Food and Agriculture Organization of the United Nations

Indian Ocean Tuna Commission
Commission des Thons de l'Ocean Indien
iotc ctoi

IOTC-2025-WPDCS21-10

FISHERIES DATA REPORTING TO THE IOTC: STATUS AND ISSUES

Author: IOTC Secretariat

Abstract

This report reviewed the status and quality of fishery data submitted to the IOTC Secretariat for the 2024 reference year, including retained catch, catch and effort, size-frequency, discard, and Fish Aggregating Device (FAD) data. Overall reporting improved compared with previous years, with most CPCs submitting core datasets for longline, purse seine, and coastal fisheries. Several CPCs that had previously faced challenges in meeting minimum reporting standards—such as Pakistan, Oman, and Somalia—submitted more complete datasets, although substantial gaps remained, particularly for geo-referenced information. Yemen also provided essential catch and fishery-level information following technical exchanges with the Secretariat.

Discard data reporting increased across longline and purse seine fisheries, largely driven by requirements under species-specific Conservation and Management Measures. Despite these improvements, discard data remained heterogeneous among fleets, often lacking raising procedures and complete information on sampling coverage. Several fleets reported nil discards for fisheries where discarding is expected, while others, such as the Maldives pole-and-line fishery, legitimately reported minimal discarding due to national protection measures. Longline fleets reported discards primarily in numbers of individuals, with sharks forming the majority of discarded catch.

Data related to drifting and anchored FADs improved in structure and consistency compared with 2023, although key variables—such as buoy identification and material composition—remained inconsistently reported. Most DFAD fleets submitted data, whereas only the Maldives submitted AFAD data.

Coastal fisheries continued to face persistent limitations in reporting geo-referenced catch-and-effort and biological sampling data due to extensive fleets, dispersed landing sites, and limited monitoring capacity.

Introduction

The management of tuna and tuna-like species by the Indian Ocean Tuna Commission (IOTC) relies on the availability of scientific data describing the biology and ecology of these species and the activities of the fisheries that target them. Since its inception in 1996, the IOTC has implemented several Conservation and Management Measures (CMMs) that call for the collection and reporting of data by its Contracting Parties and Cooperating Non-Contracting Parties (CPCs) to support scientific analysis, assess stock status, and develop advice for the Scientific Committee (SC). In addition to the main fisheries datasets required to monitor and quantify changes in fishing effort and associated catches, monitoring the numbers, characteristics, and activities of fishing vessels is essential to account for changes in fishing efficiency and prevent excess fishing capacity (FAO 1995). Furthermore, the IOTC data requirements have increased over time to progressively include the collection of information on non-IOTC species (i.e., bycatch species *sensu* IOTC) in order to analyse the ecosystem effects of tuna and tuna-like fisheries and contribute to the conservation of endangered, threatened, and protected (ETP) species such as sharks, rays, cetaceans, seabirds, and turtles that may be incidentally caught by fisheries directed at IOTC species.

The overarching objective of this document is to provide the IOTC Working Party on Data Collection and Statistics (WPDCS) with an overview of the multiple datasets managed at the IOTC Secretariat, including information on their coverage, timeliness of the submissions by the CPCs, and assessment of the quality of the main fisheries datasets with regards to IOTC reporting standards. The document finally provides a list of the main issues affecting the IOTC data and some proposals to address them.

Terminology, Definitions, and Data Requirements

Species

IOTC Species

There are currently fifteen medium and large pelagic species under the management mandate of the IOTC which are listed in Annex B of the IOTC Agreement along with southern bluefin tuna (*Thunnus maccoyii*; SBF), this latter species being managed by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) (**Table 1**). Data on SBF are collated and managed by both IOTC and CCSBT as high-seas fisheries catching SBF may catch other tuna and tuna-like species in SBF fishing grounds, but data available from CCSBT should be considered more accurate regarding the data consolidation performed by this Commission.

Table 1. Category, code, common name, and scientific name of the 16 IOTC species

Category	Code	Common name	Scientific name
BILLFISH	BLM	Black marlin	*Istiompax indica*
	BUM	Blue marlin	*Makaira nigricans*
	MLS	Striped marlin	*Kajikia audax*
	SFA	Indo-Pacific sailfish	*Istiophorus platypterus*
	SWO	Swordfish	*Xiphias gladius*
NERITIC	BLT	Bullet tuna	*Auxis rochei*
	FRI	Frigate tuna	*Auxis thazard*
	KAW	Kawakawa	*Euthynnus affinis*
	LOT	Longtail tuna	*Thunnus tonggol*
SEERFISH	COM	Narrow-barred Spanish mackerel	*Scomberomorus commerson*
	GUT	Indo-Pacific king mackerel	*Scomberomorus guttatus*
TEMPERATE	ALB	Albacore	*Thunnus alalunga*
	SBF	Southern bluefin tuna	*Thunnus maccoyii*
TROPICAL	BET	Bigeye tuna	*Thunnus obesus*
	SKJ	Skipjack tuna	*Katsuwonus pelamis*
	YFT	Yellowfin tuna	*Thunnus albacares*

Bycatch Species

The IOTC definition for bycatch differs from the one used in other areas and fisheries as bycatch species correspond to all species other than the 16 IOTC species aforementioned, whether caught or interacted with by fisheries for tuna and tuna-like species in the IOTC area of competence. Hence, early juveniles of tropical tunas (<1-1.5 kg) that are generally not marketable are not considered as a bycatch of tuna fisheries, although they may not be targeted. By contrast, oilfish may be targeted by some longline fisheries in the Indian Ocean but they are considered as bycatch for the IOTC. The IOTC Secretariat collates data on all bycatch species but has specific data requirements for turtles, cetaceans, seabirds, and whale sharks as well as for the main elasmobranch species affected by tuna fishing operations (**Table 2**).

Table 2. Category, code, common name, and scientific name of the main elasmobranch species interacting with IOTC fisheries

Category	Code	Common name	Scientific name
RAYS	PLS	Pelagic stingray	*Pteroplatytrygon violacea*
	RMA	Alfred manta	*Mobula alfredi*
	RMB	Giant manta	*Mobula birostris*
	RME	Longhorned mobula	*Mobula eregoodoo*

Category	Code	Common name	Scientific name
	RMK	Shortfin devil ray	*Mobula kuhlii*
	RMM	Devil fish	*Mobula mobular*
	RMO	Smoothtail mobula	*Mobula thurstoni*
	RMT	Chilean devil ray	*Mobula tarapacana*
SHARKS	BSH	Blue shark	*Prionace glauca*
	BTH	Bigeye thresher	*Alopias superciliosus*
	FAL	Silky shark	*Carcharhinus falciformis*
	LMA	Longfin mako	*Isurus paucus*
	OCS	Oceanic whitetip shark	*Carcharhinus longimanus*
	POR	Porbeagle	*Lamna nasus*
	PTH	Pelagic thresher	*Alopias pelagicus*
	SMA	Shortfin mako	*Isurus oxyrinchus*
	SPK	Great hammerhead	*Sphyrna mokarran*
	SPL	Scalloped hammerhead	*Sphyrna lewini*
	SPZ	Smooth hammerhead	*Sphyrna zygaena*

Fisheries

Fishery Categories

The type of datasets submitted to the Secretariat depends on a country's fishery categories. Fleets operating exclusively within National Jurisdiction Areas (NJA) with vessels under 24 m length overall have lighter reporting obligations and are classified as coastal (or artisanal) fisheries in IOTC terminology. In contrast, fisheries with larger vessels using longline or surface techniques in areas beyond national jurisdiction (ABNJ) have more stringent reporting requirements and must be listed on the IOTC Record of Authorized Vessels (RAV; Res. 19/04).

According to Res. 15/02, the IOTC fisheries are defined as follows:

- **Longline fisheries**: fisheries undertaken by vessels in the RAV that use longline gear;
- **Surface fisheries**: all fisheries undertaken by vessels in the RAV other than longline fisheries, in particular purse seine, pole-and-line, gillnet, handline, and trolling fisheries;
- **Coastal fisheries**: fisheries other than longline or surface, as defined above, also called **artisanal fisheries**.

Fishing vessels from longline and surface fisheries authorised to fish for tuna and tuna-like species and having operated on the high-seas shall be reported to the compliance section of the IOTC Secretariat with the reporting templates Record_of_IOTC_AFVs and Active_domestics_vessels, respectively.

To complement the information provided by the RAV and AVL for coastal fisheries, the Form 2FC was developed for CPCs to report the numbers and characteristics of their small vessels (<24 m length overall) fishing for tuna and tuna-like species within territorial waters. The form is voluntary and breaks down the information by type of fishery, vessel type, and vessel size. When vessel information conflicts between the AVL and the Form 2FC, clarification is sought with respect to the discrepancies and preference is given to the AVL when no feedback is provided by the concerned CPC.

Fishery Types

In the past, three types of fisheries—artisanal, semi-industrial, and industrial—were used to characterise the technical characteristics and spatial extent of vessels targeting tuna and tuna-like species in the Indian Ocean, based on information such as vessel motorisation, size, and area of operation (Moreno and Herrera 2013). However, this classification had limitations: small vessels (<15 m LOA) could fall into both artisanal and semi-industrial categories; semi-industrial vessels were not always reported in the RAV; and artisanal vessels encompassed a wide range of purposes. To address these issues, a new classification of fishery type was proposed, based on a combination of (i) the purpose of the fishery, (ii) the area of operation, and (iii) vessel length overall (IOTC-2022-WPDCS18-13_Rev3). Following feedback from CPCs, the terminology was updated to small-scale, medium-scale, and large-scale, to better reflect the operational range of the fisheries rather than the technical level of vessel industrialisation (**Table 3**). This classification is consistent with the new IOTC fisheries definition (see Section Improving IOTC fishery definitions).

Table 3. Proposed IOTC classification scheme for fishery types depending on purpose, area of operation, and length overall (LOA; m). RAV = IOTC Record of Authorized Vessels. *Subsistence fishery may include some limited commercial activity

Purpose	LOA	Area of operation	Fishery type	RAV
Recreational	< 24 m	Flag state NJA only	Recreational	NO
Subsistence	< 15 m	Flag state NJA only	Subsistence*	NO
Commercial	< 15 m	Flag state NJA only	Small-scale	NO
Commercial	15 – 24 m	Flag state NJA only	Medium-scale	NO
Commercial	< 24 m	Includes other NJAs and/or ABNJ	Medium-scale (ABNJ)	YES
Commercial	≥ 24 m	Anywhere	Large-scale	YES
Scientific	≥ 24 m	Anywhere	Exploratory	YES

Artisanal Fisheries

The terminology surrounding *artisanal fisheries* remains ambiguous, as different authors define it according to their research scope and context (Smith and Basurto 2019). (Rousseau et al. 2019) highlighted that the term is inherently complex, case-specific, and lacks a universally applicable definition. Traditionally, artisanal fisheries have been characterised by low levels of technology, non-motorized or low-powered vessels, and the use of traditional fishing gear, all of which play vital roles in coastal community livelihoods (Smith and Basurto 2019). However, these characteristics are gradually changing. Consequently, the IOTC's definition of artisanal fisheries differs from those found in the broader fisheries science literature, which tend to encompass a wider range of activities.

To clarify the classification of coastal fisheries, the FAO introduced pilot testing of the Small-Scale Fisheries Matrix (Funge-Smith 2019), aimed at developing a standardised statistical definition for small-scale fisheries. This approach has revealed the complexity and importance of small-scale

fisheries at global scale (Basurto et al. 2025; Aguión et al. 2025). Since 2021, the IOTC Secretariat has conducted a scoping study on coastal fisheries, with several CPCs contributing data on their respective coastal and artisanal sectors (IOTC Secretariat 2022a, 2023, 2024a).

Improving IOTC Fishery Definitions

The Secretariat has moved towards a new definition of IOTC fisheries to improve the reporting and dissemination of statistical data. This new definition combines several mandatory and optional factors that determine the nature of a fishery and ensure its unique codification across the Indian Ocean (IOTC-2022-WPDCS18-13). The code lists of the elements defining an IOTC fishery are available from the IOTC Reference Data Catalogue. To support CPCs in applying this definition, a Fishery ID Wizard was developed. The tool guides users in determining the appropriate fisheries by selecting key characteristics, such as fishing purpose, operating areas, and vessel size, and is continuously updated based on CPC feedback.

Data Requirements

It is imperative that CPCs comply with the reporting requirements established under various resolutions mandating data submission. These requirements encompass aspects such as timeliness, data coverage, and adherence to the relevant resolutions. The specific reporting obligations may vary depending on the characteristics and nature of each fishery (**Fig. 1** and **Table 4**).

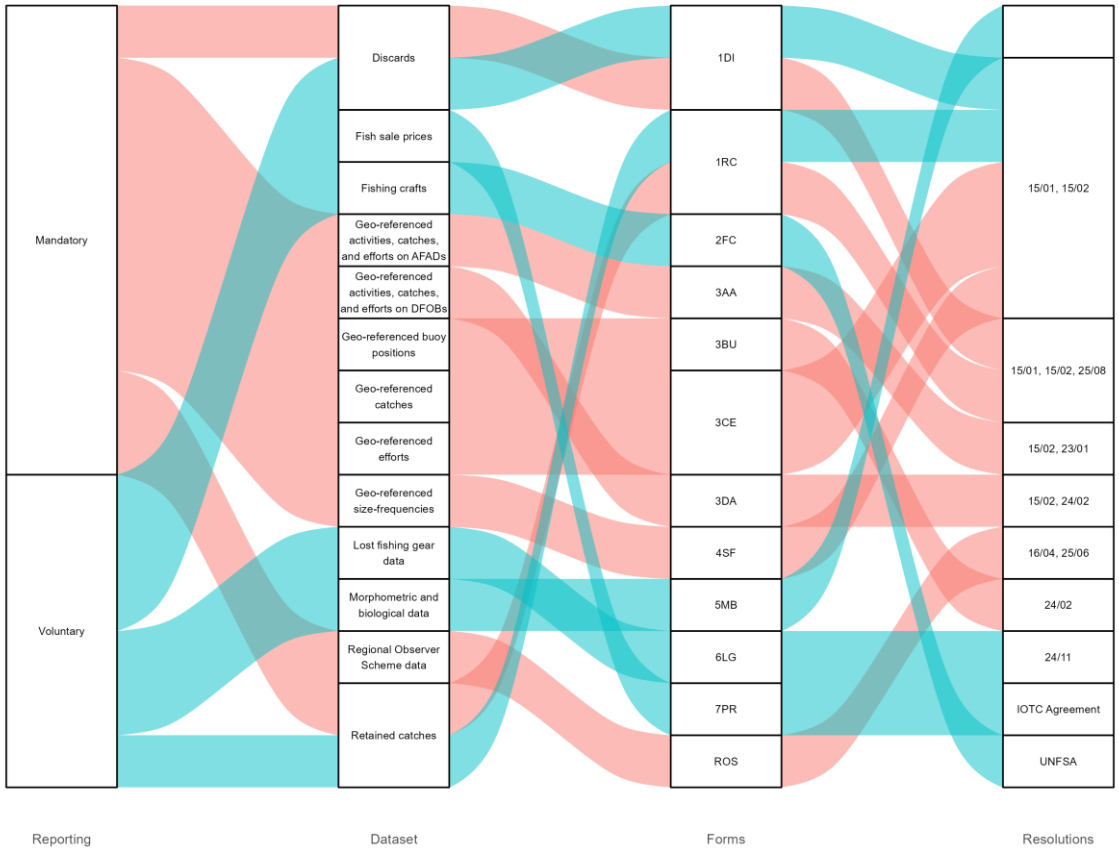

Fig. 1. Overview of the data reporting requirements, including IOTC reporting forms and tools, and Resolutions for the 16 IOTC species and bycatch species caught or interacted with by fisheries for tuna and tuna-like species in the IOTC Area of Competence. UNFSA = UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks

Table 4. Summary of IOTC data requirements applicable to IOTC and bycatch species. M = mandatory; V = voluntary; UNFSA = UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks

Dataset	Resolutions	Reporting	Forms	Artisanal	Longline and surface
Retained catches	15/01, 15/02, 25/08	M	1RC	Retained catch (weight) of the 16 IOTC species and the most commonly caught elasmobranch species by major area, gear, species and year	
		V	1RC	Retained catch (weight) of other bycatch species by major area, gear, species and year	
Discards	15/01, 15/02, 25/08	M	1DI	Discard levels of the 16 IOTC species, the most common elasmobranch species, and turtles, cetaceans, and seabirds species by major area, gear, species, and year	
		V	1DI	Discard levels of all other bycatch species by major area, gear, species, and year	
Fishing crafts	UNFSA	V	2FC	Number of fishing crafts by fishery, boat type, and year	Individual vessel data for all vessels catching IOTC species
Geo-referenced catches	15/01, 15/02	M	3CE	Catch by species, fishery, area, and period	Catch by species, fishery, school type, grid area and month strata
Geo-referenced efforts	15/01, 15/02	M	3CE	Effort by fishery, area, and month strata	Effort by fishery, school type, grid area and month strata, including supply vessels
Geo-referenced activities, catches, and efforts on DFOBs	15/02, 24/02	M	3DA	Not applicable	Interactions with drifting floating objects by purse seiners and supply vessels, by vessel, position, date, and time
Geo-referenced activities, catches, and efforts on AFADs	15/02, 23/01	M	3AA	Fishing activities by position, date, and AFAD	Fishing activities by position, date, and AFAD

Dataset	Resolutions	Reporting	Forms	Artisanal	Longline and surface
Geo-referenced buoy positions	24/02	M	3BU	Not applicable	Daily positions of active buoys equipping FADs and natural floating objects, by purse seine vessel
Geo-referenced size-frequencies	15/01, 15/02	M	4SF	Individual lengths of IOTC species and the most commonly caught elasmobranch species	
Morphometric and biological data		V	5MB	Individual-level morphometric and biological data, including sex, maturity stage, and fish samples	
Lost fishing gear data	24/11	V	6LG	Data and information on the recovery of abandoned, lost or discarded fishing gear	
Fish sale prices	IOTC Agreement	V	7PR	Monthly time series of fish sale price	
Regional Observer Scheme data	16/04, 25/06	M	ROS	Samples of catches landed to cover at least 5% of vessel activities / EMS complemented data	Samples of catches at-sea to cover at least 5% of vessel operations / EMS complemented data

IOTC Datasets and Reporting Quality

As part of their data management responsibilities, CPCs are required to report several fisheries-related datasets, which are processed by the Secretariat for dissemination and for use in stock assessment activities. The core IOTC Conservation and Management Measure (CMM) governing data reporting is IOTC Res. 15/02, which establishes the fundamental mandatory statistical reporting requirements. In addition to this, several other resolutions introduce further data-reporting obligations that are specific to certain fisheries or species (see IOTC-2025-WPDCS21-05).

IOTC fisheries comprise both longline and surface fisheries, whose vessels must be registered on the IOTC Record of Authorised Vessels operating in the IOTC area of competence, and small-scale fisheries whose vessels operate within their respective national jurisdictions (NJA). However, most resolutions focus on large-scale fisheries, reflecting the considerable fishing capacity of these vessels. Large-scale fisheries primarily target tropical tunas, as do some medium-scale fisheries. In this context, Resolution 24/06, which prohibits the discarding of bigeye tuna, skipjack tuna, yellowfin tuna, and non-targeted species, aims to prevent the wastage of these resources by large-scale fisheries in the Indian Ocean. The ban on discarded fish has been adopted by most RFMOs to minimise waste and discards, as well as to create disincentives for catching small fish (Chan et al. 2014).

To enhance reporting quality and provide clearer guidance on reporting obligations, the Secretariat continues to improve the tools available to CPCs for the submission of IOTC fisheries statistical data. The IOTC Reporting guidelines and online detailed IOTC forms are regularly updated to ensure their usability and to strengthen the support provided to CPCs. Although the Commission has endorsed the mandated use of the IOTC forms and the Secretariat has delivered training workshops on reporting procedures, IOTC Res. 15/02 still requires revision to formally incorporate the obligation to utilise these forms. In recent years, notable improvements in data quality have been observed, reflecting increased uptake and effective use of the available reporting tools by CPCs.

Main Fishery Datasets

Retained Catch Data

Retained catches, which refer to fish landing weight (FAO Catch and landings), correspond to the total retained catches (in live weight) per year, Indian Ocean major area, fleet, and fishing gear (IOTC Res. 15/02). The retained catch data reporting requirements are described in the 1RC Form webpage and can be reported using IOTC Form 1RC template.

Although the reporting deadline is set for the end of June each year, regular updates continue to be made to the data processed in the database. These updates affect the published retained catches available in the public domain. Several factors may contribute to these changes:

a. **Revisions by CPCs to their final data**. This is common for longline fleets. Under IOTC Res. 15/02, longline fleets are required to submit their final data by 30 December each year, which may lead to updates following the June deadline.

b. **Revisions resulting from improved data coverage after preliminary submissions**. Several CPCs with multiple landing sites and large numbers of small-scale and medium-scale vessels often update their final catch estimates after recovering additional logbook or fishing record data. These revisions may be submitted within the same reporting year or, in some cases, in

subsequent years. It is important to note that some of these revisions have had significant impacts on historical data and, consequently, on datasets used for stock assessments.

3. **Changes in estimation procedures implemented by the Secretariat**. Updates may occur when evidence of improved methods or assumptions becomes available (e.g., selection of proxy fleets, revised morphometric relationships). Such methodological changes are applied only after endorsement by the Scientific Committee.

4. **Historical revisions of fleet or fishery data across multiple years**. When CPCs revise historical data series, they are required to submit the methodologies used for re-estimation to the Working Party on Data Collection and Statistics (WPDCS) for review and approval, in keeping with standard data-updating procedures.

The best scientific estimates of retained catches, available for the 16 IOTC species only, must be complete and representative of all fisheries. However, there are instances where CPCs submit data late, provide only partial information, or do not report for a particular fishery, species, or year. To ensure consistency in the best scientific estimates, the Secretariat applies a set of processing steps (see **Appendix V** of IOTC (2014)), based on the following rules:

a. **Non-reporting by a CPC that normally reports regularly**. If a CPC with a consistent reporting history fails to submit data, the Secretariat may repeat the previous year's data, assuming minimal changes in fishing activity. Depending on the circumstances of non-reporting, data may also be derived from alternative sources such as partial catch-and-effort submissions, the FAO FishStat database, import data from processing plants collaborating with the International Seafood Sustainability Foundation, and information from the Electronic Port State Measure (ePSM).

b. **Submission of data considered to be of poor quality or inconsistent**. When CPC-submitted data that are unreliable, the Secretariat may re-estimate species and gear composition using historical datasets or proxy fleets of fleets operating in the same strata and assumed to have similar catch composition (e.g., Moreno et al. (2012); IOTC Secretariat (2018)).

c. **Disaggregation of aggregated data**. Although raw catch estimates undergo preliminary processing before entry into the database, the final production of best scientific estimates requires full disaggregation. All aggregated data by fishery and species are broken down to generate catch data at the level of individual species and fisheries for each IOTC species. This process is automated in the database.

Discard Data

Safeguarding the oceans by managing only target species may inadvertently harm other marine resources, including non-target species, if these are not adequately protected. Although the IOTC is a tuna-focused RFMO, it has adopted several Conservation and Management Measures (CMMs) aimed at protecting non-target and non-commercial species, many of which are discarded, alive or dead, at sea. Definitions of "discards" vary globally, but the IOTC has adopted the FAO definition provided in the literature (Alverson et al. 1994; Kelleher 2005).

Under IOTC Res. 15/02 and Resolution 24/06, CPCs are required to report estimates of total annual discards (live weight or number) by Indian Ocean area, species, and fishery type. Full descriptions of the reporting requirements for discards are provided on the 1DI Form webpage and submission of the data through 1DI Form template. To ensure complete coverage, final discard estimates should be extrapolated to represent total discards by fishery, fleet, and species.

Despite the existence of clear reporting requirements, discard data remain scarce, particularly for fleets without observers on board. In such cases, data are often unraised, based solely on available information. Data can be incomplete or missing key elements required to meet the reporting standard.

Although the minimum sampling coverage specified under the IOTC Regional Observer Scheme (IOTC Res. 25/06; ROS) remains relatively low, ROS data constitute the most reliable source of information on discards. Observers document discarding events with detailed spatial and temporal information, as well as the condition of discarded species. To strengthen coverage, the resolution has been revised to allow for the integration of electronic monitoring systems (EMS) onboard vessels. Information on the collation, management, and availability of ROS data is described in papers IOTC-2025-WPDCS21-24 and IOTC-2025-WPDCS21-25.

Geo-Referenced Catch and Effort Data

Catch-and-effort data refer to finer-scale information, usually derived from logbooks, reported in aggregated format and stratified by year, month, grid, fleet, gear, type of school, and species, in accordance with (IOTC Res. 15/02). To improve reporting flexibility, CPCs may submit catch-and-effort information either for all fisheries or as an update for a single fishery. The corresponding descriptions are provided in the 3CE Form webpage, and 3CE Form update, with submissions made using the 3CE Form template and 3CE Form update webpage, respectively.

CPCs operating surface fisheries are also required to collect and report geo-referenced data on the use of fish aggregating devices (FADs), depending on the type of FAD used by their fleets. Large-scale purse seine vessels commonly operate on drifting floating objects, whereas some small-scale and medium-scale fleets operate around anchored FADs. Reporting requirements for FAD-related activities are aligned with Res. 24/02 and Res. [23/01](on the management of anchored fish aggregating devices (AFADs). For anchored FAD (AFAD) activities, reporting requirements are detailed in the 3AA Form webpage and submission through the 3AA Form template. Updates may be provided using the 3AA update Form template, with descriptions in 3AA update webpage. For drifting FAD activities, requirements are described in the 3DA Form webpage, with submissions through the 3DA Form template.

Support vessels, primarily those assisting purse seine operations, must also report information on their activities and days at sea, disaggregated by time and area, using the 3CE Form template, to ensure full geo-referencing of operational activities.

Buoy Position Data

As a consequence of the entry in force of Res. 24/02, IOTC CPCs with fishing vessels using drifting FOBs have now the obligation to report daily information (since January 1st 2020) on all active DFADs and logs monitored at sea with satellite-tracked buoys. The information to report to the Secretariat shall follow the structure and formats of IOTC Form 3BU and contain the date, instrumented buoy ID, assigned vessel and daily position of each monitored buoy, which shall be compiled at monthly intervals, and reported to the IOTC Secretariat with a time delay of at least 30, but no longer than 60 days. A detailed description of the requirements is available from the 3BU Form webpage.

Size-Frequency Data

When visualizing the availability of the main datasets required for fisheries reporting, size-frequency data consistently appear as the least reported among the three core datasets. Size-frequency information is derived from measurements of individual body length and/or weight collected either at

sea or during the unloading of fishing vessels. The reporting requirements for size-frequency data for all fisheries and species are described in the 4SF Form webpage, with submissions made through the 4SF Form template. Updates to size-frequency data can also be submitted, as outlined on the 4SF Form update webpage, using the 4SF Form update template.

This updated reporting format enables CPCs to provide several key attributes associated with size-frequency data, as required under IOTC Res. 15/02, including: - data type, - whether the catch was retained or discarded, - the source of the data (logbooks, research institutions, or observer programmes), and - the sex of the individuals sampled.

Socio-Economic Data

Several IOTC Members rely heavily on fisheries to ensure food security and support economic growth, particularly Small Island Developing States (SIDS), where dependence on the blue economy is significant. In this context, socio-economic statistics play a key role in informing fisheries management decisions and assessing the performance and economic contribution of fisheries to national economies (Bennett 2021). The incorporation of socio-economic data into fisheries management has proven useful, particularly for the establishment of fishing quotas, as highlighted in the TCAC document for the Indian Ocean (IOTC Secretariat 2024b).

In 2025, the IOTC convened the second Working Party on Socio-Economics (WPSE02), where discussions focused on identifying fisheries socio-economic and contextual indicators considered relevant for the IOTC, with recommendations for their adoption by the Commission. Despite these developments, the IOTC currently collects only a limited set of socio-economic data, specifically fish prices, which CPCs report using the legacy IOTC Form 7PR, with its description in Form 7PR webpage. These data are primarily sourced from markets, landing sites, and export or wholesale outlets.

In addition to fish prices, fuel prices, a significant factor influencing the operating costs of high-seas fisheries (Sala and Giakoumi 2018), are obtained from data providers such as FFA, given their relevance to the economic performance of fishing fleets.

Observer Data

IOTC Resolution 25/06 *"On a Regional Observer Scheme"* makes provision for the development and implementation of national observer schemes among the IOTC CPCs starting from July 2010 with the overarching objective of collecting *"verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence"*. The ROS aims to cover *"at least 5% of the number of operations/sets for each gear type by the fleet of each CPC while fishing in the IOTC Area of competence of 24 meters overall length and over, and under 24 meters if they fish outside their EEZs shall be covered by this observer scheme"*. The Resolution further provides alternative data collection methods to meet the required coverage of 5% (para 4). Human observer may be *complemented or substituted by means of an EMS* and *the EMS shall be complemented by port sampling and/or other Commission approved data collection methods*.

The requirements for ROS data collection and reporting have been updated at the 27th session of the IOTC Scientific Committee (IOTC-2024-SC27-DATA01). The Secretariat has recently revised the ROS reporting forms and aligned the associated form descriptions for the reporting requirements of ROS data (see IOTC-2025-WPDCS21-24). This work includes the development of a dedicated ROS database to process submitted information, which had previously been on hold for some time. An update on the status, coverage, and data collected under the ROS is available in IOTC-2025-WPDCS21-25.

Biological Data

The IOTC Secretariat is responsible for the periodic update of morphometric relationships (i.e., length-length and length-weight equations) and conversion factors needed to standardize the size data submitted by CPCs and to estimate catches in live-weight equivalent when processing occurs (e.g., gilled and gutted). In addition, information on sex ratios, maturity, and other biological characteristics required for the assessment of IOTC and shark species should be made available by CPCs to ensure transparency and facilitate data reuse.

To respond to these requirements, the Secretariat has developed a voluntary form for the submission of individual-level morphometric (lengths and weights) and biological data, including sex, maturity stage, and samples of hard and soft tissues. This system will allow CPCs to provide the biological information they collect. The reporting requirements for biological data are described in IOTC Form 5MB webpage, and data may be submitted through the IOTC Form 5MB.

The Secretariat has also recently conducted two regional workshops on species identification, which included training and discussions on biological data collection. Furthermore, document IOTC-2025-WPDCS21-18 outlines the current developments and needs concerning the collection of biological data.

Few biological data have been provided to the IOTC Secretariat and data available are of variable quantity and quality (IOTC 2013). Recently, the Secretariat has initiated a comprehensive review of the morphometric relationships available for the 16 IOTC species and main elasmobranch species caught in tuna and tuna-like fisheries. In addition, the Secretariat has started collating morphometric data from CPCs and NGOs (e.g., International Game Fish Association) to analyse the variability in species-specific relationships between morphometric measurements and update the IOTC reference relationships when required (e.g., IOTC Secretariat et al. 2022).`

To support this work, the Secretariat is currently designing a new database to host morphometric and other biological data submitted by CPCs. This database will facilitate comparative analyses across fisheries and species and support the development of regional datasets necessary to evaluate drivers of variability in morphometric relationships (e.g., space, time, sex, fishing gear).

Lost Gears

IOTC Recommendation 24/11 on Conservation and Management Measure on Marine Pollution, required that the Secretariat develop a data form and standard for collecting and reporting information of the recovery of abandoned, lost, and discarded fishing gears. The IOTC form 6LG webpage provides explanation on how to collect and report information on recovery of abandoned, lost, and discarded fishing gear. The IOTC Form 6LG is the corresponding form for reporting the data.

Tagging Data

Dart Tags

Since 2002, the Secretariat has been coordinating and supervising the Indian Ocean Tuna Tagging Programme (IOTTP). The specific objective of the programme was to reinforce the scientific knowledge of tropical tuna stocks and the rate of exploitation in the Indian Ocean by obtaining the crucial model parameters for stock assessment. The programme was implemented through a combination of a main tagging project, the Regional Tuna Tagging Project in the Indian Ocean (RTTP-IO), funded by the EU (9th EDF, DG-Dev), and several pilot and small-scale tuna tagging projects that took place in Maldives, India, Mayotte, and Indonesia and were funded by the DG-Fish (ex DG-Mare) and the government of Japan.

In 2012, the data from past projects implemented in Maldives in the 1990s were added to the tagging database at the Secretariat. In total, 218,239 tropical tunas were tagged between 1990 and 2009. All the tagging and recapture data are hosted at IOTC Secretariat and available upon request to the Executive Secretary.

As of November 2025, a total of 34,193 tags deployed on tropical tunas had been recovered. The large range of information collected throughout the IOTTP has been used to better understand the population dynamics of the three tropical tunas (i.e., growth, mortality, and movements; Murua et al. (2015)) and is routinely included in the assessment models of the three species since 2008 (e.g., Fu 2020).

In order to improve the management of the tagging data collected throughout the IOTTP, the Secretariat has started a collaboration with IRD to better describe the contents of the database with standard metadata.

Satellite Tags

Following a request from the Working Party on Billfish, the Secretariat has conducted a literature review on research activities involving the use of satellite tags on tuna and tuna-like species (Tolotti et al. 2017; Carlisle et al. 2019; Rohner et al. 2020, 2021; Filmalter et al. 2021; Nieblas et al. 2023) to complement previous review work conducted on billfish (Romanov 2016). The Secretariat contacted the lead-scientists of the projects to collate and manage the metadata describing the data collected through the tag deployments in order to make them available to the IOTC scientific Community. The overarching objective of the initiative is foster collaborations and enhance research supporting the conservation and management of tuna and tuna-like species in the Indian Ocean (IOTC Secretariat 2022b). To date, the Secretariat managed to get information from a total of 201 satellite tags deployed on 10 IOTC and shark species (**Table 5**). Work is ongoing to describe the dataset through a shinyApp building on the work developed by Ifremer based on a suite of metadata elements specific to satellite tags (Sequeira et al. 2021).

Table 5. Number of satellite tags deployed on IOTC species and pelagic sharks and recovered after at least 1 day at large. FLOPPED = Project 'Finding Large Oceanic Pelagic Predators Environmental Distribution' led by Ifremer; IGFA = International Game Fish Association; TOPP = 'Tagging of Pacific Predators' programme led by the University of Stanford

Category	Code	Common name	Scientific name	Project	N
BILLFISH	BLM	Black marlin	*Istiompax indica*	FLOPPED	11
				IGFA/TOPP	12
				MARINE MEGFAUNA	34
				TOPP	1
	BUM	Blue marlin	*Makaira nigricans*	FLOPPED	36
				IGFA/TOPP	12
				TOPP	2
	MLS	Striped marlin	*Kajikia audax*	FLOPPED	4
				MARINE MEGFAUNA	40
	SFA	Indo-Pacific sailfish	*Istiophorus platypterus*	FLOPPED	17
				TOPP	2

Category	Code	Common name	Scientific name	Project	N
	SWO	Swordfish	*Xiphias gladius*	FLOPPED	3
				TOPP	1
RAYS	RMA	Alfred manta (reef manta ray)	*Mobula alfredi*	TOPP	14
SHARKS	BSH	Blue shark	*Prionace glauca*	IRD	1
	FAL	Silky shark	*Carcharhinus falciformis*	IRD	1
				TOPP	4
	OCS	Oceanic whitetip shark	*Carcharhinus longimanus*	IRD	1
TROPICAL	YFT	Yellowfin tuna	*Thunnus albacares*	TOPP	5

Data Reporting Quality

A scoring system has been designed to assess the reporting quality of the retained catch, catch and effort, and size-frequency data available at the Secretariat for all IOTC and the most commonly caught shark species as defined in Res. 15/01. The determination of the score varies according to each type of dataset and aims to account for reporting coverage and compliance with IOTC reporting standards (**Table 6**). Overall, the lower the score, the better the quality. It is to note that the quality scoring does not account for sources of uncertainty affecting the data such as under-reporting and misreporting.

Table 6. Key to IOTC quality scoring system

Data set	Criterion	By species	By gear
Retained catch	Fully available	0	0
	Partially available	2	2
	Fully estimated	4	4
Catch and effort	Available according to standards	0	0
	Not available according to standards	2	2
	Low coverage (<30% logbooks)	2	
	Not available	8	
Size frequency	Available according to standards	0	0
	Not available according to standards	2	2
	Low coverage (<1 fish per tonne caught)	2	
	Not available	8	

Availability and Timeliness of IOTC data (2012-2024)

It is imperative that the data required for stock assessment are available well in advance to allow sufficient time for processing before analyses are conducted. Late submissions have repeatedly hindered this process, as scientists face challenges in linking observed trends to changes in the fisheries when the underlying data contain uncertainties or are incomplete. The deadline for the submission of fisheries statistics is six months after the activity year, 30 June, and this applies to most data sets. Particular emphasis is placed on the three core datasets required for assessments: retained catch (RC), catch and effort (CE), and size-frequency (SF). These datasets are essential inputs for the review of fisheries management during meetings of the Working Parties and the Scientific Committee. Consequently, late reporting compromises the Secretariat's ability to validate and verify the data, especially when submissions are made close to, or during, Working Party sessions devoted to stock assessments.

As previously described, missing retained catch data are either estimated, obtained from alternative sources, or, in some cases, repeated from the previous year. The FAO FishStat database is the primary secondary source used to complement missing catch reports (see **Appendix V** of IOTC (2014)). However, in some cases, FAO data cannot be reliably incorporated due to inconsistencies between the data submitted to FAO and those reported to the IOTC Secretariat.

The three main datasets, retained catches, geo-referenced catch and effort data, and size-frequency data, are often submitted simultaneously, although in some cases individual components are received later. Upon data reception, standard controls and checks are performed to ensure that the metadata and data submitted to the Secretariat are consistent and include all mandatory fields. The controls depend on each type of data set and may require the submission of revised data from CPCs if the original one is found to be inconsistent (e.g., unknown gear code) or incomplete (e.g., missing CWP spatial grid).

Retained Catch Data

Availability

2025, the year marked a record level of submission for retained catch data, with only 1 CPC failing to report retained catch data for 2024: Sudan. This corresponds to an availability rate of 100% by the deadline. Although data from Somalia and Yemen were limited to a single year, both CPCs submitted estimated catch information by species and fishery. For non-member countries – Bahrain, Djibouti, Egypt, Eritrea, Jordan, Kuwait, Myanmar, Saudi Arabia, Timor Leste, and the United Arab Emirates – data continue to be sourced from the FAO FishStat database. The Secretariat has also begun receiving expressions of interest from some non-member countries indicating their willingness to join the IOTC.

Timeliness

Timeliness of submission in 2025 showed a marked improvement, consistent with the high level of data availability described above. This improvement can largely be attributed to CPCs becoming more familiar with the reporting requirements following the data reporting workshops held in Thailand and Kenya in 2024, as well as the follow-up Data technical workshop in Indonesia in 2025, which saw participation from most CPCs.

On average, 100% of retained catch data were available in 2025 across all species groups. By contrast, in previous years, a number of CPCs reported late or did not report retained catch data at all (**Fig. 2**).

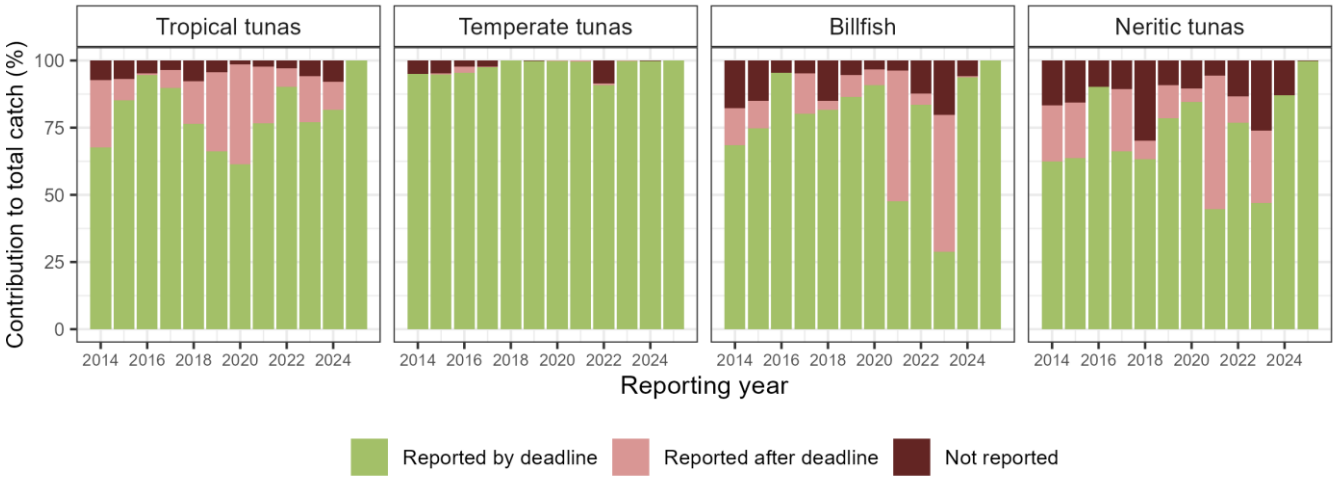

Fig. 2. Annual percentage of total retained catch of each of the IOTC species groups according to the date of submission of the retained catch data by each fleet to the IOTC Secretariat. The submission deadline is the 30th June of each year

Catch and Effort Data

Availability

Despite the improvement in the availability of retained catch data, the reporting of geo-referenced catch data remains challenging for several CPCs, although overall availability in 2025 has improved across all species groups. This is evident from the quality of the data submitted by some CPCs, which continue to face several issues such as:

(i) insufficient resources to maintain effective data-management systems;

(ii) the limited socio-economic importance of tuna and tuna-like species for the livelihoods of some coastal fishers;

(iii) weak monitoring capacity due to the large number of small landing sites and difficulties accessing them.

Moreover, the low market value of some species results in limited funding and fewer resources allocated to data collection activities (Pita et al. 2019).

The availability of geo-referenced data for billfish and neritic species remains the lowest among all species groups. These species are primarily harvested by small-scale and medium-scale fisheries, although they are also caught as bycatch in large-scale fisheries. While large-scale fleets generally submit higher-quality geo-referenced data, submissions from small-scale and medium-scale fleets remain poor, constraining the overall availability and reliability of geo-referenced data for billfish and neritic species.

The availability of catch and effort data varies substantially by species group, with distinct reporting patterns for each category (**Fig. 3**):

• *Tropical tunas*: Availability has improved in recent years. Most major fleets catching tropical tunas are now reporting CE data consistently, resulting in 88% availability by the deadline, with no reports submitted after the deadline as of November 2025.

• *Temperate tunas*: Reporting of geo-referenced catches for temperate tunas is nearly complete, with 99% of fleets submitting data on time in 2025. This strong performance mirrors trends observed for retained catch data and demonstrates consistently high reporting quality for this species group.

• *Billfish*: The availability of geo-referenced billfish data has fluctuated over time. In 2023, availability dropped to 73%, with 44% available after the deadline. However, in 2025, availability remained around 73%, similar to 2024. This improvement is largely attributed to significant progress in timely reporting by I.R. Iran, one of the major billfish fleets.

• *Neritic tunas and seerfish*: The availability of geo-referenced catch data for neritic species has also fluctuated over the years, reflecting inconsistent reporting by fleets targeting these species. Small-scale coastal fisheries, which dominate catches of neritic species, continue to face longstanding challenges in data collection. The Secretariat is assisting CPCs in developing spatial grids linked to their landing sites to improve geo-referenced reporting; however, some CPCs still do not collect temporal information or catch data by individual landing site. Despite these issues, availability improved in 2025, with 77% submitted, a slight increase compared with 2024. As of November 2025, no geo-referenced catch data for neritic species had been reported after the deadline.

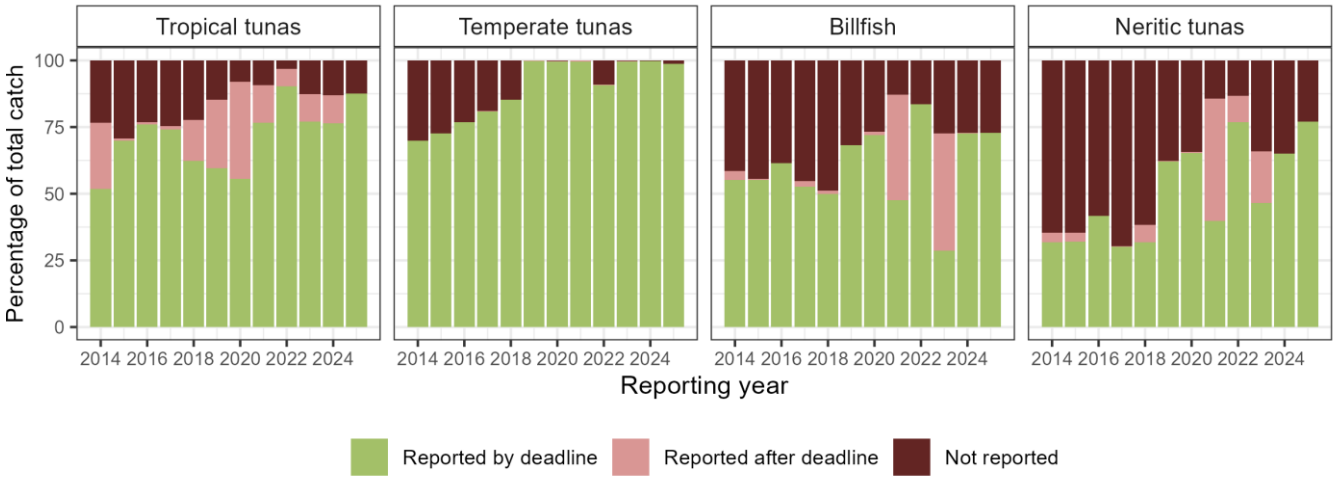

Fig. 3. Annual percentage of total retained catch of each of the IOTC species groups according to the date of submission of the geo-referenced catch and effort data by each fleet to the IOTC Secretariat. The submission deadline is the 30th June of each year

Timeliness

Comparing with previous years, the timeliness of reporting in 2025 has improved, with an overall availability by the deadline of 84%, and no CPCs submitting data after the deadline. In contrast, availability in 2024 was lower, 78%, with several instances of late reporting. Notably, some CPCs with substantial catches, such as India, Pakistan, Somalia, and other coastal fleets, continue to lack complete geo-referenced catch submissions.

Despite improvements in the timeliness of geo-referenced reporting, several CPCs remain unable to raise or report data at coverage levels representative of their total landings. As a result, the availability of geo-referenced catch data remains lower than that of retained catch data, particularly for CPCs with large and complex coastal fisheries.

Size-Frequency data

Availability

Although the availability of retained catch data improved significantly in 2025, the availability of size-frequency data remains challenging. Following a period of reduced biological sampling during the COVID-19 pandemic, particularly for industrial fleets that rely on observer data, reporting of size data from industrial fisheries has recently improved. However, availability from small-scale fisheries remains low, as reflected in the limited size data for species groups predominantly caught by these fleets. Overall, the fraction of size-frequency data available in 2025 is 70% (**Fig. 4**). This persistent gap in size-frequency data remains a significant limitation, as it hinders the ability to assess stock status and understand the size structure of fish populations, both critical elements for effective fisheries management and conservation.

For many fisheries, billfish are landed in processed form (e.g., headed and tail-off), making species identification and length measurements difficult. This challenge is compounded by the lack of observers on board vessels or sampling at sea in fleets with high billfish catches. For instance, I.R. Iran, one of the main billfish-catching fleets, reports that because billfish are of low commercial value, they are often processed at sea before landing, with little emphasis placed on collecting size data (Khorshidi 2023).

Some research initiatives are exploring ways to improve billfish sampling at landing sites. Sri Lanka, for example, has launched a pilot project to distinguish dressed billfish using visible characteristics at landing (Bandaranayake et al. 2024), with further investigations under way (Darsigan et al. 2025).

- *Tropical tunas*: Size-frequency reporting for tropical tunas improved slightly in recent years, with a fraction of 85% reported between 2023 and 2024. However, availability in 2025 decreased to 78%, largely due to missing size data from several major fleets.

- *Temperate tunas*: Availability of temperate tuna size-frequency data remained relatively stable at 90% between 2023 and 2024. Following the resumption of onboard observer programmes in longline fisheries targeting temperate tunas after the pandemic, availability increased in 2025 to 95%.

- *Billfish*: Size-frequency availability for billfish remains very low, mainly due to the product-type issues described above. Only 17% was reported in 2024. Availability increased slightly in 2025 to 40%, but remains insufficient considering the substantial billfish catches in several small-scale fisheries, where data collection mechanisms are limited or absent.

- *Neritic tunas and seerfish*: Size-frequency reporting for neritic species has declined markedly in recent years, with only 60% available from 2023–2024. This is particularly concerning given the increasing catches by key CPCs such as India, Oman, Indonesia and Pakistan. In some cases, CPCs submit size data, but the sampling is insufficient to meet the reporting requirement of one fish per metric tonne. In 2025, availability improved slightly to 67%.

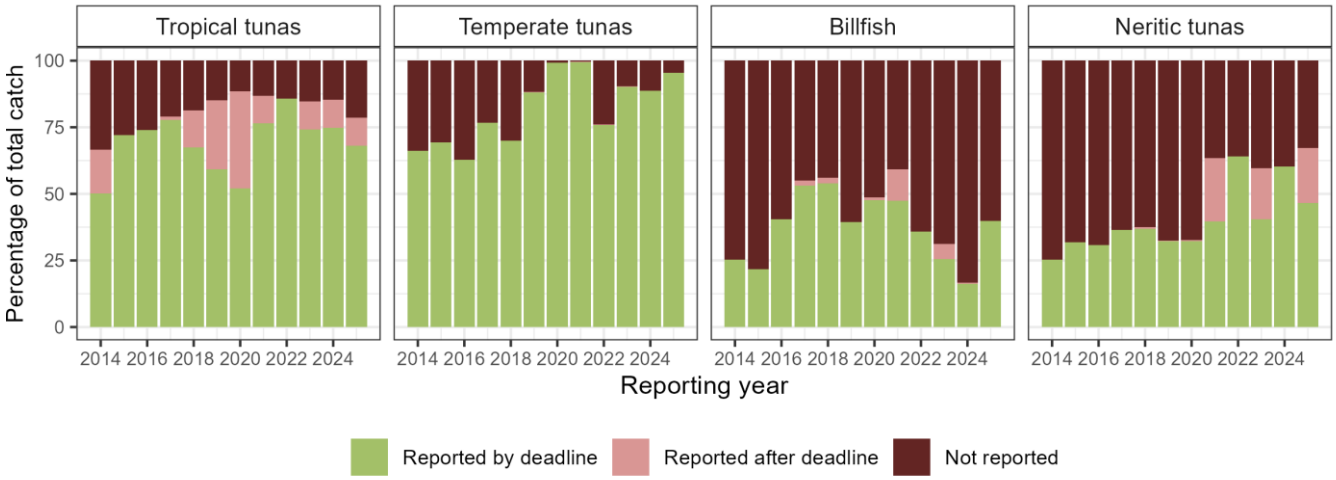

Fig. 4. Annual percentage of total retained catch of each of the IOTC species groups according to the date of submission of the size-frequency data by each fleet to the IOTC Secretariat. The submission deadline is the 30th June of each year

Timeliness

When available, size-frequency data between 2014 and 2025 were mostly reported by the deadline, with only a few delays observed in 2025 (**Fig. 4**). As with retained and geo-referenced data, the timeliness of size-frequency submissions depends largely on the type of fisheries targeting the species groups. Although overall availability varies, most of the size-frequency data that are submitted arrive by the deadline, with the exception of one coastal CPC that submitted late. In 2025, the proportions of size-frequency data reported by the deadline for tropical tunas, temperate tunas, billfish, and neritic species were 68%, 95.4%, 39.9%, and 46.5%, respectively.

Trends in reporting timeliness also show that historical size-frequency data for some fleets were often submitted after the deadline. For temperate tunas, late submissions have been relatively limited over time, and a similar pattern is observed for billfish. In contrast, tropical tunas and neritic tunas and seerfish exhibit more frequent delays. Between 2019 and 2024, an average of 15.6% of tropical-tuna size-frequency data and 7.3% of neritic species data were reported after the deadline.

Overview of the Status of the Data Reported for 2024

Retained Catch, Catch and Effort, and Size-Frequency Data

Data for the reference year 2024 were well reported compared with previous years, as noted in the preceding section. Overall, the reporting of the core datasets for all fishery categories (i.e., longline, purse seine, and coastal) indicates that most CPCs submitted retained catch data, although several continue to face challenges in providing geo-referenced data (**Table 7**). Some fleets still do not meet all standard reporting requirements.

Fleets that had previously struggled to submit basic data in accordance with the standards, namely Pakistan, Oman, and Somalia, improved the quality of their reporting in 2025, although they were still unable to provide all required datasets. Yemen, following several exchanges with the Secretariat, submitted essential information on catch levels for major species and on the fisheries operating within its jurisdiction.

Most coastal fleets continue to face difficulties in providing geo-referenced catch and effort data that meet reporting standards. Countries with extensive coastlines and numerous landing sites, such as

Indonesia and India, face particular challenges due to the large number of small vessels engaged in tuna fisheries. Monitoring all landings is not feasible with current capacity, and reliance on manual data-collection methods makes the process resource-intensive. As a result, coverage remains low, and these CPCs are unable to deliver data at the required level of detail.

Biological sampling within coastal fisheries does occur, but it is often centred on species of local economic importance or those selected for scientific research. Tuna species are not always prioritised for sampling, resulting in limited data availability. In some cases, particularly in research-oriented institutions, sampling is carried out on tuna species, but essential information such as length or weight is not submitted to the Secretariat. The lack of size-frequency data is also evident in certain industrial fisheries.

Table 7. Retained catches (metric tonnes; t) and data reporting quality of the main IOTC datasets by fishery group (industrial purse seine, industrial longline, and all other fisheries) and flag as reported in 2025 (for reference year 2024) for all IOTC species and sharks caught by tuna and tuna-like species in the Indian Ocean. RC = retained catch; CE = catch and effort; SF = size frequencies. Colour key is given in score key table

Fishery group	CPC	Fleet	Catch (t)	RC	CE	SF
Purse seine	AUS		4,237			
	EU	EUESP	115,758			
		EUFRA	71,300			
		EUITA	6,787			
	IDN		63,033			
	KEN		6,322			
	KOR		11,700			
	MOZ		2,405			
	MUS		27,171			
	OMN		11,110			
	SYC		116,994			
	TZA		12,973			
Longline	AUS		325			
	CHN	CHN	19,668			
		TWN	63,175			
	EU	EUESP	8,529			
		EUFRA	2,178			
		EUPRT	1,811			
	IDN		15,030			
	JPN		10,102			
	KEN		217			
	KOR		1,836			
	LKA		18,153			
	MUS		6,451			
	MYS		3,948			
	OMN		1,188			
	SYC		13,239			
	TZA		221			
	ZAF		1,276			
Other	AUS		231			
	BGD		17,151			
	COM		17,500			
	EU	EUFRA	810			
	GBR		14			
	IDN		451,463			
	IND		221,665			
	IRN		307,149			
	KEN		4,256			
	LKA		168,857			
	MDG		9,124			
	MDV		107,163			
	MOZ		21,605			
	MYS		29,382			
	OMN		134,081			
	PAK		52,221			
	SOM		27,125			
	SYC		630			
	THA		37,831			
	TZA		8,398			
	YEM		42,315			

Discard Data Collected through Form 1DI

Reporting of discard information is required under several specific CMMs: Res. 12/04 for marine turtles, Res. 19/03 for mobulid rays, Res. 23/06 for cetaceans, Res. 23/07 for seabirds, Res. 25/08 for sharks, and Res. 25/09 for mako sharks. The increased pressure to record discarded catch, whether of IOTC species, non-IOTC species, or species of special interest (SSI), has led to a rise in discard reporting from longline and surface fisheries. Although it is known that discards in coastal fisheries are minimal, including interactions with species of special interest, most coastal CPCs do not record discards, generally stating that all catches are retained for consumption.

Estimates of discards reported to the Secretariat are derived either from logbooks or observer programmes, though in some cases the discard information in logbooks is itself compiled from observer data. In 2025, a total of 18 fleets provided positive discard reports for the reference year 2024, expressed either in number of individuals or in weight. Raising discard estimates to total fishery level remains a challenge for some fleets. However, in 2025 several purse seine fleets attempted to raise their discard estimates to total catch.

Comparisons of discard levels among fleets and fisheries remain difficult due to the substantial heterogeneity in the information submitted, particularly with respect to sampling coverage and the absence of raising procedures for most fisheries. Although IOTC Resolution 15/02 requires that discards be extrapolated to represent the entire fishery, the reported discard levels remain low and are generally based only on observed discarding events.

Several nil discard reports have been submitted through e-MARIS for fisheries where substantial levels of discarding would normally be expected. For example, I.R. Iran, which operates large gillnet fisheries, reports minimal discards, though these are not recorded in logbooks. The Maldives, on the other hand, operates a pole-and-line fishery with very limited discarding and submitted an empty form indicating no discards, noting that species of special interest are subject to protection measures in the Maldives (Sabarros et al. 2013; Shahifar et al. 2013; Miller et al. 2017).

Discard Data from Purse Seine Fisheries

It is unlikely that large-scale purse seine fisheries do not interact with non-target species, given the non-selective nature of purse seines and the routine discarding of several unwanted non-IOTC species (Ruiz et al. 2018; Grande et al. 2019). All large-scale purse seine fleets operating in the Indian Ocean in 2024 submitted discard data. These data were reported using IOTC Form 1IN (interactions with species of special interest, as required by relevant CMMs) and/or Form 1DI, which is for reporting general discards of all species (**Fig. 5**). Discards from purse seine fisheries were reported either in weight or as the number of individuals discarded, depending on CPC practices (**Tab 8**).

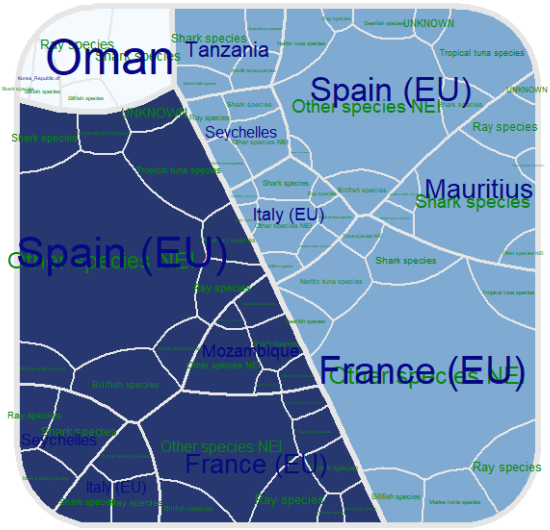

Fig. 5. Voronoi treemap describing the composition of discards in purse seine fisheries reported for 2024, by fishing mode and species group. Light blue = Purse seine fishing on FOB-associated schools; Dark blue = Purse seine fishing on free swimming schools (FSC)

Table 8. Total quantities of discards -- in numbers and weight (metric tonnes; t) -- in purse seine fisheries reported for 2024, by fishery and species group

Fishery	Fishery code	Unit	Billfish	Neritic tunas	Seerfish	Temperates	Tropicals	Tunas nei	Sharks	Rays	Cetaceans	Turtles	Others
Purse seine | Other	PSOT	Number	21	0	0	0	0	0	1,286	9	0	262	0
Purse seine | Other	PSOT	Weight	0	0	0	0	0	0	3	0	0	0	0
Purse seine | FS	PSFS	Number	299	539,092	4,852	6	480,979	0	14,225	60	6	66	291,491
Purse seine | FS	PSFS	Weight	3	55	0	0	232	0	39	11	0	2	13
Purse seine | LS	PSLS	Number	24	42,262	145	0	141,257	0	6,118	5	0	49	68,160
Purse seine | LS	PSLS	Weight	13	150	13	0	407	14	763	11	0	0	341

The condition of discarded species from purse seine fisheries varies, although the majority of individuals are discarded dead. This is not unexpected given the characteristics of purse seine operations. However, sea turtles and cetaceans were generally released alive (**Fig. 6**).

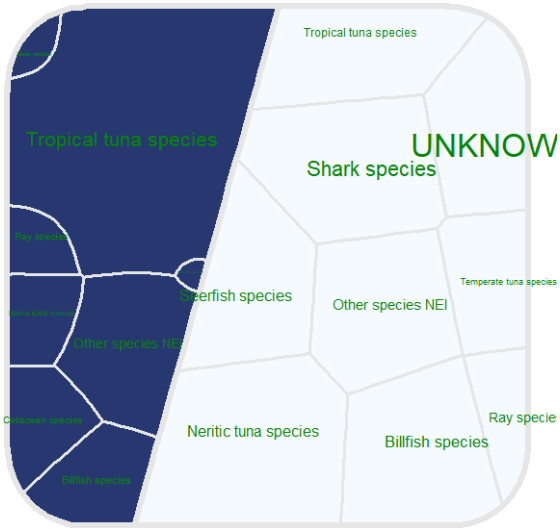

Fig. 6. Voronoi treemap describing the composition of discards reported for all purse seine fleets by condition and species group for 2024. Dark blue = Alive; Light blue = Dead

Discard Data from Longline Fisheries

Longline fisheries also interact with a wide range of species and are known for generating significant bycatch, even though high-seas longline fleets in the Indian Ocean primarily target tropical and temperate tunas (e.g., Huang and Liu 2010). Discarded catch data from large-scale longline fisheries were available from 13 countries for 2024, representing over 90% of all longline fisheries. These data included discards from both fresh-chilled and deep-freezing longline vessels. However, there was no indication that the discarded catch data reported by longline fleets had been fully raised to total catch (**Fig. 7**).

The majority of species discarded by longline fisheries were sharks, followed by tuna species. Interactions with species of special interest were more frequent in longline fisheries compared to surface fisheries. There were no attempts by longline fleets to report discard data in weight; all information was provided only as the number of individuals discarded (**Table 9**). In addition to these main groups, several other species were discarded for various operational or market-related reasons.

Fig. 7. Voronoi treemap describing the composition of discards reported in longline fisheries reported for 2024, by fleet and species group. Dark blue = deep-freezing longline fisheries; Light blue = 'fresh' longline fisheries

Table 9. Total quantities of discards (in numbers) in longline fisheries reported for 2024, by fishery and species group

Fishery	Fishery code	Unit	Billfish	Neritic tunas	Seerfish	Temperates	Tropicals	Tunas nei	Sharks	Rays	Seabirds	Cetaceans	Turtles	Others
Longline | Fresh	LLF	Number	2,355	0	63	183	557	91	8,082	1,030	25	110	326	4,916
Longline | Deep-freezing	LLD	Number	106	19	8	5,045	15,439	0	42,809	78	144	20	8	1,610

Level condition of the species at discard, caught from the longline fisheries are more or less similar to that of purse seine fisheries, with most of the species discarded dead. Data reported indicated that several marine turtle and seabird species are discarded from the longline fisheries. However, the conditions of these species recorded are mainly dead when discarded. The conditions of the marine turtle species release were indicated by several fleets, although some fleet did not provide fish conditions (reported as unknown) (**Fig. 8**). Conditions of seabirds interacted with longline were indicated as either dead or alive (**Fig. 9**).

The condition of species at the time of discard in longline fisheries is broadly similar to that observed in purse seine fisheries, with most individuals recorded as discarded dead. Available data also indicate interactions with several marine turtle and seabird species in longline operations, and in many cases these animals were reported as dead at the time of discard. Some fleets did report marine turtles as released alive. However, several others did not provide the condition at discard and instead recorded it as "unknown" (**Fig. 8**). For seabirds interacting with longline gear, fleets reported conditions as either "dead" or "alive" (**Fig. 9**).

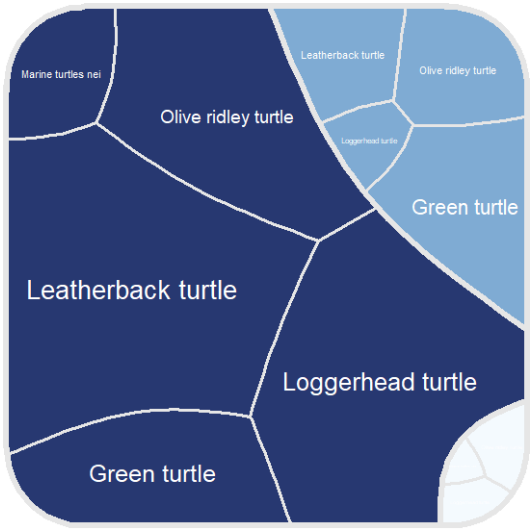

Fig. 8. Voronoi treemap describing the composition of marine turtles discarded in longline fisheries reported for 2024, by species and condition at release. Dark blue = alive; Light blue = dead

Fig. 9. Voronoi treemap describing the composition of seabirds discarded in longline fisheries reported for 2024, by species and condition at release. Dark blue = alive; Light blue = dead

Discard Data from Other Fisheries

Although discarding of unwanted species is well known in industrial fisheries (for IOTC, primarily longline and surface fisheries), several coastal fisheries also report discards of unwanted catch or of species subject to retention bans. In 2024, discarded catch was reported from fleets using beach seines, gillnets, lines, and ringnets. As in previous years, Sri Lanka accounted for the majority of discarded catch data reported by coastal fisheries (**Table 10**).

Interactions between coastal fisheries and marine turtle species are well documented. Previous studies have shown that passive gears such as gillnets can pose serious risks to marine turtles (Gilman et al. 2010). Additionally, lost fishing gears, such as hooks and lines from small-scale fisheries, can also threaten turtles through entanglement (hoiberg et al. 2025). Discard data for 2024 indicate that most turtles caught in coastal fisheries were released alive, although information on the specific

circumstances of the interactions is generally lacking. Multiple turtle species were reported, with green turtles being the most commonly encountered (**Fig. 10**).

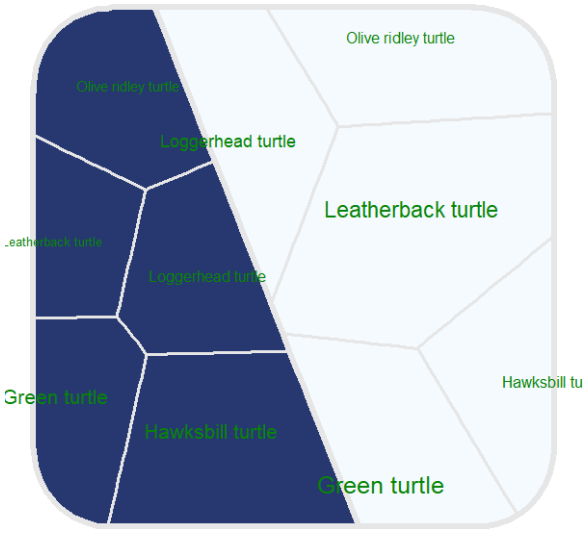

Fig. 10. Voronoi treemap describing the composition of marine turtles discarded in small and medium-scale fisheries reported for 2024, by species and condition at release. Dark blue = alive; Light blue = dead

Table 10. Total quantities of discards (in numbers) in longline fisheries reported for 2024, by fishery and species group

Fishery	Fishery code	Unit	Billfish	Tropicals	Sharks	Rays	Cetaceans	Turtles	Others
Line | Coastal longline	LIC	Number	4	1	487	7	57	432	70
Line | Trolling	LIT	Number	0	0	0	0	0	11	0
Line | Handline	LIH	Number	0	0	0	0	0	17	0
Baitboat	BB	Number	0	0	0	0	0	6	0
Gillnet	GN	Number	0	0	169	0	127	2,175	0
Other	OT	Number	0	0	0	0	0	10	0

FAD-Related Data

Following the reporting requirements of IOTC resolutions 19/02 and 24/02, and the new template development by the Secretariat, for two consecutive years, CPCs with vessels that operate on DFADs, reported detailed information on the fisheries. Although in the initial reports data were not well recorded, there are some improvements in the quality for the data reported, with more consistencies

in the data for 2024. However, the information is still limited in terms of series for better analysis, since the last comprehensive description of the DFAD-related data available at the IOTC Secretariat covering the period 2013-2022 was made at the 5th IOTC ad hoc Working Group on FADs (WGFAD05), along with the release of the consolidated datasets (IOTC 2023). However, the previous DFAD data were not as detailed as the recently collected data.

In addition to monitoring of surface fisheries operating with DFADs, Resolution 23/01 sets requirements for the reporting of activities on AFADs. However, although there are known coastal fisheries operating on AFADs, there is little management of AFAD data from these countries, besides Maldives.

General overview of the data submission for DFAD and AFAD, using the respective reporting templates, indicated that most fleets that operated on DFADs provided information for the year 2024, despite some fleets lacking some information. By contrast, only Maldives submitted data on activities on AFADs (**Table 11**).

Table 11. Data reporting status of data on interactions with AFADs (form 3AA), DFOBs (form 3DA), and daily buoy positions (3BU) as reported to the IOTC Secretariat. Grey indicates 'Not Applicable'

CPC code	Fleet	3DA	3AA	3BU
EU	EU,France			
	EU,Italy			
	EU,Spain			
OMN	Oman			
KOR	Rep. of Korea			
MUS	Mauritius			
SYC	Seychelles			
TZA	Tanzania			
MDV	Maldives			
IDN	Indonesia			
KEN	Kenya			

Review of Drifting Fish Aggregating Data (3DA)

Data reported by CPCs operating purse seine fisheries on drifting fish aggregating devices (DFADs) were briefly analysed with respect to activities conducted and the types of FADs used. Compared to submissions for 2023, the 2024 data were more structured, particularly in the use of appropriate parameter fields. However, further standardisation is still required for several core variables to ensure consistent reporting. For example, the recording of buoy identification numbers and confirmation of buoy presence remains inconsistent: some CPCs enter the buoy identifier in the “presence” field while leaving the identifier field blank, whereas others record “Yes” or “1” for presence without providing the identifier. Despite these inconsistencies, the Secretariat harmonised the data sufficiently to allow for review and analysis.

Activities conducted during visits to DFOBs that resulted in catches were predominantly “visit with fishing” although some catches were also associated with other activity types (**Fig. 11**).

Records indicate that large-scale purse seine vessels use various types of drifting objects, including both natural and artificial materials. Catches were overwhelmingly associated with DFADs for which the material composition of these devices was not specified, despite the wide range of materials commonly used (**Fig. 12**). In addition to reporting the type of DFOB, CPCs are required to indicate whether plastic and/or metal components are present in the surface or subsurface parts of the device. However, inconsistencies in how this variable was reported, combined with incomplete submissions in 2024, limited the ability to fully assess material use. Overall, approximately 50% of the catch originated from DFADs reported as having no plastic or metal components, 22% from devices for which material types were explicitly identified, and 27% from devices for which no information on the use of plastic or metal was provided.

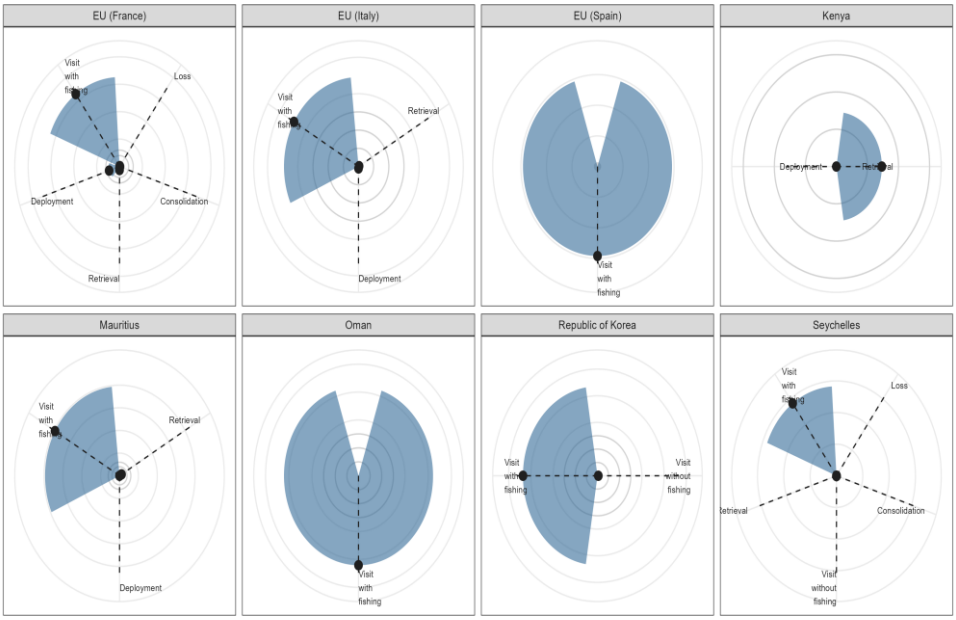

Fig. 11. Proportion of catch data by DFOB activity for each purse seine fleet in 2024 as reported to the Secretariat

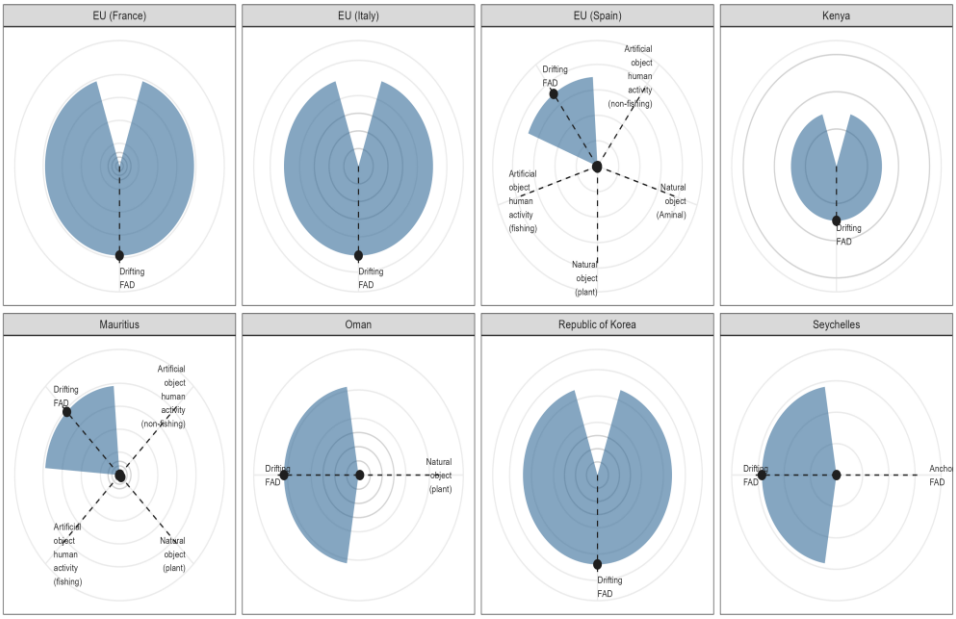

Fig. 12. Proportion of catch data by type of drifting floating object for each purse seine fleet in 2024, as reported to the Secretariat

The buoys activities and position known are recorded as required information if there are buoy present. As mentioned above, some discrepancies were found in the way the data are recorded. The overall numbers of activities related to buoys visits with and without fishing, losses, and deployments substantially vary among fleets (**Fig. 13**).

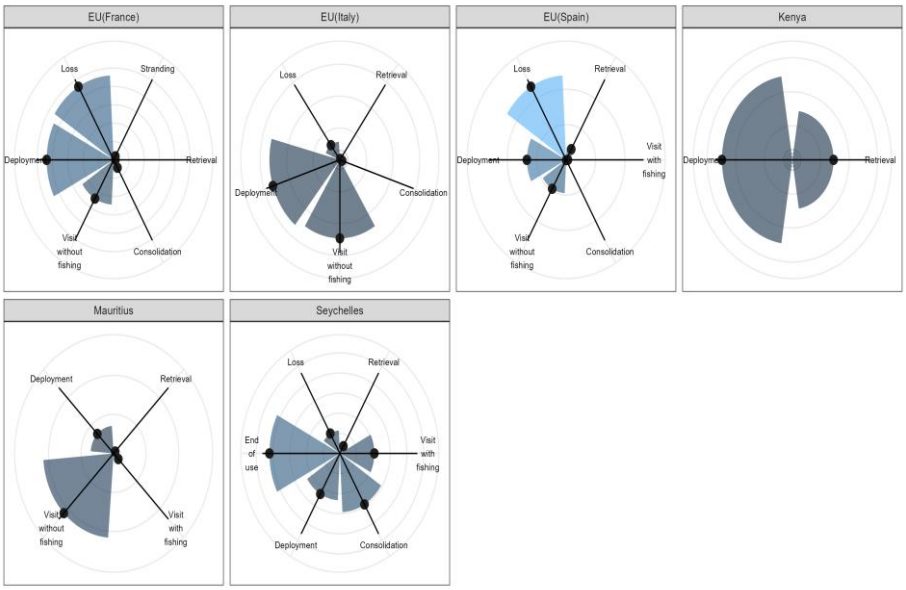

Fig. 13. Absolute number of activities undertaken when visiting buoys for each purse seine fleet in 2024, as reported to the Secretariat

References

Aguión, A., Basurto, X., Funge-Smith, S., Gorelli, G., Iversen, E., Mancha-Cisneros, M. del M., and Gutierrez, N.L. 2025. Five archetypes of small-scale fisheries reveal a continuum of production strategies to guide governance and policymaking. Nature Food: 1–12. doi:10.1038/s43016-025-01237-5.

Alverson, D.L., Freeberg, M.H., Murawski, S.A., and Pope, J.G. 1994. A global assessment of fisheries bycatch and discards. FAO, Rome, Italy. Available from http://www.fao.org/3/t4890e/T4890E00.htm.

Bandaranayake, K., Herath, J., Prasad, J., Haputhantri, S., and Jayasinghe, R. 2024. Billfish fishery resources; present context and research challenges IOTC. Seychelles. Available from https://iotc.org/documents/billfish-fishery-resources-present-context-and-research-challenges [accessed 22 November 2024].

Basurto, X., Gutierrez, N.L., Franz, N., Mancha-Cisneros, M. del M., Gorelli, G., Aguión, A., Funge-Smith, S., Harper, S., Mills, D.J., Nico, G., Tilley, A., Vannuccini, S., Virdin, J., Westlund, L., Allison, E.H., Anderson, C.M., Baio, A., Cinner, J., Fabinyi, M., Hicks, C.C., Kolding, J., Melnychuk, M.C., Ovando, D., Parma, A.M., Robinson, J.P.W., and H. Thilsted, S. 2025. Illuminating the multidimensional contributions of small-scale fisheries. Nature: 1–10. doi:10.1038/s41586-024-08448-z.

Bennett, N.J. 2021. Socio-economic monitoring and evaluation in fisheries. Fisheries Research. Available from https://www.sciencedirect.com/science/article/pii/S016578362100062X.

Carlisle, A.B., Tickler, D., Dale, J.J., Ferretti, F., Curnick, D.J., Chapple, T.K., Schallert, R.J., Castleton, M., and Block, B.A. 2019. Estimating space use of mobile fishes in a large marine protected area with

methodological considerations in acoustic array design. Frontiers in Marine Science **6**. doi:10.3389/fmars.2019.00256.

Chan, V., Clarke, R., and Squires, D. 2014. Full retention in tuna fisheries: Benefits, costs and unintended consequences - ScienceDirect. Marin Policy **45**. doi:10.1016/j.marpol.2013.10.016.

Darsigan, S., Gunasekera, G., Creech, S., and Gunawardane, N. 2025. Further observations on the use of length conversion equations to address length data deficiencies for swordfish, Indo-Pacific sailfish, black marlin and blue marlin in the Indian Ocean using images IOTC. Shanghai, China. Available from https://iotc.org/documents/WPDCS/21/11 [accessed 15 November 2025].

FAO. 1995. Code of Conduct for Responsible Fisheries. Rome, Italy. Available from https://www.fao.org/3/v9878e/v9878e00.htm.

Filmalter, J.D., Bauer, R.K., Forget, F., Cowley, P.D., and Dagorn, L. 2021. Movement behaviour and fishery interaction of silky sharks (*Carcharhinus falciformis*) in the tropical tuna purse seine fishery in the Western Indian Ocean. ICES Journal of Marine Science (fsab119). doi:10.1093/icesjms/fsab119.

Fu, D. 2020. Preliminary Indian Ocean skipjack tuna stock assessment 1950-2019 (Stock Synthesis). IOTC, Online meeting, 19 - 23 October 2020. p. 57. Available from https://www.iotc.org/documents/WPTT/2202/10.

Funge-Smith, S. 2019. Towards a statistical definition of small-scale fisheries. FAO, Rome, Italy, 15 - 18 May 2019. p. 7. Available from https://www.fao.org/fi/static-media/MeetingDocuments/cwp/cwp_26/11e.pdf.

Gilman, E., Gearhart, J., Price, B., Eckert, S., Milliken, H., Wang, J., Swimmer, Y., Shiode, D., Abe, O., Hoyt Peckham, S., Chaloupka, M., Hall, M., Mangel, J., Alfaro-Shigueto, J., Dalzell, P., and Ishizaki, A. 2010. Mitigating sea turtle by-catch in coastal passive net fisheries. Fish and Fisheries **11**(1): 57–88. doi:10.1111/j.1467-2979.2009.00342.x.

Grande, M., Ruiz, J., Hilario, M., Murua, J., Goni, N., Krug, I., Arregui, I., Salgado, A., Zudaire, I., and Santiago, J. 2019. Progress on the code of good practices on the tropical tuna purse seine fishery in the Indian Ocean. IOTC, La Réunion, France, 03-07 September 2019. p. 44. Available from https://www.iotc.org/fr/documents/WPEB/15/33.

hoiberg, M., Borgelt, J., Mostert, P., Murakawa, S., Martin, S., Gelman, J., Lynch, J., and Verones, F. 2025. Marine debris impacts on Hawaiian green sea turtles (Chelonia mydas): High prevalence of hook-and-line fishing gear in strandings - ScienceDirect. Marine Pollution Bulletin **215**. doi:doi.org/10.1016/j.marpolbul.2025.117869.

Huang, H.-W., and Liu, K.-M. 2010. Bycatch and discards by Taiwanese large-scale tuna longline fleets in the Indian Ocean. Fisheries Research **106**(3): 261–270. doi:10.1016/j.fishres.2010.08.005.

IOTC. 2013. Biological data on tuna and tuna-like species gathered at the IOTC Secretariat: Status Report. IOTC, Colombo, Sri Lanka, 27 - 31 March 2006. p. 23. Available from https://www.iotc.org/documents/biological-data-tuna-and-tuna-species-gathered-iotc-secretariat-status-report.

IOTC. 2014. Report of the 10th IOTC Working Party on Data Collection and Statistics. IOTC, Eden Island, Seychelles, 2-4 December 2014. Available from https://iotc.org/documents/report-tenth-session-iotc-working-party-data-collection-and-statistics.

IOTC. 2023. FAD activity data (2013-2022). IOTC, Online meeting, 4 - 6 October 2023. Available from https://iotc.org/documents/fad-activity-data-2013-2022.

IOTC Secretariat. 2018. Revision to the IOTC scientific estimates of Indonesia's fresh longline catches. IOTC, Victoria, Seychelles, 29 November - 1 December 2018. p. 14. Available from https://www.iotc.org/documents/WPDCS/14/23-IDN-FLL.

IOTC Secretariat. 2022b. Note on the collaboration of the Secretariat with international partners on data-related matters. IOTC, Online meeting, 28 November - 2 December 2022. p. 14. Available from https://www.iotc.org/documents/WPDCS/18/40.

IOTC Secretariat. 2022a. Preliminary results of the implementation of the FAO matrix approach for the characterization of selected IOTC fisheries. IOTC, Online meeting, 28 November - 2 December 2022. p. 5. Available from https://www.iotc.org/documents/WPDCS/18/16.

IOTC Secretariat. 2023. Updated results on the implementation of the FAO matrix approach for the characterization of selected IOTC fisheries. IOTC, Mumbai, India, 28 November - 2 December 2023. p. 8. Available from https://www.iotc.org/documents/WPDCS/19/23.

IOTC Secretariat. 2024a. Updates on the implementation of the IOTC regional observer scheme and its pilot project. Cape Town, South Africa, 26-30 November 2024. p. 16. Available from https://www.iotc.org/documents/WPDCS/20/20.

IOTC Secretariat. 2024b. TCAC Chairs draft proposal for an Allocation Regime v7 - TC & Annotated. Bangkok, Thailand. Available from https://iotc.org/documents/TCAC/13/REF01E [accessed 26 August 2024].

IOTC Secretariat, Wu, R.-F., Zhu, J., Nishida, T., Bonhommeau, S., Kitakado, T., and Hoyle, S. 2022. Preliminary analysis of the variability in the length-weight relationship of Indian Ocean albacore. IOTC, Online meeting, 25-29 July 2022. p. 21. Available from https://www.iotc.org/documents/WPTmT/802/06.

Kelleher, K. 2005. Discards in the world's marine fisheries. An update. FAO, Rome, Italy. Available from http://www.fao.org/3/y5936e/y5936e00.htm.

Khorshidi, S. 2023. Iran's measures to improve catch and effort data in 2022. IOTC, Mumbai, India, 28 November - 02 December 2023. Available from https://www.iotc.org/documents/WPDCS/19/19.

Miller, K.I., Nadheeh, I., Jauharee, A.R., Anderson, R.C., and Adam, M.S. 2017. Bycatch in the Maldivian pole-and-line tuna fishery. PLOS ONE **12**(5): e0177391. doi:10.1371/journal.pone.0177391.

Moreno, G., and Herrera, M. 2013. Estimation of fishing capacity by tuna fishing fleets in the Indian Ocean. IOTC, Busan, Rep. of Korea, 2-6 December 2013. p. 77. Available from https://www.iotc.org/documents/estimation-fishing-capacity-tuna-fishing-fleets-indian-ocean.

Moreno, G., Herrera, M., and Pierre, L. 2012. DRAFT: Pilot project to improve data collection for tuna, sharks and billfish from artisanal fisheries in the Indian Ocean. Part II: Revision of catch statistics for India, Indonesia and Sri Lanka (1950-2011). Assignment of species and gears to the total catch and issues on data quality.

Murua, H., Eveson, J.P., and Marsac, F. 2015. The Indian Ocean Tuna Tagging Programme: Building better science for more sustainability. Fisheries Research **163**: 1–6. doi:10.1016/j.fishres.2014.07.001.

Nieblas, A.-E., Bernard, S., Reunion, B.G.F., Brisset, B., Bury, M., Chanut, J., Chevrier, T., Coelho, R., Colas, Y., Evano, H., Faure, C., Hervé, G., Kerzerho, V., Nithard, A., Newton, R., Newton, T., Rouyer, T., Tracey, S., Worthington, J., and Bonhommeau, S. 2023. Findings from 101 satellite tags deployed on Indian Ocean billfish during the FLOPPED project. IOTC, La Réunion, France, 06-09 September 2023.

p. 13. Available from https://www.iotc.org/sites/default/files/documents/2023/08/IOTC-2023-WPB21-27.pdf.

Pita, C., Villasante, S., and Pascual-Fernández, J.J. 2019. Managing small-scale fisheries under data poor scenarios: Lessons from around the world. ScienceDirect **101**: 154–157. doi:10.1016/j.marpol.2019.02.008.

Rohner, C.A., Bealey, R., Fulanda, B.M., Everett, J.D., Richardson, A.J., and Pierce, S.J. 2021. Movement ecology of black marlin *Istiompax indica* in the Western Indian Ocean. Journal of Fish Biology **99**(3): 1044–1059. doi:10.1111/jfb.14809.

Rohner, C.A., Bealey, R., Fulanda, B.M., and Pierce, S.J. 2020. Movement and habitat use of striped marlin *Kajikia audax* in the Western Indian Ocean. Journal of Fish Biology **97**(5): 1415–1427. doi:10.1111/jfb.14508.

Romanov, E.V. 2016. A preliminary summary of billfish tagging in the Indian Ocean. IOTC, Victoria, Seychelles, 06 -10 September 2016. p. 58. Available from https://www.iotc.org/documents/preliminary-summary-billfish-tagging-indian-ocean.

Rousseau, Y., Watson, R.A., Blanchard, J.L., and Fulton, E.A. 2019. Defining global artisanal fisheries. Marine Policy **108**: 103634. doi:10.1016/j.marpol.2019.103634.

Ruiz, J., Abascal, F., Bach, P., Baez, J.-C., Cauquil, P., Grande, M., Krug, I., Lucas, J., Murua, H., Lourdes Alonso, M.L., and Sabarros, P.S. 2018. Bycatch of the European, and associated flag, purse seine tuna fishery in the Indian Ocean for the period 2008-2017. IOTC, Cape Town, South Africa, 10-17 September 2018. p. 15. Available from https://www.iotc.org/documents/WPEB/14/15.

Sabarros, P., Romanov, E.V., Le Foulgoc, L., Richard, E., Lamoureux, J.-P., and Bach, P. 2013. Commercial catch and discards of pelagic longline fishery of Reunion island based on the self-reporting data collection program. IOTC, La Réunion, France, 12-16 September 2013. p. 29. Available from https://www.iotc.org/documents/commercial-catch-and-discards-pelagic-longline-fishery-reunion-island-based-self-reporting.

Sala, E., and Giakoumi, S. 2018. No-take marine reserves are the most effective protected areas in the ocean. ICES Journal of Marine Science **75**(3): 1166–1168. doi:10.1093/icesjms/fsx059.

Sequeira, A.M.M., O'Toole, M., Keates, T.R., McDonnell, L.H., Braun, C.D., Hoenner, X., Jaine, F.R.A., Jonsen, I.D., Newman, P., Pye, J., Bograd, S.J., Hays, G.C., Hazen, E.L., Holland, M., Tsontos, V.M., Blight, C., Cagnacci, F., Davidson, S.C., Dettki, H., Duarte, C.M., Dunn, D.C., Eguíluz, V.M., Fedak, M., Gleiss, A.C., Hammerschlag, N., Hindell, M.A., Holland, K., Janekovic, I., McKinzie, M.K., Muelbert, M.M.C., Pattiaratchi, C., Rutz, C., Sims, D.W., Simmons, S.E., Townsend, B., Whoriskey, F., Woodward, B., Costa, D.P., Heupel, M.R., McMahon, C.R., Harcourt, R., and Weise, M. 2021. A standardisation framework for bio-logging data to advance ecological research and conservation. Methods in Ecology and Evolution **12**(6): 996–1007. doi:10.1111/2041-210X.13593.

Shahifar, R., Barghani, H.R., Noori, R.D., and Khorshidi, S. 2013. Estimation of bycatch and discard by Iranian fishing vessels (gillnets) In IOTC competence of area in 2012. IOTC, La Réunion, France, 12-16 September 2013. p. 6. Available from https://www.iotc.org/documents/estimation-bycatch-and-discard-iranian-fishing-vessels-gillnets-iotc-area-competence-2012.

Smith, H., and Basurto, X. 2019. Defining small-scale fisheries and examining the role of science in shaping perceptions of who and what counts: A systematic review. Frontiers in Marine Science **6**. Available from https://www.frontiersin.org/articles/10.3389/fmars.2019.00236.

Tolotti, M., Bauer, R., Forget, F., Bach, P., Dagorn, L., and Travassos, P. 2017. Fine-scale vertical movements of oceanic whitetip sharks (*Carcharhinus longimanus*). Fishery Bulletin **115**(3). doi:10.7755/FB.115.3.8s3.

Wang, K., Li, Q., Zhang, C., Xu, B., and Ren, Y. 2025. Enhancing catch-based stock assessment in data-limited fisheries with proxy CPUE indicators in the Yellow Sea. Scientific Reports **15**(1): 11043. doi:10.1038/s41598-025-95092-w.

Appendices

Appendix I: Availability and reporting quality of IOTC datasets for 2024

Tropical Tuna Species

Tab. A1: Retained catches (metric tonnes; t) and availability of the main IOTC datasets by fishery group (purse seine, longline, and all other fisheries) and fleet as reported in 2025 (for reference year 2024) for tropical tunas of the Indian Ocean. B = bigeye tuna; S = skipjack tuna; Y = yellowfin tuna. RC = retained catch; CE = catch and effort; SF = size frequencies. Colour key is given in Table 6

Fishery group	CPC	Fleet	Catch (t)	Species	RC	CE	SF
Purse seine	EU	EUESP	114,839	B,S,Y			
		EUFRA	69,835	B,S,Y			
		EUITA	6,714	B,S,Y			
	IDN		43,602	B,S,Y			
	KEN		6,274	B,S,Y			
	KOR		11,700	B,S,Y			
	MOZ		2,315	B,S,Y			
	MUS		26,756	B,S,Y			
	OMN		11,110	B,S,Y			
	SYC		115,117	B,S,Y			
	TZA		12,607	B,S,Y			
Longline	AUS		67	B,S,Y			
	CHN	CHN	8,813	B,S,Y			
		TWN	20,577	B,S,Y			
	EU	EUESP	66	B,S,Y			
		EUFRA	674	B,Y			
		EUPRT	12	B,Y			
	IDN		7,770	B,S,Y			
	JPN		5,385	B,S,Y			
	KEN		37	B,Y			
	KOR		1,415	B,S,Y			
	LKA		15,649	B,S,Y			
	MUS		4,856	B,S,Y			
	MYS		1,170	B,Y			
	OMN		1,067	B,S,Y			
	SYC		10,657	B,Y			
	TZA		110	B,S,Y			
	ZAF		663	B,Y			
Other	AUS		2	S,Y			
	BGD		113	S			
	COM		12,300	B,S,Y			

Fishery group	CPC	Fleet	Catch (t)	Species	RC	CE	SF
	EU	EUFRA	333	B,S,Y			
	GBR		1	S,Y			
	IDN		165,810	B,S,Y			
	IND		60,530	B,S,Y			
	IRN		113,779	B,S,Y			
	KEN		686	B,S,Y			
	LKA		68,685	B,S,Y			
	MDG		458	B,S,Y			
	MDV		107,042	B,S,Y			
	MOZ		843	S			
	MYS		167	S			
	OMN		86,257	S,Y			
	PAK		9,127	S,Y			
	SOM		20,165	B,S,Y			
	SYC		429	B,Y			
	THA		6,044	S,Y			
	TZA		3,648	B,S,Y			
	YEM		35,831	Y			

Temperate Tuna Species

Tab. A2: Retained catches (metric tonnes; t) and data reporting quality of the main IOTC datasets by fishery group and fleet as reported in 2025 (for reference year 2024) for temperate tunas of the Indian Ocean. A = albacore; S = southern bluefin tuna. RC = retained catch; CE = catch and effort; SF = size frequencies. Colour key is given in Table 6

Fishery group	CPC	Fleet	Catch (t)	Species	RC	CE	SF
Purse seine	AUS		4,237	S			
	EU	EUESP	118	A			
		EUFRA	26	A			
		EUITA	2	A			
	MUS		32	A			
	SYC		46	A			
Longline	AUS		134	A,S			
	CHN	CHN	6,381	A			
		TWN	19,880	A,S			
	EU	EUESP	3	A			
		EUFRA	337	A			
	IDN		2,855	A,S			
	JPN		4,038	A,S			
	KOR		282	A,S			
	LKA		37	A			
	MUS		651	A			
	MYS		2,234	A			
	OMN		14	A			
	SYC		302	A			
	TZA		66	A			
	ZAF		156	A,S			
Other	AUS		19	A,S			
	COM		93	A			
	EU	EUFRA	102	A			
	IDN		3,291	A,S			
	LKA		768	A			
	MDG		456	A			
	MOZ		90	A			

Billfish Species

Tab. A3: Retained catches (metric tonnes; t) and data reporting quality of the main IOTC datasets by fishery group and fleet as reported in 2025 (for reference year 2024) for billfish species of the Indian Ocean. F = Indo-Pacific sailfish; M = marlins; P = shortbill spearfish; S = swordfish. RC = retained catch; CE = catch and effort; SF = size frequencies. Colour key is given in Table 6

Fishery group	CPC	Fleet	Catch (t)	Species	RC	CE	SF
Purse seine	EU	EUESP	21	M			
		EUFRA	34	F,M,P			
		EUITA	1	F,M			
	IDN		442	F,M,S			
	KEN		4	M			
	SYC		32	M,S			
Longline	AUS		122	M,P,S			
	CHN	CHN	2,222	F,M,P,S			
		TWN	4,348	F,M,P,S			
	EU	EUESP	4,115	F,M,P,S			
		EUFRA	1,139	F,M,P,S			
		EUPRT	853	F,M,S			
	IDN		2,322	F,M,P,S			
	JPN		479	F,M,S			
	KEN		135	F,M,S			
	KOR		92	F,M,S			
	LKA		2,202	F,M,S			
	MUS		317	F,M,S			
	MYS		205	F,M,P,S			
	OMN		106	F,M,S			
	SYC		934	F,M,P,S			
	TZA		29	F,M,S			
	ZAF		390	F,M,P,S			
Other	BGD		2,170	F,M,S			
	COM		4,485	F,M,P,S			
	EU	EUFRA	270	F,M,P,S			
	IDN		19,119	F,M,P,S			
	IND		11,073	F,S			
	IRN		28,549	F,M,P,S			
	KEN		400	F,M,S			
	LKA		9,543	F,M,P,S			
	MDG		79	S			
	MOZ		128	F,M			
	MYS		397	F,S			
	OMN		2,003	F,M,S			
	PAK		4,438	F,M			
	SYC		28	F,M,P,S			
	THA		233	F			
	TZA		414	F,S			

Neritic Species

Tab. A4: Retained catches (metric tonnes; t) and data reporting quality of the main IOTC datasets by fishery group and fleet as reported in 2025 (for reference year 2024) for neritic tunas and seerfish of the Indian Ocean. B = bullet tuna; C = narrow-barred Spanish mackerel; F = frigate tuna; G = Indo-Pacific king mackerel; K = kawakawa; L = longtail tuna; X = seerfish. RC = retained catch; CE = catch and effort; SF = size frequency. Colour key is given in Table 6

Fishery group	CPC	Fleet	Catch (t)	Species	RC	CE	SF
Purse seine	EU	EUESP	641	F,X			
		EUFRA	1,061	F,K,X			
		EUITA	44	F,K,X			
	IDN		16,927	B,C,F,G,K,L,X			
	KEN		38	F,X			
	MOZ		90	F			
	MUS		312	F,X			
	SYC		1,202	F,X			
	TZA		353	F			
Longline	CHN	CHN	79	K,X			
	EU	EUESP	3	X			
		EUFRA	4	X			
	IDN		276	B,C,F,G,K,L,X			
	LKA		22	F,K,L,X			
Other	AUS		197	C,K,L,X			
	BGD		8,478	B,C,F,G,K,L			
	COM		349	F,G,K,L,X			
	EU	EUFRA	19	C,K,X			
	GBR		5	K,X			
	IDN		249,124	B,C,F,G,K,L,X			
	IND		121,405	B,C,F,G,K,L,X			
	IRN		150,087	C,F,G,K,L,X			
	KEN		2,109	B,C,F,K			
	LKA		12,607	B,C,F,G,K,L,X			
	MDG		4,012	B,C,F,G,K,X			
	MDV		110	F,K,X			
	MOZ		6,976	B,C,K,X			
	MYS		24,451	B,C,F,G,K,L,X			
	OMN		45,476	C,F,K,L			
	PAK		26,369	B,C,F,K,L			
	SOM		6,960	K,L			
	SYC		24	K			
	THA		31,554	B,C,F,G,K,L			
	TZA		4,293	B,F,K,L,X			

Main Shark Species

Tab. A5: Retained catches (metric tonnes; t) and data reporting quality of the main IOTC datasets by fishery group and fleet as reported in 2025 (for reference year 2024) for the most commonly caught sharks of the Indian Ocean. H = hammerhead sharks; L = blue shark; M = mako sharks; O = other sharks; P = pelagic thresher; S = silky shark; W = oceanic whitetip shark. RC = retained catch; CE = catch and effort; SF = size frequencies. Colour key is given in Table 6

Fishery group	CPC	Fleet	Catch (t)	Species	RC	CE	SF
Purse seine	EU	EUFRA	1	S			
	IDN		15	L,M			
	SYC		16	S,W			
	TZA		1	S			
Longline	CHN	CHN	1	L			
		TWN	3,070	L,S			
	EU	EUESP	4,285	L,M			
		EUFRA	6	L,M			
		EUPRT	939	L,M			
	IDN		785	H,L,M,S			
	JPN		200	L,M			
	KEN		43	L,M,S			
	LKA		237	L,M,O,S			
	MUS		4	L			
	SYC		295	L,O,S			
	ZAF		59	L,M			
Other	AUS		2	O			
	COM		82	L,O,S,W			
	EU	EUFRA	5	L,M			
	IDN		747	H,L,M,O,S,W			
	IRN		1,309	H,M,O,S,W			
	KEN		14	L,M,S			
	LKA		929	H,L,M,O,S			
	MDG		1,305	L,M,O,S,W			
	MOZ		6,022	H,O,W			
	MYS		126	O			
	PAK		943	M,O,P,S			
	SYC		67	H,L,O			
	TZA		43	S			

Appendix II: Data issues and proposed actions

Tab. A6: Main data issues identified by the WPDCS and actions proposed to address them. RC = retained catch; CE = catch and effort; SF = size frequencies; ROS = Regional Observer Scheme

Dataset	CPCs	Fisheries	Main issues	Proposed actions
RC	Comoros	Coastal fisheries	Lack of information on data collection and processing systems in place. Some high interannual variability in catch	In-country mission to assess the status of the systems. Potential inclusion as case-study for application of artfishR methodology
	India		Catches reported for various regions by fisheries, rather than aggregated by main IOTC areas. Catches for shark not available at species level	Follow-up of in-country visit to India in October 2025
	Indonesia	Coastal, longline, and surface fisheries	Potential issues in sampling representativeness and species identification; lack of data and information reported for elasmobranch species	Review by the WPDCS of the methodology developed to estimate catches of pelagic sharks. Assess current data collection and processing systems for elasmobranch species
	Kenya	Coastal fisheries, purse seine, and longline fisheries	Lack of consistency in historical catches	Liaise with Kenya to assist with data mining and potential re-estimation of historical catch time series
	Madagascar	Coastal and longline fisheries	Some issues to fully estimate catches of the small-scale fisheries, and the sampling program started at the end of 2024. Important gaps in data collection coverage and processing systems	Follow-up of mission conducted in 2025. Case study for reviewing current data sampling design, enhancing FAO OpenArtFish tool, and implementation of artfishR for data processing
	Pakistan	Drifting gillnet fishery	Additional validation of latest revised catch series	Liaise with Pakistan in terms of support for data appraisal

Dataset	CPCs	Fisheries	Main issues	Proposed actions
	Somalia	Coastal fisheries	Retained catch data reported for the first time for 2024. No historical time series	Support to national initiatives (e.g., Fisheries Data Collection Working Group) for the validation of databases and data collection programmes
	Yemen	Handline fishery	Aggregated retained catch as information on fishing activities	Continue liaising with Yemen to improve data reporting and potentially revise historical catches
CE	All	Most fisheries	Data either not submitted, or fall short of IOTC reporting requirements	Improvement of guidelines and workshop and bilateral meetings on reporting obligations
		Coastal fisheries	Failure to report catches and effort per month for their coastal fisheries for some CPCs	As a minimum, request CPCs to report catches and fishing by species, gear, and month, in addition to the total numbers of fishing craft operated by gear, and month (or year)
	Oman	Longline fisheries	Data either not submitted, or fall short of the IOTC data reporting requirements	Oman discussed the short falls in their data with the Secretariat in a webdinar and is expecting to present update of the revision of the data and statistical system
	Indonesia	Coastal, longline and surface fisheries	Low logbook coverage in longline and surface fisheries; potential issues of species identification for neritic tunas; lack of information on anchored FADs	Strengthen management and validation of logbook data – particularly issues of low reporting rates of submitted logbooks (<10% in recent years)
	Oman	Handline and gillnet fisheries	Data not complete or not submitted by IOTC standards	The Secretariat to liaise with Oman on how to improve the reporting following the review of the Omani statistical system
	Pakistan	Drifting gillnet fishery	Data not submitted	Liaise with Pakistan for in-country mission to assess data collection and reporting systems in place, assess the current status and data collected through the self-reporting programme, and support data reporting in accordance with IOTC standards
	Madagascar	Coastal fisheries	Issues with data collection, inconsistency and not fully covering all areas	Follow-up of mission conducted in 2025. Case study for reviewing current data sampling design, enhancing FAO OpenArtFish tool, and implementation of artfishR for data processing

Dataset	CPCs	Fisheries	Main issues	Proposed actions
DA	Kenya, Tanzania, Oman, Mauritius	Purse seine fisheries	DFAD-related data generally incomplete and not by standards	Organise a specific workshop on data reporting obligations for purse seine fisheries
SF	India, Indonesia, Malaysia, Oman, Yemen	Coastal fisheries	No or very few size frequency data reported	Data supporting missions, reporting workshop, and pilot regional sampling programme
	I.R. Iran	Drifting gillnet fishery	Historical data not by IOTC standards	The IOTC Secretariat to continue providing assistance to I.R. Iran to submit size data by fishing ground and fisheries (rather than landing site) based on port sampling as logbooks are currently being fully implemented on a limited number of vessels
	China, Japan, Seychelles, Taiwan,China	Longline fisheries	Historical issues in sampling and inconsistencies between average weights derived from logbooks and size data	Follow-up of consultancy conducted in 2025 in collaboration with Seychelles to assess the quality of size data and implement quality control procedures at the source to enhance data quality
	Pakistan	Drifting gillnet fishery	No or very few size-frequency data reported	IOTC Secretariat liaising with Pakistan in terms of possible assistance for data entry, processing, and submission
ROS	All	Longline and surface fisheries	Low levels of implementation and reporting for some fleets	Organise ROS training and data reporting workshops to assist CPCs with implementation of the ROS data collection and reporting requirements
			Information reported in formats not suitable for data extraction	Enhance ROS forms description and develop online ROS data validators. Assess feasibility to re-export historical observer data following new ROS reporting forms
		Coastal fisheries	Low levels of implementation and reporting	Extend of EMS pilot project to other countries besides Sri Lanka; Strengthen data collection mechanisms at landing sites (in-port observers, alternative data collection mechanisms)
	Sri Lanka	Coastal and offshore fisheries	Partial implementation of ROS requirements	IOTC Secretariat to continue supporting the adoption of the ROS standards and tools; possible follow-up on EMS trial projects dependent on funding. Follow-up on the pilot study of EMS in Sri Lanka for coastal fisheries
Socio-Economics	All	All	Limited data available, and collated within the IOTC database	The Secretariat to work closely with CPCs, in formulating the format for collecting socio-economic data. Furthermore, liaise with FAO and other institutes to access open repositories of fish sale price, import and export data, and national indicators. Encourage CPCs to report information of fish prices with Form 7PR

Appendix III: Status of IOTC fishing vessels

The number of vessels targeting IOTC species in the IOTC Area of Competence is used to:

- derive input-fishing capacity in the Indian Ocean (Moreno and Herrera 2013);
- estimate the catches of fleets that operate under the flags of countries that do not report data to the IOTC;
- assess the completeness of the catches reported by IOTC CPCs and completing those catches when the fleets concerned are not fully monitored by their flag countries.

NEI Category: Numbers of Vessels

The number of vessels operating under the flags of countries that do not report their catches to the IOTC are estimated from data reported by other countries. Those data include:

- IOTC IUU list (IOTC Resolution 11/03);
- identification, dimensions, and other attributes, by vessel, for those foreign vessels that owed fishing licenses to operate within the Economic Exclusive Zone (EEZ) of the reporting country (as specified in IOTC Resolution 14/05);
- identification and total catches unloaded, by species and vessel, for those foreign vessels using ports in the territory of the reporting country (as specified in IOTC Resolution 16/11 & 05/03);
- identification and total catches transshipped, by species and vessel, for vessels participating in the IOTC Transhipment Programme (as specified in IOTC Resolution 17/06);
- data provided by other parties, including data on the imports of tuna for canning, by species and vessel, from processors cooperating with the International Seafood Sustainability Foundation (ISSF) or other initiatives.

The catches for those fleets are estimated by using the estimated vessel numbers (obtained as above) and the catch data for vessels from other (reporting) fleets that operated in the same areas and targeted the same species (i.e., proxy fleets). The catches of this component are recorded under the NEI category.

Partially Reported Fleets

In addition, the Secretariat estimates catches for countries that report only partial statistics for their fleets, i.e., catches of fleets of IOTC CPCs that are not fully monitored by their flag states. The catches reported by these countries are assumed incomplete because the average catches estimated by vessel by year are significantly lower than those estimated for similar fleets of other countries, on the assumption that both fleets have the same levels of activity.

This applies to the following fleets:

- longline fleet of India: up to 100 longliners have been operating in Indian waters in recent years, including fresh-tuna longliners and deep-freezing longliners;

- longline fleets of Indonesia: Indonesia does not monitor the catches of vessels under its flag that are unloaded in ports outside its territory;

and additional catches estimated for these CPCs are also included into the NEI category.

Appendix IV: Review of fishing statistics database

Overview of IOTC Fishing Craft Statistics

Knowledge of the number of fishing vessels operating in a fishing zone is crucial, as fishing capacity is a major effort variable in stock assessment, particularly when assessments must be conducted with limited fisheries data (Wang et al. 2025). Vessel information repositories for large-scale industrial fleets, or for vessels operating on the high seas, are well established within the IOTC through the Registered Authorized Vessels (RAV) list and the Active Vessel List (AVL), both of which are closely monitored by the Secretariat's Compliance Section. However, the main concern lies with small-scale vessels, which typically do not target tuna species. Maintaining accurate records on the number and type of fishing vessels is essential for coastal nations that depend heavily on fisheries, yet many countries still lack reliable information on their overall fishing capacity. Surveys of small-scale vessels are usually conducted through boat frame surveys, carried out every five years or less. In recent years, several countries have introduced vessel registries in an effort to better understand and monitor their fishing capacity.

Discussions during the 28th Session of the Indian Ocean Tuna Commission (IOTC) in 2024 highlighted the importance of fishing craft statistics, particularly for small-scale vessels that are not listed in any existing vessel repositories. Although Resolution 15/02 has not yet been amended to make the reporting of fishing craft statistics mandatory, the quality of information submitted has improved, with more CPCs providing data. The push toward mandatory reporting of fishing craft statistics aligns with the requirements set out in UNFSA Annex 1, which specifies that States should collect vessel data to standardize fleet composition and assess overall fishing power.

The reporting guidelines developed by the Secretariat include detailed instructions on how to report fishing craft statistics using Form 2FC and the associated 2FC- form template. The form and its description are aligned with the updated fishery definitions, which incorporate vessel characteristics, operating areas, fishing purpose, and target species, with the objective of improving the description of different fishery types.

Small-scale fisheries are particularly complex, and IOTC species are not usually the primary target of these coastal fleets. Discussions during data-reporting workshops, as well as findings from the FAO survey on small-scale fisheries, highlight the diversity and variability of coastal fisheries along the Indian Ocean coastline. Key characteristics include:

(i) many small-scale fisheries are multispecies rather than targeting a single species;
(ii) the same vessels may target different species depending on the season;
(iii) vessels may use multiple gear types during the same trip; and
(iv) depending on economic and environmental conditions, some vessels may operate both within national jurisdictional areas (NJA) and in areas beyond national jurisdiction (ABNJ).

Given this complexity, it is not feasible to establish an exhaustive list of fisheries. Instead, the reporting framework allows for generalised groupings to reduce duplication in vessel counts, particularly considering the multipurpose nature of many small-scale fleets.

Fishing craft information was received from 22 CPCs, with most coastal States providing detailed numbers of vessels by fishery. Several CPCs reported multipurpose coastal fisheries using FAO vessel classifications, such as MO (multipurpose vessels), GO (gillnetters), and LO (line vessels). While these vessel categories are appropriate for reporting fishing craft statistics, catch data should continue to be reported under the corresponding combined fisheries, and disaggregated by individual fishery as required.

Tab. A7: Number of CPCs reporting fishing craft statistics by fishery category

CPC code	Fleet code	Baitboat	Gillnet	Line	Longline	Other	Purse seine
ARE*							
AUS		1		31	10		5
BGD			25,210	95		2,662	
BHR*							
CHN	**CHN**				74		

CPC code	Fleet code	Baitboat	Gillnet	Line	Longline	Other	Purse seine
	TWN				198		
COM				5,078			
DJI*							
EGY*							
ERI							
EU	EUESP				17		13
	EUFRA						11
	EUITA						
	EUMYT			62			
	EUPRT				3		
	EUREU			145	21		
GBR				9			
IDN		2,023	70,492	62,943	356	15,161	9,095
IND							
IRN			5,649	1,771			
JOR*							
JPN					37		
KEN			235	306	3		360
KOR					4		2
KWT*							
LKA		55	1,450	5,261	1,100	44,067	2,318
MDG					5		
MDV							
MMR*							
MOZ			1,567	201		34,354	
MUS					16		3
MYS			9,677	140	15	2,529	225
OMN				5	6	4,525	3
PAK			850				
QAT*							
SAU*							
SDN							
SOM							
SYC							
THA				1			216
TMP*							
TZA					1		1
YEM							
ZAF		1			20		

In many cases, the fishing craft data reported by CPCs must be verified against the list of active vessels for certain fleets. When information is missing or incomplete, data from the Active Vessel List (AVL) or the Registered Authorized Vessels (RAV) are used to complement and complete the vessel statistics for industrial fishery. Supplementary information on the number of fishing boats from coastal States is also provided in the National Reports (NRs) submitted annually to the Scientific Committee.

To complete the time series, fishing craft statistics for Bangladesh, Oman, Tanzania, Pakistan, and Mozambique were sourced from their NRs. While these countries provided statistics for 2024, data for earlier years were not available to the Secretariat either because the NR was not submitted or because vessel statistics were not included. Moreover, the information contained in the NRs is often aggregated, lacking size categories or disaggregation by individual fishery.

Most coastal States derive their vessel numbers from boat frame surveys, which are not conducted annually. Consequently, in countries without a frequently updated vessel registry, the number of fishing boats often remains unchanged for several consecutive years in the dataset.

Recent trends show that the number of coastal fishing vessels fluctuated, with lower totals reported for 2022 and 2024. This decline largely reflects changes in Indonesia's fishing craft structure, particularly reductions in the number of small gillnet and line vessels that historically comprise a large share of their coastal boat fleet. In contrast to trends in artisanal fisheries, the number of industrial vessels has continued to increase in recent years (**Fig. 14**).

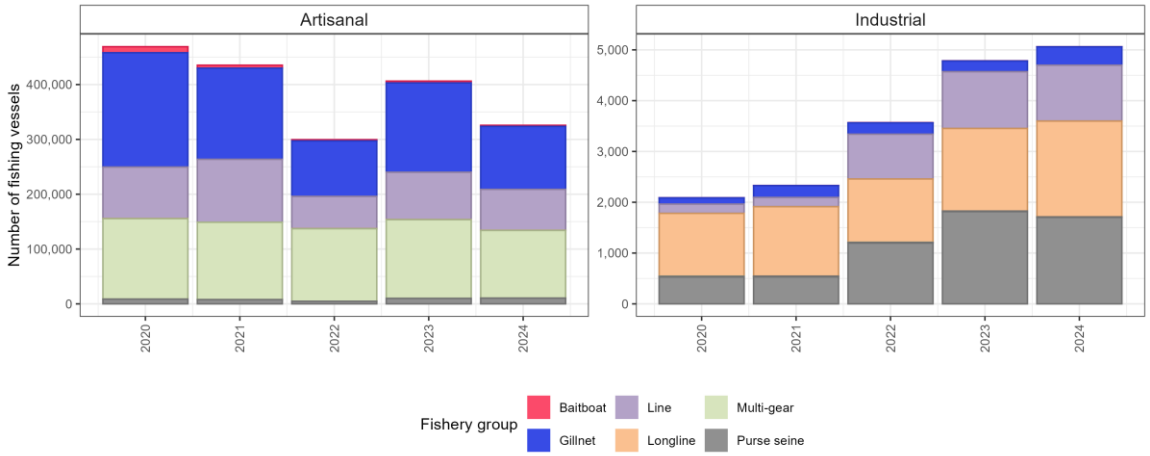

Fig. 14. Recent years (2020-2024) trend in number of operated vessel by fishery category and fishing group

The classification of fishing vessels is broadly divided into industrial and artisanal categories; however, several intermediate classifications exist based on combinations of vessel characteristics such as size, operating area, and primary fishing purpose. Some vessels typically associated with coastal fisheries, particularly line and gillnet vessels, are listed as industrial due to their technical specifications or operational behaviour. Within the IOTC region, vessels operating outside national jurisdiction areas (NJA) are generally classified as industrial or medium-scale fisheries, regardless of gear type or size.

The number of medium-scale vessels has increased in recent years, largely due to the growing fleet of line-operated vessels from Sri Lanka (**Fig. 15**). Trends in the size classes of artisanal fishing vessels, based on length overall (LOA), illustrate the diversity of coastal fleets over time. Mechanized inboard vessels show a wide range of sizes, whereas non-mechanized vessels are predominantly less than 5 metres LOA (**Fig. 15**). Although vessel numbers by gross tonnage (GT) vary across years, the vast majority of boats fall within the <50 GT category (**Fig. 16**).

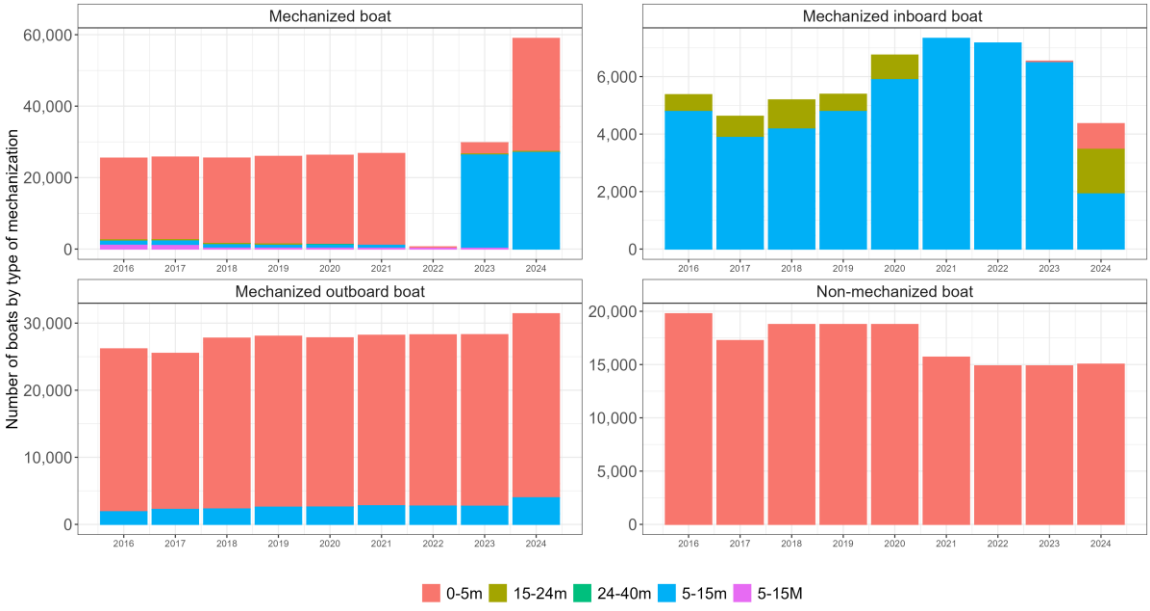

Fig. 15. Number of vessels by fishery group type and size category, reported in length overall (LOA; m), for the artisanal fisheries

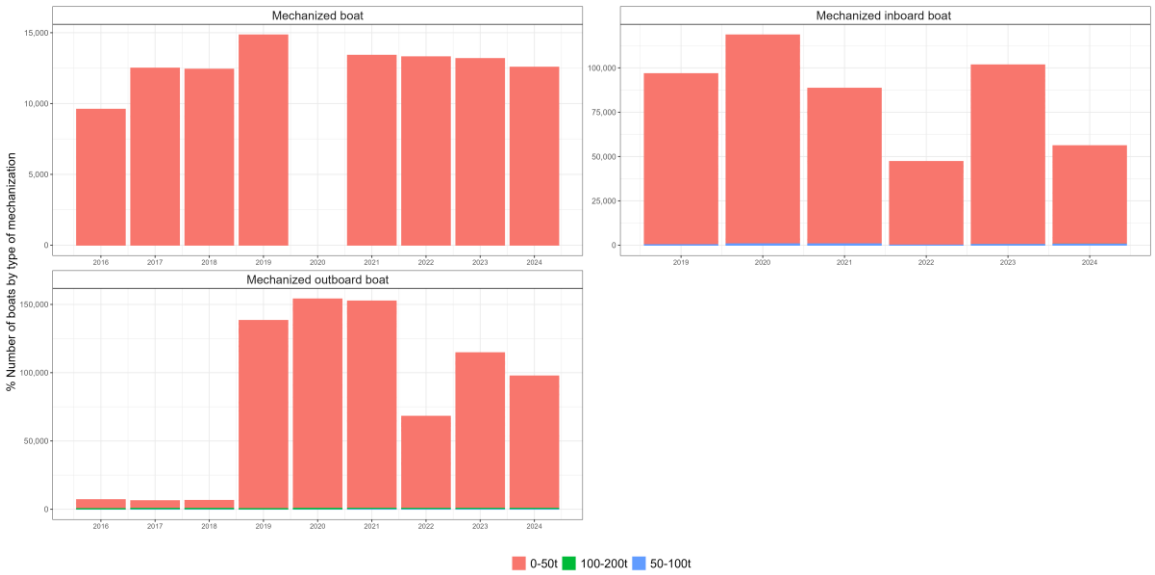

Fig. 16. Number of vessels by fishery group type and size category, reported in gross tonnage (GT or GRT) for the artisanal fisheries