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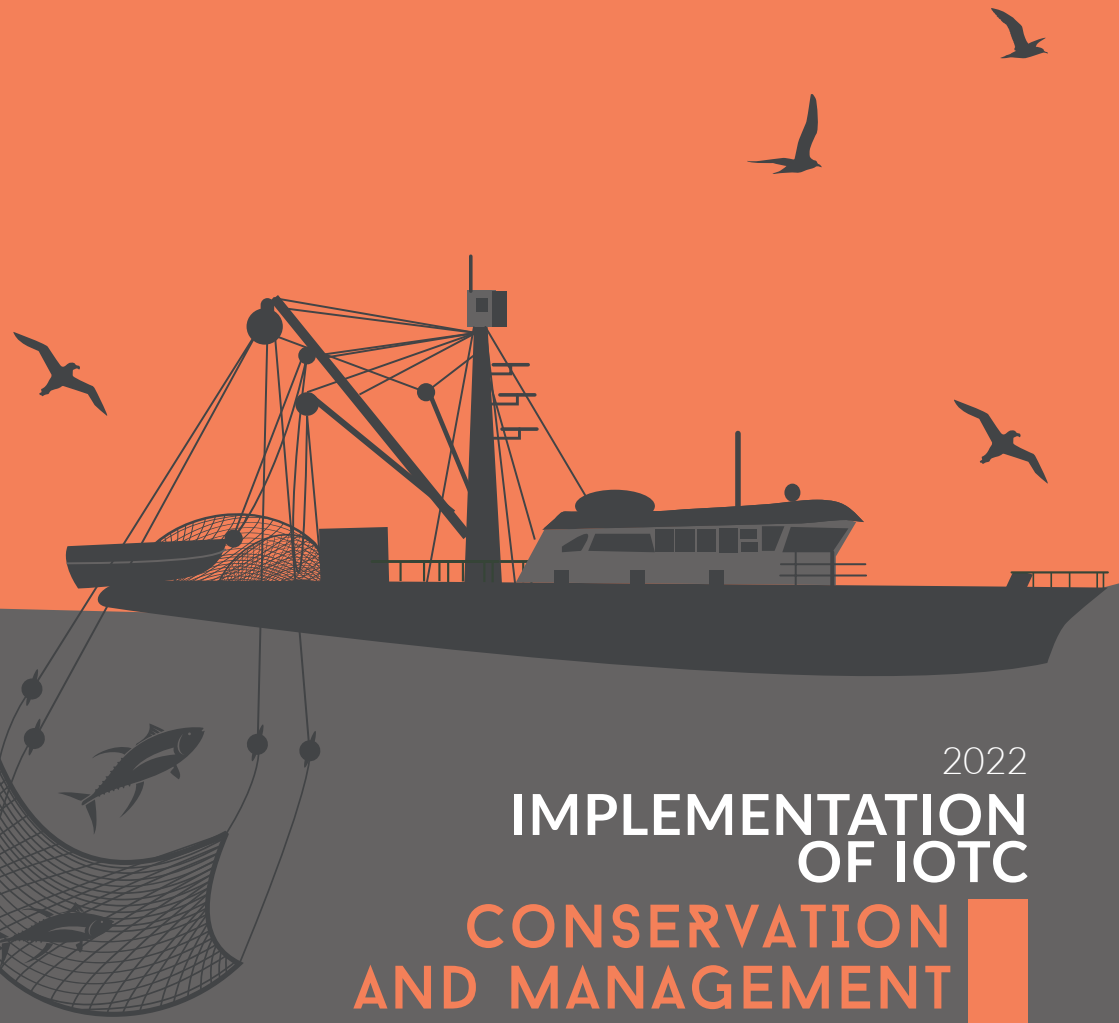

2022

IMPLEMENTATION OF IOTC CONSERVATION AND MANAGEMENT MEASURES PART A

UNDERSTANDING IOTC AND THE INTERNATIONAL FISHERIES MANAGEMENT FRAMEWORK

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SECOND EDITION

Food and Agriculture Organization of the United Nations
Victoria, 2022

IOTC. 2022. *Implementation of IOTC Conservation and Management Measures – Part A: Understanding IOTC and the international fisheries management framework. Second edition.* Victoria, FAO. https://doi.org/10.4060/cb8260en

Second edition: February 2022

ISBN 978-92-5-135613-5 [FAO]

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of FAO and do not necessarily reflect the views of the European Union.

Graphic Design: Sabine Billon

ABSTRACT

The objective of this manual is to provide a working document for Contracting Parties (or "Member") and Cooperating Non-contracting Parties (CPCs) to use in the implementation of the IOTC Resolutions. The content is divided into two chapters.

The first chapter provides a broad overview of the international regime within which the Indian Ocean Tuna Commission has evolved, then examines the role of specific key international legal instruments (conventions and agreements) related to Indian Ocean tuna fisheries. It describes the roles of regional fisheries management organisations (RFMOs) and Regional Fisheries Advisory Bodies (RFABs), and explains what the IOTC is, how it is supposed to work, who drives it and what results are expected of it.

The second chapter summarises the principles and measures provided by international instruments that guide fisheries management. It then describes the fisheries management tools used by IOTC from the perspectives of coastal States, flag States, port States and market States.

This manual should be viewed as a living document that can be revised and improved by all parties as experience is expanded in the implementation of the IOTC Conservation and Management Measures.

CHAPTER 1: THE BIG PICTURE

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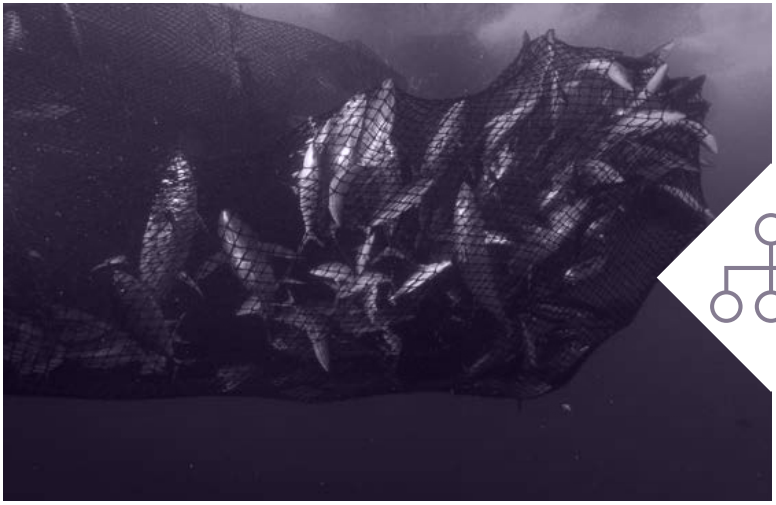
CHAPTER 2: KEY INTERNATIONAL INSTRUMENTS AND MECHANISMS



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ACKNOWLEDGEMENTS

This manual has been prepared with the financial support of the European Union under the grant *"Technical assistance to developing countries CPC of the IOTC to improve implementation of IOTC CMMs and implementation of Port State Measures"*. This grant is a voluntary contribution of the European Union to the IOTC special fund for capacity building in order to ensure compliance with IOTC Conservation and Management Measures. The capacity building fund is established under the IOTC Resolution 16/10.

We also acknowledge the contribution of photographs from Orthongel and the *Compagnie Française du Thon Océanique* (CFTO)*, l'Institut de Recherche pour le Developpement* (IRD) and *l'Institut français de recherche pour l'exploitation de la mer* (IFREMER).

The content of the manual has been developed by the IOTC Secretariat with external technical support.

The 2018 updated and published manual was funded by the World Wide Fund for Nature.

The 2022 updated and published manual was funded by the Second South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish2) under South West Indian Ocean Fisheries Governance and Shared Growth Program (SWIOFish Regional).

ABBREVIATIONS AND ACRONYMS

CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CDS	catch documentation scheme
CMM	conservation and management measure
CNCP	Cooperating non-Contracting Party
CPC	IOTC Contracting Party (or "Member") and cooperating non-Contracting Party
DWFN	distant water fishing nation
EEZ	exclusive economic zone
FAO	Food and Agriculture Organization of the United Nations
FAOCA	FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993) commonly called the FAO Compliance Agreement
FMC	fisheries monitoring centre
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IOTC	Indian Ocean Tuna Commission
IOTC Agreement 1993	Agreement for the Establishment of the Indian Ocean Tuna Commission
IPOA	International Plan of Action
IUU	illegal, unreported and unregulated (fishing)
LOA	length overall
MCS	monitoring, control and surveillance
MSY	maximum sustainable yield

nm	nautical mile
PSMA	Agreement on Port State Measures to Combat, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (2009) commonly called the Port State Agreement
RAV	record of authorised vessels
RFB	regional fishery body
RFAB	Regional Fisheries Advisory Body
RFMO	regional fisheries management organisation
UN	United Nations Organization
UNCLOS	United Nations Convention on the Law of the Sea (1982)
UNFSA	Agreement Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995) commonly called the UN Fish Stocks Agreement
USD	United States dollar
VMS	vessel monitoring system
WCPFC	West and Central Pacific Fisheries Commission

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CHAPTER 1

THE BIG PICTURE

The IOTC's institutional mandate, a description of the the Indian Ocean tuna fisheries, and how the IOTC functions, who drives it and what results are expected of it.

This chapter provides a broad overview of the international regime that provides a foundation for the management of Indian Ocean tuna fisheries. It describes the implications of maritime zones for fisheries management and introduces the key international fisheries instruments that provide a basis for governance in each zone, including on the high seas and at regional and national levels. These instruments consist of both voluntary and legally binding agreements or conventions and are further explained in Chapter 2, particularly in relation to provisions on highly migratory (e.g. tuna and billfish), straddling and transboundary fish stocks.

They provide a legal framework and guidance for fisheries management, including for regional fisheries management organisations (RFMOs) with a mandate to adopt legally binding conservation and management measures, such as the Indian Ocean Tuna Commission (IOTC), and for Regional Fisheries Advisory Bodies (RFABs) which provide management advice to their member countries. The information in this chapter contributes to the understanding of existing institutional mandates and management processes, and in this way clarifies roles and responsibilities in working together for sustainable fisheries management.

This chapter also describes the Indian Ocean tuna fisheries, defining them and highlighting their complexity and diversity. It is essential to understand the various dimensions of these fisheries in order to meet the challenges in achieving successful fisheries management.

Finally, IOTC is described, including how it functions, who drives it and what results are expected of it.

At the end of this chapter, the reader should have a basic but solid understanding of international and regional fisheries governance, how this applies to Indian Ocean tuna fisheries and how IOTC is structured to play its part and accomplish its mandate.

INTERNATIONAL MARITIME ZONES

Figure 1: A purse seiner from a distant water fishing nation

Coastal States have sovereign rights over all resources in the EEZ, jurisdiction in the EEZ for the protection and preservation of the marine environment.

Historically, for hundreds of years coastal States claimed a territorial sea extending three nautical miles (nm) out to sea from the coast – the distance of a cannon shot. Countries exercised *full sovereignty* over these waters and all their laws extended over the sea as if it were part of the territory. Areas beyond these waters were part of the "high seas". Resources of the high seas, including fisheries resources, could not be owned, belonged to nobody (principle of *res nullius*), and could therefore be freely exploited by anybody coveting them.

Today, the territorial sea extends to 12 nm and States may claim an adjacent exclusive economic zone (EEZ) extending a further 188 nm, or 200 nm from the coast. Coastal States have *sovereign rights over all resources* in the EEZ, including the rights of exploring, exploiting, conserving and managing the natural resources, including fish. Coastal States also have *jurisdiction* in the EEZ for the protection and preservation of the marine environment.

No foreign State or national may exploit the fisheries resources within a coastal State's EEZ (or territorial sea) without formal government permission; compliance with the terms and conditions of an access agreement, license and coastal State laws is essential.

EEZs include over 90 percent of the continental shelf areas worldwide. They contain most of the shelf-associated fisheries resources including demersal species such as snappers, groupers or shrimps. However, highly migratory pelagic fisheries resources, such as tuna, are much less shelf-associated and occur within and beyond the EEZs as transboundary stocks.

Due to the wider migratory patterns of these oceanic species, the management measures, to be successful, must endeavour to achieve compatibility between EEZ and high seas management regimes as required in international fisheries instruments.

The high seas, initially starting at 3nm offshore, have thus moved outward to 200 nm. And the resources of the high seas have gone from being *nobody's resource*, to becoming *everybody's resource* (principle of *res omnis*). The latter has important implications for high seas fisheries, their management and enforcement.

HIGH SEAS FISHERIES

Fisheries that take place on the high seas are generally heavily industrialised, and typically include tuna and tuna-like fisheries. High seas fisheries for other species, such as those using deep sea fishing gear, are limited. Fishing vessels used in these operations are generally large, steel-hulled and highly mechanised.

Few fisheries are exclusively based in the high seas and most move between EEZs and the high seas to follow the resources. These fisheries are often exploited by so-called "distant water fishing nations" (DWFNs) (Figure 1), which operate fleets far away from their home ports. In the Indian Ocean tuna fisheries, the predominant DWFNs include China, the Republic of Korea, Japan and some Member States of the European Union.

Vessels that fish for tuna usually follow the migratory patterns of the resource and often end up fishing large areas of ocean, moving in and out of the EEZs of coastal States. These vessels should hold licenses from the coastal State for fishing in the EEZs and authorisations from their flag State permitting fishing in the areas of ocean that lie beyond the flag State.

Few fisheries are exclusively based in the high seas and most move between EEZs and the high seas to follow the resources.

It would not be unusual for a purse seiner operating in the Western Indian Ocean, for instance, to seek fishing licences from the majority of East African States, for example Kenya, Madagascar, Mauritius, Mozambique and Seychelles.

In some fisheries, such as the longline fisheries (Figure 2), fish are often transhipped at sea; these fishing vessels may be resupplied at sea, and they stay out for months without calling to port. Vessels that receive transhipments or resupply fishing vessels are undertaking "fishing related activities", for which licenses and authorisations may also be required.

Fish can be offloaded in numerous ports across an ocean basin. Given the wide-ranging mobility of fleets, monitoring these operations is a challenging undertaking.

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Figure 2: Industrial longliners account for about 7 percent of IOTC catch

The challenges in managing high seas fisheries have been well known for centuries, but governance has been strengthening considerably in recent decades thanks to international agreements and the work of RFMOs.

UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS) AND AGREEMENT RELATING TO THE CONSERVATION AND MANAGEMENT OF STRADDLING FISH STOCKS AND HIGHLY MIGRATORY FISH STOCKS (UNFSA)

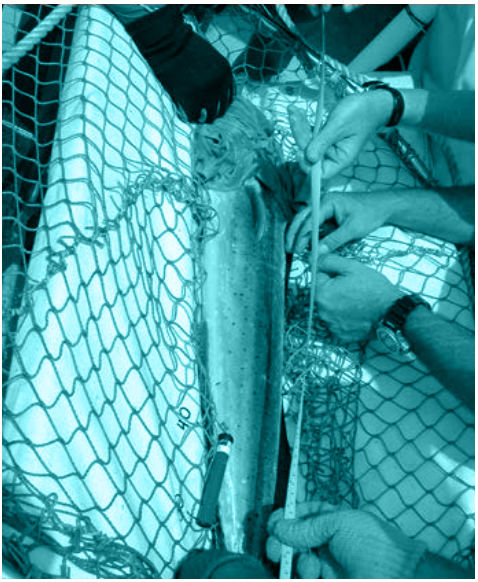

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Figure 3: States must cooperate in conservation and development such as in this scientific tagging programme

The fundamental international instruments governing high seas fisheries, including managing highly migratory and straddling fish stocks throughout their range whether on the high seas or in coastal State waters, is provided by these related instruments:

- 1982 United Nations Convention on the Law of the Sea (UNCLOS); and
- 1995 Agreement Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, commonly called the United Nations Fish Stocks Agreement (UNFSA).

The fundamental international instruments governing high seas fisheries are provided by UNCLOS and UNFSA.

By late 2020, there were 168 Parties to UNCLOS and 91 Parties to UNFSA (the European Union, representing its 27 Members, is included as one Party in each).

UNCLOS provides the legal regimes for the maritime zones, including the territorial sea, the EEZ and the high seas. It establishes the rights and duties of coastal States for exploiting the fisheries resources in their waters, as well as for managing them and allowing access to foreign vessels under specified circumstances (*Part V*).

Importantly, it also describes the rights and duties of States whose nationals (i.e. flag vessels or persons) fish on the high seas. There is no absolute freedom to fish; it is a right that is subject to a State's treaty obligations and to the rights, duties and interests of coastal States.

UNCLOS requires flag States to take certain measures to control high seas fishing by their nationals through (Articles 116-119):

- adopting high seas fisheries conservation measures for their nationals or cooperating with other States to adopt these measures (Figure 3);
- cooperating with other States to establish sub regional or regional fisheries organisations; and
- following certain rules and standards in determining allowable catch and other measures for high seas fishing, including for species that are associated or dependent on the target species.

UNCLOS firmly establishes the duty to conserve and manage fisheries resources, whether they:

- occur entirely in the waters of one State;
- are "straddling" fish stocks that swim between EEZs of different States or between EEZs and the high seas; or
- are "highly migratory" species listed in Annex I of UNCLOS, which usually swim through many States' EEZs and the high seas.

UNCLOS encourages States to cooperate in developing measures for each.

- For straddling stocks, States must agree on measures to coordinate and cooperate in conservation and development. (*Article 63*)

- For highly migratory stocks, coastal States and fishing States must cooperate in ensuring conservation of the stocks throughout the region, within and beyond the EEZs. (*Article 64*) This was an important foundation for the establishment of IOTC in 1993.

The UNFSA spotlights the role of RFMOs in managing fish stocks, and details the duties of flag States.

UNFSA builds on UNCLOS provisions that apply to the conservation and management of straddling and highly migratory fish stocks and calls for the protection of marine ecosystems and biodiversity. Its focus is on high seas cooperation and measures, but two obligations are also applicable to coastal State waters. The obligations require States to apply the *precautionary approach* and to ensure *compatibility* between management measures for the high seas and areas under national jurisdiction. This will promote consistent management of the fish stocks throughout their range.

The Agreement spotlights the role of RFMOs in managing the fish stocks, including encouraging States to cooperate through RFMOs (Figure 4), and to strengthen or establish them where none exist. It provides a framework for the functions of RFMOs and requires transparency in their operation. The IOTC, established when the UNFSA was being negotiated, meets these criteria.

UNFSA also details the duties of flag States, including measures they must take to ensure compliance by, and control of their vessels. The measures include boarding and inspection procedures on the high seas and certain port State measures, which the port State has a "right and a duty" to take.

Information provides a vital role in fisheries management and UNFSA addresses requirements for its collection and provision, as well as cooperation in scientific research.

Figure 4: Flag States must cooperate with RFMOs in management of fish stocks, such as allowing this observer to be strategically posted

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REGIONAL FISHERIES ADVISORY BODIES (RFABs) AND REGIONAL FISHERIES MANAGEMENT ORGANISATIONS (RFMOs)

Regional Fisheries Advisory Bodies (RFABs) and regional fisheries management organisations (RFMOs) are two types of intergovernmental organisations whose primary objective is the long-term conservation and sustainable use of fisheries resources and safeguarding the marine ecosystems in which these resources occur (Figure 5). Together, they comprise a family of regional fisheries bodies (RFBs).

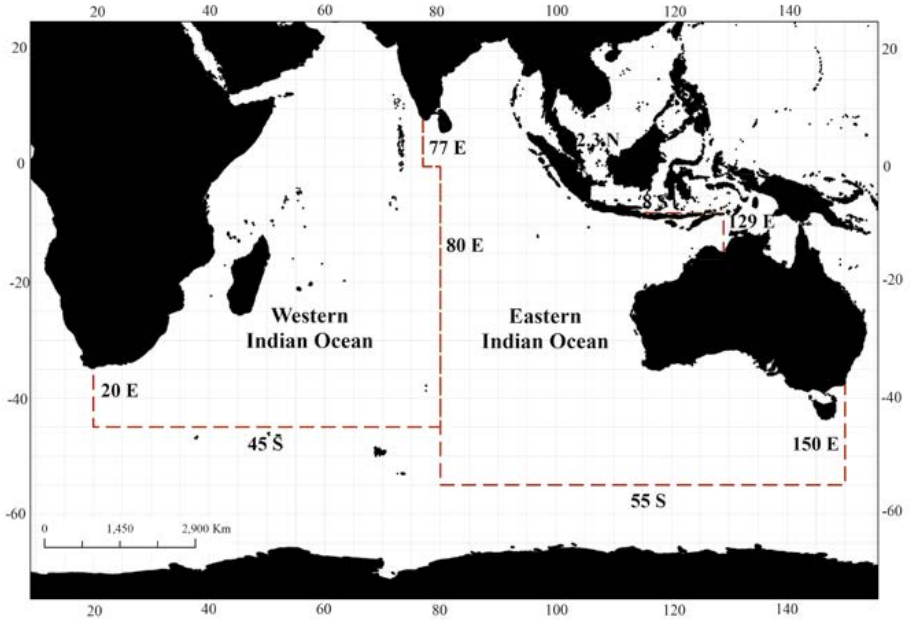
Figure 5: The primary objective of RFBs is the conservation and sustainable use of fisheries resources

There are around 50 RFBs worldwide. Most are RFABs, which are only mandated to provide advice to their members, but nearly half are RFMOs that have mandates to adopt conservation and management measures, based on the best scientific evidence, that are legally binding on their members. Several RFABs and some RFMOs have been established under the auspices of the FAO, including IOTC.

The Members of RFBs are States and Regional Economic Integration Organisations such as the European Union which, as one Member, represent all of its member States. The Agreements establishing RFBs describe their Area of Competence (or Regulatory Area), within which they exercise their mandates. In some cases, the RFMO is not limited to a particular area but instead manages a specific species throughout its range, such as the Commission for the Conservation of Southern Bluefin Tuna.

The IOTC Area Competence extends from the demarcated area shown in Figure 6 to adjacent seas in order to cover the seas north of the Antarctic Convergence as may be necessary for the purpose of managing stocks that migrate into or out of the Indian Ocean.

Figure 6: Map of the IOTC area of competence



Source: IOTC, 2022.

There are around 50 RFBs worldwide. Most are RFABs, which are only mandated to provide advice to their members, but nearly half are RFMOs that have mandates to adopt conservation and management measures

Most RFMOs manage fisheries in marine waters covering both high seas and national waters, including IOTC. Some RFMOs are generic (responsible for various species of fish) and others are species-specific (responsible for a particular stock or species). IOTC is one of the five tuna-RFMOs that are species-specific (Figure 7).

RFMOs exercise their management mandates by developing legally binding conservation and management measures – often referred to as CMMs – which their Members must implement. CMMs can cover a wide range of measures ranging from fisheries conservation and management to monitoring, control and surveillance (MCS) and information requirements such as reporting and statistics.

The RFABs serve their members in many ways through providing advice rather than taking legally binding decisions. For example, many advise on fisheries management, socio-economics, science, research, regional cooperation, information and databases, development of national fisheries legislation and regional agreements or treaties and monitoring, control and surveillance.

Cooperation among RFABs, among RFMOs and between RFABs and RFMOs has strengthened considerably over the past two decades. For example, the five tuna-RFMOs hold regular meetings, exchange information and operate a joint website. Many initiatives exist to harmonise efforts in conserving and managing their respective fisheries, mindful of the high mobility of the fleets.

The working level institutional arrangements for all RFBs usually comprise the Secretariat and various committees, working groups or working parties, which may include delegates from members and invited experts or observers. Committees address topics of continuing relevance to the mandate, such as science, information and data, compliance or finance and administration. Working groups are usually set up to address specific technical issues and report to the annual Sessions of the RFMOs through the Committees.

RFBs are generally funded by the annual financial contributions of their Members and employ a limited number of permanent staff. However, many receive additional funding from donors for specific project work.

MAP OF WORLD TUNA REGIONAL FISHERIES MANAGEMENT ORGANISATIONS (RFMOs)

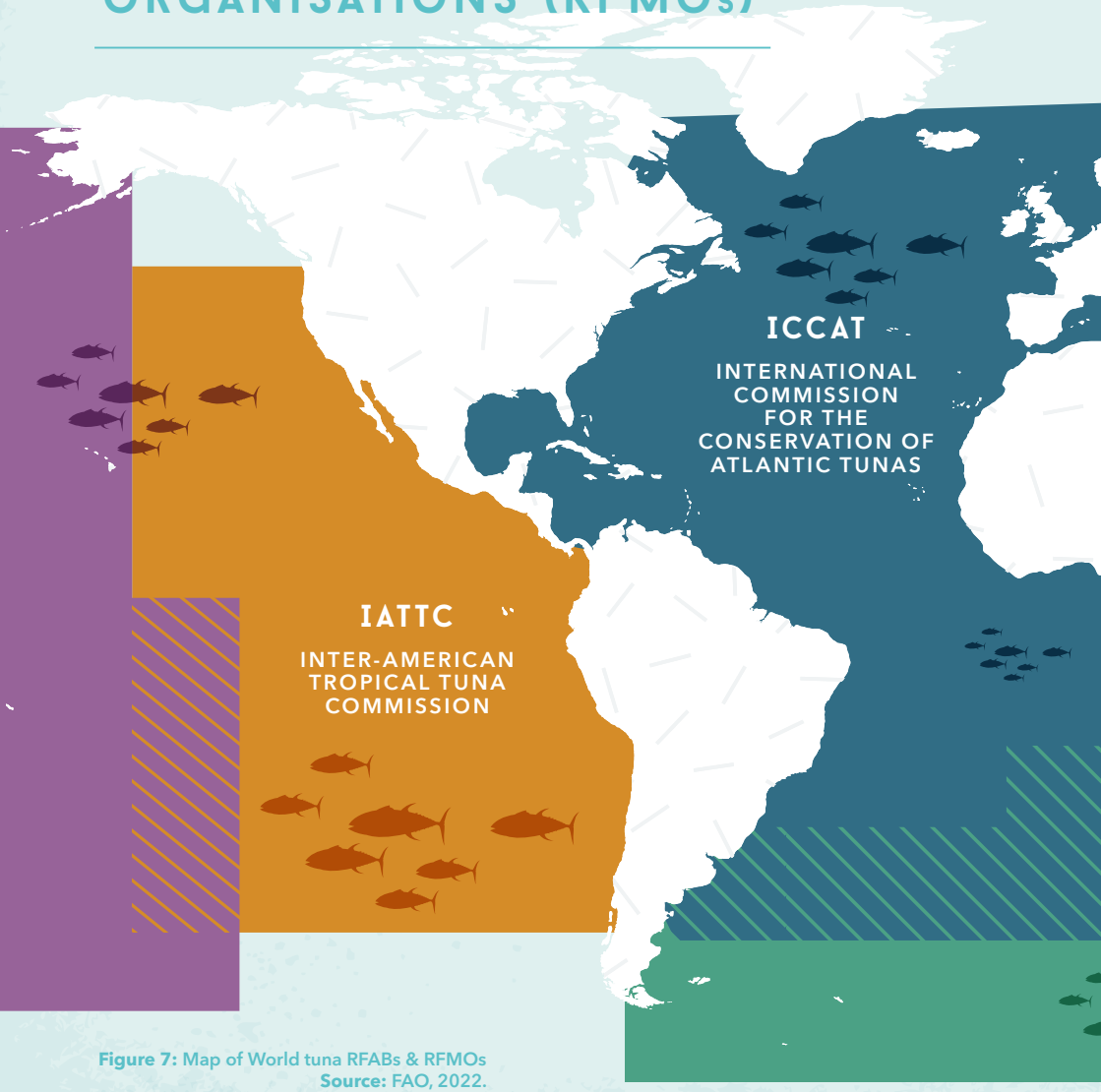
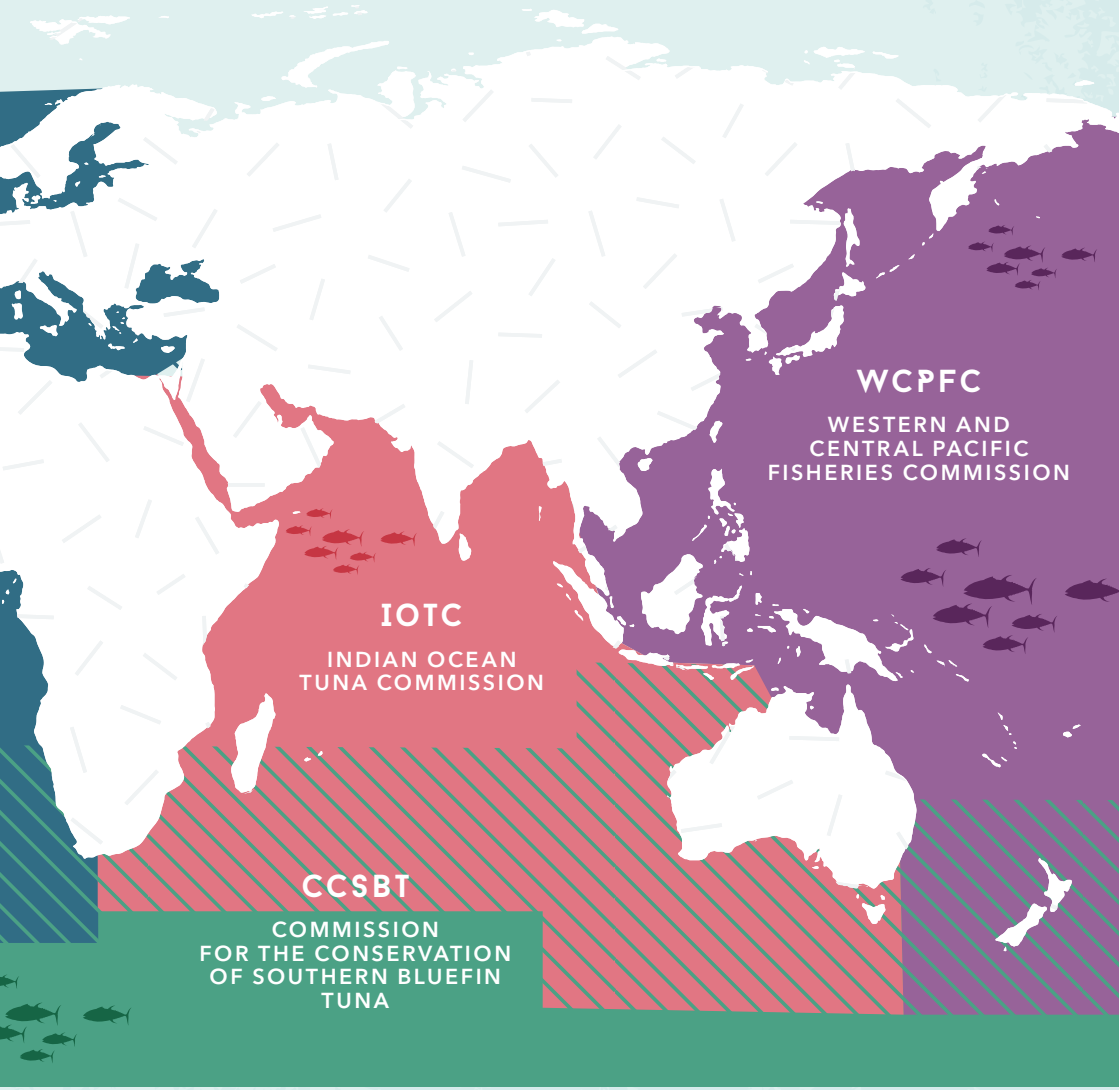


Figure 7: Map of World tuna RFABs & RFMOs
Source: FAO, 2022.


WCPFC
WESTERN AND
CENTRAL PACIFIC
FISHERIES COMMISSION
IOTC
INDIAN OCEAN
TUNA COMMISSION
CCSBT
COMMISSION
FOR THE CONSERVATION
OF SOUTHERN BLUEFIN
TUNA

TUNA AND TUNA-LIKE SPECIES OF THE INDIAN OCEAN

Figure 8: Oceanic whitetip shark

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The Indian Ocean is a vast expanse of maritime space, which borders east Africa, the Indian subcontinent, south-east Asia, and the shores of western and southern Australia. It is subdivided into a western and an eastern portion, which correspond approximately to FAO statistical areas 51 and 57, respectively, shown in Figure 6.

Over a dozen species of tuna and billfishes – falling under the management mandate of the IOTC – roam the Indian Ocean (Table 1). Many of these species have high commercial value and have been subject to large-scale industrial exploitation since the second half of the twentieth century.

The sixteen species which are covered by the *1993 Agreement for the Establishment of the Indian Ocean Tuna Commission* (IOTC Agreement) are listed in Annex B of the Agreement, as shown in Table 1. The IOTC mandate also covers "stocks", which are the populations of listed species that are located in the IOTC Area or migrate into or out of the Area. In addition, IOTC has adopted management measures in relation to various species of shark (Figure 8).

All 16 species covered by the IOTC Agreement display highly migratory behaviour, moving across EEZ boundaries between States and between EEZs and the high seas.

Of the sixteen species, nine are tuna, two are mackerel, and five are billfish. The commercial tuna species which are the principal target of the large industrial fleets are yellowfin tuna (YFT), skipjack tuna (SKJ) (Figure 10), bigeye tuna (BET) (Figure 10) and albacore (ALB). Southern bluefin tuna (SBT) are included in IOTC's mandate but IOTC has recognised that the primary responsibility for their management should be exercised by another tuna RFMO, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), which was established in the same year as IOTC.[1]

All these Indian Ocean species display highly migratory behaviour, moving across EEZ boundaries between States and between EEZs and the high seas. Migrations throughout the Indian Ocean follow cyclical, annual patterns, and stock movements and distribution vary between species.

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Figure 9: This catch of yellowfin (YFT) is just one of the species managed through IOTC

Migrations are often classified into feeding and spawning migrations. These are influenced by water circulation, sea surface temperature, vertical and horizontal nutrient distribution, and the occurrence of phyto- and zooplankton which fuel the lower trophic levels of the food chain.

[1] *At its 1st Special Session in 1997, IOTC formally recognised that CCSBT should have the prime responsibility for the conservation and management of southern bluefin tuna.*

Table 1: Tuna and tuna-like species under IOTC management

English vernacular name	Scientific name	FAO Apha-3 Species Code
Yellowfin tuna	*Thunnus albacares*	YFT
Skipjack tuna	*Katsuwonus pelamis*	SKJ
Bigeye tuna	*Thunnus obesus*	BET
Albacore	*Thunnus alalunga*	ALB
Southern bluefin tuna	*Thunnus maccoyii*	SBT
Longtail tuna	*Thunnus tonggol*	LOT
Kawakawa	*Euthynnus affinis*	KAW
Frigate tuna	*Auxis thazard*	FRI
Bullet tuna	*Auxis rochei*	BLT
Narrow-barred Spanish mackerel	*Scomberomorus commersoni*	COM
Indo-Pacific king mackerel	*Scomberomorus guttatus*	GUT
Blue marlin	*Makaira nigricans*	BUM
Black marlin	*Makaira indica*	BLM
Striped marlin	*Tetrapturus audax*	MLS
Indo-Pacific sailfish	*Istiophorus platypterus*	SFA
Swordfish	*Xiphias gladius*	SWO

Source: IOTC, 2022.

Tunas mainly feed on fish, crustaceans and cephalopods. They consume prey found in large quantities and feed mainly during daytime. The composition of stomach contents changes substantially between areas, and also between seasons.

In the Indian Ocean, most species of tuna and billfish are considered to belong to single stocks. In some cases stocks could form semi-permanent sub-stocks, for example where the feeding migration of one population of a species is more to the east, while that of another population is separate and more to the west. Where this occurs, interbreeding between such sub-stocks is high enough so that there is no genetic distinction between them. Therefore, Indian Ocean tuna stocks are considered to be single units for purposes of their management.

The IOTC carries out quantitative stock assessments.

Figure 10: Tropical tunas: from top to bottom: Yellowfin tuna (YFT), Big eye tuna (BET) and Skipjack tuna (SKJ)

Quantitative stock assessments are made to predict the reactions of fish populations to previous, current and future levels of fishing. They generally involve the use of various statistical and mathematical calculations.

They have been made on twelve of the sixteen species managed by IOTC, including the key commercial species of yellowfin tuna, skipjack tuna, bigeye tuna, albacore and swordfish, and since 2012, black marlin, blue marlin, striped marlin, Indo-Pacific sailfish, kawakawa, longtail tuna and narrow-barred Spanish mackerel.

The latest stock assessments establish that the key commercial stocks of skipjack tuna and swordfish are not overfished, while yellowfin tuna has been rated as overfished, big eye tuna and albacore tuna are subject to overfishing since 2018. Of the species assessed since 2018, blue marlin, striped marlin, longtail tuna and narrow-barred Spanish mackerel are also considered to be overfished.

In 2016, IOTC adopted its first ever total allowable catch (TAC) provisions for yellowfin tuna under Resolution 16/01, providing "*an interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence*". This Resolution is updated annually.

In 2017, IOTC adopted its first harvest control rules for Skipjack tuna under Resolution 17/10 for implementation of a total catch limit from 2018 to 2020.

In 2016 IOTC adopted its first ever total allowable catch provisions, for yellowfin tuna

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STOCK STATUS SUMMARY FOR THE IOTC SPECIES: 2019

Table 2: Status summary for species of tuna and tuna-like species under the IOTC mandate, as well as other species impacted by IOTC fisheries.
Source: IOTC, 2022.

Temperate and tropical tuna stocks: main stocks being targeted by industrial, and to a lesser extent, artisanal fisheries throughout the Indian Ocean, both on the high seas and in the EEZ of coastal states.

Stock	Indicators		2015	2016
Albacore *Thunnus alalunga*	Catch 2018:	41 603 t		
	Average catch 2014–2018:	38 030 t		
	MSY (1000 t) (95% CI):	35.7 (27.3–44.4)		
	F_{MSY} (95% CI):	0.21 (0.195-0.237)		
	SB_{MSY} (1000 t) (95% CI):	23.2 (17.6–29.2)		
	F_{2017}/F_{MSY} (95% CI):	1.346 (0.588–2.171)		
	SB_{2017}/SB_{MSY} (95% CI):	1.281 (0.574–2.071)		
	SB_{2017}/SB_{1950} (95% CI):	0.262 (-)		

Colour key to Table 2:

	Stock overfished	Stock not overfished
Stock subject to overfishing		
Stock not subject to overfishing		
Not assessed/uncertain		

2017	2018	2019	Advice to the Commission

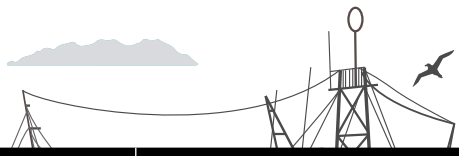
©IOTC

A new stock assessment was carried out for albacore in 2019 to update the assessment undertaken in 2016.

Although considerable uncertainty remains in the SS3 assessment conducted in 2019, particularly due to the conflicts in key data inputs, a precautionary approach to the management of albacore tuna should be applied. The K2SM indicates that catch reductions are required in order to prevent the biomass from declining to below MSY levels in the short term, due to the low recent recruitment levels. Although there is considerable uncertainty in the projections, current catches are exceeding the estimated MSY level (35 700 t).

The stock status in relation to the Commission's BMSY and FMSY target reference points indicates that the stock is **not overfished** but is **subject to overfishing.**

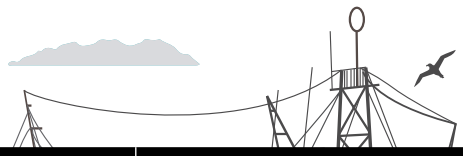
*For the most up-to-date stocks status, consult the information at the following link: http://www.iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted-iotc



Stock	Indicators		2015	2016
Bigeye tuna *Thunnus obesus*	Catch in 2018:	93 515 t (81 413 t[2])		84 %
	Average catch 2014–2018:	92 140 t (89 720 t[2])		
	MSY (1000 t) (80% CI):	87 (75 – 108)		
	F_{MSY} (80% CI):	0.24 (0.18 – 0.36)		
	SB_{MSY} (1,000 t) (80% CI):	503 (370 – 748)		
	F_{2018}/F_{MSY} (80% CI):	1.20 (0.70 – 2.05)		
	SB_{2018}/SB_{MSY} (80% CI):	1.22 (0.82 – 1.81)		
	SB_{2018}/SB_0 (80% CI):	0.31 (0.21 – 0.34)		
Skipjack tuna *Katsuwonus pelamis*	Catch in 2018:	607 701 t (606,197 t[2])		47 %
	Average catch 2014–2018:	484 993 t (484,692 t[2])		
	MSY (1000 t) (80% CI):	510.1 (455.9–618.8)		
	F_{MSY} (80% CI):	0.88 (0.72-0.98)		
	SB_{MSY} (1,000 t) (80% CI):	796.66 (582.65-1,059.29)		
	F_{2018}/F_{MSY} (80% CI):	910.4 (873.6-1195)		
	SB_{2018}/SB_{MSY} (80% CI):	1.00 (0.88–1.17)		
	SB_{2018}/SB_0 (80% CI):	0.40 (0.35–0.47)		
		0.59 (0.53-0.65)		
		2 015 220 (1,651,230–2 296 135)		

[2] *Considering the alternative purse seine log-associated catch composition for the European Union fleet in 2018 as per IOTC-2019-WPTT21-R[E]*

2017	2018	2019	Advice to the Commission
		38 %	 ©IOTC In 2019 a new stock assessment was carried out for bigeye tuna in the IOTC area of competence to update the stock status undertaken in 2016. The stock status determination changed qualitatively in 2019 to **not overfished** but **subject to overfishing**. If catches remain at current levels there is a risk of breaching MSY reference points with 58.9 percent and 60.8 percent probability in 2021 and 2028. Reduced catches of at least ten percent from current levels will likely reduce the probabilities of breaching reference levels to 49.1 percent in 2028. Continued monitoring and improvement in data collection, reporting and analyses is required to reduce the uncertainty in assessments.
			 ©IOTC No new stock assessment was carried out for skipjack tuna in 2019, thus, stock status is determined on the basis of the 2016 assessment and other indicators presented in 2019. On the weight-of-evidence available in 2019, the skipjack tuna stock is determined to be **not overfished** and is **not subject to overfishing**. Based on the results of the stock assessment of skipjack tuna in 2017, the Commission, following Resolution 16/02, adopted an annual catch limit of 470 029 tonnes for the years 2018 to 2020. Total catches in 2018 (607 701 t) were 29 percent larger than the catch limit generated by the Harvest Control Rule (470 029 t) which applies to the years 2018–2020, and there has been an increasing trend in catches over the past 3 years. The Commission needs to ensure that future catches of skipjack do not exceed the agreed limit for the 2018-2020 period.



Stock	Indicators		2015	2016
Yellowfin tuna *Thunnus albacares*	Catch in 2018:	423 815 t (437 422 t[3])		
	Average catch 2014–2018:	404 655 t (407 377 t[2])		
	MSY (1000 t) (80% CI):	403 (339–436)		
	F_{MSY} (80% CI):	0.15 (0.13–0.17)		
	SB_{MSY} (1,000 t) (80% CI):	1069 (789–1387)		
	F_{2018}/F_{MSY} (80% CI):	1.20 (1.00–1.71)		
	SB_{2018}/SB_{MSY} (80% CI):	0.83 (0.74–0.97)		
	SB_{2018}/SB_{0} (80% CI):	0.30 (0.27 – 0.33)		

[3] *Considering the alternative purse seine log-associated catches for the European Union fleet in 2018 as per IOTC-2019-WPTT21-R*

In 2017 IOTC adopted its first harvest control rules, for Skipjack tuna

2017	2018	2019	Advice to the Commission

©IOTC

No new stock assessment was carried out for yellowfin tuna in 2019, thus, stock status is determined on the basis of the 2018 assessment and other indicators presented in 2019. On the weight-of-evidence available in 2018 and 2019, the yellowfin tuna stock is determined to remain **overfished** and **subject to overfishing.**

The decline in stock status to below MSY reference level is not well understood due to various uncertainties. As a precautionary measure, the Commission should ensure that catches are reduced to end overfishing and allow the SSB to recover to SSBMSY levels. At this stage, no revised specific catch limits are recommended.

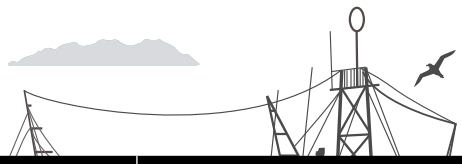
In the 2018 Scientific Committee a Workplan was developed to address the issues identified in the assessment review, aimed at increasing the Committee's ability to provide more concrete and robust advice by the 2019 meeting of the Scientific Committee. The workplan started in January 2019 which aimed at addressing the issues identified by the WPTT and the external reviewer in 2018. The draft workplan is attached as Appendix 38 of the 2018 Scientific Committee Report (IOTC-2018-SC21-R). The Commission should ensure that this workplan is budgeted appropriately. Despite the progress made to reduce the uncertainties inherent to this fishery, the WPTT agreed that no new advice could be provided in 2019.

The Commission has an interim plan for the rebuilding the yellowfin stock, with catch limitations based on 2014/2015 levels (Resolution 19/01, which superseded 17/01 and 18/01). Some of the fisheries subject to catch reductions had fully achieved a decrease in catches in 2018 in accordance with the levels of reductions specified in the Resolution; however, these reductions were offset by increases in the catches from CPCs exempt and some CPCs subject to limitations on their catches of yellowfin tuna (see Table 9 in IOTC-2019-WPTT21-R). Thus, the total catches of yellowfin in 2018 increased by around nine percent from 2014/2015 levels. The Commission should ensure that any revision of the management measure can effectively achieve any prescribed catch reduction to ensure the effectiveness of the management measure.

Stock	Indicators		2015	2016
Swordfish *Xiphias gladius*	Catch 2018:	31 628 t		
	Average catch 2014-2018:	31 343 t		
	MSY (1,000 t) (80% CI):	31.59 (26.30–45.50)		
	F_{MSY} (80% CI):	0.17 (0.12–0.23)		
	SB_{MSY} (1,000 t) (80% CI):	43.69 (25.27–67.92)		
	F_{2015}/F_{MSY} (80% CI):	0.76 (0.41–1.04)		
	SB_{2015}/SB_{MSY} (80% CI):	1.50 (1.05–2.45)		
	SB_{2015}/SB_{1950} (80% CI):	0.31 (0.26–0.43)		
Black marlin *Makaira indica*	Catch 2018:	18 180 t		
	Average catch 2014–2018:	18 074 t		
	MSY (1,000 t) (80% CI):	12.93 (9.44-18.20)		
	F_{MSY} (80% CI):	0.18 (0.11-0.30)		
	B_{MSY} (1,000 t) (80% CI):	72.66 (45.52-119.47)		
	F_{2017}/F_{MSY} (80% CI):	0.96 (0.77-1.12)		
	B_{2017}/B_{MSY} (80% CI):	1.68 (1.32-2.10)		
	B_{2017}/B_0 (80% CI):	0.62 (0.49-0.78)		

Billfish: The billfish stocks are exploited by industrial and artisanal fisheries throughout the Indian Ocean, both on the high seas and in the EEZ of coastal states. While marlins and sailfish are not usually targeted by most fleets, they are caught and retained as byproduct by the main industrial fisheries, and are also important for localised small-scale and artisanal fisheries or as targets in sports and recreational fisheries.

2017	2018	2019	Advice to the Scientific Committee
			 ©IOTC No new stock assessment was carried out for swordfish in 2019, thus, the stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019. On the weight-of-evidence available in 2019, the stock is determined to be **not overfished** and **not subject to overfishing.** The most recent catches (33 352 t in 2017) are higher than MSY (31 590 t) and should be reduced to the MSY level.
			 ©IOTC No new stock assessment for black marlin was carried out in 2019, thus, the stock status is determined on the basis of the 2018 assessment based on JABBA and other indicators presented in 2019. The Kobe plot from the JABBA model indicated that the stock is **not subject to overfishing** and is currently **not overfished**, however these status estimates are subject to a high degree of uncertainty. Current catches (>14 600 t in 2017) are higher than MSY estimate (12 930 t), which is likely to associate with high uncertainty. The catch limits as stipulated in Resolution 18/05 have also been exceeded. The Commission should provide mechanisms to ensure that catch limits are not exceeded by all concerned fisheries. Projections were not carried out due to the poor predictive capabilities identified in the assessment diagnostics.



Stock	Indicators		2015	2016
Blue marlin *Makaira nigricans*	Catch 2018:	9 969 t		
	Average catch 2014-2018:	11 382 t		
	MSY (1,000 t) (80% CI):	9.98 (8.18 –11.86)		
	F_{MSY} (80% CI):	0.21 (0.13 – 0.35)		
	B_{MSY} (1,000 t) (80% CI):	47 (29.9 – 75.3)		
	H_{2017}/H_{MSY} (80% CI):	1.47 (0.96 – 2.35)		
	B_{2017}/B_{MSY} (80% CI):	0.82 (0.56 – 1.15)		
	B_{2017}/B_0 (80% CI):	0.41 (0.28 – 0.57)		
Striped marlin *Tetrapturus audax*	Catch 2018:	2 791 t		
	Average catch 2014-2018:	3 247 t		
	MSY (1,000 t) (JABBA):	4.73 (4.27–5.18)		
	FMSY (JABBA):	0.26 (0.20–0.34)		
	BMSY (1,000 t) (JABBA):	17.94 (14.21–23.13)		
	$F_{2017/FMSY}$ (JABBA):	1.99 (1.21–3.62)		
	$B_{2017}/_{BMSY}$ (JABBA):	0.33 (0.18–0.54)		
	SB_{2017}/SB_{MSY} (SS3):	0.373		
	B_{2017}/K(JABBA):	0.12 (0.07–0.20)		
	SB_{2017}/SB_{1950} (SS3):	0.13 (0.09–0.14)		

2017	2018	2019	Advice to the Scientific Committee
		87%	 ©IOTC Stock status based on the Bayesian State-Space Surplus Production model JABBA suggests that there is an 87 percent probability that the Indian Ocean blue marlin stock in 2017 is in the red zone of the Kobe plot, indicating the stock is **overfished** and **subject to overfishing**. The current catches of blue marlin (average of 11 761 t in the last 5 years, 2013-2017) are higher than MSY (9 984 t) and the stock is currently overfished and subject to overfishing. In order to achieve the Commission objectives of being in the green zone of the Kobe Plot by 2027 (F2027 < FMSY and B2027 > BMSY) with at least a 60 percent chance, the catches of blue marlin would have to be reduced by 35 percent compared to the average of the last 3 years, to a maximum value of approximately 7 800 t.
	99%		 ©IOTC No new stock assessment for striped marlin was carried out in 2019, thus, the stock status is determined on the basis of the 2018 assessment and other indicators presented in 2019. On the weight-of-evidence available in 2019, the stock status of striped marlin is determined to be **overfished** and **subject to overfishing.** Current or increasing catches have a very high risk of further decline in the stock status. Current 2017 catches are lower than MSY (4,730 t) but the stock has been overfished for more than two decades and is now in a highly depleted state. If the Commission wishes to recover the stock to the green quadrant of the Kobe plot with a probability ranging from 60 percent to 90 percent by 2026, it needs to provide mechanisms to ensure the maximum annual catches remain between 1 500 t – 2 200 t.

Stock	Indicators		2015	2016
Indo-Pacific Sailfish *Istiophorus platypterus*	Catch 2018:	36 911 t		
	Average catch 2014-2018:	31 267 t		
	MSY (1,000 t) (80% CI):	23.9 (16.1 – 35.4)		
	F_{MSY} (80% CI):	0.19 (0.14 - 0.24)		
	B_{MSY} (1,000 t) (80% CI):	129 (81–206)		
	$F_{2017/}F_{MSY}$ (80% CI):	1.22 (1 – 2.22)		
	$B2_{017/}B_{MSY}$ (80% CI):	1.14 (0.63 – 1.39)		
	B_{2017}/B_0 (80% CI):	0.57 (0.31 – 0.70)		

Neritic tunas and mackerel: These six species have become as important or more important as the three tropical tuna species (bigeye tuna, skipjack tuna and yellowfin tuna) to most IOTC coastal states. Neritic tunas and mackerels are caught primarily by coastal fisheries, including small-scale industrial and artisanal fisheries, and are almost always caught within the EEZs of coastal states. Historically, catches were often reported as aggregates of various species, making it difficult to obtain appropriate data for stock assessment analyses.

2017	2018	2019	Advice to the Scientific Committee

©IOTC

A new stock assessment was carried out for Indo-Pacific sailfish in 2019 using the C-MSY model. The data poor stock assessment techniques indicated that F was above FMSY (F/FMSY=1.22) and B above BMSY (B/B_{MSY}=1.14). On the weight-of-evidence available in 2019, the stock status **cannot be assessed** and is determined to be uncertain.

The catch limits as stipulated in Resolution 18/05 have been exceeded. The Commission should provide mechanisms to ensure that catch limits are not exceeded by all concerned fisheries. Research emphasis on further developing possible CPUE indicators from gillnet fisheries, and further exploration of stock assessment approaches for data poor fisheries are warranted. Given the limited data being reported for coastal gillnet fisheries, and the importance of sports fisheries for this species, efforts must be made to rectify these information gaps. The lack of catch records in the Persian Gulf should also be examined to evaluate the degree of localised depletion in Indian Ocean coastal areas.

Stock	Indicators		2015	2016
Bullet tuna *Auxis rochei*	Catch 2018:	31,615 t		
	Average catch 2014–2018:	16,364 t		
	MSY (1,000 t)	unknown		
	FMSY :	unknown		
	BM_{SY} (1,000 t):	unknown		
	$F_{current}$/FMSY:	unknown		
	$B_{current}$/BMSY :	unknown		
	$B_{current}$/B0 :	unknown		
Frigate tuna *Auxis thazard*	Catch 2018:	82 909 t		
	Average catch 2014–2018:	89 253 t		
	MSY (1,000 t)	unknown		
	F_{MSY} :	unknown		
	B_{MSY} (1,000 t):	unknown		
	$F_{current}/F_{MSY}$:	unknown		
	$B_{current}/B_{MSY}$:	unknown		
	$B_{current}$/B0 :	unknown		

2017	2018	2019	Advice to the Commission
			No quantitative stock assessment is currently available for bullet tuna in the Indian Ocean, and due to a lack of fishery data for several gears, only preliminary stock status indicators can be used. Stock status in relation to the Commission's BMSY and FMSY reference points remains **unknown** For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow barred Spanish mackerel), the MSY was estimated to have been reached between 2009 and 2011 and both FMSY and BMSY were breached thereafter. Therefore, in the absence of a stock assessment of bullet tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not exceed the average catches estimated between 2009 and 2011 (8,870 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that also for bullet tuna MSY was reached between 2009 and 2011. This catch advice should be maintained until an assessment of bullet tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice.
			 ©IOTC No quantitative stock assessment is currently available for frigate tuna in the Indian Ocean, and due to a lack of fishery data for several gears, only preliminary stock status indicators can be used. Stock status in relation to the Commission's BMSY and FMSY reference points remains **unknown**. For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow barred Spanish mackerel), the MSY was estimated to have been reached between 2009 and 2011 and both FMSY and BMSY were breached thereafter. Therefore, in the absence of a stock assessment of frigate tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not exceed the average catches estimated between 2009 and 2011 (94,921 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that also for bullet tuna MSY was reached between 2009 and 2011. This catch advice should be maintained until an assessment of frigate tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice.

Stock	Indicators		2015	2016
Kawakawa *Euthynnus affinis*	Catch 2018:	173 367 t		
	Average catch 2014-2018	161 844 t		
	MSY (1,000 t) [*]	152 [125 –188]		
	FMSY [*]	0.56 [0.42–0.69]		
	BM_{SY} (1,000 t) [*]	202 [151–315]		
	$F_{2013/}$FMSY [*]	0.98 [0.85–1.11]		
	$B2_{013/}$BMSY [*]	1.15 [0.97–1.38]		
	$B2_{013}$/B0 [*]	0.58 [0.33–0.86]		
Longtail tuna *Thunnus tonggol*	Catch 2018:	136 906 t		
	Average catch 2014–2018:	138 352 t		
	MSY (1,000 t) (*):	140 (103–18[4])		
	F_{MSY} (*):	0.43 (0.28–0.6[9])		
	BM_{SY} (1,000 t) (*):	319 (200–623)		
	$F_{2015/}F_{MSY}$ (*):	1.04 (0.84–1.46)		
	$B2_{015/}BM_{SY}$ (*):	0.94 (0.68–1.16)		
	$B2_{015}$/B0 (*):	0.48 (0.34–0.59)		

2017	2018	2019	Advice to the Commission
			 ©IOTC A stock assessment was not undertaken for kawakawa in 2019 and the status is determined on the basis of the last assessment conducted in 2015, which used catch data from 1950 to 2013. Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as not overfished and not subject to overfishing. Although the stock status is classified as not overfished and not subject to overfishing, the Kobe strategy II matrix developed in 2015 showed that there is a 96 percent probability that biomass is below MSY levels and 100 percent probability that F>FMSY by 2016 and 2023 if catches are maintained at the 2013 levels. There is a 55 percent probability that biomass is below MSY levels and 91 percent probability that F>FMSY by 2023 if catches are maintained at around 2016 levels. The modelled probabilities of the stock achieving levels consistent with the MSY reference points (e.g. SB > SBMSY and F<FMSY) in 2023 are 100 percent for a future constant catch at 80 percent of 2013 catch levels. If catches are reduced by 20 percent based on 2013 levels at the time of the assessment (170 181 t) , the stock is expected to recover to levels above MSY reference points with a 50 percent probability by 2023.
67%			No new stock assessment for Longtain tuna was carried out in 2019, thus, the stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019. Based on the weight-of-evidence currently available, the stock is considered to be both overfished and subject to overfishing. There is a substantial risk of exceeding MSY-based reference points by 2018 if catches are maintained at current (2015) levels (63 percent risk that B2018<BMSY, and 55 percent risk that F2018>FMSY). If catches are reduced by 10 percent this risk is lowered to 33 percent probability B2018<BMSY and 28 percent probability F2018>FMSY). If catches are capped at current (2015) levels at the time of the assessment (i.e., 136 849 t), the stock is expected to recover to levels above MSY reference points with at least a 50 percent probability by 2025. Catches have remained below estimated MSY since 2015.

Stock	Indicators		2015	2016
Indo-Pacific king mackerel *Scomberomorus guttatus*	Catch 2018:	50,653 t		
	Average catch 2014-2018:	49,511 t		
	MSY (1 000 t)	Unknown		
	FMSY :	Unknown		
	BM_{SY} (1 000 t):	Unknown		
	$F_{current}$/FMSY:	Unknown		
	$B_{current}$/BMSY :	Unknown		
	$B_{current}$/B0 :	Unknown		
Narrow-barred Spanish mackerel *Scomberomorus commerson*	Catch 2018:	149 263 t		
	Average catch 2014-2018:	163 209 t		
	MSY (1,000 t) [*]:	131 [96–180]		
	FMSY [*]:	0.35 [0.18–0.7]		
	BM_{SY} (1,000 t) [*]:	371 [187–882]		
	F_{2015}/FMSY [*]:	1.28 [1.03–1.69]		
	B2015 BMSY [*]:	0.89 [0.63–1.15]		
	$B2_{015}$/B0 [*]:	0.44 [0.31–0.57]		

Colour key to Table 2:

	Stock overfished	Stock not overfished
Stock subject to overfishing		
Stock not subject to overfishing		
Not assessed/uncertain		

2017	2018	2019	Advice to the Commission
			No new stock assessment for Indo-Pacific king mackerel was carried out in 2019, thus, the stock status is determined on the basis of the 2016 assessment and other indicators presented in 2019. Given that no new assessment was undertaken in 2019, the WPNT considered that stock status in relation to the Commission's BMSY and FMSY target reference points remains unknown. For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow barred Spanish mackerel), the MSY was estimated to have been reached between 2009 and 2011 and both FMSY and BMSY were breached thereafter. Therefore, in the absence of a stock assessment of Indo-Pacific king mackerel a limit to the catches should be considered by the Commission, by ensuring that future catches do not exceed the average catches between 2009 and 2011 estimated at the time of the assessment (46 787 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that also for Indo-Pacific king mackerel MSY was reached between 2009 and 2011. This catch advice should be maintained until an assessment of Indo-Pacific king mackerel is available. This catch advice should be maintained until an assessment of Indo-Pacific king mackerel is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice.
89%			No new stock assessment for Narrow-barred Spanish mackerel was carried out in 2019, thus, the stock status is determined on the basis of the 2017 assessment and other indicators presented in 2019. Based on the weight-of-evidence available, the stock appears to be overfished and subject to overfishing. There is a continued high risk of exceeding MSY-based reference points by 2025, even if catches are reduced to 80 percent of the 2015 levels (73 percent risk that B2025<BMSY, and 99 percent risk that F2025>FMSY). The modelled probabilities of the stock achieving levels consistent with the MSY reference levels (e.g. B > BMSY and F<FMSY) in 2025 are 93 percent and 70 percent, respectively, for a future constant catch at 70 percent of current catch level. If catches are reduced by 30 percent of the 2015 levels at the time of the assessment, which corresponds to catches below MSY, the stock is expected to recover to levels above the MSY reference points with at least a 50 percent probability by 2025.

*For the most up-to-date stocks status, consult the information at the following link:

http://www.iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted-iotc

THE TUNA FISHERIES OF THE INDIAN OCEAN

Providing 19 percent of the global tuna catch, the tuna resources of the Indian Ocean are the second largest in the world.

Global production of major commercial tuna species[4] has increased from less than 600,000t in 1950 to some 5.3 million tonnes in 2018.

The Indian Ocean currently provides about 19 percent of the global tuna catch (1.9 million tonnes)[5]. The tuna resources of the Indian Ocean are the second-most largest in the world and make a significant contribution to food security throughout the region. The Indian Ocean tuna economy is estimated by some to be worth six billion USD.

For 2018, 83 percent of the catch of IOTC species was attributed to coastal States bordering the Indian Ocean (both artisanal and industrial fleets), with 57 percent of the total 1.9 million tonnes attributed to artisanal fisheries (Figure 11).

Around 42 percent of the four major tuna species caught in the Indian Ocean are harvested by small-scale (artisanal) fishing fleets. This contrasts with other ocean basins, such as the Western and Central Pacific, where catches are predominantly made by large-scale (industrial) fleets. Small-scale fleets in the Indian Ocean are prominent in countries such as Comoros, India, Indonesia, the Islamic Republic of Iran, Maldives, Pakistan, Sri Lanka and the Republic of Yemen. Although much of the tuna landed by small-scale fishers is directed at local markets for national consumption, a portion of the catch is also exported to other countries.

[4] *There are 23 stocks of major commercial tuna species worldwide – 6 albacore, 4 bigeye, 4 bluefin, 5 skipjack and 4 yellowfin stocks.*
[5] *10 percent of global tuna harvests stem from the Atlantic Ocean, and 67 percent from the Pacific Ocean*

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Figure 11: Around 42 percent of the catches of the four major tuna species are harvested by small-scale fleets

Eighty-three percent of the catch of IOTC species is attributed to coastal States bordering the Indian Ocean.

Countries such as Mauritius and Seychelles derive substantial economic benefits and revenue from the tuna industry. Economic benefits may be generated directly through employment (especially in the processing industry), or indirectly in terms of port State earnings. Large tuna canneries in the western Indian Ocean are located in the Seychelles, Mauritius and Madagascar. In the eastern Indian Ocean, significant tuna processors are located in Thailand and Indonesia. While tuna processors in the western Indian Ocean source tuna almost exclusively from Indian Ocean fisheries, those in southeast Asia have a history of switching their sources between ocean basins for commercial benefit. Their strategic location between the Indian Ocean and the Pacific Ocean allows them to do so with relative ease.

Key markets for Indian Ocean tuna are the European Union for canned tuna, and the Japanese and wider Asian markets for sashimi-grade (fresh or frozen) tuna. Western Indian Ocean canneries are almost exclusively targeting the European Union market, because of their preferential trade ties with the European Union under mechanisms such as Economic Partnership Agreements and Sustainable Fisheries Partnership Agreements.

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Figure 12: Industrial purse seiner

57 percent of the total 1.9 million tonnes of catch is attributed to artisanal fisheries.

Tens of thousands of fishers and their dependents around the Indian Ocean basin derive sustenance and income from these fisheries. Artisanal fleets targeting tuna operate exclusively within their EEZs, and take their catch mostly from coastal waters in the entire Indian Ocean. Statistics on species composition, size frequencies and catch per unit effort are poor, and dynamics in these fisheries remain poorly understood. A five-year IOTC tuna tagging program, which ran from 2005-2009, found it very difficult to recover tags from artisanal operators, because of the significant challenge in raising awareness about the program in remote fishing communities.

The larger-scale tuna fisheries fall into three categories, described below. The composition of each category has been shifting and evolving gradually in response to technological developments and market demand for specific types of products.

- **Industrial purse seiners.** The majority are flagged to the European Union and others are flagged to countries such as Seychelles, the Islamic Republic of Iran, the Philippines, Japan and the Republic of Korea. They account for about 28 percent (2018) of the total catch of IOTC species. There were 126 industrial purse seiners (LOA >= 24 meters) actively operating in the Indian Ocean in 2019[6] (Figure 12).

[6] *IOTC Record of Active Vessels*

- **Industrial longliners** for fresh tuna, frozen tuna and swordfish. The majority of these vessels fly the flags of countries such as China, Japan, Indonesia, Seychelles or Spain. In 2018, the 887 longline vessels that operated in the Indian Ocean accounted for 7 percent of the total catch of IOTC species[7].
- **Intermediate-scale, short range** and mostly south Asian tuna fleets consists of pole-and-line (Figure 13) vessels (Maldives), **gillnetters** (mostly the Islamic Republic of Iran and Pakistan), **multi-purpose longline and gillnet vessels** (Sri Lanka), **and purse seine and longline vessels** (Indonesia). There are many thousands of these intermediate sized vessels, the majority less than 24 meters in length. They account for a significant portion of the total catch of IOTC species. The vast majority of these vessels operate exclusively within EEZs and are considered coastal fleets.

Economic benefits may be generated directly through employment (especially in the processing industry), or indirectly in terms of port State earnings.

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Figure 13: Pole and line fishing

The industrial segments of purse seiners and longliners are operated by both DWFNs and coastal States. In 2018, the share of the industrial catch harvested by coastal States was 51 percent of the total.

[7] http://www.iotc.org/documents/nominal-catches-fleet-year-gear-iotc-area-and-species-6

IOTC – IN A NUTSHELL

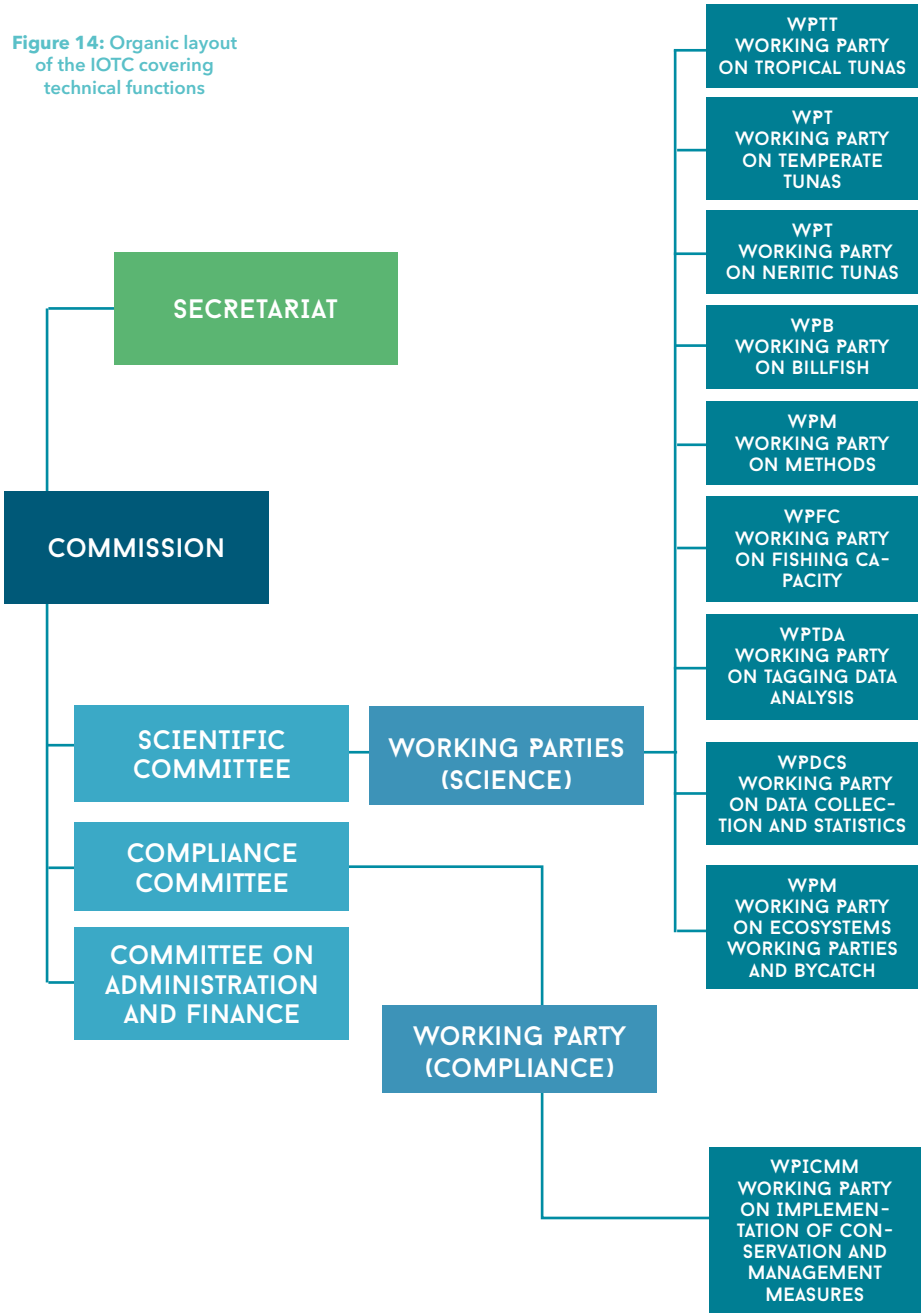
The Indian Ocean Tuna Commission was established through a legally binding international agreement, and membership is open to States and Regional Economic Integration Organisations. The IOTC Agreement was adopted by the FAO Council at its Hundred-and-fifth Session in Rome on 25 November, 1993, and entered into force upon the accession of the tenth Member on 27 March 1996. Of the five tuna RFMOs worldwide, it is the only one that is established under the FAO Constitution and operates within its framework.

The objective of the IOTC is to promote cooperation among its Members.

Under the Agreement, the IOTC is mandated to manage tuna and tuna-like species in the Indian Ocean and adjacent seas. The objective of the IOTC is to promote cooperation among its Members with a view to ensuring, through appropriate management, the conservation and optimum utilisation of stocks covered by the Agreement and encouraging sustainable development of fisheries based on these stocks.

In order to carry out its mandate, the IOTC has a structure comprising four key bodies. These are the Commission, three permanent Committees (Scientific Committee, Compliance Committee, Standing Committee on Administration and Finance) and a number of Working Parties, all supported by a Secretariat. They are shown in Figure 14.

Figure 14: Organic layout of the IOTC covering technical functions



Source: IOTC, 2022.

MEMBERS AND NON-MEMBERS

As of September 2020, the IOTC has 31 Members, including the European Union, and two Cooperating Non-Contracting Parties. The current membership of the Commission is summarised in Table 3.

Table 3: IOTC CPCs

CONTRACTING PARTIES TO THE INDIAN OCEAN TUNA COMMISSION (DATE OF ACCEPTANCE)			
Australia	(13 Nov 1996)	**Mauritius**	(27 Dec 1994)
Bangladesh	(April 2018)	**Mozambique**	(13 Feb 2012)
China	(14 Oct 1998)	**Oman**	(5 April 2000)
Comoros	(14 Aug 2001)	**Pakistan**	(27 Apr 1995)
Eritrea	(9 Aug 1994)	**Philippines**	(9 Jan 2004)
European Union	(27 Oct 1995)	**Republic of Korea**	(27 Mar 1996)
France (Territories)	(3 Dec 1996)	**Seychelles**	(26 Jul 1995)
India	(13 Mar 1995)	**Sierra Leone**	(01 Jul 2008)
Indonesia	(09 July 2007)	**Somalia**	(24 May 2014)
Iran (Islamic Republic of)	(28 Jan 2002)	**South Africa**	(16 Feb 2016)
Japan	(26 Jun 1996)	**Sri Lanka**	(13 Jun 1994)
Kenya	(29 Sep 2004)	**Sudan**	(3 Dec 1996)
Madagascar	(10 Jan 1996)	**Thailand**	(17 Mar 1997)
Malaysia	(22 May 1998)	**United Kingdom of Great Britain and Northern Ireland**	(22 Dec 2020)
Maldives	(13 July 2011)	**United Republic of Tanzania**	(18 Apr 2007)
		Yemen	(20 Jul 2012)
COOPERATING NON-CONTRACTING PARTIES TO THE INDIAN OCEAN TUNA COMMISSION			
Liberia	2015	**Senegal**	2006

Source: IOTC, 2020.

The countries with "Cooperating Non-Contracting Party" (CNCP) status are Liberia and Senegal. The criteria for obtaining the status of CNCP are in the IOTC Rules of Procedure, Appendix III. The Rules require CNCPs to confirm their commitment to respect the Commission's CMMs and inform IOTC of the measures they take to ensure compliance by their vessels. This status is obtained following an official application to the Secretary and approval by the Commission. It is subject to annual review and renewal.

The IOTC has 31 Members, including the European Union, and two Cooperating Non-Contracting Parties.

Together, Contracting Parties and CNCPs are designated as "CPCs". Many resolutions specifically refer to CPCs in their titles, indicating that both types of parties are subject to their provisions. CMMs generally address both types of parties, and the level of cooperation expected from any CNCP is all encompassing and very high.

Non-CPCs with flag vessels operating in the area have no direct obligations to control their vessels under the IOTC Agreement, but must do so under other international instruments to which they are party, such as exercising flag State responsibility under UNCLOS.

The UNFSA provides that non-CPCs are "not discharged from the obligation to cooperate" with RFMOs in the conservation and management of the relevant fish stocks, and must "not authorise vessels flying its flag to engage in fishing operations" for the stocks which are subject to the CMMs. In addition, CPCs of RFMOs must take measures to "deter activities of such vessels which undermine the effectiveness" of CMMs.

Based on these requirements, IOTC Members have adopted CMMs to control fishing and related activities by non-CPC vessels that do not cooperate and undermine the effectiveness of CMMs. For example, where a fishing vessel (including auxiliary, supply and support vessels) is not entered on the IOTC Record of Authorised Vessels (RAV), they are deemed not to be authorised to fish for, retain on board, tranship or land tuna and tuna-like species, or to support any fishing activity or set drifting fish aggregation devices (DFADs) in the IOTC Area (Figure 15)[8].

[8] *Resolution 19/04 CONCERNING THE IOTC RECORD OF VESSELS AUTHORISED TO OPERATE IN THE IOTC AREA OF COMPETENCE.*

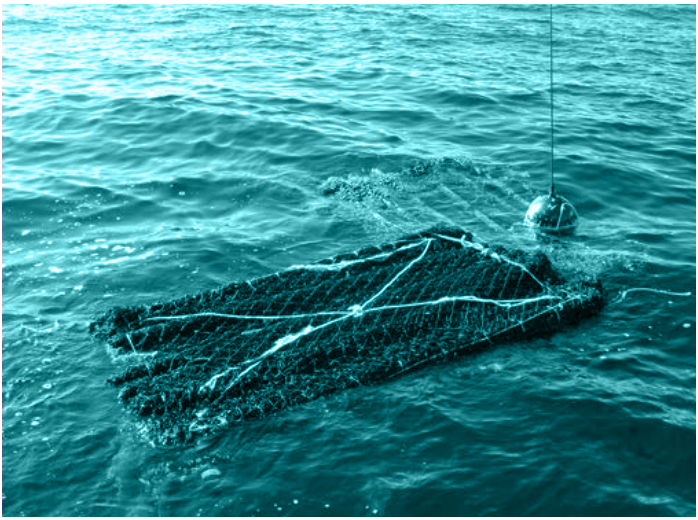


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Figure 15: The use of fish aggregating devices is regulated through IOTC

In addition, where a vessel is not on the RAV and its fishing activities in the IOTC Area are reported by a CPC, it is presumed to have been engaging in illegal, unreported and unregulated (IUU) fishing activities.[9] Members may then decide to include it on the IOTC IUU Vessel List, and if that occurs there are many actions that they must take, for example: ensuring their flag vessels do not assist, tranship or undertake joint fishing operations with them; refusing entry into its ports; prohibiting chartering; refusing to grant their flag; prohibiting the import, landing or transhipment (Figure 17), of tuna and tuna-like species from vessels included in the IUU Vessel List.

Other Resolutions introduce mechanisms with which non-CPCs will have to comply. For example the IOTC Bigeye Tuna Statistical Programme provides a documentation and certification scheme which applies to all countries (including non-CPCs) that export bigeye tuna to CPCs[10].

[9] *Resolution 18/03 ON ESTABLISHING A LIST OF VESSELS PRESUMED TO HAVE CARRIED OUT ILLEGAL, UNREPORTED AND UNREGULATED FISHING IN THE IOTC AREA OF COMPETENCE.*
[10] *Resolution 01/06.*

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Figure 16: At sea transhipment; transhipments at sea and in port are regulated through IOTC

THE COMMISSION

In order to achieve its objectives, the functions and responsibilities of the Commission designated in the IOTC Agreement include following, in accordance with the principles expressed in UNCLOS:

a. keep under review the conditions and trends of the stocks and to gather, analyse and disseminate scientific information and data relevant to the conservation and management of the stocks;

b. encourage, recommend, and coordinate research and development activities of the stocks and fisheries;

c. adopt, on the basis of scientific evidence, conservation and management measures to ensure the conservation of the stocks; and

d. keep under review the economic and social aspects of the fisheries; and

e. carry out such other activities as may be necessary to fulfil its objectives.

The Commission normally meets once a year during an Annual Session. The officers of the Commission are elected from the delegates present at Commission meetings and hold office for a biennium. Rules of Procedure, developed by the Commission, define its decision-making processes.

The Commission considers proposals for legally binding CMMs, which are formally submitted or sponsored by a Member of the Commission.

The Commission adopts decisions and recommendations based on the reports of the Committees and the Secretariat, with a view to furthering the objectives of the IOTC Agreement. It considers proposals for legally binding CMMs, which are formally submitted or sponsored by a Member of the Commission.

CMMs must be adopted by a two-thirds majority of Members present and voting. Members must ensure that action is taken to implement CMMs under its national legislation, including the imposition of adequate penalties for violations. However, Individual members that file a formal objection to a decision will not be bound by it.

Recommendations concerning conservation and management of the stocks, which should be implemented but are not legally binding, need only be adopted by a simple majority of its Members present and voting.

Sub-commissions can be established to deal with one or more of the stocks under the Agreement, but to date, no sub-commission has been constituted.

The Committees do much of the technical work, and prepare recommendations for the Commission to act upon.

THE COMMITTEES

Committees are subsidiary bodies of the Commission. They do much of the technical work, and prepare recommendations for the Commission to act upon. Committees generally convene before Commission meetings.

Committees currently in existence are the Scientific Committee (SC), the Compliance Committee (CoC), and the Standing Committee on Administration and Finance (SCAF). The former two cover technical tasks, while the latter is administrative in nature.

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Figure 17: An observer measuring a fish for feeding scientific models

THE SCIENTIFIC COMMITTEE

The Scientific Committee is established by the IOTC Agreement, and its terms of reference are in the IOTC Rules of Procedure adopted in 2014. It is comprised of scientists from IOTC Members, as well as experts to enhance and broaden the expertise of the Committee and its Working Parties.

The Scientific Committee is supported by a number of Working Parties, generally constituted by scientists attending in their individual capacity.

The main activities of the Scientific Committee are to consider matters referred by the Commission, and to:

- recommend policies and procedures for the collection, processing, dissemination and analysis of fishery data (Figure 17);
- facilitate the exchange and critical review among scientists of information on research and operation of fisheries of relevance to the Commission;
- develop and coordinate cooperative research programs involving Members of the Commission and other interested parties, in support of fisheries management;
- assess and report to the Commission on the status of stocks of relevance to the Commission and the likely effects of further fishing and of different fishing patterns and intensities;

- formulate and report to the sub-commission, as appropriate, on recommendations concerning conservation, fisheries management and research, including consensus, majority and minority views; and
- carry out other technical activities relevant to the Commission.

The Scientific Committee is supported by a number of Working Parties (Figure 14) which report to the Committee and inform its recommendations to the Commission. The Working Parties address technical issues relating to the management of the IOTC fish stocks and the ecosystems in which the fisheries operate. Their most common objective is to provide the Scientific Committee with scientific analyses of the current status of the stocks and evaluations of possible management measures. However, other matters may be addressed such as the scientific procedures and methods considered by the Working Party on Data Collection and Statistics and the Working Party on Methods.

The work of the Working Parties includes the following:

- review new information on the biology and stock structure of the relevant species, their fisheries and environmental data;
- coordinate and promote collaborative research on the species and their fisheries;
- develop and identify agreed models and procedures for the assessment of stock status of each species;
- conduct stock assessments for each of each species or stock;
- provide technical advice on management options, the implications of management measures and other issues;
- identify research priorities, and specify data and information requirements (Figure 18) that are necessary for the Working Party to meet its responsibilities.

©IOTC

Figure 18: One yellowfin tuna and one bigeye tuna: it requires skill to identify fish accurately

The Working Parties are generally constituted by scientists attending in their individual capacity and not representing any particular CPC. Their meetings are open to all interested scientists with expertise in the relevant issues under the Working Party consideration. Seven different Working Parties met formally in 2019, producing a total of 313 working and information papers.

THE COMPLIANCE COMMITTEE

The Compliance Committee is responsible for reviewing CPCs' compliance with binding IOTC CMMs, including data and statistical reporting requirements.

The Compliance Committee is responsible for reviewing all aspects of CPCs' individual compliance with binding IOTC CMMs. It is constituted of policy makers (Commissioners) and fisheries monitoring, control and surveillance (MCS) practitioners. Its comprehensive terms of reference are in the IOTC Rules of Procedure adopted in 2014. The main activities of the Compliance Committee are to:

- review all aspects of CPCs individual compliance with IOTC CMMs (Figure 19 and Figure 20);
- review information relevant to compliance from IOTC subsidiary bodies and from Reports of Implementation submitted by CPCs; and
- identify and discuss problems related to the effective implementation of, and compliance with, IOTC CMMs, and make recommendations to the Commission on how to address these problems.

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Figure 19: A whale shark: CMMs include measures to release accidental bycatch of important species

The Compliance Committee is supported by one Working Party (Figure 14). The primary objective of this Working Party is to lead technical discussions, to prepare assessments and documents, to alleviate the workload, and to address the time constraints of the Compliance Committee.

The Compliance Committee is assisted in its work by the Compliance Section of the Secretariat.

In discharging its terms of reference, the Compliance Committee reviews reports containing compliance monitoring information prepared by the Secretariat and makes recommendations to the Commission.

Compliance monitoring information is gathered primarily on the basis of a questionnaire which is circulated annually by the Secretariat, and to which CPCs must respond. In addition, many CMMs contain reporting requirements which CPCs must make to the Secretariat in relation to their implementation of the CMMs, including the provision of data and statistics.

THE STANDING COMMITTEE ON ADMINISTRATION AND FINANCE

The terms of reference of the Standing Committee on Administration and Finance are in the 2014 IOTC Rules of Procedure. The primary objective of its annual meeting is to present the IOTC Members with a biennial Programme of Work and Budget (PWB) for their consideration and recommendation to the Commission. The PWB consists of detailed proposals related to: staffing; operating expenses; extra-budgetary funding; value for money proposals; and further recommendations.

The Committee also addresses the past year's financial statement and reviews: the current state of contributions to the IOTC; detailed expenditure transactions; the balance of funds; and further recommendations. It reviews the Progress of the Secretariat for the past year against the PWB approved in the previous year, as well as other related business.

The IOTC Financial Regulations govern the financial administration of the IOTC.

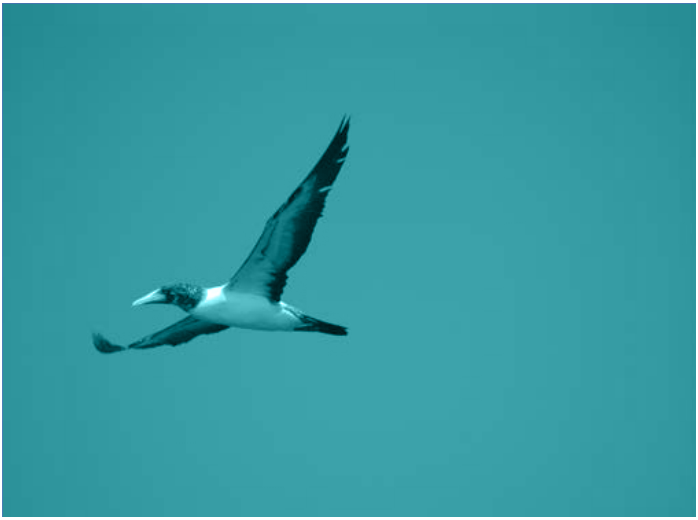
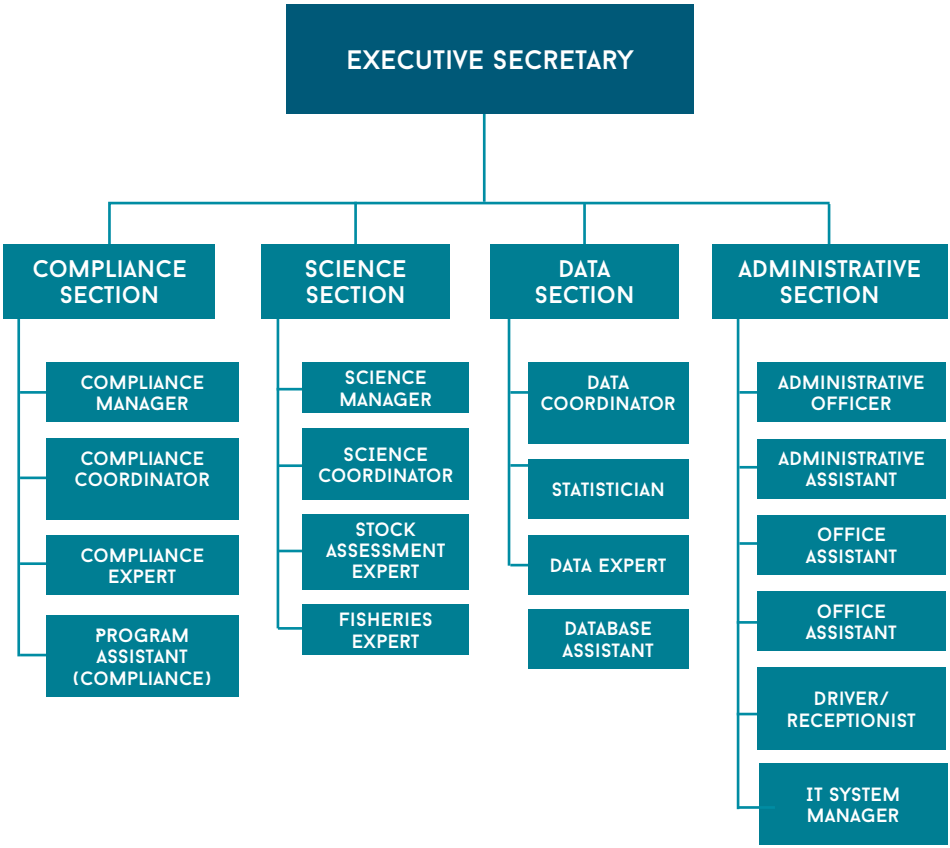


Figure 20: A seabird: CMMs include measures to prevent harming seabirds

THE IOTC SECRETARIAT

The offices of the IOTC Secretariat are located in Victoria, the capital of the Seychelles, on the island of Mahé. The office started its operations on first of January, 1998. The Secretariat comprises technical and administrative positions. The organigram of the Secretariat is presented in Figure 21.

Figure 21: Structure of the IOTC Secretariat in 2020



Source: SCAF17 meeting documents.

The Secretariat provides support to science, compliance and meetings, as well as communications and public information.

The mission of the Secretariat is to facilitate the processes required to implement the policies and activities of the Commission, whose goal is to achieve the objectives stated in the IOTC Agreement. In essence, these processes include the acquisition, processing and dissemination of information that constitutes the basis for the Commission's decisions, as well as supporting the actions taken by the CPCs to effectively implement those decisions.

The activities of the Secretariat are grouped into six major functional areas.

1. **Support to scientific activities.** The acquisition and processing of scientific data, as required by the Scientific Committee to conduct stock status analyses. Supply of stock assessment services as required by the working groups .
2. **Support to compliance activities.** Maintenance of lists of vessels and compliance databases, reporting on compliance by Members. Providing support to CPCs in the implementation of IOTC Resolutions.
3. **Communications and public information.** Considered essential in allowing CPCs to follow the progress of the Commission's work in a transparent way, and to increase the visibility of the Commission's activities to the general public and also share experiences, information and strengthen liaison between tuna RFMOs and RFABs.
4. **Support to meetings.** Logistic support in the facilitation of meetings, preparation of reports and maintenance of the meetings calendar
5. **Information Technology.** Provide basic computer infrastructure, including maintenance of the network and servers, as well as Internet support.
6. **Administration.** Financial administration in conjunction with FAO, administration of extra-budgetary funds, travel arrangements, general logistical support to the activities of the technical sections.

©IOTC

Figure 22: Inspectors need to be trained to convert this processed striped marlin to whole weight for use in science

In order to provide support to the scientific activities of the Commission and its subsidiary bodies, there is close cooperation between the Data Section and the Science Section in the production of datasets and analyses that will assist the Scientific Committee and its Working Parties to formulate its advice to the Commission. Similarly, the Data Section and the Compliance Section cooperate in the maintenance and analyses of the databases needed to monitor the effectiveness of the implementation of the measures adopted by the Members and recommend operational support or capacity building (Figure 22) to enhance implementation, thus supporting the work of the Commission.

The Secretariat can also become involved in the implementation of projects that further the objectives of the Commission. For example, from 2005 to 2009, the IOTC Secretariat hosted the European Union-funded Regional Tuna Tagging Programme (RTTP), whose aim was to enhance scientific knowledge about stocks and species through a tag recovery program. This project, which tagged in excess of 160 000 individual tunas throughout the Western Indian Ocean, substantially enhanced the state of knowledge on tuna biology available to tuna scientists working on Indian Ocean tuna stocks.

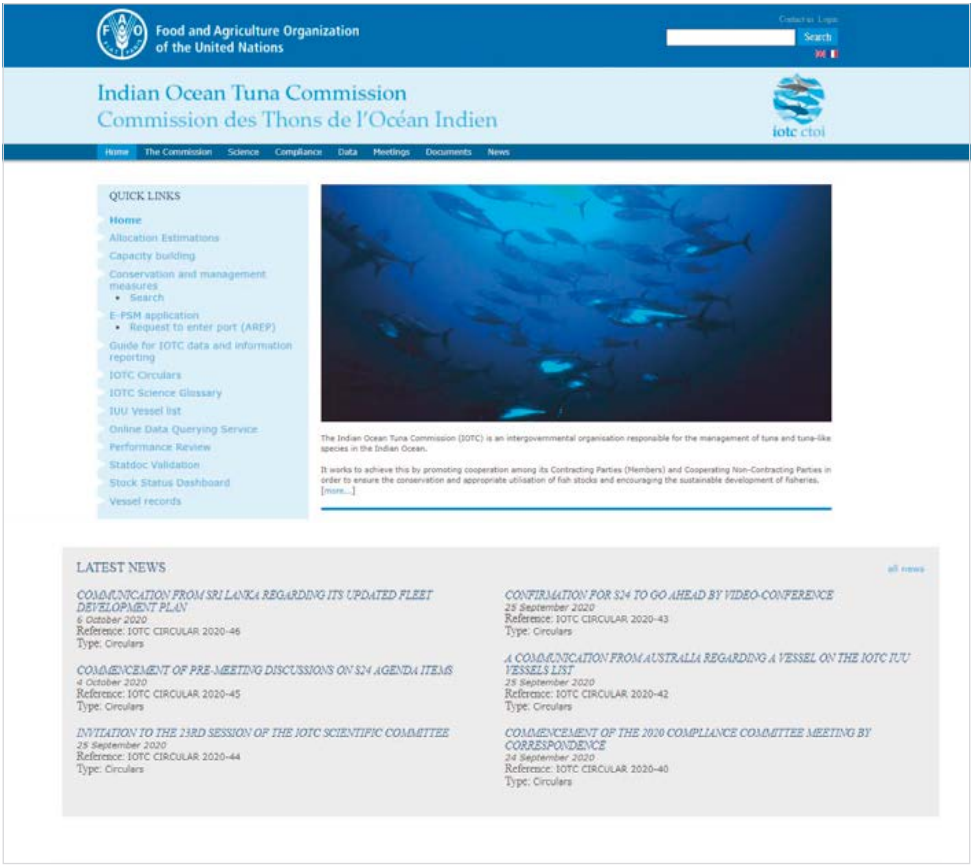
More recently, in 2012 the Secretariat launched an initiative to strengthen the implementation of IOTC CMMs and PSMs through capacity building. These activities, which include producing this manual, provide direct training for CPC workforces to improve their skills to effectively implement CMMs and thereby comply with their country's obligations.

Overall, from 2012 to 2019, CPC compliance with CMMs has risen from an estimated 46 percent to an estimated 70.8 percent, much of which may be directly attributed to the impact of the Secretariat's capacity building efforts. Similar capacity building efforts also address scientists and their capacity to contribute to the Commission's scientific processes.

CPC compliance with CMMs has risen to 70.8 percent, which may be directly attributed to the Secretariat's capacity-building activities.

With respect to providing public information, the Secretariat has developed a website in which comprehensive information resources converge. The website, which is found under www.iotc.org pools resources such as reports, and databases (complete with web-based query interfaces), in order to provide CPCs with all the information they may (or must) use in order to honour their duties under the agreement. Figure 23 provides a screen grab of the tools page of the IOTC website, on which are concentrated the access to the IOTC record of authorised vessels, the list of IUU vessels, validation of IOTC statistical documents and the collection of IOTC documents.

By 2015 the IOTC had upgraded its website to meet the requirements of the rules of confidentiality for data that would be available for CPCs, but not to the general public. The new website is user friendly and the search engine is particularly efficient.



Source: IOTC, 2020.

Figure 23: Screen grab of IOTC's web page listing tools available to users

OBLIGATIONS: RESOLUTIONS, REPORTING BACK & NAVIGATING FORWARD

CPCs must send information and data on a regular and ad hoc basis.

Many of the resolutions that are currently in force provide for active reporting requirements, which CPCs must honour. Such reports have to be submitted on an annual, or bi-annual basis (*e.g.* information on the vessels actively fishing for tunas and tuna-like species in the IOTC Area of Competence).

In addition to periodic reporting requirements, CPCs must send information and data to the Secretariat among others on an ad hoc basis (e.g. a foreign vessel in port of a CPC is convicted of having engaged in IUU fishing).

The resolutions requiring reporting, information and data, are presented and discussed in detail in Manual B of this series of manuals.

Reporting requires dedicated resources within national fisheries administrations for compliance purposes (Figure 24). Submission of the mandatory information is monitored by the Compliance Committee as one of its several functions. The Compliance Section produces an annual guide to IOTC data and information reporting requirements for CPCs, in order to facilitate their planning to gather, record and submit information in a timely fashion.

Figure 24: IOTC CMMs standardise fishing logbooks, which are an important source of catch data

©IOTC

The failure to submit information can seriously undermine the Commission's potential to fulfil its mandate. To encourage reporting the Secretariat publishes an annual report on CPC Compliance with reporting. Where compliance needs improvement the report may highlight concerns about the requirement or the language of a resolution or capacity building needs.

The failure to submit information can seriously undermine the Commission's potential to fulfil its mandate.

Finally, a crucial role of the Members of the Commission is to propose new conservation and management measures. CMMs are developed and sponsored by Members, who propose them for consideration to the Commission. This allows the IOTC to evolve and adapt its management framework to emerging needs and developing international laws and standards.

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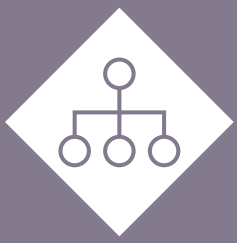

CHAPTER 2

KEY INTERNATIONAL INSTRUMENTS AND MECHANISMS

In order to develop a good sense of how IOTC works, and the actions and measures it can, cannot, or should take or adopt, it is important to understand the principles, standards and obligations of States and RFMOs that are provided in international fisheries instruments. The importance of the international legal framework cannot be understated; it has been carefully developed by the international community with the aim of harmonised and robust governance.

Importantly, IOTC must operate according to its Agreement and the international framework. IOTC CMMs are conditioned by, respond to, and are also sometimes limited by the principles and provisions that are in this overarching international legal framework.

THE KEY INSTRUMENTS

There are a number of international fisheries instruments which provide the basis for fisheries governance. Some are legally binding, others are voluntary but highly influential.

As described above, UNCLOS and UNFSA are two robust instruments which provide a broad legal basis for fisheries governance and are implemented by a wide range of States and RFMOs. Other influential fisheries instruments include the following.

Some are legally binding, others are voluntary but highly influential.

LEGALLY BINDING

- 1995 FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (Compliance Agreement).
- 2009 FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA).

VOLUNTARY

- 1995 FAO Code of Conduct for Responsible Fisheries (Code of Conduct) and the International Plans of Action elaborated under it, including the 2001 International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU).
- 2010 FAO International Guidelines on Bycatch Management and Reduction of Discards.

- 2014 FAO Voluntary Guidelines for Flag State Performance.
- 2017 FAO Voluntary Guidelines for catch documentation schemes (CDS).

The following brief summaries of the fisheries instruments explain their key elements for fisheries governance, including considerations for RFMOs.

UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS) AND AGREEMENT RELATING TO THE CONSERVATION AND MANAGEMENT OF STRADDLING FISH STOCKS AND HIGHLY MIGRATORY FISH STOCKS (UNFSA)

These instruments are described in Chapter 1 of this manual.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO) COMPLIANCE AGREEMENT (1993)

The FAOCA places the onus on flag States to assume full responsibility for, and control over, vessels flying their flags.

The FAO Compliance Agreement entered into force in 2003 and requires parties to take effective action to ensure compliance by their flag vessels with conservation and management measures relating to living marine resources on the high seas. Hinging squarely on the principle of flag State responsibility, the instrument places the onus on flag States to assume full responsibility for, and control over, vessels flying their flags while operating on the high seas.

The Compliance Agreement provides a fundamental mechanism for control purposes; flag States must formally authorise their fishing vessels before allowing them to leave their EEZ and to operate on the high seas. The Agreement also makes provision for cooperation between parties to the Agreement to exchange information concerning vessels of parties that have been reported to have engaged in IUU fishing.

FAO maintains a record of high seas fishing vessels authorised under the terms of the Agreement. It is in the form of an online database and can be accessed at : http://www.fao.org/fishery/collection/hsvar/en.

However, this Agreement has been largely superseded by other instruments, including UNFSA, and there are relatively fewer parties to the Compliance Agreement.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS AGREEMENT ON PORT STATE MEASURES TO COMBAT, DETER AND ELIMINATE ILLEGAL, UNREPORTED AND UNREGULATED FISHING (FAO PSMA)

Port State controls had been exercised for almost three decades in the maritime shipping sector, but not over fishing vessels.

The FAO PSMA was developed because flag States were not discharging their primary responsibility for control over their fishing vessels. Port State controls had been exercised for almost three decades in the maritime shipping sector, but not over fishing vessels. Previous instruments, including the UNFSA and the IPOA-IUU, recognised that port States had a right and duty to take measures to combat IUU fishing.

The Agreement, endorsed by the FAO Conference in 2009, entered into force on 5 June 2016, after having been ratified by a 25th State. In 2010, IOTC CPCs had adopted a Resolution 10/11 on port State measures (superseded by Res. 16/11), which mirrored the provisions of the PSMA without waiting for it to enter into force.

The basic provisions of the PSMA involve: designation by port States of ports where foreign vessels may enter; a formal advance request for port entry and authorisation to enter; denial of port entry; conditions for denial of port use after entry without inspection; and inspections (Figure 25) and subsequent denial of port use. Information, communications, including with other national agencies such as the Port Authorities, the flag State and IOTC, and the conduct of inspections are addressed.

Figure 25: Inspectors must be allowed to all parts of the vessel

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This applies to fishing vessels and carrier vessels, and where a vessel is denied "use of port", it includes use for landing (Figure 26), transhipping, packaging and processing of fish that have not been previously landed and for other port services, including, among others, refuelling and resupplying, maintenance and drydocking.

Important outcomes of port State measures include detection of IUU fishing and related offences, severe economic hardship for the fishing concerns and as appropriate the imposition of charges, penalties and sanctions.

FAO CODE OF CONDUCT (1995) & INTERNATIONAL PLANS OF ACTION (IPOAS) (1999 & 2001)

The CCRF has formed the basis for fisheries policies, strategies, legislation and other activities at all levels.

The FAO Code of Conduct is the first and only voluntary international fisheries instrument of its type to have been developed. The Code is global in scope, and is directed toward States, fishing entities, subregional, regional and global organisations, whether governmental or non-governmental, and all persons involved in fisheries; they are all encouraged to apply the Code and give effect to it.

Because it is a voluntary instrument, the potential for its application worldwide is significant. It has formed the basis for fisheries policies, strategies, legislation and other activities at all levels – national, regional and international.

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Figure 26: Southern bluefin tuna being offloaded by string

It encourages States to take measures through RFMOs, including in relation to general principles, fisheries management, fishing operations and research.

The Code "*provides principles and standards applicable to the conservation, management and development of all fisheries*." It also addresses the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management.

The Code integrates some provisions and standards that are also in legally binding instruments, including in UNCLOS and the 1993 FAO Compliance Agreement (Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas). The UNFSA was being developed in parallel with the Code, and some of its expected outcomes were also integrated.

A range of voluntary instruments has been elaborated under the Code and adopted by FAO, including four international plans of action (IPOAs). They are:

1. International Plan of Action for Conservation and Management of Sharks (1999);
2. International Plan of Action for Reducing Incidental Catch of Seabirds in the Longline Fisheries (1999);
3. International Plan of Action for the Management of Fishing Capacity (1999);
4. International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) (2001).

States are encouraged to implement the IPOAs by forming National Plans of Action. Regional Plans of Action have also been adopted under the IPOA-IUU, including in Southeast Asia and the wider Caribbean region.

The Guidelines on bycatch and discards include key management considerations and measures to ensure the conservation of target and non-target species and affected habitats.

FAO INTERNATIONAL GUIDELINES ON BYCATCH MANAGEMENT AND REDUCTION OF DISCARDS (2010)

The FAO International Guidelines on Bycatch Management and Reduction of Discards aim to help States and RFMOs in formulating and implementing appropriate measures for the management of bycatch (Figure 27) and reduction of discards.

Figure 27: Frozen bycatch: IOTC regulates bycatch through several instruments

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They are voluntary and provide guidance on management factors ranging from an appropriate regulatory framework to the components of a good data collection programme. They include the identification of key management considerations and measures necessary to ensure the conservation of target and non-target species and affected habitats.

The Guidelines address a wide range of issues including bycatch management planning, data collection and bycatch assessments, research and development, management measures, MCS, capacity building measures, special considerations for RFMOs and special requirements of developing States.

FAO VOLUNTARY GUIDELINES ON FLAG STATE PERFORMANCE (2014)

The FAO Voluntary Guidelines for Flag State Performance provide guidance to strengthen and monitor compliance by flag States with their international duties and obligations regarding the flagging and control of fishing vessels.

They cover the relevant responsibilities of flag States on the basis of elements contained in international law, including binding and non-binding international fisheries instruments.

Fisheries management, registration and records of vessels, authorisations, MCS and cooperation between flag States and coastal States are among the central components of the Guidelines.

Fisheries management, registration and records of vessels, authorisations, MCS and cooperation between flag States and coastal States are among the central components of the Guidelines

They spell out a range of actions that countries can take to ensure that vessels registered under their flags do not conduct IUU fishing, including monitoring, control and surveillance (MCS) activities, such as vessel monitoring systems (VMS) and observers.

Importantly, general flag State performance assessment criteria include determining whether the flag State has taken measures to ensure that its vessels do not undermine RFMO CMMs, and whether it effectively contributes to relevant RFMOs through compliance with CMMs.

The Guidelines also include recommendations on how countries can encourage compliance and take action against non-compliance by vessels, as well as on how to enhance international cooperation to assist developing countries to fulfil their flag state responsibilities.

FAO VOLUNTARY GUIDELINES FOR CATCH DOCUMENTATION SCHEMES (CDS) (2017)

The FAO Guidelines on CDS provide a system to determine whether fish originate from catches consistent with applicable national, regional and international CMMs.

The FAO Voluntary Guidelines for Catch Documentation Schemes aim to assist States, RFMOs and others that are developing, implementing, harmonising or reviewing such schemes.

CDS are trade-related measures to combat IUU fishing. They provide a system to determine throughout the supply chain whether fish originate from catches consistent with applicable national, regional and international CMMs. They function most effectively when used with other tools such as the PSMA.

The Guidelines include sections on the application of basic principles, cooperation and notification, recommended functions and standards and special requirements of developing States. The Annex includes information elements for catch certificates and additional information along the supply chain. They apply to wild capture fish caught for commercial purposes in marine or inland areas, whether processed or not.

RIGHTS AND RESPONSIBILITIES OF COASTAL, PORT AND MARKET STATES

Over the past three decades and based on UNCLOS, the international fisheries instruments have developed and refined rights and responsibilities for States based on their role as a coastal State, flag State, port State, and/or market State.

These categories, together with the combined category designating "all States", are reflected in various IOTC CMMs. However, if a State does not fall into a category (e.g. it does not provide a market for fish subject to a CMM) then the related responsibilities in a CMM would not apply.

In the following sections, the key responsibilities of coastal, flag, port and market States are summarised.

COASTAL STATE RESPONSIBILITIES

ACCESS TO TUNA STOCKS

Where it does not have the capacity to harvest the allowable catch the coastal State must give other States access to do so, subject to conditions and requirements it may impose.

The coastal State has sovereign rights to exploit living marine resources in its EEZ and it also has the right to grant foreign vessels access to fishing in its EEZ. With the aim of encouraging full utilisation of the fisheries resources, UNCLOS requires the coastal State to determine the allowable catch in its waters, as well as its capacity to harvest that catch. Where it does not have the capacity to harvest the allowable catch it must give other States access to do so, subject to agreements, licensing, conditions and other requirements it may impose. (*Article 62.1 and 62.2*)

In giving other States access to its EEZ, a coastal State must take into account, among others, the significance of the living resources of the area to the economy of the coastal State concerned and its other national interests. This means that the foreign States or vessels cannot make any demands contrary to what the coastal State identifies as its national interests. (*Article 62.3*)

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Figure 28: Air patrols are a useful tool for coastal States

In addition, nationals of other States fishing in the coastal State's EEZ must comply with relevant conservation and management measures and with the other terms and conditions and laws of the coastal State (Figure 28), which may include elements such as those listed below. Importantly, the IOTC CMMs relate in various ways to all these elements, and the coastal State must implement the relevant CMMs in their terms, conditions and laws: (*Article 62.4*)

a. licensing of fishermen, fishing vessels and equipment, including payment of fees and other forms of remuneration;

b. determining the species which may be caught, and fixing quotas of catch;

c. regulating seasons and areas of fishing, gear, and the fishing vessels that may be used;

d. fixing the age and size of fish and other species that may be caught;

e. specifying information required of fishing vessels, including catch and effort statistics and vessel position reports;

f. requiring the conduct of specified fisheries research programmes and regulating the research;

g. the placing of observers or trainees on board such vessels by the coastal State;

h. the landing of all or any part of the catch by such vessels in the ports of the coastal State;

i. terms and conditions relating to joint ventures or other co-operative arrangements;

j. requirements for the training of personnel and the transfer of fisheries technology;

k. enforcement procedures.

Some of these elements are elaborated below.

PRE-LICENSING INSPECTION

A pre-licensing inspection is considered good MCS practice.

Vessels that seek to exploit tuna resources in the EEZ of a coastal State may be required to undergo a pre-licensing inspection in port, ideally preceding the first time a vessel is granted a license.

A pre-licensing inspection is not a mandatory provision in any international instrument, but it is considered good MCS practice consistent with the Code that provides "*States should establish, within their respective competences and capacities, effective mechanisms for fisheries monitoring, surveillance, control and enforcement to ensure compliance with their conservation and management measures* (…)". (Art. 7.1.7)

The fisheries laws vary among coastal States and within Indian Ocean tuna fisheries.

A pre-licensing inspection is crucial for a coastal State to ascertain whether:

- the vessel is actually the one described in the application and requesting to operate in its waters;
- the vessel is rigged and fitted according to the application received;
- the vessel is not carrying illegal gear on board;
- the vessel and gear markings are in good order (Figure 29);
- the captain has received all relevant documentation and full briefings.

Further, pre-licensing and pre-fishing inspections enable the coastal State to verify the master's declaration, upon zone entry, of the fish on board by species and weight, thus reducing the potential of a false declaration. Without a pre-licensing inspection, one of the most powerful elements of control for coastal States over foreign fleets is forfeited. In practice, coastal States that do not carry out pre-licensing inspections will not know what a vessel licensed to fish in their waters looks like.

Figure 29: A marked vessel: during the pre-licensing inspection coastal States must ascertain that vessels and gear are clearly marked

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ENTRY AND EXIT OF VESSELS FROM EXCLUSIVE ECONOMIC ZONE (EEZ)

A second very important element of control is monitoring fishing vessels' entries into and exits from the EEZ. Masters are usually required to report to the coastal State the species caught and their quantities. License fees can be determined partly by the quantities fished within the EEZ of the coastal State – introducing a de facto incentive for the master to under-report the catch, or over report the catch on board on entry.

On entry and exit of EEZs masters are usually required to report to the coastal State the species caught and their quantities.

There may be other reasons why masters would want to under- or over-report catches. When vessels are made to report on entry into and on exit from the EEZ, they must declare the amount of fish by species that they carry in their holds. If a difference arises between entry and exit, it means that the difference has been fished within the EEZ of the coastal State requiring the reporting. The existence of such reports enables boarding parties during inspection

to verify their accuracy. If misreporting is coupled with stiff sanctions under national law, a master is strongly discouraged from reporting false data.

It is up to coastal States to require the same reporting from unlicensed fishing vessels transiting through the EEZ. Monitoring entry and exit requires a well organised fisheries monitoring centre (FMC) and an operating VMS.

VESSEL MONITORING SYSTEM (VMS) AND DATA

Vessels registered on the IOTC Record of Authorised Vessels are not permitted to operate in the IOTC area, unless they are fitted with VMS (Resolution 15/03).

Vessels registered on the IOTC Record of Authorised Vessels are not permitted to operate in the IOTC area, unless they are fitted with VMS

Coastal States that license foreign tuna fishing vessels should register the vessels' VMS transponders on their land-based systems, to monitor their movements when they approach – and enter – their EEZ. The existence of a capable FMC that can monitor vessel movements in this way allows a coastal State to assert a certain degree of control over the activities that are taking place within its EEZ Figure 30.

It is essential for coastal States to have VMS legislation that implements the requirements of the IOTC Resolution on VMS, and that provide effective sanctions for tampering with the VMS' installation and transmissions.

Coastal States should always require foreign fishing vessels to maintain fishing logbooks and submit catch data on a regular basis to the fisheries administration. For tuna fishing logbooks it is recommended to implement the standards of Resolution 15/01. Coastal States should contribute to the effort of cross-checking data from different sources (e.g. flag State, port State, IOTC and other) in order to ascertain the accuracy of submitted data or establish reporting fraud.

Figure 30: Coordinates are an important element that inspectors must check

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FLAG STATE RESPONSIBILITIES

UNCLOS requires that "every State shall effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag"

UNCLOS requires that "*every State shall effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag*" (Art. 94); this includes fishing vessels.

The flag State has primary responsibility for controlling its vessels. Because some flag States are unwilling or unable to exercise their responsibilities, there is a need for coastal and port State controls. The 3 sets of control are central to responsible and sustainable fisheries management, especially in fisheries that occur far away in areas beyond national jurisdiction, including the high seas.

As noted above, the FAO Compliance Agreement and UNFSA introduced a number of provisions which aimed to dramatically enhance the control that flag States exert over their fishing vessels on the high seas. In the case of UNFSA, the framework for international collaboration through regional organisations or arrangements was given. At this level, the requirement for the active participation of the flag State in the conservation and management of highly migratory fish stocks fully came to the fore.

However, the fact remained that many flag States were unable or unwilling to exercise the required control over their vessels. This gave rise to the adoption of the 2014 FAO Voluntary Guidelines for Flag State Performance which contain criteria for assessment of how they discharge their duties, described above.

FLAGGING OF VESSELS

Where a flag State grants its flag to a vessel through registration, it also serves as a grant of nationality. UNCLOS requires there to be a "genuine link" between the State and the ship (Art. 91). However, mindful of the common practice of selling registrations to non-national vessels, this has been interpreted more recently by the International Tribunal for the Law of the Sea, so the duty of the flag State is instead to exercise "effective control" over its flag vessel.

Where a flag State grants its flag to a vessel, UNCLOS requires there to be a "genuine link" between the State and the ship

A range of requirements to prohibit registering vessels have been developed in international fisheries instruments, including refusal of registration in cases of: "flag hopping" where vessels seek to reflag to escape requirements of the current flag; changing identity to avoid detection; and inclusion on an RFMO IUU Vessel List (unless the vessel has changed ownership, and links to former beneficiaries of IUU fishing operations have been severed).

AUTHORISATION TO FISH IN AREAS BEYOND NATIONAL JURISDICTION

The FAO Compliance Agreement (Art. III.2) and the UNFSA (Art. 18.2 and 18.3. (a) and (b)) require vessels to hold flag State authorisations for fishing on the high seas, and in the case of UNFSA to ensure that its vessels do not conduct unauthorised fishing in national waters of other States. The Code of Conduct also encourages States to issue such authorisations: "*Flag States should ensure that no fishing vessels entitled to fly their flag fish on the high seas or in waters under the jurisdiction of other States unless such vessels have been issued with a Certificate of Registry and have been authorised to fish by the competent authorities*." (Art. 8.2.2)

The flag State may adopt regulations or require conditions to be attached to their authorisations that require compliance with CMMs in areas beyond national jurisdiction. Authorisations to fish should also identify the area the vessel is allowed to operate (e.g. ocean basin, the

FAO fishing zones or the area of competence of an RFMO).

The authorisation process enables the flag State to understand where and under what other licenses a vessel intends to operate (Figure 31). Without this information, the flag State will have difficulty in effectively monitoring and controlling its vessels.

IOTC Members have established a Record of Authorised Vessels, listing the vessels that have been authorised by their flag States to fish in the IOTC Area

Figure 31: a Authorisation to fish issued by a flag State

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As noted above, IOTC Members have established a Record of Authorised Vessels, accessible through the IOTC website, which lists the vessels that have been authorised by their flag States to fish for tuna and tuna-like species in the IOTC Area. Any addition, deletion, or modification to any vessel by the flag State is to be promptly notified to the Executive Secretary at any time the changes occur.

MONITORING AND DISCIPLINING FLEETS

Flag States have the responsibility to regulate and control their operators and ensure that they comply with applicable national legislation and CMMs, whether they fish on the high seas or in waters under the jurisdiction of other States. For this reason, the UNFSA dedicates two entire parts to the duties of the flag State (Part V), and compliance and enforcement (Part VI). By 1995, the dynamics of IUU fishing – on the high seas in particular –

had become obvious enough to lawmakers to understand that management frameworks needed to go hand in hand with stringent compliance and enforcement mechanisms if results were to be achieved.

Flag States have the responsibility to regulate and control their operators, whether they fish on the high seas or in other States' EEZs.

Generally accepted minimum elements for flag State monitoring of its vessels in areas beyond national jurisdiction include the following:

- existence of a functional VMS registered with the flag State's FMC;
- submission of copies of all licenses held for fishing in third party EEZs; and
- submission of regular and complete data on all catches, transhipments and landings.

A flag State that does not operate a capable VMS system or FMC is missing the most basic technological element to monitor its fleet, and is unable to exercise effective control as required under international law. It should therefore not authorise its fishing vessels to operate in areas beyond national jurisdiction (Figure 32).

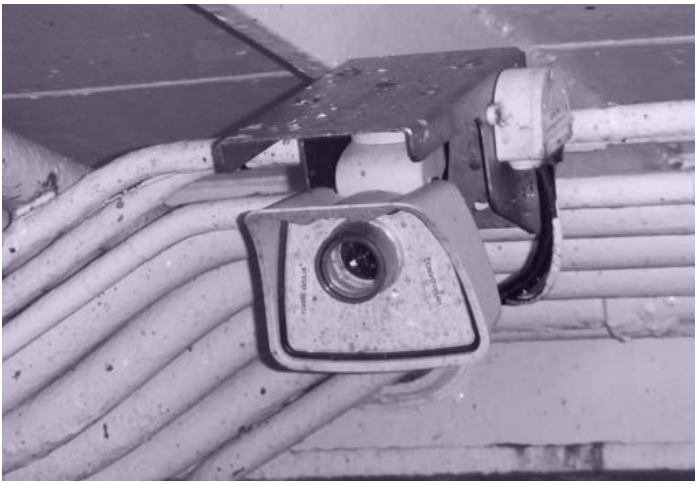

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Figure 32: Surveillance cameras can be a useful tool for monitoring fishing activities

COLLECTION AND SUBMISSION OF CATCH STATISTICS

Catch and landing statistics are a crucial element of fisheries management. Without such statistics, fisheries management is flying blind and cannot function properly. For highly migratory species fisheries, catch statistics are primarily derived from the flag State because fishing vessels can provide the finest level of detail of where and when what catches have been realised. The more data are detailed, the more scientific value they have.

Without statistics, fisheries management is flying blind and cannot function properly.

Vessels' masters must record and report catch and effort data to the flag State including data specified by IOTC under Resolution 15/01. The flag State then submits to IOTC the catch and effort data in aggregated format, together with other statistical data (e.g. nominal catch, length frequency) in a required format as specified under Resolution 15/02.

Coastal, port and market States may also be required to submit landings and market data, but these data more often serve to cross-check flag State submissions, identify reporting errors and sometimes to detect fraud.

The duty of the flag State to collect such data is provided in the FAO Compliance Agreement (Art. III.7) and the UNFSA (Art. 18.3). The UNFSA provides: "*Measures to be taken by a State in respect of vessels flying its flag shall include: (e) requirements for recording and timely reporting of vessel position, catch of target and non-target species, fishing effort and other relevant fisheries data in accordance with subregional, regional and global standards for collection of such data*;" The subregional and regional standards referred to in this provision are those adopted by the relevant RFMO.

PORT STATE MEASURES

Because some flag States are unwilling or unable to exercise their responsibilities, there is a need for coastal and port State controls

UNCLOS did not provide for any port State measures for fisheries. Under UNCLOS, port State enforcement is largely limited to functions of the port State in the protection and preservation of the marine environment (Part XII). With UNFSA, the port State assumes an active part. UNFSA establishes that the port State has "*the right and duty to take measures*", and spells out actions to be taken by the Port State to directly promote the effectiveness of RFMO CMMs (Art. 23), including to prohibit landings and/or transhipments by vessels in port where the vessel has undermined a CMM on the high seas. In 2001 the IPOA-IUU was the first fisheries instrument that elaborated a wide range of actions that a port State should take (paragraphs 52-64). Many of these provided the foundation for negotiation of the PSMA, and have been transformed into binding requirements.

In 2009, the FAO PSMA , provided port States and RFMOs with a full gambit of tools to combat IUU fishing.

The core elements of port State measures are described in detail in another IOTC manual. They are briefly outlined here for completeness.

DESIGNATION OF PORTS

Port States must designate the ports to which foreign vessels may have access and publicise this list. Access to all other ports should be denied to foreign fishing vessels. In the designated ports, national authorities should ensure that an adequate fisheries inspectorate is in place and can execute its functions.

PORT ENTRY

Port entry procedures require fishing vessels to submit an advance request for port entry.

Port entry procedures require fishing vessels to submit an advance request for port entry, which includes certain information including details of the vessel, licenses and permits on-board, the object of the port call and catch on-board. Port entry may be granted, and an authorisation to enter port issued unless there is sufficient proof that the vessel has engaged in IUU fishing or related activities, and in particular where it is on an RFMO IUU Vessel List.

However, the port State may also decide to allow the vessel into port exclusively for the purpose of inspecting it and taking other appropriate actions to combat IUU fishing and related activities which are at least as effective as denial of port entry. In such a case, the use of port will be denied for landing (Figure 33) , transhipping (Figure 34), packaging, and processing of fish and for any other port services including, *inter alia*, refuelling and resupplying, maintenance and drydocking.

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Figure 33: Inspectors should be present when fish is offloaded, identify species and estimate quantities

The advantage of this is that the inspectors can gather and assess evidence of IUU fishing. Interagency cooperation is essential between fisheries authorities and other authorities such as ports, immigration and health. This will allow the fisheries authorities to take leadership in matters of port access and port services at all times for fishing vessels and applicable carrier vessels.

Where a vessel is requesting port entry based on *force majeure*, the port State has the right to assess the request and accept or deny it.

DENIAL OF USE OF PORT

Denial of port use, in combination with denial of port entry, are extremely potent deterrents to IUU fishing.

When a vessel is in port, it may be denied use of port for certain reasons without inspection, including:

a. the vessel does not have a valid and applicable authorisation for fishing or related activities required by its flag State, or by a relevant coastal State in respect of its waters;

b. there is evidence that the fish on board was taken in contravention of applicable coastal State requirements in respect of areas under the national jurisdiction of that State;

c. the flag State does not confirm within a reasonable period of time, on the request of the port State, that the fish on board was taken in accordance with applicable requirements of a relevant RFMO; or

d. there are reasonable grounds to believe that the vessel was otherwise engaged in IUU fishing or fishing related activities.

After inspection, the vessel may be denied use of port where there are clear grounds for believing that a vessel has engaged in IUU fishing or fishing related activities.

These measures, in combination with denial of port entry, are extremely potent deterrents to IUU fishing, because they deny the IUU vessel owners and operators to turn illegal catch into currency, cause economic loss where catch cannot be offloaded in any port States that are party to the PSMA or IOTC Resolution 16/11 and provide a platform for detecting a wide range of associated violations and fraud.

Figure 34: Dressed swordfish being transhipped at sea: IOTC regulates transhipments and port States must inspect these operations

©IOTC

INSPECTIONS & RESULTS

Port States should ensure the existence of a properly trained corps of port inspectors, and inspect a minimum number of vessels.

Port States should ensure the existence of a properly trained corps of port inspectors, and inspect a minimum number of vessels on an annual basis. Port States are encouraged to develop benchmarks for the number and types of vessels to inspect.

The results of port inspections (must be transmitted to the IOTC Executive Secretary, the flag State of the inspected vessel and any other relevant parties, such as the State of which the master is a national, other RFMOs and/or the FAO.

MARKET STATE CONTROL

The concept and place of the market State as a specific type of jurisdiction, entrusted with a particular part to play in fisheries conservation and management, is quite recent. UNCLOS, the FAO Compliance Agreement and UNFSA make no single direct mention of the market State, and the same is true of the PSMA.[11]

The Code of Conduct introduces principles for responsible international trade in fisheries products (Art. 11.2) and regarding laws and regulations relating to fish trade (Art. 11.3), but does not specifically mention the "market State". Provisions generally relate to compatibility of trade measures, trade liberalisation and non-discrimination issues. While these provisions have merit in domains unrelated to the conservation and management of fisheries resources, they introduce few elements that bear any direct impact on the sustainable management of fisheries resources through the action of the market State.

[11] *The PSMA, in its annexes, merely provides that port inspections should assess mandatory documentation (i.e. certificates) related to catch documentation schemes, in cases where such schemes apply.*

IUU fishing and related operations should not be tolerated, simply because gains to the national economy might appear attractive.

Code article 11.2.12, however, also introduces the short, but all-important notion that "*States should not undermine conservation measures for living aquatic resources in order to gain trade or investment benefits*." In other words, IUU fishing and related operations should not be tolerated – or facilitated – by market States, simply because gains thus accruing to the national economy might appear attractive.

The IPOA-IUU, under "*Internationally Agreed Market-Related Measures*" provides twelve paragraphs (65 to 76) which detail the action that market States should take in order to ensure that they play their full part in combatting IUU fishing.

Two, key market State control measures are briefly highlighted in the following sections.

RESTRICTIONS TO MARKET ACCESS

A key action that is expected of market States is to prevent that fish caught by vessels on RFMO IUU Vessels Lists from being traded or imported into their territories. (IPOA-IUU paragraph 66)

Market States should cooperate with other States to implement market measures in relation to products that have been harvested illegally in such States. (IPOA-IUU paragraph 68)

MARKET-RELATED MEASURES

One of the key tools to assist States in applying market State control measures against IUU fishing products is the development and implementation of multilateral catch documentation and certification schemes (IPOA-IUU paragraph 69). These schemes generally serve to discourage IUU fishing operations, strengthen the relevant conservation and management regimes, and deny market access to products that have been sourced from IUU fishing operations. In addition, catch and trade documentation schemes can play a major part in the collection of fisheries data – as is the case under the IOTC Bigeye Tuna Statistical Programme provided under Resolution 01/06.

The standard of market-related measures in the form of catch documentation schemes has recently been strengthened through the development, and adoption by the FAO Council in July 2017, of the FAO *Voluntary Guidelines for Catch Documentation Schemes*, described above.

Catch documentation schemes have been shown to be potent deterrents of IUU fishing, when they are well designed, and effectively implemented. Especially in situations where TACs and quotas are in place, CDS become a tool of choice for directly monitoring and enforcing quota allocations by flag and fleet (Figure 35).

Especially in situations where TACs and quotas are in place, CDS become a tool of choice for directly monitoring and enforcing quota allocations by flag and fleet.

Figure 35: Southern Bluefin tuna labelled and numbered under a catch certification scheme

IOTC Members have adopted Resolution 10/10 on market related measures to open the possibility of restricting access to markets from Members who undermine the conservation and management efforts of IOTC. These are generally referred to as trade restrictive measures (TREMs) or trade sanctions. They differ from CDS in the sense that they are purely punitive in nature. TREMs may only be adopted where Members have not succeeded in preventing a State from supporting IUU fishing activities.

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The original development and release of this manual was funded by the European Commission.

The 2017 update was funded by the World Wide Fund for Nature and the 2022 update by the SWIOFish2 project of the World Bank.

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Funded by

ISBN 978-92-5-135613-5

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CB8260EN/1/02.22