REVIEW OF THE STATISTICS FOR INDIAN OCEAN TROPICAL TUNA FISHERIES, 1950-2024

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Introduction

Tropical tuna species are highly migratory and are found across all oceans, where they are harvested at various levels worldwide. The Law of the Sea recognizes that migratory species do not adhere to national jurisdiction boundaries, a fact that has been confirmed by global tuna tagging studies (Fonteneau & Hallier 2015). Catch trends show a continuous increase in global tropical tuna harvests, with a peak of around 6 million tonnes in 2024. The Western and Central Pacific Ocean has been the primary region for tropical tuna catches, showing steady growth since the early years and contributing approximately 48% of the global catch (**Fig. 1**). The Indian Ocean ranks as the second largest contributor, accounting for 17% of the total.

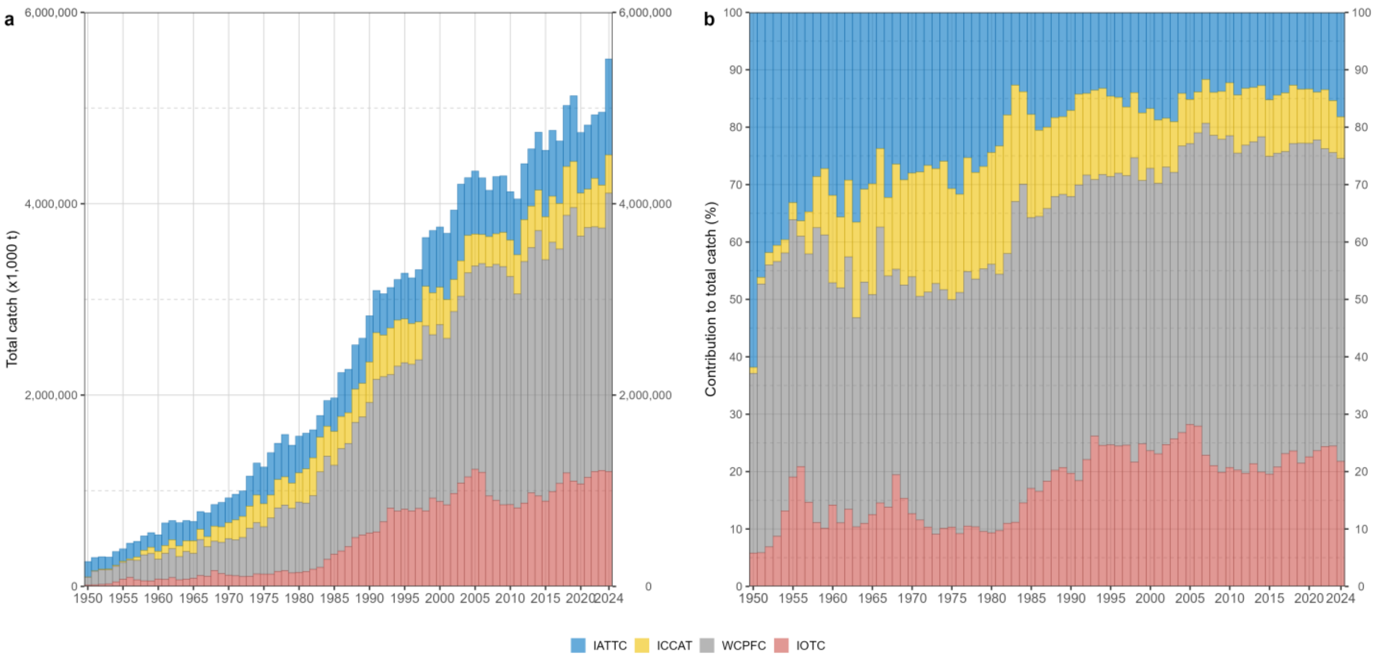

Figure 1: Annual time series of cumulative retained catches (metric tonnes; t) of tropical tunas by ocean basin for the period 1950-2024. Source: Global Tuna Atlas

The primary objective of this paper is to provide participants of the 28th Session of the Data Preparatory Meeting of the IOTC Working Party on Tropical Tunas (WPTT28(DP)) with updated information on Indian Ocean tropical tunas and their associated fisheries since the last Assessment Meeting held in October 2025 (WPTT27).

This document presents an overview of the datasets available in the IOTC Secretariat databases for bigeye tuna (Thunnus obesus), skipjack tuna (Katsuwonus pelamis), and yellowfin tuna (Thunnus albacares) as of 12 May 2026, with particular emphasis on data from the 2024 statistical year.

Materials & Methods

The Secretariat continuously updates the reference materials provided to CPCs to support reporting in accordance with IOTC requirements. These materials include reporting guidelines outlining best practices for dataset submission, the IOTC Reference Data Catalogue, and standardized reporting forms. All documents are regularly revised to incorporate improvements and to ensure alignment with the quality and scope of information derived from CPC fishery activities.

Recently, the reporting guidelines have been expanded to include procedures for submitting data under the Regional Observer Scheme (ROS). In addition, the Secretariat is developing validation tools for datasets related to interactions with drifting floating objects (DFOB). The objectives of these developments are to: (i) ensure that all reference codes are consistent with those in the reference catalogue; (ii) improve consistency across data fields; and (iii) standardize reporting formats.

Methods

The release in the public-domain of the IOTC curated data sets for tropical tunas, as per the confidentiality rules set in IOTC Res. 12/02, is done following some processing data steps which are briefly summarized below.

Data processing

The Secretariat has recently developed tools that enable CPCs to conduct preliminary checks on their data prior to submission, ensuring the accuracy of reference codes and the completeness of datasets. Upon receipt of submissions, the Secretariat performs additional control checks, as outlined below.

First, standard controls are carried out to verify that both metadata and submitted data are consistent and include all mandatory fields (e.g., stratification dimensions). These checks are dataset-specific and may require CPCs to resubmit revised data if the initial submissions are found to be incomplete or inconsistent.

Second, a series of processing steps is applied to derive the best scientific estimates of retained catches for the 16 IOTC species (see **Appendix V** of IOTC (2014)), by implementing the following rules:

a. When retained catches are not reported by a CPC, catch data from the previous year may be repeated or catches may be derived from a range of sources, e.g., partial catch and effort data, the FAO global capture production database, data on imports of tropical tunas from processing factories collaborating with the International Seafood Sustainability Foundation, etc.;

b. For certain fisheries with known and significant data quality issues, species and/or gear composition may be re-estimated using data from other years, areas, or proxy fleets. Proxy fleets are defined as fleets operating in the same strata and assumed to have similar catch compositions Moreno et al. (2012) and IOTC Secretariat (2018);

c. Finally, a disaggregation process is applied to allocate catches by species (**Table 1**) and gear (**Table 2**) when these are reported as *aggregated* categories. This process estimates the proportional contribution of each IOTC species and/or gear using data from strata where they are reported separately. When necessary, proxy fleets, proxy gears, and spatial–temporal substitution methods are applied.

Table 1: List of species groups that include one or more tropical tuna species

Species code	Species name	Species scientific name	BET	SKJ	YFT
AG10	Skipjack tuna and kawakawa	*Katsuwonus pelamis; Euthynnus affinis*		✓	
AG35	Yellowfin tuna and skipjack tuna	*Thunnus albacares; Katsuwonus pelamis*		✓	✓
TUN	Tunas nei	*Thunnini*	✓	✓	✓
TUS	True tunas nei	*Thunnus spp*	✓	✓	✓
TUX	Tuna-like fishes nei	*Scombroidei*	✓	✓	✓

Table 2: List of gear aggregates with their component gear codes (limited to gear aggregates that have reported catches of tropical tunas)

Aggr. code	Gear aggregate	Category	BB	GILL	HAND	LIFT	LL	LLCO	PS	PSS	RR	SPOR	TRAW	TROL
BBPS	Baitboat and purse seine	Baitboat	✓						✓					
GIHT	Gillnet and hand line and troll line	Gillnet		✓	✓									✓
HABBTR	Hand line, Pole and line and Troll line	Trolling			✓									
HATR	Hand line and Troll line	Trolling			✓									✓
HOOK	Hook and line	Trolling			✓			✓						✓
LLTR	Coastal Longline and Troll line combination	Longline						✓						✓
UNCL	Unclassified	Other	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Third, and applicable only to the five major IOTC species (albacore, bigeye tuna, skipjack tuna, yellowfin tuna, and swordfish), geo-referenced catches are raised to the best scientific estimates of retained catches using all available information, including expert judgment. This is achieved either by leveraging data from proxy fleets or by applying spatial–temporal substitution schemes when information is unavailable for a given stratum.

For this reason, the resulting raised catch datasets represent the best scientific estimates of geo-referenced catches based on the information available to the Secretariat, while accounting for limitations in data availability and quality across several fisheries. These datasets include estimated catches expressed in both weight and number, stratified by year, month, fleet, gear, school type (when available), and 5°x5° grid, and cover the full time series for which retained catch data are available. Average species weights can be directly derived from the corresponding raised weights and numbers for each stratum; the accuracy of these estimates is directly dependent on the availability and quality of the underlying geo-referenced catch and size-frequency data.

Fourth, and applicable to all 16 IOTC species, as well as the most common shark species defined in the appendices of IOTC IOTC Resolution 15/01, filtering and conversion procedures are applied to size-frequency datasets to harmonize their format and structure, and to remove records that do not comply with IOTC standards. For example, data are excluded when size measurements are reported using bin widths that exceed the maximum values considered biologically meaningful for a given species (IOTC Secretariat 2020a).

The standard length measurements considered at IOTC are the eye-fork length (EFL; straight distance from the orbit of the eye to the fork of the tail) for black and blue marlins and the fork length (FL; straight distance from the tip of the lower jaw to the fork of the tail) for all other species subject to mandatory size measurements (IOTC Secretariat 2020a). All size samples collected using other types of measurements are converted into FL and EFL by using the IOTC equations, considering size range and intervals that may vary with species. If no IOTC-endorsed equations exist to convert from a given length measurement for a species to the standard FL and EFL measurements, the original size data are not disseminated but kept within the IOTC databases for future reference.

Finally, a specific processing protocol is applied to tagging data collected for the three tropical tuna species. This includes filtering potentially erroneous records, correcting for tag loss, and adjusting for the under-reporting of recaptures (IOTC Secretariat 2020b).

Data quality

A scoring system has been implemented to assess the quality of retained catch, catch-and-effort, and size-frequency data available at the Secretariat for all IOTC species. The methodology used to assign scores varies by dataset type and is designed to account for both reporting coverage and compliance with IOTC reporting standards (**Table 3**). In general, lower scores indicate higher data quality.

It should be noted, however, that the scoring system does not account for all sources of uncertainty affecting retained catch estimates, such as under-reporting and misreporting. Furthermore, the assessment is conducted at the reporting level only and does not consider the intrinsic quality of the data collected, including sampling procedures and coverage levels.

Table 3: 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	

Results

Retained catches

Long-term trends (1950-2024)

Tropical tuna species constitute the majority of IOTC catches in the Indian Ocean. Catch trends show a general increase over time, with peak tropical tuna catches reaching approximately 1,225,000 in 2005. Between 2000 and 2024, tropical tunas contributed an average of 62% of the total IOTC catch. In comparison, catches of other species groups remained lower, although neritic species have shown an increasing trend in recent years (**Figure 2**).

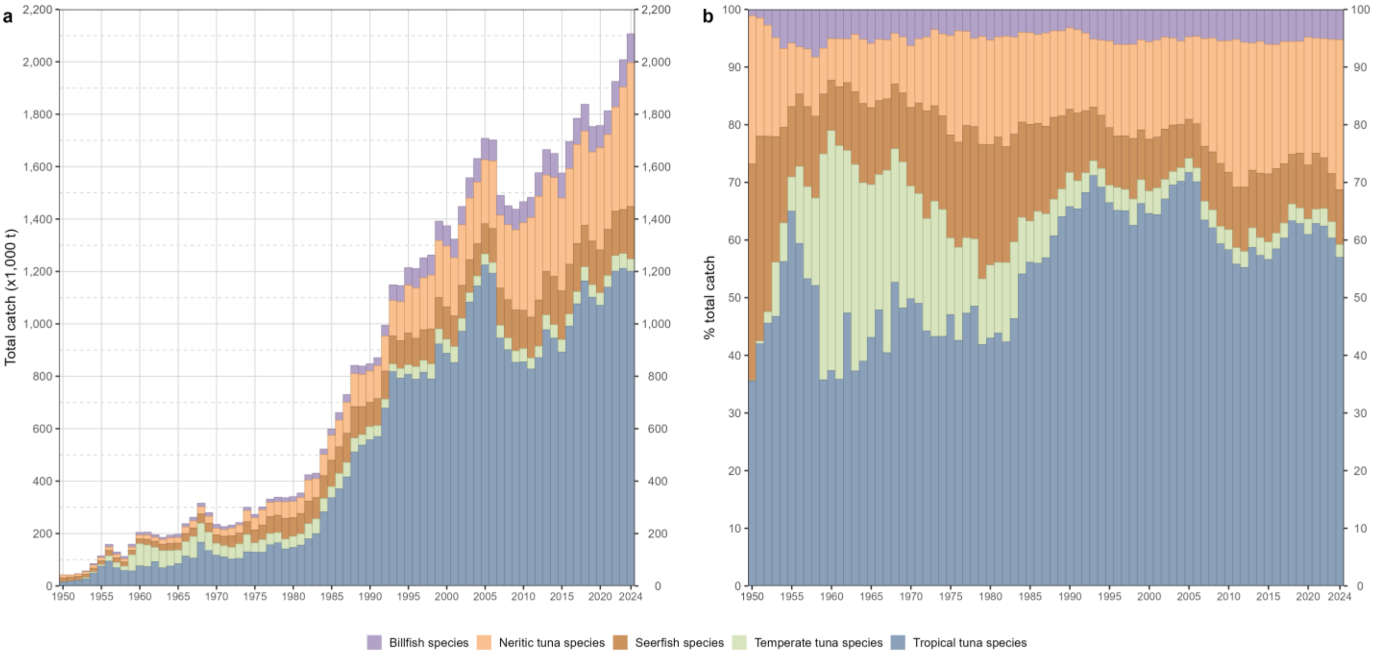

Figure 2: Annual time series of cumulative retained absolute (a) and relative (b) catches (metric tonnes; t) of all IOTC tuna and tuna-like species by species category for the period 1950-2024

Although most tropical tuna catches are derived from industrial fisheries, there have been periods when coastal fisheries accounted for more than 50% of total tropical tuna catches. This occurred in the early 2010s and reflects the relocation of vessels, particularly industrial fleets, from highly productive fishing areas in the western Indian Ocean due to piracy. In recent years, the contribution of industrial and coastal fisheries has stabilized, averaging approximately 58% and 42% of total tropical tuna catches, respectively (**Figure 3**).

Trends in tropical tuna catches have been influenced by a combination of factors, including management and conservation measures, environmental variability, and external events. For example, the decline in catches between 2009 and 2012 corresponds to reduced fishing activity in key areas affected by piracy in the western Indian Ocean (Chassot et al. 2012). Over the last three years, catches have remained relatively stable, following the implementation of management measures aimed at limiting catches and regulating the use of drifting fish aggregating devices (dFADs), particularly for the sustainability of yellowfin tuna stocks (Tidd et al. 2025).

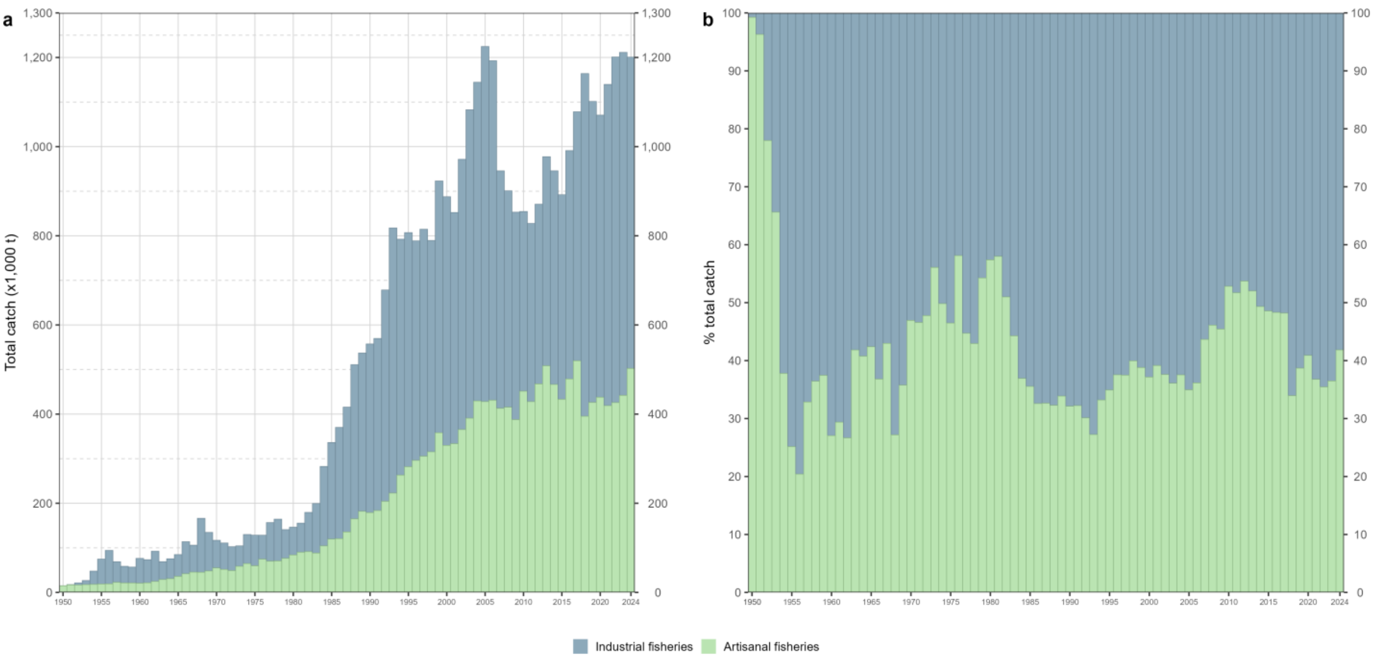

Figure 3: Annual time series of retained catches (metric tonnes; t) of Indian Ocean tropical tuna by fishery type for the period 1950-2024

Catch trends for the three tropical tuna species indicate a continuous increase in skipjack tuna catches, whereas catches of yellowfin and bigeye tuna have remained relatively stable or have shown a slight decline. Since the 2000s, skipjack tuna has accounted for approximately 50% of total tropical tuna catches in the Indian Ocean, reflecting the expansion of purse seine fisheries since the 1990s (**Figure 4**).

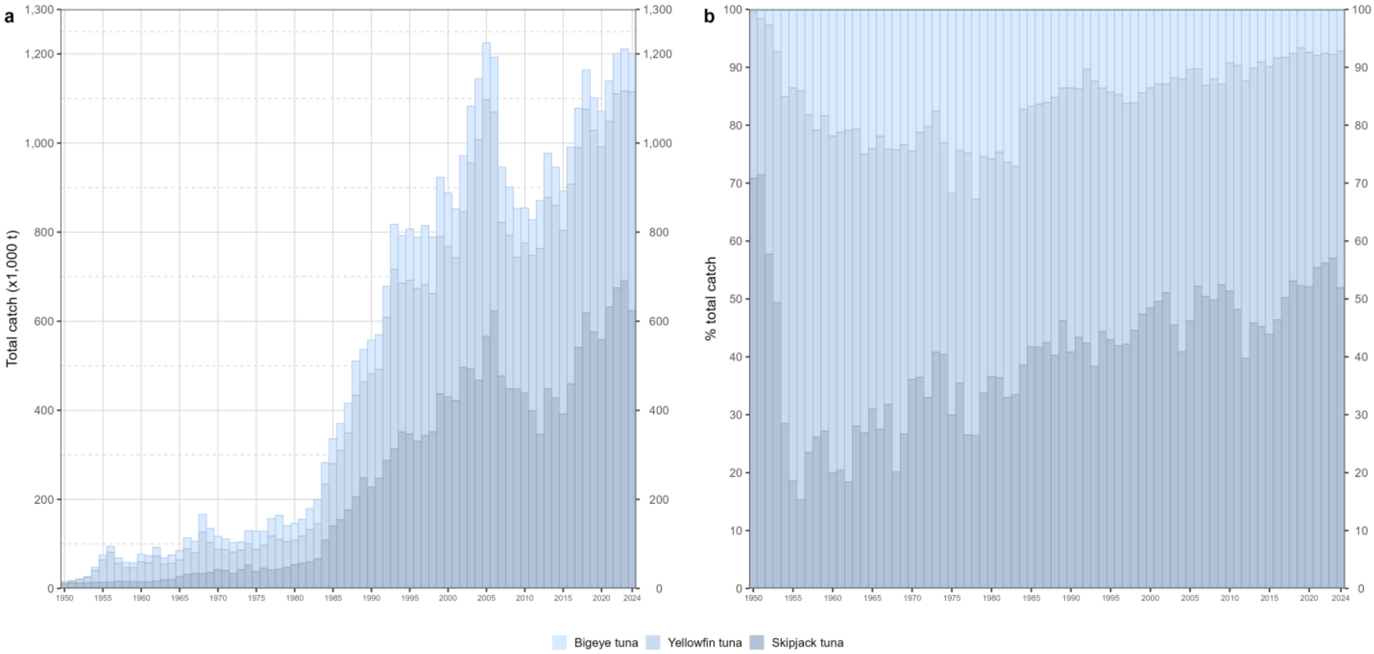

Figure 4: Annual time series of cumulative retained absolute (a) and relative (b) catches (metric tonnes; t) of Indian Ocean tropical tuna by species for the period 1950-2024

In the earlier period, tropical tuna fisheries were dominated by line fisheries, primarily pole-and-line and longline, prior to the development of industrial purse seine fisheries. Before the 1970s, catches of tropical tuna from other fisheries were relatively limited.

From the 1990s onwards, the expansion of purse seine and gillnet fisheries significantly altered the distribution of catches among fisheries, leading to a relative decline in longline contributions. In addition to the rapid development of purse seine fisheries, the number of longline vessels gradually decreased, accompanied by shifts in target species. At the same time, gillnet fisheries underwent notable changes, including modifications in vessel types and fishing practices, allowing operations to extend further offshore, particularly in countries of the north-western Indian Ocean.

The transition of gillnet operations from surface to subsurface configurations not only increased catches of tropical tuna species but also contributed to reducing bycatch of threatened species (Moazzam 2021, Elliott et al. 2024)

In terms of contribution, longline fisheries accounted for approximately 63% of tropical tuna catches prior to the 1990s, after which their contribution declined to an average of around 20%. This decline continued in recent years, with longline catches representing only 7% of total tropical tuna catches in 2024.

In contrast, purse seine fisheries expanded rapidly from the 1990s onwards, becoming the dominant fishing gear and contributing approximately 42% of total catches between 1990 and 2010. This level of contribution has been largely maintained in recent years.

Catches from gillnet and line fisheries have also increased over time, with average contributions of approximately 18% and 16%, respectively, between 2000 and 2024. Pole-and-line fleets, targeting predominantly yellowfin and skipjack tunas (over 90% of catches), have contributed an average of around 12% of total tropical tuna catches in the Indian Ocean (**Figure 5**).

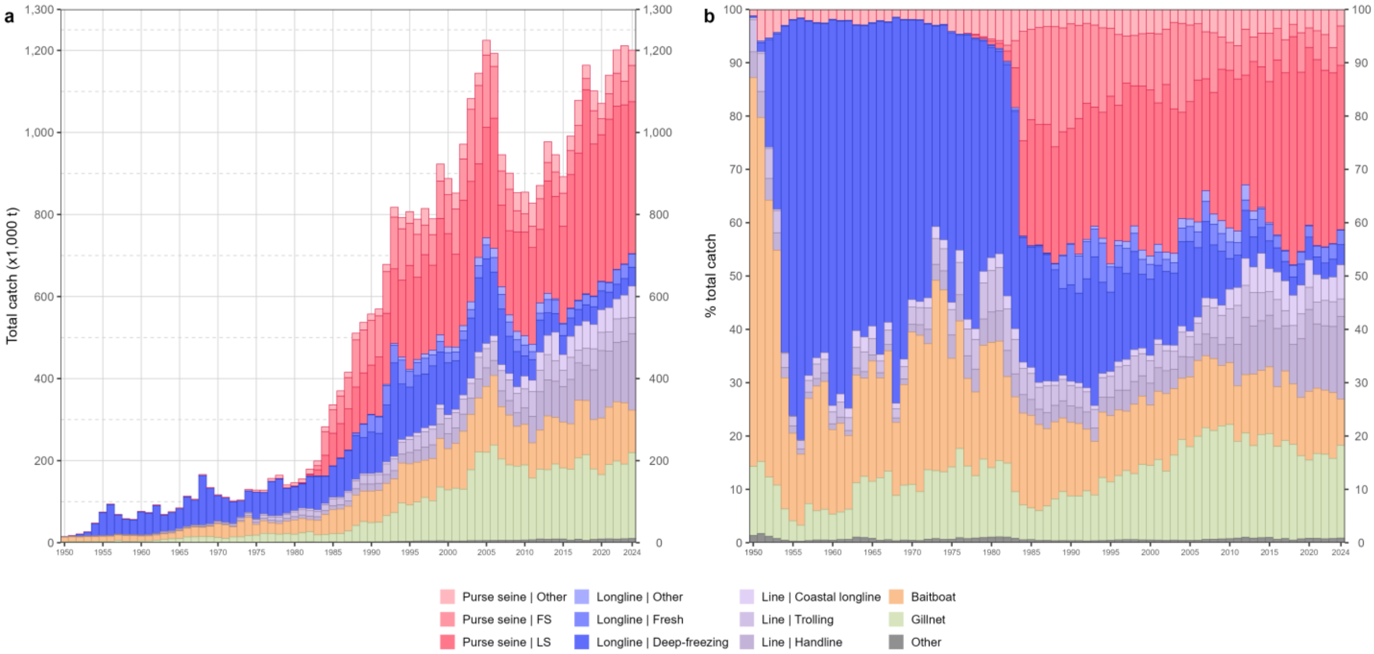

Figure 5: Annual time series of retained catches (metric tonnes; t) of Indian Ocean tropical tuna by fishery for the period 1950-2024

Main fishery features (2020-2024)

Between 2020 and 2024, purse seine fisheries, including large industrial vessels operating on floating objects (FOBs) and free school sets, as well as coastal surrounding nets, dominated tropical tuna catches, as illustrates in **Table 4**, Purse seine fisheries contributed approximately 43% of the total. Line fisheries, comprising handline, trolling, and coastal longline operations, represented the second largest component, accounting for approximately 23% of catches over the same period. This reflects a relative increase in the importance of these fisheries in recent years.In contrast, industrial longline fisheries made the smallest contribution, accounting for approximately 6% of total tropical tuna catches, despite the higher market value often associated with longline-caught tuna (The challenges of purse seine versus longline tuna fishing 2012).

Table 4: Mean annual catches (metric tonnes; t) of Indian Ocean tropical tuna by fishery between 2020 and 2024

Fishery	Fishery code	Catch	Percentage
Purse seine | LS	PSLS	382,046	32.8
Gillnet	GN	183,863	15.8
Line | Handline	LIH	156,607	13.4
Baitboat	BB	135,031	11.6
Purse seine | FS	PSFS	65,530	5.6
Line | Coastal longline	LIC	59,021	5.1
Purse seine | Other	PSOT	52,785	4.5
Line | Trolling	LIT	48,762	4.2
Longline | Deep-freezing	LLD	41,154	3.5
Longline | Fresh	LLF	29,546	2.5
Other	OT	9,399	0.8
Longline | Other	LLO	969	0.1

Catches of tropical tuna species have been reported by most fleets operating in the Indian Ocean, regardless of fishery type. Coastal fleets employing a variety of fishing gears contribute substantially to total tropical tuna catches. During the period 2020–2024, Indonesia accounted for approximately 18% of total tropical tuna catches across multiple fisheries, with the majority originating from purse seine operations (both industrial and coastal). Among industrial fleets, the EU-Spain and Seychelles were the leading contributors, accounting for approximately 12% and 11% of total catches, respectively. The Maldives, characterized by its pole-and-line fishery, contributed around 12% of total tropical tuna catches over the same period. Notably, Iran operates the principal gillnet fishery targeting tropical tunas in the region, contributed approximately 10%, (**Fig. 6**).

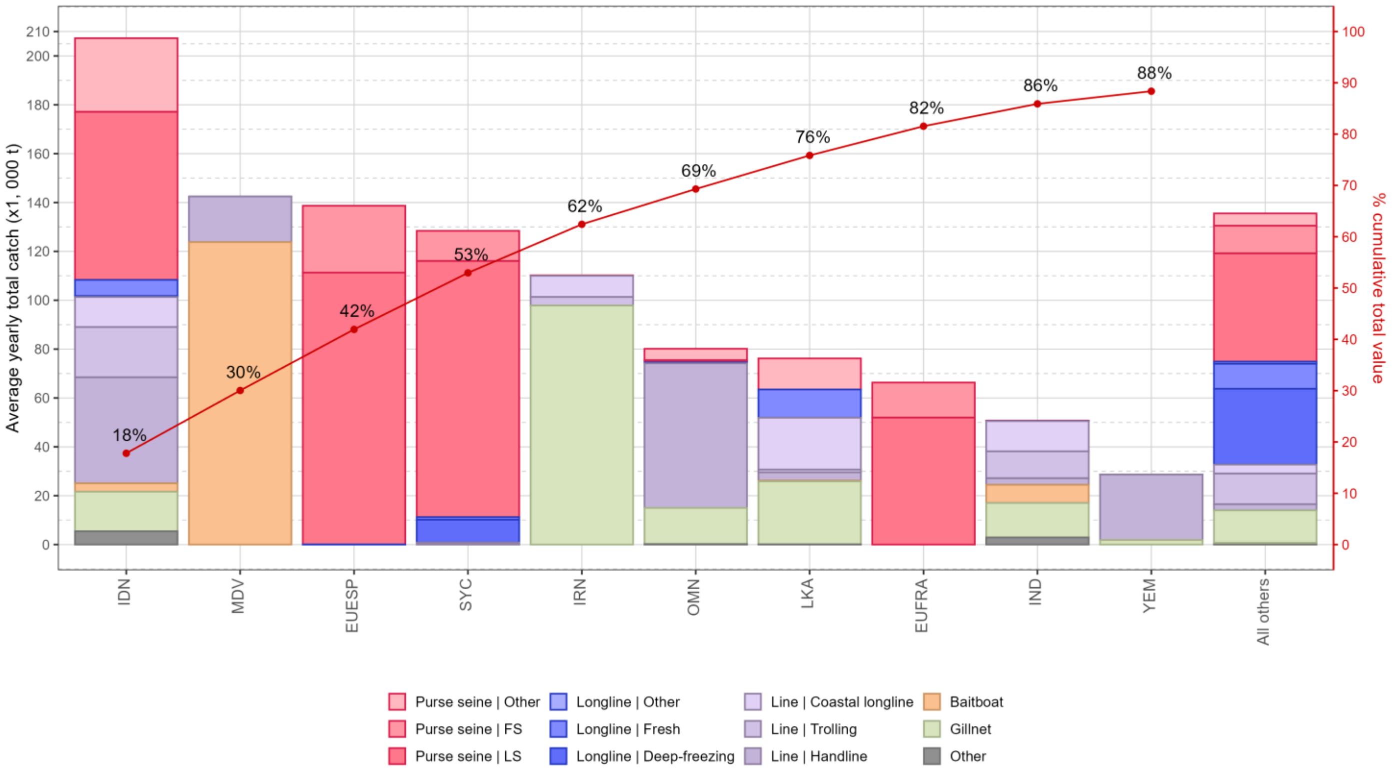

Figure 6: Mean annual catches (metric tonnes; t) of Indian Ocean tropical tuna by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet.

Detailed catch contribution by fishery and fleet are illustrated in **Fig. 7** and **Fig. 8** for recent temporal trends in retained catch of tropical tuna between 2020 and 2024. Overall, catch levels vary significantly across fishery groups with the main fleets within each fishery group showing different inter-annual changes in catches.

As noted above, purse seine fisheries continue to dominate tropical tuna catches. Over the past five years, catches from these fisheries peaked in 2022 at approximately 535087.9 tonnes, followed by a slight decline to around 497197.5 tonnes in subsequent years. The peak in 2022 was primarily driven by an increase in Indonesian purse seine catches, which rose from approximately 80979.44 tonnes in 2022 to 122110.7 tonnes in 2022, remained high in 2023, and then declined to below 91720.42 tonnes in 2024. In contrast, purse seine catches from the EU-Spain and Seychelles have shown declining trends in recent years, while other purse seine fleets collectively increased between 2020 and 2024.

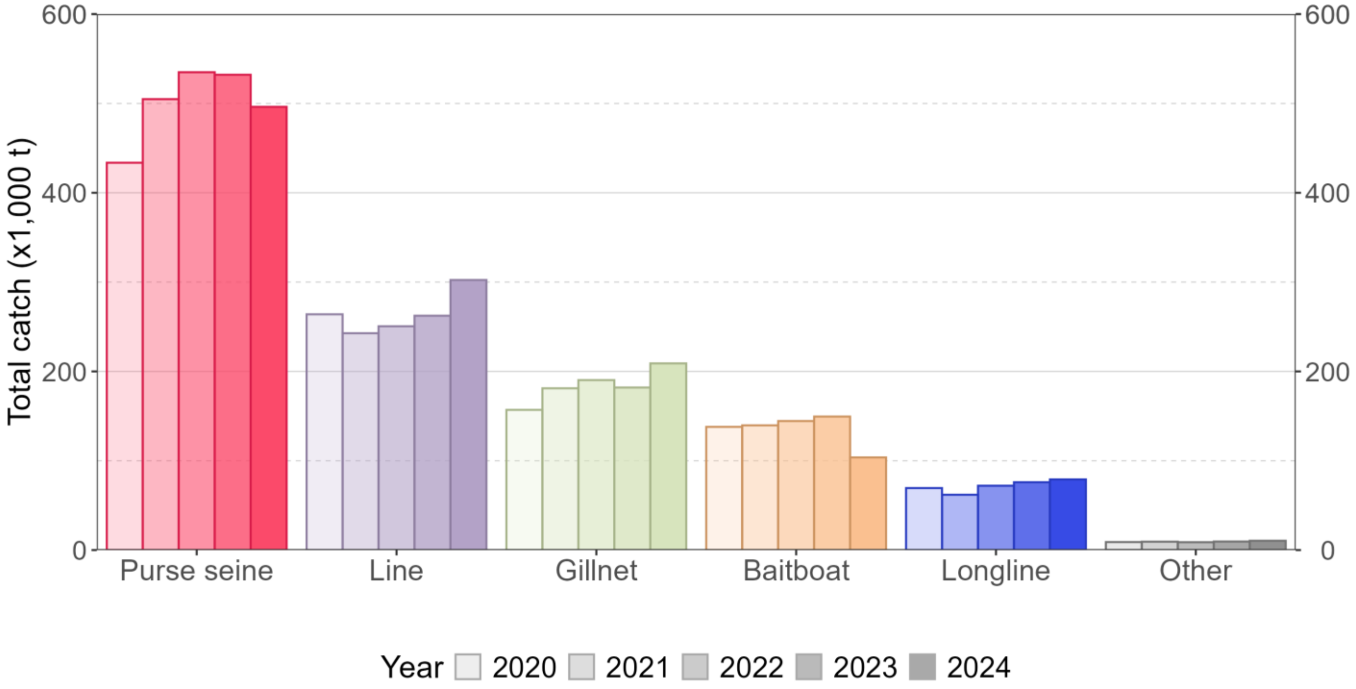

Figure 7: Annual catch (metric tonnes; t) trends of Indian Ocean tropical tuna by fishery group between 2020 and 2024

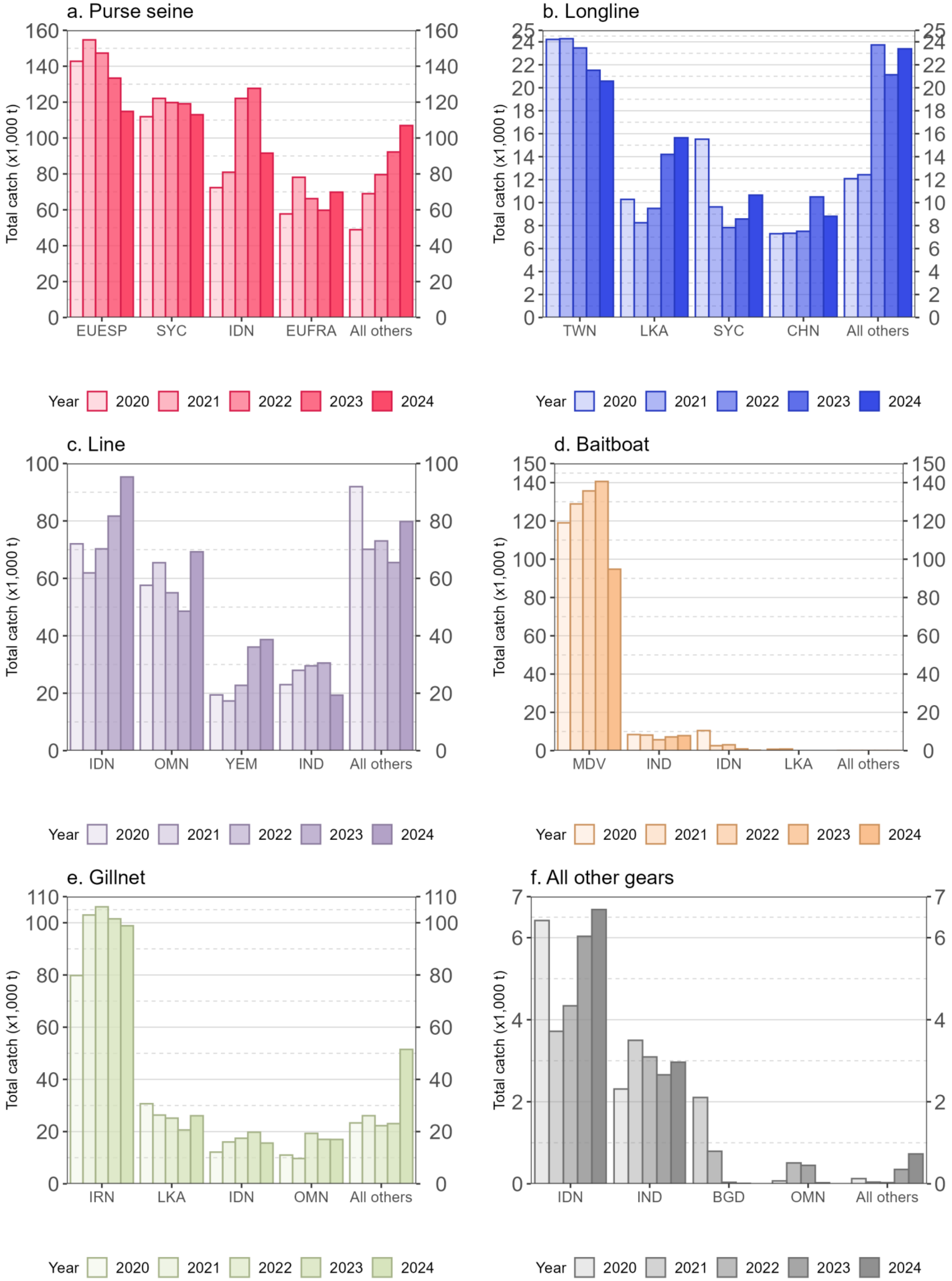

Figure 8: Annual catch (metric tonnes; t) trends of Indian Ocean tuna by main fishery group and fleet between 2020 and 2024

Reporting quality of retained catch data

There have been significant improvements in the quality of retained catch data reported by fleets, particularly in small-scale fisheries targeting tropical tuna species. A key development has been the recent re-estimation of historical catches by Indonesia, the second-largest tropical tuna fishing nation, which contributed, on average, 13% to reported catches for the period 1950-2024. This revision has substantially improved the availability and completeness of tropical tuna catch data over this time frame. In addition to Indonesia, an increasing number of CPCs are now providing better catch estimates for tropical tuna species from their fisheries. This has reduced the need for Secretariat to perform catch estimations and reliance on secondary data sources. Furthermore, data quality has improved for fleets that previously submitted incomplete information.These improvements are likely driven by several factors:

- Increased compliance pressure under Conservation and Management Measures (CMMs) requiring comprehensive catch reporting;
- Extended training initiatives aimed at improving the reporting of mandatory fisheries data;
- The development and adoption of electronic monitoring systems in many countries;
- The implementation of alternative data collection approaches, particularly for small-scale fisheries (Martin 2023).

Despite these advances, it is important to recognize that multiple factors continue to influence the quality of data collected from small-scale fisheries. Such as (i) the availability of enumerators; (ii) funding constraints; (iii) the large number of dispersed landing sites; and (iv) broader socio-economic conditions. These factors can lead to variability in data quality across years. In addition, in many coastal countries, tuna species are often given lower priority compared to other aquatic resources, which can further affect reporting quality.

• Over the period 2000-2024, an average of 82.92% of retained catch data was available in accordance with IOTC reporting standards. In recent years, there has been notable improvement in data availability from coastal fisheries, increasing from 67% in 2010 to 93% in 2024. A short period between 2021 and 2023 recorded near-complete data availability, with levels approaching 100%. Data availability from industrial fisheries has remained consistently high, exceeding 92%, between 1980 and 2010, and reaching nearly 100% in recent years (**Fig. 9**).

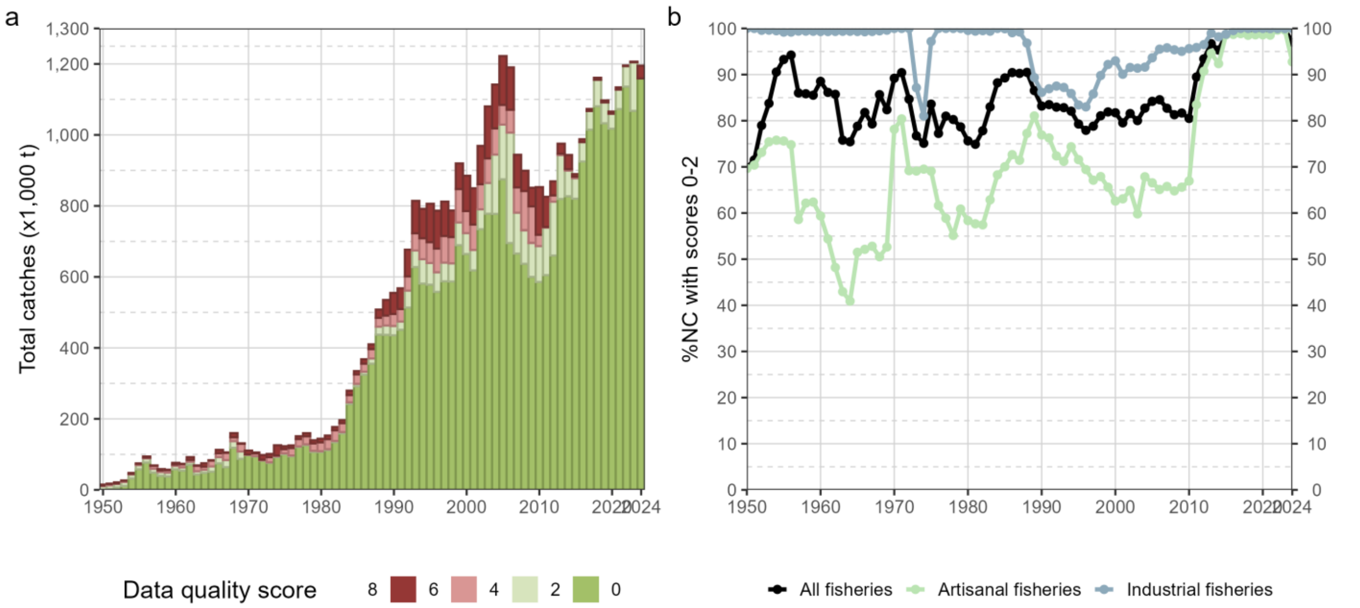

Figure 9: (a) Annual retained catches (metric tonnes; t) of Indian Ocean tropical tuna estimated by quality score and (b) percentage of retained catch fully or partially reported to the IOTC Secretariat for all fisheries and by type of fishery, in the period 1950-2024

Since the implementation of a catch limit on yellowfin tuna to rebuild the stock since 2017 (Res. 17/01), concerns have been raised about potential misreporting and high-grading in some fisheries (IOTC Secretariat 2019, Medley et al. 2021). Notably, the 21st session of the WPTT highlighted how the relative composition of tropical tuna species reported for the year 2018 by the purse seine fleet from EU-Spain showed a higher proportion of bigeye tuna than in previous years (IOTC 2019). Furthermore, other study revisited the catch data of large fishing fleets in the Indian Ocean, focusing on the species composition, concluding that there is possibility of overestimating yellowfin tuna catches in the past (Abascal et al. 2024).

Spatial distribution of reported efforts

In the early years, geo-referenced data were limited. Spatial information was often reported at broad areas of the Indian Ocean or simply distinguishing between the Western and Eastern Indian Ocean. Available data indicate that longline fisheries targeting tropical tuna species have operated throughout the Indian Ocean since the 1950s. However, geo-referenced effort data during this period were primarily available for distant-water fishing nations operating in the region. The spatial distribution of purse seine effort began to be reported from the early 1980s. For small-scale fisheries, spatial information has been available since the 1970s, although initially reported using irregular grids that largely reflected national jurisdictional areas. These data were later standardized and mapped onto conventional geo-referenced spatial grids.

Despite ongoing efforts to improve the reporting of spatial and temporal data, particularly for coastal fisheries and fleets lacking robust data collection systems, such information remains incomplete for some fisheries.

Longline fisheries

Distant-water fishing nations, including Japan, Taiwan,China, and the Republic of Korea, have operated longline fisheries in the Indian Ocean since the early decades of industrial fishing. Spatial distribution patterns indicate that Japanese deep-freezing longline vessels operated primarily in the southeastern Indian Ocean, with more limited activity in the western regions during the 1950s. In contrast, fleets from Taiwan,China were predominantly concentrated in the western Indian Ocean from the 1960s, as reflected in available effort distribution maps. From the 1970s onwards, Japanese longline operations expanded further into the southern Indian Ocean, while additional types of longline fisheries began targeting tropical tuna species. By the 1990s, spatial patterns showed a notable shift, with Taiwanese deep-freezing longline fleets expanding their operations across much of the Indian Ocean (**Fig. 10**). In recent years, significant changes have occurred in longline fisheries. Since 2019, fresh tuna longline fleets have become the dominant operators, with activity primarily concentrated in the southwestern Indian Ocean and gradually expanding into other regions (**Fig. 11**).

By decade (1950-2009)

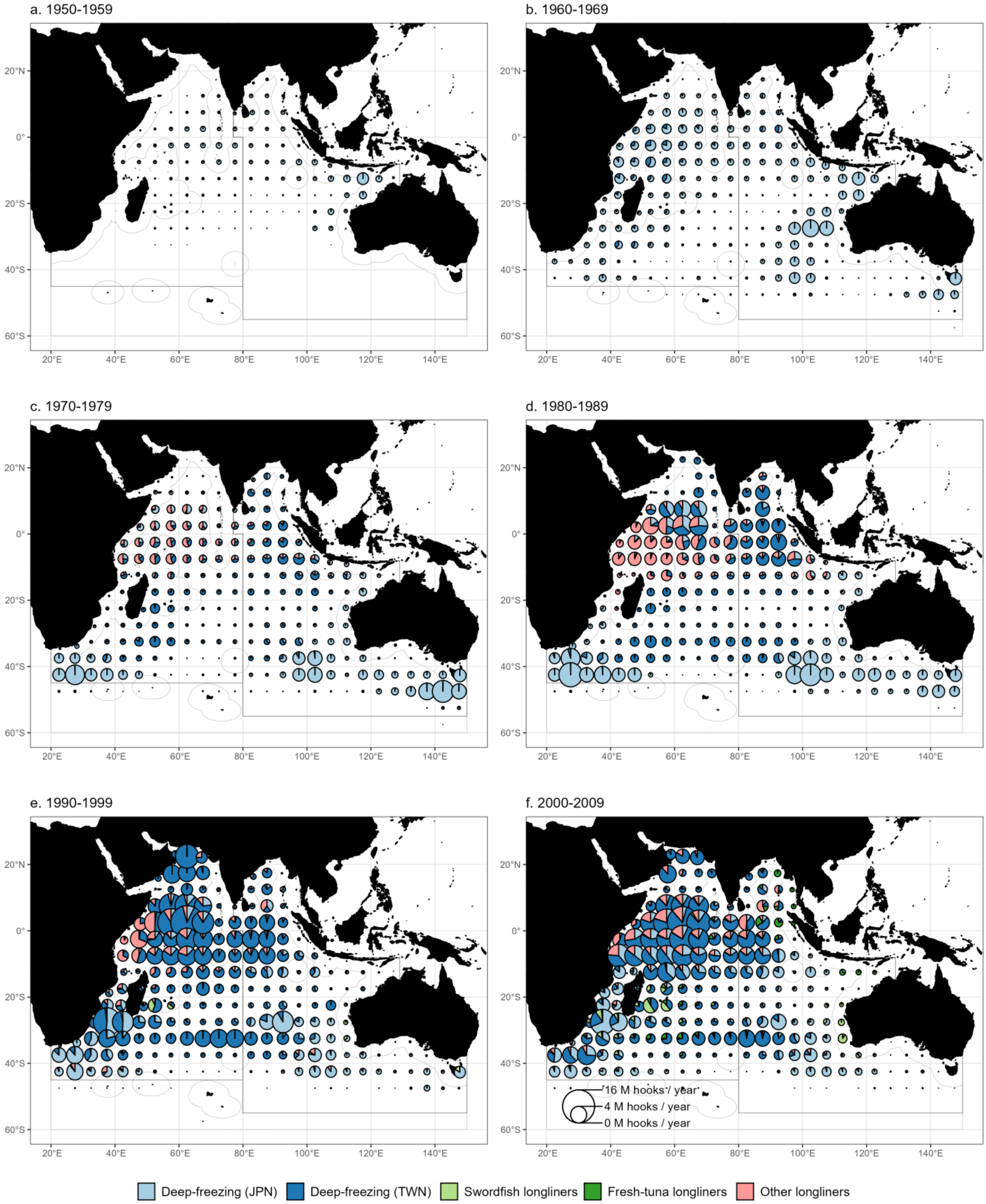

Figure 10: Mean annual effort (millions hooks deployed) exerted by industrial longline fleets by decade, 5°x5° grid, and fleet. Data source: [time-area effort dataset for longline fisheries]() (Res. 15/02)

By last years (2020-2024) and decade (2010-2019)

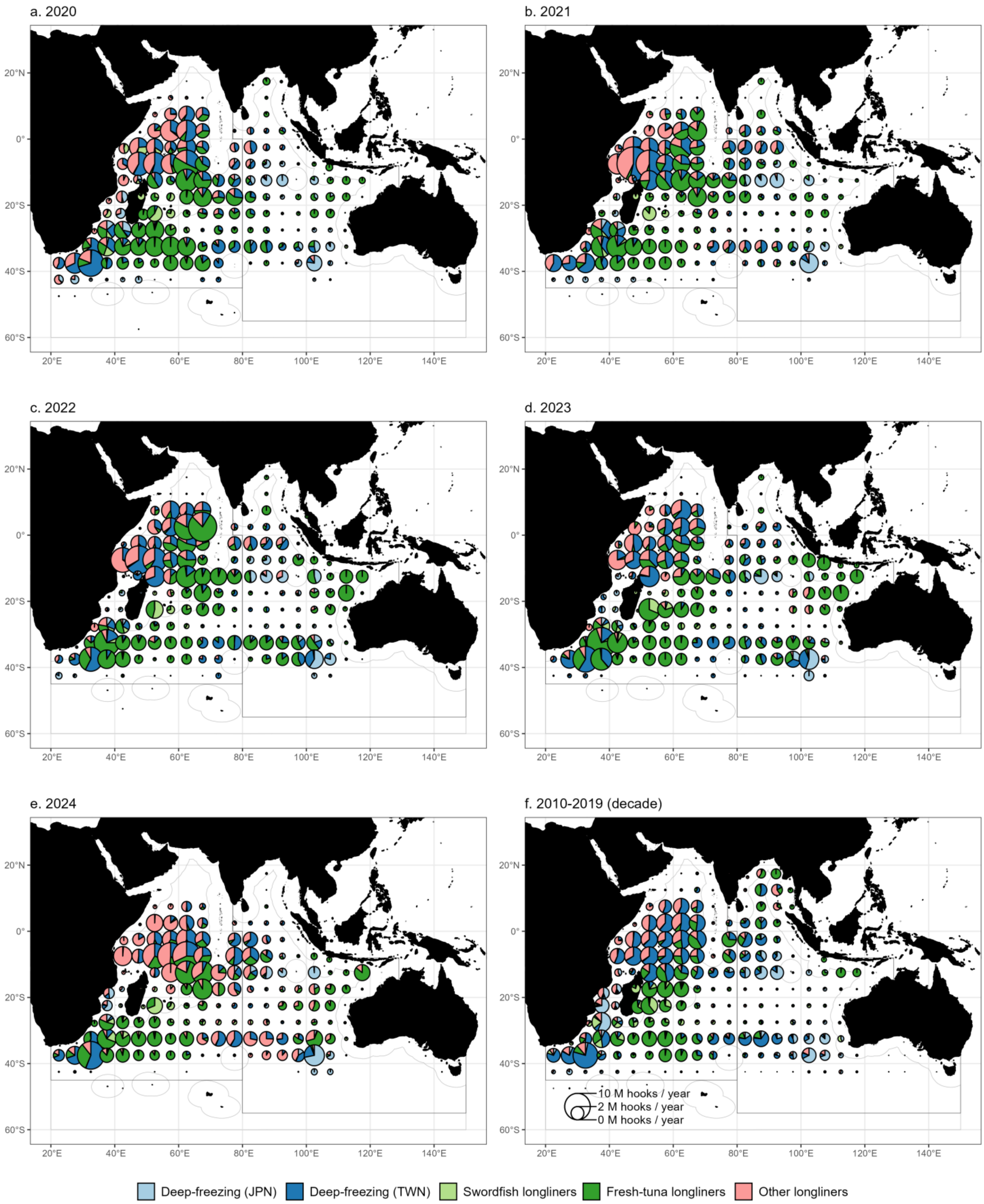

Figure 11: Mean annual effort (millions hooks) exerted by industrial longline fleets by year / last decade, 5°x5° grid. and fleet. Data source: time-area effort dataset for longline fisheries (Res. 15/02)

Purse seine fisheries

Spatially geo-referenced effort data for purse seine fisheries have been available since the 1980s, coinciding with the development of these fisheries in the Indian Ocean. The distribution of effort indicates that the Western Indian Ocean has consistently served as the primary fishing ground, particularly for European and associated fleets. Other purse seine fleets exhibited broadly similar spatial patterns in earlier decades, although overall effort levels varied among fleets (**Fig. 12**).

In recent years, European purse seine fleets have maintained a high level of fishing effort in the Western Indian Ocean (**Fig. 13**). However, notable changes in spatial distribution have been observed for other purse seine fleets, including a marked increase in effort in the Eastern Indian Ocean. This shift is largely attributed to the expansion of Indonesia's industrial purse seine activities (**Fig. 14**).

All, by decade (1980-2009)

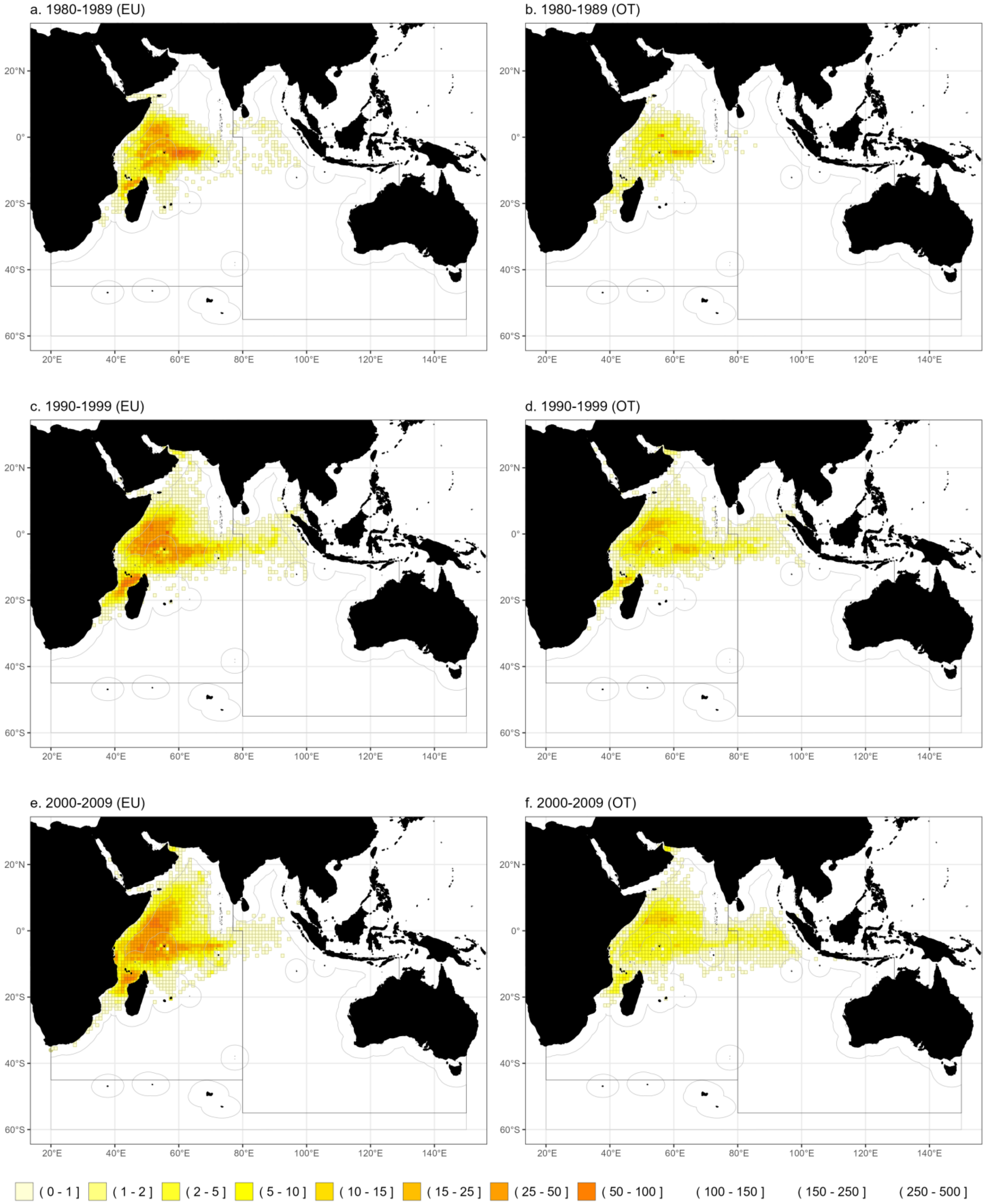

Figure 12: Mean annual effort (fishing days) exerted by the industrial purse seine fleets of the European Union and comparable fleets (EU) vs. all other flags (OT) by decade, 1°x1° grid, and fleet. Data source: [time-area effort dataset for purse-seine fisheries](#) (Res. 15/02)

European Union, by last years (2020-2024) and decade (2010-2019)

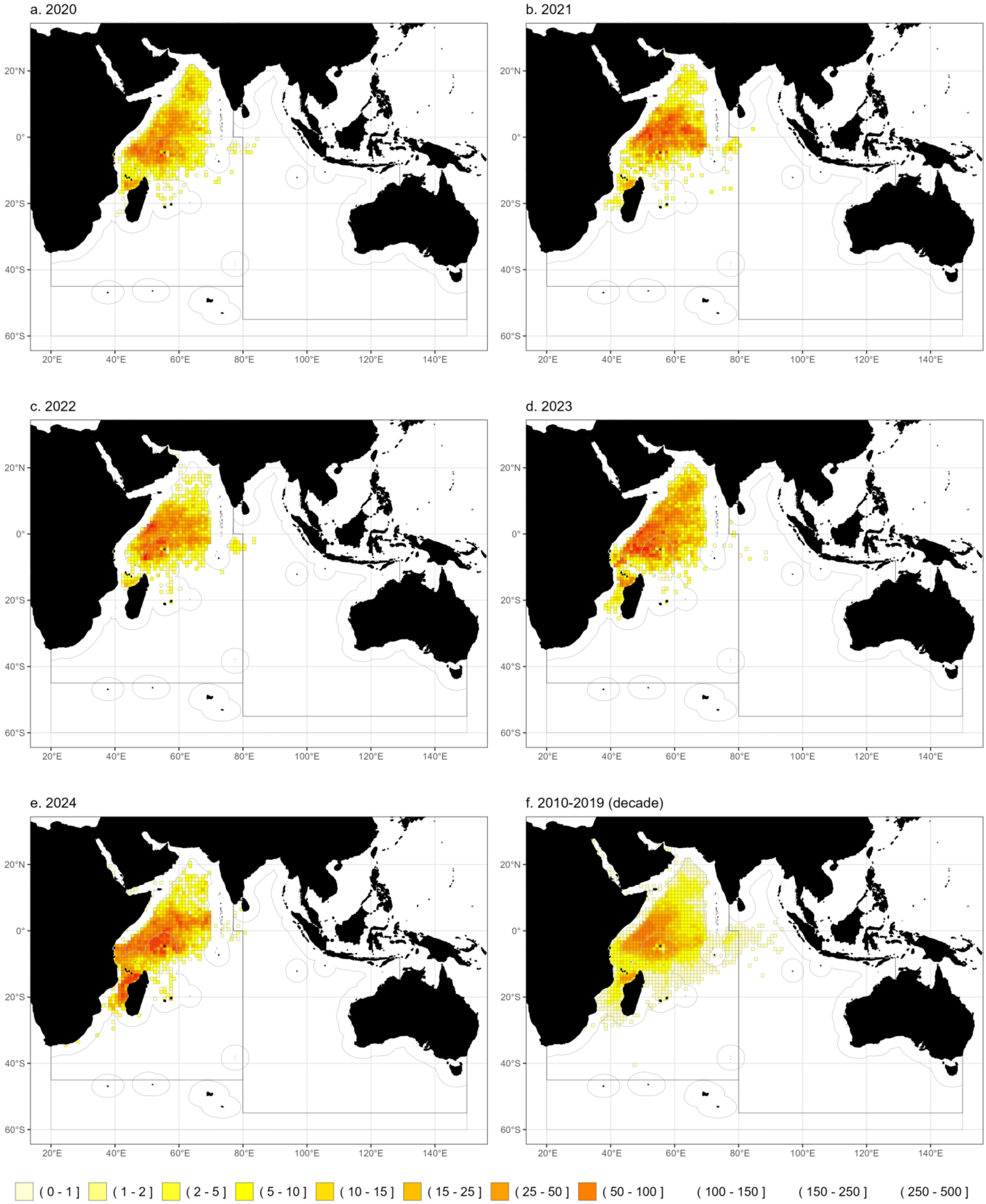

Figure 13: Mean annual effort (fishing days) exerted by the industrial purse seine fleets of the European Union and comparable fleets (EU) by year / decade and 1°x1° grid. Data source: [time-area effort dataset for purse-seine fisheries](#) (Res. 15/02)

All others, by last years (2020-2024) and decade (2010-2019)

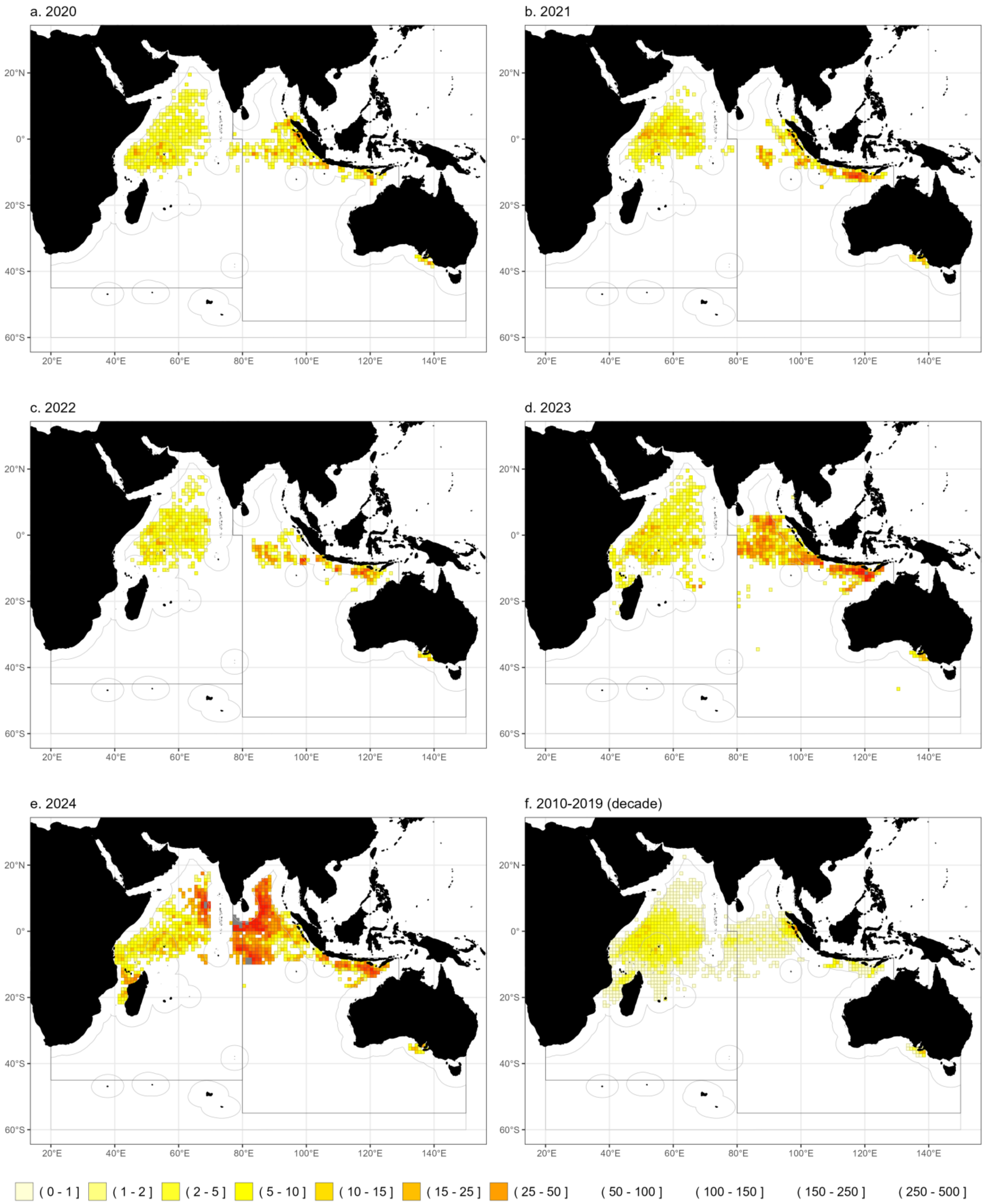

Figure 14: Mean annual effort (fishing days) exerted by purse seine fleets from other flags (OT) by year / decade and 1°x1° grid. Data source: [time-area effort dataset for purse-seine fisheries](#) (Res. 15/02)

Spatial distribution of reported catches

Geo-referenced catch data distribution for all fisheries indicates that, in addition to longline fisheries, pole-and-line fisheries were prominent in the early years around the Maldives. From the 1980s onward, purse seine fisheries reported high catches in the Western Indian Ocean, along with gillnet fisheries particularly in the Northern Indian Ocean (**Fig. 15**).

Recent spatial catch distribution illustrates an emerging trend among several coastal fisheries, particularly line and gillnet fisheries since 2019. In comparison to the 2010 decade, gillnet fisheries have seen a reduction in catch distribution, while spatial catch data from line fisheries have increased. These shifting patterns is attributed to the conversion of gillnet vessels or seasonally adapted for line fishing, specifically targeting yellowfin tuna (**Fig. 16**).

Geo-referenced catches by fishery and decade (1950-2009)

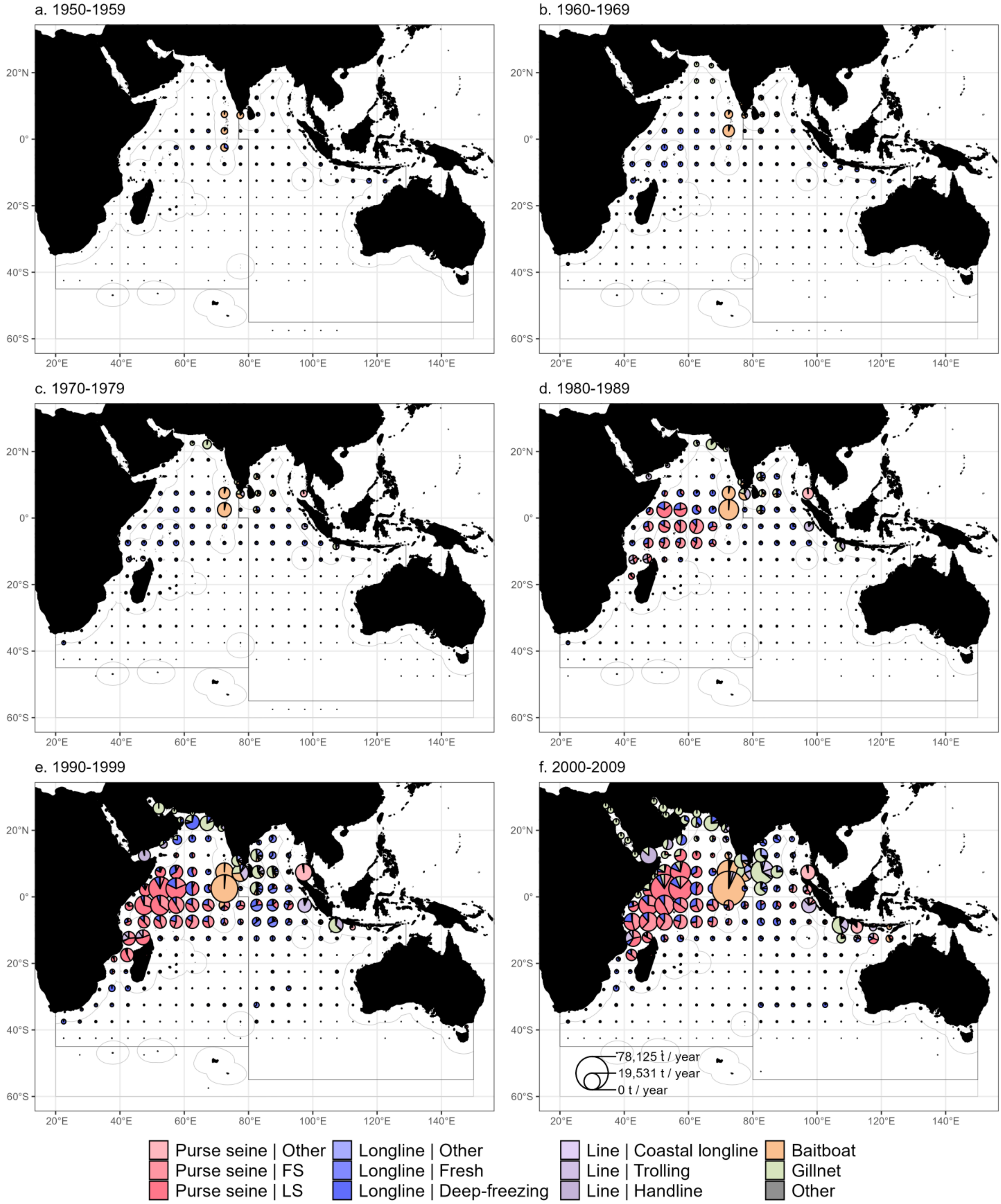

Figure 15: Estimated mean annual time-area catches (metric tonnes; t) of Indian Ocean tropical tuna by decade, 5°x5° grid, and fishery. Data source: tropical tuna raised time-area catches

Geo-referenced catches by fishery, last years (2020-2024), and decade (2010-2019)

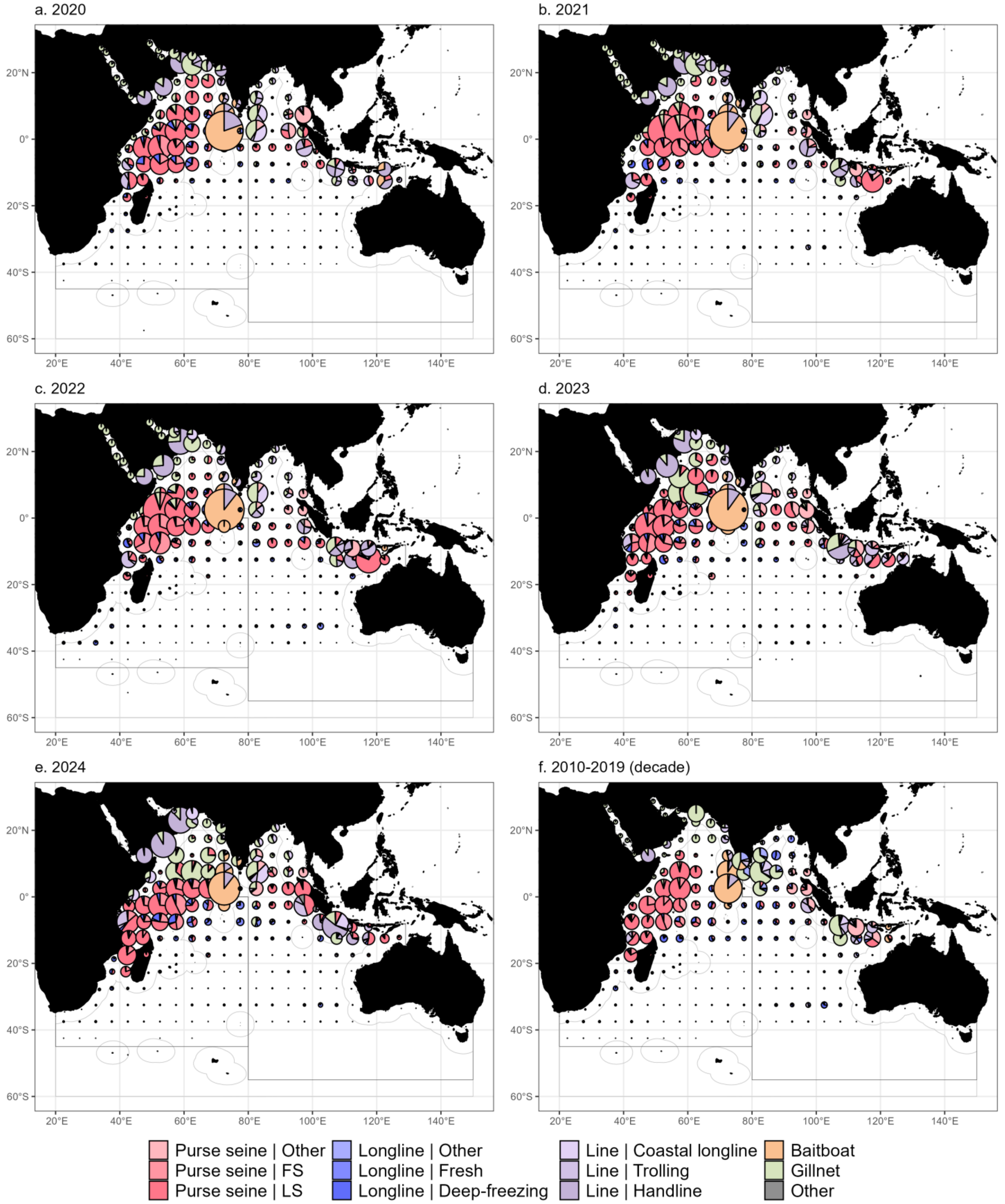

Figure 16: Estimated mean annual time-area catches (metric tonnes; t) of Indian Ocean tropical tuna by year / decade, 5°x5° grid, and fishery. Data source: Tropical tuna raised time-area catches

Reporting quality of catch and effort data

Although there have been significant improvements in the quality and availability of retained catch data, the reporting of geo-referenced catch and effort remains challenging for many fleets. Several coastal fleets are still unable to provide geo-referenced data due to limitations in data collection systems. In some cases, geo-referenced catch data are only partially reported, not raised to total catch levels, or are inconsistent with species or fishery specific reporting in other datasets. During recent scientific meetings and country missions, CPCs have demonstrated ongoing efforts to strengthen data collection and processing systems, including the adoption of new tools and alternative methods to improve geo-referenced data reporting (Martin 2023).

The availability of geo-referenced catch and effort data from industrial fisheries targeting tropical tuna has varied over time, particularly in relation to total retained catch. Between the 1990s and 2010s, several fleets, including Iranian offshore gillnet vessels; Indonesian longline and purse seine fisheries; chartered or licensed non-member flagged vessels (Pallarés et al. 1998); and other offshore operations, conducted substantial fishing activities without consistently providing geo-referenced records. As a result, the availability of geo-referenced catch data for industrial fisheries averaged about 81% between 2000 and 2010 (i.e., scores 0–2; **Table 3**). From around 2010 onwards, the availability and quality of geo-referenced data from industrial fisheries improved steadily. This progress reflects advancements in data collection systems, wider use of logbooks, and, more recently, the adoption of electronic monitoring systems. Since 2015, the availability of geo-referenced catch data from industrial fisheries has averaged approximately 97% (**Fig. 17**).

In contrast, geo-referenced catch and effort data from coastal fisheries remain limited. This reflects ongoing challenges, including insufficient data collection and processing systems, the relatively low prioritization of tuna species in many coastal fisheries, and the greater socio-economic importance of other species. In addition, countries with substantial tropical tuna catches from coastal fisheries face logistical challenges in monitoring numerous landing sites and multiple gear types, often used within the same fisheries.

Between 2000 and 2010, the availability of geo-referenced catch and effort data for coastal fisheries was particularly low, averaging around 29%. However, improvements in national data systems, such as the development of fisheries statistics in Iran from 2007, and enhancements in Sri Lanka and the Maldives from 2015, have contributed to increased availability. From 2015 onwards, geo-referenced data availability for coastal fisheries averaged approximately 58%. By 2024, availability reached 73%, compared with 60% in 2023 (**Fig. 17**).

Overall, the trend indicates a marked improvement in the availability of high-quality geo-referenced data since 2015, with average availability reaching 81% over the period 2015–2024. However, despite requirements under IOTC Resolution 15/01 (paragraph 11) for CPCs to progressively strengthen data collection and reporting systems, inconsistencies in geo-referenced catch and effort data persist. Some CPCs still face structural limitations that hinder full compliance with reporting obligations.

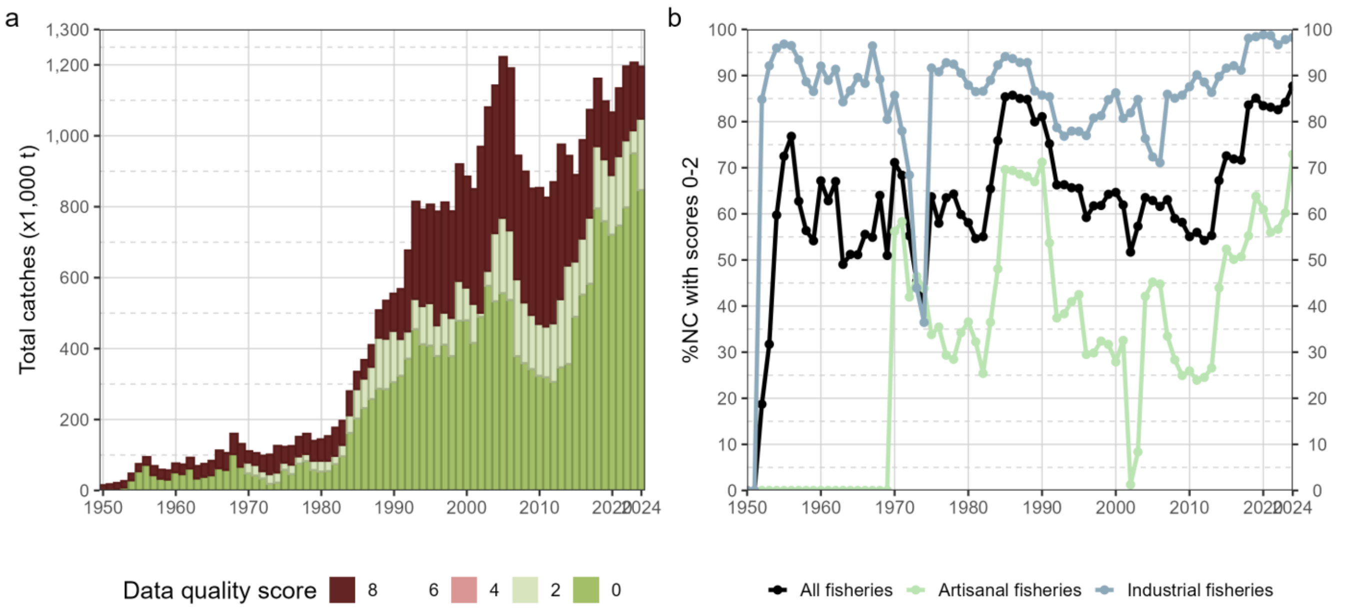

Figure 17: (a) Annual retained catches (metric tonnes; t) of Indian Ocean tropical tuna estimated by quality score and (b) percentage of geo-referenced catches reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02 for all fisheries and by type of fishery, in the period 1950-2024

Size-frequency

Reporting quality of size-frequency data

Size-frequency data represent a key dataset that CPCs are required to submit annually. Despite the importance of biological sampling for stock assessment, reporting of size-frequency data remains incomplete across many fisheries. While recent years have seen notable improvements in the quality and availability of retained catch and effort data, this progress has not been matched by size-frequency data, where overall availability remains comparatively low. Although most fleets targeting tropical tuna species are generally associated with established data collection systems and do submit size-frequency data, the level of coverage remains below requirements. In particular, reported sampling intensity often falls short of the IOTC Resolution 15/02 guideline of measuring at least one fish per ton of catch.

Size-frequency data have been available since the 1950s; however, early records were often incomplete due to limited infrastructure and data collection mechanisms. Improvements became more evident from the 1980s onwards, coinciding with the expansion of fishing activities and advancements in monitoring systems. Nevertheless, the overall reporting levels and data quality during this period remained below required standards (**Fig. 18a**). Higher-quality size-frequency data are generally associated with industrial fisheries, despite the growing contribution of coastal fisheries to total catches.

For industrial fisheries, the availability of size-frequency data ranged between 77% in 2010 and 82% in 2019. Coverage declined sharply to below 50% in 2020, largely due to disruptions caused by the COVID-19 pandemic. Subsequently, reporting levels recovered, with coverage reaching approximately 86% in 2024.

In contrast, size-frequency data availability from coastal (artisanal) fisheries has shown considerable variability over time. This fluctuation is largely driven by inconsistencies in data reporting, particularly for pole and line fisheries between the late 1990s and 2010, where records were often incomplete or absent. In addition, limited or no size-frequency data have been reported for gillnet fisheries, including major fleets operating in countries such as Sri Lanka and the Islamic Republic of Iran. Since 2010, there has been a gradual improvement in the availability of size-frequency data from coastal fisheries, increasing from approximately 20% in 2010 to 59% in 2020. However, this trend has not been sustained in recent years. Despite increasing catches of tropical tuna species from coastal fisheries, data coverage declined to 27% in 2024.

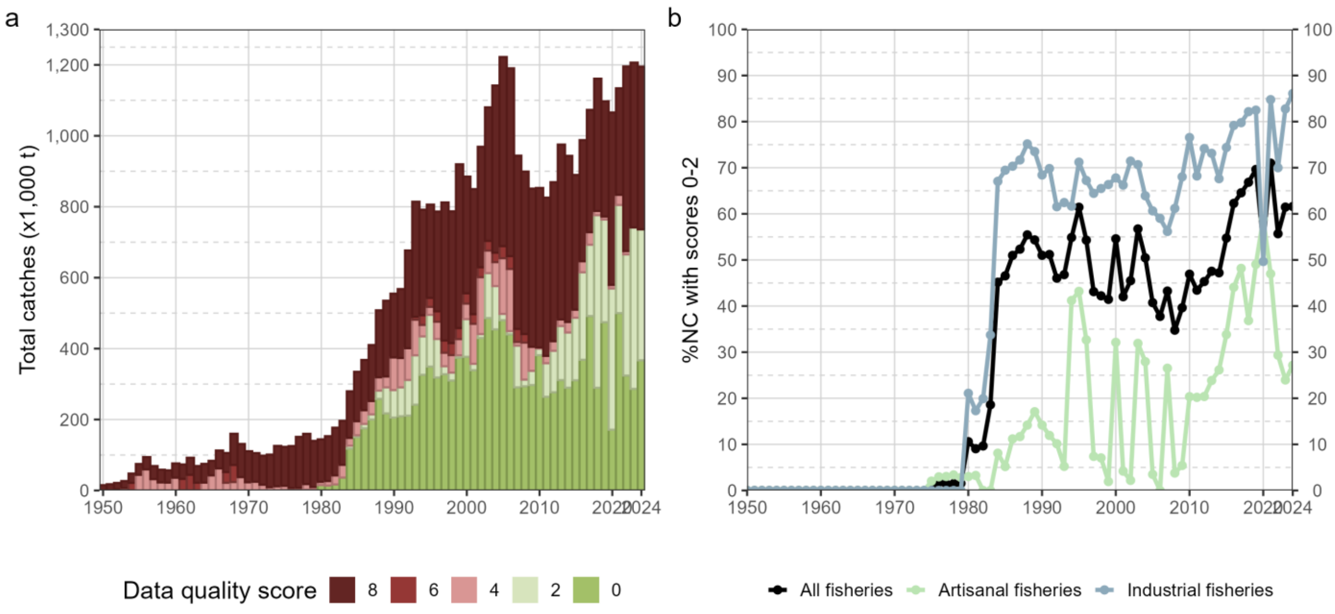

Figure 18: Annual retained catches (metric tonnes; t) of Indian Ocean tropical tuna estimated by quality score (barplot) and percentage of geo-referenced size-frequency data reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02 (lines with dots) for all fisheries (a) and by type of fishery (b), in the period 1950–2024

Appendix I: Monthly time series of tropical tuna import prices, 2000-2024

Frozen purse seine, Thai import prices (canning grade)

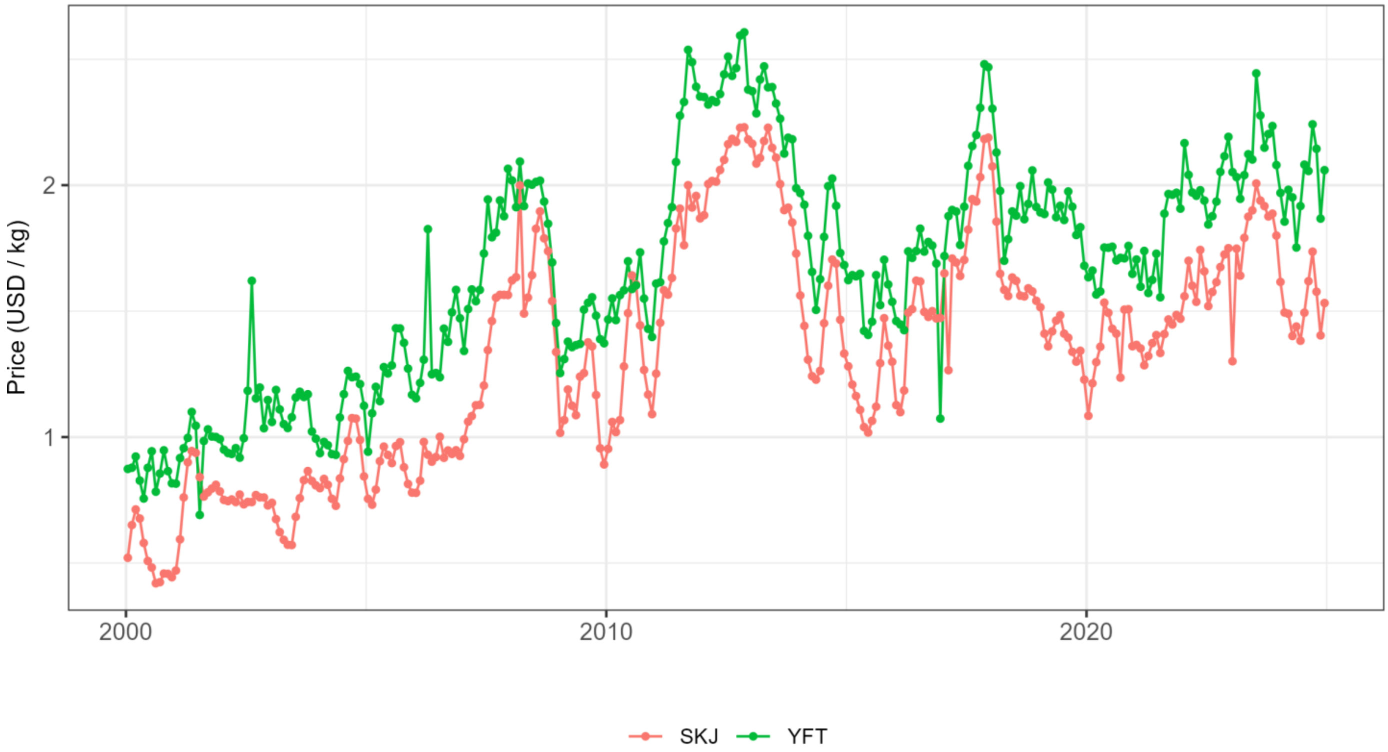

Figure 19: Monthly time series of import prices (USD/kg) in Thailand for canning-grade frozen skipjack and yellowfin tunas during the period 2000-2024. Data sourced from Thailand customs, compiled, and curated by the FFA Fisheries Development Division (Ruaia et al. 2020)

Frozen longline, Japanese import prices (sashimi grade)

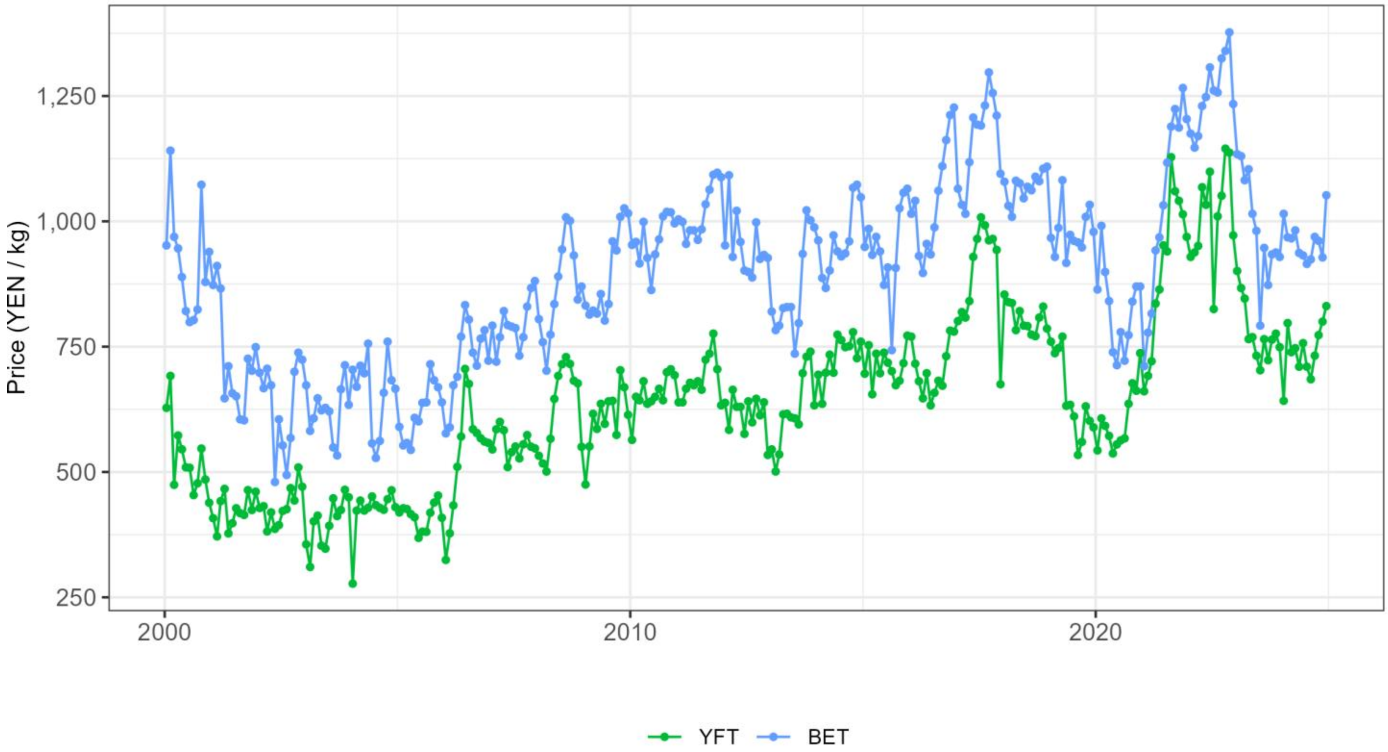

Figure 20: Monthly time series of import prices (YEN/kg) in Japan for sashimi-grade frozen during the period 2000-2024. Data sourced from Japanese customs, compiled, and curated by the FFA Fisheries Development Division (Ruaia et al. 2020)

Fresh longline, Japanese import prices (sashimi grade)

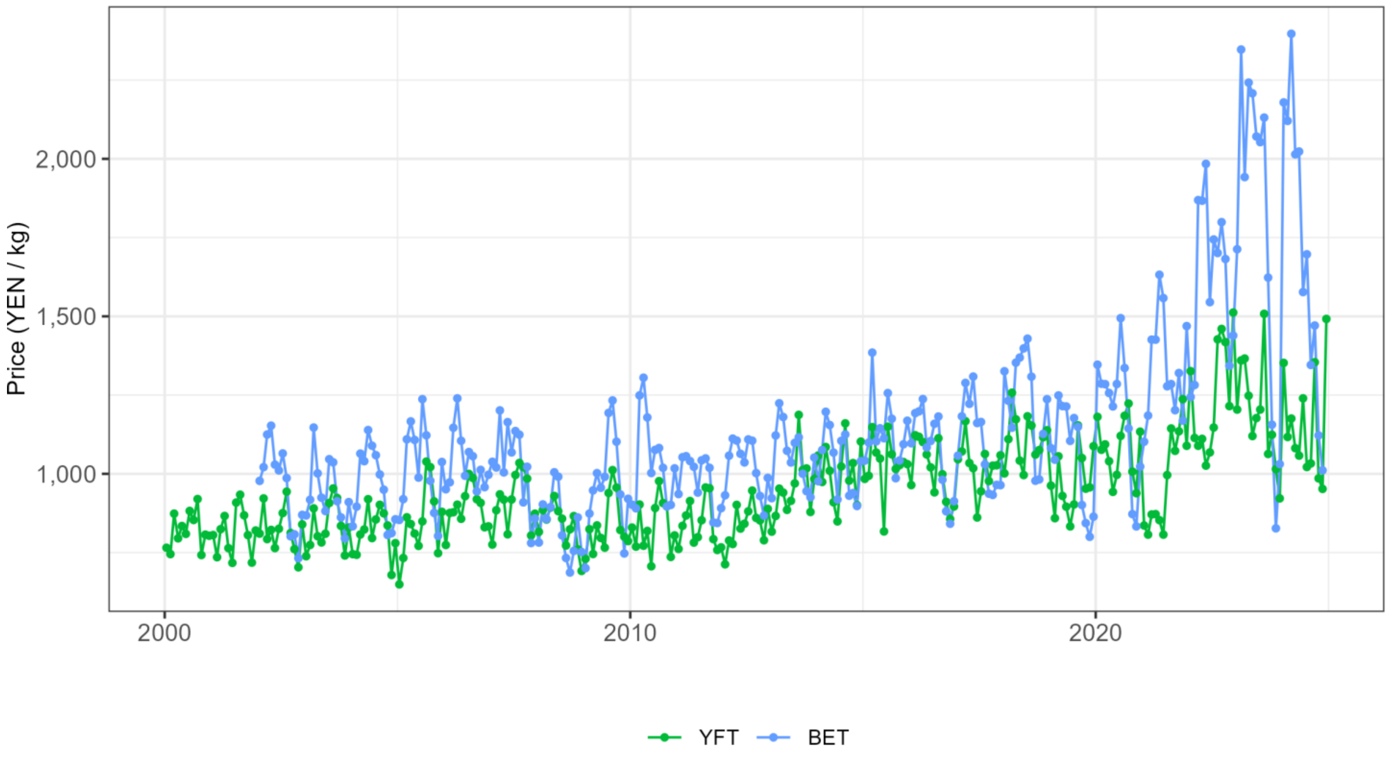

Figure 21: Monthly time series of import prices (USD/kg) in Thailand for canning-grade frozen during the period 2000-2024. Data sourced from Japanese customs, compiled, and curated by the FFA Fisheries Development Division (Ruaia et al. 2020)

Fresh longline, US import prices (sashimi grade)

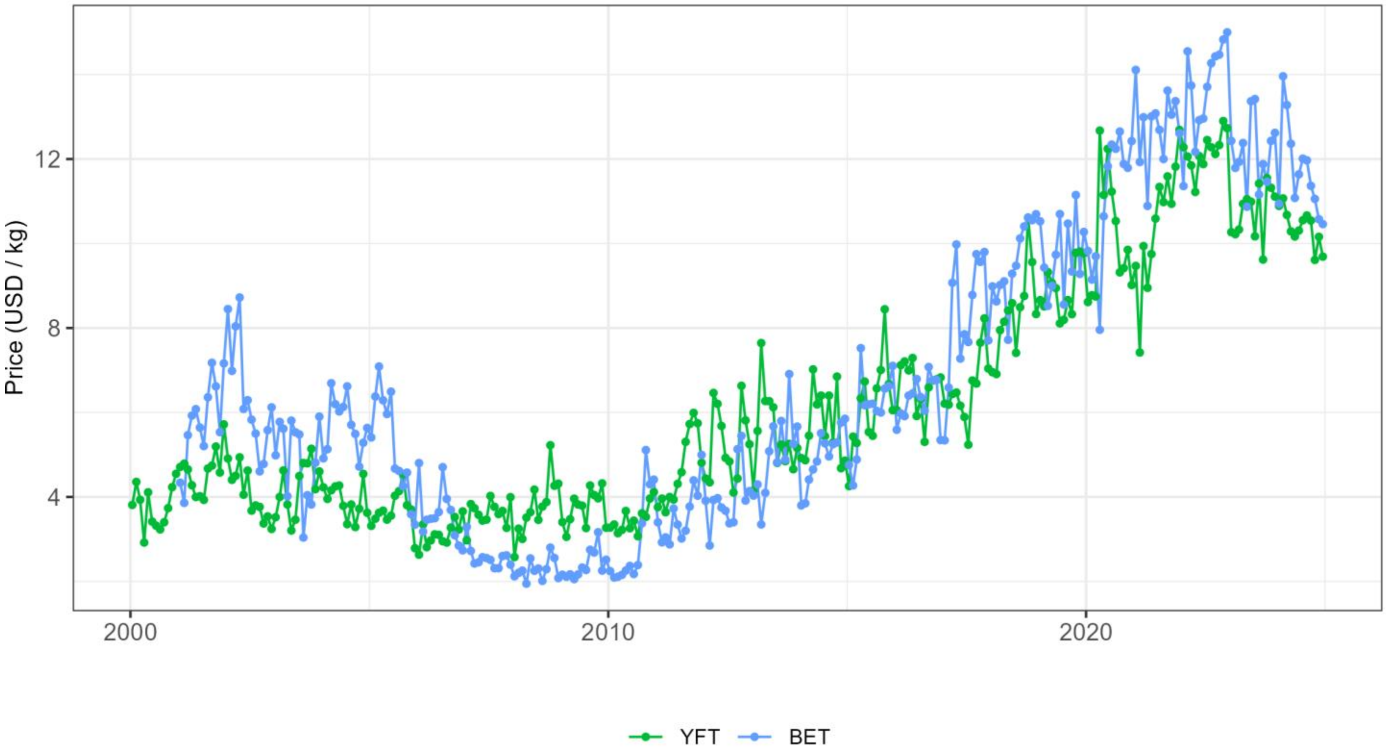

Figure 22: Monthly time series of import prices (USD/kg) in Thailand for canning-grade frozen during the period 2000-2024. Data sourced from USA customs, compiled, and curated by the FFA Fisheries Development Division (Ruaia et al. 2020)

Appendix II: Monthly time series of crude oil prices, 2000-2024

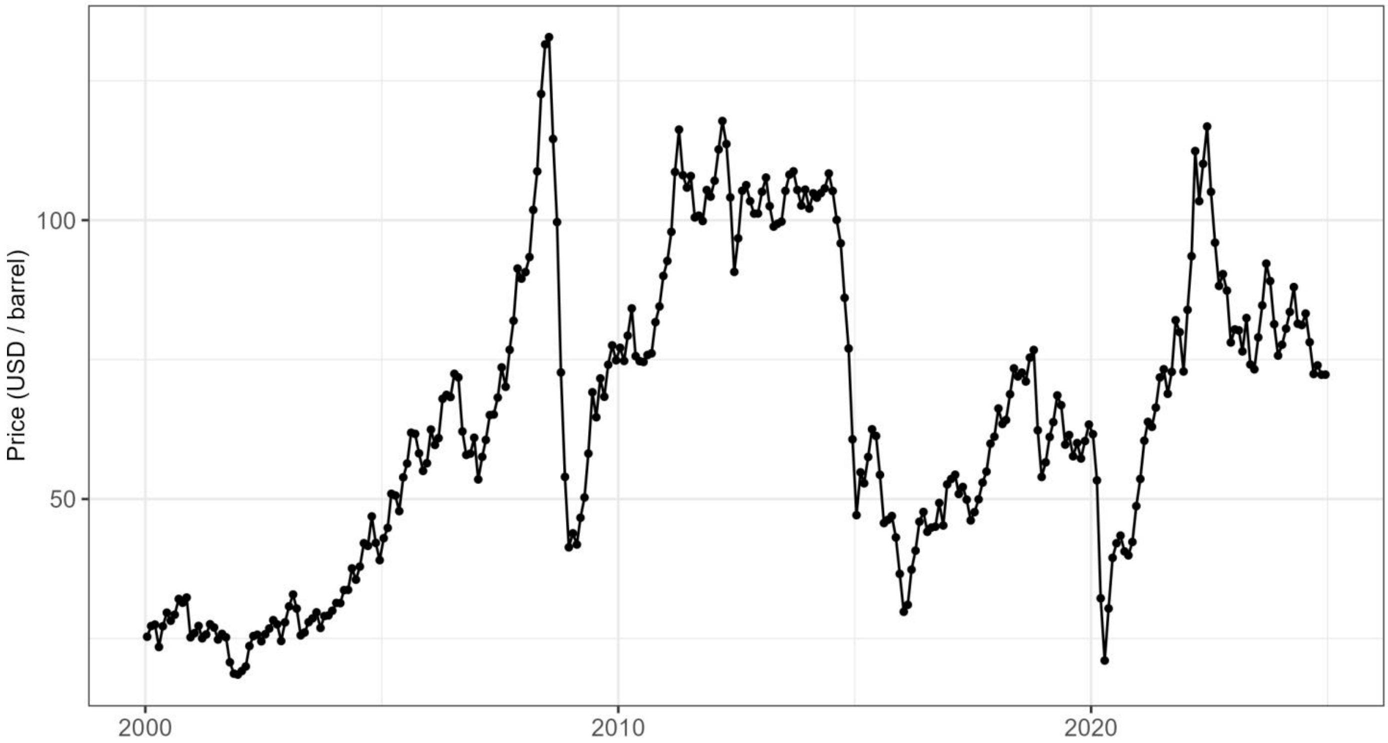

Figure 23: Monthly time series of crude oil spot price (USD/barrel) during the period 2000-2024. Data sourced from the spot prices of Brent, Dubai, and West Texas, compiled, and curated by the FFA Fisheries Development Division

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