

## REVIEW OF INDIAN OCEAN SKIPJACK TUNA STATISTICAL DATA

Author: [IOTC Secretariat](#)

### Introduction

As a migrated species, tagged tuna species global movements observer, confirm the law of the Sea, that these species do not recognise the national jurisdiction areas ([Fonteneau & Hallier 2015](#)). Globally, skipjack tuna catches trend indicated constant increased, although fluctuated in some years, reaching a peak of 3.5 million t in 2024. The shared between oceans of skipjack tuna catches, indicate a skewed towards the Western-Central Pacific Ocean, with increasing catch since the early years, contributing 48% of the global skipjack tuna catch. (**Fig. 1**). The Indian Ocean is the second largest contributors, with 17%.

As highly migratory species, tagged tuna have demonstrated extensive global movements, confirming the Law of the Sea principle that these species do not recognize national jurisdiction boundaries ([Fonteneau & Hallier 2015](#)). Globally, skipjack tuna catches have shown a consistent upward trend, despite some interannual fluctuations, reaching a peak of 3.5 million tonnes in 2024. The distribution of skipjack tuna catches across oceans is uneven, with a strong skew toward the Western and Central Pacific Ocean. This region has experienced a steady increase in catches since the early years and currently contributes approximately 48% of the global skipjack tuna catch (**Fig. 1**). The Indian Ocean is the second-largest contributor, accounting for about 17% of total global catches.

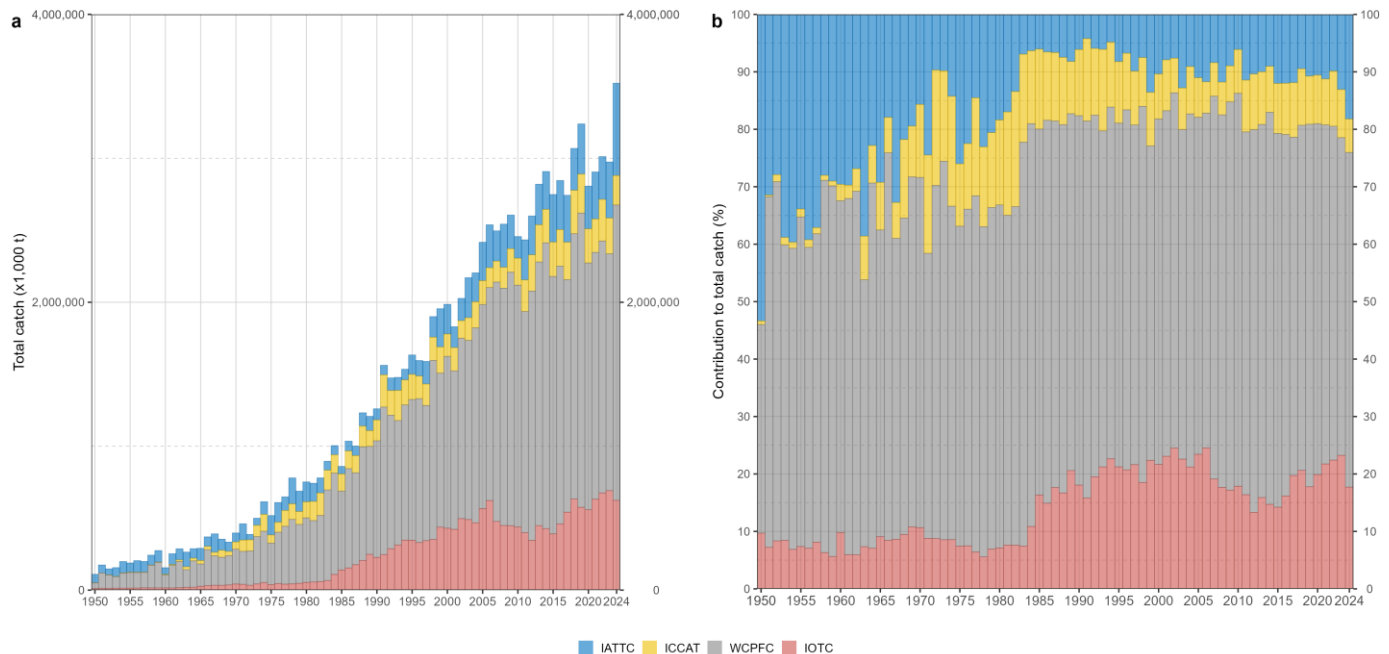


Figure 1: Annual time series of cumulative retained catches (metric tonnes; t) of skipjack tuna by ocean basin for the period 1950-2024. Source: [Global Tuna Atlas](#)

This paper aims to provide participants of the 28<sup>th</sup> Session of the Data Preparatory Meeting of the IOTC Working Party on Tropical Tunas ([WPTT28\(DP\)](#)) with updated information on Indian Ocean skipjack tuna (*Katsuwonus pelamis*; SKJ) and its fisheries since the October 2025 assessment meeting ([WPTT27](#)). It presents an overview of temporal and spatial catch trends, recent fishery developments, and the quality of reported datasets. A detailed description of the data compiled and curated by the Secretariat is available in document [IOTC-2026-WPTT28-07.1](#).

## Retained catches

### Historical trends (1950-2024)

Skipjack tuna in the Indian Ocean are harvested by multiple fisheries across a wide geographical range. Trends indicate shifts in dominant fisheries over time. From the 1950s, coastal fisheries, particularly baitboat, dominated catches (**Table 1 & Figs. 2-3**). With the introduction of industrial purse seine fisheries in the 1980s, catches increased substantially, tripling relative to previous decades. Industrial purse seiners alone contributed around 52,000 tonnes, exceeding earlier average total catches, ranging between 14,000 tonnes in 1950 and 43,000 tonnes in 1970. In the 1990s, the expansion of large-scale purse seine fleets drove average catches to 324,000 tonnes. Catches remained high thereafter, peaking in the 2020s at an average of 636,000 tonnes.

### Purse seine catch trends by fishing mode

Since the late 1980s, purse seine fisheries, in particular those operating on drifting fishing objects (dFOBs), have dominated skipjack catches. Catches associated with dFOBs were roughly 5 times higher in the 2000s than in the 1980s (**Table 1**). Piracy in the western Indian Ocean (2009-2012) significantly disrupted operations, reducing purse seine catches by 61%, from 255,000 tonnes in 2006 to a historic low of 99,000 tonnes in 2012 (**Fig. 2**). Skipjack fisheries were less affected than other tropical tuna fisheries due to continued coastal production. Catches recovered from 2018 onward, averaging 295,000 tonnes (**Table 2**).

### Baitboat fisheries catch trends

Baitboat fisheries, historically dominant and led by the Maldives (>90% of catches), showed increasing trends until the mid-2000s. However, their proportion of the total catch decreased as industrial purse seine fisheries started to expand. Catches peaked at 149,000 tonnes in 2006 before declining to 70,000 tonnes in 2011. This reduction is attributed to several factors, including: (i) shifts toward other fishing gears and target species; (ii) increased fuel costs reducing effort; and (iii) climate-related changes such as warming ocean temperatures ([Hohne-Sparborth et al. 2012](#), [Sharma et al. 2013](#)). Catches continue to fluctuate between 85 and 136 kt over the last ten years (**Fig. 2 & Table 1**).

### Gillnet fisheries catch trends

Gillnet fisheries have shown increasing catches since the mid-1980s, peaking at 154,000 tonnes in 2006. The increase in the early 2000s was driven mainly by offshore operations from Iran and Sri Lanka using large-mesh drift gillnets. The adoption of subsurface gillnets in parts of the northwest Indian Ocean, aimed at reducing cetacean bycatch, also contributed to higher catches of skipjack and yellowfin tuna ([Anderson et al. 2020](#)). Catches declined to 81,000 tonnes in 2016. Since then, catches have been increasing, albeit with substantial yearly variability (**Fig. 2**).

Table 1: Best scientific estimates of average annual retained catches (t) of skipjack tuna by decade and fishery for the period 1950-2019. The background intensity color of each cell is directly proportional to the catch level. Data source: raised time-area catches

Fishery	1950s	1960s	1970s	1980s	1990s	2000s	2010s	2020s
Purse seine   Other	931	1,599	3,572	9,666	22,714	28,574	35,156	44,944
Purse seine   FS			137	15,252	30,776	25,672	9,716	22,554
Purse seine   LS			415	34,496	124,044	170,609	180,500	266,650
Longline   Other				45	625	1,812	859	1
Longline   Fresh	0	0	1	2	8	36	383	387
Longline   Deep-freezing	277	521	381	895	2,103	3,177	71	83
Line   Coastal longline	6	29	78	223	447	1,388	10,324	10,089
Line   Trolling	740	1,442	3,492	8,944	17,751	24,452	25,239	25,116
Line   Handline	115	193	925	1,872	3,449	4,035	10,830	26,380
Baitboat	10,099	15,303	24,965	42,041	78,036	111,033	93,231	120,236

Fishery	1950s	1960s	1970s	1980s	1990s	2000s	2010s	2020s
Gillnet	1,438	5,305	8,666	12,522	41,569	113,006	93,645	113,210
Other	160	371	569	1,094	2,245	3,335	4,653	6,257
<b>Total</b>	<b>13,768</b>	<b>24,763</b>	<b>43,201</b>	<b>127,055</b>	<b>323,769</b>	<b>487,129</b>	<b>464,607</b>	<b>635,908</b>

Despite significant increases in most fisheries, skipjack tuna catches in 2024 declined slightly, falling below the 2021 level (Figs. 2).

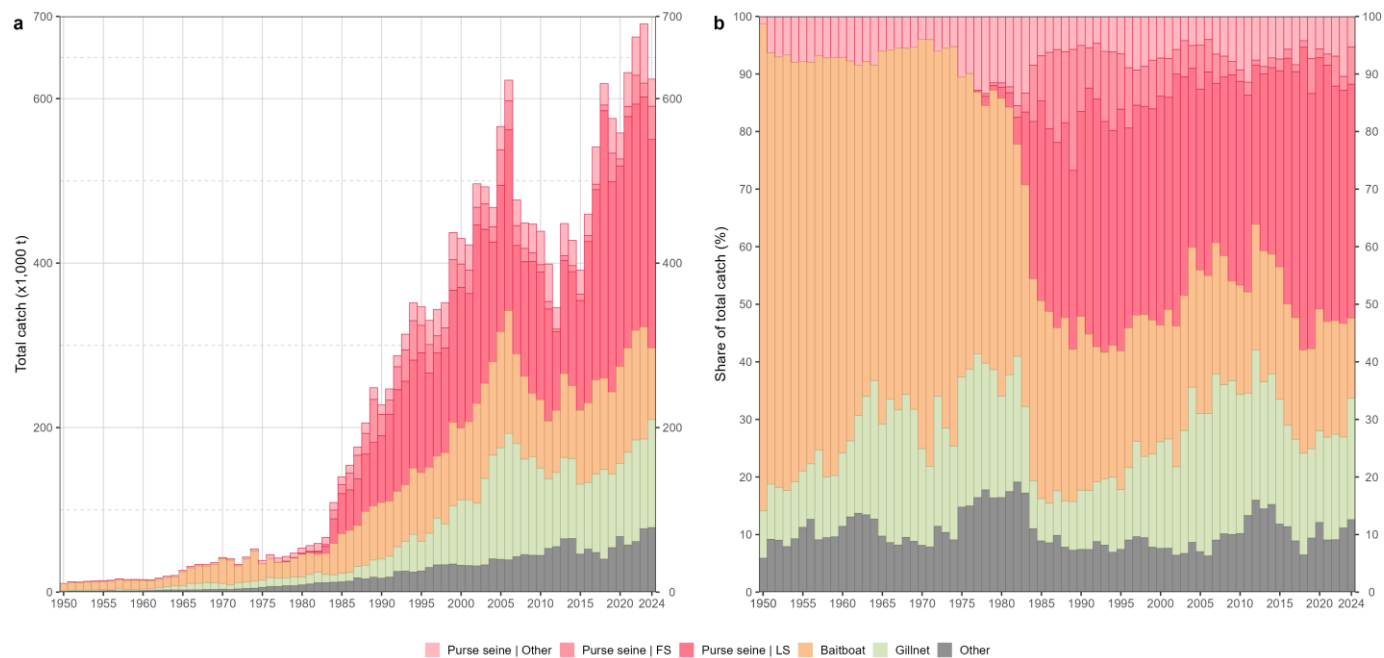


Figure 2: Annual time series of cumulative retained absolute (a) and relative (b) catches (t) of skipjack tuna by fishery for the period 1950-2024. LS = schools associated with floating objects; FS = free-swimming schools. Data source: raised time-area catches

Table 2: Best scientific estimates of annual retained catches (t) of skipjack tuna by fishery for the period 2015-2024. The background intensity color of each cell is directly proportional to the catch level. Data source: raised time-area catches

Fishery	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Purse seine   Other	28,995	26,252	45,428	26,094	42,288	31,606	41,302	46,657	72,075	33,081
Purse seine   FS	7,971	7,139	6,586	6,943	34,795	8,518	12,125	35,038	16,687	40,402
Purse seine   LS	133,374	196,229	231,248	325,101	255,445	243,713	281,381	274,986	279,783	253,387
Longline   Other	0	6	1	0	1	1	0	0	0	4
Longline   Fresh	1,040	280	424	457	334	231	189	456	457	604
Longline   Deep-freezing	53	135	64	59	60	65	49	68	109	125
Line   Coastal longline	7,583	8,013	7,448	5,954	10,327	10,835	8,598	7,331	9,984	13,699
Line   Trolling	22,475	26,866	17,955	21,495	23,298	21,583	23,063	29,061	35,540	16,334
Line   Handline	9,331	13,472	16,883	9,347	15,624	28,815	19,837	18,747	23,774	40,725
Baitboat	89,909	96,912	114,366	111,008	99,953	118,042	126,822	133,267	136,172	86,874
Gillnet	84,916	80,915	95,602	109,021	89,369	88,852	112,796	123,676	109,171	131,556
Other	5,761	3,454	5,354	2,765	4,418	5,996	5,508	5,710	7,106	6,967
<b>Total</b>	<b>391,408</b>	<b>459,672</b>	<b>541,359</b>	<b>618,246</b>	<b>575,912</b>	<b>558,255</b>	<b>631,669</b>	<b>674,997</b>	<b>690,860</b>	<b>623,759</b>

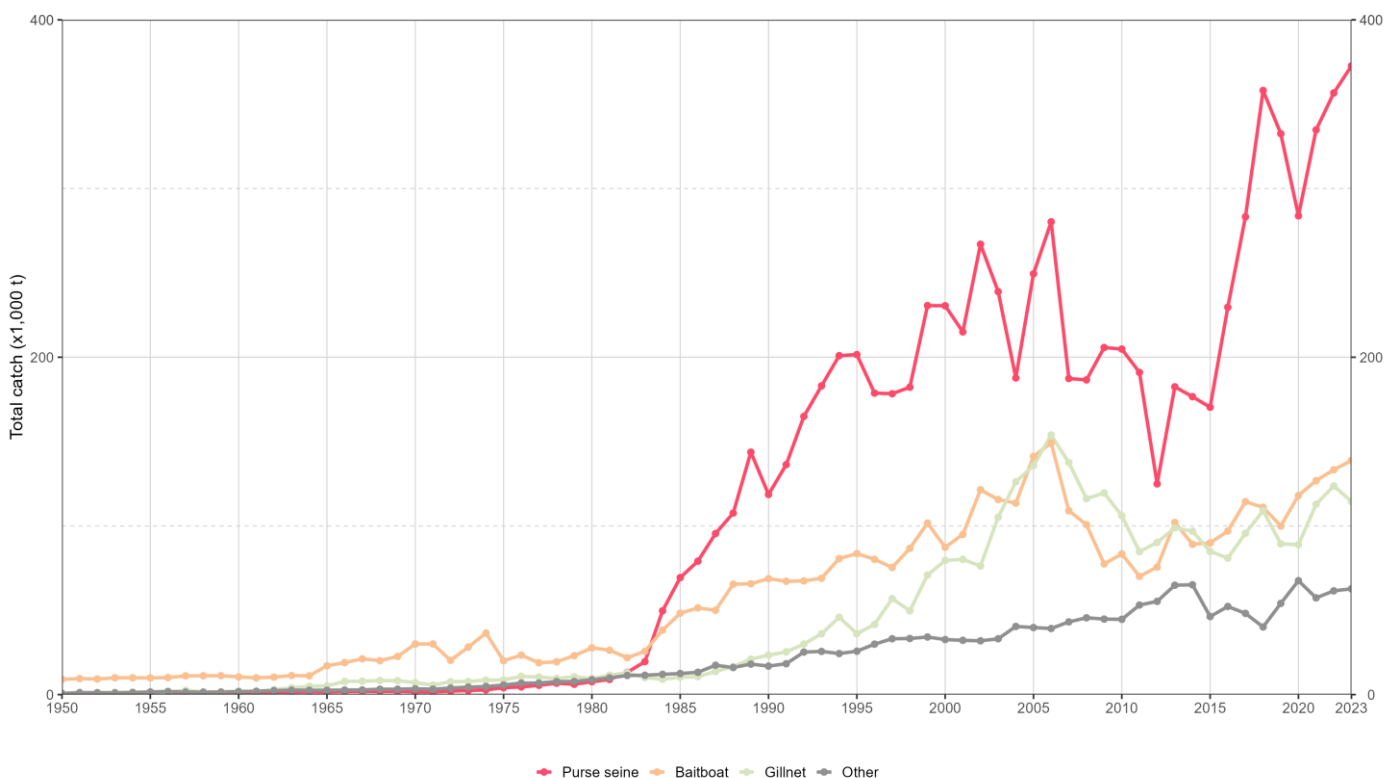


Figure 3: Annual time series of retained catches (t) of skipjack tuna by fishery group for the period 1950-2024. Data source: [best scientific estimate of retained catches](#)

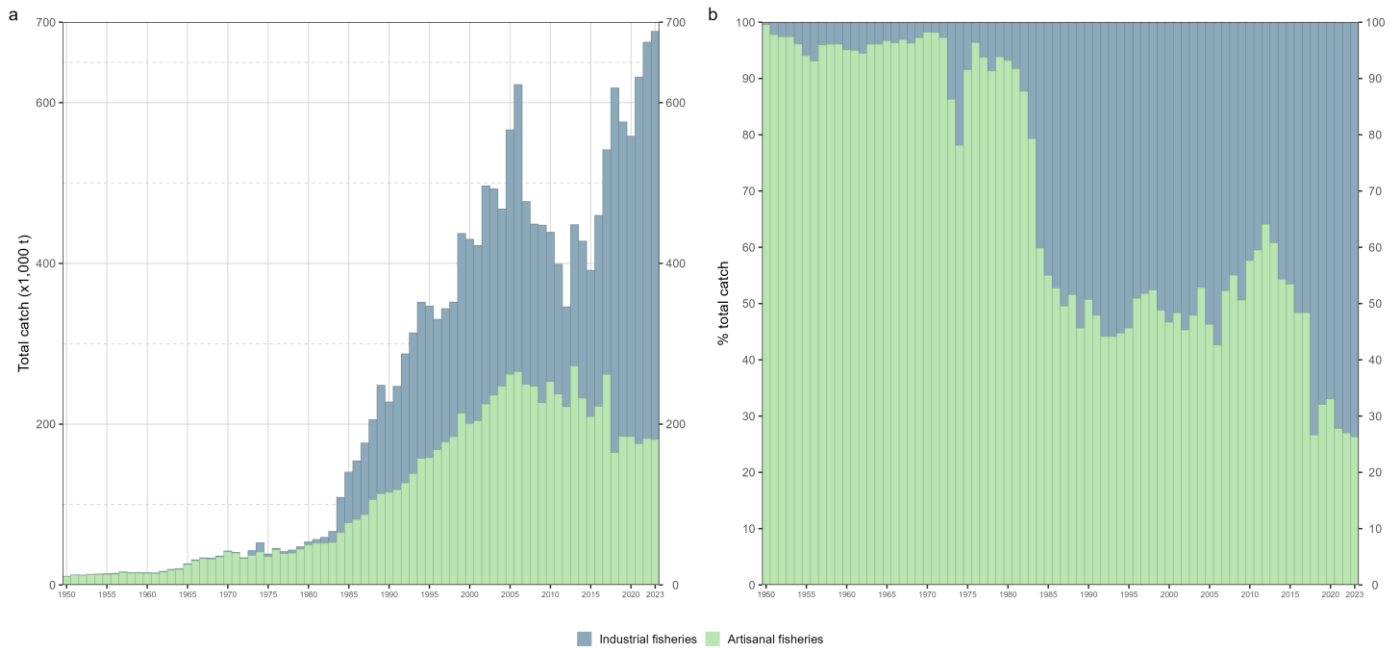


Figure 4: Annual time series of cumulative retained absolute (a) and relative (b) catches (t) of skipjack tuna by type of fishery for the period 1950-2024. Data source: [best scientific estimate of retained catches](#)

## Fishery type catch trends

### Artisanal fisheries

Artisanal fisheries were increasing between the 1950s, eventually peaking at 272,000 tonnes in 2013. Catches fluctuated from 2014 onward and declined, largely due to reclassification of some fleets (e.g., Maldives and Iran), when coastal fisheries operating outside national jurisdiction areas were reassigned to *offshore* (industrial) categories. Fluctuations in skipjack tuna catches are largely driven by interannual variability in Indonesian coastal fisheries. In addition, the disaggregation of Sri Lankan fisheries, previously grouped as gillnet/longline into more detailed categories, resulted in a reduction in reported artisanal skipjack catches (**Fig. 4**).

Industrial fisheries similarly exhibit a strong increasing trend, particularly from the 1980s with the introduction of purse seine fisheries using dFOBs. The overall catches of the industrial fisheries declined during 2009-2012, reaching a low of 124,000 tonnes in 2012 due to piracy-related disruptions, but resumed again from 2014. A slight decline occurred again in 2020, likely associated with reduced fishing activity during the COVID-19 pandemic (**Fig. 4**).

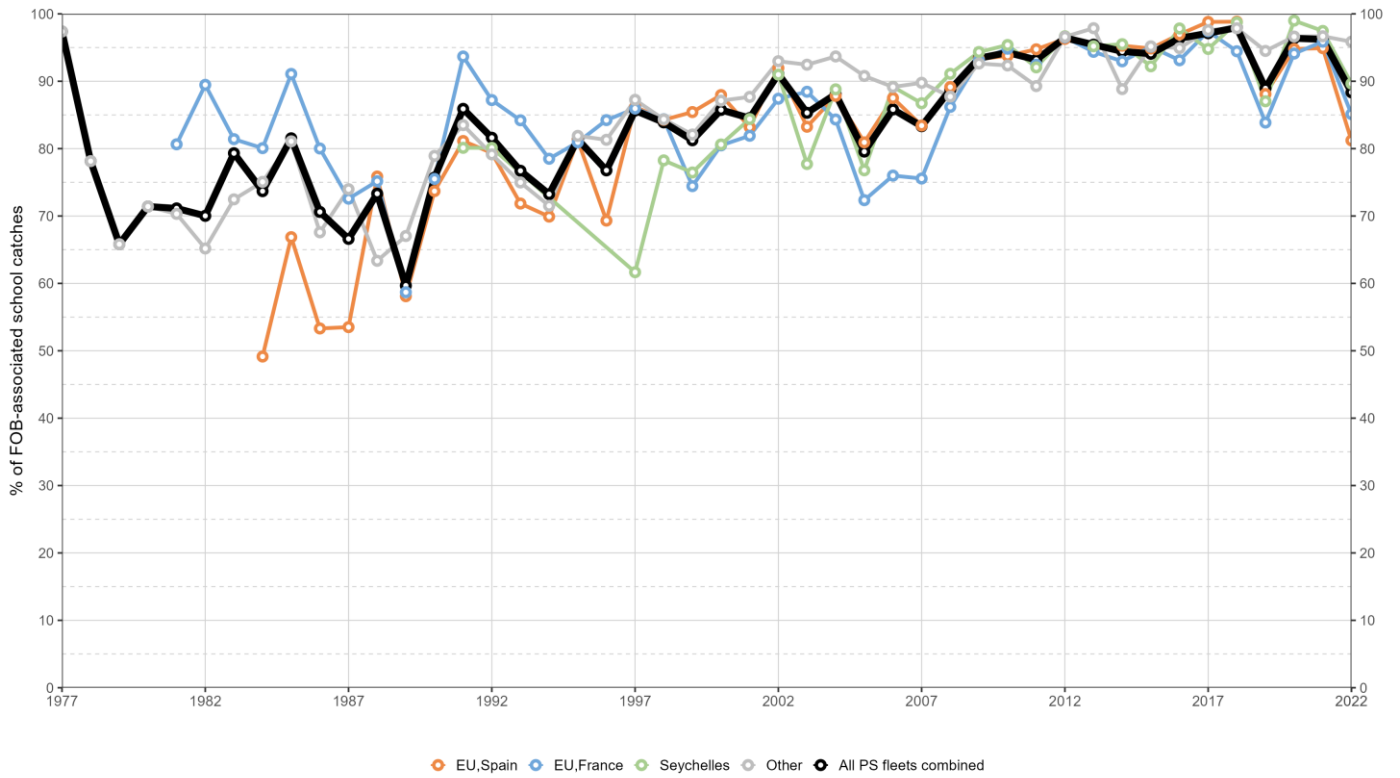


Figure 5: Annual percentages of purse seine FOB-associated catches of skipjack tuna by fleet for the period 1977-2024. *Other* includes purse seine fleets such as ex-Soviet Union, I.R. Iran, France (Mayotte), Mauritius, Japan, Korea, Indonesia, Thailand, EU,Italy, Belize, and others. Data source: [time-area catch dataset for purse seine fisheries](#) (Res. 15/02)

### Main fishery features (2020-2024)

Purse seine fisheries (PSLS, PSFS, PSOT) remain the dominant source of skipjack tuna catches in recent years, contributing around 52.7% (Table 3). Indonesia is the largest contributor overall with 22% , with its purse seine fisheries (coastal and industrial) accounting for 12.9% (Fig. 6). The Maldivian baitboat fishery follows at 17.5% . High catches from industrial purse seine fisheries are largely driven by three major fleets, EU (Spain and France) and Seychelles, which together contribute 31.4% of recent catches (Fig. 6).

Table 3: Mean annual catches of skipjack tuna (t) by fishery between 2020 and 2024. LS = schools associated with floating objects; FS = free-swimming schools. Data source: raised time-area catches

Fishery	Fishery code	Catch	Percentage
Purse seine   LS	PSLS	266,650	41.9
Baitboat	BB	120,236	18.9
Gillnet	GN	113,210	17.8
Other	OT	68,314	10.7
Purse seine   Other	PSOT	44,944	7.1
Purse seine   FS	PSFS	22,554	3.5

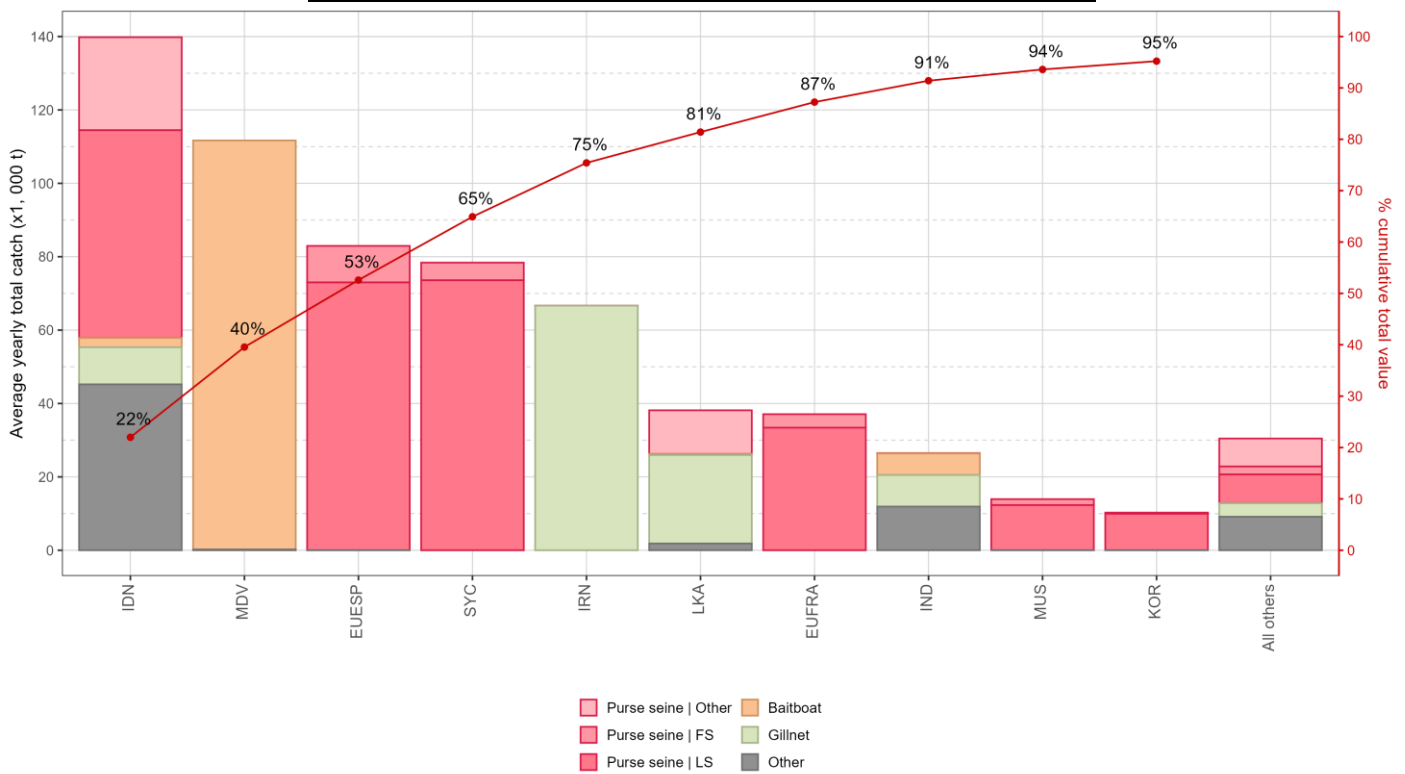


Figure 6: Mean annual catches of skipjack (t) tuna by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. FS = free-swimming schools; LS = schools associated with floating objects. Data source: raised time-area catches

Catch trends for 2020-2024 indicate generally stable levels across most fishery groups, although some declined in 2024 (Fig. 7).

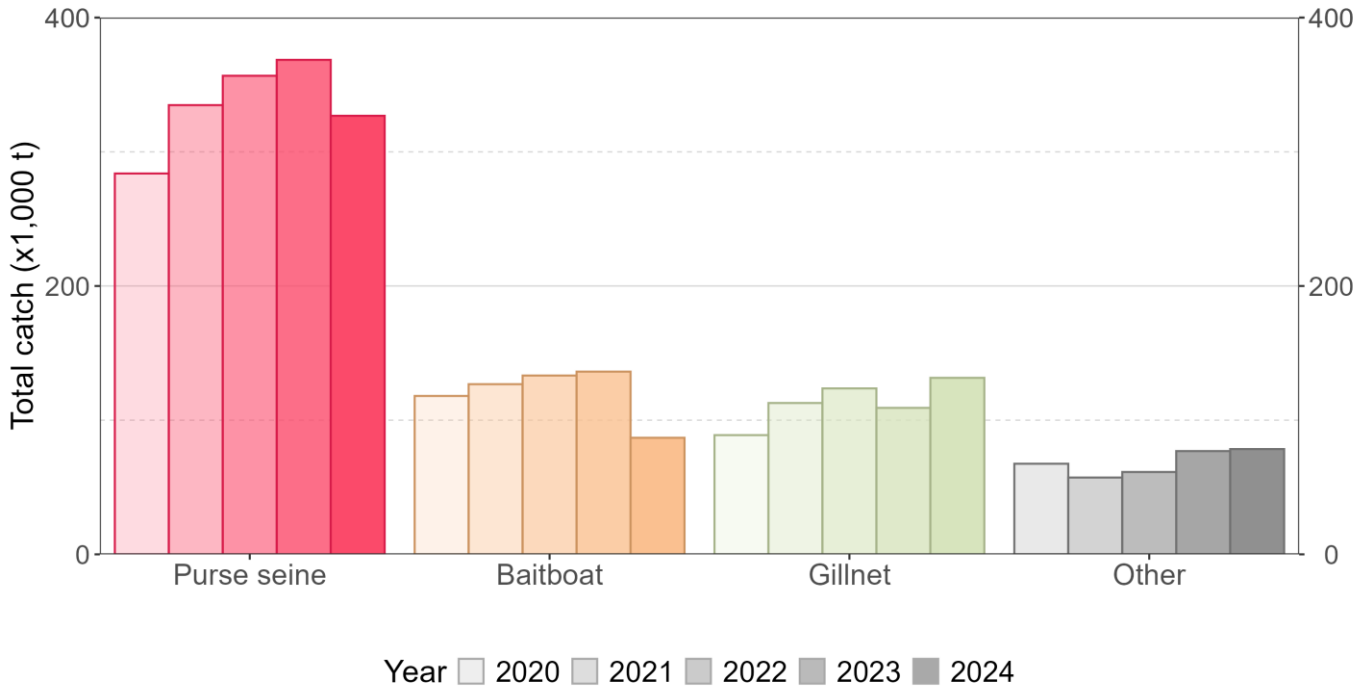


Figure 7: Annual catch (t) trends of skipjack tuna by fishery group between 2020 and 2024. Data source: [best scientific estimate of retained catches](#)

Overall purse seine catches increased from 2020 to 2023, followed by a slight decrease in 2024 (Fig. 7). Among purse seine fishing modes, dFOB-associated operations showed reduced catches across most major fleets in 2024. EU-Spain catches from dFOBs declined by 37% (-27,000 tonnes) between 2023 and 2024, with smaller decreases observed for Seychelles and EU-France fleets. In contrast, catches from free-school and coastal purse seine fisheries increased in 2024 across major fleets (Fig. 8).

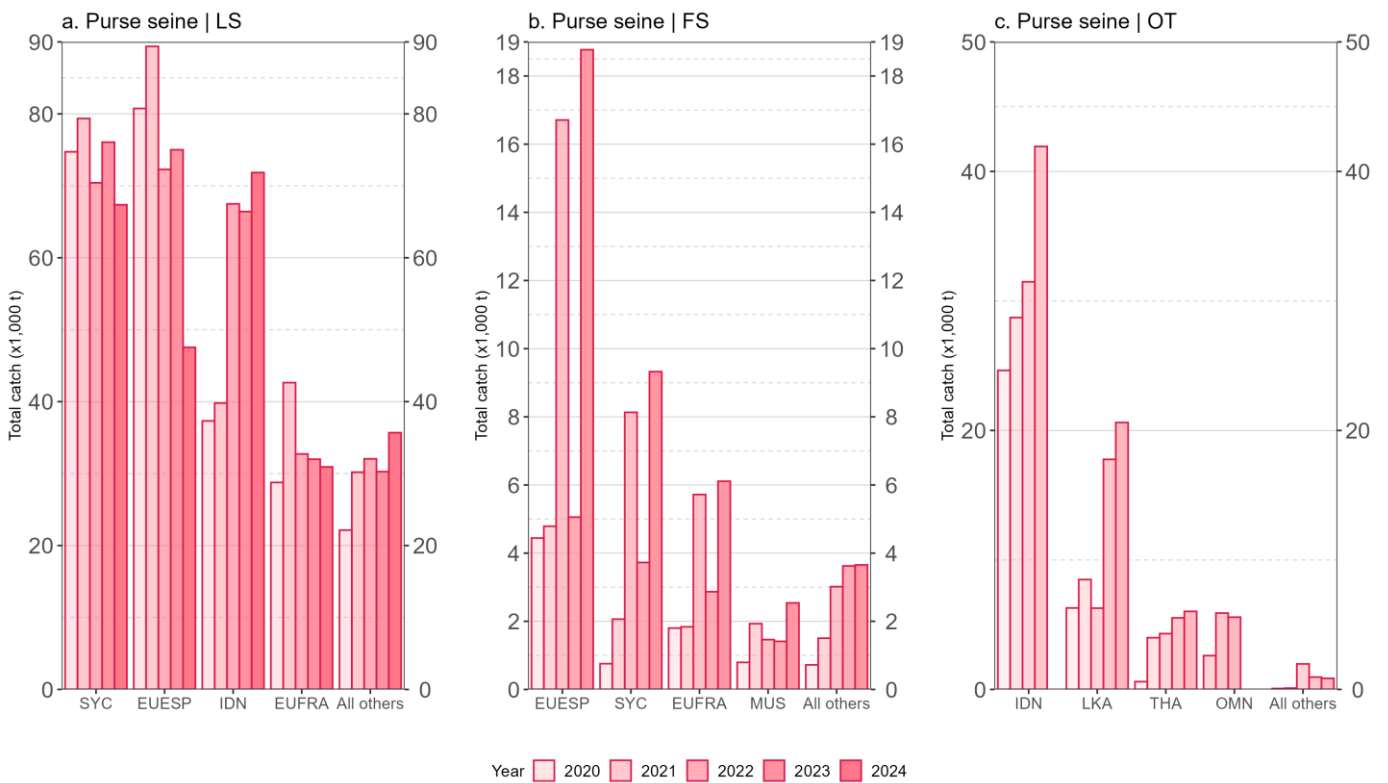


Figure 8: Annual purse seine catch (t) trends of skipjack tuna by fishing mode and fleet between 2020 and 2024. FS = free-swimming schools; LS = schools associated with floating objects. Data source: raised time-area catches

Similar to purse seine fisheries, baitboat fisheries showed generally stable catch trends between 2020 and 2023, followed by a decline in 2024 (**Fig. 7**). Catches from the Maldives, which account for over 90% of baitboat skipjack catches, decreased by 38% between 2023 and 2024. Although Indonesia’s baitboat catches are relatively small, they declined sharply over the same period, reaching nearly zero in 2024 (**Fig. 9**).

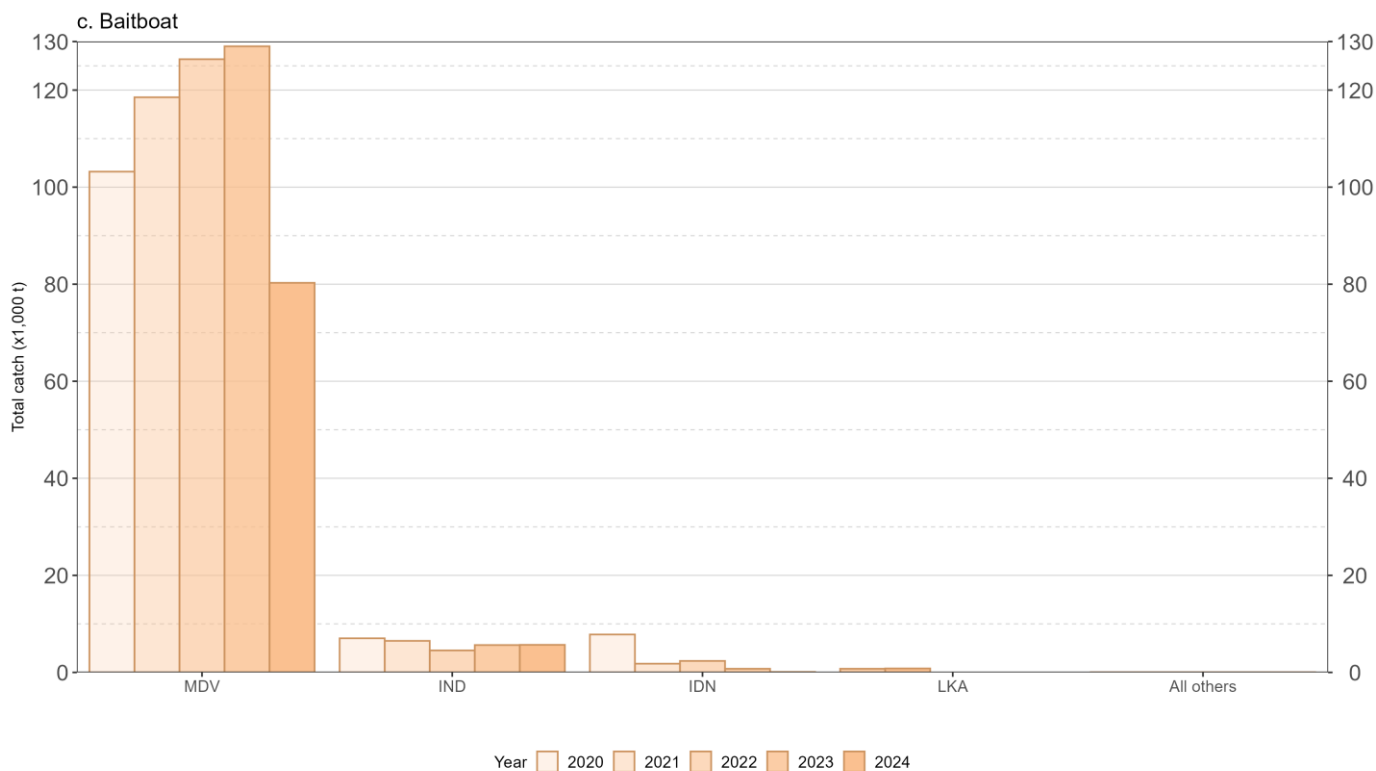


Figure 9: Annual baitboat fisheries catch (t) trends of skipjack tuna by fleet between 2020 and 2024. Data source: raised time-area catches

Gillnet fisheries show an overall increasing trend in recent years (**Fig. 7**). However, the principal fleet, Iran, exhibits a decline from a peak of 79,000 tonnes in 2022 to 70,000 tonnes in 2024. This reduction reflects the continued conversion of gillnet vessels to longline gear targeting yellowfin tuna ([Roshan 2024](#)). In contrast, other gillnet fleets, particularly India and Indonesia, have shown increasing catch trends in recent years (**Fig. 10**).

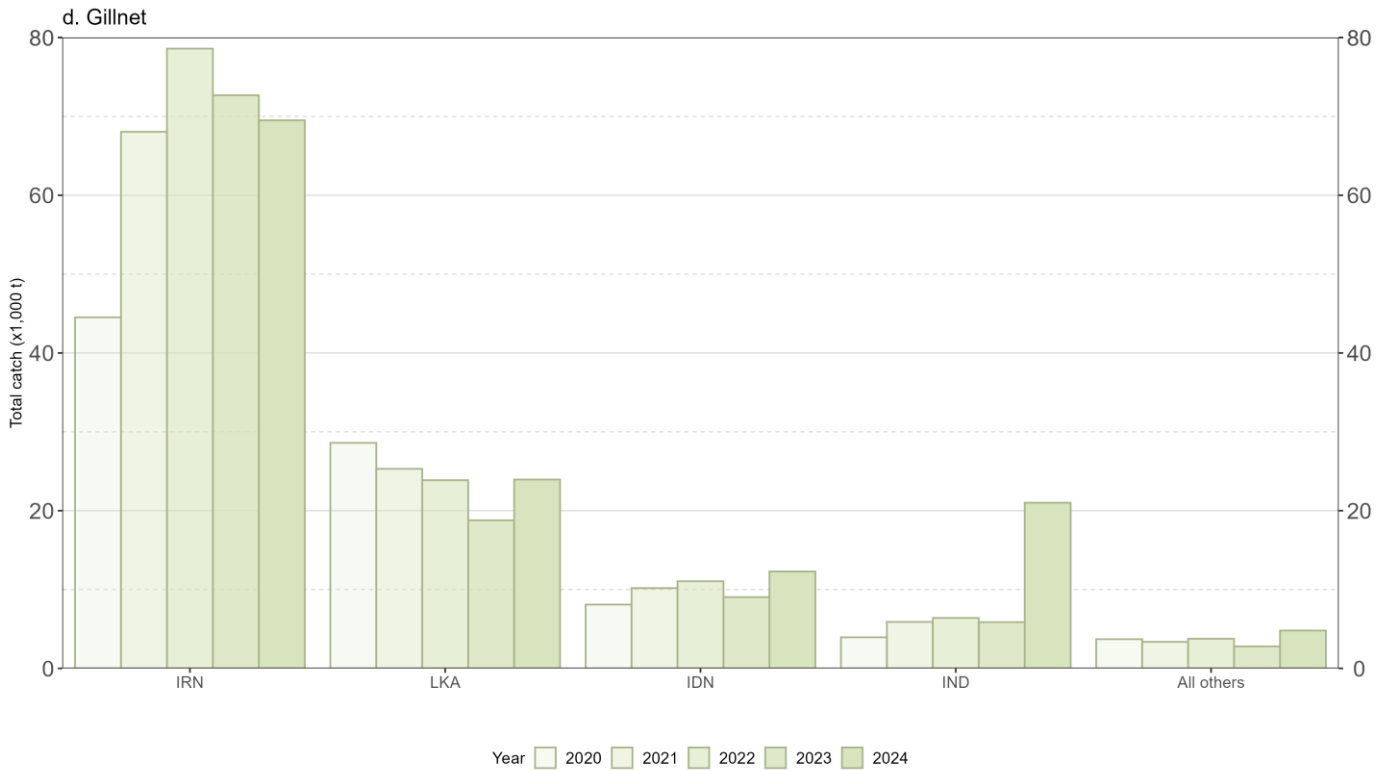


Figure 10: Annual gillnet fisheries catch (t) trends of skipjack tuna by fleet between 2020 and 2024. Data source: raised time-area catches

Line and related fisheries (handline, troll line, and coastal longline) show variable catch trends since 2020. Notably, skipjack tuna catches from Indonesian “other fisheries” increased markedly, with 2024 catches doubling those reported in 2021. This rise reflects higher reported catches from the handline fishery in 2024. Despite recent re-estimation of historical catches by Indonesia, inconsistencies remain, particularly in recent estimates. Catches from other fleets declined or remained low in 2024 (Fig. 11).

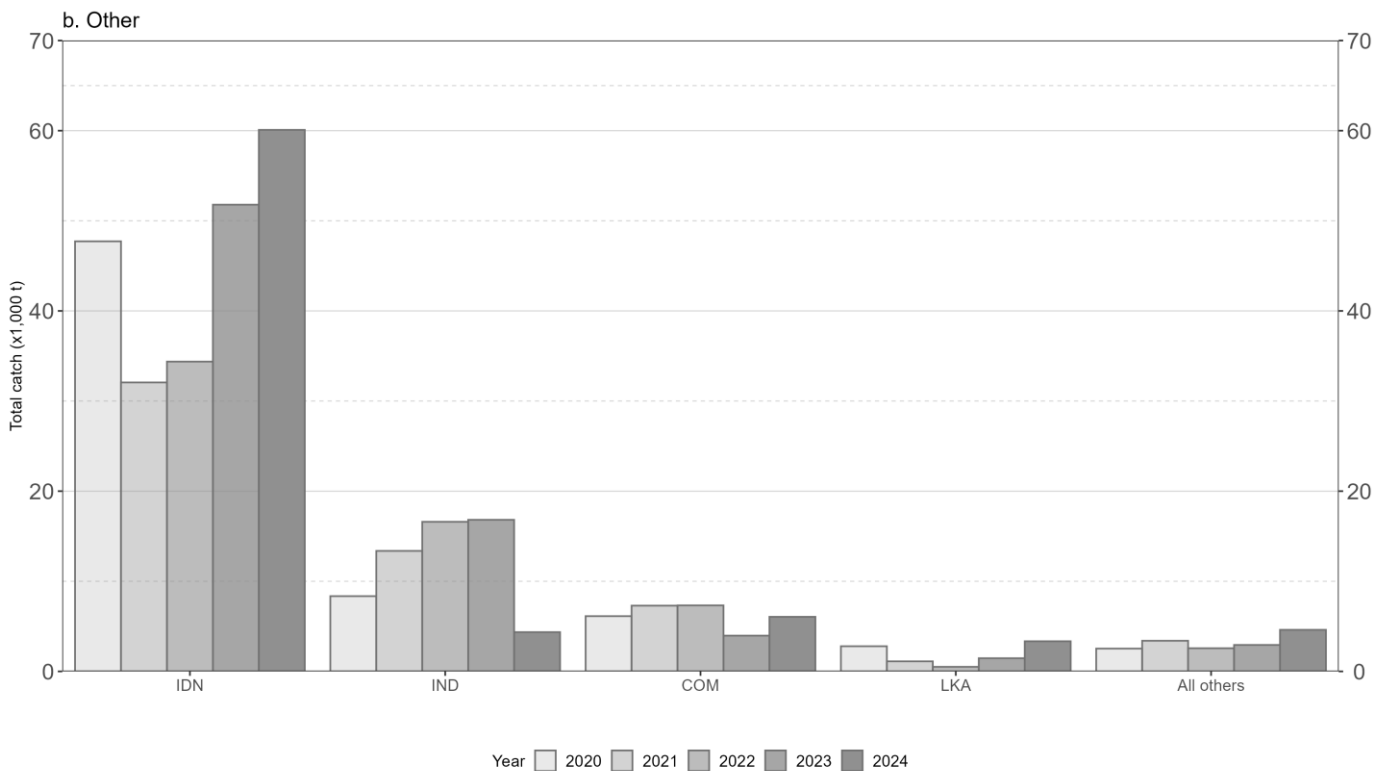


Figure 11: Annual other fisheries catch (t) trends of skipjack tuna by fleet between 2020 and 2024. Data source: raised time-area catches

## Changes from previous WPTT

Only minor changes were made to the time series of best scientific estimates of skipjack tuna catches between the [WPTT27](#) assessment meeting (October 2025) and the current [WPTT28\(DP\)](#) data preparation (June 2026). Total skipjack catches for 2024 are approximately -700 tonnes lower than previously reported at [WPTT27](#) in October 2025. Revisions to catch data submitted by CPCs after [WPTT27](#) were limited to Seychelles and India. Seychelles revised its 2024 purse seine catches downward by -1,200 tonnes. India updated catches across all fisheries, mainly adjusting allocations by fishing ground and fishery; however, its total skipjack catch increased by 300 tonnes. Minor changes were also made to data from non-reporting countries derived from secondary sources, [FAO](#) which released 2024 data in March 2026, including updated catches for Yemen and Timor-Leste. Revisions for Sri Lanka reflect internal adjustments to the assignment of catches by area within the database.

In contrast, substantial revisions have been made since the previous assessment ([WPTT25](#), 2023), (**Fig. 12**), including:

- Indonesia's re-estimation of historical catches from the 1950s, resulting in both upward and downward annual revisions;
- Revisions to 2018 purse seine catch data by EU-Spain;
- Updates to EU Italy catches for 2015–2022;
- Additional revisions from Bangladesh (>2020), Oman (2022), and India (2022);
- FAO updates from 2012 onward, affecting catches for Timor-Leste, Yemen, and other countries.

[Appendix 1](#) illustrate the differences in catches between WPTT25 and WPTT28 for the period 2014 and 2022, by year, fleet, fishery group and area

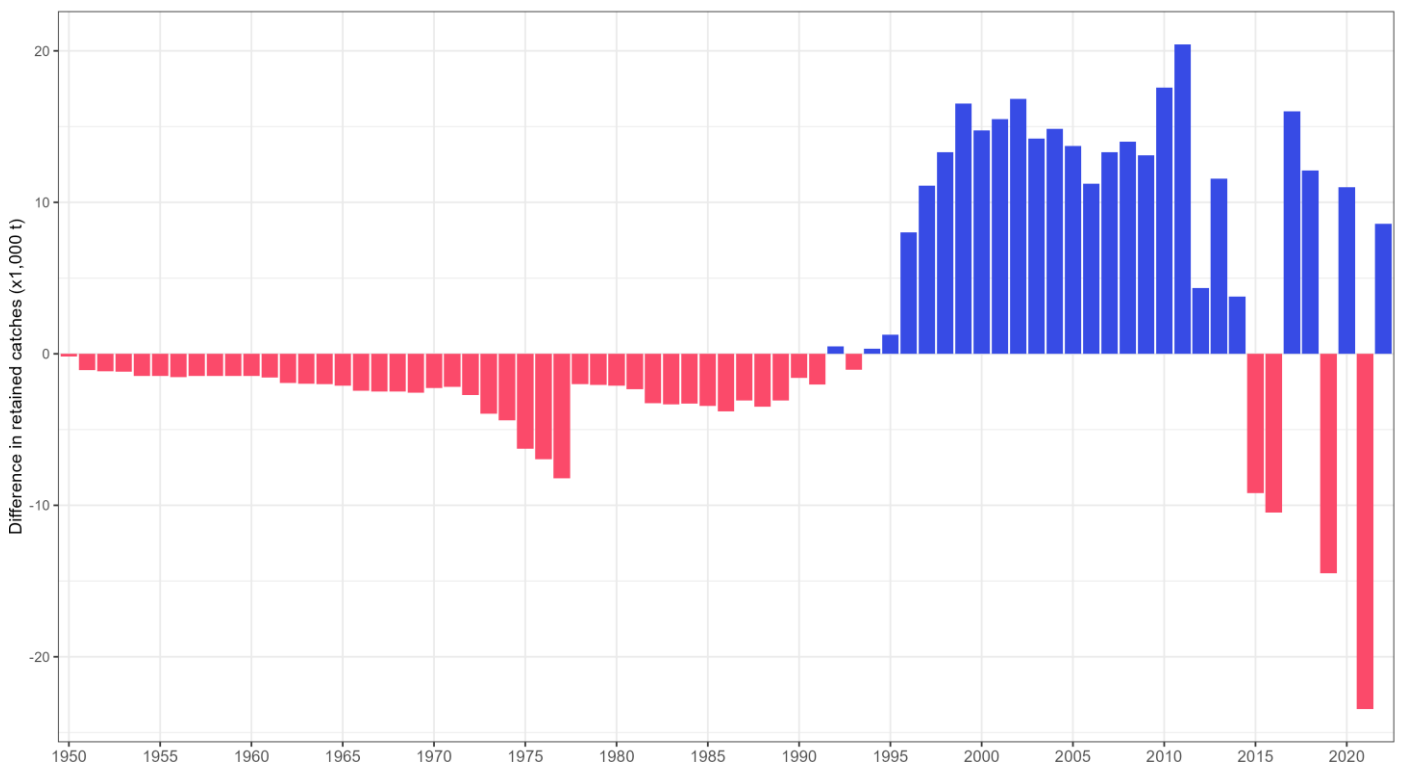


Figure 12: Differences in the available best scientific estimates of retained catches (t) of skipjack tuna between this WPTT and its previous session ([WPTT25](#) October 2023)

## Uncertainties in retained catch data

### Reporting quality

The quality of reported retained skipjack tuna catches submitted to the IOTC Secretariat varies over time (**Fig. 13**) and is largely influenced by the contribution of coastal fisheries. As a major contributor, Indonesia's historical data revisions since the 1950s reflect improved availability of coastal fisheries data. Although data quality was lower in the mid-2000s due to non-reporting, coverage has improved to near 100% in recent years. However, uncertainty estimates do not capture all underlying data limitations, including differences in data collection, sampling, and coverage.

Historical catch estimates for some CPCs remain uncertain due to incomplete or missing data, and in some cases have been repeated. Several coastal countries are currently undertaking efforts to re-estimate historical catches using available fisheries information.

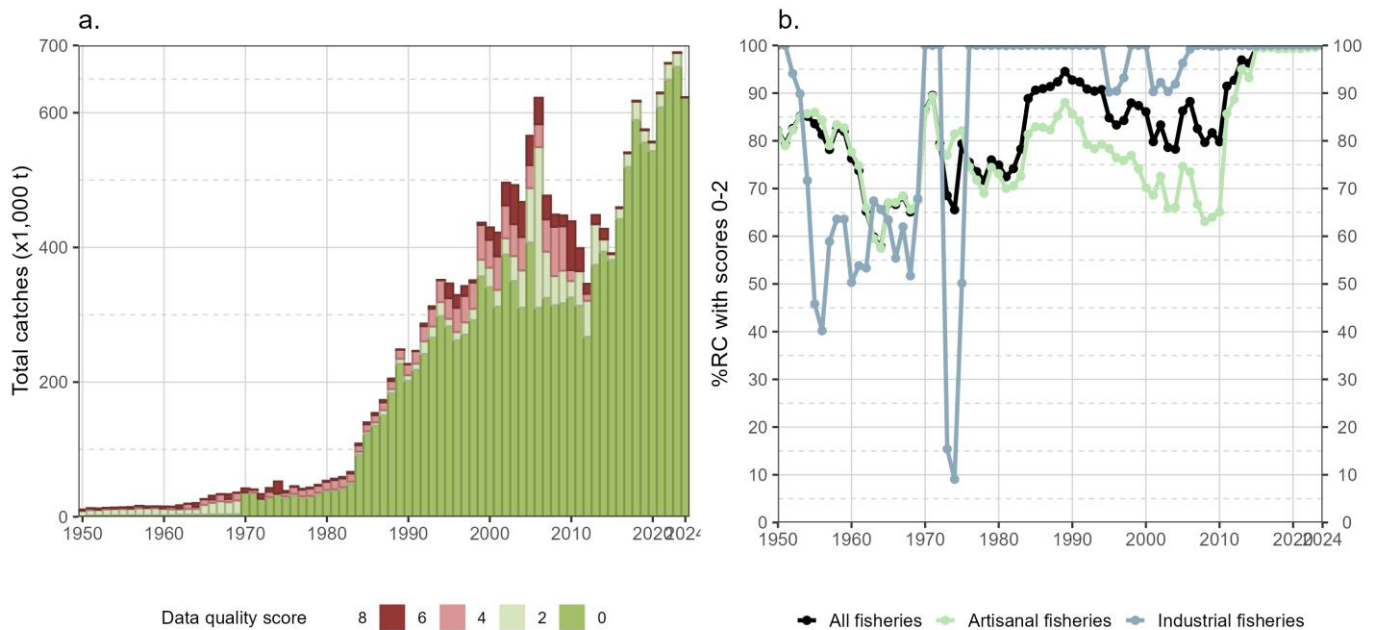


Figure 13: Annual retained catches (t) of skipjack tuna estimated by quality score (barplot) and percentage of nominal catch fully/partially reported to the IOTC Secretariat (lines with dots) for all fisheries (a) and by type of fishery (b), in the period 1950-2024

## Geo-referenced catch

### Spatial distribution of catches

Historical geo-referenced data indicate baitboat fisheries from the 1950s to the 1980s in western Indian Ocean, prior to the expansion of purse seine operations (**Fig. 14**). The data also show the development of gillnet and line fisheries in the eastern Indian Ocean in the 1980s (**Fig. 14d**). The limited spatial distribution of skipjack tuna catches in the south-eastern Indian Ocean, despite high catches from Indonesia, reflects the scarcity of geo-referenced data reported by Indonesia before the 2020s. During the 1990s and 2000s, purse seine and baitboat fisheries expanded both catches and fishing grounds in the western Indian Ocean, while gillnet and line fisheries further developed in the north-eastern region (**Fig. 14e-f**). In recent years, spatial patterns have shifted, with industrial purse seine fleets moving towards the north-western Indian Ocean (Arabian Sea), alongside expansion of gillnet fisheries, particularly by Iran and Sri Lanka in the western Indian Ocean (**Fig. 15**).

Georeferenced catches by fishery and decade (1950-2009)

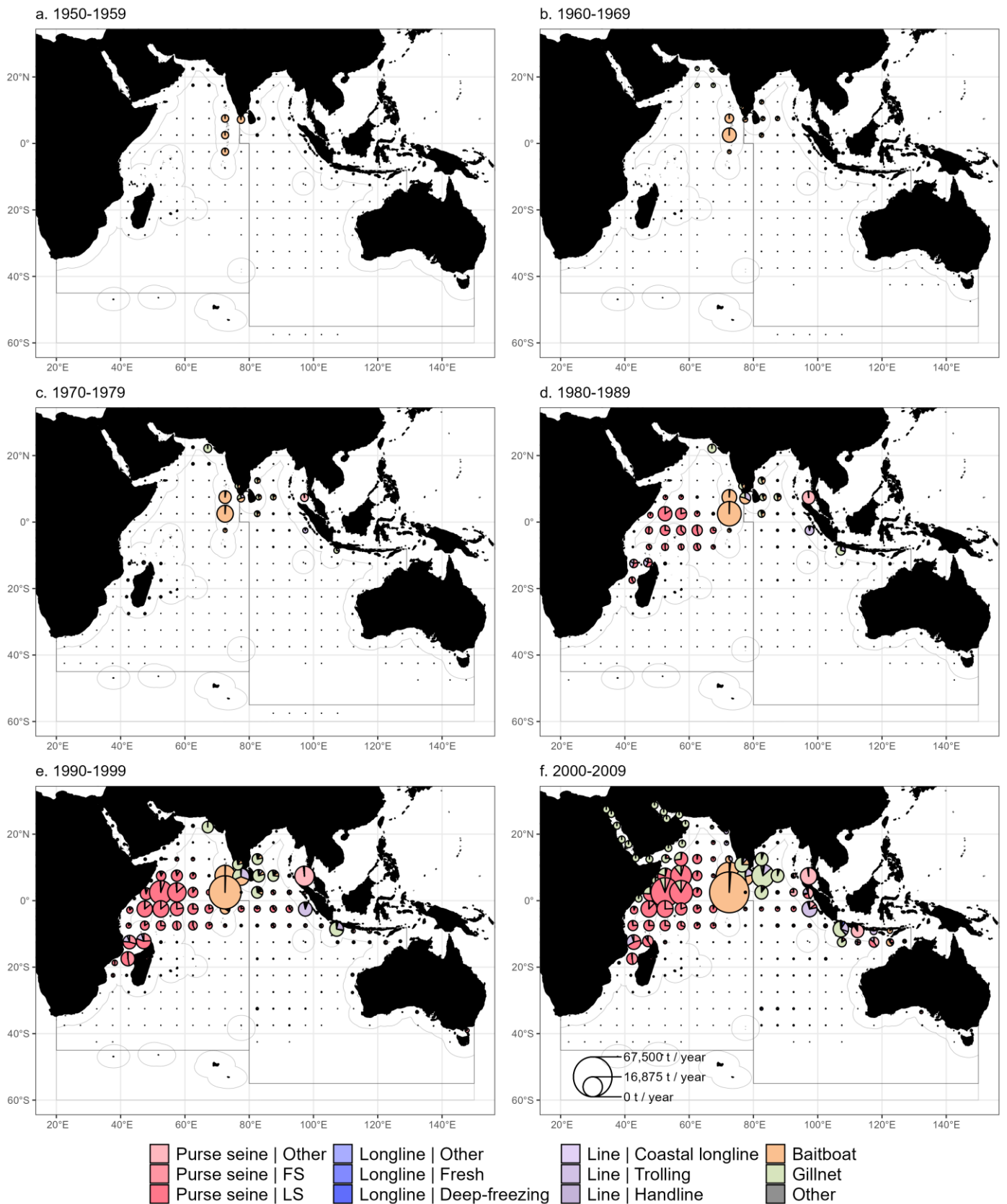


Figure 14: Estimated mean annual time-area catches (t) of skipjack tuna, by decade, 5x5 grid, and fishery. Data source: raised time-area catches

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

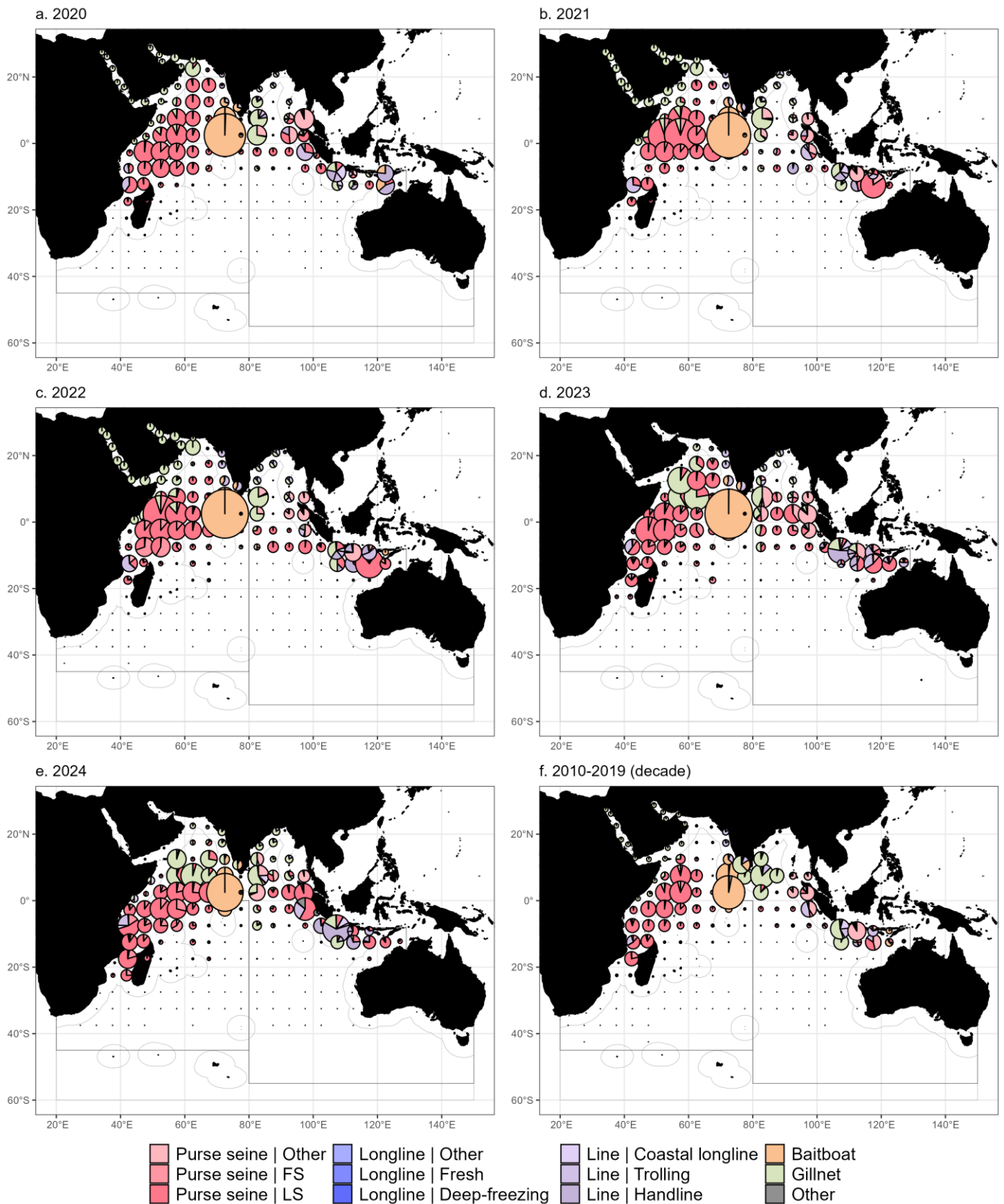


Figure 15: Estimated average annual time-area catches (t) of skipjack tuna, by year / decade, 5x5 grid, and fishery. Data source: raised time-area catches

Catch distributions from multiple Indonesian fisheries indicate operations mainly within national jurisdiction areas (NJAs), including industrial purse seine fisheries (Fig. 15d-e). Although re-estimated data suggest that industrial purse seine operations date back to the 1950s, the lack of geo-referenced information limits observed spatial patterns to more recent years.

## Uncertainties in catch and effort data

The availability of geo-referenced skipjack tuna catch data has varied considerably over time for both industrial and artisanal fisheries. Historically, such data were scarce or absent, particularly for coastal fisheries (**Fig. 16b**). Availability improved with the development of purse seine fisheries from the 1980s, although artisanal catch data increased in the 2000s without corresponding geo-referenced information, reducing overall data quality.

Key gaps in historical geo-referenced data remain for several major fleets:

- Indonesia's industrial purse seine catches, estimated from the 1950s, are only reported from 2018 with low logbook coverage;
- I.R. Iran's purse seine data are incomplete or missing prior to 2004;
- Sri Lanka's fisheries (since 2014) are affected by poor-quality effort data;
- Several coastal fisheries lack complete reporting, notably Comoros (until 2018), Indonesia (2018-2020), and India, Tanzania, and Pakistan.

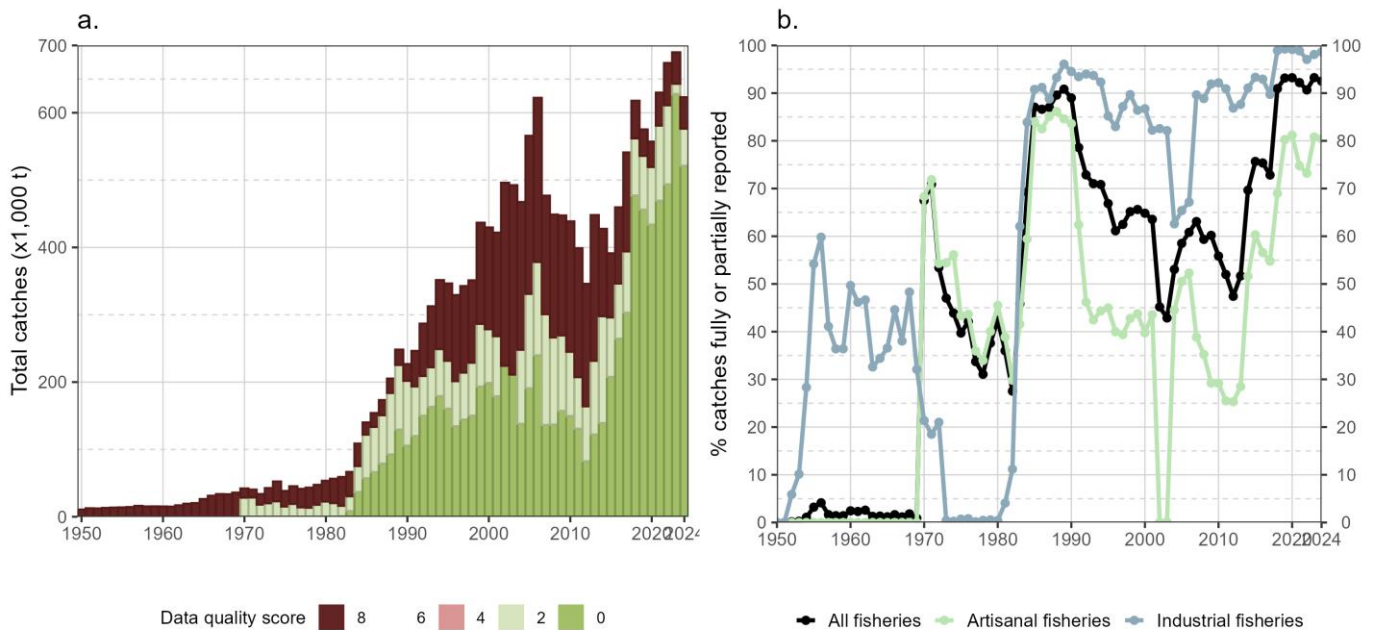


Figure 16: Annual retained catches (t) of skipjack tuna estimated by quality score (barplot) and percentage of geo-referenced catches reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02 (lines with dots) for all fisheries (a) and by type of fishery (b), in the period 1950-2024

The proportion of high-quality data (scores 0-2) ranged from 43% to 89% in the 1990s-2000s, improving to over 93% in recent years (**Fig. 16a-b**), despite a slight decline in 2024. Data availability has increased for key coastal fisheries, including Sri Lanka (since 2014), I.R. Iran (since 2007), and Indonesia (since 2018).

Nevertheless, geo-referenced catch and effort data remain unavailable for about 7% ( $\approx 50,000$  tonnes) of total skipjack catches in 2024, mainly from artisanal fisheries in India, Pakistan, and Tanzania, and from limited coverage in Indonesia. In addition, emerging Omani industrial fisheries still do not meet reporting requirements for geo-referenced data.

## Size composition of the catch

### Samples availability

#### By fishery group

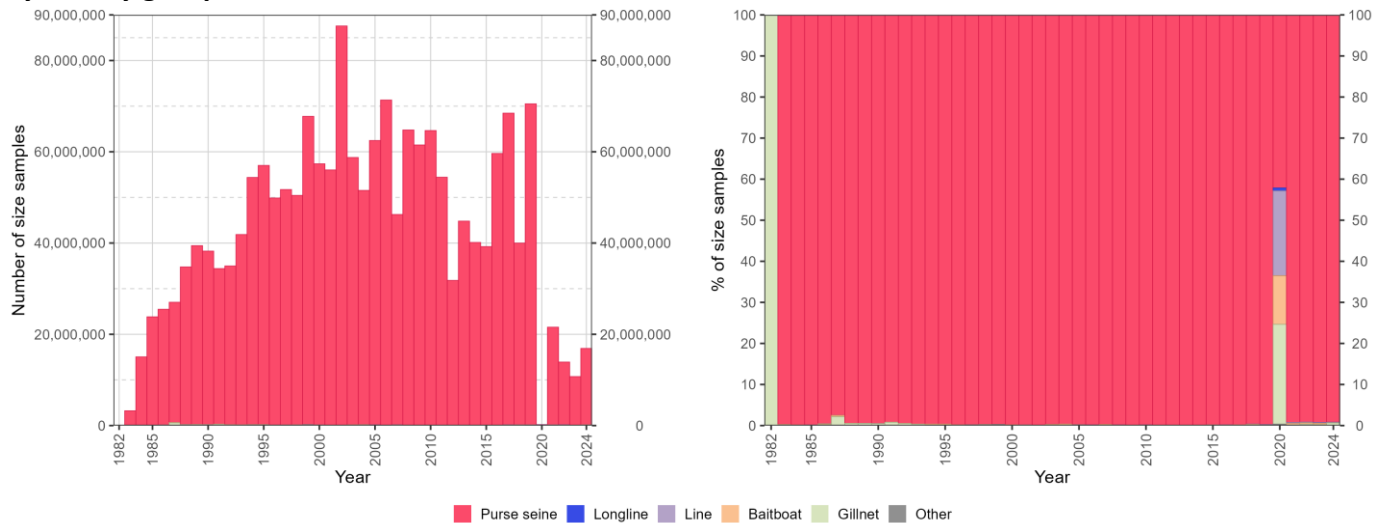


Figure 17: Availability of skipjack tuna size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and fishery group. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Comprehensive size-frequency data for skipjack tuna are only available from the early 1980s (see also [Uncertainties in size-frequency data](#)).

Most samples were collected following the development of purse seine fisheries and are reported as *raised* samples (i.e., scaled to represent catch-at-size by fleet and year). This explains the large sample sizes, which peaked at over 80 million individual length measurements in a single year (**Fig. 17**).

Other fisheries contribute only marginally to available samples, disproportionate to their actual catch levels (**Fig. 29**).

Due to the COVID-19 pandemic, size-frequency data from purse seine fisheries were largely unavailable in 2020, except for limited sampling by EU-France, Mauritius, and Seychelles. In recent years, the spatial distribution of samples by fishery type broadly reflects fishing grounds and is proportional to reported catch levels (**Fig. 18**).

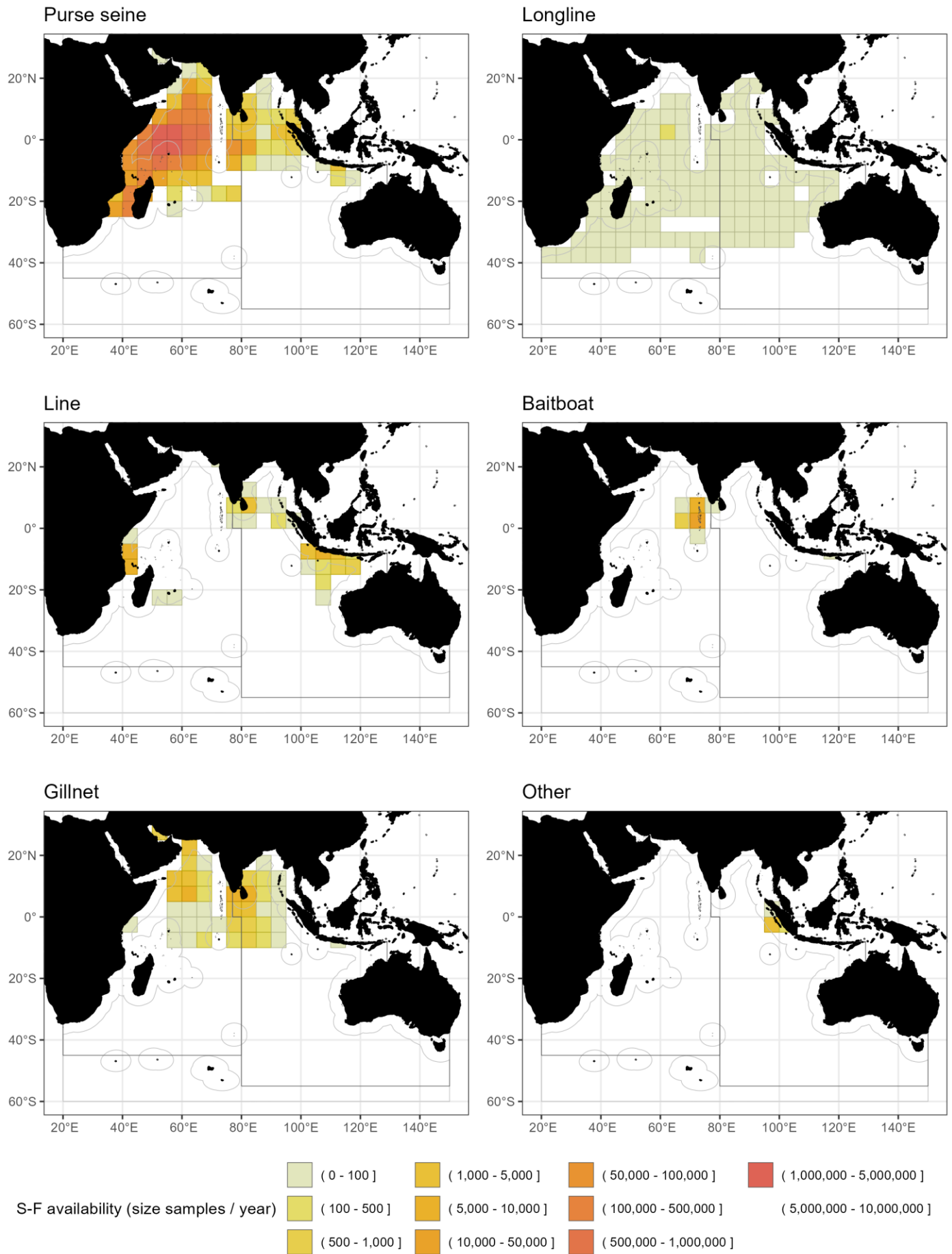


Figure 18: Spatial distribution (average number of samples per grid per year) of available skipjack tuna size-frequency data for each fishery group in the period 2020-2024. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

By fishery

Purse seine fisheries

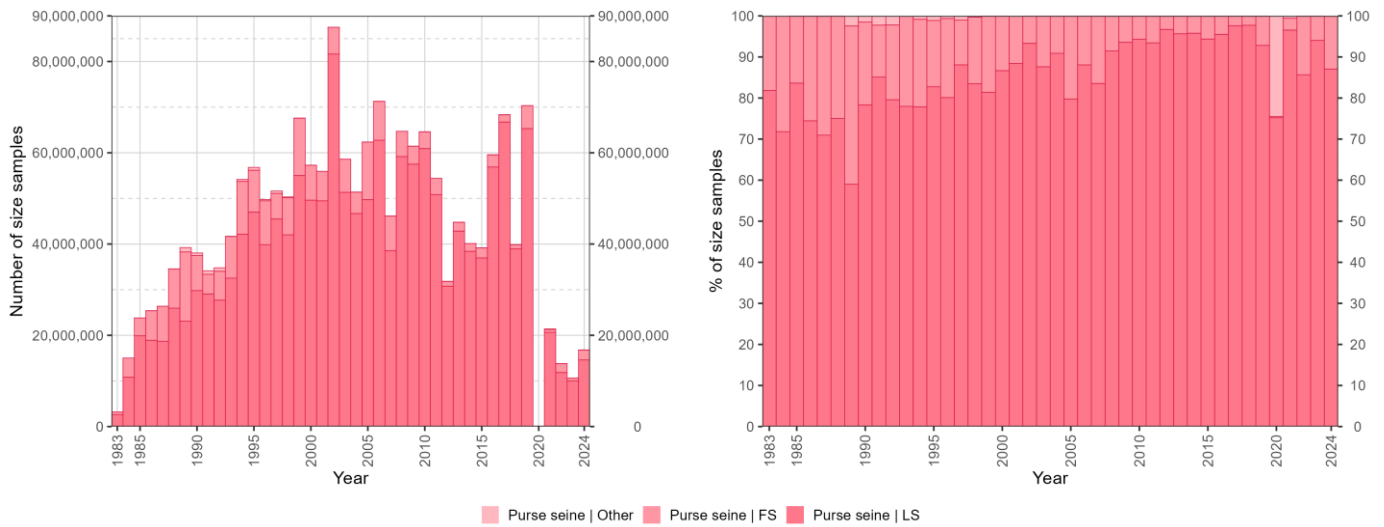


Figure 19: Availability of skipjack tuna size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and purse seine fishery type. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

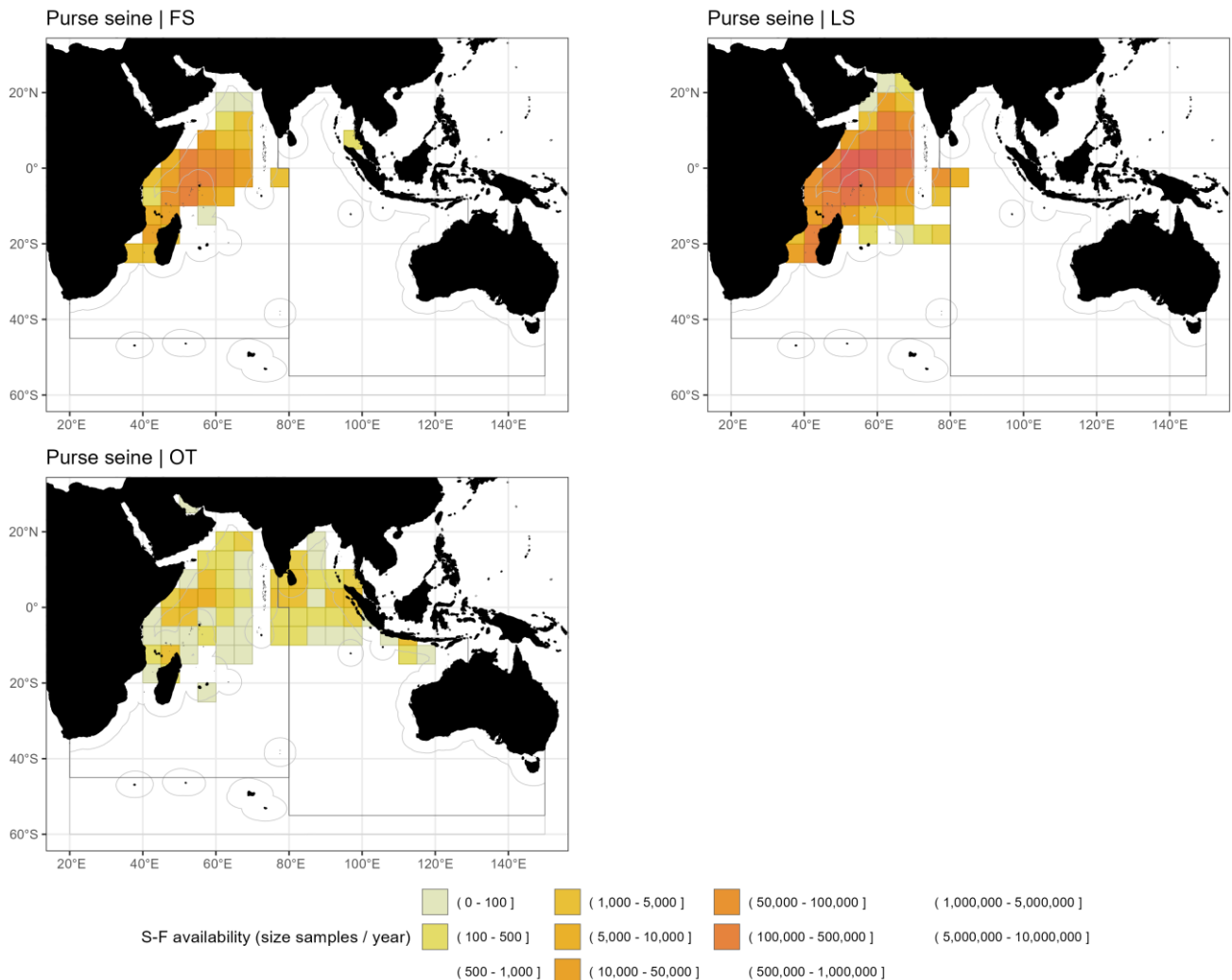


Figure 20: Spatial distribution (average number of samples per grid per year) of available skipjack tuna size-frequency data by purse seine fishery types in the period 2020-2024. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

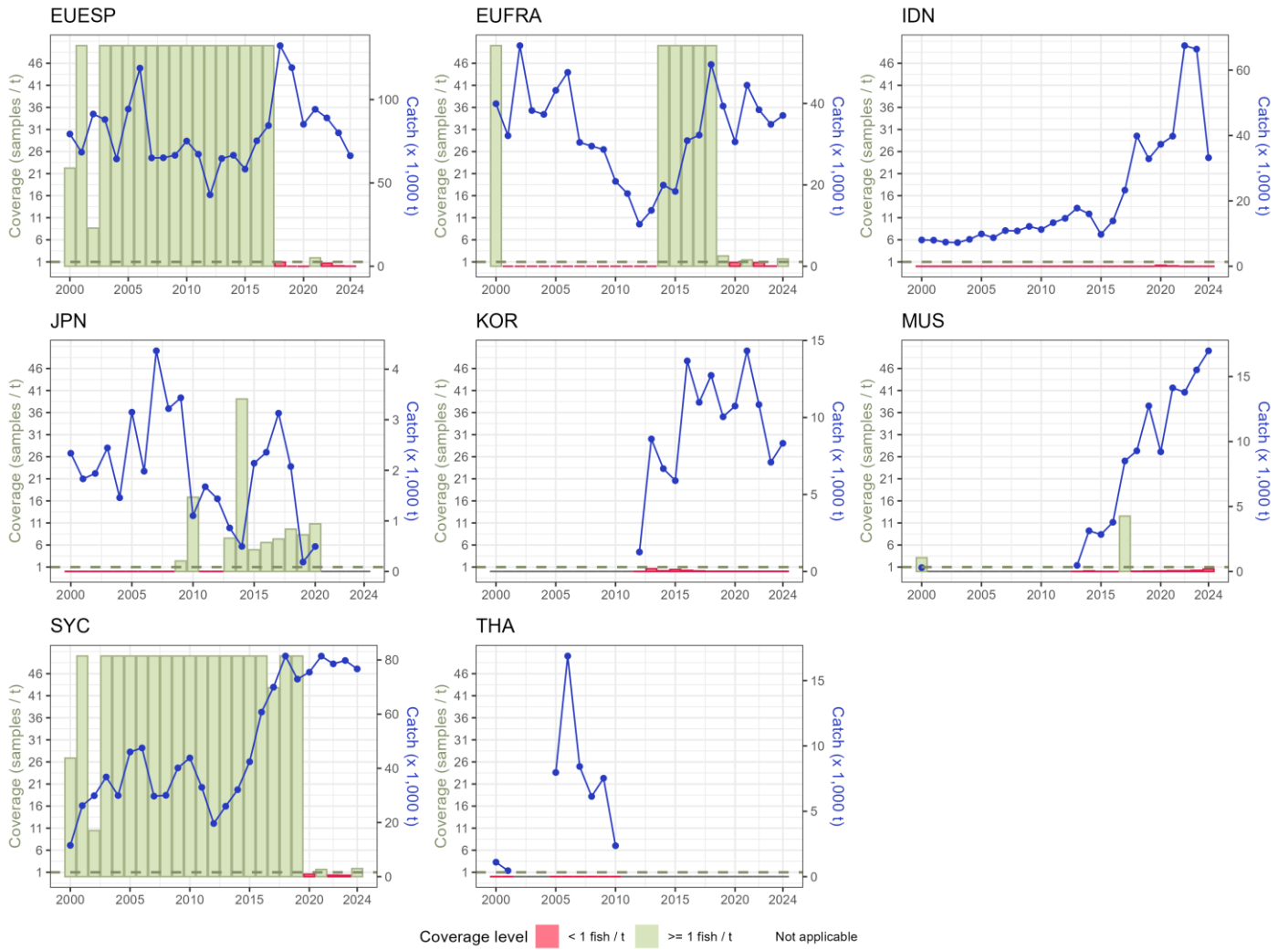


Figure 21: Size-frequency samples coverage (number of fish measured by t of retained catches) of skipjack tuna caught by the major industrial purse-seine fleets, by fleet and year (2000-2024). Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Longline fisheries

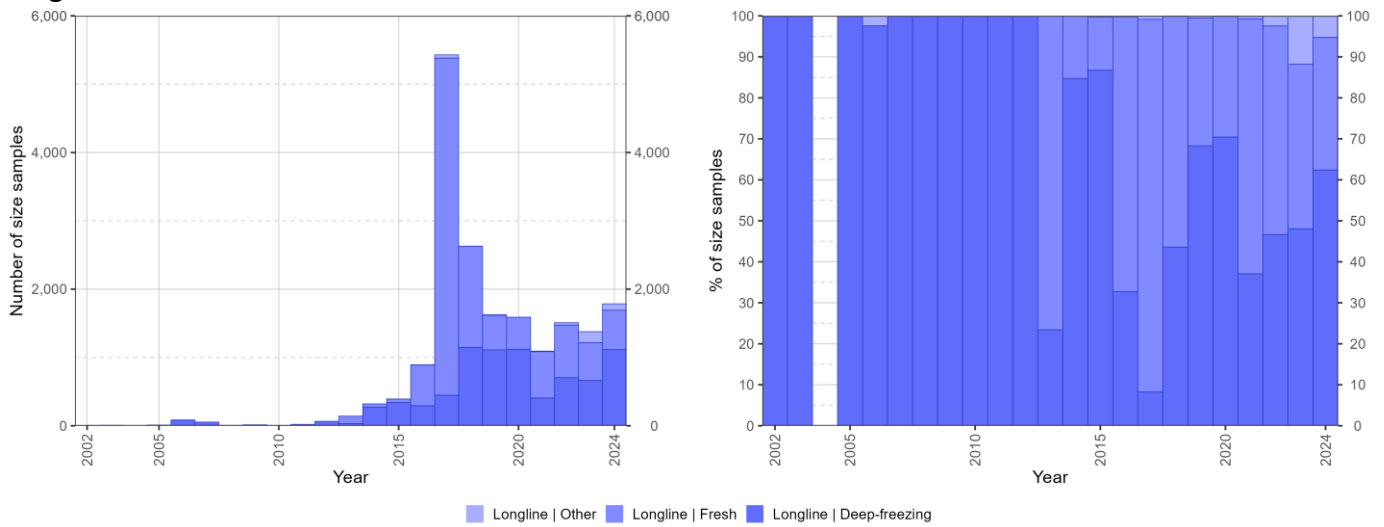


Figure 22: Availability of skipjack tuna size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and longline fishery type. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

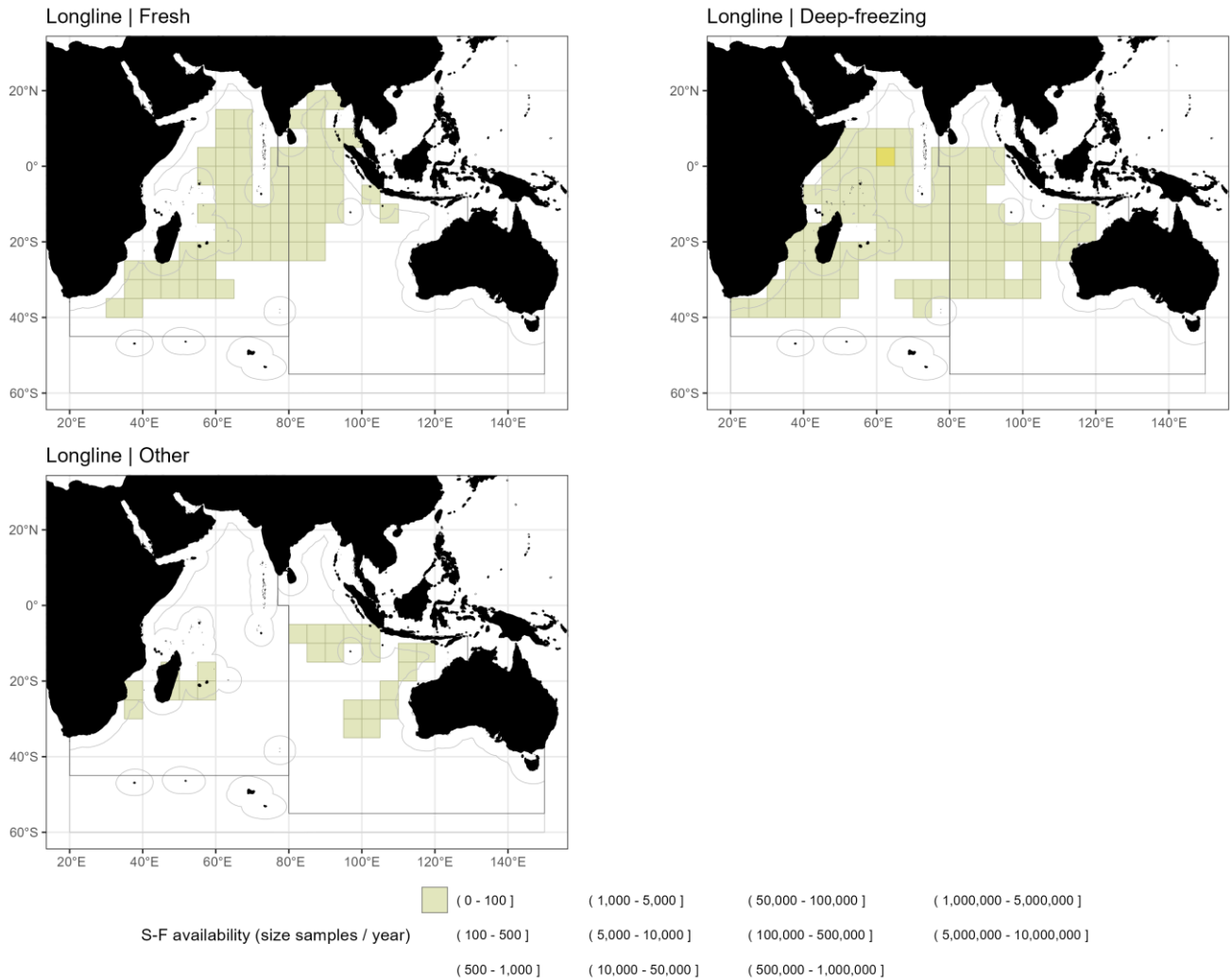


Figure 23: Spatial distribution (average number of samples per grid per year) of available skipjack tuna size-frequency data by longline fishery types in the period 2020-2024. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Line fisheries

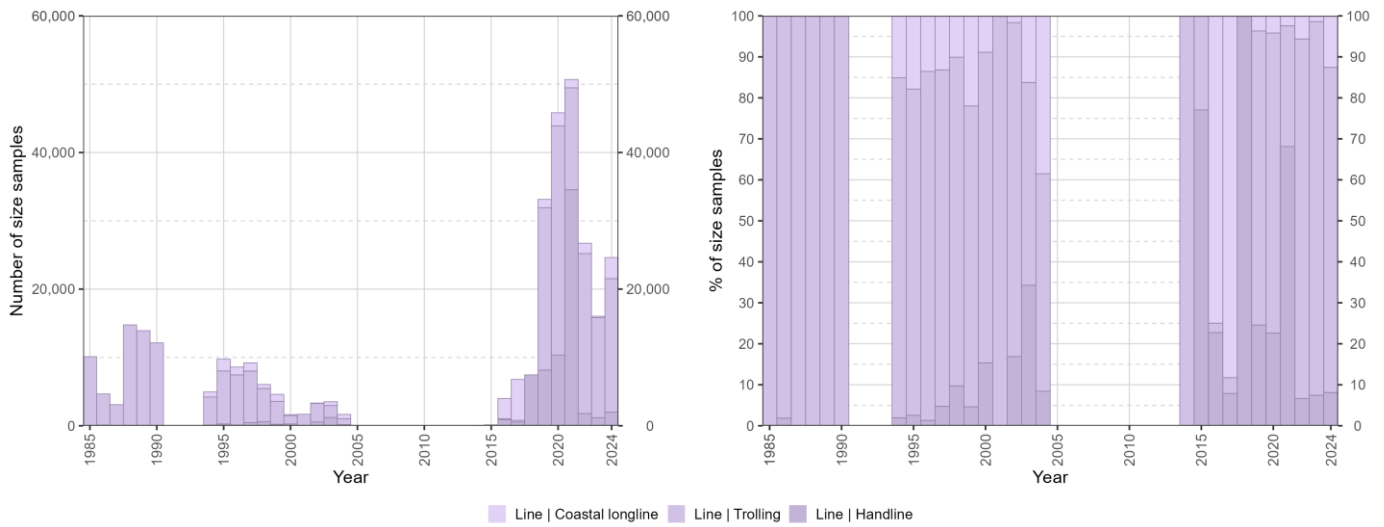


Figure 24: Availability of skipjack tuna size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and line fishery type. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

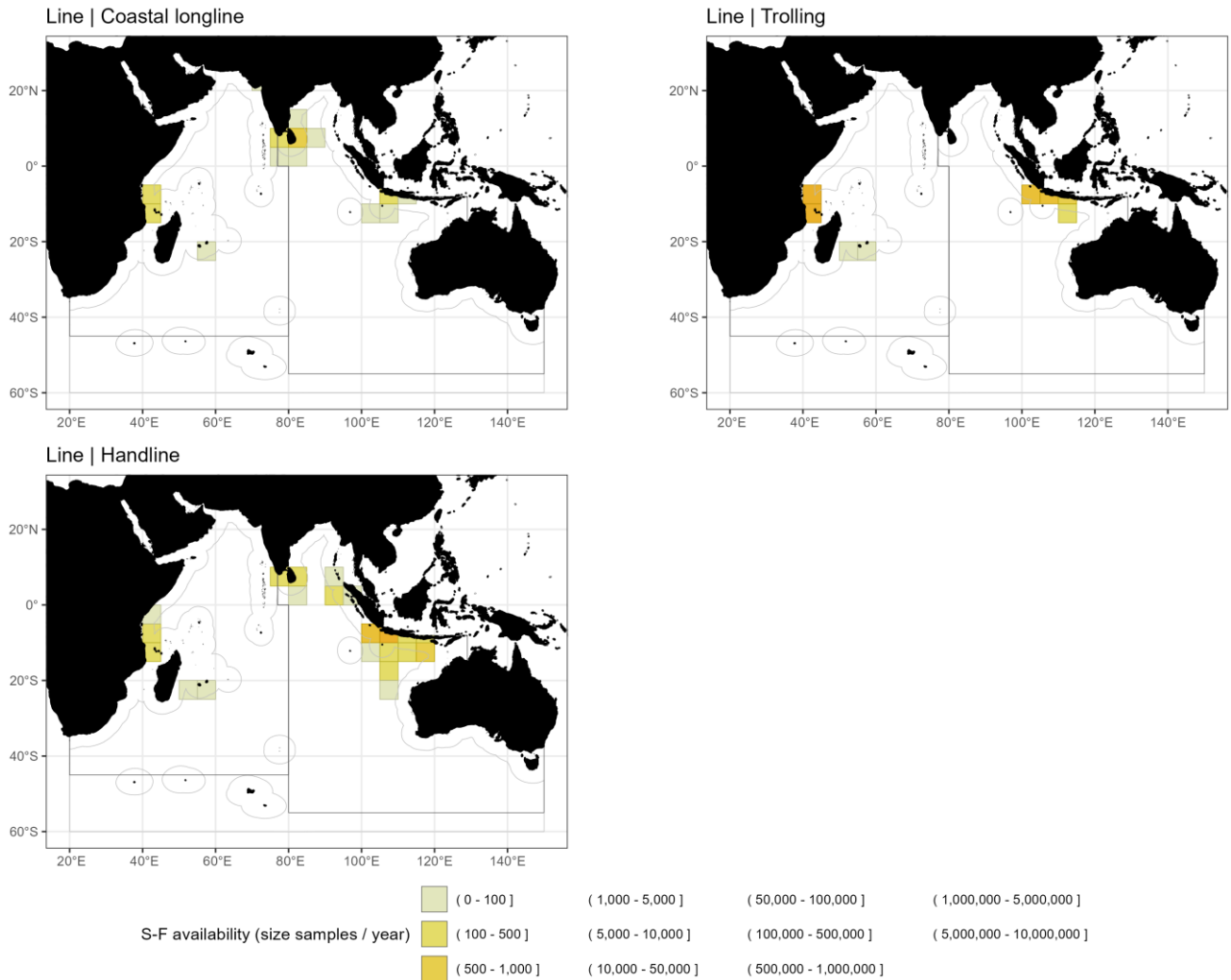


Figure 25: Spatial distribution (average number of samples per grid per year) of available skipjack tuna size-frequency data by line fishery types in the period 2020-2024. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

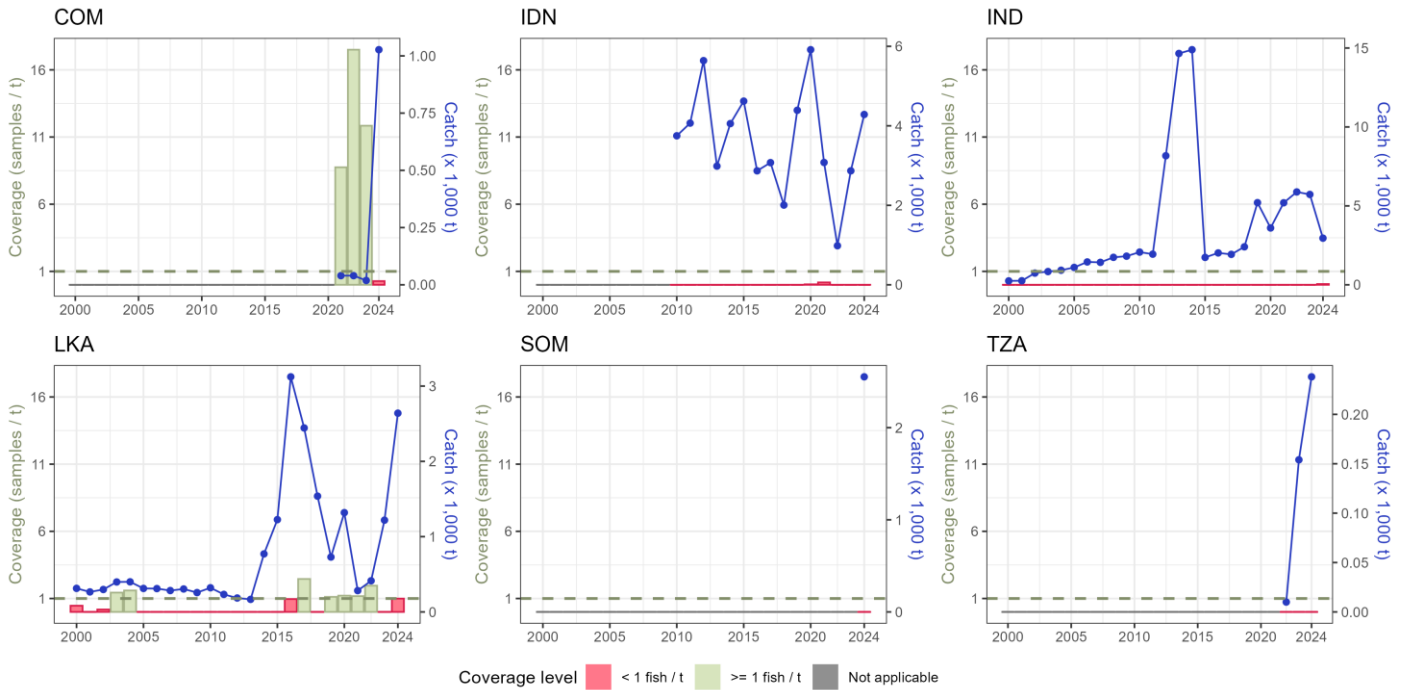


Figure 26: Size-frequency samples coverage (number of fish measured by t of retained catches) of skipjack tuna caught by the major coastal longline fleets, by fleet and year (2000-2024). Data source: [standardized size-frequency dataset](#) (Res. 15/02)

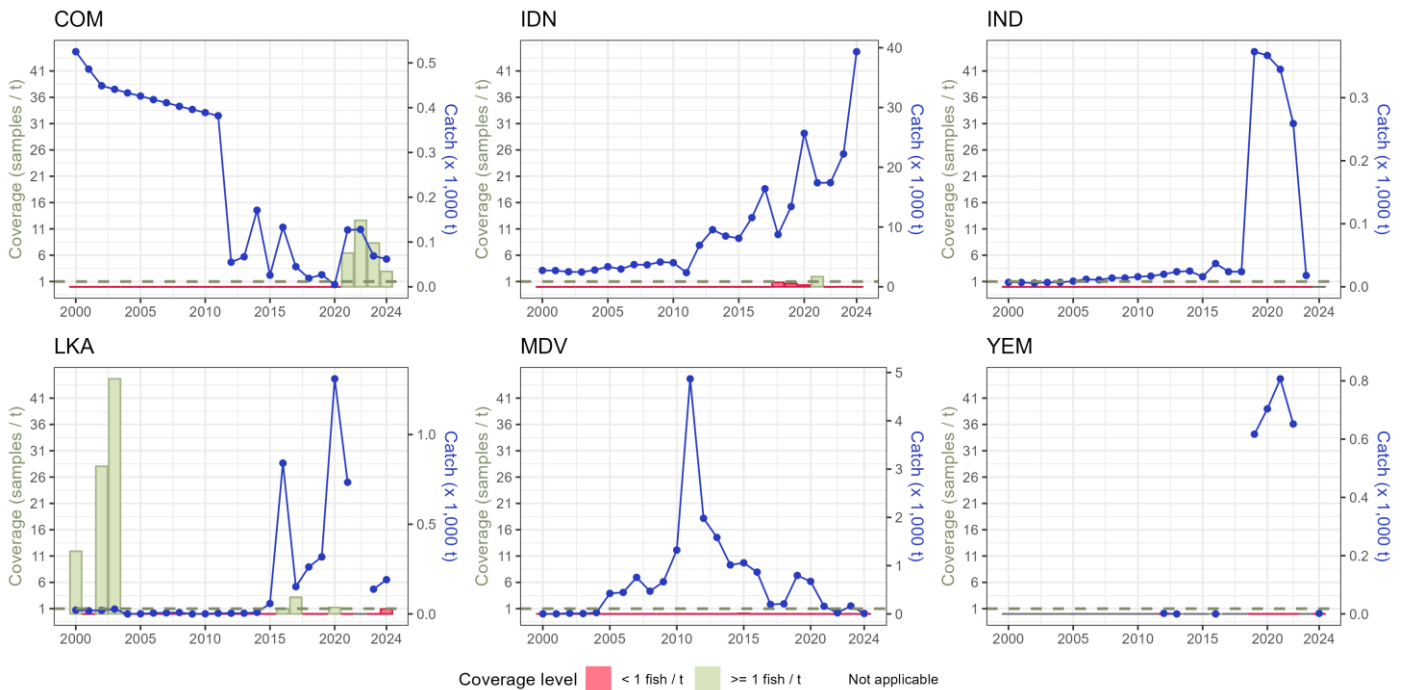


Figure 27: Size-frequency samples coverage (number of fish measured by t of retained catches) of skipjack tuna caught by the major handline fleets, by fleet and year (2000-2024). Data source: [standardized size-frequency dataset](#) (Res. 15/02)

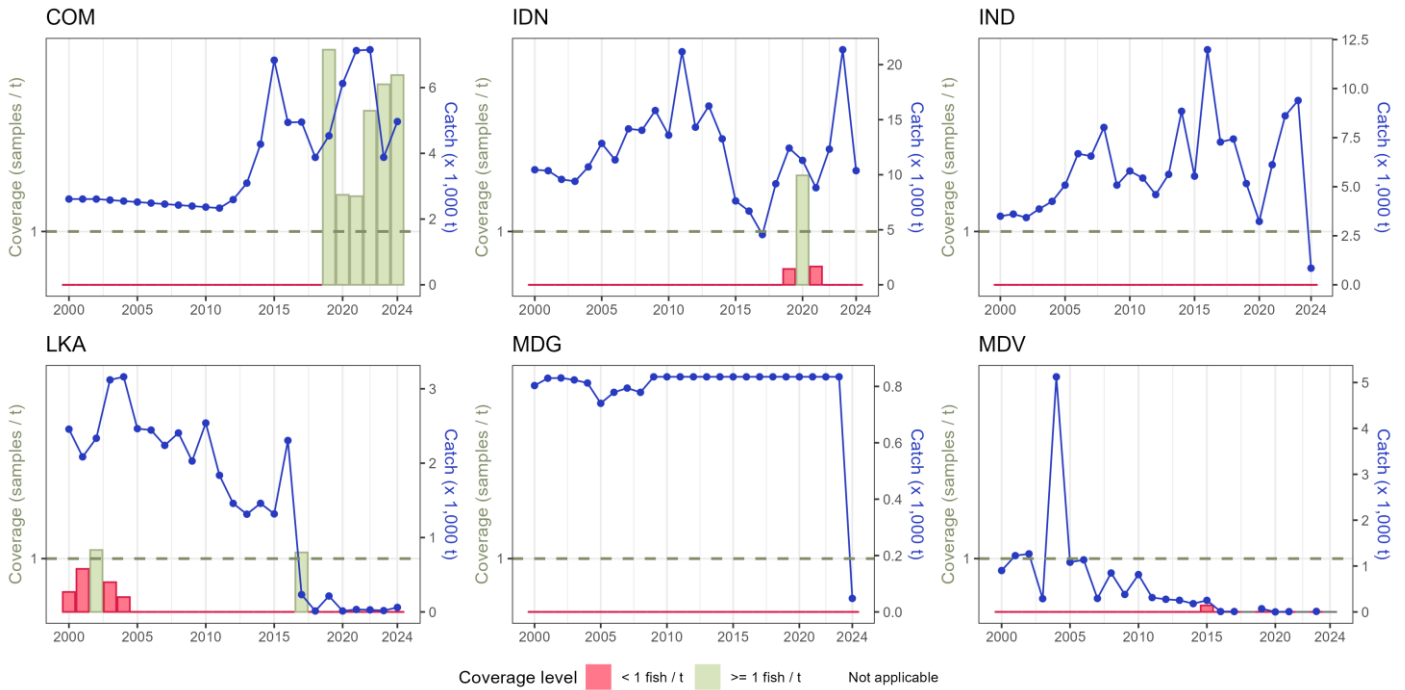


Figure 28: Size-frequency samples coverage (number of fish measured by t of retained catches) of skipjack tuna caught by the major trolling fleets, by fleet and year (2000-2024). Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Other fisheries

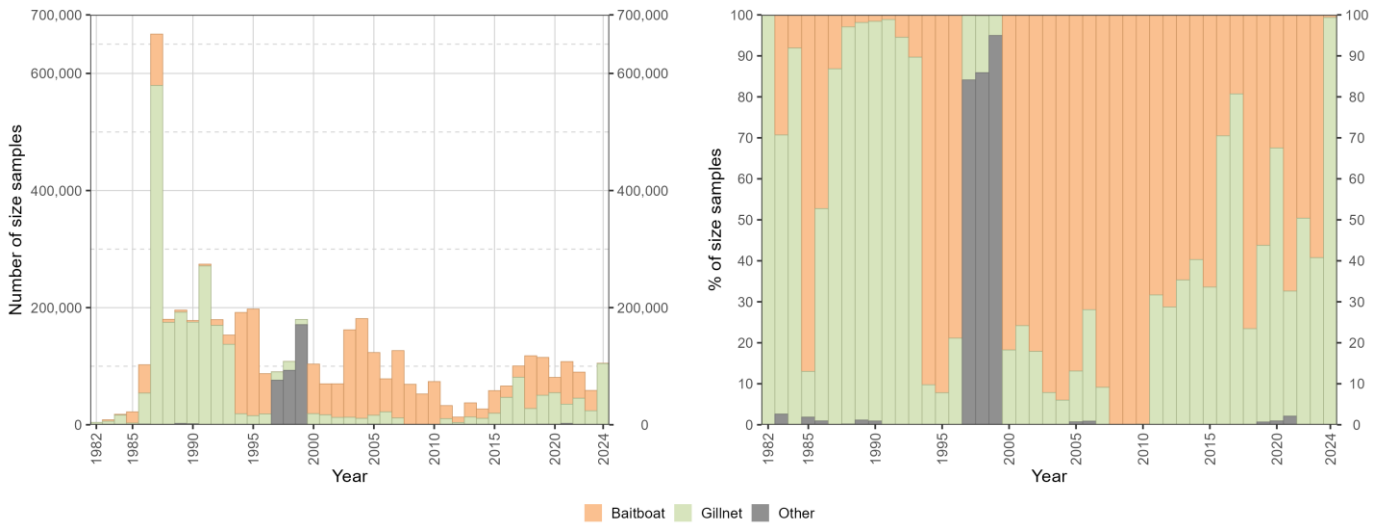


Figure 29: Availability of skipjack tuna size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and all other fishery types. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

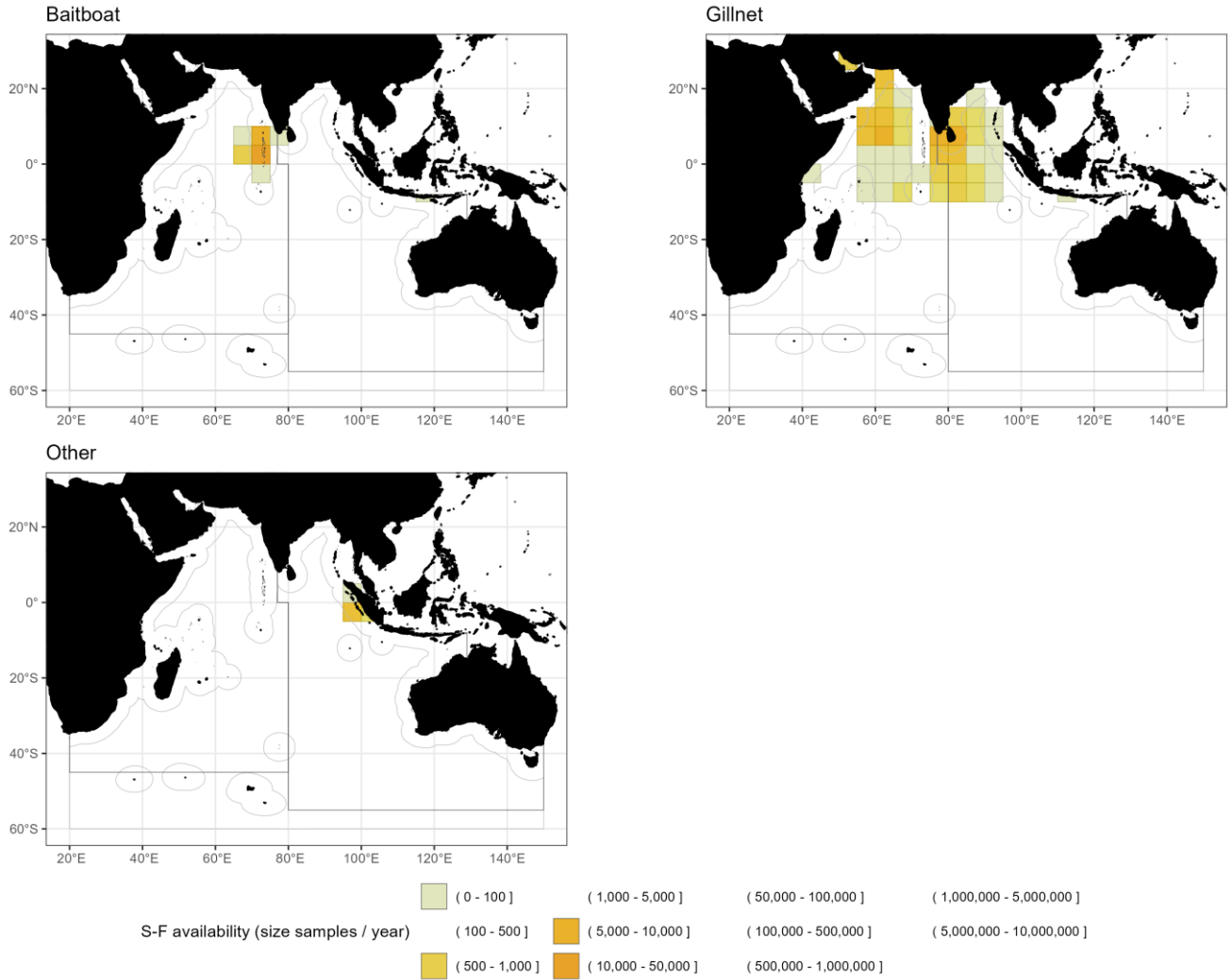


Figure 30: Spatial distribution (average number of samples per grid per year) of available skipjack tuna size-frequency data by all other fishery types in the period 2020-2024. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

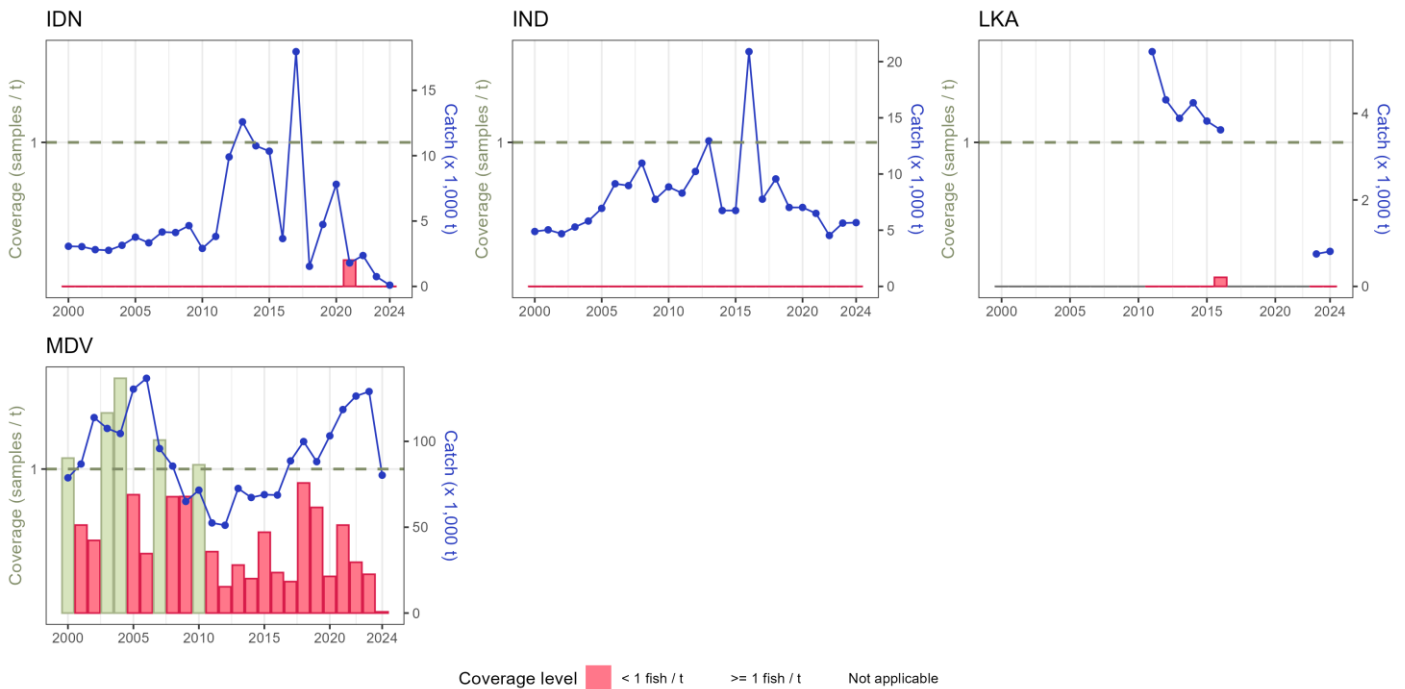


Figure 31: Size-frequency samples coverage (number of fish measured by t of retained catches) of skipjack tuna caught by the major baitboat fleets, by fleet and year (2000-2024). Data source: [standardized size-frequency dataset](#) (Res. 15/02)

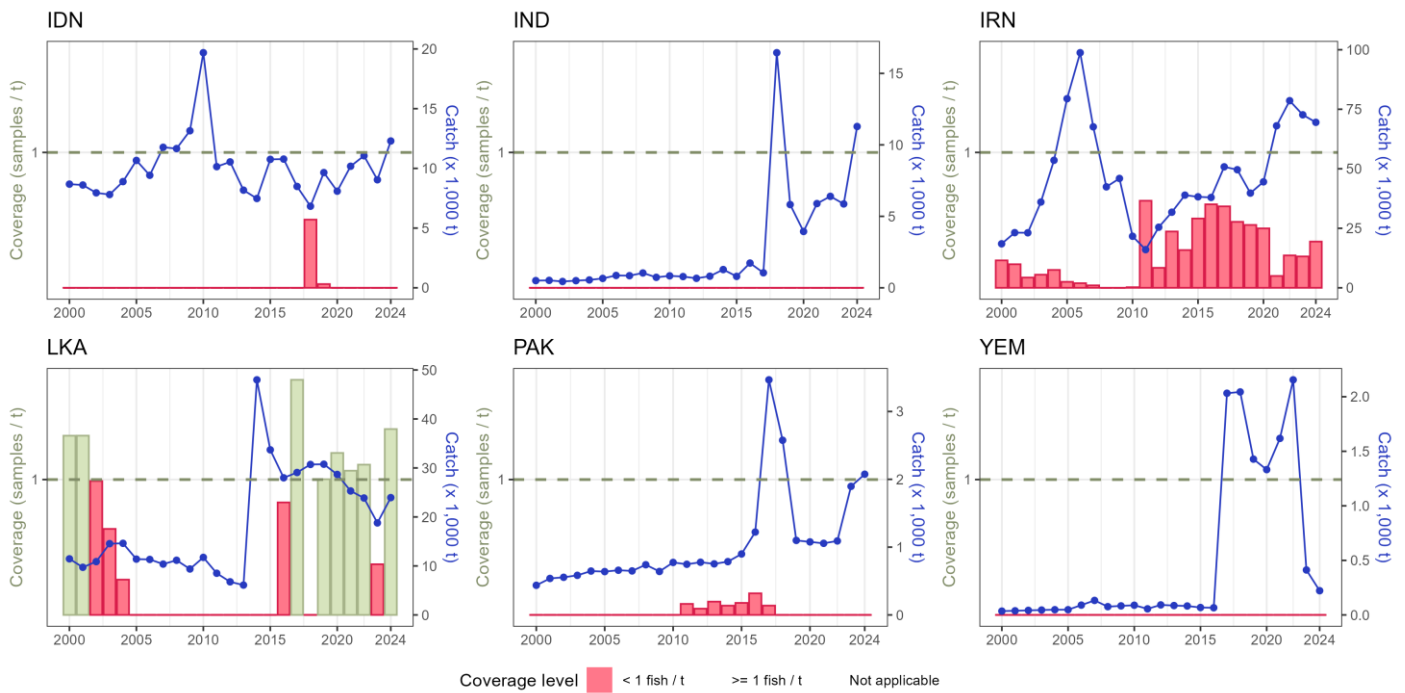


Figure 32: Size-frequency samples coverage (number of fish measured by t of retained catches) of skipjack tuna caught by the major gillnet fleets, by fleet and year (2000-2024). Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Sampling levels for most Indian Ocean fisheries remain low and, in some cases (e.g., gillnet, handline, and baitboat), may reflect limited interactions with skipjack tuna. Among all fleets, only Sri Lankan, Maldivian, Iranian, and Indonesian fisheries are relatively well sampled in recent years. Despite their importance, baitboat and gillnet fisheries have limited sampling coverage and data availability. In small-scale fisheries, samples are collected at landing sites, and low availability may also reflect known difficulties in species identification, with smaller individuals potentially misreported as other small tuna species.

The temporal patterns and trends in size frequency data by fishery are illustrated in [appendix II](#)

## Temporal trends in estimated average weights

Trends in average weights of skipjack tuna can be derived from the raised time-area catches in weight and numbers. While they can be estimated for the entire time series and for each fishery, due to the lack of original samples for several strata (especially in the early periods of the fisheries) they are considered accurate only for those periods for which actual samples are available and cover strata that correspond to at least 50 t of retained catches per year.

Considering the limitations in the original data and in the process that produces this estimation, it shall be noted that the average weights calculated for the log associated and free school component of the purse seine fisheries are relatively stable and fluctuate at around 2-3.5kg and 3-5 kg respectively (**Fig. 34**). Other purse seine fisheries operating in the Indian Ocean, on the contrary, shows marked fluctuations with a higher estimated average weight of 4.5 kg in the 1980s, which declined to 1.9 kg in 2024 (lower than the estimated average for all fisheries combined, which in 2024 was estimated at 2.9 kg).

In fact, the overall average weights for all fisheries (**Fig. 34 - 'All fisheries'**) shows a decreasing trend from the late 2000s onwards, and reflects similar trends detected for industrial purse seiners and baitboats (**Fig. 34 - 'Purse seine | FS / LS / OT', 'Baitboat'**).

Trends in average weight for all other fisheries (baitboat, gillnet and all other gears) are more challenging to assess due to their inherently artisanal nature, which in turn implies a lower number of available samples and with a lower quality compared to those provided by the industrial fleets (which are recorded through logbooks or collected by scientific observers, in several cases).

Nevertheless, marked increases in average weights are detected in 2022 for industrial purse seiners (all fishing modes), while the average weight estimated for coastal purse seiners and ring nets (34 - 'Purse seine | OT') remains the lowest among all gears. Outliers exist in estimated average weights from gillnet fisheries for 2021 (Fig. 34 - 'Gillnet'), due to the high proportion of large fish (> 60 cm FL) reported by I.R. Iran and Sri Lanka, with the latter also reporting significant number of fish of 85 cm FL and above which need further investigation.

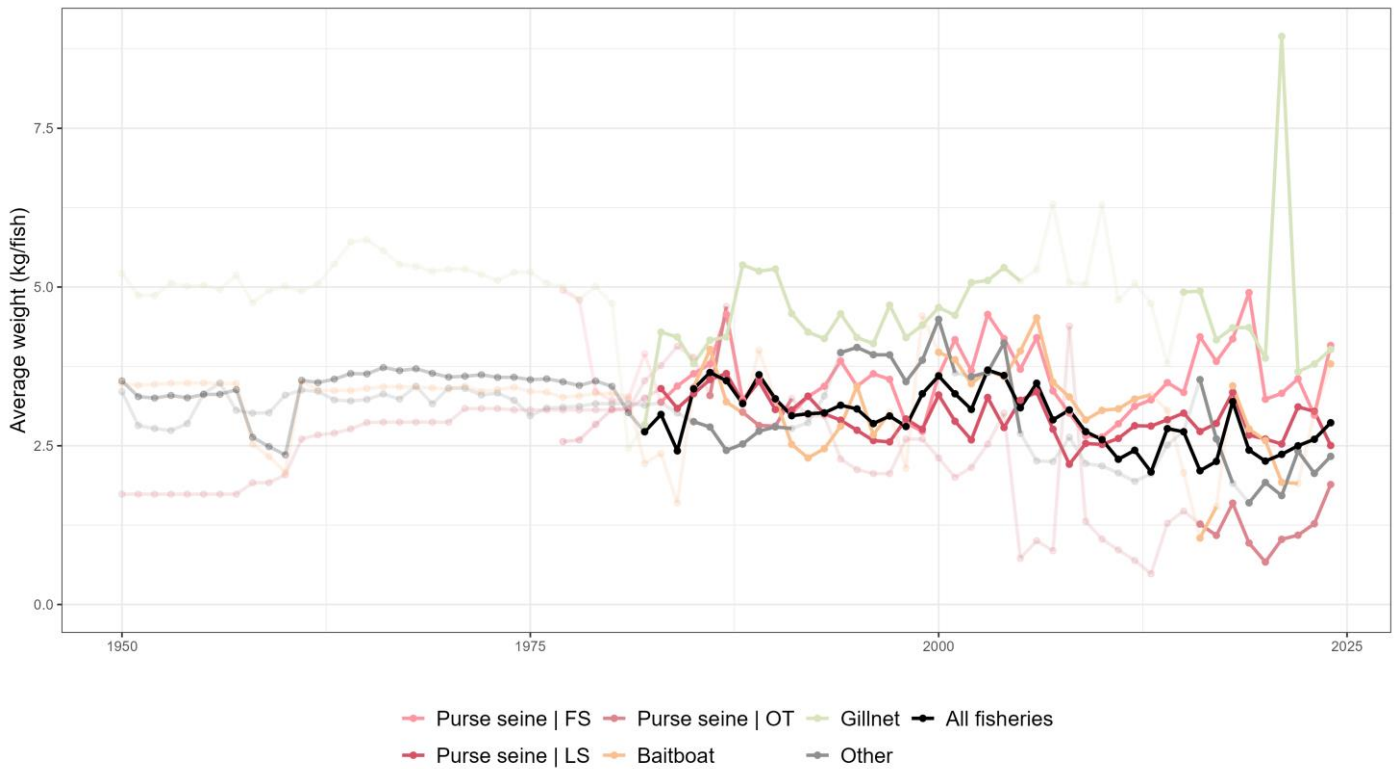


Figure 33: Combined estimated skipjack tuna average weight (kg/fish) in the catch by fishery and year. Semi-transparent points correspond to years for which the original size samples cover strata with reported catches (by year and fishery) **lower** than 50 t. LS = schools associated with floating objects; FS = free-swimming schools; OT = school type unknown. Data source: raised time-area catches

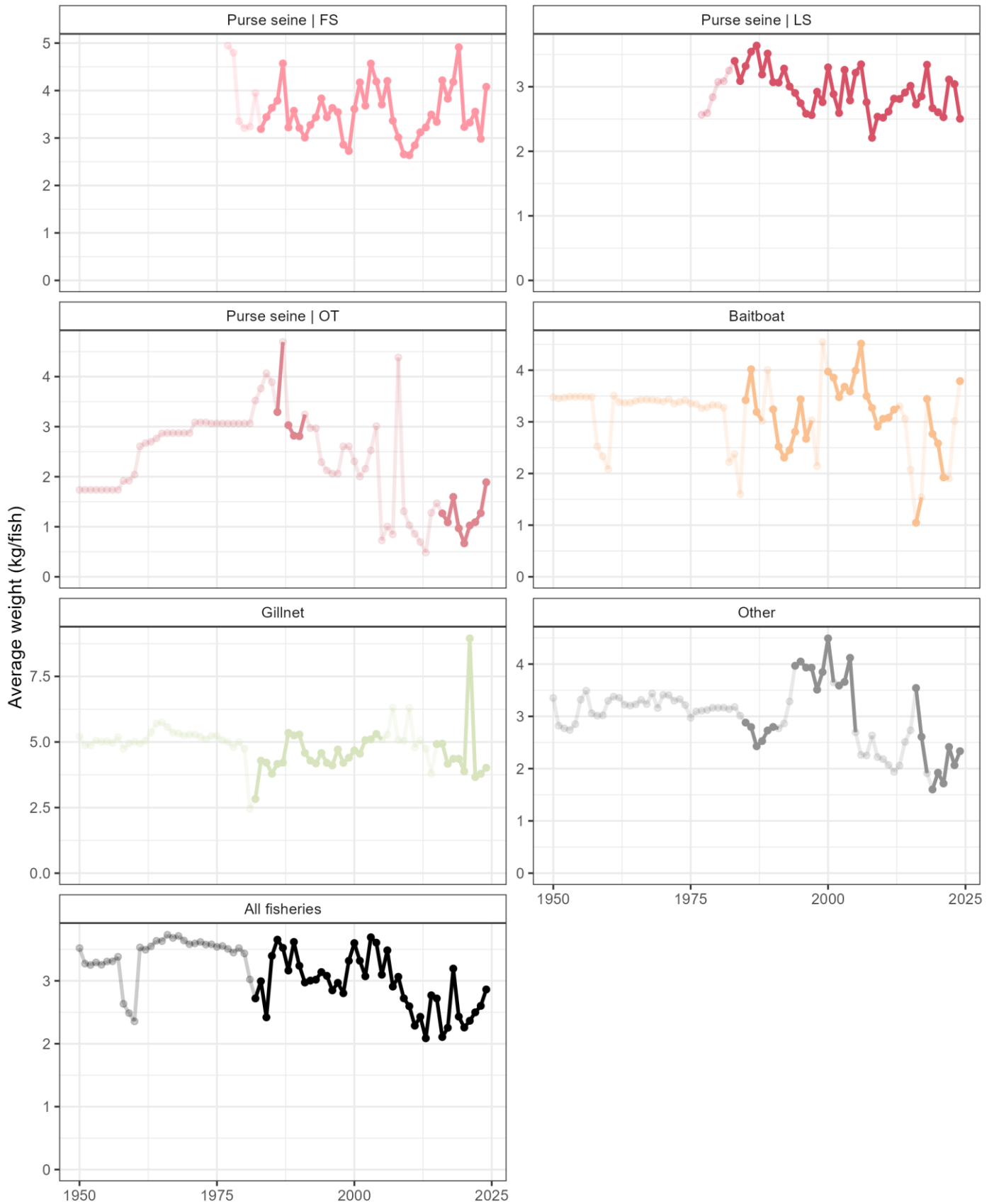


Figure 34: Estimated skipjack tuna average weight (kg/fish) in the catch by fishery and year. Semi-transparent points correspond to years for which the original size samples cover strata with reported catches (by year and fishery) **lower** than 50 t. LS = schools associated with floating objects; FS = free-swimming schools; OT = coastal purse seines and ringnets. Data source: raised time-area catches

Overall, the trend in average weights that results from combining together data for all fisheries shows a clear and steady decrease in the size of fish caught since the beginning of the 1990s, which can be explained by the generalized

increased efforts exerted by several coastal fleets combined with the rapid increase in catches from schools associated to floating objects in the purse seine fishery (Fig. 33).

### Spatial distribution of average weights

#### Estimated average weights by decade (1950-2019)

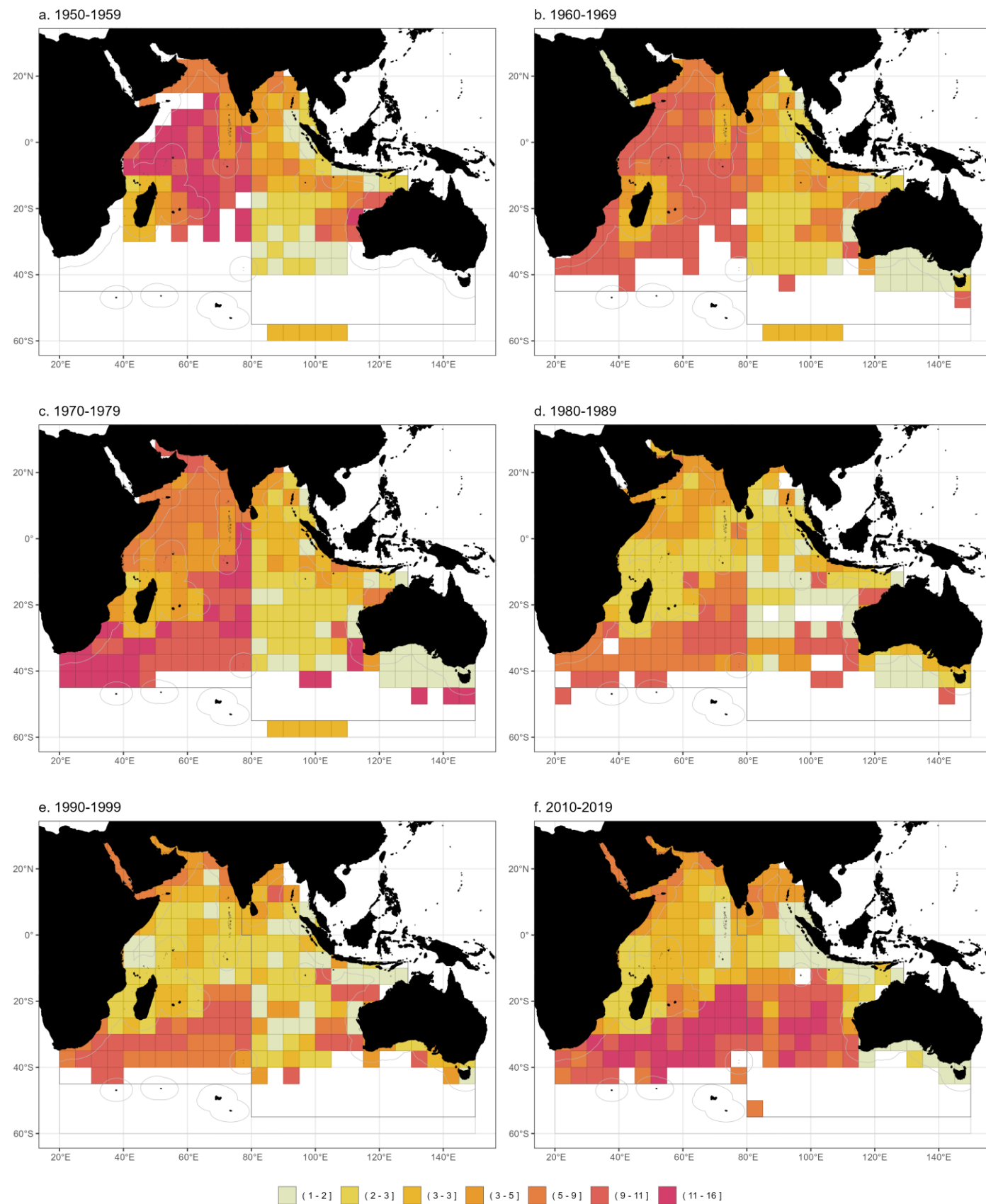


Figure 35: Estimated skipjack tuna average weight (kg/fish) in the catch by decade and 5x5 grid, for all fisheries combined for the period 1950-2019. Data source: raised time-area catches

**Estimated average weights by year (2020-2024) and last decade (2010-2019)**

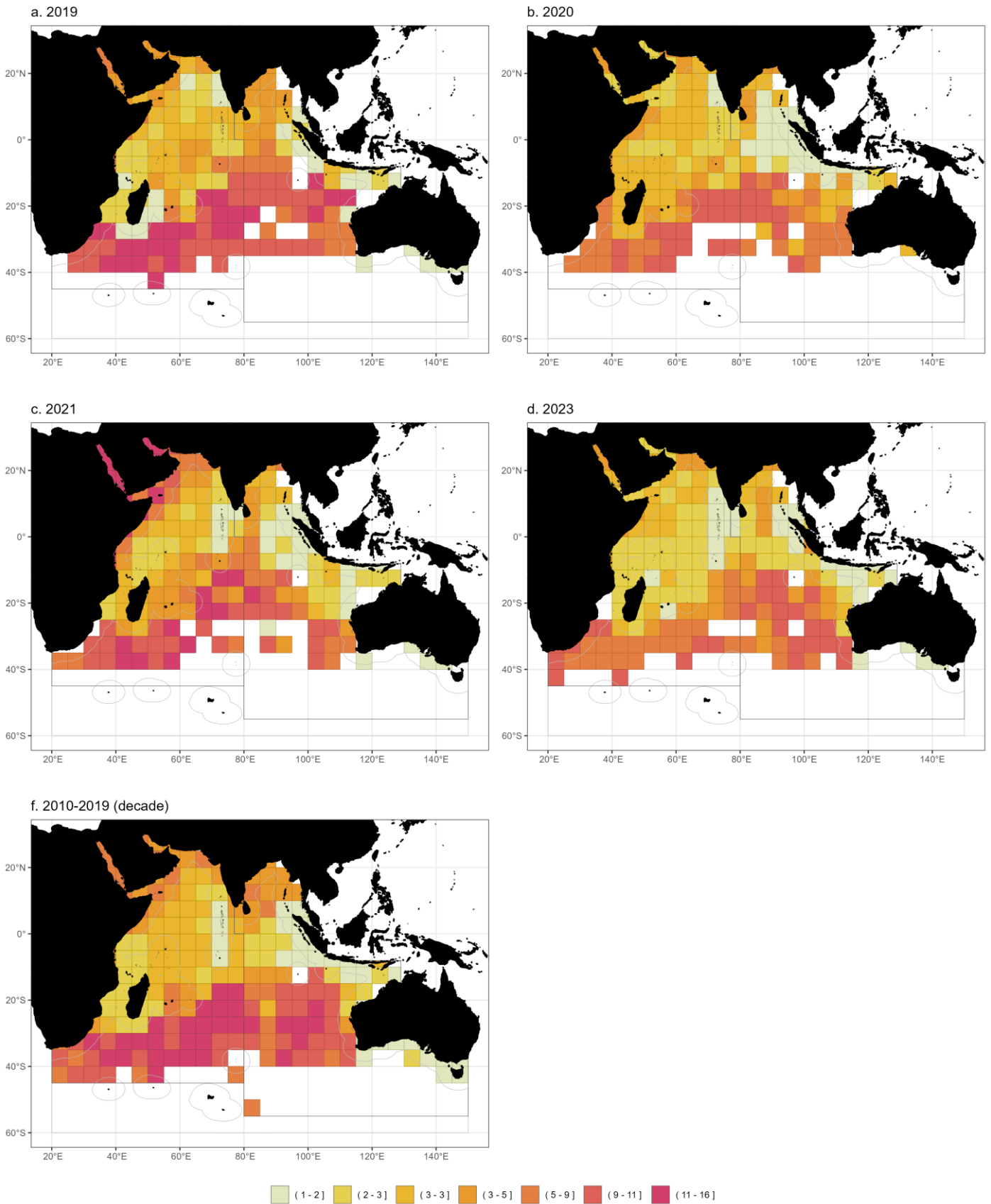


Figure 36: Estimated skipjack tuna average weight (kg/fish) in the catch by year and 5x5 grid, for all fisheries combined for the period 2020-2024 and for the decade 2010-2019. Data source: raised time-area catches

Estimated average weights by fishery group in recent years (2020-2024)

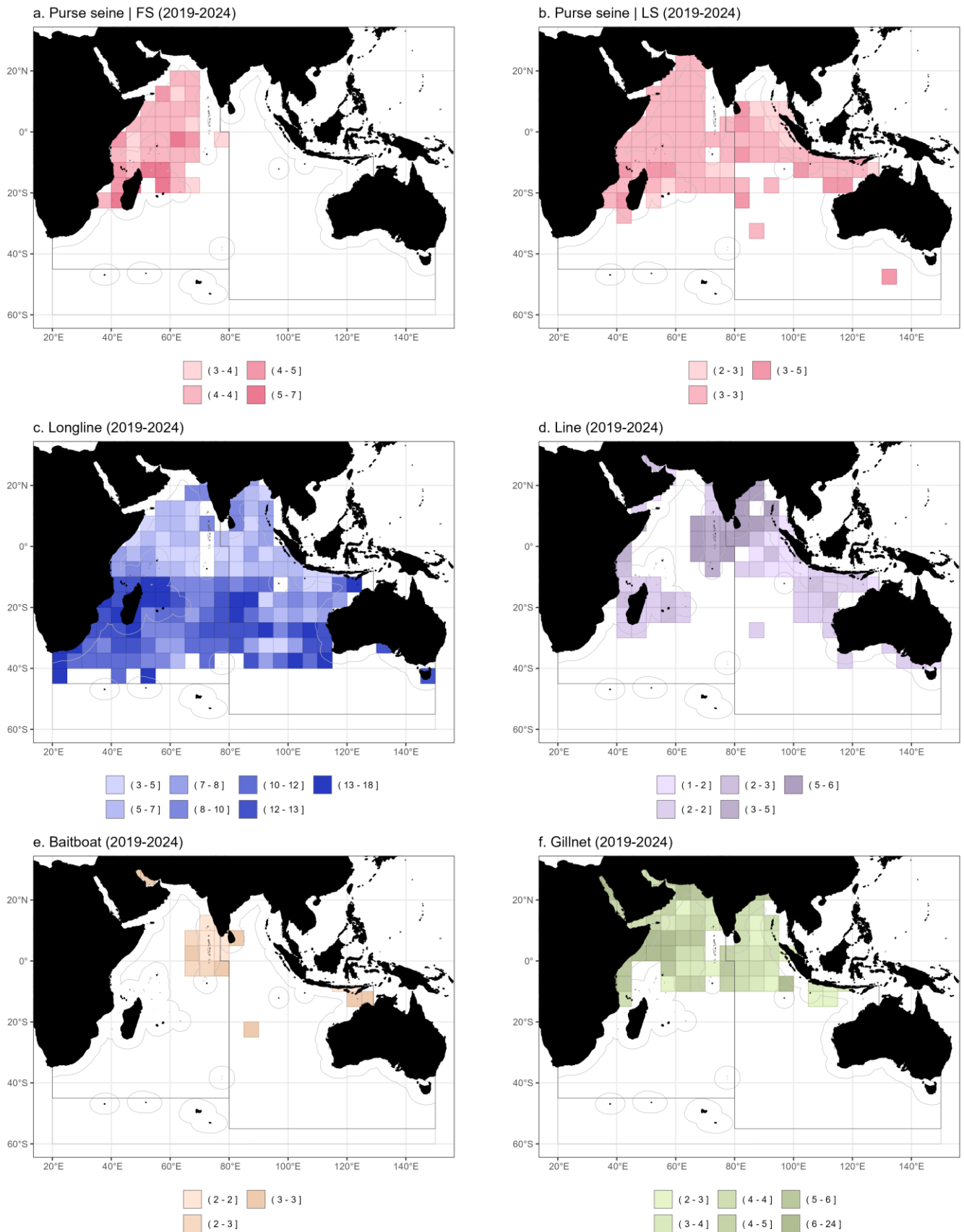


Figure 37: Estimated skipjack tuna average weight (kg/fish) in the catch by 5x5 grid and fishery group for the period 2020-2024. LS = schools associated with floating objects; FS = free-swimming schools. Data source: raised time-area catches

### Uncertainties in size-frequency data

The quality of the size frequency data continues to be poor particularly for the artisanal fisheries. Although there were some improvements around 2020s, availability of skipjack tuna size frequency reduced to as low as 31% in 2024, from 80% in 2020. Size frequency data for industrial fisheries, is averaging at 80% between 2022 and 2024 (Fig. 38). The Secretariat did not receive any historical update of size frequency for skipjack tuna, although data could potentially be available but not share for various reasons.

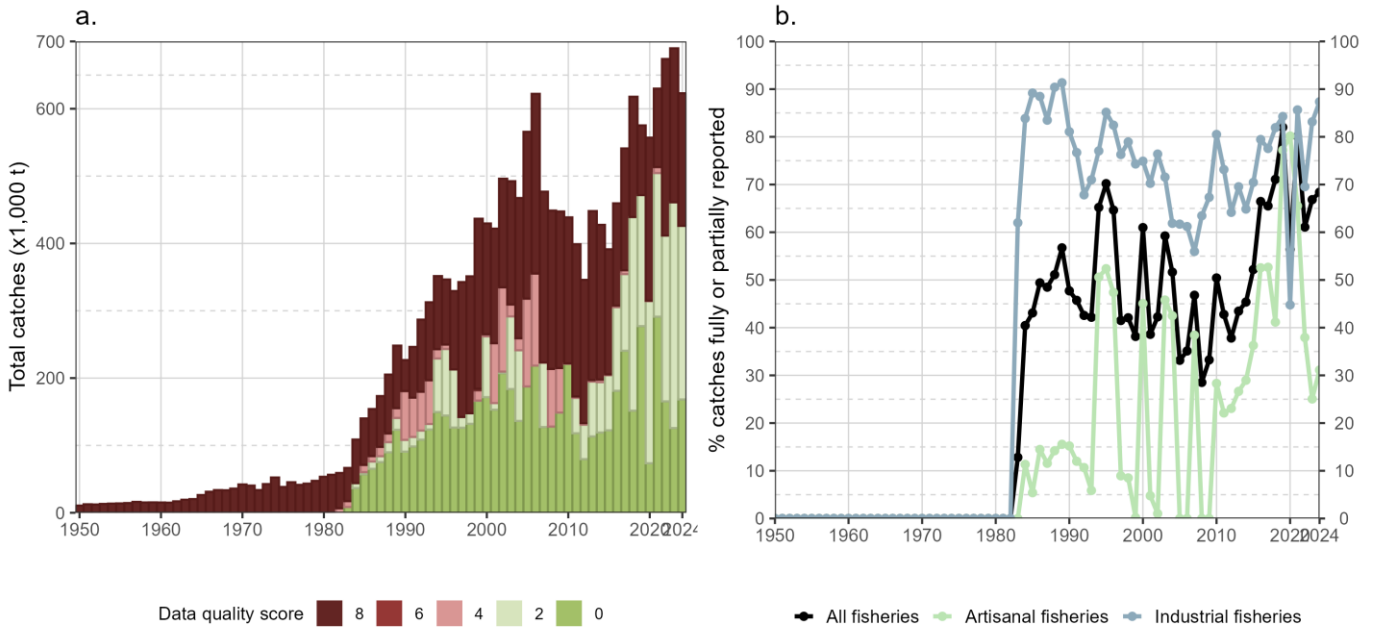


Figure 38: Annual retained catches (t) of skipjack tuna estimated by quality score (barplot) and percentage of geo-referenced size-frequency data reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02 (lines with dots) for all fisheries (a) and by type of fishery (b), in the period 1950–2024

## Industrial purse seine fisheries

Size-frequency data for skipjack tuna are available for several years for major industrial purse seine fleets. However, datasets often include a mix of *raw* (unraised) and *raised* (scaled to total catch) measurements, resulting in differences in the number of fish sampled across fleets and years. For EU fleets and comparable fleets (e.g., Seychelles and Mauritius), these differences are considered to affect only sample size, with negligible impact on size distributions.

Sampling reflects fishing mode, with fewer samples from free-swimming schools than from dFOB-associated schools, consistent with lower fishing effort on free schools (**Fig. 39-Fig. 40**). Length distributions differ by mode: free-school catches typically show bimodal distributions (~50 and 60 cm FL), whereas dFAD-associated catches show a single mode around 50 cm FL. Recent data indicate slight increases in size for EU–Spain free-school catches (>80cm FL).

For free-swimming schools, some fleets (EU, Spain and Seychelles, 2018) show an average size distributions below the expected threshold (**Table 4**), i.e. with a higher first mode in the lower part of the size distribution, below 50 cm FL (**Fig. 39**). Data for these strata have been provided as raw measurements, while all others are reported as raised to total catches, i.e., they can be considered to represent catch-at-size (**Fig. 40**).

Considering the impracticalities of managing a mix of raw and raised size data, as it is currently the case, the IOTC Secretariat is liaising with concerned CPCs to ensure that either both data sets are provided at the same time, or preference is given to raw measurements for both historical and new data submissions.

Data coverage varies across fleets. Limited data are available for the single vessel of EU-Italy (2015, 2017, 2023, 2024), while fleets such as Mauritius and the Republic of Korea face challenges in assigning samples by fishing mode. In many cases, samples are either unclassified or assumed to originate from dFOB-associated sets.

Sampling was significantly disrupted in 2020 due to COVID-19, resulting in minimal or missing data, particularly for free-school catches. No data were available for EU–Spain, and only limited samples were reported by EU-France, Mauritius, and Seychelles. Efforts to recover missing EU-Spain data are ongoing (**Fig. 39**).

Recent data are also available for other fleets (Indonesia, I.R. Iran, Japan, and the Republic of Korea), although most are not disaggregated by fishing mode, limiting comparability (**Fig. 42**). Available distributions suggest Indonesian and Japanese fleets predominantly fish on dFOB-associated schools, while Iranian fleets operate more on free-swimming schools. Thailand reports size data exclusively from coastal purse seine fisheries. Finally, size-frequency data from several non-EU fleets do not meet the minimum sampling requirement (one fish per tonne of retained catch; Res. 15/02). In particular, Indonesia and the Republic of Korea consistently fall below this threshold, raising concerns about the representativeness of their samples (**Fig. 42**).

Size data reported by non-EU fleets do not always comply with the requirement of sampling at least one fish per metric ton of retained catches by species. In particular, data from Indonesia and the Republic of Korea (even though the latter are collected by observers at sea) are consistently below the threshold set by [Res. 15/02](#) for all years concerned, and this further questions the representativeness of the length samples reported by the two fleets.

Finally, these fleets seem to have been less affected by the CoViD-19 pandemic, as data were regularly provided by all of them (albeit in numbers lower than usual in the case of Indonesia and I.R. Iran) (**Fig. 42**).

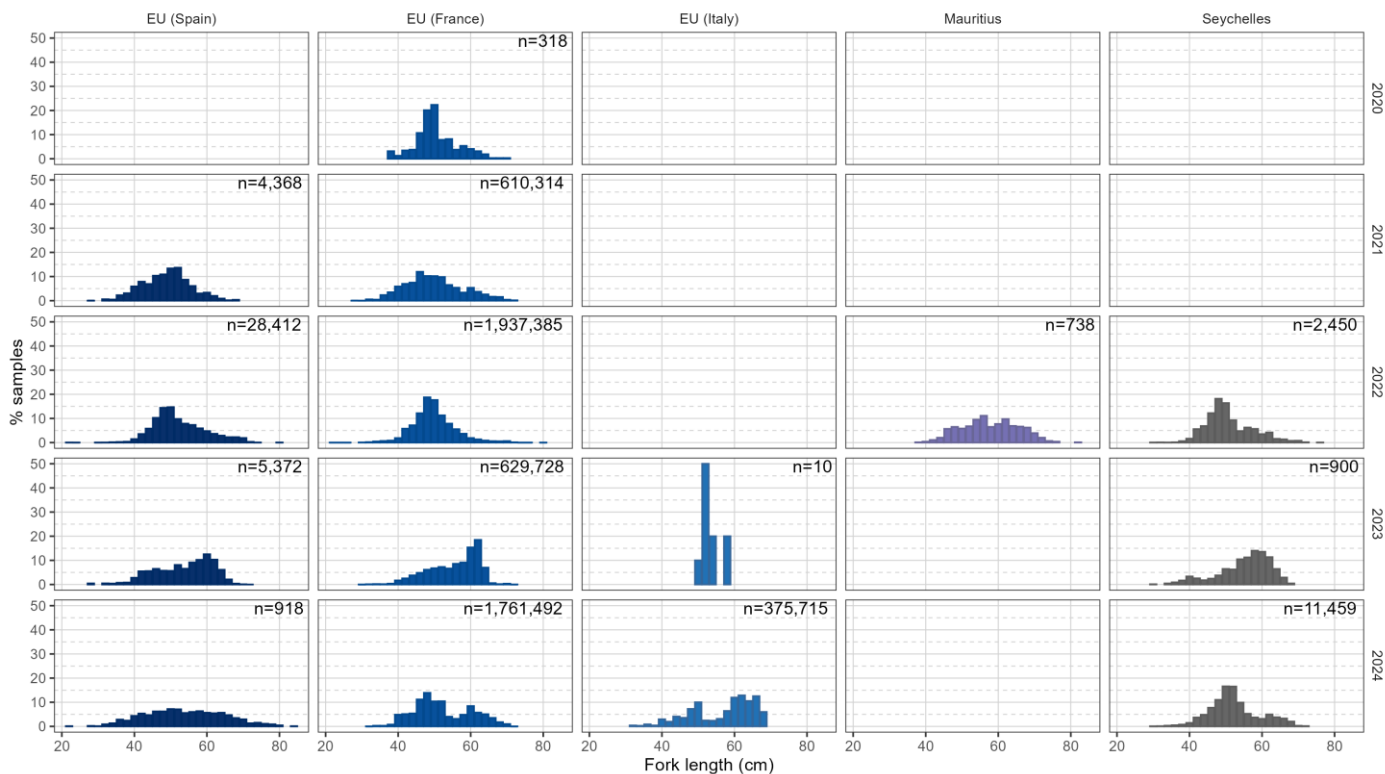


Figure 39: Relative size distribution of skipjack tuna (fork length in cm) recorded for free-swimming schools, by year (2020–2024) and main purse seine fleet. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Table 4: Percentage of sampled skipjack tuna with fork length below 50 cm recorded by the major purse seine fleets fishing on free-swimming schools, as reported for the period 2020-2024. Data source: [standardized size-frequency dataset](https://www.iotc.org/WPTT/28DP/Data/05-SFSKJ) (Res. 15/02)

Fleet	2020	2021	2022	2023	2024
EU (Spain)		48	36	29	35
EU (France)	42	49	48	20	42
EU (Italy)				0	22
Mauritius			16		
Seychelles			45	17	30

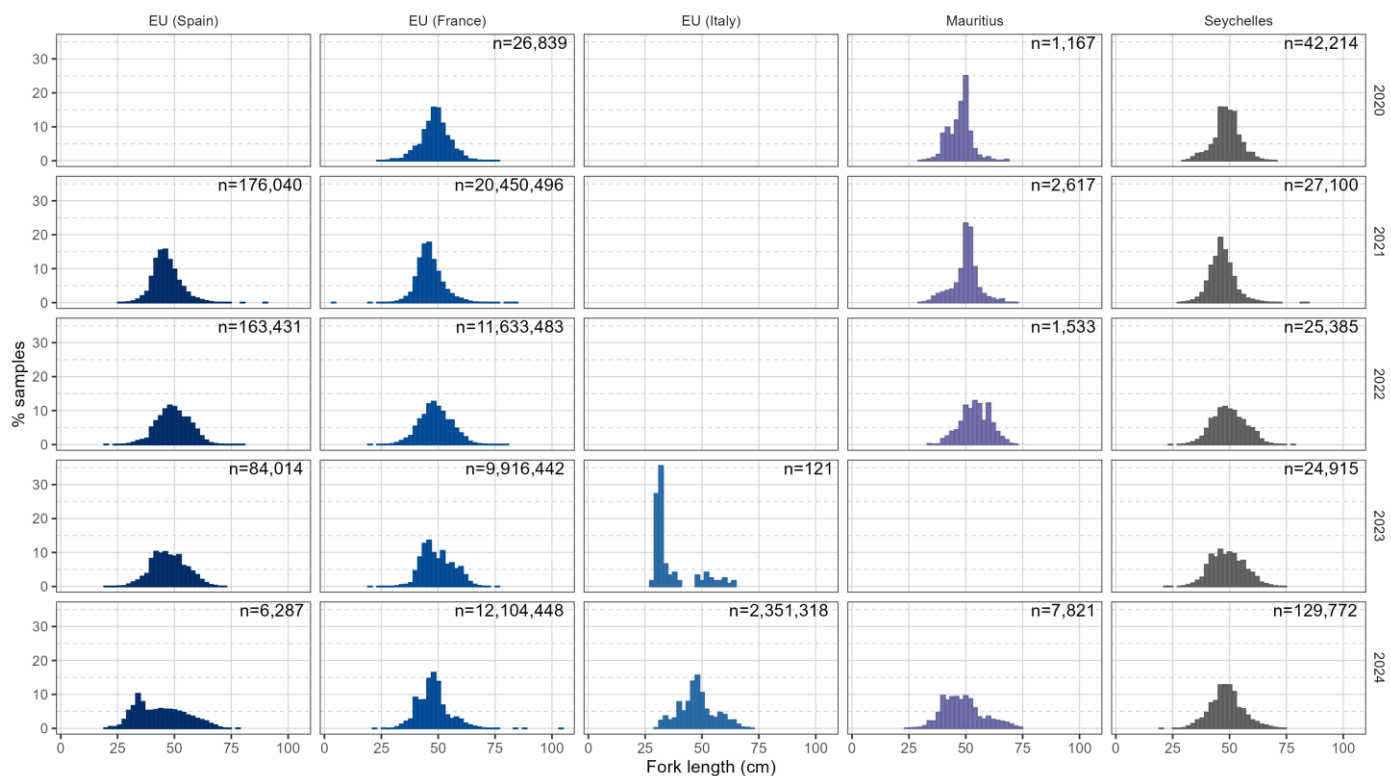


Figure 40: Relative size distribution of skipjack tuna (fork length in cm) recorded for FOB-associated schools, by year (2020–2024) and major purse seine fleet. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Table 5: Percentage of sampled skipjack tuna with fork length above 50 cm recorded by the major purse seine fleets fishing on FOB-associated schools, as reported for the period 2020-2024. Data source: [standardized size-frequency dataset](https://www.iotc.org/WPTT/28DP/Data/05-SFSKJ) (Res. 15/02)

Fleet	2020	2021	2022	2023	2024
EU (Spain)		29	52	42	33
EU (France)	48	26	47	49	37
EU (Italy)				17	38
Republic of Korea					44
Mauritius	42	68	80		45
Seychelles	49	29	52	49	47

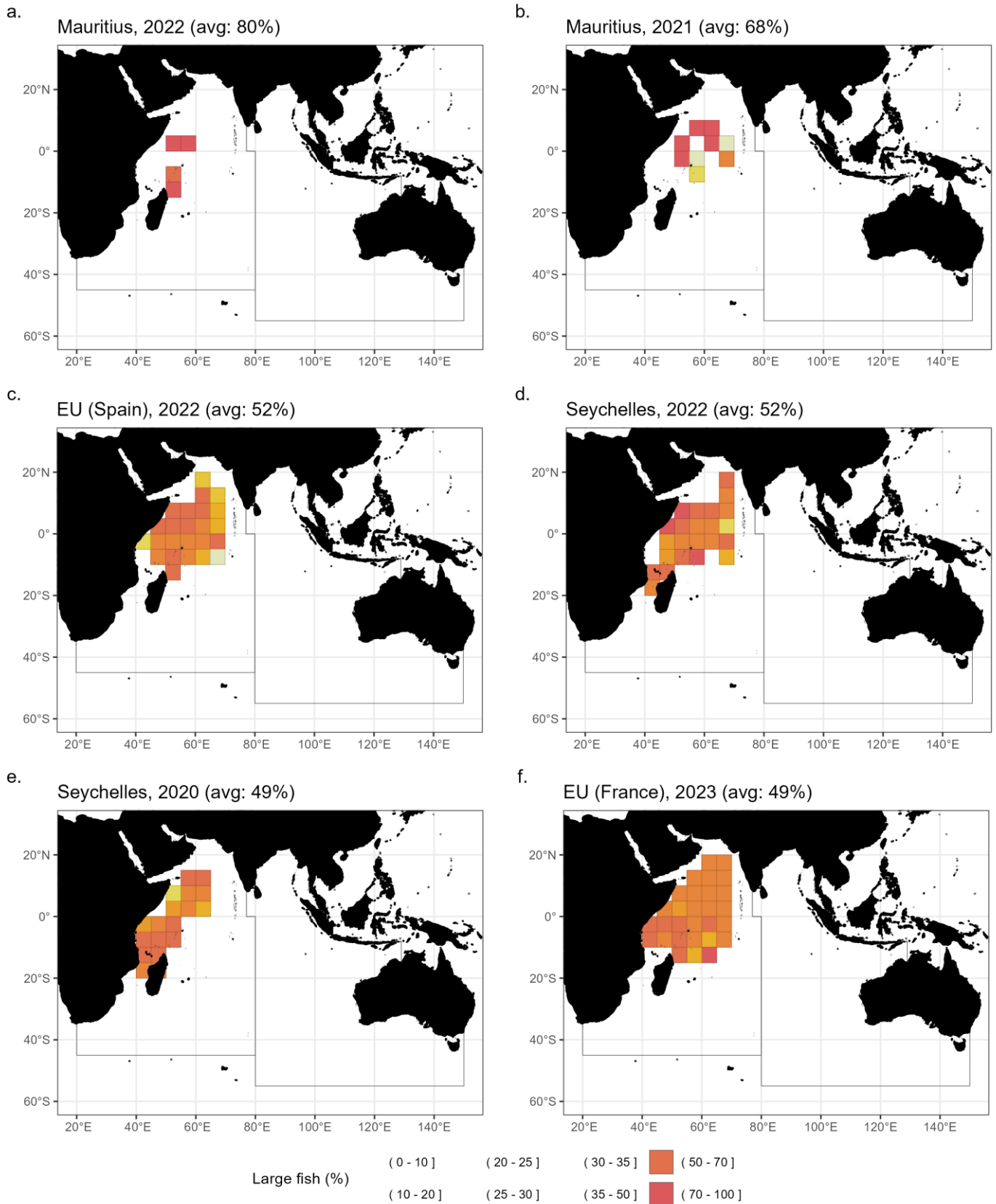


Figure 41: Spatial distribution of sampled skipjack tuna with fork length above 50 cm recorded by the major purse seine fleets fishing on FOB-associated schools, as reported for the period 2020-2024. Data source: [standardized size-frequency dataset](#) (Res. 15/02)



Figure 42: Relative size distribution of skipjack tuna (fork length in cm) recorded for unclassified schools, by year (2020–2024) and other purse seine fleet. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

## Appendix I:

### Comparative analysis of skipjack tuna catches between WPTT25 and WPTT28 by year, fleet, fishery group, and area, 2014-2022

Table 6: Changes in best scientific estimates of average annual retained catches of skipjack tuna by year, fleet, fishery group and main Indian Ocean area, limited to absolute values (>10t). Data source: (<https://www.iotc.org/WPTT/28DP/Data/02-RC>)

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)	
2022	BGD	Gillnet	Eastern Indian Ocean	81	4,357	-4,276	
		Other	Eastern Indian Ocean	480	279	201	
	EUITA	Purse seine	Western Indian Ocean	3,569	3,205	364	
	IDN	Baitboat	Eastern Indian Ocean	2,362	3,384	-1,022	
		Gillnet	Eastern Indian Ocean	11,055	13,932	-2,878	
		Line	Eastern Indian Ocean	30,725	25,426	5,299	
		Longline	Eastern Indian Ocean	284	1,528	-1,244	
		Other	Eastern Indian Ocean	3,366	7,356	-3,990	
		Purse seine	Eastern Indian Ocean	98,966	91,706	7,260	
		IND	Baitboat	Western Indian Ocean	4,532	5,600	-1,067
	Gillnet		Eastern Indian Ocean	6,113	4,902	1,211	
	Gillnet		Western Indian Ocean	286	175	111	
	Line		Eastern Indian Ocean	5,509	4,004	1,505	
	Line		Western Indian Ocean	9,246	6,044	3,201	
	Other		Eastern Indian Ocean	1,813	1,454	359	
	Other		Western Indian Ocean	31	19	12	
	Purse seine		Eastern Indian Ocean	108	86	21	
	OMN	Purse seine	Western Indian Ocean	2,613	0	2,613	
	PAK	Gillnet	Western Indian Ocean	1,091	1,053	38	
	TMP	Gillnet	Eastern Indian Ocean	124	0	124	
	TZA	Gillnet	Western Indian Ocean	119	371	-252	
		Line	Western Indian Ocean	159	0	159	
		Purse seine	Western Indian Ocean	8,407	8,343	64	
	YEM	Gillnet	Western Indian Ocean	2,155	1,296	859	
		Line	Western Indian Ocean	652	731	-79	
	2021	BGD	Gillnet	Eastern Indian Ocean	70	4,277	-4,206
			Other	Eastern Indian Ocean	1,059	928	131

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
	EUITA	Purse seine	Western Indian Ocean	5,123	5,416	-293
	IDN	Baitboat	Eastern Indian Ocean	1,795	3,283	-1,488
		Gillnet	Eastern Indian Ocean	10,179	13,516	-3,337
		Line	Eastern Indian Ocean	29,299	23,245	6,054
		Longline	Eastern Indian Ocean	45	1,019	-974
		Other	Eastern Indian Ocean	2,719	7,136	-4,417
		Purse seine	Eastern Indian Ocean	68,514	83,966	-15,451
	TMP	Gillnet	Eastern Indian Ocean	147	3	145
	YEM	Gillnet	Western Indian Ocean	1,618	1,352	266
		Line	Western Indian Ocean	807	675	133
<b>2020</b>	BGD	Gillnet	Eastern Indian Ocean	2	24	-22
	EUITA	Purse seine	Western Indian Ocean	3,212	2,433	779
	IDN	Baitboat	Eastern Indian Ocean	7,811	4,114	3,697
		Gillnet	Eastern Indian Ocean	8,091	16,938	-8,847
		Line	Eastern Indian Ocean	42,900	29,130	13,770
		Longline	Eastern Indian Ocean	80	1,843	-1,763
		Other	Eastern Indian Ocean	4,744	8,943	-4,199
		Purse seine	Eastern Indian Ocean	61,959	55,152	6,807
	LKA	Gillnet	Eastern Indian Ocean	27,555	27,476	79
TMP	Gillnet	Eastern Indian Ocean	765	3	763	
<b>2019</b>	EUITA	Purse seine	Western Indian Ocean	2,788	2,357	431
	IDN	Baitboat	Eastern Indian Ocean	4,736	2,813	1,923
		Gillnet	Eastern Indian Ocean	9,648	11,583	-1,935
		Line	Eastern Indian Ocean	30,239	19,920	10,319
		Longline	Eastern Indian Ocean	128	1,457	-1,329
		Other	Eastern Indian Ocean	2,638	6,115	-3,477
		Purse seine	Eastern Indian Ocean	66,361	87,099	-20,738
	LKA	Gillnet	Eastern Indian Ocean	29,029	28,991	38
	TMP	Gillnet	Eastern Indian Ocean	314	3	312
	YEM	Gillnet	Western Indian Ocean	1,428	1,416	11

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
2018	EUESP	Purse seine	Western Indian Ocean	132,354	130,572	1,782
	EUITA	Purse seine	Western Indian Ocean	4,372	4,510	-138
	IDN	Baitboat	Eastern Indian Ocean	1,535	2,413	-878
		Gillnet	Eastern Indian Ocean	6,830	9,936	-3,105
		Line	Eastern Indian Ocean	19,936	17,088	2,849
		Longline	Eastern Indian Ocean	225	1,314	-1,089
		Other	Eastern Indian Ocean	2,221	5,246	-3,024
		Purse seine	Eastern Indian Ocean	58,491	42,929	15,562
		TMP	Gillnet	Eastern Indian Ocean	146	3
	YEM	Gillnet	Western Indian Ocean	2,044	2,031	13
2017	EUITA	Purse seine	Eastern Indian Ocean	36	0	36
		Purse seine	Western Indian Ocean	2,683	3,181	-498
	IDN	Baitboat	Eastern Indian Ocean	17,959	3,800	14,159
		Gillnet	Eastern Indian Ocean	8,487	15,644	-7,156
		Line	Eastern Indian Ocean	24,036	26,904	-2,868
		Longline	Eastern Indian Ocean	198	454	-256
		Other	Eastern Indian Ocean	4,994	8,259	-3,266
		Purse seine	Eastern Indian Ocean	61,090	45,229	15,860
2016	EUITA	Purse seine	Western Indian Ocean	1,587	1,719	-133
	IDN	Baitboat	Eastern Indian Ocean	3,659	3,047	613
		Gillnet	Eastern Indian Ocean	10,779	12,543	-1,765
		Line	Eastern Indian Ocean	21,140	21,572	-432
		Longline	Eastern Indian Ocean	19	279	-261
		Other	Eastern Indian Ocean	2,572	6,622	-4,050
		Purse seine	Eastern Indian Ocean	31,827	36,265	-4,438
2015	EUITA	Purse seine	Western Indian Ocean	1,099	1,315	-216
	IDN	Baitboat	Eastern Indian Ocean	10,344	3,206	7,138
		Gillnet	Eastern Indian Ocean	10,755	13,200	-2,445
		Line	Eastern Indian Ocean	20,359	22,701	-2,342
		Longline	Eastern Indian Ocean	618	350	268

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
		Other	Eastern Indian Ocean	5,114	6,969	-1,855
		Purse seine	Eastern Indian Ocean	28,418	38,163	-9,745

## Appendix II:

### Temporal patterns and trends in size distributions

#### Industrial purse seine fisheries

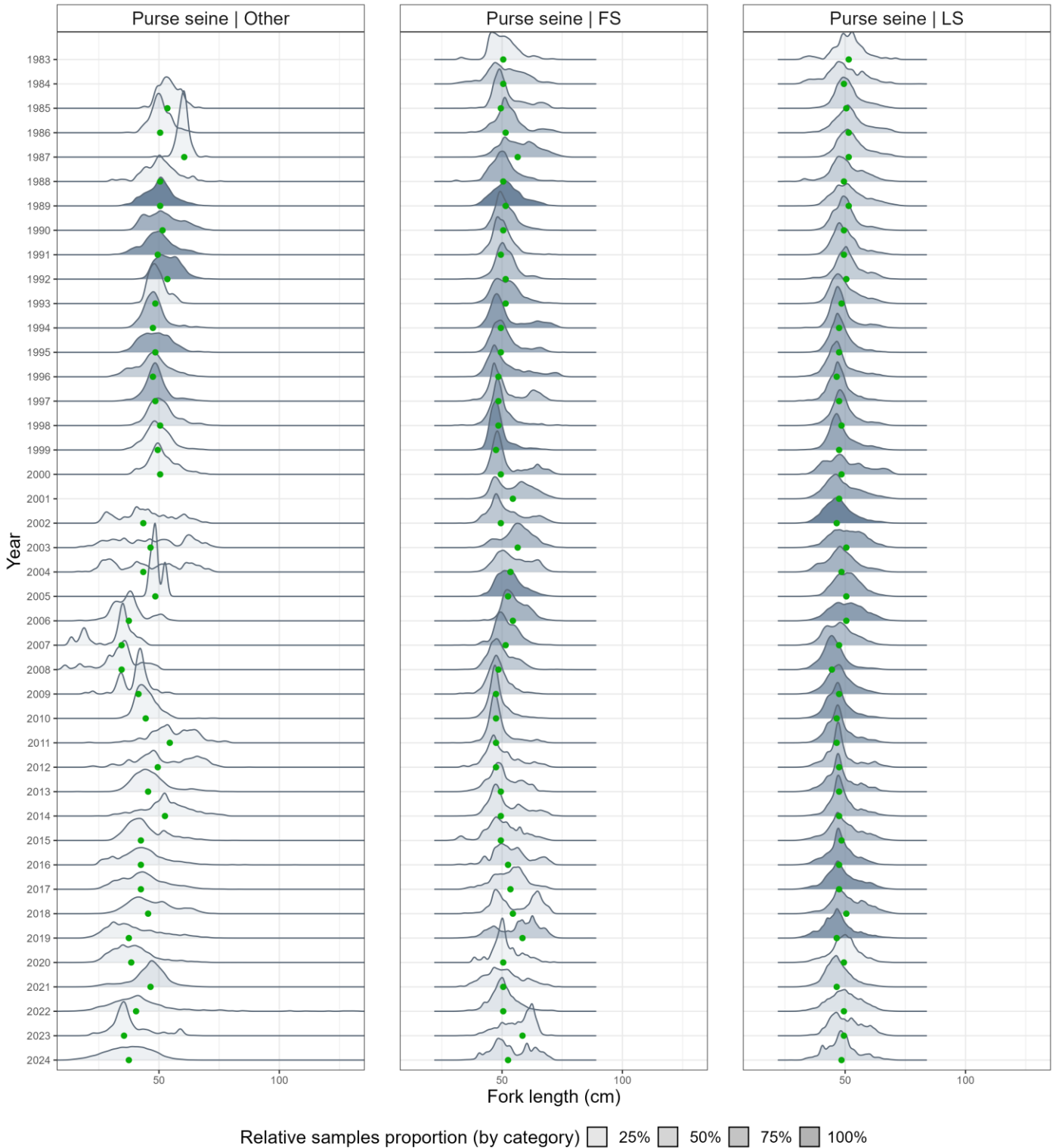


Figure 43: Relative size distribution (fork length in 2 cm size bins) of skipjack tuna caught by all purse seine fleets for the period 1983-2024. Other = no information provided on the school association; FS = free-swimming schools; LS = schools associated with floating objects. Fill intensity is proportional to the number of samples recorded for the year, while the green dot corresponds to the median value. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Coastal fisheries

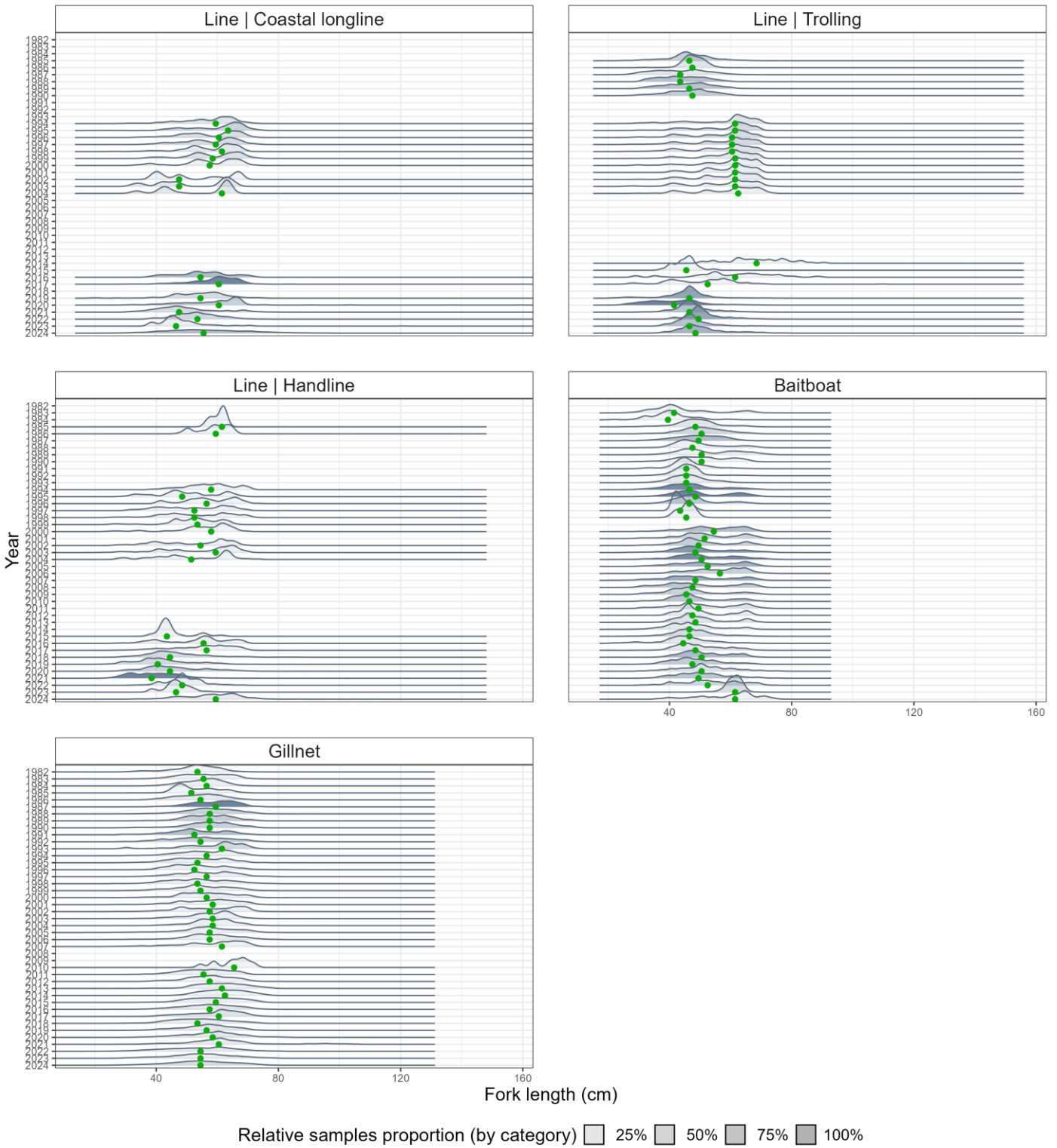


Figure 44: Relative size distribution (fork length in 2 cm size bins) of skipjack tuna caught by all coastal fisheries for the period 1982-2024. Fill intensity is proportional to the number of samples recorded for the year, while the green dot corresponds to the median value. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Baitboat fisheries

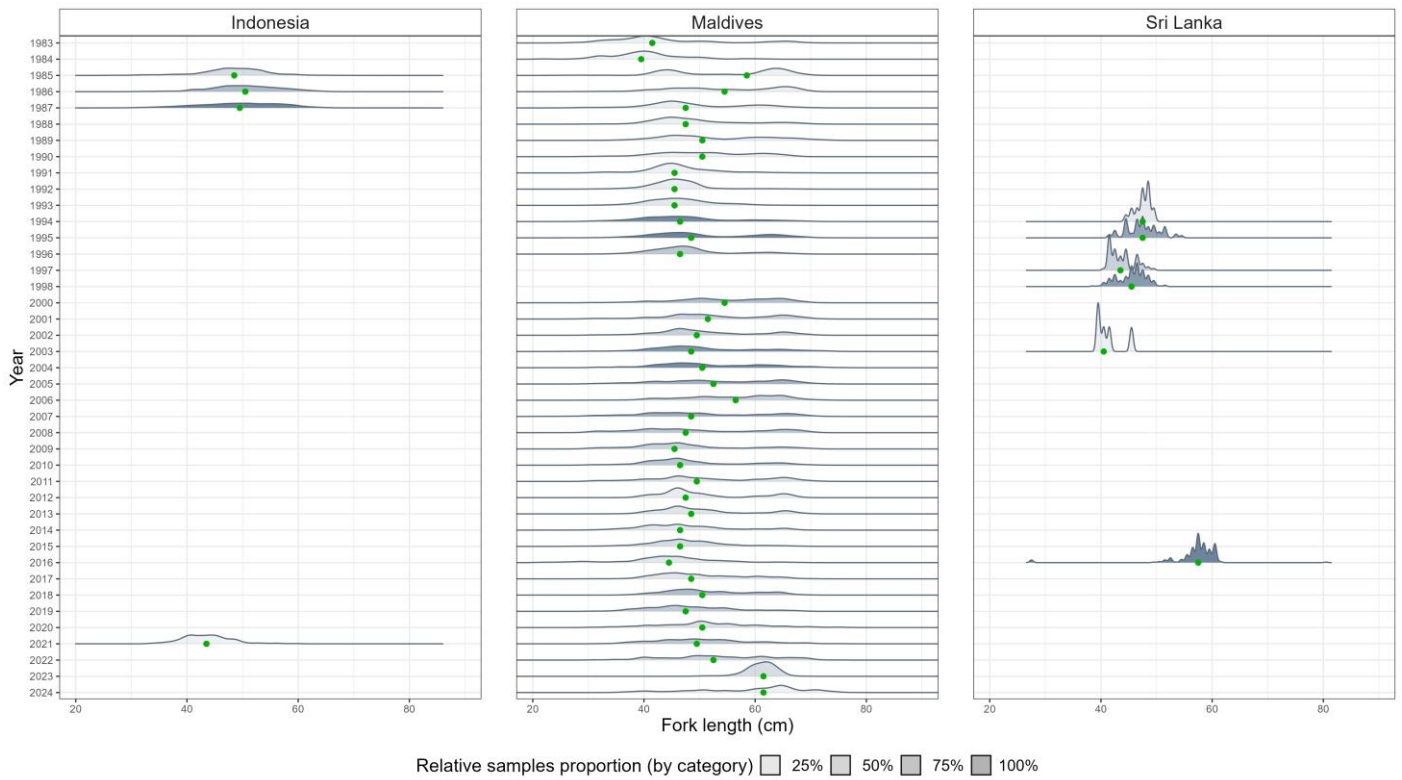


Figure 45: Relative size distribution (fork length in 2 cm size bins) of skipjack tuna caught by baitboat fleets for the period 1982-2024. Fill intensity is proportional to the number of samples recorded for the year, while the green dot corresponds to the median value. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

Gillnet fisheries

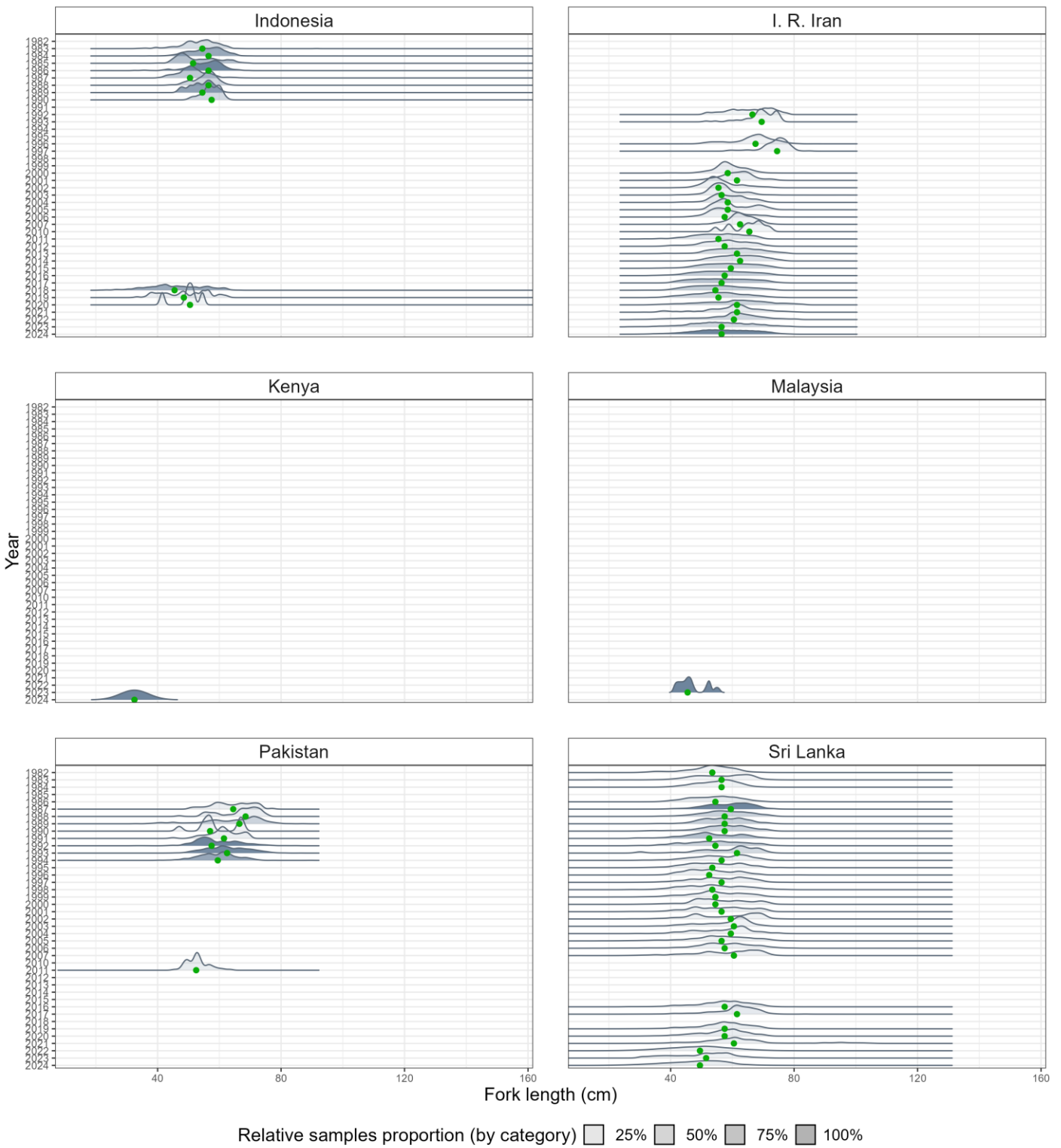


Figure 46: Relative size distribution (fork length in 2 cm size bins) of skipjack tuna caught by gillnet fleets for the period 1982-2024. Fill intensity is proportional to the number of samples recorded for the year, while the green dot corresponds to the median value. Data source: [standardized size-frequency dataset](#) (Res. 15/02)

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