspecified), some neritic tunas, and other related pelagic finfish (some specified, others unspecified) are retained (IOTC 2025a). For a full list, see the Criterion 2 Summary and the catch composition tables in the Appendices; note that all species from IOTC data are retained species.

General Management

In 2012, the IOTC adopted a measure to implement the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d). In FAD fisheries, fishing pressure is also controlled based on adopted dFAD limits. A 2024 resolution implements the latest limits for the number of total and active dFADs that can be used per purse seine vessel, which have been further lowered since the previous FAD management resolution was passed in 2019 (IOTC 2025e). In addition, purse seine vessels are required to retain/land all bigeye, skipjack, and yellowfin tunas that they catch, unless the fish are unfit for human consumption (ibid). This discard ban also extends to nontarget species, including other tunas, rainbow runner, dolphinfish, triggerfish, billfish, wahoo, and barracuda, though these species tend to be caught more in the smaller, coastal purse seine fleets (ibid) (IOTC 2025a).

Stock-Specific Management

Bigeye tuna

The IOTC performs consistent stock assessments for bigeye tuna, with the most recent assessment being carried out in 2022. The latest assessment indicates that bigeye abundance is below the target reference point but above the limit reference point, and fishing mortality is above its target reference point (IOTC 2022j). Reference points set by the IOTC for the species are MSY-based. The IOTC developed a management procedure for bigeye tuna in 2022, which set the TAC for 2024–25 (ibid). The model for the MP was developed under a scenario with a 60% chance that the bigeye population reaches its target reference point by 2034–38 and with a high probability that it does not fall below its limit reference point (Hillary et al. 2022). In its 2025 meeting, the Commission adopted amendments to bigeye management that apply a new TAC under the MP and allocate catch to IOTC members (CPCs) (IOTC 2025e; Murua and Robertson 2025). Although two CPCs objected to the measure, they are not part of the primary contributing CPCs to the TAC. This is the second cycle of the bigeye tuna MP, but the stock's biomass status has decreased since the 2019 assessment and overfishing is still occurring, so it is not clear if the MP is successful.

Skipjack tuna

Though Resolution 15/10 set out MSY-based interim reference points for skipjack, Resolution 16/02, passed the following year, shifted skipjack management to virgin biomass-based reference points. This resolution also created an HCR for skipjack, and stipulated that stock assessments should be carried out every 3 years and that a TAC should be put in place based on stock status and other indicators. The HCR was reviewed and a new HCR, via Resolution 21/03, was put in place to set catch limits for 2021 through 2023. The latest assessment in 2023 found that the stock biomass was above its limit and target reference points, and fishing exploitation was below its limit and target reference points, using virgin biomass reference points for stock abundance and MSY reference points for fishing mortality (Fu 2023d). But catches under the previous HCR exceeded the catch limits set for 2018 to 2019, and catches in 2021 and 2022 exceeded the 2021–23 catch limit. The HCR was replaced by an MP in 2024, which confirms the virgin biomass-based reference points and creates achievable goals around stock health and TAC changes {IOTC 2024F}. The MP will be run in 2025 to set a 3-year TAC beginning in 2027, and it will be reviewed in 2032. At the 2025 Commission meeting, this TAC (stemming from the MP) was agreed on, but some provisions are in place that could result in the TAC continuing to be exceeded (Murua and Robertson 2025). But importantly, the 2025 meeting led to the passing of an allocation scheme for the current TAC (HCR-derived) and future TACs (MP-derived) (IOTC 2025d). This Resolution will look to alleviate concerns about continual exceedance of the stock's TAC, but it has not been in place long enough to determine its effectiveness. Two of the nine CPCs contributing the most to skipjack catch in the Indian Ocean objected to the catch allocation scheme, which could sway its effectiveness if their catch is not constrained in the future (ibid).

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution after its adoption, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that now it is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

All main, retained species in this fishery are managed by the IOTC. No IOTC reference points or harvest control rules/strategies exist for any shark or ray species. Skipjack tuna has reference points and a harvest control rule to limit fishing in place, but the catch in recent years has exceeded the limit in the HCR. A skipjack management procedure was developed in 2024 to replace this HCR, but the new MP was first used to set a TAC in 2025, so its effectiveness is unknown. Yellowfin tuna is no longer overfished; though rebuilding efforts had not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. Marlin species have no reference points or harvest control rules in place, despite blue marlin's overfished status and black marlin's trends toward an overfished status. Other neritic tunas and pelagic species also lack reference points and catch management measures. Based on the lack of reference points and effective harvest control rules and strategies for more than 30% of the main, retained species, management strategy and implementation is considered "ineffective" (per lines 1 and 3 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party

(CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the gillnet fishery, tunas, sharks, marlins, and related pelagic teleosts are retained (IOTC 2025a). For a full list, see the Criterion 2 Summary and the catch composition tables in the Appendices; note that all species from IOTC data are retained species.

General Management

In 2012, the IOTC implemented a measure to apply the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

Stock-Specific Management

Skipjack tuna

Though Resolution 15/10 set out MSY-based interim reference points for skipjack, Resolution 16/02, passed the following year, shifted skipjack management to virgin biomass-based reference points. This resolution also created an HCR for skipjack, and stipulated that stock assessments should be carried out every 3 years and that a TAC should be put in place based on stock status and other indicators. The HCR was reviewed and a new HCR, via Resolution 21/03, was put in place to set catch limits for 2021 through 2023. The latest assessment in 2023 found that the stock biomass was above its limit and target reference points, and fishing exploitation was below its limit and target reference points, using virgin biomass reference points for stock abundance and MSY reference points for fishing mortality (Fu 2023d). But the catches under the previous HCR exceeded the catch limits set for 2018 to 2019, and the catch in 2021 and 2022 exceeded the 2021–23 catch limit. The HCR was replaced by an MP in 2024, which confirms the virgin biomass-based reference points and creates achievable goals around stock health and TAC changes {IOTC 2024F}. The MP was run in 2025 to set a 3-year TAC beginning in 2027, and it will be reviewed in 2032. But the MP currently lacks a mechanism for constraining catch to the MP-derived level, and this must be developed by 2026 before the new TAC is in place (ibid). At the 2025 Commission meeting, this TAC (stemming from the MP) was agreed on, but some provisions are in place that could result in the TAC continuing to be exceeded (Murua and Robertson 2025).

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution after its adoption, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that now it is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

Black marlin

Though stock assessments for black marlin have been attempted by IOTC, data for the species are highly uncertain, resulting in an unknown stock status (IOTC 2022o). No reference points have been developed for the stock. Resolution 18/05 sets out management measures for billfishes, including an overall catch limit for black marlin and the option to develop or revise further management measures if this limit is exceeded (IOTC 2023b). But this catch limit has been exceeded for 2 years since 2020, with no further management measures in place (IOTC 2022o). The population is trending toward an overfished status.

Striped marlin

Striped marlin is regularly assessed by the IOTC and is considered to be overfished with overfishing occurring. The overfished status of striped marlin has been in place for over 10 years (IOTC 2023k). Although recent catches have been below MSY, they were above the limit set by Resolution 18/05. No formal reference points have been adopted for this or other billfish species. IOTC has not introduced a rebuilding plan or similar management measures to rectify the overfished status of the stock.

Blue marlin

Blue marlin is regularly assessed, but no reference points exist for this species, as with other marlins. As noted previously, Resolution 18/05 sets a catch limit, but no other management measures (e.g., to enforce this limit) are in place.

Other pelagics

Mackerels and neritic tunas do not have any reference points in place. Data-limited stock assessments are performed every few years but sometimes have conflicting results. The Scientific Committee has recommended the adoption of catch limits for neritic tunas, but no limiting measures or limit reference points have been developed. There are no management measures in place that are specific to neritic tunas or other related pelagic teleosts, and data collection for these species under Resolution 15/01 is poor. Catch limits have been suggested for some neritic tunas but not adopted. No reference points are defined for sailfish, though Resolution 18/05 does put a catch limit in place for the species. Other pelagic species lack both management measures and stock assessments.

Sharks

The IOTC has not adopted reference points for any shark species. The status of sharks in the Indian Ocean varies, though the majority are species of concern. IOTC requires catch data for shark species to be collected, but many shark species are still data poor and lack precautionary management measures.

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

All main, retained species in this fishery are managed by the IOTC. Management procedures have been adopted for skipjack, and a rebuilding plan is in place for yellowfin tuna. A catch allocation scheme was recently approved for skipjack but has not been in place long enough to determine its effectiveness. Bigeye is in the second cycle of its MP, but it is unclear if the MP's control rules are successfully controlling fishing pressure. Yellowfin tuna is no longer overfished; though rebuilding efforts have not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. The IOTC has not developed any reference points for shark species. Other pelagic teleosts lack assessments, reference points, and management measures. Based on the lack of reference points and effective harvest control rules and strategies for more than 30% of the main, retained species, and the unlikelihood that the fishery is negatively affecting these unmanaged stocks, management strategy and implementation is considered "ineffective" (per line 3 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the

handline fishery, skipjack, yellowfin, related smaller pelagic species, and shark species are retained (IOTC 2025a). For a full list, see the Criterion 2 Summary and the catch composition tables in the Appendices; note that all species from IOTC data are landed (retained) species.

General Management

In 2012, the IOTC implemented a measure to apply the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

Stock-Specific Management

Skipjack Tuna

Though Resolution 15/10 set out MSY-based interim reference points for skipjack, Resolution 16/02, passed the following year, shifted skipjack management to virgin biomass-based reference points. This resolution also created an HCR for skipjack, and stipulated that stock assessments should be carried out every 3 years and that a TAC should be put in place based on stock status and other indicators. The HCR was reviewed and a new HCR, via Resolution 21/03, was put in place to set catch limits for 2021 through 2023. The latest assessment in 2023 found that the stock biomass was above its limit and target reference points, and fishing exploitation was below its limit and target reference points, using virgin biomass reference points for stock abundance and MSY reference points for fishing mortality (Fu 2023d). But catches under the previous HCR exceeded catch limits set for 2018 to 2019, and catches in 2021 and 2022 exceeded the 2021–23 catch limit. The HCR was replaced by an MP in 2024, which confirms the virgin biomass-based reference points and creates achievable goals around stock health and TAC changes {IOTC 2024F}. The MP will be run in 2025 to set a 3-year TAC beginning in 2027, and it will be reviewed in 2032. At the 2025 Commission meeting, this TAC (stemming from the MP) was agreed on, but some provisions are in place that could result in the TAC continuing to be exceeded (Murua and Robertson 2025). But importantly, the 2025 meeting led to the passing of an allocation scheme for the current TAC (HCR-derived) and future TACs (MP-derived) (IOTC 2025d). This Resolution will look to alleviate concerns about continual exceedance of the stock's TAC, but it has not been in place long enough to determine its effectiveness. Two of the nine CPCs contributing the most to skipjack catch in the Indian Ocean objected to the catch allocation scheme, which could sway its effectiveness if their

catch is not constrained in the future (ibid).

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution after its adoption, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in the catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that now it is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

The IOTC has not adopted reference points for any shark species. The status of sharks in the Indian Ocean varies, though the majority are species of concern. IOTC requires catch data for shark species to be collected, but many shark species are still data poor and lack precautionary management measures.

Other pelagics

Smaller tunas and other pelagic teleosts (e.g., dolphinfish, amberjack) largely lack stock assessments, and they do not have reference points or management measures in place. Note that while a Seafood Watch rating for albacore caught in this fishery is provided in this assessment, the stock does not meet the SFW "main species" criteria for this fishery, so management of fishery impacts on the stock is not considered here.

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

All main, retained species in this fishery are managed by the IOTC. A management procedure has been adopted for skipjack, and a rebuilding plan is in place for yellowfin tuna. A catch allocation scheme was recently approved for skipjack but has not been in place long enough to determine its effectiveness. Yellowfin tuna is no longer overfished; though rebuilding efforts have not previously seemed effective, the 2024 stock

assessment and 2025 update indicate that high recruitment has allowed for improvement. Although some neritic tunas and mackerels are assessed, these data-poor species lack reference points and management measures. No IOTC reference points or harvest control rules/strategies exist for any shark species. Based on the lack of reference points and effective harvest control rules and strategies for more than 30% of the main, retained species, and the unlikelihood that the fishery is negatively affecting these unmanaged stocks, management strategy and implementation is considered "ineffective" (per line 3 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the troll fishery, skipjack, yellowfin, neritic tunas, sharks, and narrow-barred Spanish mackerel are retained (IOTC 2025a).

General Management

In 2012, the IOTC implemented a measure to apply the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

Stock-Specific Management

Skipjack tuna

Though Resolution 15/10 set out MSY-based interim reference points for skipjack, Resolution 16/02, passed the following year, shifted skipjack management to virgin biomass-based reference points. This resolution also created an HCR for skipjack, and stipulated that stock assessments should be carried out every 3 years and that a TAC should be put in place based on stock status and other indicators. The HCR was reviewed and a new HCR, via Resolution 21/03, was put in place to set catch limits for 2021 through 2023. The latest assessment in 2023 found that the stock biomass was above its limit and target reference points, and fishing exploitation was below its limit and target reference

points, using virgin biomass reference points for stock abundance and MSY reference points for fishing mortality (Fu 2023d). But catches under the previous HCR exceeded catch limits set for 2018 to 2019, and catches in 2021 and 2022 exceeded the 2021–23 catch limit. The HCR was replaced by an MP in 2024, which confirms the virgin biomass-based reference points and creates achievable goals around stock health and TAC changes {IOTC 2024F}. The MP will be run in 2025 to set a 3-year TAC beginning in 2027, and it will be reviewed in 2032. At the 2025 Commission meeting, this TAC (stemming from the MP) was agreed on, but some provisions are in place that could result in the TAC continuing to be exceeded (Murua and Robertson 2025). But importantly, the 2025 meeting led to the passing of an allocation scheme for the current TAC (HCR-derived) and future TACs (MP-derived) (IOTC 2025d). This Resolution will look to alleviate concerns about continual exceedance of the stock's TAC, but it has not been in place long enough to determine its effectiveness. Two of the nine CPCs contributing the most to skipjack catch in the Indian Ocean objected to the catch allocation scheme, which could sway its effectiveness if their catch is not constrained in the future (ibid).

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution after its adoption, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that now it is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

Other pelagics

Mackerels and neritic tunas do not have any reference points in place. Data-limited stock assessments are performed every few years but sometimes have conflicting results. The Scientific Committee has recommended the adoption of catch limits for neritic tunas, but no limiting measures or limit reference points have been developed. There are no management measures in place that are specific to neritic tunas or other related pelagic teleosts, and data collection for these species under Resolution 15/01 is poor. Catch limits

have been suggested for some neritic tunas but not adopted. No reference points are defined for sailfish, though Resolution 18/05 does put a catch limit in place for the species. Other pelagic species lack both management measures and stock assessments.

Sharks

The IOTC has not adopted reference points for any shark species. The status of sharks in the Indian Ocean varies, though the majority are species of concern. IOTC requires catch data for shark species to be collected, but many shark species are still data poor and lack precautionary management measures.

Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western

Highly effective

Yellowfin tuna is the sole main, retained species in the Maldivian handline fishery, and it is managed by IOTC. The stock is no longer overfished; though rebuilding efforts have not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. Although yellowfin has general management and rebuilding measures in place, and the stock has improved based on the latest assessment, it is unclear whether this improvement is attributable to IOTC's rebuilding measures, which are often not fully complied with across members. But the Maldives has fully complied with rebuilding plan stipulations, and there is a regulatory mechanism (management triggers) in place at the national level that ensures that catch allocations will continue to be complied with in the future. Therefore, management strategy and implementation is considered "highly effective" (per lines 1, 2, and 4-6 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels: see Criterion 3 Summary) through the adoption of Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the handline fishery, skipjack, yellowfin, related smaller pelagic species, and shark species are retained (IOTC 2025a). For a full list, see the Criterion 2 Summary and the catch composition tables in the Appendices; note that all species from IOTC data are landed (retained) species.

General Management

In 2012, the IOTC adopted a measure to implement the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative

impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

In the Maldives, fisheries are managed under a number of regulations, including the Fishery Law of the Maldives, the Fisheries Bill, and more specialized fisheries management plans (Kiseleva et al. 2017). These regulations stipulate allowable fishing methods and zones, as well as management controls for different fisheries. For management of tuna, the Maldives uses a Tuna Fisheries Management Plan (2021) and its subsequent amendments (Ministry of Fisheries, Marine Resources, and Agriculture 2021). This legislation details licensing requirements and specifics, establishes a committee to advise on the implementation and review of the tuna FMP, discusses monitoring and surveillance operations, and outlines consequences for rule-breaking. The regulation covers skipjack, yellowfin, bigeye, frigate, and kawakawa tunas (ibid). Further, the regulation prevents fishers from targeting, landing, and harming protected species, and it requires vessels to land all targeted species that are fit for human consumption. The plan highlights the need to maintain the longevity of the fishery and its resources and lays out several tasks for the Maldivian fisheries ministry, including an FAD management plan, continued incorporation of IOTC measures into national legislation, an e-observer program, and national plans of action regarding overfished stocks and illegal, unreported, and unregulated fishing (IUU), though it does not include yellowfin-specific or skipjack-specific management measures (ibid). In 2025, a Standard Operating Procedure (SOP) for managing tuna catch limits was created; this legislation details management triggers for keeping skipjack, yellowfin, and bigeye catch in the Maldives within limits determined by the IOTC, filling the previous gap in stock-specific management in the Maldives (Ministry of Fisheries and Ocean Resources 2025). Current work is being carried out to implement an electronic logbook program, which will improve data collection, and the creation of a Strategic Action Plan focused on continued improvements in yellowfin and skipjack managem

Stock-Specific Management

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b).

Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a). Despite these challenges at the RFMO level, the Maldives' average catch has declined by over 50%, well beyond the amount dictated in Resolution 21/01 (ibid). Management triggers that slow and halt processor purchasing of yellowfin will be used in 2026 onward in the Maldives to ensure that the national catch does not exceed the stipulated limit (Ministry of Fisheries and Ocean Resources 2025).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that now it is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Highly effective

Main, retained species in the Maldivian pole-and-line fishery include skipjack and yellowfin, both of which are managed by IOTC. Skipjack tuna has reference points and a harvest control rule to limit fishing in place, but catch across all IOTC members in recent years has exceeded the limit set out in the HCR. A skipjack management procedure was developed in 2024 to replace this HCR, but a catch allocation scheme for the HCR and the MP was not established until 2025, so its effectiveness is unknown. Yellowfin tuna is no longer overfished; though rebuilding efforts have not previously seemed effective, the 2024 stock assessment and 2025 update indicate that high recruitment has allowed for improvement. The Maldives has fully complied with yellowfin rebuilding plan stipulations, and there are regulatory mechanisms (management triggers) in place at the national level that ensure that catch allocations will continue to be complied with in the future for both yellowfin and skipjack. Because the latest assessments suggest that skipjack and yellowfin stocks are healthy, and Maldivian legislation ensures that catch limits will be followed at the national level, management strategy and implementation is considered "highly effective" (per lines 1, 2, and 4-6 in table 3.1.1 of the Seafood Watch Standard).

Supplementary Information

IOTC manages the impacts of Contracting Party and Cooperating Non-Contracting Party (CPC) fisheries on the stocks under its mandate (i.e., tunas, swordfish, marlins, sailfish, Spanish and king mackerels; see Criterion 3 Summary) through the adoption of

Recommendations and Resolutions (collectively, Conservation and Management Measures [CMMs]), which CPCs are expected to implement for their fisheries. In the pole-and-line fishery, skipjack, yellowfin, related smaller pelagic species, and shark species are retained (IOTC 2025a). For a full list, see the Criterion 2 Summary and the catch composition tables in the Appendices; note that all species from IOTC data are landed (retained) species.

General Management

In 2012, the IOTC implemented a measure to apply the precautionary approach, which included the use of stock-specific reference points, associated harvest control rules, the ability to enact emergency measures in the face of natural phenomena having a negative impact on resources, and evaluation of the performance of reference points and potential harvest control rules through management strategy evaluation (IOTC 2013l). Since then, a number of CMMs have been adopted that are not species-specific but apply to target species more broadly. These include mandates for recording and reporting of information (IOTC 2015b), limiting fishing capacity (IOTC 2015d), and recording of active fishing vessels in the IOTC area (IOTC 2014b). Resolution 15/10 by IOTC created interim MSY-based reference points for IOTC-managed tuna species, as well as guidance for how to treat stocks based on their status relative to those reference points (IOTC 2015d).

In the Maldives, fisheries are managed under a number of regulations, including the Fishery Law of the Maldives, the Fisheries Bill, and more specialized fisheries management plans (Kiseleva et al. 2017). These regulations stipulate allowable fishing methods and zones, as well as management controls for different fisheries. For management of tuna, the Maldives uses a Tuna Fisheries Management Plan (2021) and its subsequent amendments (Ministry of Fisheries, Marine Resources, and Agriculture 2021). This legislation details licensing requirements and specifics, establishes a committee to advise on the implementation and review of the tuna FMP, discusses monitoring and surveillance operations, and outlines consequences for rule-breaking. The regulation covers skipjack, yellowfin, bigeye, frigate, and kawakawa tunas (ibid). Further, the regulation prevents fishers from targeting, landing, and harming protected species, and it requires vessels to land all targeted species that are fit for human consumption. The plan highlights the need to maintain the longevity of the fishery and its resources and lays out several tasks for the Maldivian fisheries ministry, including an FAD management plan, continued incorporation of IOTC measures into national legislation, an e-observer program, and national plans of action regarding overfished stocks and IUU, though it does not include yellowfin-specific or skipjack-specific management measures (ibid). In 2025, a Standard Operating Procedure (SOP) for managing tuna catch limits was created; this legislation details management triggers for keeping skipjack, yellowfin, and bigeye catch in the Maldives within limits determined by the IOTC, filling the previous gap in stock-specific management in the Maldives (Ministry of Fisheries and Ocean Resources 2025). Current work is being carried out to implement an electronic logbook program, which will improve data collection, and the creation of a Strategic Action Plan focused on continued

improvements in yellowfin and skipjack management.

Stock-Specific Management

Skipjack tuna

Though Resolution 15/10 set out MSY-based interim reference points for skipjack, Resolution 16/02, passed the following year, shifted skipjack management to virgin biomass-based reference points. This resolution also created an HCR for skipjack, and stipulated that stock assessments should be carried out every 3 years and that a TAC should be put in place based on stock status and other indicators. The HCR was reviewed and a new HCR, via Resolution 21/03, was put in place to set catch limits for 2021 through 2023. The latest assessment in 2023 found that the stock biomass was above its limit and target reference points, and fishing exploitation was below its limit and target reference points, using virgin biomass reference points for stock abundance and MSY reference points for fishing mortality (Fu 2023d). But catches under the previous HCR exceeded catch limits set for 2018 to 2019, and catches in 2021 and 2022 exceeded the 2021–23 catch limit. The HCR was replaced by an MP in 2024, which confirms the virgin biomass-based reference points and creates achievable goals around stock health and TAC changes {IOTC 2024F}. The MP will be run in 2025 to set a 3-year TAC beginning in 2027, and it will be reviewed in 2032. At the 2025 Commission meeting, this TAC (stemming from the MP) was agreed on, but some provisions are in place that could result in the TAC continuing to be exceeded (Murua and Robertson 2025). But importantly, the 2025 meeting led to the passing of an allocation scheme for the current TAC (HCR-derived) and future TACs (MP-derived) (IOTC 2025d). This Resolution was cosponsored by the Maldives and will look to alleviate concerns about continual exceedance of the stock's TAC, but it has not been in place long enough to determine its effectiveness. Two of the nine CPCs contributing the most to skipjack catch in the Indian Ocean objected to the catch allocation scheme, which could sway its effectiveness if their catch is not constrained in the future (ibid). But in the Maldives, new management triggers have been developed to ensure that the national catch remains below the 2025–26 catch limit via the use of data review and processor limits (Ministry of Fisheries and Ocean Resources 2025).

Yellowfin tuna

Yellowfin tuna was overfished in the Indian Ocean from 2015 to 2021. In response to the stock's multiyear (since 2015) overfished status, the IOTC has passed several rebuilding plans (Resolutions 16/01, 17/01, 18/01, and 19/01), none of which seemed to be successful in rebuilding the stock (WWF 2023). In 2021, Resolution 21/01 was passed, which put a TAC in place for yellowfin tuna. But a number of CPCs objected to this resolution, allowing them to opt out of IOTC-mandated catch limits for the species (IOTC 2023b). Further, other IOTC members have noted their refusal to comply with catch reductions until these objectors agree to rebuilding resolutions (Heidrich et al. 2023). This has resulted in catch reductions from the rebuilding plans and TAC setting to be offset by those nations with fisheries that are able to exceed catch limits (IOTC 2024a). Despite

these challenges at the RFMO level, the Maldives' average catch has declined by over 50%, well beyond the amount dictated in Resolution 21/01 (ibid). Management triggers that slow and halt processor purchasing of yellowfin will be used in 2026 onward in the Maldives to ensure that the national catch does not exceed the stipulated limit (Ministry of Fisheries and Ocean Resources 2025).

In the early 2020s, the yellowfin stock was projected to collapse in 2027 unless total catch across CPCs decreased (WWF 2023). But the 2024 stock assessment and its follow-up 2025 revision indicated a sharp increase in stock health, with recruitment in the 2020s being high and the stock no longer considered overfished or undergoing overfishing (IOTC 2024b). Because of uncertainties in the 2024 assessment, some tweaks were made in 2025, and the Scientific Committee noted in its December 2025 meeting that now it is comfortable using the assessment results to set a 2026–27 TAC (IOTC 2025g).

3.2 Bycatch Strategy

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

A number of vulnerable taxa are caught as bycatch in longline and gillnet fisheries for tunas and large pelagics in the Indian Ocean (see the Criterion 2 summary and the Appendices). The IOTC has adopted a number of measures to mitigate the impacts on these taxa, and vessels that target southern bluefin tuna are required to adhere to IOTC regulations (CCSBT 2018; IOTC 2023b). These include the reporting of interactions, the prohibition of retention of some sharks and mobulid rays, a prohibition of setting on mammals, and general calls for safe handling and release techniques to be employed and the availability of tools to do so. CCSBT has also adopted its own strategies and measures for seabird bycatch mitigation. But many measures allow for exemptions and/or have not been implemented by CPCs. The catch of vulnerable taxa, especially shark species, continues to be an issue in Indian Ocean tuna fisheries. Therefore, bycatch strategy is considered "ineffective" for longline and gillnet fisheries in this assessment (per line 1 in table 3.2.1 of the Seafood Watch Standard).

Supplementary Information

Sharks

The 1999 International Plan of Action for the Conservation and Management of Sharks

developed by the FAO underpins the shark conservation measures of the IOTC (IOTC 2021f). The IPOA-Sharks prescribes specific aims, such as ensuring that shark catch is sustainable, assessing fishing impacts (especially for vulnerable shark stocks), improving coordination between states, and minimizing discards. All CPCs are required to prepare a periodic Shark Assessment Report (SAR) with "the aim of identifying conservation, management and any other issues associated with the shark catch." Any issues identified can then be addressed by each CPC in a National Plan of Action (IOTC 2021f). Although many sharks are seen in the landings data for IOTC fisheries, bycatch summary data suggest that, on longlines, many sharks may also be discarded, so it is likely that some shark species are retained and others are discarded, though the exact percentage breakdown between retentions and discards is unknown.

IOTC has issued a number of specific and binding Conservation and Management Measures related to sharks:

- Oceanic whitetip shark: Per Resolution 13/06, retention is banned, and discarded sharks are required to be released unharmed (IOTC 2023b). This applies to all gear types, and catch and discard reporting is encouraged. But there are exemptions for artisanal fleets operating exclusively in EEZs and for the purpose of local consumption, and 13/06 is not binding on India (which objected to it), so some vessels are excluded from the requirements. In addition, there are no mitigation measures required before capture, and 13/06 does not specify how the sharks should be released unharmed. Finally, it is not clear how often the effectiveness of the measure is evaluated, if at all. Industrial vessels of several CPC nations have reported retained catches of oceanic whitetip shark since the passing of this resolution (IOTC 2023a).
- Thresher shark: Per Resolution 12/09, retention is banned, and discarded sharks are required to be released unharmed (IOTC 2023b). This applies to all fisheries, both industrial and artisanal.
- Whale shark: Per Resolution 13/05, purse seine fleets are required to avoid setting on whale shark and to ensure its safe release if set upon by accident (IOTC 2023b). The Resolution also requires documentation and reporting of interactions, and for purse seine fleets to adopt non-entangling FADs. The Resolution does not cover gillnet fleets and allows exemptions for artisanal fisheries in EEZs.
- Blue shark: Per resolution 18/02, additional reporting requirements and catch data collection programs are in place, and scientific and management measures are encouraged but not established or enforced (ibid).
- Mako, hammerhead silky, and other sharks: No species-specific CMMs (Resolutions or Recommendations), but there are CMMs for sharks generally (Martin and Shahid 2021) that adopt the aims of the FAO IPOA-Sharks as previously summarized. General shark CMMs focus on reporting requirements rather than conservation measures.
- At its 2025 meeting, the Commission adopted best-handling practices for sharks and rays (Murua and Robertson 2025).

Seabirds

Similar to measures for sharks, the FAO developed an IPOA-Seabirds in 1998 (IOTC 2021f). The original purpose of addressing concerns with longline fishing was expanded to include advice on trawl and gillnet fisheries. There is a single active IOTC resolution on seabirds, Resolution 23/07, which is an update of several earlier resolutions. The Resolution reflects the IOTC's and CPCs' ultimate aim of zero bycatch of seabirds in fisheries under the IOTC's purview. The Resolution requires reporting of seabird bycatch, reporting on how the Resolution is being implemented, and that CPCs seek to reduce seabird bycatch through the use of effective mitigation measures (with consideration given to crew safety and the practicability of the measures). The Resolution also stipulates mitigation measures (i.e., night setting with minimum deck lighting, bird-scaring/tori lines, and line weighting) and minimum technical and deployment specifications, and that at least two of these measures be used by all longline vessels operating below lat. 25º S. (IOTC 2023b). The CCSBT has a recommendation list for mitigating seabird bycatch, which includes implementing IPOAs, collecting and reporting interaction data, the use of hook shields, and the ability to perform risk assessments (CCSBT 2019f). But as a recommendation, this document does not include binding conservation measures for Members and CNMS.

Sea turtles

Although FAO has not developed an IPOA for turtles, it did adopt "Guidelines to Reduce Sea Turtle Mortality in Fishing Operations" in 2005 (IOTC 2021f). The IOTC subsequently adopted legally binding text within Resolution 09/06, later superseded with Resolution 12/04, requiring that all member states implement the FAO guidelines (IOTC 2023b). In addition to establishing reporting requirements across all fisheries, the Resolution requires (and specifies) safe handling and recovery techniques to maximize the survivorship of captured turtles, including line cutters and dehookers on longline vessels and specific measures for purse seiners, such as dip nets and stopping operations until turtles are freed. All CPCs are "requested" to undertake research on mitigation methods, including circle hooks, different baits, and alternative FADs and gillnet designs (IOTC 2023b).

Marine mammals

The IOTC has one active CMM for cetaceans (Resolution 23/06) (IOTC 2025e). Resolution 13/04, which was superseded by 23/06, established reporting requirements for all fisheries, and specific measures for purse seine fisheries such as a prohibition on intentionally setting on mammals, requirements for safe handling and release techniques after incidental capture, and the adoption of FAD designs that reduce entanglement. As with sharks and seabirds, artisanal vessels operating in their EEZs are exempt from these rules. The reporting requirements are waived for member states that have their own legislation for protecting mammals (IOTC 2023b; Martin and Shahid 2021). Resolution 23/06 includes similar language around reporting requirements, intentional purse seine

setting, and safe handling and release techniques. In addition, 23/06 asked the Scientific Committee to both develop marine mammal handling and release best-practices guidelines by 2025 and create recommendations for mitigating IOTC impacts on cetaceans by 2025, given their status in the Indian Ocean (IOTC 2023b). This Resolution does not apply to artisanal EEZ fishers, though these vessels are encouraged to release marine mammals unharmed. But the Commission did not adopt these anticipated best practices for cetaceans at its 2025 meeting (Murua and Robertson 2025).

Mobulids

The IOTC has adopted a single CMM on the conservation of mobulid rays, which includes manta rays (Resolution 19/03) (IOTC 2023b). The Resolution prohibits targeted fishing, retention, and transshipment, and it requires (and specifies) training, safe handling, and release techniques. Mobulid rays that are accidentally brought to land cannot be sold but may be used for domestic human consumption. Subsistence fisheries are exempt (IOTC 2023b; Martin and Shahid 2021). Further best-handling practices were adopted at the Commission's 2025 meeting (Murua and Robertson 2025).

Implementation by CPCs

The preceding resolutions for turtles, seabirds, and cetaceans all have requirements for reporting interactions with these taxa to the IOTC. Resolution 12/04 requires an annual evaluation of turtle interactions by the IOTC Scientific Committee. But the committee has not undertaken such an evaluation to date because of a lack of reporting by CPCs (IOTC 2021g). For seabirds, Resolution 12/06 required an evaluation in 2016. At that time, the frequency of use of each of the three required measures (night setting, tori lines, and line weighting) was poorly known, and data collection by CPCs was not meeting requirements. But the preliminary information did suggest that measures currently in use may be proving effective in some cases, though some conflicting aspects required further exploration (IOTC 2022h). The new Resolution on cetaceans does not have an evaluation requirement, nor did the previous Resolution. Data collection (and provision to the IOTC) has been scattered to date, and likely severely underestimates interactions and mortalities (IOTC 2021j). The latest bycatch data review confirms that discards reporting is largely scarce and incomplete (IOTC WPEB 2024).

In addition, CPCs are required to submit annual updates on progress toward meeting the requirements established. Many states have not yet completed (or even started) work toward meeting the IPOA-Sharks, IPOA-Seabirds, or the requirements for turtle bycatch mitigation, despite these requirements having been in place since the late 1990s (seabirds and sharks) and 2005 (turtles).

Table 12: Status of development and implementation of National Plans of Action (NPOA) for seabirds and sharks and implementation of the FAO Guidelines to Reduce Marine Turtle Mortality in Fishing Operations (2023) [summarized from Appendix 5 in (IOTC 2023k)]. Green: completed; yellow: drafting being finalized; orange: drafting commenced; red: not begun; white: exempted because that CPC's fisheries do not catch these taxa. Note: in 2023, Senegal did not renew its CNCP status, so it is not included.

CPC	Sharks	Seabirds	Turtles
Members			
Australia			
Bangladesh			
China			
Taiwan, China			
Comoros			
Eritrea			
European Union			
France (territories)			
India			
Indonesia			
Iran, Islamic Republic of			
Japan			
Kenya			
Korea, Republic of			
Madagascar			
Malaysia			
Maldives, Republic of			
Mauritius			
Mozambique			

Oman, Sultanate of			
Pakistan			
Philippines			
Seychelles, Republic of			
Somalia			
South Africa, Republic of			
Sri Lanka			
Sudan			
Tanzania, United Republic of			
Thailand			
United Kingdom			
Yemen			
Cooperating Noncontracting Parties			
Liberia			

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Moderately Effective

A number of vulnerable taxa are caught as bycatch in purse seine fisheries for tunas and large pelagics in the Indian Ocean (see the Criterion 2 Summary and the Appendices). Most IOTC bycatch information for purse seines stems from the industrial dFAD fleets, but information on a similar coastal fleet in the WCPO suggests that sharks and turtles may interact with the aFAD fishery but are not at significant risk (Fishery Progress 2024). The IOTC has adopted a number of measures to mitigate the impacts on these taxa (IOTC 2025e). These include the reporting of interactions, the prohibition of retention of some sharks and mobulid rays, and general calls for safe handling and release techniques to be employed and the availability of tools to do so. In addition, IOTC will require that only fully non-entangling (nonmesh) drifting FADs be used by 2029, with a movement toward

increasingly biodegradable FAD use before then. The catch of vulnerable taxa, especially shark species, continues to be an issue in Indian Ocean tuna fisheries, though sharks are likely at lower risk from the smaller, coastal purse seine fishery (Fishery Progress 2024). New FAD measures are aimed at reducing the entanglement of nontarget species, but the effectiveness of these measures is unknown because of their novelty, so bycatch strategy is considered "moderately effective" (per line 3 in table 3.2.1 of the Seafood Watch Standard).

Supplementary Information

Sharks

The 1999 International Plan of Action for the Conservation and Management of Sharks developed by the FAO underpins the shark conservation measures of the IOTC (IOTC 2021f). The IPOA-Sharks prescribes specific aims, such as ensuring that shark catch is sustainable, assessing fishing impacts (especially for vulnerable shark stocks), improving coordination between states, and minimizing discards. All CPCs are required to prepare a periodic Shark Assessment Report (SAR) with "the aim of identifying conservation, management and any other issues associated with the shark catch." Any issues identified can then be addressed by each CPC in a National Plan of Action (IOTC 2021f). Although many sharks are seen in the landings data for IOTC fisheries, sharks are not typically retained in the purse seine fisheries. They are noted as a primary bycatch group, with silky shark making up the majority of bycaught sharks in the industrial longline fishery (IOTC WPEB 2024) (Acevedo-Iglesias et al. 2025).

IOTC has issued a number of specific and binding Conservation and Management Measures related to sharks:

- Oceanic whitetip shark: Per Resolution 25/03, landing of oceanic whitetip shark is prohibited (IOTC 2025e). This species is the second-most common shark bycatch species in industrial purse seines, though bycatch numbers are much lower for whitetip than for silky shark (Acevedo-Iglesias et al. 2025).
- Bycatch mitigation for sharks: Per Resolution 25/03, branch lines on longline vessels will be prohibited beginning in 2026, and trials will be done on wire tracers to reduce oceanic whitetip, silky, and other shark bycatch. For purse seine vessels, drifting FADs that are deployed must be increasingly biodegradable beginning in 2026, with fully non-entangling, biodegradable FADs used by 2029 (IOTC 2025e). These changes are expected to benefit sharks, sea turtles, and other vulnerable bycatch species. The use of non-entangling, biodegradable FADs may also reduce potential ghost fishing impacts from lost gear, though this and bycatch reduction impacts from changes in FAD materials cannot be confirmed until this measure has been in place longer and more data have been collected.
- Whale shark: Per Resolution 13/05, purse seine fleets are required to avoid setting on whale shark and ensure its safe release if set upon by accident (IOTC 2023b). The Resolution also requires documentation and reporting of interactions, and for

purse seine fleets to adopt non-entangling FADs. The Resolution does not cover gillnet fleets and allows exemptions for artisanal fisheries in EEZs.

- Other sharks: No species-specific CMMs have been adopted for silky shark (the top shark bycatch species in purse seines), but there are CMMs for sharks generally (Martin and Shahid 2021) that adopt the aims of the FAO IPOA-Sharks previously summarized. General shark CMMs focus on reporting requirements rather than conservation measures.
- At its 2025 meeting, the Commission adopted best-handling practices for sharks and rays (Murua and Robertson 2025).

Sea turtles

Although FAO has not developed an IPOA for turtles, it did adopt "Guidelines to Reduce Sea Turtle Mortality in Fishing Operations" in 2005 (IOTC 2021f). The IOTC subsequently adopted legally binding text within Resolution 09/06, later superseded by Resolution 12/04, requiring that all member states implement the FAO guidelines (IOTC 2023b). In addition to establishing reporting requirements across all fisheries, the Resolution requires (and specifies) safe handling and recovery techniques to maximize the survivorship of captured turtles, including line cutters and dehookers on longline vessels and specific measures for purse seiners, such as dip nets and stopping operations until turtles are freed. The Resolution also encourages the use of whole finfish bait on longlines and the adoption of FAD designs in purse seine fisheries to reduce entanglement. All CPCs are "requested" to undertake research on mitigation methods, including circle hooks, different baits, and alternative FADs and gillnet designs) (IOTC 2023b).

Implementation by CPCs

The Resolutions for sharks and turtles all have requirements for reporting interactions with these taxa to the IOTC. Resolution 12/04 requires an annual evaluation of turtle interactions by the IOTC Scientific Committee. But the committee has not undertaken such an evaluation to date because of a lack of reporting by CPCs (IOTC 2021g). Data collection (and provision to the IOTC) has been scattered to date, and likely severely underestimates interactions and mortalities (IOTC 2021j). The latest bycatch data review confirms that discards reporting is largely scarce and incomplete (IOTC WPEB 2024).

In addition, CPCs are required to submit annual updates on progress toward meeting the requirements established. Many states have not yet completed (or even started) work toward meeting the IPOA-Sharks or the requirements for turtle bycatch mitigation, despite these requirements having been in place since the late 1990s (sharks) and 2005 (turtles).

Table 13: Status of development and implementation of National Plans of Action (NPOA) for and sharks and implementation of the FAO Guidelines to Reduce Marine Turtle Mortality in Fishing Operations (2023) [summarized from Appendix 5 in (IOTC 2023k)]. Green: completed; yellow: drafting being finalized; orange: drafting commenced; red: not begun; white: exempted because

that CPC's fisheries do not catch these taxa. Note: in 2023, Senegal did not renew its CNCP status, so it is not included.

CPC	Sharks	Turtles
Members		
Australia		
Bangladesh		
China		
Taiwan, China		
Comoros		
Eritrea		
European Union		
France (territories)		
India		
Indonesia		
Iran, Islamic Republic of		
Japan		
Kenya		
Korea, Republic of		
Madagascar		
Malaysia		
Maldives, Republic of		
Mauritius		
Mozambique		
Oman, Sultanate of		
Pakistan		

Philippines		
Seychelles, Republic of		
Somalia		
South Africa, Republic of		
Sri Lanka		
Sudan		
Tanzania, United Republic of		
Thailand		
United Kingdom		
Yemen		
Cooperating Noncontracting Parties		
Liberia		

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Highly effective

Bycatch is generally low in pole-and-line fisheries [e.g., see (Kelleher 2005) and (Miller et al. 2017b)]. Landings data suggest that nontarget species are caught in small amounts, and pole-and-line fisheries generally pose little risk to ETP species such as marine mammals, seabirds, and sea turtles (see the Seafood Watch Unknown Bycatch Matrices). But sharks may be captured in pole-and-line fisheries, though likely in much smaller quantities than in other gears, and sample observer programs in the Maldives suggest that shark bycatch is not an issue in pole-and-line fisheries (Miller et al. 2017b). IOTC also has some shark measures in place, such as retention bans and data reporting requirements. Because bycatch is thought to be minimal in pole-and-line fisheries, bycatch strategy is considered “highly effective” (per table 3.2.1 of the Seafood Watch Standard).

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

A number of vulnerable taxa are caught as bycatch in purse seine fisheries for tunas and large pelagics in the Indian Ocean (see the Criterion 2 Summary and the Appendices). The IOTC has adopted a number of measures to mitigate the impacts on these taxa (IOTC 2025e). These include the reporting of interactions, the prohibition of retention of some sharks and mobulid rays, and general calls for safe handling and release techniques to be employed and the availability of tools to do so. In addition, IOTC will require that only fully non-entangling (nonmesh) drifting FADs be used by 2029, with a movement toward increasingly biodegradable FAD use before then. The catch of vulnerable taxa, especially shark species, continues to be an issue in Indian Ocean tuna fisheries. New FAD measures are aimed at reducing the entanglement of nontarget species, but some of these measures have been delayed in their implementation (see Justification) and do not follow suggested advice for the most effective ways to reduce bycatch, juvenile catch, and ghost fishing impacts from FADs. Because currently implemented measures may be insufficient to control bycatch and ghost gear impacts, bycatch strategy is considered "ineffective" (per lines 1 and 4 in table 3.2.1 of the Seafood Watch Standard).

Supplementary Information

FAD management

FADs, especially drifting FADs, pose a significant risk of ghost fishing and habitat impacts across ocean basins, including in the Indian Ocean (Sheik Heile et al. 2024). FAD management in the Indian Ocean has been criticized in the recent past, though a new dFAD measure was adopted in 2024 by the IOTC (ibid) (Van der Geest and Murua 2024). The 2024 resolution includes:

- the creation of a dFAD register in 2026 (previously introduced in Resolution 23/02)
- limits on the number of allowable dFADs per purse seine vessel (via instrumented buoy limits in 2026, with lower limits in 2028) (previously introduced at lower rates in Resolution 23/02)
- requirements for dFAD management plans for CPCs (previously introduced in Resolution 23/02)
- the submission of monitoring data for instrumented buoys (previously introduced in Resolution 23/02)
- measures to decrease dFAD loss/abandonment and improve dFAD retrieval (previously introduced in Resolution 23/02)
- increasing biodegradable and non-entangling dFAD requirements, from 2026 to 2029 (previously introduced in Resolution 23/02, with a timeline from 2026 to 2027)
- a dFAD marking scheme (previously introcued in Resolution 23/02)
- required reductions in supply vessels from 2026 to 2029 (previously introduced in Resolution 23/02 with a deadline of July 2024).

The 2024 resolution creates more restricted limits for allowable numbers of instrumented buoys, though in some cases these limits still exceed those implemented by other RFMOs,

such as WCPFC, and are higher than previous limits introduced in Resolution 23/02 (IOTC 2025e). If successfully implemented and complied with, the measure could lower the impact of both ghost and active FAD fishing on bycatch species and juvenile tunas. But the most important pieces of the resolution that could reduce ghost fishing impacts have not yet been implemented, and 100% biodegradable FADs will not be in full use until 2029. Therefore, the risks of ghost fishing from Indian Ocean FADs are still relevant in considering bycatch impacts within this fishery. Further, the need for more stringent measures has been discussed (e.g., a 3-month FAD closure), but proposed measures aligned with this thinking have not found success in the Commission (Muzaffar 2024). Scientific backing for the buoy limits introduced in the latest FAD measure is unclear, and limits are higher than those suggested by external organizations (ibid.) (WWF 2023b). A previous FAD resolution, 23/02, included all the current resolution's measures in addition to a 3-month closure of FAD fisheries (as seen in other ocean basins), but this resolution was effectively cancelled after its adoption as a result of multiple members' objections to the measure (Bloom Association 2023; IOTC 2023). Aspects of this resolution found in the current CMM, including a dFAD register, limits on the number of buoys/dFADs per vessel, and improved monitoring of dFADs, were previously set to begin in 2024, but the effective cancellation (via objections) of the previous measure has pushed back the timeline for effectively reducing impacts of FADs in the Indian Ocean.

Sharks

The 1999 International Plan of Action for the Conservation and Management of Sharks developed by the FAO underpins the shark conservation measures of the IOTC (IOTC 2021f). The IPOA-Sharks prescribes specific aims, such as ensuring that shark catch is sustainable, assessing fishing impacts (especially for vulnerable shark stocks), improving coordination between states, and minimizing discards. All CPCs are required to prepare a periodic Shark Assessment Report (SAR) with "the aim of identifying conservation, management and any other issues associated with the shark catch." Any issues identified can then be addressed by each CPC in a National Plan of Action (IOTC 2021f). Although many sharks are seen in the landings data for IOTC fisheries, sharks are not typically retained in the purse seine fisheries. They are noted as a primary bycatch group, with silky shark making up the majority of bycaught sharks in the industrial longline fishery (IOTC WPEB 2024) (Acevedo-Iglesias et al. 2025).

IOTC has issued a number of specific and binding Conservation and Management Measures related to sharks:

- Oceanic whitetip shark: Per Resolution 25/03, landing of oceanic whitetip shark is prohibited (IOTC 2025e). This species is the second-most common shark bycatch species in industrial purse seines, though bycatch numbers are much lower for whitetip than for silky shark (Acevedo-Iglesias et al. 2025).
- Bycatch mitigation for sharks: Per Resolution 25/03, branch lines on longline vessels will be prohibited beginning in 2026, and trials will be done on wire tracers

to reduce oceanic whitetip, silky, and other shark bycatch. For purse seine vessels, drifting FADs that are deployed must be increasingly biodegradable beginning in 2026, with fully non-entangling, biodegradable FADs used by 2029 (IOTC 2025e). These changes are expected to benefit sharks, sea turtles, and other vulnerable bycatch species. The use of non-entangling, biodegradable FADs may also reduce potential ghost fishing impacts from lost gear, though this and bycatch reduction impacts from changes in FAD materials cannot be confirmed until this measure has been in place longer and more data have been collected.

- Whale shark: Per Resolution 13/05, purse seine fleets are required to avoid setting on whale shark and ensure its safe release if set upon by accident (IOTC 2023b). The Resolution also requires documentation and reporting of interactions, and for purse seine fleets to adopt non-entangling FADs. The Resolution does not cover gillnet fleets and allows exemptions for artisanal fisheries in EEZs.
- Other sharks: No species-specific CMMs have been adopted for silky shark (the top shark bycatch species in purse seines), but there are CMMs for sharks generally (Martin and Shahid 2021) that adopt the aims of the FAO IPOA-Sharks previously summarized. General shark CMMs focus on reporting requirements rather than conservation measures.
- At its 2025 meeting, the Commission adopted best handling practices for sharks and rays (Murua and Robertson 2025).

Sea turtles

Although FAO has not developed an IPOA for turtles, it did adopt "Guidelines to Reduce Sea Turtle Mortality in Fishing Operations" in 2005 (IOTC 2021f). The IOTC subsequently adopted legally binding text within Resolution 09/06, later superseded by Resolution 12/04, requiring that all member states implement the FAO guidelines (IOTC 2023b). In addition to establishing reporting requirements across all fisheries, the Resolution requires (and specifies) safe handling and recovery techniques to maximize the survivorship of captured turtles, including line cutters and dehookers on longline vessels and specific measures for purse seiners, such as dip nets and stopping operations until turtles are freed. The Resolution also encourages the use of whole finfish bait on longlines and the adoption of FAD designs in purse seine fisheries to reduce entanglement. More recent resolutions have implemented a rollout plan for the full use of non-entangling FADs (IOTC 2025e). All CPCs are "requested" to undertake research on mitigation methods, including circle hooks, different baits, and alternative FADs and gillnet designs (IOTC 2023b).

Implementation by CPCs

The resolutions for sharks and turtles all have requirements of reporting interactions with these taxa to the IOTC. Resolution 12/04 requires an annual evaluation of turtle interactions by the IOTC Scientific Committee. But the committee has not undertaken such an evaluation to date because of a lack of reporting by CPCs (IOTC 2021g). Data

collection (and provision to the IOTC) has been scattered to date, and likely severely underestimates interactions and mortalities (IOTC 2021j). The latest bycatch data review confirms that discards reporting is largely scarce and incomplete (IOTC WPEB 2024).

In addition, CPCs are required to submit annual updates on progress toward meeting the requirements established. Many states have not yet completed (or even started) work toward meeting the IPOA-Sharks or the requirements for turtle bycatch mitigation, despite these requirements having been in place since the late 1990s (sharks) and 2005 (turtles).

Status of development and implementation of National Plans of Action (NPOA) for and sharks and implementation of the FAO Guidelines to Reduce Marine Turtle Mortality in Fishing Operations (2023) (summarized from Appendix 5 in (IOTC 2023k)). Key: Green=Completed, Yellow=Drafting being finalized, Orange=Drafting commenced, Red=Not begun, White=exempted because that CPC's fisheries do not catch these taxa. Note that in 2023, Senegal did not renew its CNCP status, thus it is not included below.

Table 14: Status of development and implementation of National Plans of Action (NPOA) for sharks and implementation of the FAO Guidelines to Reduce Marine Turtle Mortality in Fishing Operations (2023) [summarized from Appendix 5 in (IOTC 2023k)]. Green: completed; yellow; drafting being finalized; orange: drafting commenced; red: not begun; white: exempted because that CPC's fisheries do not catch these taxa. Note: in 2023, Senegal did not renew its CNCP status, so it is not included.

CPC	Sharks	Turtles
Members		
Australia		
Bangladesh		
China		
Taiwan, China		
Comoros		
Eritrea		
European Union		
France (territories)		
India		
Indonesia		
Iran, Islamic Republic of		

Japan		
Kenya		
Korea, Republic of		
Madagascar		
Malaysia		
Maldives, Republic of		
Mauritius		
Mozambique		
Oman, Sultanate of		
Pakistan		
Philippines		
Seychelles, Republic of		
Somalia		
South Africa, Republic of		
Sri Lanka		
Sudan		
Tanzania, United Republic of		
Thailand		
United Kingdom		
Yemen		
Cooperating Noncontracting Parties		
Liberia		

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

Bycatch is minimal in handline and troll line fisheries, which primarily catch tuna (including neritic tunas) and retain both target and nontarget tuna species (e.g., mackerels and neritic tunas). But some shark species are captured in these fisheries. IOTC has some measures in place focused on sharks, including retention bans for certain species, best-handling practices (though primarily for longlines), and data reporting requirements. Because of these fisheries' captures of sharks, with some management in place, but with minimal other bycatch, bycatch strategy is considered "moderately effective" (per line 2 in table 3.2.1 of the Seafood Watch Standard).

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

A number of vulnerable taxa are caught as bycatch in purse seine fisheries for tunas and large pelagics in the Indian Ocean (see the Criterion 2 Summary and the Appendices). The IOTC has adopted a number of measures to mitigate the impacts on these taxa (IOTC 2025e). These include the reporting of interactions, the prohibition of retention of some sharks and mobulid rays, and general calls for safe handling and release techniques to be employed and the availability of tools to do so. The catch of vulnerable taxa, especially shark and ray species, continues to be an issue in Indian Ocean tuna fisheries, but some management is in place. Unassociated purse seines have fewer bycatch interactions than FAD-set fisheries, but it is unclear how effective general IOTC shark, ray, and turtle mitigation measures are; thus, bycatch strategy is considered "moderately effective" (per line 2 in table 3.2.1 of the Seafood Watch Standard).

Supplementary Information

Mobulids

The IOTC has adopted a single CMM on the conservation of mobulid rays, which includes manta rays (Resolution 19/03) (IOTC 2023b). The Resolution prohibits targeted fishing, retention, and transshipment, and it requires (and specifies) training, safe handling, and release techniques. Mobulid rays that are accidentally brought to land cannot be sold but may be used for domestic human consumption. Subsistence fisheries are exempt (IOTC 2023b; Martin and Shahid 2021). Further best-handling practices were adopted at the Commission's 2025 meeting (Murua and Robertson 2025).

Sharks

The 1999 International Plan of Action for the Conservation and Management of Sharks developed by the FAO underpins the shark conservation measures of the IOTC (IOTC 2021f). The IPOA-Sharks prescribes specific aims, such as ensuring that shark catch is sustainable, assessing fishing impacts (especially for vulnerable shark stocks), improving coordination between states, and minimizing discards. All CPCs are required to prepare a

periodic Shark Assessment Report (SAR) with "the aim of identifying conservation, management and any other issues associated with the shark catch." Any issues identified can then be addressed by each CPC in a National Plan of Action (IOTC 2021f). Though many sharks are seen in the landings data for IOTC fisheries, sharks are not typically retained in the purse seine fisheries. They are noted as a primary bycatch group, with silky shark making up the majority of bycaught sharks in the industrial longline fishery (IOTC WPEB 2024) (Acevedo-Iglesias et al. 2025).

IOTC has issued a number of specific and binding Conservation and Management Measures related to sharks:

- Oceanic whitetip shark: Per Resolution 25/03, landing of oceanic whitetip shark is prohibited (IOTC 2025e). This species is the second-most common shark bycatch species in industrial purse seines, though bycatch numbers are much lower for whitetip than for silky shark (Acevedo-Iglesias et al. 2025).
- Whale shark: Per Resolution 13/05, purse seine fleets are required to avoid setting on whale shark and ensure its safe release if set upon by accident (IOTC 2023b). The Resolution also requires documentation and reporting of interactions, and for purse seine fleets to adopt non-entangling FADs. The Resolution does not cover gillnet fleets and allows exemptions for artisanal fisheries in EEZs.
- Other sharks: No species-specific CMMs have been adopted for silky shark (the top shark bycatch species in purse seines), but there are CMMs for sharks generally (Martin and Shahid 2021) that adopt the aims of the FAO IPOA-Sharks previously summarized. General shark CMMs focus on reporting requirements rather than conservation measures.
- At its 2025 meeting, the Commission adopted best-handling practices for sharks and rays (Murua and Robertson 2025).

Sea turtles

Although FAO has not developed an IPOA for turtles, they did adopt "Guidelines to Reduce Sea Turtle Mortality in Fishing Operations" in 2005 (IOTC 2021f). The IOTC subsequently adopted legally binding text within Resolution 09/06, later superseded by Resolution 12/04, requiring that all member states implement the FAO guidelines (IOTC 2023b). In addition to establishing reporting requirements across all fisheries, the Resolution requires (and specifies) safe handling and recovery techniques to be used to maximize the survivorship of captured turtles, including line cutters and dehookers on longline vessels and specific measures for purse seiners, such as dip nets and stopping operations until turtles are freed.

Though both sea turtle and shark interactions occur in both unassociated and FAD sets, they are significantly lower in unassociated purse seine sets (Acevedo-Iglesias et al. 2025). More focus is put into reducing FAD bycatch interactions than unassociated set bycatch interactions because of the increased risk that FADs pose.

Implementation by CPCs

The resolutions for sharks and turtles all have requirements of reporting interactions with these taxa to the IOTC. Resolution 12/04 requires an annual evaluation of turtle interactions by the IOTC Scientific Committee. But the committee has not undertaken such an evaluation to date because of a lack of reporting by CPCs (IOTC 2021g). Data collection (and provision to the IOTC) has been scattered to date, and likely severely underestimates interactions and mortalities (IOTC 2021j). The latest bycatch data review confirms that discards reporting is largely scarce and incomplete (IOTC WPEB 2024).

In addition, CPCs are required to submit annual updates on progress toward meeting the requirements established. Many states have not yet completed (or even started) work toward meeting the IPOA-Sharks or the requirements for turtle bycatch mitigation, despite these requirements having been in place since the late 1990s (sharks) and 2005 (turtles).

Table 15: Status of development and implementation of National Plans of Action (NPOA) for sharks and implementation of the FAO Guidelines to Reduce Marine Turtle Mortality in Fishing Operations (2023) [summarized from Appendix 5 in (IOTC 2023k)]. Green: completed; yellow: drafting being finalized; orange: drafting commenced; red: not begun; white: exempted because that CPC's fisheries do not catch these taxa. Note: in 2023, Senegal did not renew its CNCP status, so it is not included.

CPC	Sharks	Turtles
Members		
Australia		
Bangladesh		
China		
Taiwan, China		
Comoros		
Eritrea		
European Union		
France (territories)		
India		
Indonesia		
Iran, Islamic Republic of		
Japan		

Kenya		
Korea, Republic of		
Madagascar		
Malaysia		
Maldives, Republic of		
Mauritius		
Mozambique		
Oman, Sultanate of		
Pakistan		
Philippines		
Seychelles, Republic of		
Somalia		
South Africa, Republic of		
Sri Lanka		
Sudan		
Tanzania, United Republic of		
Thailand		
United Kingdom		
Yemen		
Cooperating Noncontracting Parties		
Liberia		

Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western

Highly effective

The Maldivian handline and pole-and-line fisheries have little to no bycatch, as evidenced both by their landings data from IOTC and research conducted in the pole-and-line fishery (Miller et al. 2017b; Jaujaree et al. 2023). Although some silky sharks have previously been reported as bycatch in the handline fishery, shark fishing in the Maldives has been banned since 2010, which has greatly reduced silky shark catch and bycatch (Miller et al. 2017b). The Maldives also has a livebait management plan in place to ensure that bait use is not too high and to decrease post-capture mortality of bait species (Lebechnech et al. 2024). Because bycatch is quite low and a strategy is in place to reduce risks to ETP species (namely sharks) and bait species, bycatch strategy is considered "highly effective" (per table 3.2.1 of the Seafood Watch Standard).

3.3 Scientific Data Collection and Analysis

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Ineffective

Of the stocks identified as main species in this Seafood Watch assessment (see the Criterion 2 summary and the Appendices), many are assessed with up-to-date and peer-reviewed stock assessments. These include albacore, bigeye, skipjack, yellowfin, and southern bluefin tunas, swordfish, blue shark, black marlin, blue marlin, striped marlin, sailfish, and several neritic tunas/mackerels. Those that do not have stock assessments include bullet and frigate tunas and most shark species, though sharks do not fall under IOTC's mandate. But the quality of data collected and made available to stock assessment scientists varies by species and by reporting country, and there are persistent issues with a lack of data and poor quality of data, despite data reporting mandates that are in place.

The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. But observer coverage in IOTC fisheries remains low: about 2% total. Compliance with IOTC Resolution 22/04, which lays out the requirements of the ROS, is about 32% (IOTC 2025b). The CCSBT has a mandate for 10% observer coverage. In 2022 and 2023, CCSBT coverage levels ranged from 0.98% to 23% between different flag states, with only Australia, Korea, and Taiwan achieving over the required level for both fishing seasons (CCSBT 2024a). But the COVID-19 pandemic affected observer rates for some countries in 2022 and previous years. Before 2021, most countries, except Indonesia, were able to make and sometimes exceed the 10% mandate (CCSBT 2020). IOTC observer coverage for the same fleets ranged from an average of 0.33% to 11.67% from 2019 to 2023, though it is expected that the pandemic also affected these levels

(IOTC 2024f).

The lack of quality data hinders a confident understanding of the impacts of the fisheries, especially where those fisheries catch rare and vulnerable species such as seabirds, turtles, mammals, and elasmobranchs (sharks and rays). Fisheries that interact the most with vulnerable bycatch species include longlines and gillnets; because of their lack of data and observers, scientific data collection and analysis is considered "ineffective" (per line 2 in table 3.3.1 of the Seafood Watch Standard).

Supplementary Information

Quality and collection of data

Several documents from IOTC note its struggles with ensuring that CPCs adhere to data mandates. In the 2023 and 2024 Scientific Committee reports, concerns were noted around uncertain stock statuses of some IOTC species from a lack of data. Reporting issues have been noted for several species, including bullet and frigate tunas, making it difficult to carry out stock assessments with confidence in their results (IOTC 2023d). Black marlin also suffers from data uncertainty and availability issues. A proposal was discussed at the 2023 Committee meeting to help resolve catch and effort data reporting issues related to Resolution 15/01, but this proposal was ultimately deferred (ibid). The Scientific Committee has further noted that three CPCs did not submit their required National Reports in 2024, which hinders proper data collection and analysis (IOTC 2024a).

Regional Observer Scheme (ROS)

IOTC recognizes the importance of fisheries observer programs to help resolve data issues and has required national governments to implement observer programs for over a decade. Resolution 11/04 (superseded by Resolution 22/04) noted the importance of fisheries observer data for stock assessments (aiding in the standardization of catch rates) and analysis of bycatch mitigation measures (IOTC 2023b). The main objective is to collect verified catch data of tuna and large pelagics in the IOTC area through the establishment of national observer programs, which began in July 2010. The ROS also monitors transshipments as part of catch data collection efforts. The Resolution sets the minimum observer coverage level at 5% for vessels of 24 m overall length and over and for vessels under 24 m if they fish outside their EEZ. Implementation by CPCs has been variable, with some meeting or even exceeding the requirement of 5% observer coverage in some fisheries, and others having not developed a national program at all. Overall, coverage remains at around 2%, which is significantly below the IOTC's requirements, and well below the levels needed to fully understand the effectiveness of bycatch mitigation measures (IOTC 2021m). The IOTC has been focused on implementing pilot projects and training options to help countries meet the current requirements of 5% observer coverage, but these were hindered by COVID-19. Pilot projects resumed at the end of 2021, and pilot deployments took place in two of the four involved countries in 2022

(IOTC 2022k; IOTC 2022q). A 2022 resolution (22/04) updated the requirements, allowing electronic monitoring to be considered along with human observers; however, that resolution did not raise the coverage requirements or require coverage for artisanal fisheries (IOTC 2023b).

To date, despite efforts to improve implementation, such as a pilot project to promote the scheme (Resolution 16/04), "national implementation of the Regional Observer Scheme remains very low among IOTC CPCs. Where observer programmes have been established, these are wide ranging and highly variable in the type and quality of information collected and the reporting of data to IOTC standards remains poor and so the data that are submitted and stored regionally are currently of little value" (IOTC 2021m). Thus, the Scientific Committee has expressed concern "that the level of coverage remains low and that there is no coverage of the artisanal fleet which comprise a large proportion of catches taken in the Indian Ocean" (IOTC 2021m). Although the CCSBT requires a higher level (10%) of observer coverage to monitor interactions with bycatch species, this level is still relatively low, making it difficult to estimate interactions with ETP species (CCSBT 2019e; BirdLife International 2019b).

Appropriate level of observer coverage

Several scientific studies suggest that coverages of at least 20% would be necessary to provide reasonable estimates of total bycatch and the bycatch of common species, while equivalent sampling for rare species would need to be at least 50% (Babcock et al 2003; Lawson 2006; Pierre 2019; Curtis and Carretta 2020). The IOTC, aware of this research, has agreed and indicated in Resolution 22/04 that the current required 5% coverage level is below the minimum needed. The Scientific Committee has also stated that increasing the required minimum level of observer coverage will help it achieve its goals related to catch and bycatch (IOTC 2022q).

Contracting parties	Total effort (no. hooks)					Observed effort (no. hooks)					Coverage rate					Average		
	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023	Effort	Coverage	Trend
Australia	373,810	241,225	241,225	-	233,220	47,047	27,710	37,109	27,802	15,290	12.59%	11.49%	15.38%		6.56%	217,896	11.67%	
Bangladesh, People's Republic of	-	-	-	-	-	-	-	-	-	-						-		
China	26,380,951	27,858,657	34,043,659	38,273,218	30,536,496	1,814,426	966,347	288,750	809,448	690,959	6.88%	3.47%	0.85%	2.11%	2.26%	31,418,596	2.91%	
Taiwan,China	207,142,582	179,463,473	169,175,506	178,619,657	157,860,339	8,829,597	4,073,449	4,063,118	5,914,505	6,553,443	4.26%	2.27%	2.40%	3.31%	4.15%	178,452,311	3.30%	
Comoros	-	-	-	-	-	-	-	-	-	-						-		
Eritrea	-	-	-	-	-	-	-	-	-	-						-		
EU,France	4,046,121	3,577,112	3,414,766	3,610,932	3,671,370	497,672	496,928	555,825	574,843	656,660	12.30%	13.89%	16.28%	15.92%	17.89%	3,664,060	15.18%	
EU,Italy	-	-	-	-	-	-	-	-	-	-						-		
EU,Portugal	810,000	593,600	648,200	488,200	501,400	139,600	-	-	-	37,794	17.23%	0.00%	0.00%	0.00%	7.54%	608,280	5.83%	
EU,Spain	2,992,243	2,654,022	2,086,803	1,982,653	3,212,085	-	49,686	-	19,559	-	0.00%	1.87%	0.00%	0.99%	0.00%	2,585,561	0.54%	
EU,United Kingdom	-	-	-	-	-	-	-	-	-	-						-		
France (OT)	-	-	-	-	-	-	-	-	-	-						-		
India	17,807,204	11,454,587	15,167,855	19,983,679	17,454,550	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	16,373,575	0.00%	
Indonesia	40,293,417	46,732,418	33,901,959	108,646,131	60,234,901	264,421	86,845	199,704	401,210	-	0.66%	0.19%	0.59%	0.37%	0.00%	57,961,765	0.33%	
Iran, Islamic Republic of	-	-	-	-	-	-	-	-	-	-						-		
Japan	20,666,375	21,648,621	22,227,264	20,163,695	19,492,548	1,998,387	1,975,168	-	-	-	9.67%	9.12%	0.00%	0.00%	0.00%	20,839,701	3.81%	
Kenya	819,786	595,542	1,067,054	1,067,054	490,395	2,400	682	-	-	-	0.29%	0.11%	0.00%	0.00%	0.00%	807,966	0.08%	
Korea, Republic of	5,899,410	4,980,671	2,131,036	1,667,422	1,421,920	277,326	-	-	279,776	-	4.70%	0.00%	0.00%	16.78%	0.00%	3,220,092	3.46%	
Madagascar	150,944	141,585	133,095	133,095	65,620	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	124,868	0.00%	
Malaysia	9,230,095	9,682,855	8,181,422	6,677,958	10,702,632	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	8,894,992	0.00%	
Maldives	165,327	-	-	-	-	-	-	-	-	-	0.00%					33,065	0.00%	
Mauritius	1,553,466	129,500	-	6,877,244	4,454,172	-	-	-	-	-	0.00%	0.00%		0.00%	0.00%	2,602,876	0.00%	
Mozambique	205,152	749,074	-	-	-	-	-	-	-	-	0.00%	0.00%				190,845	0.00%	
Oman, Sultanate of	1,743,474	817,673	1,041,675	1,268,635	1,182,924	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	1,210,876	0.00%	
Pakistan	-	-	-	-	-	-	-	-	-	-						-		
Philippines	-	-	-	-	-	-	-	-	-	-						-		
Seychelles	39,953,285	40,551,445	39,851,995	27,746,812	19,632,893	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	33,547,286	0.00%	
Somalia	-	-	-	-	-	-	-	-	-	-						-		
Sri Lanka	65,262,565	46,844,095	37,819,735	39,410,594	59,912,890	185,217	108,738	138,641	144,199	820	0.28%	0.23%	0.37%	0.37%	0.00%	49,849,976	0.23%	
South Africa	1,355,677	572,461	901,104	1,295,129	-	81,112	78,310	209,976	144,634	-	5.98%	13.68%	23.30%	11.17%		824,874	12.40%	
Sudan	-	-	-	-	-	-	-	-	-	-						-		
Tanzania	11,663	10,212	21,979	352,506	666,591	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	212,590	0.00%	
Thailand	-	-	-	-	-	-	-	-	-	-						-		
United Kingdom	621,600	270,000	-	-	-	38,163	-	-	-	-	6.14%	0.00%				178,320	4.28%	
Yemen	-	-	-	-	-	-	-	-	-	-						-		
Cooperating non-contracting parties																		
Liberia	-	-	-	-	-	-	-	-	-	-						-		
0	-	-	-	-	-	-	-	-	-	-						-		
Total	447,485,147	399,568,828	372,056,332	458,264,614	391,726,946	14,175,368	7,863,863	5,493,123	8,288,174	7,954,966	3.17%	1.97%	1.48%	1.81%	2.03%	413,820,373	2.12%	
	Total effort is ESTIMATED			Total effort is AS REPORTED		Observed effort is > total effort			Observed effort is ≤ total effort		Coverage is	Unavailable	= 0%	< 5%	≥ 5%			

Figure 10: Annual total effort and estimated observer coverage for IOTC longline fleets from 2019 to 2023. Source: (IOTC 2024f).

Ineffective

Of the stocks identified as main species in this Seafood Watch assessment (see the Criterion 2 Summary and the Appendices), only some are regularly assessed with quantitative assessments approved by the IOTC Scientific Committee. These include skipjack and yellowfin tunas, and kawakawa has also recently been assessed using data-limited methods. But the quality of data collected and made available to stock assessment scientists varies by species and by reporting country, and there are persistent issues with a lack of data and poor quality of data, despite data reporting mandates that are in place.

The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. Observer coverage in general across IOTC fisheries remains low: about 2% total. Compliance with IOTC Resolution 22/04, which lays out the requirements of the ROS, is about 32% (IOTC 2025b). Indonesian vessels make up a significant portion of this fishery, and the Indonesian fleet notably lacks observers (Harlyan et al. 2024).

The lack of quality data hinders a confident understanding of the impacts of the purse seine fisheries, especially where those fisheries catch rare and vulnerable species such as sharks and sea turtles. Although some additional information from certification programs is available, the lack of observer coverage and assessments of some main species (frigate, bullet tunas) hinders understanding of all potential impacts of the aFAD and coastal purse seine fleets; thus, scientific data collection and analysis is considered “ineffective” (per line 2 in table 3.3.1 of the Seafood Watch Standard).

Supplementary Information

Quality and collection of data

Several documents from IOTC note its struggles with ensuring that CPCs adhere to data mandates. In the 2023 and 2024 Scientific Committee reports, concerns were noted around uncertain stock statuses of some IOTC species from a lack of data. Reporting issues have been noted for several species, including bullet and frigate tunas, making it difficult to carry out stock assessments with confidence in their results (IOTC 2023d). Black marlin also suffers from data uncertainty and availability issues. A proposal was discussed at the 2023 Committee meeting to help resolve catch and effort data reporting issues related to Resolution 15/01, but this proposal was ultimately deferred (ibid). The Scientific Committee has further noted that three CPCs did not submit their required National Reports in 2024, which hinders proper data collection and analysis (IOTC 2024a).

Regional Observer Scheme (ROS)

IOTC recognizes the importance of fisheries observer programs to help resolve data issues and has required national governments to implement observer programs for over a decade. Resolution 11/04 (superseded by Resolution 22/04) noted the importance of fisheries observer data for stock assessments (standardization of catch rates) and analysis of bycatch mitigation measures (IOTC 2023b). The main objective is to collect verified catch data of tuna and large pelagics in the IOTC area through the establishment of national observer programs, which began in July 2010. The Resolution sets the minimum observer coverage level at 5% for vessels of 24 m overall length and over and vessels under 24 m if they fish outside their EEZ. Implementation by CPCs has been variable, with some meeting or even exceeding the requirement of 5% observer coverage in some fisheries, and others having not developed a national program at all. Overall, coverage remains at around 2%, which is significantly below the IOTC's requirements, and well below the levels needed to fully understand the effectiveness of bycatch mitigation measures (IOTC 2021m). The IOTC has been focused on implementing pilot projects and training options to help countries meet the current requirements of 5% observer coverage, but these were hindered by COVID-19. Pilot projects resumed at the end of 2021, and pilot deployments took place in two of the four involved countries in 2022 (IOTC 2022k; IOTC 2022q). A 2022 resolution (22/04) updated the requirements, allowing electronic monitoring to be considered along with human observers; however, that resolution did not raise the coverage requirements or require coverage for artisanal fisheries (IOTC 2023b).

To date, despite efforts to improve implementation, such as a pilot project to promote the scheme (Resolution 16/04), "national implementation of the Regional Observer Scheme remains very low among IOTC CPCs. Where observer programmes have been established, these are wide ranging and highly variable in the type and quality of information collected and the reporting of data to IOTC standards remains poor and so the data that are submitted and stored regionally are currently of little value" (IOTC 2021m). Thus, the Scientific Committee has expressed concern "that the level of coverage remains low at 2.15% and that there is no coverage of the artisanal fleet which comprise a large proportion of catches taken in the Indian Ocean" (IOTC 2021m).

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

Of the stocks identified as main species in this Seafood Watch assessment (see the Criterion 2 Summary and the Appendices), the primary tunas (yellowfin and skipjack) are assessed with up-to-date and peer-reviewed stock assessments. Frigate tuna lacks stock assessments in the Indian Ocean. The quality of data collection for capture species varies across species and reporting country. The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. But observer

coverage in IOTC fisheries remains low: about 2% total.

The lack of quality data hinders a confident understanding of the impacts of the fisheries. But this is more of a concern in fisheries that affect vulnerable species. In pole-and-line fisheries, there is less concern over such species, so scientific data collection and analysis is considered "moderately effective" (per line 1 in table 3.3.1 of the Seafood Watch Standard).

Supplementary Information

Quality and collection of data

Several documents from IOTC note its struggles with ensuring that CPCs adhere to data mandates. In the 2023 and 2024 Scientific Committee reports, concerns were noted around uncertain stock statuses of some IOTC species from a lack of data. Reporting issues have been noted for several species, including bullet and frigate tunas, making it difficult to carry out stock assessments with confidence in their results (IOTC 2023d). Black marlin also suffers from data uncertainty and availability issues. A proposal was discussed at the 2023 Committee meeting to help resolve catch and effort data reporting issues related to Resolution 15/01, but this proposal was ultimately deferred (ibid). The Scientific Committee has further noted that three CPCs did not submit their required National Reports in 2024, which hinders proper data collection and analysis (IOTC 2024a).

Regional Observer Scheme (ROS)

IOTC recognizes the importance of fisheries observer programs to help resolve data issues and has required national governments to implement observer programs for over a decade. Resolution 11/04 (superseded by Resolution 22/04) noted the importance of fisheries observer data for stock assessments (standardization of catch rates) and analysis of bycatch mitigation measures (IOTC 2023b). The main objective is to collect verified catch data of tuna and large pelagics in the IOTC area through the establishment of national observer programs, which began in July 2010. The Resolution sets the minimum observer coverage level at 5% for vessels of 24 m overall length and over and vessels under 24 m if they fish outside their EEZ. Implementation by CPCs has been variable, with some meeting or even exceeding the requirement of 5% observer coverage in some fisheries, and others having not developed a national program at all. Overall, coverage remains at around 2%, which is significantly below the IOTC's requirements, and well below the levels needed to fully understand the effectiveness of bycatch mitigation measures (IOTC 2021m). The IOTC has been focused on implementing pilot projects and training options to help countries meet the current requirements of 5% observer coverage, but these were hindered by COVID-19. Pilot projects resumed at the end of 2021, and pilot deployments took place in two of the four involved countries in 2022 (IOTC 2022k; IOTC 2022q). A 2022 resolution (22/04) updated the requirements, allowing electronic monitoring to be considered along with human observers; however,

that resolution did not raise the coverage requirements or require coverage for artisanal fisheries (IOTC 2023b). It should also be noted that existing research suggests that observers are less necessary in understanding pole-and-line fisheries' interactions with ETP species, given the low likelihood of these interactions; e.g., see (Miller et al. 2017b).

To date, despite efforts to improve implementation, such as a pilot project to promote the scheme (Resolution 16/04), "national implementation of the Regional Observer Scheme remains very low among IOTC CPCs. Where observer programmes have been established, these are wide ranging and highly variable in the type and quality of information collected and the reporting of data to IOTC standards remains poor and so the data that are submitted and stored regionally are currently of little value" (IOTC 2021m). Thus, the Scientific Committee has expressed concern "that the level of coverage remains low at 2.15% and that there is no coverage of the artisanal fleet which comprise a large proportion of catches taken in the Indian Ocean" (IOTC 2021m).

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

Of the stocks identified as main species in this Seafood Watch assessment (see the Criterion 2 Summary and the Appendices), all are regularly assessed with quantitative assessments approved by the IOTC Scientific Committee. This includes bigeye, skipjack, and yellowfin tunas. But the quality of data collected and made available to stock assessment scientists varies by species and by reporting country, and there are persistent issues with a lack of data and poor quality of data, despite data reporting mandates that are in place.

The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. Observer coverage in general across IOTC fisheries remains low: about 2% total. Compliance with IOTC Resolution 22/04, which lays out the requirements of the ROS, is about 32% (IOTC 2025b). But the industrial purse seine fleet, which is primarily flagged to France and Spain (with other flags such as Seychelles that are also operating under the EU), has fairly high coverage, with 2019–23 average rates for relevant flags ranging from 5.48% to 42.95% (IOTC 2024f). The industrial purse seine fleet has an additional voluntary observer program in place that aims for 100% coverage (Acevedo-Iglesias et al. 2025). Recent coverage from this program has resulted in about 10% of industrial purse seine catches being observed (ibid).

A lack of quality data can hinder a confident understanding of the impacts of the purse seine fisheries, especially where those fisheries catch rare and vulnerable species such as sharks and sea turtles. But the industrial FAD fleet has better observer coverage among its contributing members than many other IOTC members. Because all main species' stocks are regularly assessed and observer coverage is higher than in other IOTC fisheries, but

increased coverage would further understandings of potential bycatch impacts, data collection and analysis is considered "moderately effective" (per line 2 in table 3.3.1 of the Seafood Watch Standard).

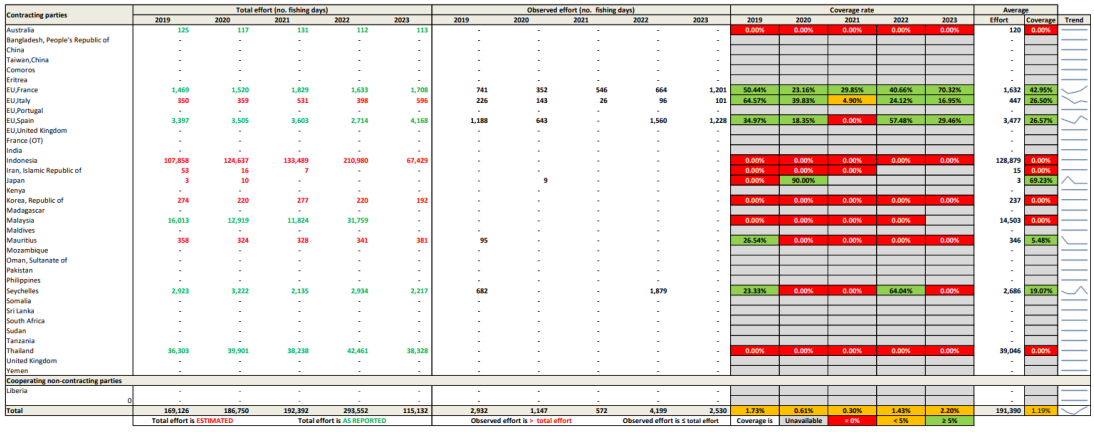
Supplementary Information

Quality and collection of data

Although data collection is an issue for some IOTC species, tropical tunas are all regularly assessed with quantitative stock assessments that are considered by the IOTC Scientific Committee.

Regional Observer Scheme (ROS)

IOTC recognizes the importance of fisheries observer programs to help resolve data issues and has required national governments to implement observer programs for over a decade. Resolution 11/04 (superseded by Resolution 22/04) noted the importance of fisheries observer data for stock assessments (standardization of catch rates) and analysis of bycatch mitigation measures (IOTC 2023b). The main objective is to collect verified catch data of tuna and large pelagics in the IOTC area through the establishment of national observer programs, which began in July 2010. The Resolution sets the minimum observer coverage level at 5% for vessels of 24 m overall length and over and vessels under 24 m if they fish outside their EEZ. Implementation by CPCs has been variable, with some meeting or even exceeding the requirement of 5% observer coverage in some fisheries, and others having not developed a national program at all. Overall, coverage remains at around 2%, which is significantly below the IOTC's requirements, and well below the levels needed to fully understand the effectiveness of bycatch mitigation measures (IOTC 2021m). But coverage in the industrial purse seine fleet is much higher than this average, allowing for a better understanding of bycatch impacts in this fishery.



Contracting parties	Total effort (no. fishing days)					Observed effort (no. fishing days)					Coverage rate					Average		Trend
	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023	Effort	Coverage	
Australia	125	117	131	112	113	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	120	0.00%	
Bangladesh, People's Republic of	-	-	-	-	-	-	-	-	-	-						-		
China	-	-	-	-	-	-	-	-	-	-						-		
Taiwan,China	-	-	-	-	-	-	-	-	-	-						-		
Comoros	-	-	-	-	-	-	-	-	-	-						-		
Eritrea	-	-	-	-	-	-	-	-	-	-						-		
EU,France	1,469	1,520	1,829	1,633	1,708	741	352	546	664	1,201	50.44%	23.16%	29.85%	40.66%	70.32%	1,632	42.95%	
EU,Italy	350	359	531	398	596	226	143	26	96	101	64.57%	39.83%	4.90%	24.12%	16.95%	447	26.50%	
EU,Portugal	-	-	-	-	-	-	-	-	-	-						-		
EU,Spain	3,397	3,505	3,603	2,714	4,168	1,188	643	-	1,560	1,228	34.97%	18.35%	0.00%	57.48%	29.46%	3,477	26.57%	
EU,United Kingdom	-	-	-	-	-	-	-	-	-	-						-		
France (OT)	-	-	-	-	-	-	-	-	-	-						-		
India	-	-	-	-	-	-	-	-	-	-						-		
Indonesia	107,858	124,637	133,489	210,980	67,429	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	128,879	0.00%	
Iran, Islamic Republic of	53	16	7	-	-	-	-	-	-	-	0.00%	0.00%	0.00%			15	0.00%	
Japan	3	10	-	-	-	-	9	-	-	-	0.00%	90.00%				3	69.23%	
Kenya	-	-	-	-	-	-	-	-	-	-						-		
Korea, Republic of	274	220	277	220	192	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	237	0.00%	
Madagascar	-	-	-	-	-	-	-	-	-	-						-		
Malaysia	16,013	12,919	11,824	31,759	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%		14,503	0.00%	
Maldives	-	-	-	-	-	-	-	-	-	-						-		
Mauritius	358	324	328	341	381	95	-	-	-	-	26.54%	0.00%	0.00%	0.00%	0.00%	346	5.48%	
Mozambique	-	-	-	-	-	-	-	-	-	-						-		
Oman, Sultanate of	-	-	-	-	-	-	-	-	-	-						-		
Pakistan	-	-	-	-	-	-	-	-	-	-						-		
Philippines	-	-	-	-	-	-	-	-	-	-						-		
Seychelles	2,923	3,222	2,135	2,934	2,217	682	-	-	1,879	-	23.33%	0.00%	0.00%	64.04%	0.00%	2,686	19.07%	
Somalia	-	-	-	-	-	-	-	-	-	-						-		
Sri Lanka	-	-	-	-	-	-	-	-	-	-						-		
South Africa	-	-	-	-	-	-	-	-	-	-						-		
Sudan	-	-	-	-	-	-	-	-	-	-						-		
Tanzania	-	-	-	-	-	-	-	-	-	-						-		
Thailand	36,303	39,901	38,238	42,461	38,328	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	39,046	0.00%	
United Kingdom	-	-	-	-	-	-	-	-	-	-						-		
Yemen	-	-	-	-	-	-	-	-	-	-						-		
Cooperating non-contracting parties																		
Liberia	-	-	-	-	-	-	-	-	-	-						-		
0																-		
Total	169,126	186,750	192,392	293,552	115,132	2,932	1,147	572	4,199	2,530	1.73%	0.61%	0.30%	1.43%	2.20%	191,390	1.19%	
	Total effort is ESTIMATED			Total effort is AS REPORTED		Observed effort is > total effort			Observed effort is ≤ total effort		Coverage is	Unavailable	= 0%	< 5%	≥ 5%			

Figure 11: Annual total effort and estimated observer coverage for purse seine fleets from 2019 to 2023. Source: (IOTC 2024f).

Moderately Effective

Of the stocks identified as main species in this Seafood Watch assessment (see the Criterion 2 Summary and the Appendices), the primary target tunas are assessed with up-to-date and peer-reviewed stock assessments. These include yellowfin and skipjack tunas. Longfin tuna is also regularly assessed via data-limited methods. Those that do not have stock assessments include associated pelagic species like greater amberjack, dolphinfish, and dogtooth tuna, as well as shark species. But the quality of data collected and made available to stock assessment scientists varies by species and by reporting country, and there are persistent issues with a lack of data and poor quality of data, despite data reporting mandates that are in place.

The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. But observer coverage in IOTC fisheries remains low: about 2% total.

The lack of quality data hinders a confident understanding of the impacts of the fisheries. But this is more of a concern in fisheries that affect vulnerable species. In handlines and trolling lines, there is less concern over such species (though some sharks are captured in these fisheries), so scientific data collection and analysis is considered “moderately effective” (per line 1 in table 3.3.1 of the Seafood Watch Standard).

Supplementary Information

Quality and collection of data

Several documents from IOTC note its struggles with ensuring that CPCs adhere to data mandates. In the 2023 and 2024 Scientific Committee reports, concerns were noted around uncertain stock statuses of some IOTC species from a lack of data. Reporting issues have been noted for several species, including bullet and frigate tunas, making it difficult to carry out stock assessments with confidence in their results (IOTC 2023d). Black marlin also suffers from data uncertainty and availability issues. A proposal was discussed at the 2023 Committee meeting to help resolve catch and effort data reporting issues related to Resolution 15/01, but this proposal was ultimately deferred (ibid). The Scientific Committee has further noted that three CPCs did not submit their required National Reports in 2024, which hinders proper data collection and analysis (IOTC 2024a).

Regional Observer Scheme (ROS)

IOTC recognizes the importance of fisheries observer programs to help resolve data issues and has required national governments to implement observer programs for over a decade. Resolution 11/04 (superseded by Resolution 22/04) noted the importance of

fisheries observer data for stock assessments (standardization of catch rates) and analysis of bycatch mitigation measures (IOTC 2023b). The main objective is to collect verified catch data of tuna and large pelagics in the IOTC area through the establishment of national observer programs, which began in July 2010. The Resolution sets the minimum observer coverage level at 5% for vessels of 24 m overall length and over and vessels under 24 m if they fish outside their EEZ. Implementation by CPCs has been variable, with some meeting or even exceeding the requirement of 5% observer coverage in some fisheries, and others having not developed a national program at all. Overall, coverage remains at around 2%, which is significantly below the IOTC's requirements, and well below the levels needed to fully understand the effectiveness of bycatch mitigation measures (IOTC 2021m). The IOTC has been focused on implementing pilot projects and training options to help countries meet the current requirements of 5% observer coverage, but these were hindered by COVID-19. Pilot projects resumed at the end of 2021, and pilot deployments took place in two of the four involved countries in 2022 (IOTC 2022k; IOTC 2022q). A 2022 resolution (22/04) updated the requirements, allowing electronic monitoring to be considered along with human observers; however, that resolution did not raise the coverage requirements or require coverage for artisanal fisheries (IOTC 2023b).

To date, despite efforts to improve implementation, such as a pilot project to promote the scheme (Resolution 16/04), "national implementation of the Regional Observer Scheme remains very low among IOTC CPCs. Where observer programmes have been established, these are wide ranging and highly variable in the type and quality of information collected and the reporting of data to IOTC standards remains poor and so the data that are submitted and stored regionally are currently of little value" (IOTC 2021m). Thus, the Scientific Committee has expressed concern "that the level of coverage remains low at 2.15% and that there is no coverage of the artisanal fleet which comprise a large proportion of catches taken in the Indian Ocean" (IOTC 2021m).

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

Of the stocks identified as main species in this Seafood Watch assessment (see the Criterion 2 Summary and the Appendices), many are assessed with up-to-date and peer-reviewed stock assessments. These include skipjack and yellowfin tunas. Other species are assessed with data-limited methods, including Spanish mackerel, longtail tuna, and kawakawa. Those that do not have stock assessments include frigate tuna and most shark species. But the quality of data collected and made available to stock assessment scientists varies by species and by reporting country, and there are persistent issues with a lack of data and poor quality of data, despite data reporting mandates that are in place.

The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. But observer coverage in IOTC fisheries remains low: about

2% total.

The lack of quality data hinders a confident understanding of the impacts of the fisheries. But this is more of a concern in fisheries that affect vulnerable species. In handlines and trolling lines, there is less concern over such species (though some sharks are captured in these fisheries), so scientific data collection and analysis is considered "moderately effective" (per line 1 in table 3.3.1 of the Seafood Watch Standard).

Supplementary Information

Quality and collection of data

Several documents from IOTC note its struggles with ensuring that CPCs adhere to data mandates. In the 2023 and 2024 Scientific Committee reports, concerns were noted around uncertain stock statuses of some IOTC species from a lack of data. Reporting issues have been noted for several species, including bullet and frigate tunas, making it difficult to carry out stock assessments with confidence in their results (IOTC 2023d). Black marlin also suffers from data uncertainty and availability issues. A proposal was discussed at the 2023 Committee meeting to help resolve catch and effort data reporting issues related to Resolution 15/01, but this proposal was ultimately deferred (ibid). The Scientific Committee has further noted that three CPCs did not submit their required National Reports in 2024, which hinders proper data collection and analysis (IOTC 2024a).

Regional Observer Scheme (ROS)

IOTC recognizes the importance of fisheries observer programs to help resolve data issues and has required national governments to implement observer programs for over a decade. Resolution 11/04 (superseded by Resolution 22/04) noted the importance of fisheries observer data for stock assessments (standardization of catch rates) and analysis of bycatch mitigation measures (IOTC 2023b). The main objective is to collect verified catch data of tuna and large pelagics in the IOTC area through the establishment of national observer programs, which began in July 2010. The Resolution sets the minimum observer coverage level at 5% for vessels of 24 m overall length and over and vessels under 24 m if they fish outside their EEZ. Implementation by CPCs has been variable, with some meeting or even exceeding the requirement of 5% observer coverage in some fisheries, and others having not developed a national program at all. Overall, coverage remains at around 2%, which is significantly below the IOTC's requirements, and well below the levels needed to fully understand the effectiveness of bycatch mitigation measures (IOTC 2021m). The IOTC has been focused on implementing pilot projects and training options to help countries meet the current requirements of 5% observer coverage, but these were hindered by COVID-19. Pilot projects resumed at the end of 2021, and pilot deployments took place in two of the four involved countries in 2022 (IOTC 2022k; IOTC 2022q). A 2022 resolution (22/04) updated the requirements, allowing electronic monitoring to be considered along with human observers; however,

that resolution did not raise the coverage requirements or require coverage for artisanal fisheries (IOTC 2023b).

To date, despite efforts to improve implementation, such as a pilot project to promote the scheme (Resolution 16/04), "national implementation of the Regional Observer Scheme remains very low among IOTC CPCs. Where observer programmes have been established, these are wide ranging and highly variable in the type and quality of information collected and the reporting of data to IOTC standards remains poor and so the data that are submitted and stored regionally are currently of little value" (IOTC 2021m). Thus, the Scientific Committee has expressed concern "that the level of coverage remains low at 2.15% and that there is no coverage of the artisanal fleet which comprise a large proportion of catches taken in the Indian Ocean" (IOTC 2021m).

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

Of the stocks identified as main species in this Seafood Watch assessment (see the Criterion 2 Summary and the Appendices), all are regularly assessed with quantitative assessments approved by the IOTC Scientific Committee. These include skipjack and yellowfin tunas. But the quality of data collected and made available to stock assessment scientists varies by species and by reporting country, and there are persistent issues with a lack of data and poor quality of data, despite data reporting mandates that are in place.

The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. Observer coverage in general across IOTC fisheries remains low: about 2% total. Compliance with IOTC Resolution 22/04, which lays out the requirements of the ROS, is about 32% (IOTC 2025b). The industrial purse seine fleet, which is primarily flagged to France and Spain (with other flags such as Seychelles that are also operating under the EU), has an additional voluntary observer program in place that aims for 100% coverage (Acevedo-Iglesias et al. 2025). Recent coverage from this program has resulted in about 10% of industrial purse seine catches being observed (ibid). Further, coverage for these flag states by IOTC observers averaged from 5.48% to 42.95% from 2019 to 2023, far exceeding the average across other IOTC purse seine fleets (IOTC 2024f).

A lack of quality data can hinder a confident understanding of the impacts of the purse seine fisheries, especially where those fisheries catch rare and vulnerable species such as sharks and sea turtles. But the observer coverage and data that do exist suggest that the risk to vulnerable species is much lower in unassociated purse seines than FAD-set purse seines, so a lower level of observer coverage is needed in the unassociated fishery. Because main species are regularly assessed and some bycatch data are collected, scientific data collection and analysis is considered "moderately effective" (per line 1 in

table 3.3.1 of the Seafood Watch Standard).

Supplementary Information

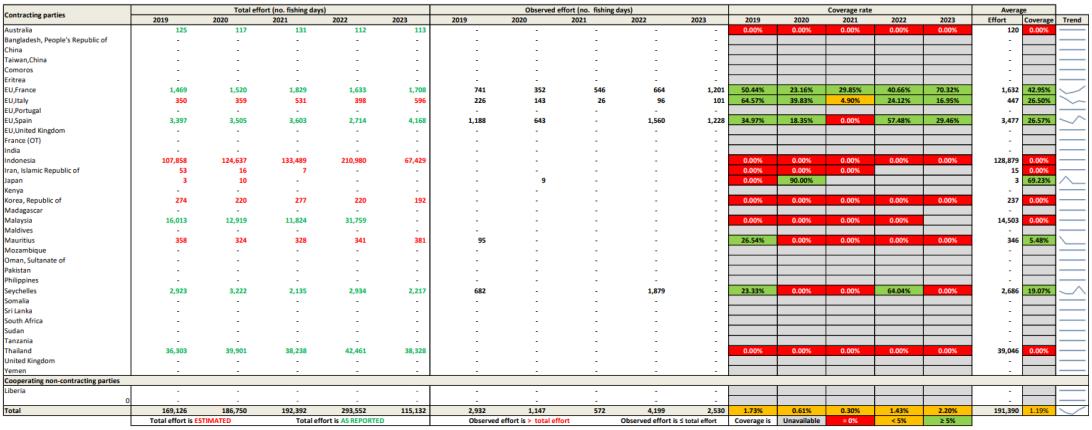
Quality and collection of data

Several documents from IOTC note its struggles with ensuring CPCs adhere to data mandates. In the 2023 and 2024 Scientific Committee reports, concerns were noted around uncertain stock statuses of some IOTC species due to a lack of data. Reporting issues have been noted for several species, including bullet and frigate tuna, making it difficult to carry out stock assessments with confidence in their results (IOTC 2023d). Black marlin also suffers from data uncertainty and availability issues. A proposal was discussed at the 2023 Committee meeting to help resolve catch and effort data reporting issues related to Resolution 15/01, but this proposal was ultimately deferred (ibid). The Scientific Committee has further noted that three CPCs did not submit their required National Reports in 2024, which hinders proper data collection and analysis (IOTC 2024a).

Regional Observer Scheme

IOTC recognizes the importance of fisheries observer programs to help resolve data issues and has required national governments to implement observer programs for over a decade. Resolution 11/04 (superseded by Resolution 22/04) noted the importance of fisheries observer data for stock assessments (standardization of catch rates) and analysis of bycatch mitigation measures (IOTC 2023b). The main objective is to collect verified catch data of tuna and large pelagics in the IOTC area through the establishment of national observer programs, which began in July 2010. The Resolution sets the minimum observer coverage level at 5% for vessels 24 meters overall length and over, and under 24 meters if they fish outside their EEZ. Implementation by CPCs has been variable, with some meeting or even exceeding the requirement of 5% observer coverage in some fisheries, and others having not developed a national program at all. Overall, coverage remains at around 2%, which is significantly below the IOTC's requirements, and well below levels needed to fully understand the effectiveness of bycatch mitigation measures (IOTC 2021m). In the industrial purse seine fleet, however, coverage rates are much higher (IOTC 2024f).

To date, despite efforts to improve implementation, such as a via pilot project to promote the scheme (Resolution 16/04), “national implementation of the Regional Observer Scheme remains very low among IOTC CPCs. Where observer programmes (sic.) have been established, these are wide ranging and highly variable in the type and quality of information collected and the reporting of data to IOTC standards remains poor and so the data that are submitted and stored regionally are currently of little value.” (IOTC 2021m). Thus, the Scientific Committee has expressed concern that “that the level of coverage remains low at 2.15% and that there is no coverage of the artisanal fleet which comprise a large proportion of catches taken in the Indian Ocean.” (IOTC 2021m).



Contracting parties	Total effort (no. fishing days)					Observed effort (no. fishing days)					Coverage rate					Average		
	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023	Effort	Coverage	Trend
Australia	125	117	131	112	113	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	120	0.00%	
Bangladesh, People's Republic of	-	-	-	-	-	-	-	-	-	-						-		
China	-	-	-	-	-	-	-	-	-	-						-		
Taiwan,China	-	-	-	-	-	-	-	-	-	-						-		
Comoros	-	-	-	-	-	-	-	-	-	-						-		
Eritrea	-	-	-	-	-	-	-	-	-	-						-		
EU,France	1,469	1,520	1,829	1,633	1,708	741	352	546	664	1,201	50.44%	23.16%	29.85%	40.66%	70.32%	1,632	42.95%	
EU,Italy	350	359	531	398	596	226	143	26	96	101	64.57%	39.83%	4.90%	24.12%	16.95%	447	26.50%	
EU,Portugal	-	-	-	-	-	-	-	-	-	-						-		
EU,Spain	3,397	3,505	3,603	2,714	4,168	1,188	643	-	1,560	1,228	34.97%	18.35%	0.00%	57.48%	29.46%	3,477	26.57%	
EU,United Kingdom	-	-	-	-	-	-	-	-	-	-						-		
France (OT)	-	-	-	-	-	-	-	-	-	-						-		
India	-	-	-	-	-	-	-	-	-	-						-		
Indonesia	107,858	124,637	133,489	210,980	67,429	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	128,879	0.00%	
Iran, Islamic Republic of	53	16	7	-	-	-	-	-	-	-	0.00%	0.00%	0.00%			15	0.00%	
Japan	3	10	-	-	-	-	9	-	-	-	0.00%	90.00%				3	72.21%	
Kenya	-	-	-	-	-	-	-	-	-	-						-		
Korea, Republic of	274	220	277	220	192	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	237	0.00%	
Madagascar	-	-	-	-	-	-	-	-	-	-						-		
Malaysia	16,013	12,919	11,824	31,759	-	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%		14,503	0.00%	
Maldives	-	-	-	-	-	-	-	-	-	-						-		
Mauritius	358	324	328	341	381	95	-	-	-	-	26.54%	0.00%	0.00%	0.00%	0.00%	346	5.48%	
Mozambique	-	-	-	-	-	-	-	-	-	-						-		
Oman, Sultanate of	-	-	-	-	-	-	-	-	-	-						-		
Pakistan	-	-	-	-	-	-	-	-	-	-						-		
Philippines	-	-	-	-	-	-	-	-	-	-						-		
Seychelles	2,923	3,222	2,135	2,934	2,217	682	-	-	1,879	-	23.33%	0.00%	0.00%	64.04%	0.00%	2,686	19.07%	
Somalia	-	-	-	-	-	-	-	-	-	-						-		
Sri Lanka	-	-	-	-	-	-	-	-	-	-						-		
South Africa	-	-	-	-	-	-	-	-	-	-						-		
Sudan	-	-	-	-	-	-	-	-	-	-						-		
Tanzania	-	-	-	-	-	-	-	-	-	-						-		
Thailand	36,303	39,901	38,238	42,461	38,328	-	-	-	-	-	0.00%	0.00%	0.00%	0.00%	0.00%	39,046	0.00%	
United Kingdom	-	-	-	-	-	-	-	-	-	-						-		
Yemen	-	-	-	-	-	-	-	-	-	-						-		
Cooperating non-contracting parties																		
Liberia	-	-	-	-	-	-	-	-	-	-						-		
0	-	-	-	-	-	-	-	-	-	-						-		
Total	169,126	186,750	192,392	293,552	115,132	2,932	1,147	572	4,199	2,530	1.73%	0.61%	0.30%	1.43%	2.20%	191,390	1.19%	
	Total effort is ESTIMATED			Total effort is AS REPORTED		Observed effort is > total effort			Observed effort is ≤ total effort		Coverage is	Unavailable	= 0%	< 5%	≥ 5%			

Figure 11: Annual total effort and estimated observer coverage for purse seine fleets from 2019 to 2023. Source: (IOTC 2024f).

Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western

Moderately Effective

Main species in both Maldivian fisheries (yellowfin and skipjack tuna) are regularly assessed via quantitative stock assessments that are then presented to and accepted by the Commission's scientific committee. The IOTC requires 5% observer coverage across gear types, excluding gillnets, handlines, and artisanal EEZ fisheries. But observer coverage in IOTC fisheries remains low: about 2% total. The Maldives has employed some electronic monitoring and human observers on its vessels in the past; although coverage is low and inconsistent, studies using observers and logbooks have confirmed that bycatch risks are low, so the fishery may not require consistent monitoring as other tuna fisheries do. Still, monitoring could be improved, so scientific data collection and analysis is considered "moderately effective" (per line 1 in table 3.3.1 of the Seafood Watch Standard).

Supplementary Information

In the Maldives, electronic monitoring has become cost prohibitive, so the Maldivian government is working toward increasing human observer coverage. A 2017 study used observers to confirm that bycatch is minimal in the pole-and-line fishery, suggesting that the fishery is unlikely to need a consistent or expanded observer program (Miller et al. 2017b). A later 2023 study used a combination of logbook and observer data from 2016 to 2023 to review ETP risks from the Maldives tuna (handline and pole-and-line) fisheries, and concluded that there were no interactions with mammals, sea turtles, or rays, and interactions with sharks were minimal during both bait fishing and tuna fishing activities (Jaujaree et al. 2023). But the government has recognized that more consistent observer coverage would allow for continued confirmation that species such as silky shark are not at risk in this or the handline fishery (Lebechnech et al. 2024). Most recently, the government has finalized an electronic logbook monitoring program that allows for real-time catch data to be obtained, which is required on all licensed tuna vessels as of 2025 (ibid).

3.4 Enforcement of and Compliance with Management Regulations

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

Compliance for the temperate longline fishery is considered across both IOTC and CCSBT. CCSBT has a compliance plan that lays out a framework to achieve full compliance over time. Within the plan is a 3-year action plan aimed at priority issues around compliance. In the 2024 CCSBT Compliance Committee Meeting Report, several instances of noncompliance are noted regarding TAC overages, submission of national reports, meeting attendance, and transshipment observer requirements (CCSBT 2024a). Temperate and southern longlines in the IO also must follow IOTC measures, which are more extensive than CCSBT measures because they cover a wider range of species and activities. IOTC noted that, while CPC compliance overall increased from 2023 to 2024, compliance issues are still prevalent in several issue areas, including observer requirements, mandatory reporting, and integration of IOTC resolutions into national legislation (IOTC 2025b). Although compliance and enforcement mechanisms are in place, there are some instances of noncompliance and lack of implementation, so enforcement of and compliance with management regulations is considered “moderately effective” (per table 3.4.1 of the Seafood Watch Standard).

Supplementary Information

CCSBT has several Compliance Policy guidelines: minimum performance requirements, corrective actions policy, monitoring control and surveillance collection and sharing, and guidance for extraordinary circumstances. Within the CCSBT is a Quality Assurance Review program that provides information to individual member countries on how well they are complying and provides recommendations on ways to improve in the development of management strategies (CCSBT 2019e). CCSBT's 2018–2020 Compliance Action Plan was most recently extended to 2022.

In its 2024 meeting, the CCSBT Compliance Committee noted that one member exceeded its TAC in both 2019 and 2020, though this overage is now being paid back (CCSBT 2024a). Another member did not submit several required documents (national reports, catch data, certain forms, and port inspection reports) in 2022 or 2023 (ibid). Several other instances of noncompliance were also noted during the meeting.

Further, the IOTC-required level of observer coverage was not met in 2022 and 2023 by Indonesia (1% and 2%, respectively) and in 2022 by Japan. Australia and Korea—the other members fishing for southern bluefin tuna with longlines in the Indian Ocean—met their observer requirements. A compliance report was not provided for Taiwan, but China's compliance rate in 2024 was 92.2%. Overall, Australia had a 94.1% compliance rate according to its latest summary compliance report, Indonesia had an 80.3% compliance rate, Japan had an 88.7% compliance rate, and Korea also had an 88.7% compliance rate (IOTC 2025c).

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Ineffective

The IOTC monitors vessels via: (1) a record of all vessels over 24 m in length or under 24 m and fishing outside of their flag country's EEZ; (2) data recording systems in place on registered vessels; (3) reporting of IUU information by CPC countries to IOTC; (4) VMS on vessels over 15 m in length; and (5) landing and transshipment inspections in each country's port (IOTC 2023b). But compliance and IUU issues still exist within IOTC waters.

In FAD fisheries specifically, poor compliance has undermined the ability of management measures to reduce ghost fishing and other bycatch risks, though this is more prevalent in dFADs than aFADs (Sheik Heile et al. 2024; Van der Geest and Murua 2024). RFMO-level aFAD management exists through Resolution 23/01, which only had a 20% compliance rate in 2024 (IOTC 2025f). Because aFAD fisheries have demonstrated poor compliance and noncompliance, enforcement of and compliance with management regulations is considered "ineffective" (per table 3.4.1 of the Seafood Watch Standard).

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

The IOTC monitors vessels via: (1) a record of all vessels over 24 m in length or under 24 m and fishing outside of their flag country's EEZ; (2) data recording systems in place on registered vessels; (3) reporting of IUU information by CPC countries to IOTC; (4) VMS on vessels over 15 m in length; and (5) landing and transshipment inspections in each country's port (IOTC 2023b). But compliance and IUU issues still exist within IOTC waters.

In FAD fisheries specifically, poor compliance has previously undermined the ability of management measures to reduce ghost fishing and other bycatch risks (Sheik Heile et al. 2024; Van der Geest and Murua 2024). Recent examinations of recovered FADs in Somalian waters found that none of the FADs were fully compliant with IOTC's regulations in place at the time (Resolution 19/02) (Sheik Heile et al. 2024). Recovered FADs in this study that could be tracked were mostly found to belong to the industrial fishing fleet; e.g., flagged to Spain and the Seychelles (ibid). The IOTC has increased its monitoring and reporting requirements around FADs within its latest management measure (24/02), but it is unclear if enforcement will improve with these efforts. But the latest compliance report from IOTC suggests that compliance is high with the pieces of the new measure that have been implemented: the EU and Seychelles are 100% compliant with dFAD marking requirements and dFAD management plan requirements, though overall compliance with CMM 24/02 is 65%. Based on these conflicting information sources, there is some uncertainty around compliance in FAD fisheries, so enforcement of and compliance with management regulations is considered "moderately effective" (per table 3.4.1 of the Seafood Watch Standard).

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderately Effective

The IOTC monitors vessels via: (1) a record of all vessels over 24 m in length or under 24 m and fishing outside of their flag country's EEZ; (2) data recording systems in place on registered vessels; (3) reporting of IUU information by CPC countries to IOTC; (4) VMS on vessels over 15 m in length; and (5) landing and transshipment inspections in each country's port (IOTC 2023b).

Despite these measures, IUU fishing continues to be an issue in IOTC waters (IOTC 2023h). The IOTC Compliance Committee verifies each CPC country's compliance with adopted management measures. In its 2025 meeting, the Compliance Committee noted several issues, including failure of CPCs to submit required reports and low compliance with certain resolutions (IOTC 2025c). Other enforcement and compliance issues include exceeding catch limits and not providing required reporting data. The IOTC is currently assessing and reviewing compliance issues around the implementation of management measures, to help strengthen compliance and to provide technical support to developing nations (ibid). Though there have been improvements in both compliance with IOTC regulations and reducing IUU fishing in recent years, some concerns remain, so enforcement of and compliance with management regulations is considered "moderately effective" (per table 3.4.1 of the Seafood Watch Standard).

Supplementary Information

Data recording systems include logbooks (paper or electronic) that collect information such as required catch and effort data (IOTC 2015b). Information on illegal, unreported, and unregulated (IUU) vessels is required to be reported by individual countries to the Commission (IOTC 2017h). Vessel monitoring systems (VMS) are required on all vessels greater than 15 m in length, and compliance with the time/area closure must be monitored by individual countries through methods such as VMS; these records must be provided to the Commission (Resolution 15/03) (IOTC 2023b). In addition, countries must inspect at least 5% of landings or transshipments in their ports per year (Resolution 16/11) (IOTC 2023b). Additional transshipment oversight was adopted at the 2025 meeting: vessel carriers will now be required to be flagged to IOTC members (Murua and Robertson 2025).

The Compliance Committee verifies compliance by countries around implementing and following adopted management measures (IOTC 2023g). The Committee meets before the annual Commission meeting to assess compliance and enforcement of management measures by individual countries. The Committee is responsible for reporting its recommendations to the Commission and discusses problems related to the implementation of management measures, then provides the Commission with advice on how to address these issues. The Committee has also been tasked with developing incentives and sanctions to encourage compliance with adopted measures (IOTC 2013e). But the Committee only considers compliance with a measure, not quality or

completeness of data submitted, though IOTC has noted via other working parties/committees that data quality is often poor or incomplete; e.g., see (IOTC WPEB 2024). In addition, although the Committee will let countries know through a formal letter that they are not in compliance, it does not necessarily inform them on how to comply with the measures (Domingue 2022). Information on compliance with measures, such as the observer scheme, is reported in publicly accessed reports (IOTC 2023e). Individual country compliance reports are also produced (IOTC 2023f). It has been noted that many countries fail to provide all the information necessary to monitor compliance (IOTC 2023e). The latest compliance reports show a range of compliance throughout CPCs, with a low of 4.8% (Pakistan, Sudan, Yemen) and a high of 100% (France) (IOTC 2025c). The average level of compliance across CPCs in 2024 was 67.26%, which is an improvement from the previous two years (IOTC 2025b).

Recently, the catch limit for skipjack has been exceeded, despite being laid out in an HCR that is part of Resolution 21/03. Catch limits for the stock were exceeded in 2018, 2019, 2021, and 2022. The skipjack MP and resulting TAC may help with this, as well as the catch allocation scheme for the TAC (passed in 2025), but their effectiveness is currently unknown because of their novelty. Further, five CPCs were noncompliant with the yellowfin tuna rebuilding plan (Resolution 21/01) in 2022, before the stock's shift in status (IOTC 2025b). These instances of noncompliance threaten the health of fished stocks in IOTC waters. The catch limit for Indo-Pacific sailfish has also been exceeded in 2020, 2021, 2022, and 2023.

Table 16: CPC's level of compliance (number of requirements complied with/number of requirements applicable) between 2010 and 2024. Green and yellow squares indicate CPCs that have benefitted from IOTC compliance programs (green: Compliance Support Mission; orange: Data-Compliance Support Mission). Source: (IOTC 2023e; IOTC 2025c).

CPC	Compliance rate by year, 2010–24															Trend
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Australia	0.47	0.85	0.78	0.84	0.85	0.88	0.93	0.96	0.96	0.97	0.95	0.77	0.97	0.93	0.94	↑
Bangladesh						0.1	0.09	0.16	0.39	0.27	0.32	0.29	0.43	0.18	0.32	↑
China	0.55	0.74	0.76	0.85	0.96	0.9	0.88	0.96	1	0.96	0.9	0.82	0.82	0.78	0.92	↑
Comoros	0.29	0.43	0.79	0.55	0.61	0.75	0.96	0.85	0.91	0.72	0.58	0.73	0.54	0.14	0.28	↑
Eritrea	0	0	0	0.07	0.07	0.08	0.08	0.08	0.06	0.05	0.06	0.06	0.04	NA*	NA*	

European Union	0.71	0.73	0.8	0.83	0.88	0.83	0.88	0.77	0.77	0.75	0.71	0.79	0.77	0.70	0.76	↑
France (OT)	0.61	0.55	0.72	0.77	0.8	0.9	1	1	1	1	1	1	1	0.89	1.0	↑
India	0.29	0.24	0.32	0.38	0.23	0.09	0.06	0.39	0.64	0.73	0.88	0.76	0.27	0.12	0.4	↑
Indonesia	0.13	0.07	0.47	0.45	0.62	0.6	0.68	0.73	0.77	0.75	0.74	0.81	0.8	0.83	0.80	↓
Iran, Islamic Republic of	0.11	0.52	0.6	0.65	0.69	0.75	0.76	0.71	0.7	0.56	0.73	0.73	0.49	0.31	0.85	↑
Japan	0.82	0.97	0.93	0.93	0.91	0.97	0.92	0.95	0.85	0.7	0.95	0.92	0.81	0.75	0.89	↑
Kenya	0.03	0.08	0.31	0.66	0.71	0.66	0.49	0.42	0.39	0.71	0.76	0.64	0.66	0.36	0.35	↓
Korea, Republic of	0.77	0.84	0.92	0.89	0.96	0.97	0.91	0.95	0.95	0.93	0.91	0.88	0.92	0.93	0.89	↓
Liberia						1	1	1	1	1	0.92		0.88	0.50	0.43	↓
Madagascar	0.13	0.18	0.22	0.75	0.81	0.66	0.81	0.65	0.74	0.61	0.77	0.73	0.76	0.55	0.78	↑
Malaysia	0.11	0.26	0.17	0.4	0.57	0.56	0.75	0.74	0.79	0.8	0.79	0.87	0.93	0.49	0.75	↑
Maldives	0.03	0.33	0.5	0.57	0.79	0.78	0.76	0.69	0.72	0.79	0.82	0.87	0.89	0.78	0.93	↑
Mauritius	0.15	0.48	0.54	0.69	0.8	0.81	0.88	0.81	0.82	0.89	0.92	0.91	0.91	0.89	0.85	↓
Mozambique		0.47	0.58	0.72	0.82	0.8	0.89	0.92	0.81	0.85	0.71	0.61	0.68	0.64	0.76	↑
Oman, Sultanate of	0.1	0.11	0.27	0.33	0.53	0.57	0.78	0.58	0.45	0.32	0.44	0.32	0.22	0.01	0.75	↑
Pakistan	0	0.11	0.05	0.07	0.05	0.06	0.19	0.53	0.53	0.58	0.57	0.37	0.09	0.06	0.05	↓

Philippines	0.18	0.52	0.48	0.61	0.8	0.67	0.79	0.6	0.67	0.73	0.87	0.78	0.86	0.83	0.90	↑
Senegal	0	0	0.5	0.6	0.56	0.67	0.75	0.75	1	1	0.8	0.4	NA**	NA**	NA**	
Seychelles	0.36	0.47	0.41	0.56	0.74	0.73	0.72	0.78	0.7	0.73	0.8	0.8	0.86	0.75	0.77	↑
Somalia					0.8	0.71	0.73	0.44	0.48	0.17	0.23	0.2	0.16	0.04	0.07	↑
South Africa	0.38	0.48	0.64	0.54	0.65	0.76	0.77	0.87	0.85	0.92	0.88	0.78	0.87	0.75	0.68	↓
Sri Lanka	0.05	0.18	0.47	0.51	0.6	0.74	0.77	0.82	0.87	0.9	0.86	0.76	0.83	0.74	0.71	↓
Sudan	0	0	0	0.06	0.06	0.06	0.06	0.06	0.23	0.05	0.04	0.05	0.11	0.04	0.05	↑
Tanzania	0	0.07	0.04	0.45	0.6	0.56	0.63	0.54	0.62	0.82	0.73	0.8	0.7	0.51	0.76	↑
Thailand	0.28	0.38	0.43	0.44	0.45	0.68	0.66	0.85	0.84	0.92	0.91	0.98	0.98	0.93	0.98	↑
United Kingdom	0.86	1	1	1	1	1	1	1	1	1	1	0.91	1	0.87	0.85	↓
Yemen			0	0.03	0.03	0.02	0.02	0.02	0.02	0.05	0.06	0.06	0.04	0.04	0.05	↓
Commission (All CPCs)	0.25	0.38	0.46	0.54	0.59	0.575	0.621	0.666	0.682	0.697	0.734	0.699	0.65	0.56	0.67	↑

* Eritrea withdrew from IOTC in 2022.
** Senegal has not renewed its CNCP status.

Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western

Moderately Effective

The IOTC monitors vessels via: (1) a record of all vessels over 24 m in length or under 24 m

and fishing outside of their flag country's EEZ; (2) data recording systems in place on registered vessels; (3) reporting of IUU information by CPC countries to IOTC; (4) VMS on vessels over 15 m in length; and (5) landing and transshipment inspections in each country's port (IOTC 2023b). The IOTC is currently assessing and reviewing compliance issues around the implementation of management measures, to help strengthen compliance and to provide technical support to developing nations (IOTC 2023e). The Maldives also has its own monitoring systems in place, including control checks carried out by the Maldives Ministry of Fisheries and Ocean Resources (Lebechnech et al. 2024). Licensing in the Maldives is required for all commercial vessels, and VMS is installed per IOTC regulations (Ministry of Fisheries, Marine Resources, and Agriculture 2021). The Maldives Tuna FMP also includes a goal of 5% e-observer coverage on tuna vessels via electronic monitoring, though this goal is not currently met. As a method to prevent IUU, the Maldives uses a catch certifcation scheme established by its Tuna FMP (ibid).

The IOTC Compliance Committee verifies each CPC country's compliance with adopted management measures. The Maldives generally has compliance levels above the Commission's average, with a mean compliance rate of ≈83% from 2019 to 2023 (ibid). But one noted compliance issue for the Maldives is with data collection and observer requirements, because the country has some vessels that the ROS should apply to but that observers have not been placed on (IOTC Compliance Committee 2025). Importantly, the Maldives has a record indicating full compliance with catch reductions laid out in yellowfin rebuilding plans (see factor 3.1 for additional details). No compliance infringements or issues have been found by the Marine Stewardship Council in its assessments of the Maldivian pole-and-line skipjack fishery or in initial Fishery Improvement Project assessments of the Maldivian yellowfin handline fishery (Lebechnech et al. 2024). Though the Maldives has a strong record of compliance with IOTC measures in recent years, some concerns remain because the Maldives is not yet 100% compliant with IOTC's measures; thus, enforcement of and compliance with management regulations is considered "moderately effective" (per table 3.4.1 of the Seafood Watch Standard).

Supplementary Information

In its pole-and-line fishery, the Maldives uses aFADs. While overall IOTC members' compliance with current aFAD measures is low (20%), the Maldives is 100% compliant with marking its aFADs, creating an aFAD management plan, and implementing progress on its aFAD management plan (IOTC 2025f).

3.5 Stakeholder Inclusion

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

Highly effective

CCSBT allows both Members and Cooperating Non-Members to attend and participate in its meetings and activities, though only Members are able to vote. Membership in the Commission is open to any state with vessels capturing southern bluefin tuna. Committees exist within CCSBT that bring together different stakeholders, including scientists, government managers, industry members, producers, and others. Also, observers are allowed to attend CCSBT meetings, with approval from CCSBT Members. These observers may be short- or long-term, and long-term observers include representatives from intergovernmental organizations and conservation/environmental nongovernmental organizations (NGOs) (CCSBT 2023a). CCSBT allows for participation and observation from all relevant stakeholders, so stakeholder inclusion is considered "highly effective" (per lines 1–5 in table 3.5.1 of the Seafood Watch Standard).

Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Highly effective

The IOTC allows for the inclusion of stakeholders in developing management objectives through participation in countries' delegations, and allows for accredited observers to attend all Commission meetings (IOTC 2014c). CPCs are able to object to any IOTC proposed resolutions before they are adopted, and the adoption and voting process is transparent and allows for participation from all CPCs. Within the IOTC are committees and working parties consisting of scientists, policy makers, and others. IOTC also collaborates with a number of other organizations consisting of relevant stakeholders, such as other RFMOs, the FAO, research institutes, and environmental NGOs (IOTC 2023c). Because there are numerous opportunities for stakeholders to be involved in IOTC processes, stakeholder inclusion is considered "highly effective" (per lines 1–5 in

table 3.5.1 of the Seafood Watch Standard).

Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western

Highly effective

The IOTC allows for the inclusion of stakeholders in developing management objectives through participation in countries' delegations, and allows for accredited observers to attend all Commission meetings (IOTC 2014c). CPCs are able to object to any IOTC proposed resolutions before they are adopted, and the adoption and voting process is transparent and allows for participation from all CPCs. Within the IOTC are committees and working parties consisting of scientists, policy makers, and others. IOTC also collaborates with a number of other organizations consisting of relevant stakeholders, such as other RFMOs, the FAO, research institutes, and environmental NGOs (IOTC 2023c). Further, the Maldives has a strong stakeholder consultation program in place that allows for regular communication between the government and various interest parties (Hough Associated Ltd 2021) (Lebechnech et al. 2024). A committee that guides reviews and revisions of the Maldives Tuna FMP includes representatives from science, industry, government, and other relevant interest groups, and utilizing a participatory approach to governance is one of the guiding principles of the FMP (Ministry of Fisheries, Marine Resources, and Agriculture 2021). Because there are numerous opportunities for stakeholders to be involved in IOTC and Maldivian processes, stakeholder inclusion is considered "highly effective" (per lines 1–5 in Table 3.5.1 of the Seafood Watch Standard).

Criterion 4: Impacts on the Habitat and Ecosystem

This Criterion assesses the impact of the fishery on seafloor habitats, and increases that base score if there are measures in place to mitigate any impacts. The fishery's overall impact on the ecosystem and food web and the use of ecosystem-based fisheries management (EBFM) principles is also evaluated. Ecosystem Based Fisheries Management aims to consider the interconnections among species and all natural and human stressors on the environment. The final score is the geometric mean of the impact of fishing gear on habitat score (factor 4.1 + factor 4.2) and the Ecosystem Based Fishery Management score. The Criterion 4 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Guiding principles

- Avoid negative impacts on the structure, function or associated biota of marine habitats where fishing occurs.
- Maintain the trophic role of all aquatic life.
- Do not result in harmful ecological changes such as reduction of dependent predator populations, trophic cascades, or phase shifts.
- Ensure that any enhancement activities and fishing activities on enhanced stocks do not negatively affect the diversity, abundance, productivity, or genetic integrity of wild stocks.
- Follow the principles of ecosystem-based fisheries management.

Rating cannot be Critical for Criterion 4.

Criterion 4 summary

Fishery	Physical Impact of Fishing Gear on the Habitat/Substrate	Modifying Factor: Mitigation of Gear Impacts	Ecosystem-based Fisheries Management	Score
Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	High Concern	Yellow (3.162)
Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	High Concern	Yellow (3.162)
Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine	Score: 5	Score: 0	Moderate Concern	Green (3.873)
Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	Moderate Concern	Green (3.873)
Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	Moderate Concern	Green (3.873)
Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	High Concern	Yellow (3.162)
Indian Ocean - Handlines - Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	High Concern	Yellow (3.162)
Indian Ocean - Trolling lines - Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	High Concern	Yellow (3.162)
Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western	Score: 5	Score: 0	Moderate Concern	Green (3.873)

Fishery	Physical Impact of Fishing Gear on the Habitat/Substrate	Modifying Factor: Mitigation of Gear Impacts	Ecosystem-based Fisheries Management	Score
Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western	Score: 5	Score: 0	Moderate Concern	**Green (3.873)**
Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western	Score: 5	Score: 0	Moderate Concern	**Green (3.873)**

Criterion 4 Assessment

Scoring Guidelines

Factor 4.1 - Physical Impact of Fishing Gear on the Habitat/Substrate

Goal: The fishery does not adversely impact the physical structure of the ocean habitat, seafloor or associated biological communities.

- *5 - Fishing gear does not contact the bottom*
- *4 - Vertical line gear*
- *3 - Gears that contacts the bottom, but is not dragged along the bottom (e.g. gillnet, bottom longline, trap) and is not fished on sensitive habitats. Or bottom seine on resilient mud/sand habitats. Or midwater trawl that is known to contact bottom occasionally. Or purse seine known to commonly contact the bottom.*
- *2 - Bottom dragging gears (dredge, trawl) fished on resilient mud/sand habitats. Or gillnet, trap, or bottom longline fished on sensitive boulder or coral reef habitat. Or bottom seine except on mud/sand. Or there is known trampling of coral reef habitat.*
- *1 - Hydraulic clam dredge. Or dredge or trawl gear fished on moderately sensitive habitats (e.g., cobble or boulder)*
- *0 - Dredge or trawl fished on biogenic habitat, (e.g., deep-sea corals, eelgrass and maerl) Note: When multiple habitat types are commonly encountered, and/or the habitat classification is uncertain, the score will be based on the most sensitive, plausible habitat type.*

Factor 4.2 - Modifying Factor: Mitigation of Gear Impacts

Goal: Damage to the seafloor is mitigated through protection of sensitive or vulnerable seafloor habitats, and limits on the spatial footprint of fishing on fishing effort.

- *+1 —>50% of the habitat is protected from fishing with the gear type. Or fishing intensity is very low/limited and for trawled fisheries, expansion of fishery's footprint is prohibited. Or gear is specifically modified to reduce damage to seafloor and modifications have been shown to be effective at reducing damage. Or there is an effective combination of 'moderate' mitigation measures.*

- *+0.5 —At least 20% of all representative habitats are protected from fishing with the gear type and for trawl fisheries, expansion of the fishery's footprint is prohibited. Or gear modification measures or other measures are in place to limit fishing effort, fishing intensity, and spatial footprint of damage caused from fishing that are expected to be effective.*
- *0 —No effective measures are in place to limit gear impacts on habitats or not applicable because gear used is benign and received a score of 5 in factor 4.1*

Factor 4.3 - Ecosystem-Based Fisheries Management

Goal: All stocks are maintained at levels that allow them to fulfill their ecological role and to maintain a functioning ecosystem and food web. Fishing activities should not seriously reduce ecosystem services provided by any retained species or result in harmful changes such as trophic cascades, phase shifts or reduction of genetic diversity. Even non-native species should be considered with respect to ecosystem impacts. If a fishery is managed in order to eradicate a non-native, the potential impacts of that strategy on native species in the ecosystem should be considered and rated below.

- *5 — Policies that have been shown to be effective are in place to protect species' ecological roles and ecosystem functioning (e.g. catch limits that ensure species' abundance is maintained at sufficient levels to provide food to predators) and effective spatial management is used to protect spawning and foraging areas, and prevent localized depletion. Or it has been scientifically demonstrated that fishing practices do not have negative ecological effects.*
- *4 — Policies are in place to protect species' ecological roles and ecosystem functioning but have not proven to be effective and at least some spatial management is used.*
- *3 — Policies are not in place to protect species' ecological roles and ecosystem functioning but detrimental food web impacts are not likely or policies in place may not be sufficient to protect species' ecological roles and ecosystem functioning.*
- *2 — Policies are not in place to protect species' ecological roles and ecosystem functioning and the likelihood of detrimental food impacts are likely (e.g. trophic cascades, alternate stable states, etc.), but conclusive scientific evidence is not available for this fishery.*
- *1 — Scientifically demonstrated trophic cascades, alternate stable states or other detrimental food web impact are resulting from this fishery.*

4.1 Physical Impact of Fishing Gear on the Habitat/Substrate

All fisheries

Score: 5

Fishing gears such as trolling line and pole-and-line, pelagic longline, drifting gillnet, and purse seine rarely make contact with the bottom. Thus, all gears in this report score “5” according to the Seafood Watch Standard for Fisheries.

4.2 Modifying Factor: Mitigation of Gear Impacts

All fisheries

Score: 0

Not applicable because the gear used is benign and the fishery received a score of “5” for factor 4.1.

4.3 Ecosystem-based Fisheries Management

Antarctic Indian Ocean | Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Antarctic | Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The temperate/southern longline fishery operating in the Indian Ocean lands ecologically important species including tunas, billfish, and sharks. In particular, sharks are considered top predators in many ecosystems and play a critical role in how these ecosystems are structured and function (Stevens et al. 2000; Piraino et al. 2002). The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r). The CCSBT has a resolution in place to align its measures for ecologically related species with measures used by the IOTC, WCPFC, and ICCAT (CCSBT 2018). Also, a swordfish MP was adopted by the IOTC in 2025, and this MP requires ecosystem impacts to be considered upon its initial review.

As of 2025, the IOTC has adopted multiple management measures for sharks; however, current policies for sharks may not provide enough protection for them, and their loss could cause ecosystem changes. A new shark measure in 2025 prevents shark finning and the landing of some shark species (IOTC 2025e). Several retained species of IOTC tuna vessels lack management rules (e.g., marlins, sharks), and it is possible that localized depletion has occurred in some shark populations affected by this fishery (e.g., pelagic thresher) (ibid) (IOTC 2024a). Because ecosystem functioning of sharks and other

ecologically related species is not adequately protected by IOTC Resolutions, ecosystem-based fisheries management is considered a “high concern” (per lines 1.a-b in table 4.3.1 of the Seafood Watch Standard).

Supplementary Information

At its 2025 meeting, the Commission adopted further best-handling practices for sharks and rays, as well as a ban on shark finning and on the retention of whitetip, thresher, and whale sharks, but no handling practices were adopted for other species, and more-extensive management measures for shark protection (e.g., quotas) are still lacking (IOTC 2025e; Murua and Robertson 2025). But the Commission did adopt a measure to help recover mako shark stocks, which requires the safe release of shortfin and longfin mako sharks (unless hauled in dead in the presence of an observer) and sets a path to create constraints on fishing pressure by 2028, with a goal of shortfin mako stock recovery by 2038 (IOTC 2025e). Further, a measure on blue shark was adopted that opens the door for creating management measures for the stock in 2026, though no management is currently in place (ibid). Other existing resolutions focus on safe handling, data collection and reporting, and prohibitions on catches of certain species. But no resolutions put in place management measures or plans for ecologically related species in IOTC tuna fisheries. This is especially concerning for captured shark species, because the loss of these predators can cause many changes, such as affecting prey abundances, that can lead to a cascade of other effects (Schindler et al. 2002; Duffy 2003; Myers et al. 2007; Ferretti et al. 2010) and behavioral changes in the ecosystem (Heithaus et al. 2007).

Existing HCRs and management measures for other species may be inadequate in preventing localized depletion and protecting ecosystem functioning. Localized depletion is a noted potential issue for several Indian Ocean shark stocks, which all lack management measures because they are outside the IOTC mandate (IOTC 2025e). Spatial management is not used for main, retained species in this fishery. The lack of management plans and other control measures for many populations affected by IOTC fisheries leaves room for their depletion within the ecosystem.

In southern bluefin tuna fisheries, in addition to CCSBT members being bound to IOTC measures, members are encouraged to abide by nonbinding measures that focus on improving mitigation techniques and effectiveness, information exchange and education, and IPOAs.

Eastern Indian Ocean | Western Indian Ocean - Drifting longlines - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

The tropical tuna longline fishery operating in the Indian Ocean catches ecologically important species including tunas, billfish, and sharks. In particular, sharks are considered

top predators in many ecosystems and play a critical role in how these ecosystems are structured and function (Stevens et al. 2000; Piraino et al. 2002). The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

As of 2025, the IOTC has adopted multiple management measures for sharks; however, current policies for sharks may not provide enough protection for them, and their loss could cause ecosystem changes (see the Justification). Management measures for other ecologically related species primarily focus on data collection. A new shark measure in 2025 prohibits shark finning and the landing of some shark species (IOTC 2025e). Several retained species of IOTC tuna vessels lack management rules (e.g., marlins, associated finfish, sharks), and it is possible that localized depletion has occurred in some shark populations affected by these fisheries (ibid) (IOTC 2024a). Because ecosystem functioning of sharks and other ecologically related species is not adequately protected by IOTC Resolutions, ecosystem-based fisheries management is considered a “high concern" (per lines 1.a-b in table 4.3.1 of the Seafood Watch Standard).

Supplementary Information

At its 2025 meeting, the Commission adopted further best-handling practices for sharks and rays, as well as a ban on shark finning and on the retention of whitetip, thresher, and whale sharks, but no handling practices were adopted for other species, and more-extensive management measures for shark protection (e.g., quotas) are still lacking (IOTC 2025e) (Murua and Robertson 2025). But the Commission did adopt a measure to help recover mako shark stocks, which requires the safe release of shortfin and longfin mako sharks (unless hauled in dead in the presence of an observer) and sets a path to create constraints on fishing pressure by 2028, with a goal of shortfin mako stock recovery by 2038 (IOTC 2025e). Other existing resolutions focus on safe handling, data collection and reporting, and prohibitions on catches of certain species. But no resolutions put in place management measures for ecologically related species in IOTC tuna fisheries. This is especially concerning for captured shark species, because the loss of these predators can cause many changes, such as affecting prey abundances, that can lead to a cascade of other effects (Schindler et al. 2002; Duffy 2003; Myers et al. 2007; Ferretti et al. 2010) and behavioral changes in the ecosystem (Heithaus et al. 2007).

Existing management measures for other species may be inadequate in preventing localized depletion and protecting ecosystem functioning. Localized depletion is a noted potential issue for several Indian Ocean shark stocks, which all lack management measures because they are outside the IOTC mandate (IOTC 2025e). Spatial management is not used for relevant stocks in the tropical tuna fishery. The lack of management plans and other protective measures for many populations affected by IOTC fisheries leaves room for their depletion within the ecosystem.

Eastern Indian Ocean | Western Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western - Small purse seine

Moderate Concern

The small purse seine fleets target tuna (skipjack, yellowfin), which are top predators and considered "exceptional species." In addition to large tuna, associated species (kawakawa, frigate tuna, and finfish species) are landed. The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

In this fishery, no species of concern (e.g., sharks) are retained; however, control rules and management for skipjack and yellowfin do not explicitly account for the ecological roles of these stocks, and other landed species lack management. But the MP for skipjack does require that ecosystem impacts be considered upon its initial review. It is unknown (though unlikely) if this fishery causes detrimental impacts to the food web, but it is possible that more stringent measures are needed. Because of these uncertainties, ecosystem-based fisheries management is considered a "moderate" concern (per line 2.a in table 4.3.1 of the Seafood Watch Standard).

Eastern Indian Ocean | Western Indian Ocean - Hand-operated pole-and-lines | Mechanized lines and pole-and-lines - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Pole-and-line fisheries target tuna, which are top predators and considered "exceptional species." In addition to tuna, pole fisheries rely on live baitfish, which may include forage species such as anchovy or sardines. The effect of the removal of these species on the ecosystem is unknown, and few baitfish fisheries are managed (Gillett 2012; FAO 2014). The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

In the pole-and-line fishery, no species of concern (e.g., sharks) are retained; however, control rules and management for skipjack and yellowfin do not explicitly account for the ecological roles of these stocks, and frigate tuna lacks management. But the MP for skipjack does require that ecosystem impacts be considered upon its initial review. It is unknown (though unlikely) if this fishery causes detrimental impacts to the food web, but it is possible that more stringent measures are needed. Because of these uncertainties, ecosystem-based fisheries management is considered a "moderate" concern (per line 2.a in table 4.3.1 of the Seafood Watch Standard).

Supplementary Information

Existing resolutions focus on safe handling, data collection and reporting, and prohibitions on catches of certain species, though these are primarily focused on bycatch species that are not captured in pole-and-line fisheries. But no resolutions put in place management measures for ecologically related species, such as neritic tunas, in IOTC tuna fisheries.

Indian Ocean - Floating object purse seine (FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Industrial tuna FAD fisheries operating in the Indian Ocean land yellowfin, skipjack, and bigeye tunas, which are some of the top predators in the ecosystem. The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

Bigeye and skipjack both have MPs in place, and the MP for skipjack requires that ecosystem impacts be considered upon its initial review (IOTC 2025e). Yellowfin tuna, though recently upgraded in stock status, remains under a rebuilding plan. There are no explicit ecosystem management plans in place for these target tuna species, but based on their latest stock assessments, it is unlikely that the fishery is negatively affecting their stocks. Because ecosystem functioning is not fully protected by IOTC resolutions, but detrimental food web impacts seem to be unlikely, ecosystem-based fisheries management is considered a “moderate concern” (per line 2.a in table 4.3.1 of the Seafood Watch Standard).

Supplementary Information

The use of FADs can also affect the functioning of the ecosystem and its species components. Juvenile tuna, specifically bigeye and yellowfin, are often associated with FADs, which could lead to growth and recruitment overfishing in these species (Freon and Dagorn 2000; Bromhead et al. 2003). In addition, increases in the biomass of tunas captured in FADs, reduced free-school abundance, changes in school movement patterns and structure, and differences between the age and size of free and FAD-associated schools have occurred with the introduction of FAD fisheries (Fonteneau et al. 2000; Menard et al. 2000). But yellowfin’s stock has recently improved, and bigeye, though undergoing overfishing, maintains an abundance above a sustainable level, so there is currently no evidence of fundamental harm to these stocks in the Indian Ocean.

Indian Ocean - Gillnets and entangling nets - Indian Ocean, Eastern | Indian Ocean, Western

High Concern

Tuna gillnet fisheries operating in the Indian Ocean land ecologically important species including sharks and large tunas. In particular, sharks are considered top predators in many ecosystems and play a critical role in how these ecosystems are structured and function (Stevens et al. 2000; Piraino et al. 2002). The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

As of 2025, the IOTC has adopted bycatch management measures for sharks and management measures for tunas; however, current policies for sharks do not provide enough protection for them, and their loss could cause ecosystem changes. Management measures for other ecologically related species primarily focus on data collection. Several retained species of IOTC tuna gillnet vessels lack management (e.g., marlins, small tunas), and it is possible that localized depletion has occurred in silky shark and other shark populations affected by this fishery (IOTC 2024a). Because the ecosystem role of sharks and other ecologically related species is not adequately protected by IOTC resolutions, ecosystem-based fisheries management is considered a “high concern” (per lines 1.a-b in table 4.3.1 of the Seafood Watch Standard).

Supplementary Information

A resolution on sharks was considered at the 2023 IOTC meeting but was not adopted (IOTC 2023i). At its 2025 meeting, the Commission adopted further best-handling practices for sharks and rays but not for other species, and more extensive management measures for shark protection (e.g., quotas) are still lacking (Murua and Robertson 2025). Other existing resolutions focus on safe handling, data collection and reporting, and prohibitions on catches of certain species. But no resolutions put in place management measures or ecosystem plans for ecologically related species in IOTC tuna fisheries. This is especially concerning for captured shark species, because the loss of these predators can cause many changes, such as affecting prey abundances, that can lead to a cascade of other effects (Schindler et al. 2002; Duffy 2003; Myers et al. 2007; Ferretti et al. 2010) and behavioral changes in the ecosystem (Heithaus et al. 2007).

Existing HCRs and management measures for other species may be inadequate in preventing localized depletion and protecting ecosystem functioning. Localized depletion is a noted possible issue for several Indian Ocean shark species, which lack control rules and ecosystem management because they are outside the IOTC mandate (IOTC 2018i; IOTC 2022g). Spatial management is not used for main, retained species in this fishery. The lack of management and other protective measures for many populations affected by IOTC fisheries leaves room for their depletion within the ecosystem.

High Concern

Trolling line and handline fisheries target tuna, which are top predators and considered "exceptional species." In addition to tuna, troll and handline fisheries rely on live baitfish, which may include forage species such as anchovy or sardines. The effect of the removal of these species on the ecosystem is unknown, and few baitfish fisheries are managed (Gillett 2012; FAO 2014). The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

As of 2025, the IOTC has adopted management measures for sharks, but current policies do not provide enough protection for them, and their loss could cause ecosystem changes. Several target species of IOTC tuna vessels lack harvest control rules, and it is possible that localized depletion has occurred in both swordfish and silky shark populations affected by these fisheries. Because ecosystem functioning of baitfish and tunas is not adequately protected by IOTC resolutions, ecosystem-based fisheries management is considered a "high concern" (per lines 1.a-b in table 4.3.1 of the Seafood Watch Standard).

Supplementary Information

A resolution on sharks was considered at the 2023 IOTC meeting but was not adopted (IOTC 2023i). At its 2025 meeting, the Commission adopted further best-handling practices for sharks and rays but not for other species, and more extensive management measures for shark protection (e.g., quotas) are still lacking (Murua and Robertson 2025). Other existing resolutions focus on safe handling, data collection and reporting, and prohibitions on catches of certain species. But no resolutions put in place management measures or ecological plans for ecologically related species in IOTC tuna fisheries. This is especially concerning for captured shark species, because the loss of these predators can cause many changes, such as affecting prey abundances, that can lead to a cascade of other effects (Schindler et al. 2002; Duffy 2003; Myers et al. 2007; Ferretti et al. 2010) and behavioral changes in the ecosystem (Heithaus et al. 2007).

Existing HCRs and management measures for other species may be inadequate in preventing localized depletion and protecting ecosystem functioning. Localized depletion is a noted possible issue for Indian Ocean silky shark and other shark stocks, which lack management rules because they are outside the IOTC mandate (IOTC 2024a). Spatial management is not used for main, retained species in this fishery. The lack of HCRs and other protective measures for many populations affected by IOTC fisheries leaves room for their depletion within the ecosystem.

Indian Ocean - Unassociated purse seine (non-FAD) - Indian Ocean, Eastern | Indian Ocean, Western

Moderate Concern

Industrial tuna FAD fisheries operating in the Indian Ocean land yellowfin and skipjack tunas, which are some of the top predators in the ecosystem. The IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

Skipjack has an MP in place, and it requires that ecosystem impacts be considered upon its initial review (IOTC 2025e). Yellowfin tuna, though recently upgraded in stock status, remains under a rebuilding plan. There are no explicit ecosystem management plans in place for these target tuna species, but based on their latest stock assessments, it is unlikely that the fishery is negatively affecting their stocks. Because ecosystem functioning is not fully protected by IOTC resolutions, but detrimental food web impacts seem to be unlikely, ecosystem-based fisheries management is considered a "moderate concern" (per line 2.a in table 4.3.1 of the Seafood Watch Standard).

Maldives - Western Indian Ocean - Mechanized lines and pole-and-lines - Maldives - Indian Ocean, Western

Maldives - Western Indian Ocean - Handlines - Maldives - Indian Ocean, Western

Moderate Concern

The Maldives' tuna fisheries target yellowfin and skipjack tuna, which are top predators and considered "exceptional species." In addition to tuna, handline and pole fisheries rely on live baitfish such as scads. The Maldives government has a national livebait management plan in place, generally uses a small ratio of bait to tuna, and is working to improve baitfish issues such as post-harvest mortality (Lebechnech et al. 2024). Ecosystem-based management is one of the guiding principles included in the Maldvies Tuna FMP, and ecosystem considerations are laid out within the FMP; however, there is no official EBFM plan in place, nor are there EBFM-based harvest control rules in place at the national level (Ministry of Fisheries, Marine Resources, and Agriculture 2021). At the regional level, IOTC has a Working Party on Ecosystems and Bycatch (WPEB) that analyzes technical problems related to the management goals, identifies research priorities, indicates data and information requirements that are needed, and provides management advice (IOTC 2022r).

The Maldivian fisheries are unlikely to create detrimental food web impacts based on their targeted nature and minimal bait use, but ecosystem functions of retained tunas are not fully accounted for in regional or national management (e.g., a formalized ecosystem

plan). Therefore, ecosystem-based fisheries management is considered “moderately effective” (per line 2.a in table 4.3.1 of the Seafood Watch Standard).

Acknowledgements

Scientific review does not constitute an endorsement of the Seafood Watch® program, or its seafood recommendations, on the part of the reviewing scientists. Seafood Watch® is solely responsible for the conclusions reached in this report.

Seafood Watch would like to thank the consulting researcher and author of this report, Alexia Morgan, as well as several anonymous reviewers for graciously reviewing this report for scientific accuracy.

References

Abreu-Grobois, A & Plotkin, P. (IUCN SSC Marine Turtle Specialist Group) 2008. Lepidochelys olivacea . The IUCN Red List of Threatened Species 2008: e.T11534A3292503. https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T11534A3292503.en.

Acevedo-Iglesias, S., M. Herrera, M. L. Ramos, J. C. Baez, J. Ruiz, G. Rodriguez-Rodriguez, V. Rojo, P. J. Pascual-Alayon, and F. J. Abascal. 2025. Bycatch trend and its fate of the Spanish-owned tuna purse seiners fleet from the Atlantic and Indian oceans: Impacts of the implementation of good practices. Marine Policy 177.

Adrill, D., Itano, D. and Gillett, R. 2012. A review of bycatch and discard issues in Indian Ocean tuna fisheries. Smartfish Working Papers No 00X.

Anderson, R.C., Herrera, M., Ilangakoon, A.D., Koya, K.M., Moazzam, M., Mustika, P.L. and Sutaria, D.N. 2020. Cetacean bycatch in Indian Ocean tuna gillnet fisheries. Endangered Species Research 41:39-53.

Aranda, M. 2017. Description of tuna gillnet capacity and bycatch in the IOTC Convention Area. IOTC-2017-WPEB13-18.

Babcock EA, Pikitch EK, Hudson CG. 2003. *How much observer coverage is enough to adequately estimate bycatch?*: Pew Institute for Ocean Science

BirdLife International 2018d. Procellaria cinerea. The IUCN Red List of Threatened Species 2018: e.T22698159A132630237. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22698159A132630237.en. Downloaded on 02 October 2020.

BirdLife International. 2018a. Thalassarche melanophris. The IUCN Red List of Threatened Species 2017: e.T22698375A119512041. http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22698375A119512041.en.

BirdLife International. 2018c. Procellaria aequinoctialis. The IUCN Red List of Threatened Species 2018: e.T22698140A132628887. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22698140A132628887.en. Downloaded on 22 July 2020.

BirdLife International. 2018e. Thalassarche carteri. The IUCN Red List of Threatened Species 2018.

BirdLife International. 2019. Ardenna carneipes (amended version of 2018 assessment). The IUCN Red List of Threatened Species 2019: e.T22698188A155469189. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T22698188A155469189.en. Downloaded on 02 October 2020.

BirdLife International. 2019b. Observer coverage for monitoring bycatch of seabirds and other

ETP species in pelagic longline fisheries. SBWG9 Inf 26 Rev 1Agenda Item 13.1 Ninth Meeting of the Seabird Bycatch Working Group. Florianópolis, Brazil, 6 - 8 May 2019.

BirdLife International. 2020. Species factsheet: Ardenna carneipes. Downloaded from http://www.birdlife.org on 02/10/2020.

Bloom Association. 2023. A Crucial Resolution for the Indian Ocean, Fiercely Opposed by the Franco-Spanish Industrial Fishers, was Cancelled. Bloom, Paris, France.

Bromhead, D., Foster, J., Attard, R., Findlay, J. and Kalish, J. 2003. A review of the impacts of fish aggregating devices (FADs) on tuna fisheries. Final report to the Fisheries Resources Research Fund. Bureau of Rural Sciences, Canberra, Australia. 122 p.

Brunel, T., Coelho, R., Merino, G., Urbina, J., Rosa, D., Santos, C., Murua, H., Bach, P., Saber, S., and Macias, D. 2019. A preliminary stock assessment for the shortfin mako shark in the Indian Ocean using data-limited approaches. IOTC-2019-WPEB15-INFO05.

Casale, P. & Tucker, A.D. 2017. Caretta caretta. (amended version published in 2015) The IUCN Red List of Threatened Species 2017: e.T3897A119333622. http://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T3897A119333622.en

CCSBT. 2017b. Resolution on the CCSBT Vessel Monitoring System (VMS). Commission for the Conservation of Southern Bluefin Tuna.

CCSBT. 2017c. Resolution on the Allocation of the Global Total Allowable Catch. Commission for the Conservation of Southern Bluefin Tuna.

CCSBT. 2018. Resolution to Align CCSBT's Ecologically Related Species measures with those of other tuna RFMOs. Commission for the Conservation of Southern Bluefin Tuna, Canberra, Australia.

CCSBT. 2019e. Report on Biology, Stock Status and Management of Southern Bluefin Tuna: 2019. Attachment 9 of the Report of the 24th Meeting of the Scientific Committee.

CCSBT. 2019f. Recommendation to Mitigate the Impact on Ecologically Related Species of Fishing for Southern Bluefin Tuna. Commission for the Conservation of Southern Bluefin Tuna, Canberra, Australia.

CCSBT. 2020. Compliance with CCSBT management measures. CCSBT-CC/2020/04

CCSBT. 2022a. Report of the Seventeenth meeting of the Compliance Committee. Commission for the Conservation of Southern Bluefin Tuna.

CCSBT. 2022b. Report of the Fourteenth Meeting of the Ecologically Related Species Working

Group. Commission for the Conservation of Southern Bluefin Tuna, Canberra, Australia.

CCSBT. 2022c. Multi-year Seabird Strategy. Commission for the Conservation of Southern Bluefin Tuna.

CCSBT. 2023a. “Attendance at Meetings by Observers.” Commission for the Conservation of Southern Bluefin Tuna. Accessed October 16, 2023.

CCSBT. 2023b. Report on Biology, Stock Status, and Management of Southern Bluefin Tuna: 2023. Attachment 8 of the Report of the Twenty-Eight Meeting of the Scientific Committee. Commission for the Conservation of Southern Bluefin Tuna, Canberra, Australia.

CCSBT. 2023d. Management Procedure. Accessed October 20th, 2023.

CCSBT. 2024a. Compliance with CCSBT Management Measures. Commission for the Conservation of Southern Bluefin Tuna's Compliance Committee, Canberra, Australia.

CCSBT. 2025. ERSWG Data. Commission for the Conservation of Southern Bluefin Tuna, Canberra, Australia.

CCSBT. 2025c. SBT Catch by Ocean, Year, Flag. Commission for the Conservation of Southern Bluefin Tuna, Canberra, Australia.

CCSBT. 2025d. Ecologically Related Species Data. Commission for the Conservation of Southern Bluefin Tuna, Canberra, Australia.

Clarke, S. 2017. Southern Hemisphere porbeagle shark (Lamna nasus) stock status assessment. Covering Note on Stock Status and Conservation Advice. CCSBT-ERS/1905/10 (rev. 1), (ERSWG Agenda item 5.2.2). Sharks and Bycatch Common Oceans (ABNJ) Tuna Project. Food and Agriculture Organization of the United Nations. Rome, Italy.

Collette, B. B., A Di. Natale, J. Suzuki, and D. A. Pollard. 2023c. Gymnosarda unicolor. The IUCN Red List of Threatened Species 2023. Accessed 1 March 2024.

Collette, B. B., A. Di Natale, M. Hinton, B. Pohlot, and K. Schratwieser. 2023g. Tetrapturus angustirostris. The IUCN Red List of Threatened Species 2023. Accessed on 3/12/24.

Collette, B. B., A. Di Natale, S. Miller, and D. A. Pollard. 2023. Auxis rochei. The IUCN Red List of Threatened Species 2023. Accessed on 3/18/24.

Collette, B. B., A. Di Natale, S. Miller, and D. A. Pollard. 2023. Auxis thazard. The IUCN Red List of Threatened Species 2023.

Collette, B. B., J. Graves, and F. H. Viera Hazin. 2023f. Acanthocybium solandri. The IUCN Red List of Threatened Species 2023. Accessed on 3/11/24.

Collette, B. B., M. Curtis, W. F. Smith-Vaniz, F. Pina Amargos, J. T. Williams, and L. Grijalba Bendeck. 2015. Ruvettus pretiosus. The IUCN Red List of Threatened Species 2015.

Collette, B. B., M. Hinton, R. Serra, and E. Yanez. 2023e. Sarda orientalis. The IUCN Red List of Threatened Species 2023. Accessed on 3/11/24.

Collette, B., A. Acero, A. F. Amorim, A. Boustany, C. Canales Ramirez, G. Cardenas, K. E. Carpenter, N. de Oliveira Leite Jr., A. Natale, W. Fox, F. L. Fredou, J. Graves, F. H. Viera Hazin, M. Juan Jorda, C. Minte Vera, N. Miyabe, R. Montano Cruz, R. Nelson, H. Oxenford, K. Shaefer, R. Serra, C. Sun, R. P. Teixeira Lessa, P. E. Pires Ferreira Travassos, Y. Uozumi, and E. Yanez. 2011. Coryphaena hippurus. The IUCN Red List of Threatened Species.

Correa, G. M., G. Merino, and A. Urtizberea. 2025. Re-run of the 2024 Yellowfin Stock Assessment with Revised Longline CPUE. Indian Ocean Tuna Commission, Victoria, Seychelles.

Curtis KA and JV Carretta 2020. ObsCovgTools: Assessing observer coverage needed to document and estimate rare event bycatch. Fisheries Research Volume 225, May 2020, 105493

Dagorn L, Holland KN, Restrepo V, Moreno G (2013). Is it good or bad to fish with FADs? What are the real impacts of the use of drifting FADs on pelagic marine ecosystems? Fish and Fisheries 14(3): 391–415.

Domingue, G. 2022. Compliance Procedsures in the Indian Ocean Tuna Commission. IATTC's Workshop in Compliance. Indian Ocean Tuna Commission, Victoria, Seychelles.

Duffy, J.E. 2003. Biodiversity loss, trophic skew and ecosystem functioning. Ecology Letters 6:680-687.

FAO. 2014. Fishing techniques tuna pole and line fishing. FAO Fisheries and Aquaculture Department.

Ferreira, L. C. and C. Simpfendorfer. 2019. Galeocerdo cuvier, The IUCN Red List of Threatened Species 2019.

Ferretti, F., B. Worm, G.L. Britten, M.R. Heithaus, H.K. and Lotze. 2010. Patterns and ecosystem consequences of shark declines in the ocean. Ecology Letters, 13: 1055– 1071.

Fishery Progress. 2024. Western and Central Pacific Ocean Skipjack & Yellowfin Tuna-Purse Seine (General Tuna Corporation) Three-Year Evaluation Report. FisheryProgress.org.

Fonteneau, A., Ariz, J., Gaertner, D., Nordstrom, V. and Pallares, P. 2000a. Observed changes in

the species composition of tuna schools in the Gulf of Guinea between 1981 to 1999, in relation with the fish aggregating device fishery. Aquatic and Living Resources 13:253-257.

Fréon, P. and Dagorn, L. 2000. Review of fish associative behavior: Toward a generalization of the meeting point hypothesis. Reviews in Fish Biology and Fisheries 10:183-207.

Froese, R. and D. Pauly. 2024b. Seriola dumerili. FishBase.

Froese, R. and D. Pauly. Editors. 2019. FishBase. World Wide Web electronic publication. www.fishbase.org,version

Froese, R., and D. Pauly. Editors. 2020. FishBase. Worldwide web electronic publication. www.fishbase.org, version (10/2019).

Fu, D. 2023a. Assessment of Indian Ocean kawakawa (Euthynnus affinis) using data-limited methods. IOTC-2023-WPNT13-15. Indian Ocean Tuna Commission, Victoria, Seychelles.

Fu, D. 2023b. Assessment of Indian Ocean longtail tuna (Thunnus tonggol) using data-limited methods. IOTC-2023-WPNT13-14. Indian Ocean Tuna Commission, Victoria, Seychelles.

Fu, D. 2023c. Assessment of Indian Ocean narrow-barred Spanish mackerel (Scomberomorus commerson) using datalimited methods. IOTC-2023-WPNT13-16. Indian Ocean Tuna Commission, Victoria, Seychelles.

Fu, D. 2023d. Indian Ocean Skipjack Tuna Stock Assessment 1950-2022 (Stock Synthesis). IOTC-2023-WPTT25-09. Indian Ocean Tuna Commission, Victoria, Seychelles.

Fu, D. 2023e. Indian Ocean Swordfish Stock Assessment 1950-2021 (Stock Synthesis). IOTC-2023-WPB21-19. Indian Ocean Tuna Commission, Victoria, Seychelles.

Gillett, R. 2012. Report of the 2012 ISSF Workshop: the management of tuna bait fisheries: The results of a global study. ISSF Technical Report 2012-08. International Seafood Sustainability Foundation, Washington, D.C.

Harlyan, L. I., A. K. Sari, A. R. Baroqi, and Heri. 2024. Indonesia Indian Ocean Skipjack, Yellowfin and Bigeye Tuna Purse Seine Fishery Pre-Assessment Report. Marine Stewardship Council, London, UK.

Heidrich, K. N., J. J. Meeuwig, M. J. Juan-Jorda, M. L. D. Palomares, D. Pauly, C. D. H. Thompson, A. M. Friedlander, E. Sala, and D. Zeller. 2023. Multiple lines of evidence highlight the dire straits of yellowfin tuna in the Indian Ocean. Ocean and Coastal Management 246(1).

Heithaus, M.R., Frid, A., Wirsing, A.J., Dill, L.M., Fourqurean, J.W., Burkholder, D., Thomson, J. and Bejder, L 2007. State-dependent risk taking by green sea turtles mediates top-down

effects of tiger shark intimidation in a marine ecosystem. Journal of Animal Ecology 76:837-844.

Hillary, R. M., A. L. Preece, A. Williams, and P. Jumppanen. 2022. Bigeye Tuna Management Procedure for Adoption. IOTC-2022-TCMP05-07.

Hough Associated Ltd. 2021. Maldives Yellowfin Tuna (YFT) Handline Fishery Pre-Assessment Report. Marine Stewardship Council, London, UK.

Hoyle, S. D., C. T. T. Edwards, M.-J. Roux, S. C. Clarke, and M. P. Francis. 2017. Southern Hemisphere porbeagle shark stock status assessment. Western and Central Pacific Fisheries Commission, Pohnpei, Micronesia.

IOTC 2021f. Status of development and implementation of National Plans of Action for seabirds and sharks, and implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations. IOTC–2021–SC24–06 [E]. IOTC Secretariat November 2021. Accessed 10/04/22 at https://iotc.org/sites/default/files/documents/2021/11/IOTC-2021-SC24-06E_-_Status_of_NPOAs.pdf

IOTC 2021g. Executive summary: Marine turtles (2021). Accessed 10/5/2022 at https://iotc.org/sites/default/files/documents/science/species_summaries/english/23_MarineTurtles2021E.pdf

IOTC 2021j. Executive summary: Cetaceans (2021). Accessed 10/5/2022 at https://iotc.org/sites/default/files/documents/science/species_summaries/english/25_Cetaceans2021E.pdf

IOTC 2022c. Status summary for species of tuna and tuna-like species under the IOTC mandate, as well as other species impacted by IOTC fisheries. Webpage, accessed 10/5/2022 at https://iotc.org/node/3379

IOTC 2022h. Executive summary: Seabirds (2021). Accessed 10/5/2022 at https://iotc.org/sites/default/files/documents/science/species_summaries/english/24_Seabirds2021E.pdf

IOTC Compliance Committee. 2025. 2025 Summary Compliance Report for: Maldives. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC WPEB. 2024. Review of the Statistical Data Available for IOTC Bycatch Species. Indian Ocean Tuna Commission's Working Party on Ecosystems and Bycatch, Seychelles, Victoria.

IOTC. 2013e. Resolution 13/04 on the conservation of cetaceans. Indian Ocean Tuna Commission.

IOTC. 2014b. Concerning a record of licensed foreign vessels fishing for IOTC species in the IOTC area of competence and access agreement information. Resolution 14/05

IOTC. 2014c. Indian Ocean Tuna Commission: Rules of Procedure (2014). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2015b. On the recording of catch and effort by fishing vessels in the IOTC area of competence. Resolution 15/01.

IOTC. 2015d. Resolution 15/10 on interim target and limit reference points and a decision framework. IOTC-CMM-15-10

IOTC. 2016i. Shortfin mako shark Supporting Information. Indian Ocean Tuna Commission. 5pp.

IOTC. 2017d. Swordfish supporting information. Indian Ocean Tuna Commission.

IOTC. 2017f. Albacore Supporting Information: Information collated from reports of the Working Party on Temperate Tunas and other sources as cited. Updated December 2017. 13 pp.

IOTC. 2017h. Resolution 17/03 On Establishing a List of Vessels Presumed to Have Carried out Illegal, Unreported, and Unregulated Fishing in the IOTC Area of Competence. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2018a. Status of Indian Ocean skipjack tuna (SKJ: Katsuwonus pelamis) resource. Executive summary.

IOTC. 2018c. Status of the Indian Ocean frigate tuna (FRI: Auxis thazard) resource. IOTC Executive Summary.

IOTC. 2018d. Status of the Indian Ocean yellowfin tuna (YFT: Thunnus albacares) resource. Executive summary: yellowfin tuna.

IOTC. 2018g. Status of the Indian Ocean blue shark (BSH: Prionace glauca). Indian Ocean Tuna Commission.

IOTC. 2018h. Status of marine turtles in the Indian Ocean. Indian Ocean Tuna Commission.

IOTC. 2018i. Status of the Indian Ocean silky shark (FAL: Carcharhinus falciformis). Indian Ocean Tuna Commission.

IOTC. 2018l. Status of the Indian Ocean shortfin mako shark (SMA: Isurus oxyrinchus). Indian Ocean Tuna Commission.

IOTC. 2018m. Blue Shark Supporting Information. Blue Shark E. Indian Ocean Tuna Commission.

IOTC. 2019e. Report of the 22nd session of the IOTC Scientific Committee. Karachi, Pakistan, 2-6 December 2019.

IOTC. 2019h. Status of the Indian Ocean scalloped hammerhead shark (SPL: Sphyrna lewini). Indian Ocean Tuna Commission.

IOTC. 2021e. Executive summary: Skipjack Tuna (2021). Indian Ocean Tuna Commission.

IOTC. 2021m. Update on the implementation of the IOTC Regional Observer Scheme. IOTC_2021-SC24-07.

IOTC. 2021o. Executive Summary: Blue Shark (2021). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 20223h. IOTC IUU Vessels List. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022f. Executive Summary: Albacore (2022). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022g. Executive Summary: Swordfish (2022). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022j. Executive summary: Bigeye tuna (2022). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022k. Updates on the Implementation of the IOTC Regional Observer Scheme and its Pilot Project. IOTC-2022-SC25-07. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022l. Executive Summary: Indo-Pacific King Mackerel. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022m. Executive Summary: Blue Shark (2022). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022o. Executive Summary: Black Marlin (2022). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022p. Executive Summary: Blue Marlin (2022). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022q. Report of the 25 th Session of the IOTC Scientific Committee. IOTC–2022–SC25–R[E]. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2022r. Science Committee and Working Parties Program of Work. Indian Ocean Tuna

Commission, Victoria, Seychelles.

IOTC. 2023. Resolution 23/02 On Management of Drifting Fish Aggregating Devices (dFADs) in the IOTC Area of Competence. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023a. Nominal Catch by Species, Gear and Vessel Flag Reporting Country. [online database]. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023b. Compendium of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023c. IOTC Collaborative Arrangements - An Overview. IOTC-2023-S27-06. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023d. Report of the 27 th Session of the Indian Ocean Tuna Commission. IOTC–2023–S27–R[E]. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023e. Report of the 20th Session of the Compliance Committee. IOTC-2023-CoC20-R[E]. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023f. Monitoring of Compliance. Accessed November 9, 2023.

IOTC. 2023g. Compliance Committee: Roles and Duties. Accessed November 9, 2023.

IOTC. 2023i. Outcomes of the 27th Sessions of the Commission. IOTC-2023-WPEB19-03. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023k. Report of the 26th Session of the IOTC Scientific Committee. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2023n. Review of the Statistical Data Available for IOTC Bycatch Species. IOTC Working Party on Ecosystems and Bycatch, Victoria, Seychelles.

IOTC. 2024a. Report of the 27th Session of the IOTC Scientific Committee. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2024b. Executive Summary: Yellowfin Tuna (2024). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2024c. Executive Summary: Black Marlin (2024). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2024d. Executive Summary: Striped Marlin (2024). Indian Ocean Tuna Commission,

Victoria, Seychelles.

IOTC. 2024e. Executive Summary: Indo-Pacific King Mackerel (2024). Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2024f. Updates on the Implementation of the IOTC Regional Observer Scheme and its Pilot Project. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2025a. Nominal catch by species, gear and vessel flag reporting country. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2025b. Report of the 22nd Session of the Compliance Committee. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2025c. Summary Compliance Reports. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2025d. Resolution 25/03 on Establishing Limits for Skipjack Tuna in the IOTC Area of Competence. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2025e. Compendium of Active CMMs Augsut 2025. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2025f. Summary Report on the Level of Compliance. Indian Ocean Tuna Commission, Victoria, Seychelles.

IOTC. 2025g. Report of the 28th Session of the IOTC Scientific Committee. Indian Ocean Tuna Commission, Victoria, Seychelles.

Jauharee, A. R., M. S. Adam, R. Abdulla, I. Nadheeh, and I. Saneeh. 2023. Review on the reporting and monitoring of interactions with Endangered, Threatened and Protected (ETP) species during tuna fishing in the Maldives – 2023 . Maldives Marine Research Institute and International Pole and Line Foundation.

Kelleher, K. 2005. Discards in the world's marine fisheries. An update. FAO Fisheries Technical Paper No. 470. Rome, FAO. 131 p.

Kiseleva, A., K. Stokes, and J. Akroyd. 2017. Final Report for the Re-assessment of the Maldives Pole & Line Skipjack Tuna Fishery. Det Norske Veritas, Baerum, Norway.

Kiszka, J. J., M. Moazzam, G. Boussarie, U. Shahid, B. Khan, and R. Nawaz. 2021. Setting the net lower: A potential low-cost mitigation method to reduce cetacean bycatch in drift gillnet fisheries. Aquatic Conservation: Marine and Freshwater Ecosystems, 31(11): 3111-3119.

Kiszka, J., Berggren, P., Baulik, G., Collins, T., Minton, G. and Reeves, R. 2017. Cetacean bycatch in the western Indian Ocean: a review of available information on coastal gillnet, tuna purse seine and pelagic longline fisheries. IOTC-2017-WPEB13-40.

Lawson, T. 2006. Observer Coverage Rates And Reliability Of CPUE Estimates For Purse Seiners In The Western And Central Pacific Ocean. WCPFC-SC2-2006/ST IP-3. 7-18 August 2006 Manila, Philippines. Accessed 10/25/22 at https://meetings.wcpfc.int/node/6279

Lebechnech, L., J. Gascoigne, and R. Grollemund. 2024. Maldives pole & line skipjack tuna surveillance audit report. Marine Stewardship Council, London, UK.

Marshall, A., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Derrick, D., Herman, K., Jabado, R.W., Liu, K.M., Rigby, C.L. & Romanov, E. 2022. *Mobula birostris* (amended version of 2020 assessment). *The IUCN Red List of Threatened Species* 2022: e.T198921A214397182. https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T198921A214397182.en. Accessed on 13 October 2022.

Marshall, A., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Rigby, C.L. & Romanov, E. 2022. *Mobula mobular* (amended version of 2020 assessment). *The IUCN Red List of Threatened Species* 2022: e.T110847130A214381504. https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T110847130A214381504.en. Accessed on 13 October 2022..

Marshall, A., R. Barreto, J. Carlson, D. Fernando, S. Fordham, M. P. Francis, K. Herman, R. W. Jabado, K. M. Liu, C. L. Rigby, and E. Romanov. 2022. Mobular mobular (amended version of 2020 assessment). The IUCN Red List of Threatened Species 2022.

Martin, S. and U. Shahid 2021. Bycatch management in IOTC Fisheries. IOTC-2021-WPEB17(AS)-24_rev1.

Menard, F., Fonteneau, A., Gaertner, D., Nordstrom, V. Stequert, B. and Marchal, E. 2000. Exploitation of small tunas by a purse-seine fishery with fish aggregating devices and their feeding ecology in an eastern tropical Atlantic ecosystem. ICES Journal of Marine Science 57:525-520.

Miller KI, Nadheeh I, Jauharee AR, Anderson RC, Adam MS (2017). Bycatch in the Maldivian pole-and-line tuna fishery. PLoS ONE; 12(5): e0177391.

Miller, K. I., I. Nadheeh, A. R. Jauharee, R. C. Anderson, and M. S. Adam. 2017. Bycatch in the Maldivian pole-and-line tuna fishery. PLoS ONE, 12(5).

Ministry of Fisheries and Ocean Resources. 2025. Standard Operating Procedure (SOP) for managing the tuna catch limits allocated to the Maldives by the IOTC. Maldives Ministry of Fisheries and Ocean Resources, Male, Republic of Maldives.

Ministry of Fisheries, Marine Resources, and Agriculture. 2021. Maldives Tuna Fishery Management Plan. Government of Maldives, Male, Maldives.

Mortimer, J.A & Donnelly, M. (IUCN SSC Marine Turtle Specialist Group) 2008. Eretmochelys imbricata . The IUCN Red List of Threatened Species 2008: e.T8005A12881238. https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T8005A12881238.en

Mosquiera, I. and R. Hillary. 2023. Updates on development of MSE analyses for Indian Ocean albacore tuna. IOTC-2023-TCMP06-10.

Murua, H., and K. Robertson. 2025. Progress Made at IOTC: ISSF Applauds New Measures for Skipjack, Bigeye, and Sharks, Urges Further Action. International Seafood Sustainability Foundation, McLean, Virginia.

Muzaffar, I. 2024. The fight over fish attractors in the Indian Ocean. Dialogue Earth.

Myers, R.A., Baum, J.K., Shepherd, T.D., Powers, S.P. and Peterson, C.H. 2007. Cascading effects of the loss of apex predatory sharks from a coastal. Science 315:1846-1850

NOAA Fisheries. 2023. Foreign Trade Database. [online database].

Pérez Roda MA (ed.), Gilman E, Huntington T, Kennelly SJ, Suuronen P, Chaloupka M, Medley P (2019). A third assessment of global marine fisheries discards. FAO Fisheries and Aquaculture Technical Paper No. 633. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.

Pierre JP., 2019. Observer coverage for monitoring bycatch of seabirds and other ETP species in pelagic longline fisheries. In: ACAP - Ninth Meeting of the Advisory Committee. ACAP SBWG9 Inf 26 Rev 1, Florianópolis, Brazil. Accessed 10/25/22 at https://www.acap.aq/working-groups/seabird-bycatch-working-group/seabird-bycatch-wg-meeting-9/sbwg9-information-papers/3391-sbwg9-inf-26-observer-coverage-for-monitoring-bycatch-of-seabirds-and-other-etp-species-in-pelagic-longline/file

Piraino, S., Fanelli, G., Boero, F. 2002. Variability of species roles in marine communities: change of paradigms for conservation priorities. Marine Biology 140:1067-1074.

Rice, J. 2017. Stock assessment blue shark (Prionace glauca) in the Indian Ocean using Stock Synthesis. IOTC-2017- WPEB13-33. Indian Ocean Tuna Commission, Victoria, Seychelles.

Rice, J. 2021a. Stock assessment blue shark (Prionace glauca) in the Indian Ocean using Stock Synthesis. IOTC-2021-WPEB17-15_Rev2.

Rigby, C. L. A. Bin Ali, K. K. Bineesh, D. Derrick, Fahmi, D. Fernando, and A. B. Haque. 2021c. Carcharhinus macloti. The IUCN Red List of Threatened Species 2021.

Rigby, C. L., A. N. Gutteride, D. Derrick, and N. Pacoureau. 2021d. Loxodon macrorhinus. The IUCN Red List of Threatened Species 2021.

Rigby, C. L., A. V. Harry, N. Pacoureau, K. Herman, L. Hannan, and D. Derrick. 2020. Rhizoprionodon acutus. The IUCN Red List of Threatened Species 2020.

Rigby, C. L., J. Carlson, A. Chin, D. Derrick, M. Dicken, and N. Pacoureau. 2021. Carcharhinus limbatus. The IUCN Red List of Threatened Species 2021. Accessed 1 March 2024.

Rigby, C. L., R. Barreto, J. Carlson, D. Fernando, S. Fordham, K. Herman, R. W. Jabado, K. M. Liu, A. Marshall, N. Pacoureau, E. Romanov, R. B. Sherley, and H. Winker. 2019. Sphyrna zygaena. The IUCN Red List of Threatened Species 2019. Accessed 3/11/24.

Rigby, C. L., R. Barreto, J. Carlson, D. Fernando, S. Fordham, M. P. Francis, K. Herman, R. W. Jabado, K. M. Liu, A. Marshall, N. Pacoureau, E. Romanov, R. B. Sherley, and H. Winker. 2019e. The IUCN Red List of Threatened Species 2019.

Rigby, C.L., Dulvy, N.K., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019c. Sphyrna lewini . The IUCN Red List of Threatened Species 2019: e.T39385A2918526.

Rigby, C.L., R. Barreto, J. Carlson, D. Fernando, S. Fordham, M.P. Francis, K. Herman, R.W. Jabado, K.M. Liu, A. Marshall, N. Pacoureau, E. Romanov, R.B. Sherley, and H. Winker. 2019d. Lamna nasus. The IUCN Red List of Threatened Species 2019: e.T11200A500969. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T11200A500969.en. Downloaded on 05 October 2020.

Rigby, C.L., Sherman, C.S., Chin, A. & Simpfendorfer, C. 2017. Carcharhinus falciformis. The IUCN Red List of Threatened Species 2017: e.T39370A117721799. http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T39370A117721799.en.

Ruiz, J., F. J. Abascal, P. Bach, J. C. Baez, P. Cauquil, M. Grande, I. Krug, J. Lucas, H. Murua, M. L. Ramos Alonso, and P. S. Sabarros. 2018. Bycatch of the European, and Associated Flag, Purse-Seine Tuna Fishery in the Indian Ocean for the Period 2008-2017. Indian Ocean Tuna Commission, Victoria, Seychelles.

Salcedo-Bojorquez, S. and F. Arreguin-Sanchez. 2011. An Exploratory Analysis to Identify Reproductive Strategies of Billfishes. Journal of Fisheries and Aquatic Science 6(6):578-591.

Schindler, D.E., Essington, T.E., Kitchell, J.F., Boggs, C. and Hilborn, R. 2002. Sharks and tunas: fisheries impacts on predators with contrasting life histories. Ecological Applications 12:735-748.

Seafood Watch 2020. Seafood Watch Standard for Fisheries v4, published April 2020. Accessed 10/5/2022 at https://www.seafoodwatch.org/globalassets/sfw/pdf/standards/fisheries/seafood-watch-fisheries-standard-version-f4.pdf

Sheik Heile, A., E. Dyer, R. Bealey, and M. Bailey. 2024. Drifting fish aggregating devices in the Indian ocean impacts, management, and policy implications. NPJ Ocean Sustainability 3(60).

Simpfendorfer, C., A. Bin Ali, K. K. Bineesh, D. Derrick, Dharmadi, Fahmi, D. Fernando, A. B. Haque, T. Krajangdara, A. Maung, L. Seyha, D. Tanay, J. A. T. Utzurrum, V. Q> Vo, and R. R. Yuneni. 2021. Carcharhinus amblyrhynchoides. The IUCN Red List of Threatened Species 2021.

Simpfendorfer, C., D. Derrick, D. Tanay, L. Seyha, Fahmi, A. B. Haque, A. Bin Ali, A. Maung, K. K. Bineesh, V. Q. Vo, J. A. T. Utzurrum, R. R. Yuneni, and D. Fernando. 2021b. Carcharhinus sorrah. The IUCN Red List of Threatened Species 2021.

Simpfendorfer, C., D. Fahmi, A. Bin Ali, J. A. T. Utzurrum, L. Seyha, A. Maung, K. K. Bineesh, R. R. Yuneni, A. Sianipar, A. B. Haque, D. Tanay, D. A. Gautama, and V. Q. Vo. 2020. Carcharhinus amblyrhynchos. The IUCN Red List of Threatened Species 2020.

Simpfendorfer, C., R. W. Jabado, A. Moore, T. Valinassab, and I. Elhassan. 2019. Carcharhinus dussumieri. The IUCN Red List of Threatened Species 2019.

Smith-Vaniz, W. F., F. Pina Amargos, J. Brown, M. Curtis, and J. T. Williams. 2015. Seriola dumerili (errata version published in 2017). The IUCN Red List of Threatened Species 2015. Accessed on 3/12/24.

Smith-Vaniz, W.F., Williams, J.T., Pina Amargos, F., Curtis, M. & Brown, J. 2015. Elagatis bipinnulata. The IUCN Red List of Threatened Species 2015: e.T16440027A16510157. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T16440027A16510157.en. Downloaded on 21 August 2019

Stevens, J.D., Bonfil, R., Dulvy, N.K. and Walker, P.A. 2000. The effects of fishing on sharks, rays, and chimaeras (chondrichthuyans), and the implications for marine ecosystems. ICES Journal of Marine Science 57:476-494.

Sun, C. L., H. Y. Chang, T. Y. Liu, S. Z. Yeh, and Y. J. Chang. 2015. Reproductive biology of the black marlin, Istiompax indica, off southwestern and eastern Taiwan. Fisheries Research 166:12-20.

Van der Geest, C. and H. Murua. 2024. Indian Ocean Fisheries Managers Adopt Strongest FAD Management Measure Among Tuna RFMOs. International Seafood Sustainability Foundation, Munich, Germany.

Wallace, B. P. and A. C. Broderick. 2025. Chelonia mydas. The IUCN Red List of Threatened Species 2025.

Wallace, B.P., Kot, C.Y., DiMatteo, A.D., Lee, T., Crowder, L.B. and Lewison, R.L., 2013a. Impacts of fisheries bycatch on marine turtle populations worldwide: toward conservation and research priorities. Ecosphere, 4(3), pp.1-49.

WPEB15-INFO4.

WWF. 2023. Factsheet: Yellowfin Tuna. WWF Southwest Indian Ocean Regional Programme. World Wildlife Fund, Switzerland.

WWF. 2023b. dFADs: Fisher's Freiend or Foe?. World Wildlife Fund, SW Indian Ocean Regional Programme, Gland, Switzerland.

Appendix A: 2025 Update

The previous Indian Ocean tuna and large pelagics report included three longline fisheries: general drifting longlines, tropical tuna drifting longlines, and southern bluefin tuna drifting longlines. In this new assessment, the general and tropical tuna drifting longline fisheries are combined, because their catch composition and primary contributing flag states overlap too much to justify separating them. The other longline fishery remains separate but has shifted to a temperate longline fishery targeting albacore and sharks that also captures southern bluefin tuna, and its catch composition is based on catch from flag states with longlines operating in southern Indian Ocean waters (according to CCSBT data). Thus, there are now two longline fisheries: one temperate and one tropical.

The FAD purse seine fishery was split into two fisheries: one representing the industrial, primarily dFAD purse seine fleet, and a second representing the smaller, more coastal, primarily aFAD purse seine fleet. Unassociated purse seines are still only represented at the industrial level.

The previous handline/pole-and-line fishery was separated into two individual fisheries to better reflect the target catch with each gear type.

Maldivian fisheries for yellowfin and skipjack (handlines and pole-and-lines, separately) are now assessed separately from IOTC-level ratings.

Catch composition data were updated up to 2023, and Appendices B–K were added to reflect these new data.

Criterion 2 species composition was edited based on the latest IOTC landings data (2019–23 data from the IOTC that include target and nontarget species, as noted previously), IOTC latest bycatch update, and CCSBT landings data and associated species data.

Criterion 1 was updated based on the latest available science (stock assessments produced between 2020 and 2024). The resulting Criterion 1 score changes based on stock assessments are:

- Yellowfin tuna changed from red to green
- Albacore changed from red to green
- Bigeye changed from yellow to red
- Blue shark remained green based on a new stock assessment
- Shortfin mako shark remained red but increased numerically
- Skipjack remained green but increased numerically
- Southern bluefin tuna changed from yellow to green
- Swordfish C1 score remained green.

Criterion 2 species were updated for each fishery, and some scores for species in the current and previous assessment were updated based on stock assessments, IUCN assessments, PSAs, and data-limited assessments. See the following appendices for a full list of Criterion 1 and

Criterion 2 species in each fishery. Longline fisheries and the RFMO-level handline fishery remained red in Criterion 2. The pole-and-line fishery, now separated from handlines, is green in Criterion 2. The Maldives fisheries are green in Criterion 2.

Factors 3.1 and 3.2 were updated following the addition of new main species. Factor 3.1 changed from "moderately effective" to "ineffective" for longline fisheries based on a lack of management measures for main species identified through IOTC data. Handlines and troll fisheries changed from "highly effective" to "moderately effective" in factor 3.2 because of shark bycatch concerns (based on IOTC data). Factors 3.3 through 3.5 were previously not scored because factor 3.1 and 3.2 "ineffective" scores drive factor 3.3 to be red overall, but factors 3.3–3.5 have been scored in this assessment and updated via the latest information from IOTC's 2024 and 2025 meetings. Criterion 3 has improved for the unassociated purse seine fishery and the pole-and-line RFMO-level fishery but remains red for other existing fisheries.

Criterion 4 for all fisheries changed from green to yellow based on factor 4.3 shifting from a "moderate concern" to "high concern" for all fisheries, because of concerns over the impacts of high shark catches. All longline ratings remain red, as do FAD ratings. Unassociated purse seine and pole-and-line ratings (RFMO level) improve to yellow (aside from bigeye in unassociated purse seine), though handline and troll ratings remain red. Maldives ratings are green.

Appendix B: IOTC Troll Fisheries Catch Composition

Species	Landings (t)	Main Species?
Skipjack tuna	123,444	Yes (5% of catch)
Yellowfin tuna	108,935	Yes (5% of catch)
Narrow-barred Spanish mackerel	57,780	Yes (5% of catch)
Sharks various nei	37,038	Yes (5% of catch)
Longtail tuna	31,163	Yes (5% of catch)
Frigate tuna	31,109	Yes (5% of catch)
Kawakawa	26,421	Yes (5% of catch)
Indo-Pacific sailfish	17,419	No
Bigeye tuna	12,997	No
Albacore	8,199	No
Bonnethead and hammerhead sharks	8,142	No
Bullet tuna	6,611	No
Other non tuna-like fishes nei	6,275	No
Indo-Pacific king mackerel	6,146	No
Blue shark	5,246	No
Common dolphinfish	3,619	No
Other bony fish nei	3,002	No
Mako sharks	2,534	No
Wahoo	1,561	No
Black Marlin	1,393	No
Non targeted, associated and dependent species	1,371	No
Silky shark	1,194	Yes (ETP species)
Thresher sharks nei	1,123	No
Blue Marlin	897	No
Dogtooth tuna	832	No
Swordfish	701	No
Blue marlin and black marlin	502	No
Striped bonito	350	No
Milk shark	234	Yes (ETP species)
Striped marlin	213	No
Hammerhead sharks nei	189	No
Spinetail mobula	97	No
Indo-Pacific sailfish and shortbill spearfish	91	No
OTHER SPECIES	84	No
Spot-tail shark	83	No
Short-billed spearfish	63	No
Giant Mantas	55	No

Figure 12: Catch composition in IOTC troll fisheries from 2019 to 2023 (retained catch only). Relevant gear types include handline and troll line, troll line, trolling mechanized, and trolling nonmechanized. Species with catch over a 5-year period that was under 50 MT are not included. Some shark species have been excluded because they are exclusively caught by flag states that do not contribute to target tuna catch. Data source: (IOTC 2025a).

Appendix C: IOTC Handline Fisheries Catch Composition

Species	Landings (t)	Main Species?
Yellowfin tuna	462,133	Yes (5% of catch)
Skipjack tuna	84,253	Yes (5% of catch)
Longtail tuna	57,803	Yes (5% of catch)
Other non tuna-like fishes nei	53,041	Yes (5% of catch)
Narrow-barred Spanish mackerel	36,902	No
Kawakawa	32,723	No
Common dolphinfish	27,435	Yes (20% of mortality)
Frigate tuna	25,327	No
Bigeye tuna	20,694	No
Albacore	9,552	No
Indo-Pacific sailfish	9,097	No
Black Marlin	7,078	No
Sharks various nei	5,995	Yes (ETP species)
Blue Marlin	5,785	No
Indo-Pacific king mackerel	5,378	No
Greater amberjack	5,243	Yes (20% of mortality)
Bullet tuna	5,049	No
Swordfish	4,435	No
Other bony fish nei	3,935	No
Rainbow runner	2,307	No
Tuna-like fishes nei	1,632	No
Carangidae	1,577	No
Dogtooth tuna	1,487	Yes (20% of mortality)
Blacktip shark	1,388	Yes (ETP species)
Marlins and sailfish and spearfish nei	1,201	No
Striped bonito	1,183	No
OTHER SPECIES	1,140	No
Wahoo	996	No
Smooth hammerhead	924	Yes (ETP species)
Kanadi kingfish	910	No
Short-billed spearfish	847	No
Hammerhead sharks nei	764	No
Hardnose shark	746	No
Indian mackerel	541	No
Mako sharks	511	Yes (ETP species)
Silky shark	483	Yes (ETP species)
Scalloped hammerhead	397	No
Graceful shark	348	Yes (ETP species)
Tunas nei	342	No
Striped marlin	288	No
Bull shark	249	No
Marlins nei	195	No
Devil Ray	193	No
Spinetail mobula	192	No

Spinetail mobula	192	No
True tunas nei	163	No
Frigate and bullet tunas	133	No
Marine fishes nei	113	No
Oilfish	108	No
Seerfishes nei	103	No
Giant Mantas	89	No
Blue shark	82	No
Bigeye scad	78	No
Barracudas	72	No
Longfin mako	58	No
Thresher sharks nei	57	No
Sliteye shark	57	No
Thresher sharks nei	57	No
Sliteye shark	57	No

Figure 13: Catch composition in IOTC handline fisheries from 2019 to 2023 (retained catch only). Relevant gear types include handline and handline (offshore). Species with catch over a 5-year period that was under 50 MT are not included. Mako shark has been included in the Criterion 2 "sharks" category alongside various sharks nei. Some shark and ray species have been excluded because they are exclusively caught by flag states that do not contribute to target tuna catch. Albacore, though not a main species, is included in Criterion 1 to produce a rating. Data source: (IOTC 2025a).

Appendix D: IOTC Gillnet Fisheries Catch Composition

Species	Landings (t)	Main Species?
Skipjack tuna	518,709	Yes (5% of catch)
Longtail tuna	402,890	Yes (5% of catch)
Narrow-barred Spanish mackerel	370,114	Yes (5% of catch)
Kawakawa	351,202	Yes (5% of catch)
Yellowfin tuna	320,030	Yes (5% of catch)
Frigate tuna	221,699	Yes (5% of catch)
Indo-Pacific king mackerel	115,234	Yes (20% of mortality)
Indo-Pacific sailfish	109,945	Yes (20% of mortality)
Common dolphinfish	76,168	Yes (20% of mortality)
Non targeted, associated and dependent species	68,753	Yes** (20% of mortality)
Sharks various nei	60,501	Yes (ETP species)
Black Marlin	57,896	Yes (20% of mortality)
Other non tuna-like fishes nei	48,830	No
Indian mackerel	44,815	No
Tunas nei	31,939	Yes* (20% of mortality)
Tuna-like fishes nei	26,142	No
Bullet tuna	22,815	No
Seerfishes nei	19,783	Yes* (20% of mortality)
Swordfish	19,099	No
Bigeye tuna	16,531	No
Striped marlin	10,844	Yes (20% of mortality)
Striped bonito	9,190	Yes (20% of mortality)
Blue marlin and black marlin	8,784	Yes - blue only (20% of mortality)
Milk shark	7,896	Yes (ETP species)
Marlins and sailfish and spearfish nei	6,866	Yes* (20% of mortality)
Other bony fish nei	6,707	No
Blue Marlin	5,372	No
Silky shark	3,888	Yes (ETP species)
Hardnose shark	3,442	Yes (ETP species)
Hammerhead sharks nei	3,417	No
Wahoo	3,019	Yes (20% of mortality)
OTHER SPECIES	2,612	Yes** (20% of mortality)
Blue shark	2,465	No
Short-billed spearfish	2,369	Yes (20% of mortality)
Spot-tail shark	2,162	Yes (ETP species)
Whitecheek shark	2,104	Yes (ETP species)
Requiem sharks nei	1,621	No
Scalloped hammerhead	1,324	No
Thresher sharks nei	1,110	Yes (ETP species)
Shortfin mako	1,084	Yes (ETP species)
Indo-Pacific sailfish and shortbill spearfish	1,055	No
Smooth hammerhead	1,047	Yes (ETP species)
Blacktip shark	962	Yes (ETP species)
Albacore	940	No
Pelagic thresher shark	809	Yes (ETP species)
Batoid fishes nei	775	Yes*** (20% of mortality)
Sliteye shark	745	Yes (ETP species)
Greater amberjack	733	No
Bull shark	706	No
Mantas, devil rays nei	690	Yes (ETP species)
Billfish nei	670	Yes* (20% of mortality)
Mako sharks	663	Yes (ETP species)

Devil Ray	656	Yes (ETP species)
Rainbow runner	596	No
Rays and stingrays and mantas nei	571	No
Mackerel scad	561	No
Giant Mantas	554	Yes (ETP species)
Sharks mackerel and porbeagles nei	476	Yes (20% of mortality)
Marlins nei	443	No
Finetooth shark	407	Yes (ETP species)
Dogtooth tuna	393	No
Indian scad	372	No
Spinetail mobula	308	No
Mackerels nei	307	Yes* (20% of mortality)
Kanadi kingfish	298	No
Frigate and bullet tunas	279	No
Carangidae	251	No
Graceful shark	208	Yes (ETP species)
Blacktail reef shark	204	Yes (ETP species)
Stingrays, butterfly rays nei	178	Yes*** (20% of mortality)
Ocean triggerfish	169	No
Spadenose shark	162	No
Blackspot shark	160	No
Oceanic whitetip shark	150	No
Tuna nei	131	Yes* (20% of mortality)
Dusky shark	115	No
Toothponies nei	83	No
True tunas nei	79	No
Marine fishes nei	51	No

Figure 14: Catch composition in IOTC gillnet fisheries from 2019 to 2023 (retained catch only). The only relevant IOTC gear type for this fishery is gillnet. Species with catch over a 5-year period that was under 50 MT are not included. Species marked with * in the "Main Species?" column have been lumped into a general "finfish" category in Criterion 2. Those marked with ** are not included because their descriptions are too vague, and those marked *** have been lumped into a general rays category in Criterion 2. Some shark and finfish species have been excluded because they are exclusively caught by flag states that do not contribute to target tuna catch. Finetooth shark is a species that is only present in the Atlantic, so this is assumed to be a misidentification and is not included as a main species in this fishery. Sharks that are not identified to the species level have been included in the Criterion 2 "sharks" category alongside various sharks nei. Data source: (IOTC 2025a).

In addition to the Figure 14 data, information and data from IOTC's latest review of bycatch statistical data were used to determine main species in gillnet fleets (IOTC WPEB 2024). Direct gillnet observer data are not reported in this review, but overarching understandings of gillnet interactions with ETP species are. Gillnets in the Indian Ocean are thought to interact significantly with sea turtles; however, species are not identified in the data review, so a general sea turtles category was added to Criterion 2 (ibid). Gillnets are thought to be the primary contributing gear to direct cetacean mortality in the Indian Ocean, with external literature also supporting the inclusion of marine mammals in this fishery (ibid) (Kiszka et al. 2017) (Anderson et al. 2020; Kiszka et al. 2021).

Appendix E: IOTC Purse Seine Fisheries Catch Composition

Species	Landings (t)	Main Species?
Skipjack tuna	1,206,742	Yes (5% of catch)
Yellowfin tuna	590,629	Yes (5% of catch)
Bigeye tuna	156,471	Yes (5% of catch)
Southern bluefin tuna	21,923	No**
Frigate tuna	6,399	No
Frigate and bullet tunas	5,311	No
Common dolphinfish	4,583	No
Rainbow runner	2,048	No
Black Marlin	1,190	No
Longtail tuna	1,108	No
Kawakawa	761	No
Marlins and sailfish and spearfish nei	665	No
Albacore	637	No
Wahoo	544	No
Tuna-like fishes nei	508	No
Other bony fish nei	486	No
Marine fishes nei	428	No
Other non tuna-like fishes nei	288	No
Blue Marlin	189	No
Dolphinfishes nei	180	No
Little tunny(=Atl.black skipj)	78	No
Marlins nei	71	No
Ocean triggerfish	65	No
Bullet tuna	53	No

Figure 15: Catch composition in IOTC industrial purse seine fisheries from 2019 to 2023 (retained catch only). Relevant gear types include purse seine. Indonesia, which reports catches under both "purse seine" and "small purse seine" gear categories, has been excluded from catch composition because it is not part of the industrial fleet. IOTC data do not differentiate between FAD-set and unassociated purse seine landings. Species with catch over a 5-year period that was under 50 MT are not included. ** Southern bluefin tuna caught in purse seines are exclusively caught in an Australian fishery and are used for net pen operations, so it is not included as a main species for this gear type. Data source: (IOTC 2025a).

In addition to the Figure 15 data, information and data from IOTC's latest review of bycatch statistical data were used to determine main species in purse seine fleets (IOTC WPEB 2024). Data from the ROS warrant the additional inclusion of several sea turtle species, including olive ridley, green, hawksbill, and loggerhead (see Table 5 in (IOTC WPEB 2024)). Although leatherback interactions are also seen in the ROS data, these are considered negligible (3 over

17 years), so this species is not included in any purse seine fishery. It is unknown if these interactions are attributed to FAD-set or unassociated purse seine fisheries, but it is thought that industrial FAD-set fisheries have a greater impact on sea turtles than their unassociated counterparts (Acevedo-Iglesias et al. 2025). As a precaution, relevant sea turtle species have been added to both industrial fisheries, in the absence of data indicating no or negligible interactions with unassociated sets. Observer reports suggest that sea turtle survival rates from purse seine releases may be over 95%, but the observer percentage is low (ibid). Although this information cannot be used to remove sea turtles as Criterion 2 species, it does affect Criterion 2 scoring.

Species	Landings (t)	Main Species?
Skipjack tuna	426,389	Yes (5% of catch)
Other non tuna-like fishes nei	252,687	Yes (5% of catch)
Kawakawa	142,265	Yes (5% of catch)
Bullet tuna	73,958	Yes (5% of catch)
Frigate tuna	60,946	Yes (5% of catch)
Yellowfin tuna	60,839	Yes (5% of catch)
Longtail tuna	52,997	No
Bigeye tuna	35,022	No
Narrow-barred Spanish mackerel	15,905	No
Indo-Pacific king mackerel	3,856	No
Frigate and bullet tunas	2,526	No
Sharks various nei	1,957	No
Common dolphinfish	1,866	No
Seerfishes nei	1,246	No
Indo-Pacific sailfish	756	No
Black Marlin	692	No
Albacore	568	No
Dogtooth tuna	358	No
Other bony fish nei	220	No
Swordfish	168	No
OTHER SPECIES	152	No
Striped bonito	103	No
Blue Marlin	91	No
Wahoo	63	No
Striped marlin	61	No
Short-billed spearfish	54	No

Figure 16: Catch composition in IOTC smaller, coastal purse seine fisheries from 2019 to 2023 (retained catch only). Relevant gear types include purse seine and small purse seine, and relevant flags include Indonesia, India, Mozambique, Malaysia, and Thailand. Some shark species have been excluded because they are exclusively caught by flag states that do not contribute to target tuna catch. IOTC data do not differentiate between FAD-set and unassociated purse seine landings. Data source: (IOTC 2025a).

Appendix F: IOTC Tropical Longline Fisheries Catch Composition

Species	Landings (t)	Main Species?
Yellowfin tuna	352,109	Yes (5% of catch)
Bigeye tuna	186,684	Yes (5% of catch)
Albacore	175,905	No
Swordfish	83,328	No
Other non tuna-like fishes nei	70,467	Yes* (5% of catch)
Blue shark	40,231	No
Skipjack tuna	32,351	No
Southern bluefin tuna	30,214	No
Frigate tuna	27,507	No
Marine fishes nei	18,286	Yes* (20% of mortality)
Blue Marlin	16,901	Yes (20% of mortality)
Oilfish	10,800	Yes (20% of mortality)
Narrow-barred Spanish mackerel	9,661	No
Sharks various nei	9,260	Yes (ETP species)
Black Marlin	8,984	No
Indo-Pacific sailfish	8,119	No
Blue marlin and black marlin	7,025	No
Longtail tuna	6,998	No
Mako sharks	4,758	Yes (ETP species)
Kawakawa	4,585	No
Thresher sharks nei	4,490	Yes (ETP species)
OTHER SPECIES	4,122	Yes (20% of mortality)
Other bony fish nei	3,268	No
Silky shark	3,004	Yes (ETP species)
Common dolphinfish	2,818	No
Indo-Pacific sailfish and shortbill spearfish	2,563	No
Hammerhead sharks nei	2,509	Yes (ETP species)
Striped marlin	2,399	No
Seerfishes nei	2,354	No
Indo-Pacific king mackerel	2,014	No
Kanadi kingfish	1,691	No
Tuna-like fishes nei	1,527	No
Dogtooth tuna	1,136	Yes (20% of mortality)
Bullet tuna	1,063	No
Short-billed spearfish	470	No
Shortfin mako	465	No
Marlins nei	436	No
Wahoo	387	No
Tunas nei	354	No
Carangidae	237	No
Tiger shark	218	Yes (ETP species)
Rays and stingrays and mantas nei	155	Yes (ETP species)
Spinetail mobula	150	No
Mackerel scad	117	No
Indian mackerel	102	No
Opah	97	No
Scalloped hammerhead	88	No
Giant Mantas	86	No
Rainbow runner	67	No
Marlins and sailfish and spearfish nei	64	No
Devil Ray	63	No
Mantas, devil rays nei	50	No

Figure 17: Catch composition in IOTC tropical longline fisheries from 2019 to 2023 (retained catch only).

Relevant gear types include coastal longline, longline, and longline fresh. Species with catch over a 5-year period that was under 50 MT are not included. Species marked with * in the "Main Species?" column have been lumped into a general "finfish" category in Criterion 2. Some finfish species have been excluded because they are exclusively caught by flag states that do not contribute to target tuna catch. Any sharks nei categories have been included in the Criterion 2 "sharks" category alongside sharks various nei. Finally, spinetail mobula and "rays and stingrays and mantas nei" have been lumped into a general mobula category in Criterion 2. Data source: (IOTC 2025a).

Note: although dolphinfish is not a main species, it is included as a Criterion 1 species in order to produce a rating. In addition to the above data, information and data from IOTC's latest review of bycatch statistical data were used to determine the main species in tropical longline fleets (IOTC WPEB 2024). ROS data warrant the inclusion of several sea turtles in tropical longlines (sea turtles are primarily found in tropical environments and are unlikely to be present where the southern fishery operates), including loggerhead, olive ridley, leatherback, and green (see Table 5 in (IOTC WPEB 2024)). Hawksbill and flatback turtles are also noted in the data but in negligible amounts, so they are not included here as main species. Data for cetacean interactions are more limited but suggest that marine mammals should be included as main species in the longline fishery as well. Risso's dolphin and toothed whales such as false killer whale are most often seen in the data, but these data are quite limited in terms of fleet coverage, so more species may be applicable (see Table 6 in (IOTC WPEB 2024)). Finally, though longlines generally present a threat to seabirds, it is thought that seabird interactions are most significant south of lat. 25° S., which is below the operations of the tropical longline fishery.

Appendix G: IOTC Temperate Longline Fisheries Catch Composition

Species	Landings (t)	Main Species?
Albacore	142,122	Yes (5% of catch)
Bigeye tuna	109,813	No
Yellowfin tuna	103,700	No
Other non tuna-like fishes nei	69,562	Yes* (5% of catch)
Blue shark	35,040	Yes (5% of catch)
Swordfish	31,743	Yes (20% of mortality)
Southern bluefin tuna	30,012	Yes (20% of mortality)
Skipjack tuna	26,989	No
Frigate tuna	21,791	No
Marine fishes nei	16,737	Yes* (20% of mortality)
Blue Marlin	10,015	Yes (20% of mortality)
Longtail tuna	6,837	No
Narrow-barred Spanish mackerel	6,021	No
Thresher sharks nei	4,469	Yes (ETP species)
Mako sharks	4,243	Yes (ETP species)
Kawakawa	4,141	No
Black Marlin	3,601	No
Indo-Pacific sailfish	3,047	No
Common dolphinfish	1,903	No
Indo-Pacific king mackerel	1,847	No
Silky shark	1,744	No
Sharks various nei	1,732	Yes (ETP species)
Hammerhead sharks nei	1,695	No
Oilfish	1,467	No
Striped marlin	1,369	No
Dogtooth tuna	1,135	No
Bullet tuna	899	No
Other bony fish nei	450	No
Short-billed spearfish	433	No
Tiger shark	209	Yes (ETP species)
Shortfin mako	107	No
Marlins and sailfish and spearfish nei	60	No

Figure 18: Catch composition in the IOTC temperate longline fisheries (targeting albacore, sharks, and swordfish, and catching southern bluefin tuna) from 2019 to 2023 (retained catch only). Relevant gear types include coastal longline, longline, longline targeting sharks, longline targeting swordfish, and fresh longline. This longline fishery is also differentiated from the tropical fishery by only including landings from flag states that CSBT notes as fishing for southern bluefin tuna in the Indian Ocean: Australia, Indonesia, Japan, South Korea, and Taiwan. Species with catch over a 5-year period that was under 50 MT are not included. Species marked with * in the "Main Species?" column have been lumped into a general "finfish" category in Criterion 2. Sharks nei categories (not listed as individual species) have been included in the Criterion 2 "sharks" category alongside sharks various nei. Data source: (IOTC 2025a).

In addition to the Figure 18 data, information and data from IOTC's latest review of bycatch statistical data were used to determine the main species in southern longline fleets (IOTC WPEB 2024). Sea turtle interactions in longlines are not a concern in nontropical areas, and there is no evidence of marine mammal interactions in southern waters, based on IOTC or CCSBT data (ibid) (CCSBT 2025). But seabird interactions are thought to be significant below lat. 25° S., and CCSBT data confirm that multiple seabird species are caught in longline fisheries targeting southern bluefin tuna. Several species of albatross (e.g., yellow-nosed, flesh-footed) and petrels (e.g., white-chinned, Hall's giant) appear in IOTC data, including those not specified to the species level (see Table 7 in (IOTC WPEB 2024) for specified species). CCSBT data (see Appendix H) also indicate non-species-specific albatross and petrel catches.

Appendix H: CCSBT Bycatch Composition Data

Species	Observed Captures	Observed Mortalities
Blue shark	34,885	17,511
Porbeagle	6,300	2,507
Other sharks	3,697	1,180
Shortfin mako	2,189	916
Other	1,843	1,840
Other albatross	770	756
Giant petrels	498	476
Skates, rays	391	340
Unidentified albatross	172	8
Dark colored albatross	164	163
Other seabirds	151	100
Large albatross	108	93
Turtles	19	3
Unidentified seabirds	1	1

Figure 19: Observed interactions with ecologically related species on longlines targeting southern bluefin tuna and operating in CCSBT statistical areas in the Indian Ocean from 2019 to 2023. Several species/species groups noted in this dataset are already included in the southern longline fishery via IOTC data (blue shark, other sharks, skates/rays). Data source: (CCSBT 2025).

From these data, it is assumed that retention patterns follow those seen in IOTC data. Thus, blue shark may be retained, and some other sharks may be retained, but it is unlikely that other species listed here are retained species. Shortfin mako shark is rated in Criterion 1 based on these data but is not considered a main species.

Appendix I: Maldives Handline Catch Composition

Species	Landings (t)	Main Species?
Yellowfin tuna	106,888	Yes (5% of catch)
Skipjack tuna	1,819	No
Bigeye tuna	172	No
Kawakawa	15	No
Frigate tuna	6	No
Common dolphinfish	6	No
Indo-Pacific sailfish	4	No
Wahoo	3	No
Rainbow runner	3	No
Billfish nei	2	No
Marlins nei	2	No
Dogtooth tuna	1	No

Figure 20: Catch composition in the Maldives handline fishery from 2019 to 2023 (retained catch only). Relevant gear types include handline and handline (offshore). Data source: (IOTC 2025a).

Appendix J: Maldives Pole-and-Line Catch Composition

Species	Landings (t)	Main Species?
Skipjack tuna	565,274	Yes (5% of catch)
Yellowfin tuna	63,384	Yes (5% of catch)
Bigeye tuna	1,196	No
Frigate tuna	422	No
Kawakawa	57	No
Rainbow runner	34	No
Wahoo	19	No
Common dolphinfish	18	No
Indo-Pacific sailfish	12	No
Dogtooth tuna	1	No
Black Marlin	1	No
Marlins nei	0	No
Billfish nei	0	No

Figure 21: Catch composition in the Maldives pole-and-line fishery from 2019 to 2023 (retained catch only). Relevant gear types include bait boat and bait boat (offshore). Data source: (IOTC 2025a).

Appendix K: IOTC Pole-and-Line Fisheries Catch Composition

Species	Landings (t)	Main Species?
Skipjack tuna	51,534	Yes (5% of catch)
Yellowfin tuna	10,581	Yes (5% of catch)
Frigate tuna	4,923	Yes (5% of catch)
Other non tuna-like fishes nei	4,030	No
Kawakawa	3,871	No
Bigeye tuna	2,531	No
Longtail tuna	2,163	No
Narrow-barred Spanish mackerel	1,724	No
OTHER SPECIES	1,644	No
Other bony fish nei	1,125	No
Indo-Pacific sailfish	461	No
Common dolphinfish	453	No
Indo-Pacific king mackerel	343	No
Wahoo	206	No
Blue marlin and black marlin	140	No
Albacore	65	No

Figure 22: Catch composition in IOTC pole-and-line fisheries from 2019 to 2023 (retained catch only). Relevant gear types include baitboat, baitboat (offshore), baitboat mechanized, and baitboat nonmechanized. Species with catch over a 5-year period that was under 50 MT are not included. Data source: (IOTC 2025a).