



## REVIEW OF THE STATISTICAL DATA AVAILABLE FOR INDIAN OCEAN INDO-PACIFIC SAILFISH (1950-2023)

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### Abstract

The document provides an overview of the consolidated knowledge about fisheries catching Indo-Pacific sailfish (*Istiophorus platypterus*) in the Indian Ocean since the early 1950s based on a range of data sets collected by the Contracting Parties and Cooperating Non-Contracting Parties (CPCs) of the IOTC and curated by the IOTC Secretariat. The available fisheries statistics indicate that Indo-Pacific sailfish are mostly caught by artisanal fisheries using gillnets and a combination of longlines, trolling lines, and handlines operated in coastal areas. Total catches of Indo-Pacific sailfish have steadily increased since the 1980s to exceed 35,000 t in 2018, before decreasing to 30,600 t in 2020. However, in 2021, catches increased to 40,400 t. Information available on discarding practices of Indo-Pacific sailfish in industrial fisheries indicates that discard levels are small in large-scale longline and purse seine fisheries and individuals generally discarded dead at sea. Discarding in coastal fisheries interacting with the species is poorly known but considered to be small. Information available on the spatial distribution of catch and effort has substantially improved over the last decade but remains limited, half of the total catch lacking accurate data on fishing grounds in 2020. Catches of Indo-Pacific sailfish are mainly located along the coasts of I.R. Iran, Pakistan, Oman, India, Sri Lanka and Tanzania, although the catch levels for this latter CPC are largely unknown. The reporting of size-frequency data has also improved over the last decade but remains very limited for most fisheries.

**Keywords:** billfish | Indo-Pacific sailfish | Indian Ocean | tuna fisheries

## Introduction

Indo-Pacific sailfish (*Istiophorus platypterus*) is a species of billfish that occurs in tropical and subtropical waters throughout the world oceans. Fisheries statistics available from FAO fisheries statistics show that Indo-Pacific sailfish are from two oceans, with 97% (**Fig. 1**). The global trend shows significant increased in the 1990s and some increasing catches from IATTC in the 1970s

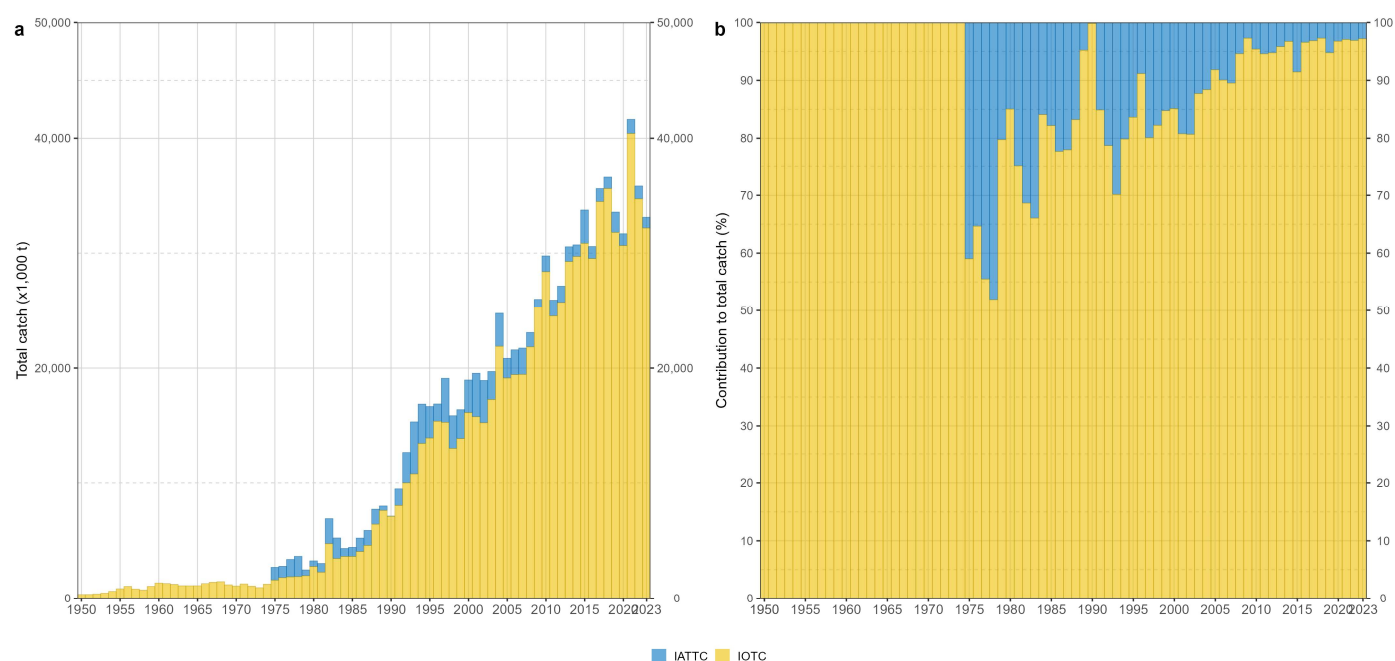


Figure 1: Annual time series of cumulative retained catches (metric tonnes; t) of Indo-Pacific sailfish by region 1950-2023. Source: ([https://www.fao.org/fishery/statistics-query/en/capture/capture\\_quantity](https://www.fao.org/fishery/statistics-query/en/capture/capture_quantity))

The overarching objective of this paper is to provide participants in the 23<sup>rd</sup> Session of the IOTC Working Party on Billfish ([WPB23](#)) with a review of the status of the information available on Indian Ocean Indo-Pacific sailfish (*Istiophorus platypterus*) through the analysis of temporal and spatial trends in catches and their main recent features, as well as an assessment of the reporting quality of the data sets. A full description of the data collated and curated by the Secretariat is available in ([IOTC2025?](#)).

## Total retained (nominal) catch

### Historical trends (1950-2023)

Overall, total reported catches of Indo-Pacific sailfish show a marked increase from the early 1980s until today (**Fig. 2a**), with a peak in annual catches recorded in 2021 at around 40,000 t and slightly decreasing catches reported for 2019 and 2020.

Historical trends of Indo-Pacific sailfish catches indicate the species as predominant in its group (together with swordfish) with a contribution to over 30% of total billfish catches in the Indian Ocean. Furthermore, due to the tendency of the species to inhabit shallower waters ([Nakamura 1985](#)), the fraction of catches reported by artisanal fisheries is consistently higher than what reported for other billfish species (**Fig. 2b**). Nevertheless, the development of longline fisheries in the mid-1950s increased catches of billfish species in general, and sailfish in particular, as did the drastic development of gillnet fisheries from the 1980s onward (**Table 1**) in several coastal countries ([Maldeniya et al. 1995](#), [Hornby et al. 2014](#)).

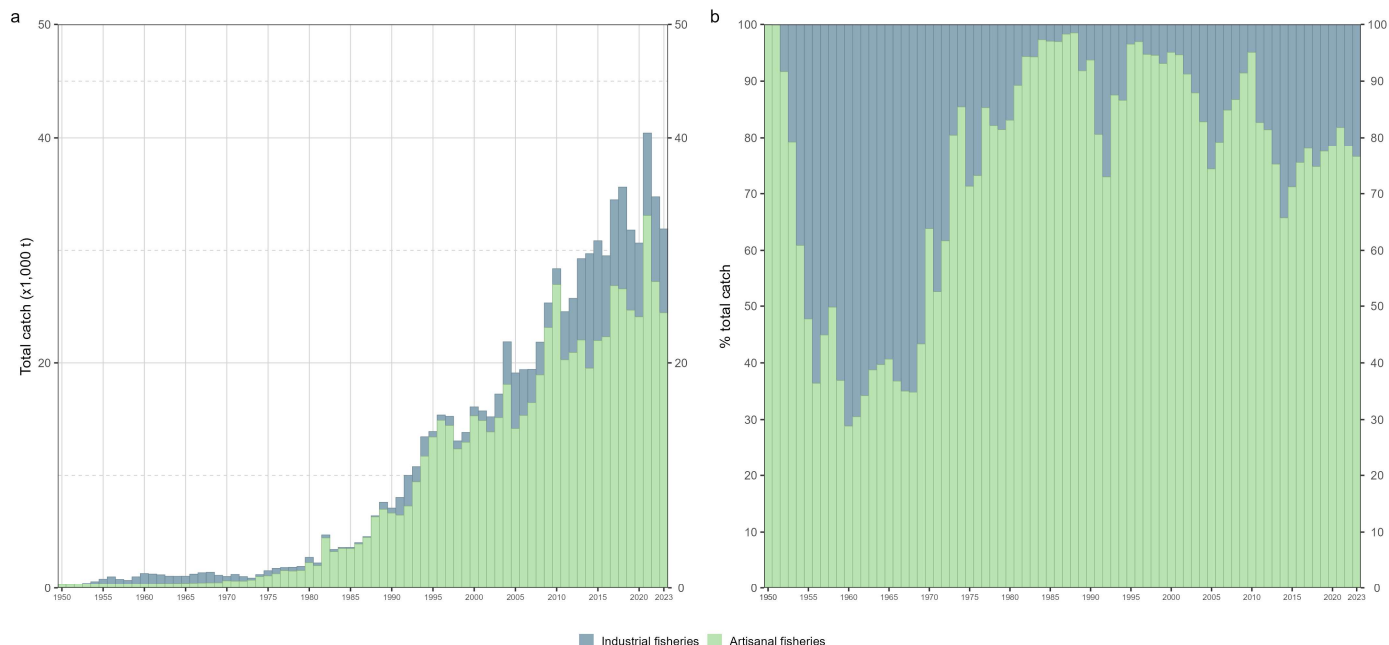


Figure 2: Annual time series of cumulative retained absolute (a) and relative (b) catches (metric tonnes; t) of Indo-Pacific sailfish by type of fishery for the period 1950-2023. Data source: [best scientific estimates of retained catches](#)

The relative proportions of catches of Indo-Pacific sailfish by fishery changed over the years, with both artisanal and industrial gillnets contributing the highest proportion from 1980s onward (reaching around 69 % of total catches in recent years), line fisheries (coastal longline, trolling and handline) increasing their contribution between mid-1970s and mid-1990s before stabilizing to around 26 % of total reported catches in recent years, and proportions from longline fisheries strongly declining between 1970 and 1990, when catches of the species caught by swordfish-targeting longliners began to increase again (**Fig. 3b** and **Table 1**). There are also reports of Indo-Pacific sailfish catches from purse seine (1980-2023) and baitboat fisheries (1970-1974 and 2015-2020), although very low in absolute terms at less than 100 t per year in the periods concerned.

Table 1: Mean annual retained catches (metric tonnes; t) of Indo-Pacific sailfish 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: [best scientific estimates of retained catches](<https://www.iotc.org/WPB/23/Data/03-NC>)

Fishery	1950s	1960s	1970s	1980s	1990s	2000s	2010s
Purse seine   Other	0	1	4	30	12	20	52
Longline   Other	0	0	0	19	488	1,127	517
Longline   Fresh	0	1	1	39	387	486	565
Longline   Deep-freezing	297	804	368	188	616	341	381
Line   Coastal longline	23	27	40	151	309	634	2,252
Line   Trolling	135	185	310	932	1,852	3,050	2,890
Line   Handline	34	36	156	529	790	916	1,931
Baitboat	3	5	39	28	65	102	242
Gillnet	170	190	540	2,345	7,456	12,263	20,800
Other	5	9	21	71	123	191	346
<b>Total</b>	<b>668</b>	<b>1,257</b>	<b>1,479</b>	<b>4,332</b>	<b>12,098</b>	<b>19,130</b>	<b>29,976</b>

Table 2: Annual retained catches (metric tonnes; t) of Indo-Pacific sailfish by fishery for the period 2014-2023. The background intensity color of each cell is directly proportional to the catch level. Data source: [best scientific estimates of retained catches](https://www.iotc.org/WPB/23/Data/03-NC)

Fishery	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Purse seine   Other	33	26	40	227	26	48	184	52	123	702
Longline   Other	236	67	110	69	56	58	30	29	46	50
Longline   Fresh	1,013	496	511	724	923	908	484	357	403	309
Longline   Deep-freezing	282	494	1,143	281	377	344	252	235	282	337
Line   Coastal longline	2,278	2,998	2,027	4,498	3,932	2,634	1,658	1,752	3,868	2,513
Line   Trolling	2,330	2,577	3,145	1,977	2,246	3,064	4,217	3,422	5,174	3,588
Line   Handline	1,008	1,771	2,486	2,614	1,569	2,461	2,637	3,023	3,098	1,672
Baitboat	273	366	144	469	57	138	202	100	34	0
Gillnet	21,816	21,577	19,698	23,093	26,239	21,922	20,557	31,211	21,348	22,702
Other	440	476	220	505	152	216	425	246	345	17
<b>Total</b>	<b>29,710</b>	<b>30,847</b>	<b>29,525</b>	<b>34,457</b>	<b>35,577</b>	<b>31,792</b>	<b>30,647</b>	<b>40,428</b>	<b>34,723</b>	<b>31,889</b>

Industrial longline (deep-freezing) and coastal fisheries are known to be catching Indo-Pacific sailfish since the 1950s, with the Japanese fleet operating in the western Indian Ocean being the major contributor to the former component (since the mid-1950s) and Omani, Malagasy, and Indian fisheries being the major contributors to the latter, starting from the 1970s.

It is also assumed that vessels from Taiwan, China operating in the western Indian Ocean during the 1980s had substantial catches of sailfish, although these were reported to the IOTC as aggregates of billfish species ([Campbell & Tuck 1998](#)), therefore explaining the low catches of sailfish recorded during a period of time that saw substantial increases in the number of active longline vessels.

Indo-Pacific sailfish catches were also influenced by the development of gillnet fisheries in Sri Lanka ([Maldeniya et al. 1995](#)) and Pakistan ([Hornby et al. 2014](#)) during the 1980s. Moreover, the contribution of coastal longline fisheries to Indo-Pacific sailfish catches gradually increased from the 2000s, with average annual catches almost doubling between the 2000s and 2010s (**Fig. 4** and **Table 1**).



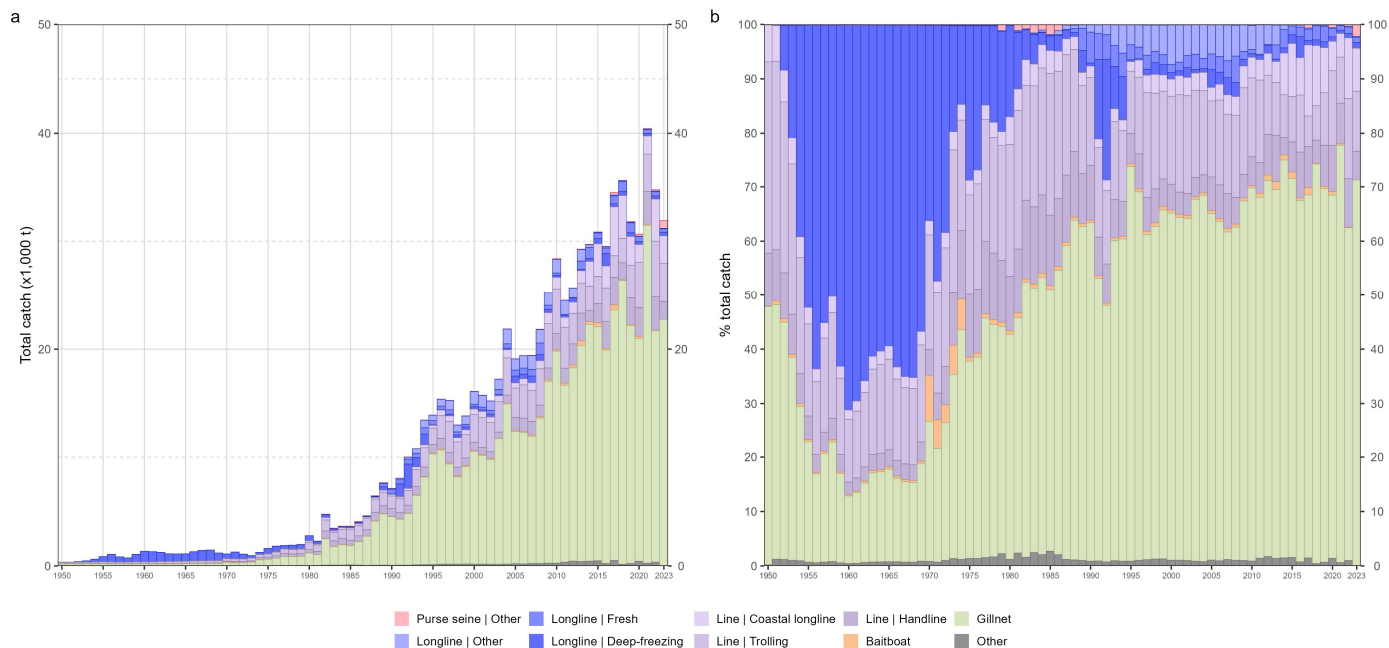


Figure 3: Annual time series of cumulative retained absolute (a) and relative (b) catches (metric tonnes; t) of Indo-Pacific sailfish by fishery for the period 1950-2023. Data source: [best scientific estimates of retained catches](#)

In 2017 Pakistan fully revised their time series of gillnet catches for the period 1987-2016 based on information collected through the WWF crew-based data collection programme, although without major improvements on the species composition of billfish catches ([IOTC Secretariat 2019](#), [Moazzam 2019](#)). This required the IOTC Secretariat to post-process all catches of aggregated billfish species from the gillnet fisheries of Pakistan, which in the years between mid-1980s and mid-1990s were in turn all assigned to Indo-Pacific sailfish (*Istiophorus platypterus*).

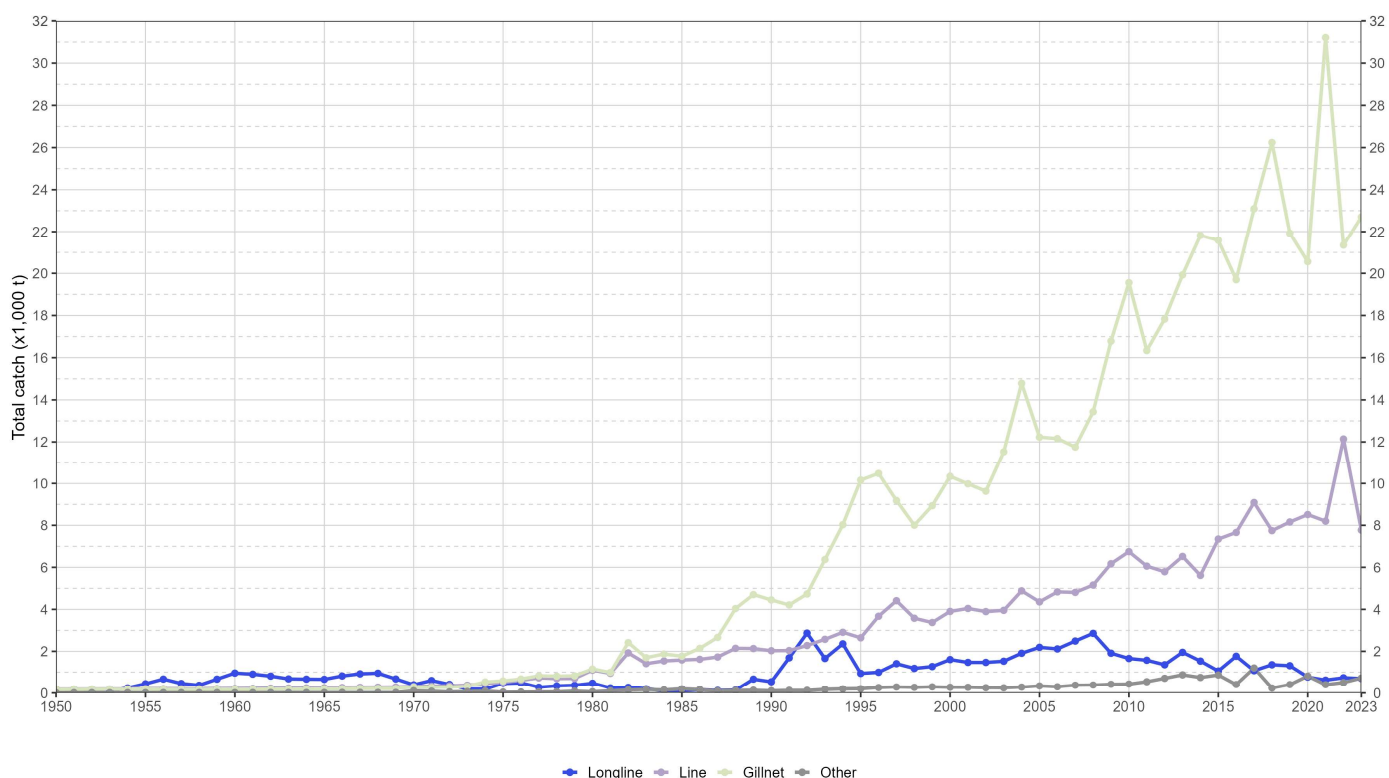


Figure 4: Annual time series of retained catches (metric tonnes; t) of Indo-Pacific sailfish by fishery group for the period 1950-2023. Data source: [best scientific estimates of retained catches](#)

## Main fishery features (2019-2023)

In recent years (2019-2023), gillnet fisheries contributed to 69.5% of Indo-Pacific sailfish catch, followed by *coastal* line fisheries (combining coastal longline, troll line and handline fisheries) with 26.4%, fresh longline fisheries with 1.5%, deep-freezing longline fisheries with 0.9% and purse seine fisheries with 0.7% (**Table 3**).

With regards to purse seine fisheries, the vast majority of catches of Indo-Pacific sailfish is reported by the coastal purse seiners of Indonesia and by the ringnets of Sri Lanka, although the latter reached non-negligible levels only in 2018 when approximately 17 t of the species were recorded, in total, for the fishery.

Very limited information on retained catches of Indo-Pacific sailfish for industrial purse seine fisheries has been reported to the Secretariat through the retained catch data form (1-RC) while information from the ROS indicates that some Indo-Pacific sailfish may be caught in these fisheries and retained or discarded at sea (see section [Discard levels](#)).

Table 3: Mean annual catches (metric tonnes; t) of Indo-Pacific sailfish by fishery between 2019 and 2023. Data source: [best scientific estimates of retained catches](<https://www.iotc.org/WPB/23/Data/03-NC>)

Fishery	Fishery code	Catch	Percentage
Gillnet	GN	23,548	69.5
Line   Trolling	LIT	3,893	11.5
Line   Handline	LIH	2,578	7.6
Line   Coastal longline	LIC	2,485	7.3
Longline   Fresh	LLF	492	1.5
Longline   Deep-freezing	LLD	290	0.9
Other	OT	250	0.7
Purse seine   Other	PSOT	222	0.7
Baitboat	BB	95	0.3
Longline   Other	LLO	42	0.1

Catches of Indo-Pacific sailfish are highly concentrated, as it takes just five countries to reach ~82% of the average 2019-2023 total annual catch levels (**Fig. 5**). In particular, the gillnet fisheries of I.R. Iran account for 36% of the total Indo-Pacific sailfish catches, of which 50% are reported by I.R. Iran as caught by larger vessels that can operate in areas beyond national jurisdiction. India, Indonesia, Sri Lanka and Pakistan also reported substantial amounts of Indo-Pacific sailfish caught with a variety of coastal and offshore fisheries that include gillnet, line, and longline, contributing to 41% of the total catch reported between 2019 and 2023 (**Fig. 5**).

Finally, it is important to recall that catch levels of Indo-Pacific sailfish reported by Pakistan for years prior to 2018 are the result of the disaggregation process adopted by the IOTC Secretariat to break down catches originally reported by the CPC as a generic aggregate of billfish species.

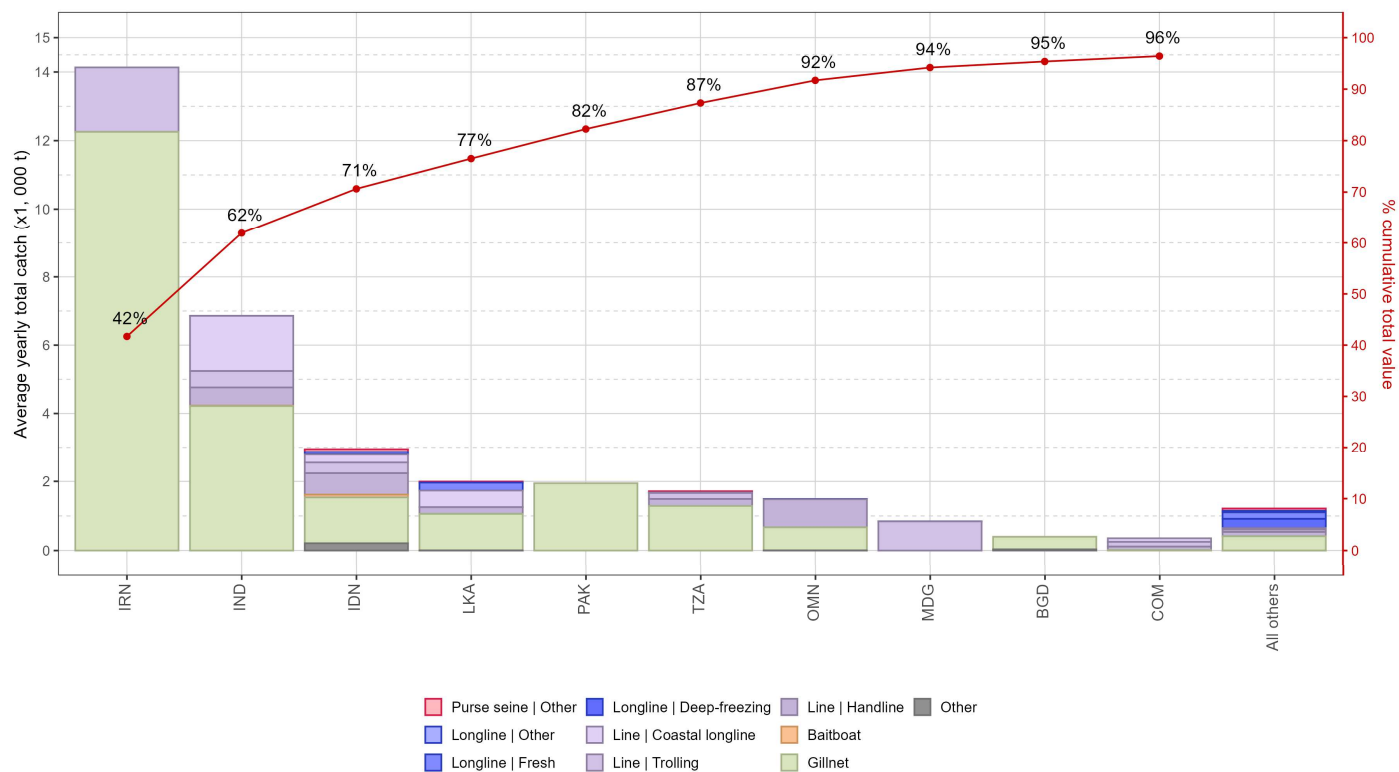


Figure 5: Mean annual catches (metric tonnes; t) of Indo-Pacific sailfish by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet. Data source: [best scientific estimates of retained catches](#)

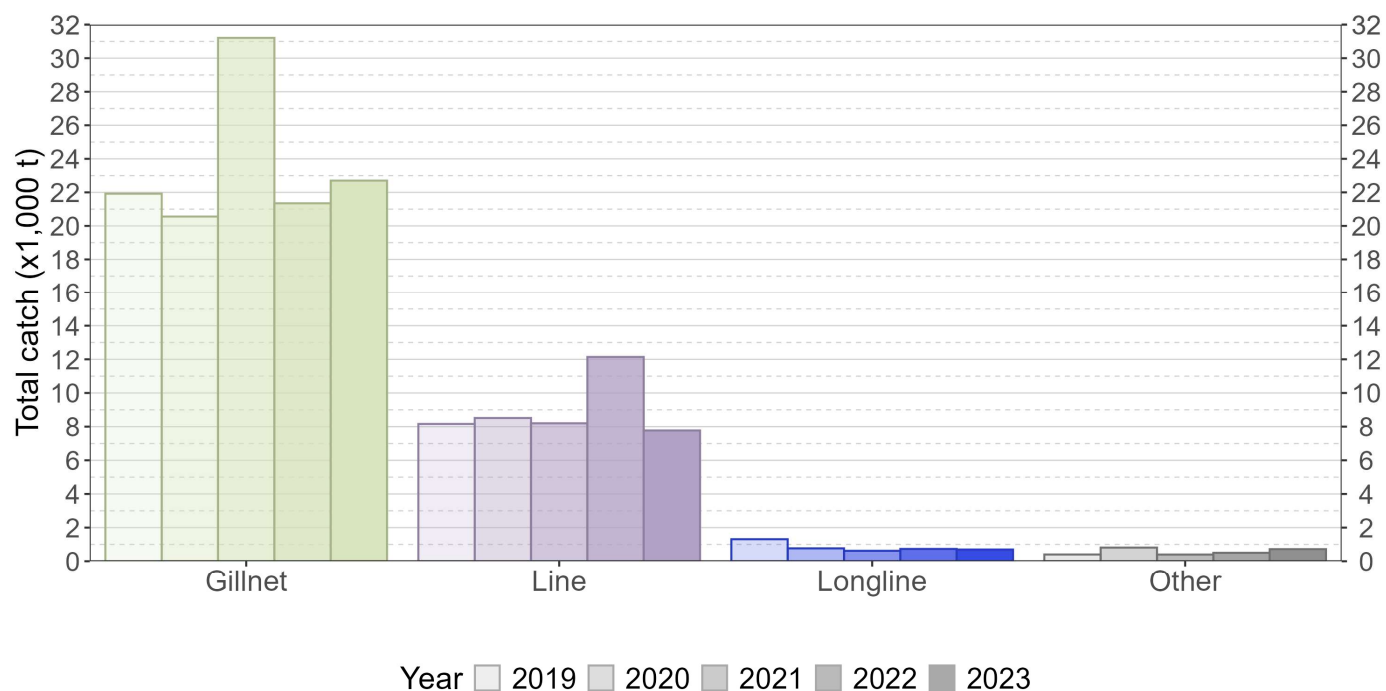


Figure 6: Annual catch (metric tonnes; t) trends of Indo-Pacific sailfish by fishery group between 2019 and 2023. Data source: [best scientific estimates of retained catches](#)

Annual catches of Indo-Pacific sailfish by fishery group show that *gillnet* peaked in 2021 and decline in 2022, before slight recovery in 2023; *line* peaked in 2022, *longline* remain low but stable and *other* remain stable at low catch compared to other fisheries.

In 2021 gillnet catches increased by 52% compared to 2020 catch (**Fig. 6**). Catches from industrial longline fisheries are generally declining after a period of relative stability, when not of increasing catch trends, as is the case of Sri Lanka until 2019 (**Fig. 7b**).

On a fishery-specific basis, gillnet catches are prominently accounted for by gillnetters from I.R. Iran, followed by India, Pakistan and Indonesia. India also dominates catches of Indo-Pacific sailfish from line-related fisheries, although the overall trend is decreasing in recent years, and Indonesia appears as the major source of catches for the species reported by fisheries of *other* types (**Fig. 6**).

Additional uncertainties are introduced by significant reporting of aggregated billfish and marlin catches by several fisheries of India in 2019 and 2020, which required explicit disaggregation of catch records by the Secretariat in order to produce species-specific catches (including Indo-Pacific sailfish) for these two years.

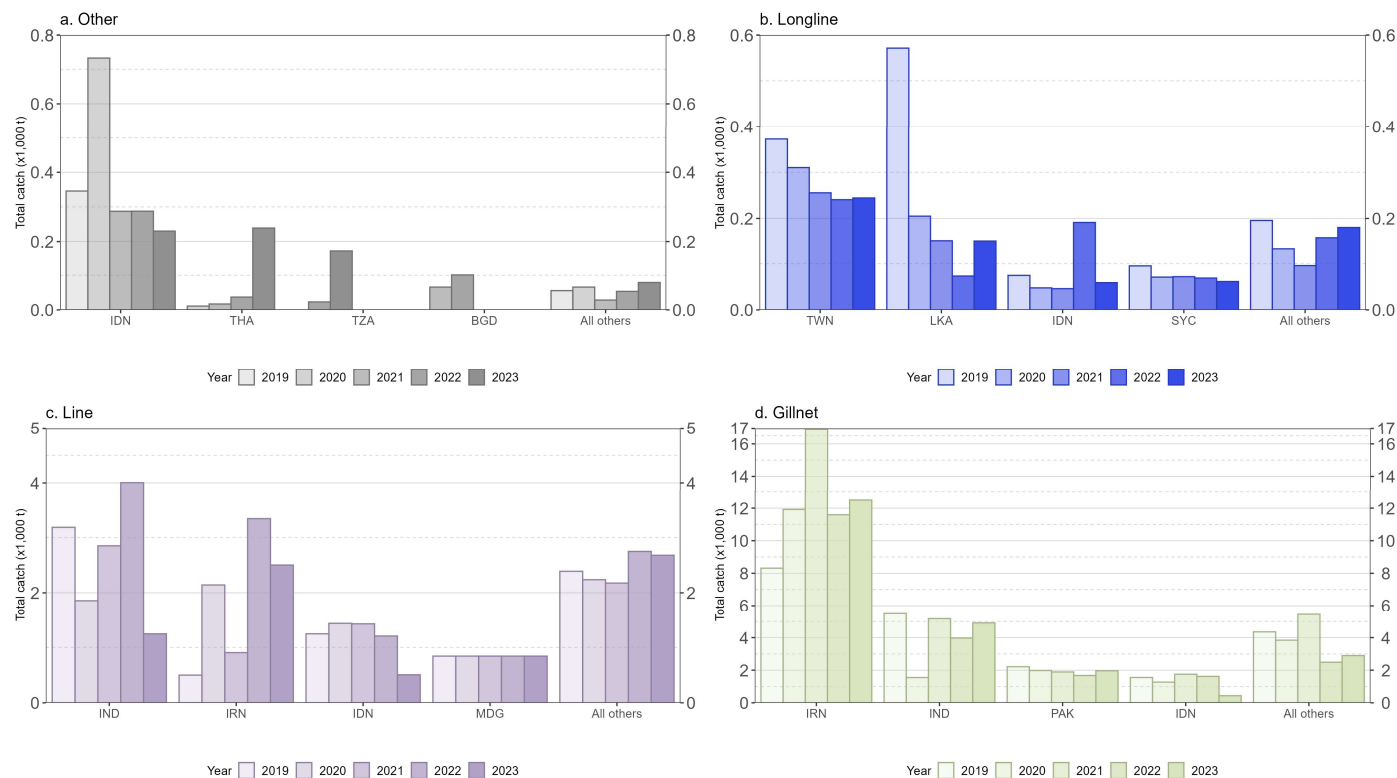


Figure 7: Annual catch (metric tonnes; t) trends of Indo-Pacific sailfish by fishery group and fleet between 2019 and 2023. Data source: [best scientific estimates of retained catches](#)

## Changes from previous Working Party

There was significant data revision between the Working Parties on Billfish held in 2024 (WPB22) and 2025 (WPB23) which could impact the historical catch trend of Indo-Pacific sailfish. This is due to the re-estimation of the Indonesian historical catches between 1950 and 2022. Additionally, the disaggregation of marlin and billfish aggregated catches, which relies on proxy fleets and years, slightly altered past data estimated for Indo-Pacific sailfish (**Fig. 8**). Furthermore, changes were due to (i) the revision of catches for Bangladesh fisheries in 2022, (ii) updates in the data collated from the [FAO global capture production database](#) for non-CPC coastal states (United Arab Emirates, Jordan, Yemen), which are used in absence of data reported to the Secretariat (see [Appendix II](#) for additional details on the most important changes in retained catches recorded in recent years).

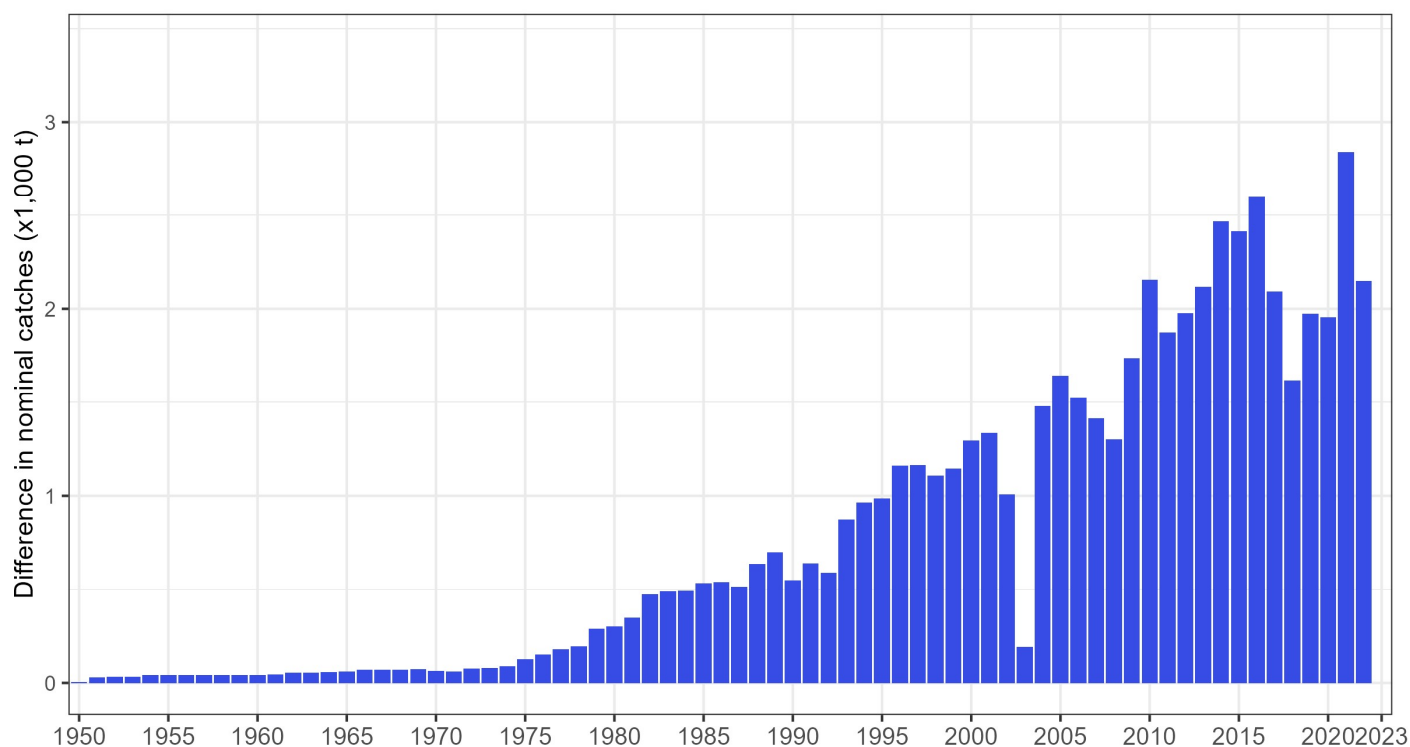


Figure 8: Differences in the available best scientific estimates of retained catches (metric tonnes; t) of Indo-Pacific sailfish between this WPB and its previous session ([WPB22](#) meeting held in September 2024)

## Uncertainties in retained catch data

Uncertainties in Indo-Pacific sailfish catches are generally more relevant than with other billfish species, due to the higher proportion of catches originating from coastal fisheries for which the species is thought to have been often under-reported in the past.

The quality of retained catches is quite variable, with a marked drop starting in 1970 before reaching satisfactory levels again in 2010, when important coastal fisheries such as those from I.R. Iran and Sri Lanka started improving the quality of the data by providing detailed catches of billfish species for their major fisheries.

Overall there are marked uncertainties in the catch of industrial fisheries, as in the 1990s several industrial longline fisheries (mostly those operating fresh tuna longliners) were not reporting catch data to the IOTC Secretariat. Hence, most of the catches were estimated using proxy fleets and recorded as *not elsewhere identified* (NEI) ([Herrera2002?](#)) therefore explaining the very low quality scores of industrial fisheries for the period, which were often below the estimated quality level of artisanal fisheries. Furthermore, the lack of information at species level reduced the accuracy of the data available for Indo-Pacific sailfish (**Fig. 9**).

Around 11% of retained catches of Indo-Pacific sailfish is considered uncertain in 2023 (**Fig. 9**), and it predominantly consists of re-estimated catches for coastal fisheries, including non-reporting ones (e.g., line fisheries of Madagascar, and non-IOTC members).

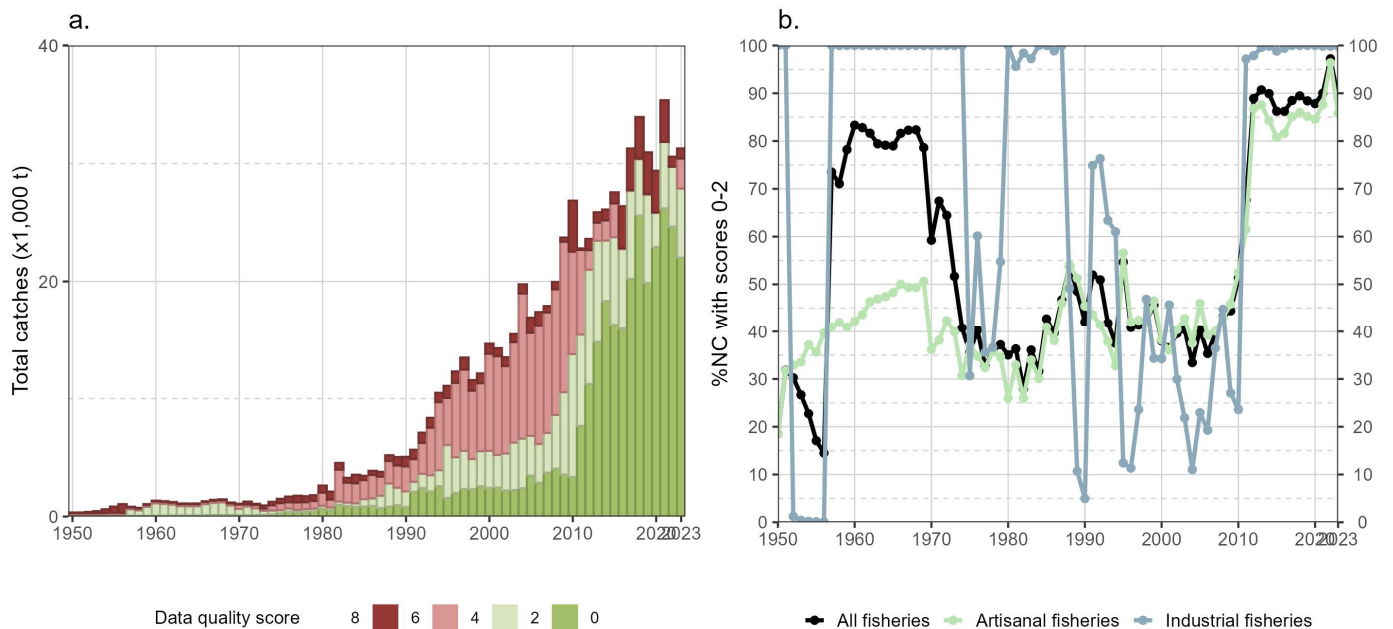


Figure 9: (a) Annual retained catches (metric tonnes; t) of Indo-Pacific sailfish estimated by quality score and (b) percentage of total retained catches fully/partially reported to the IOTC Secretariat for all fisheries and by type of fishery, in the period 1950-2023

## Discard levels

Information collected from scientific observers at sea through the ROS suggests that Indo-Pacific sailfish is more often discarded in large-scale purse seine than longline fisheries. The size composition of the catch shows that the species may be discarded at all sizes in purse seine fisheries, while little-to-no size data for discarded Indo-Pacific sailfish are available from longline fisheries (Fig. 10).

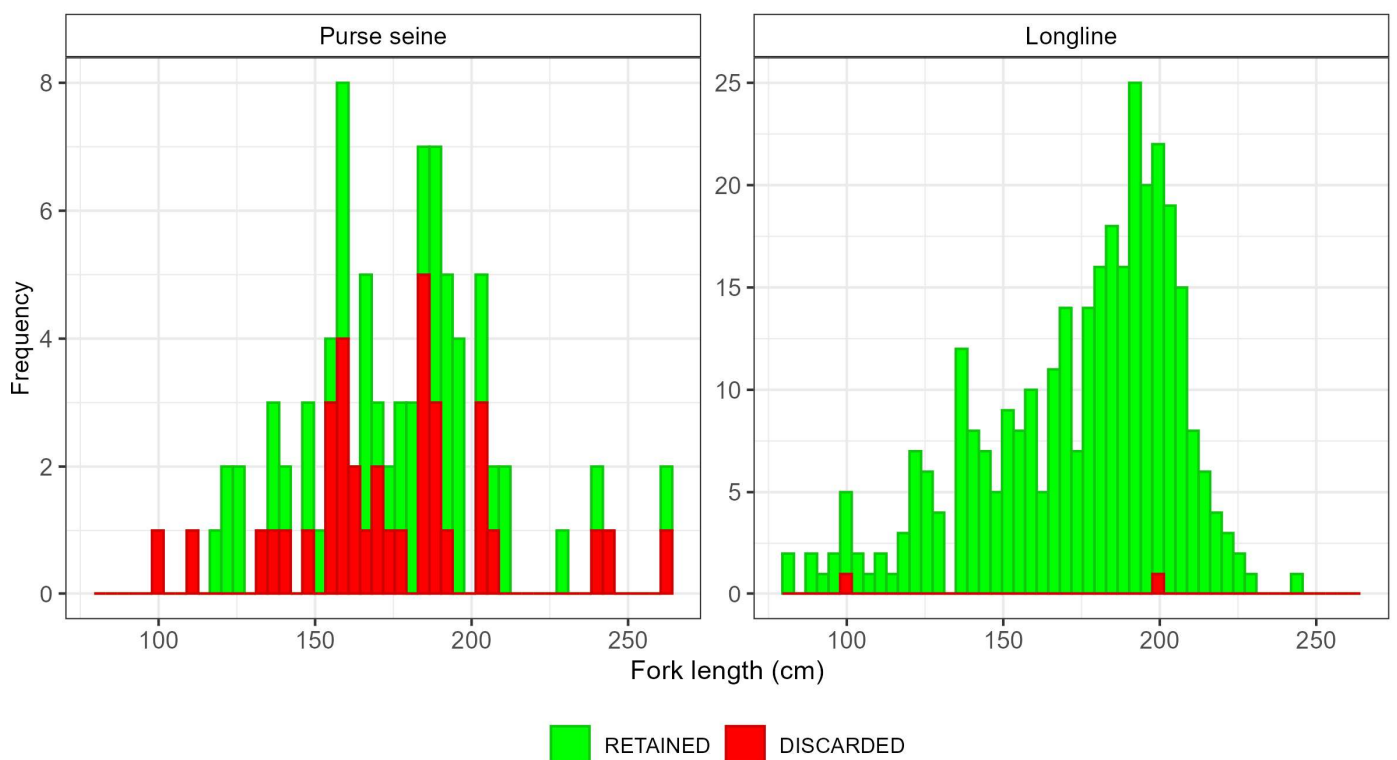


Figure 10: Size (fork length; cm) frequency distribution of Indo-Pacific sailfish retained and discarded at sea in purse seine and longline fisheries as available in the ROS regional database

Information collected on the condition (i.e., individual released *dead* or *alive*) suggests that the very large majority of the fish do not survive when discarded at sea, whatever the fishery group or fishing ground.

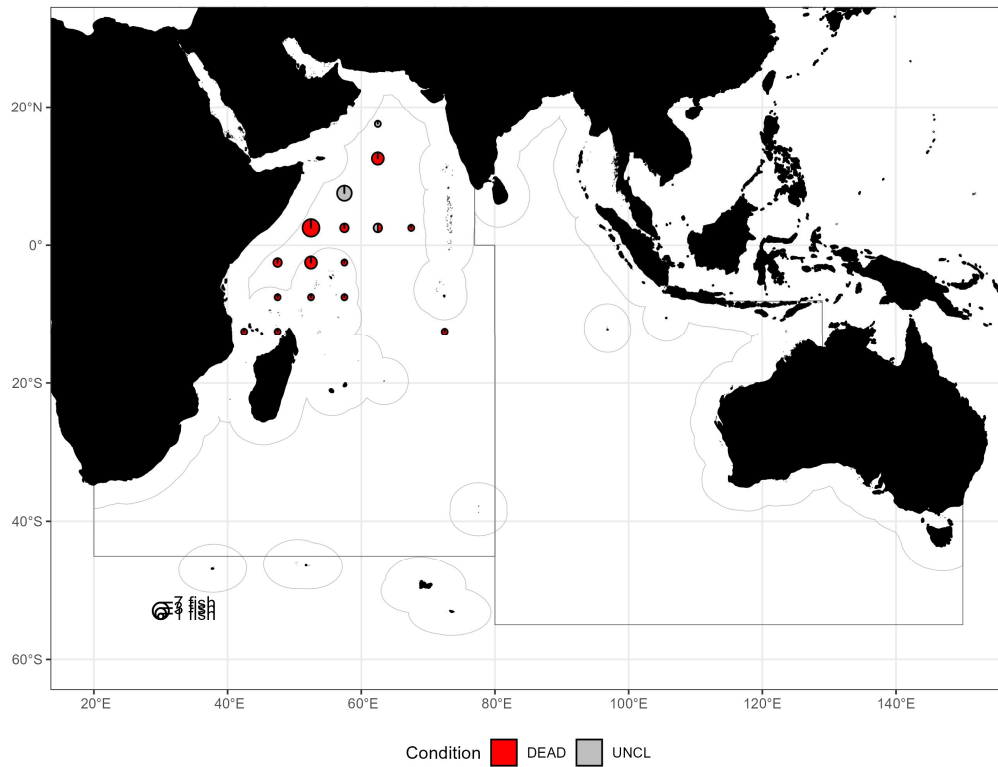


Figure 11: Distribution of Indo-Pacific sailfish discarded at sea in the western Indian Ocean purse seine fisheries with information on condition as available in the ROS regional database

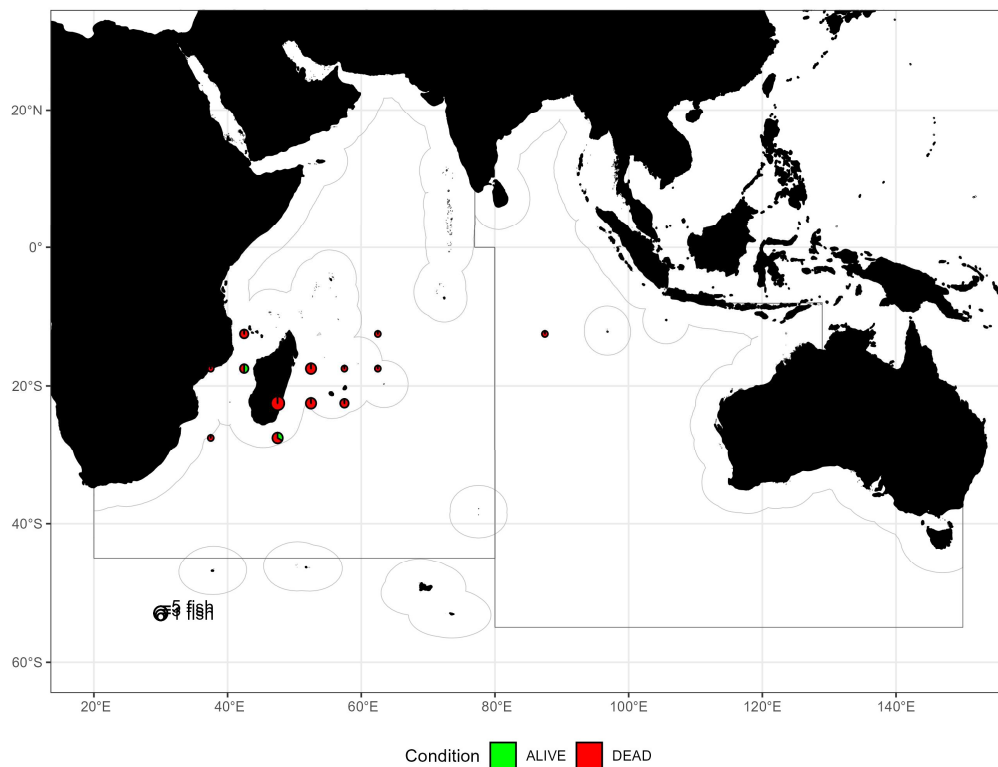


Figure 12: Distribution of Indo-Pacific sailfish discarded at sea in the Indian Ocean longline fisheries with information on condition as available in the ROS regional database



## Geo-referenced catch

### Spatial distribution of catches

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

In the past, geo-referenced catches of Indo-Pacific sailfish were generally available for the major industrial longline fisheries operating in the Indian Ocean. The distribution of the catch indicates that - from the 1970s to the 1990s - these were mostly occurring in equatorial waters both in the western and eastern Indian Ocean, as well as in the bay of Bengal (**Fig. 13a-b**). Starting with the 2000s, evidence of increased catches from longline vessels begun to appear in the Southwest Indian Ocean and in the Mozambique channel in particular (**Fig. 13c-d**). Between 1970 and 1989 most of the available geo-referenced catches of Indo-Pacific sailfish originated from Korean longliners, with Japanese longliners becoming predominant between 1990 and 2009. In the 2010s, longline catches appear to be more concentrated in the southwestern Indian Ocean and Mozambique channel, with information from Seychellois and Chinese longliners beginning to be reported in tropical areas of the western Indian Ocean, mostly south of the equatorial line. In 2023, the distribution indicates very high catches of SFA from gillnet and line fisheries in northwest Indian Ocean.

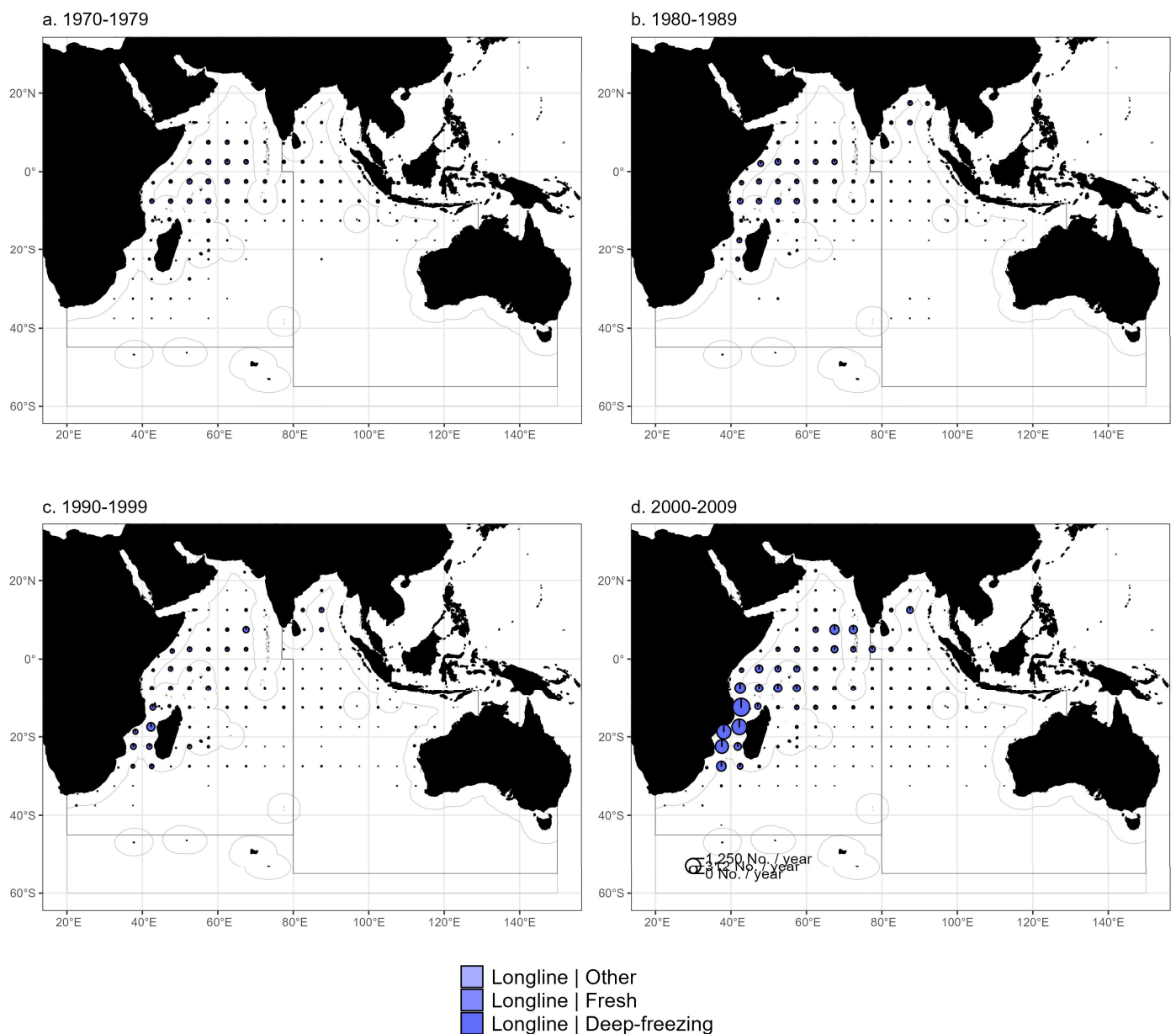


Figure 13: Mean annual time-area catches in numbers of Indo-Pacific sailfish, by decade, 5x5 grid, and fishery. Data source: [time-area catches](#)

### Geo-referenced catches by fishery, last years (2019-2023) and decade (2010-2019)

The quality of the geo-referenced catches reported to the Secretariat has substantially improved in recent years, and spatial information on fishing activities is now available for most industrial and coastal fisheries. Geo-referenced catches in weight indicate high catch levels in the northern Arabian sea, in the areas of national jurisdiction of Sri Lanka and in the Mozambique channel for both line and gillnet fisheries (**Fig. 14**), while catches from longline fisheries (in number) remain high in the western Indian Ocean (particularly in the Mozambique Channel) and in temperate waters of both the eastern and western Indian Ocean (**Fig. 15**).

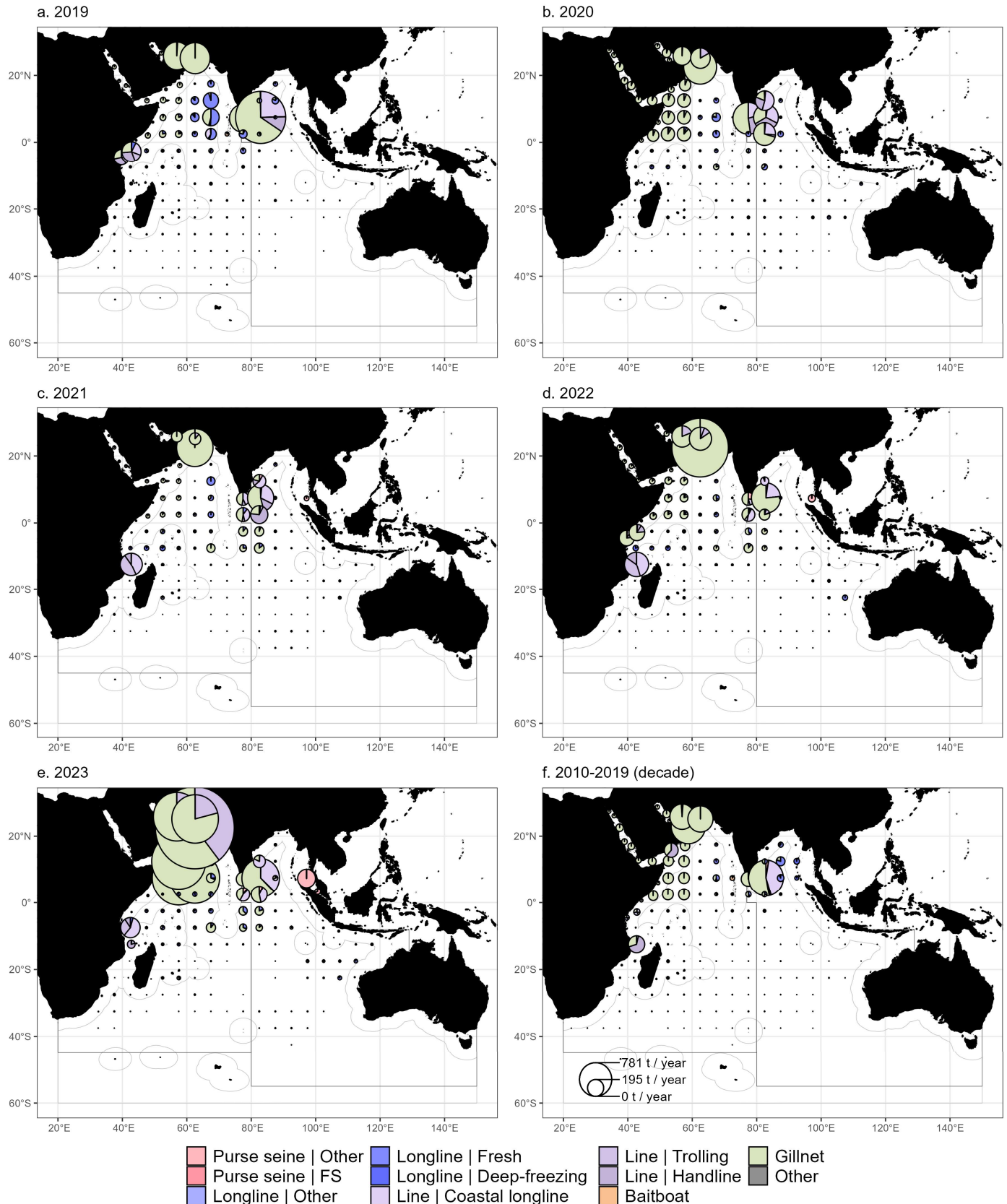


Figure 14: Mean annual time-area catches in weight (metric tonnes; t) of Indo-Pacific sailfish, by year / decade, 5x5 grid, and fishery. Data source: [time-area catches](#)

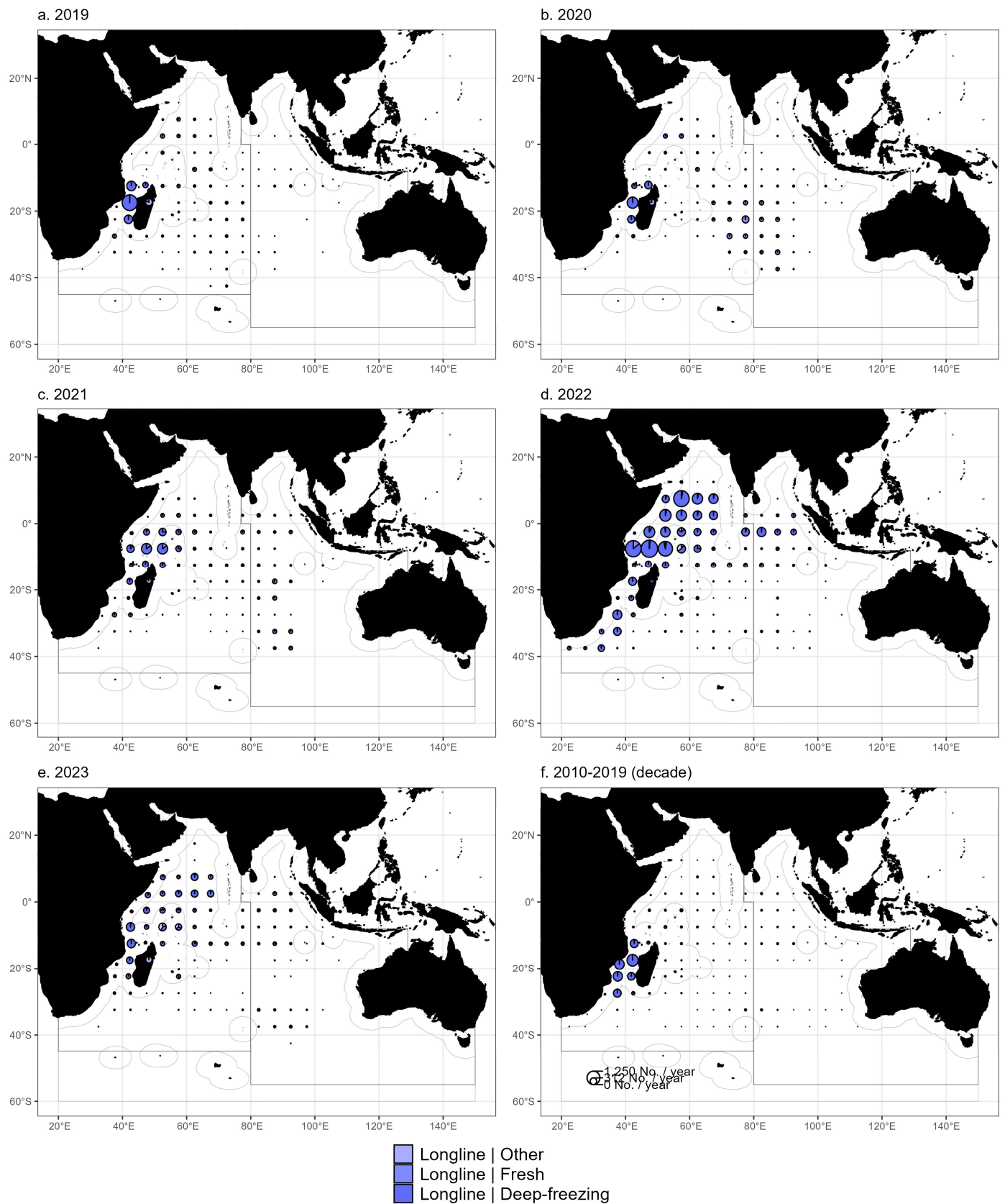


Figure 15: Mean annual time-area catches in numbers of Indo-Pacific sailfish, by year / decade, 5x5 grid, and fishery. Data source: [time-area catches](#)

## Uncertainties in catch and effort data

Uncertainties in geo-referenced catch and effort data of Indo-Pacific sailfish are higher than those for total retained catch data, as catch and effort data for artisanal fisheries were only available from Sri Lanka prior to 2007 and the quality and completeness of data reported from industrial longline fleets is generally mediocre and extremely variable for the years between 1975 and 2010 (**Fig. 16**). Besides the limited extent of the data reported to the Secretariat, additional issues have been identified for the catch and effort records available for the species:

- data from Iranian fisheries have only become available since 2007, although not fully reported by IOTC standard. However, some improving in the 2023 reported catch;
- data for the main fisheries of Indonesia are not available prior to 2018, and appear characterized by a low coverage for all fisheries;
- data for the longline fisheries of China are not available prior to 2018;
- no data available for the longline fisheries of Taiwan, China;
- most industrial longline fisheries report catch and effort in numbers, although these appear to be low in the period 1970s to 2000s.

Overall, 61% of the retained catches reported for 2023

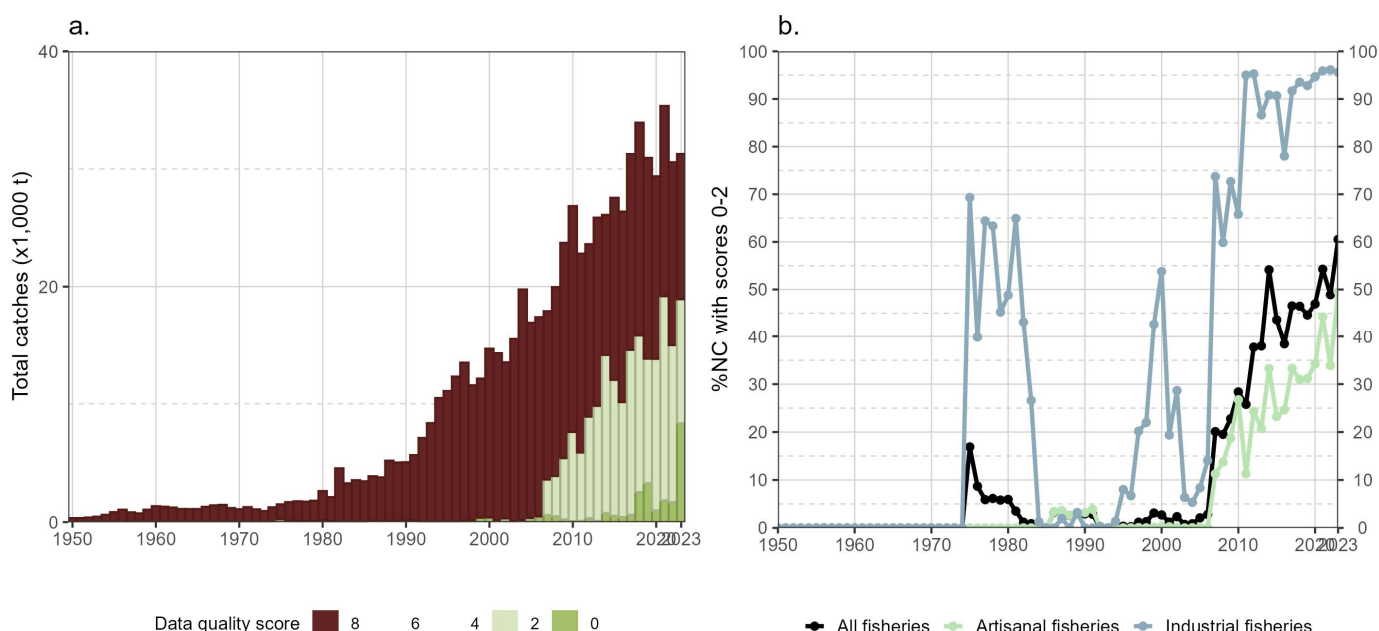


Figure 16: (a) Annual retained catches (metric tonnes; t) of Indo-Pacific sailfish estimated by quality score and (b) percentage of total retained catches for which geo-referenced catches were reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02 for all fisheries and by type of fishery in the period 1950-2023

## Size composition of the catch

### Samples availability

#### By fishery group

The availability of size-frequency samples for Indo-Pacific sailfish varies greatly over time and between fishery groups and fleets. A significant number of samples is available for the industrial longline fisheries, mainly recorded by Japanese vessels between 1960 and 1985 and from 2010 onwards (**Fig. 17**). A large number of size samples for Indo-Pacific sailfish was also collected by the gillnet fishery of Sri Lanka through the ITPP sampling programme conducted between 1988 and 2005. In recent years, however, size samples of Indo-Pacific sailfish are predominantly reported by longline fisheries (and namely those from Taiwan, China, Japan, EU, Portugal, and Sri Lanka), by gillnet fisheries (Sri Lanka) and to a lesser extent by line fisheries (Sri Lanka and Indonesia). although there are high catches in recent years from coastal fisheries, size measurement of SFA remain very low from these fisheries, or even non-reporting.

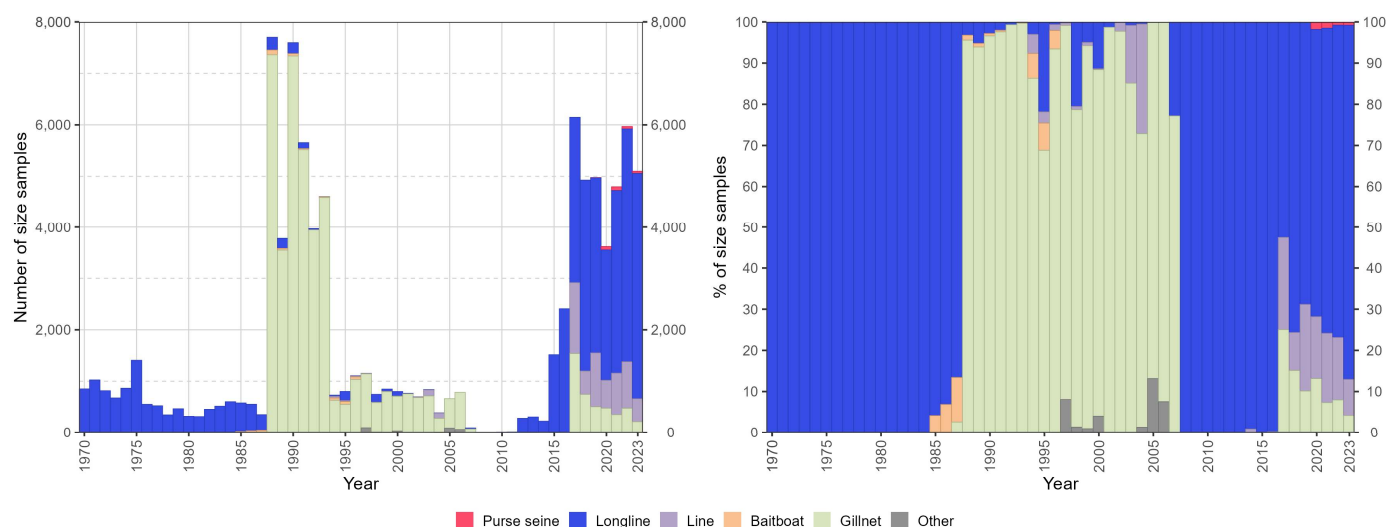


Figure 17: Availability of Indo-Pacific sailfish size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and fishery group. Data source: [standardized size-frequency dataset](#)

### Purse seine fisheries

Overall, only a negligible fraction of the size samples of Indo-Pacific sailfish available at the Secretariat has been collected from purse seine fisheries. The spatial extent of the size samples available for these fisheries in recent years is extremely limited (**Fig. 18**) with additional size samples that have been collected for both retained and discarded individuals by scientific observers onboard large-scale purse seiners (see section [Discards](#)).

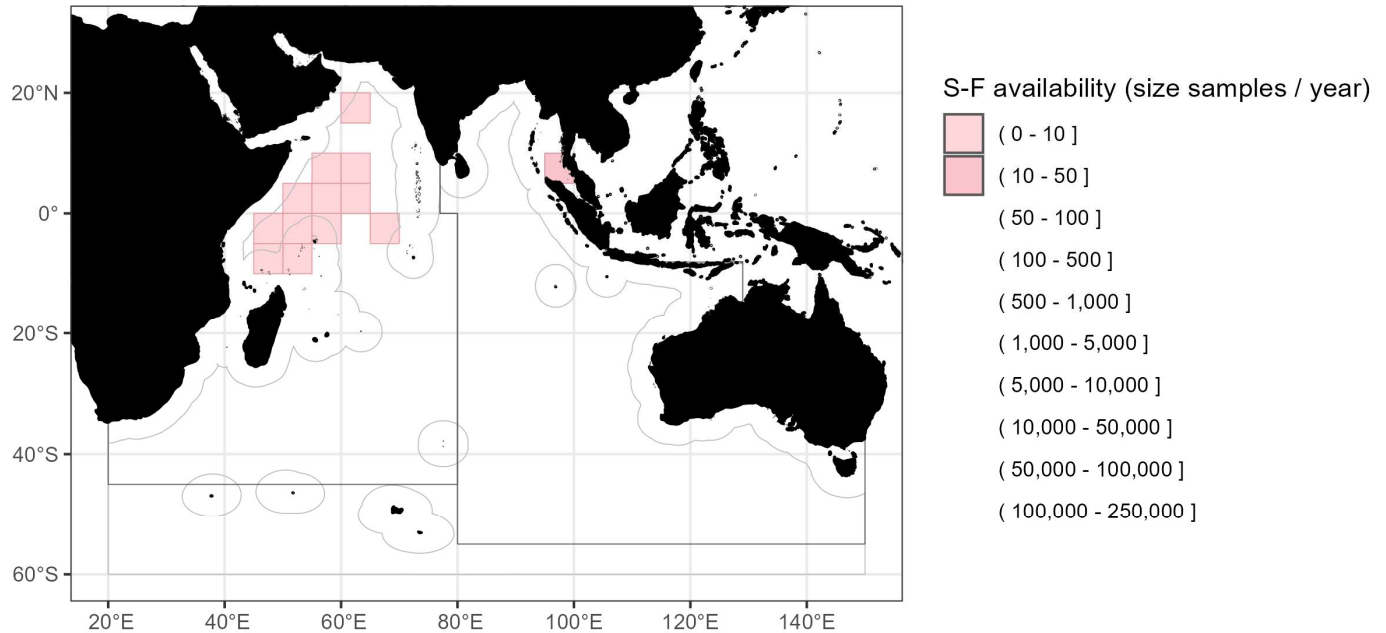


Figure 18: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data for purse seine fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)



## Longline fisheries

Longline fisheries provide a large number of Indo-Pacific sailfish samples, which are of particular interest considering the decline in catches for these fisheries recorded in recent years. Longliners from Taiwan, China sampled on average 2,500 fish per year between 2016 and 2020, followed by longliners from Japan, with an average of 200 sampled individuals, and although at low numbers, samples of the species are continuously reported by the longline fisheries of Korea and EU, Portugal. Data for Sri Lankan industrial longliners are also available from 2019 onwards. Overall, size-frequency data are generally collected by fishermen, recorded in the logbook, and additionally by scientific observers on board.

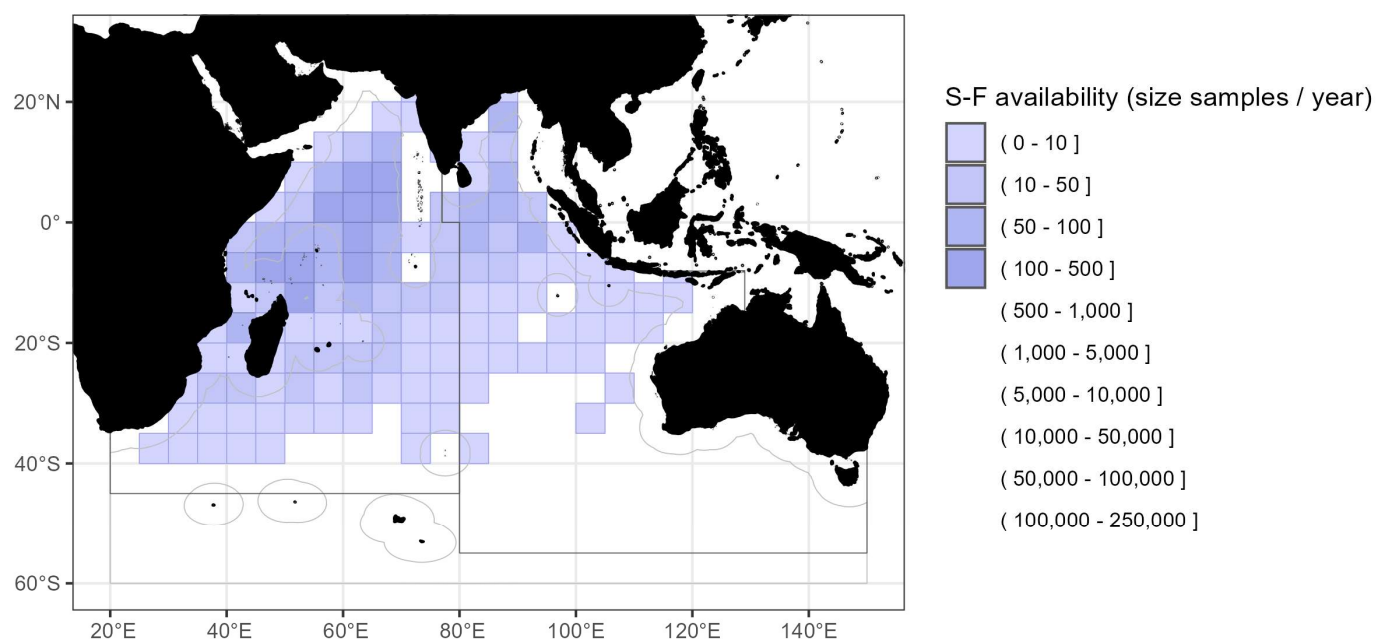


Figure 19: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data for longline fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

### Gillnet fisheries

Gillnet fisheries collected substantial samples of Indo-Pacific sailfish during the years of activity of the ITPP sampling programme (1988-2003). In recent years (2019\_2023), and notwithstanding the large amount of catches regularly reported for the species by the gillnet fisheries of several IOTC coastal states, size samples of Indo-Pacific sailfish are only available from the gillnet fishery of Sri Lanka.

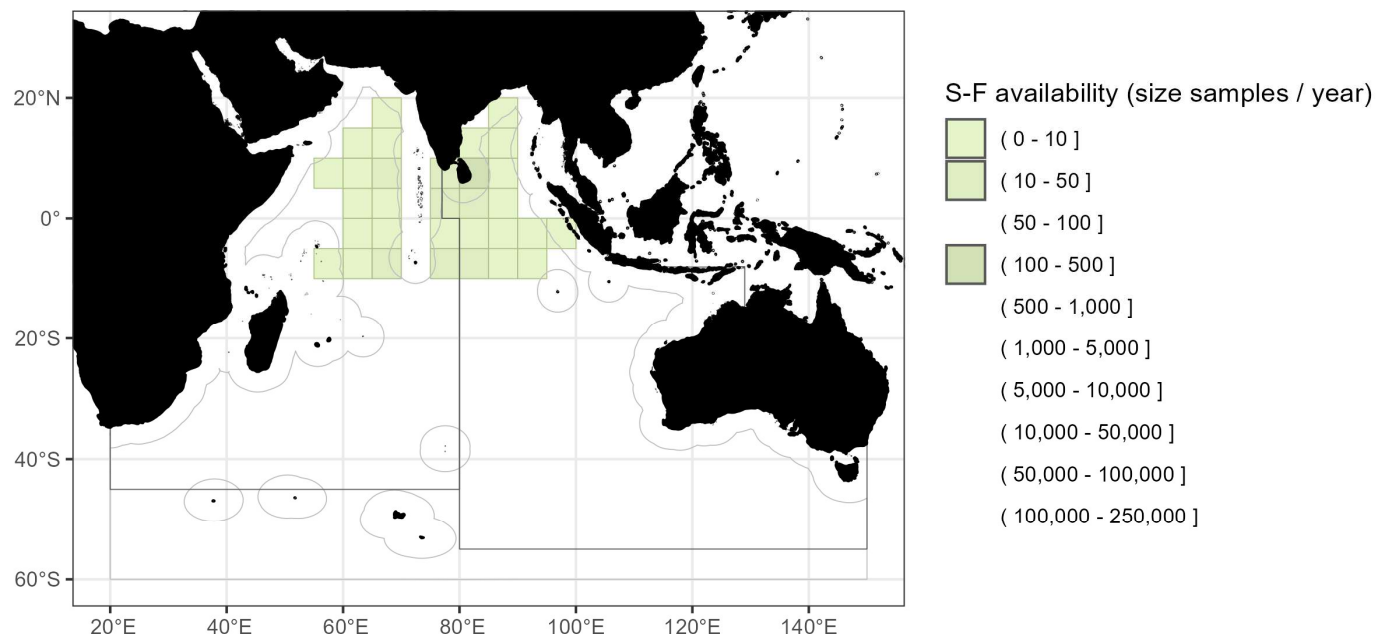


Figure 20: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data for gillnet fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)



### Line fisheries

Indo-Pacific sailfish are increasingly caught by line fisheries, including those operating with coastal longlines which represent the source of the majority of samples available for the *line* fishery group. In recent years, sample of Indo-Pacific sailfish from line fisheries become available in most fishing areas, such as the areas of national jurisdiction of Sri Lanka, Comoros, Reunion island, Mozambique, and also in the eastern Indian Ocean, collected in Indonesian coastal line fisheries.

It is assumed that size samples for the species are regularly collected in the context of recreational fisheries, especially in the western Indian Ocean, although this information is seldom made available to the Secretariat. Most of the Indo-Pacific sailfish interacted with by these fisheries are caught on a tag-and-release basis ([Billfish foundation](#)).

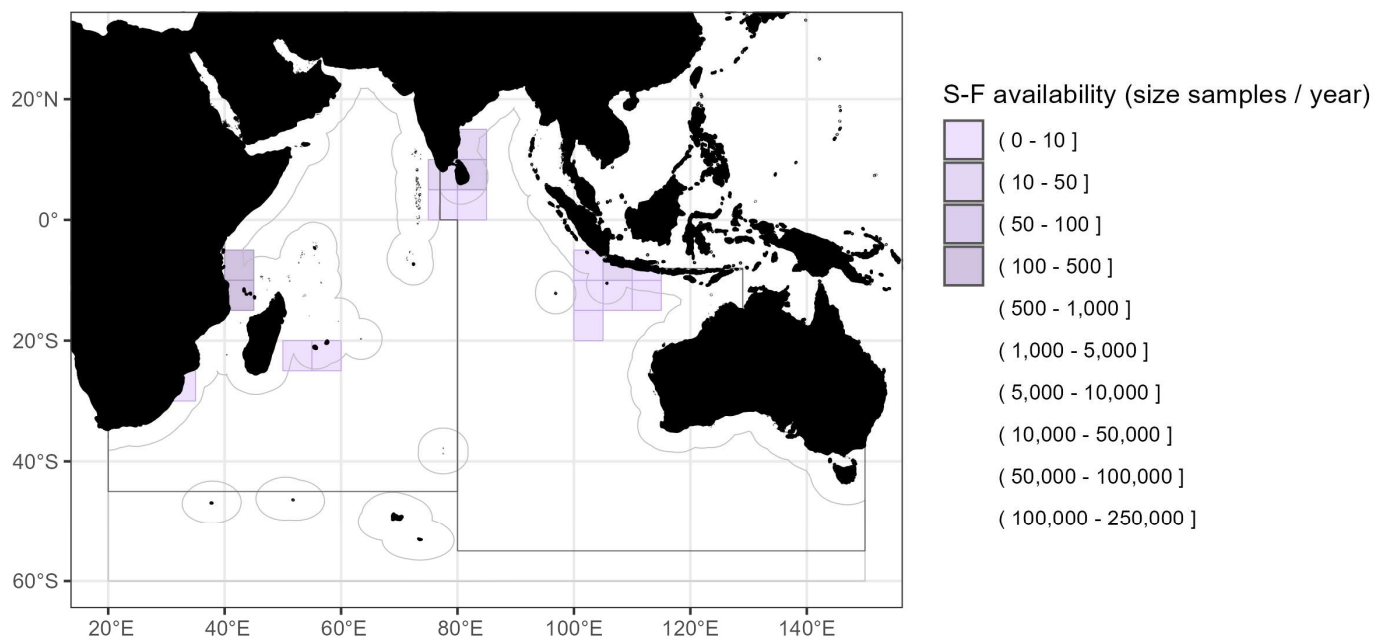


Figure 21: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data for line fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

## By fishery

### Longline fisheries

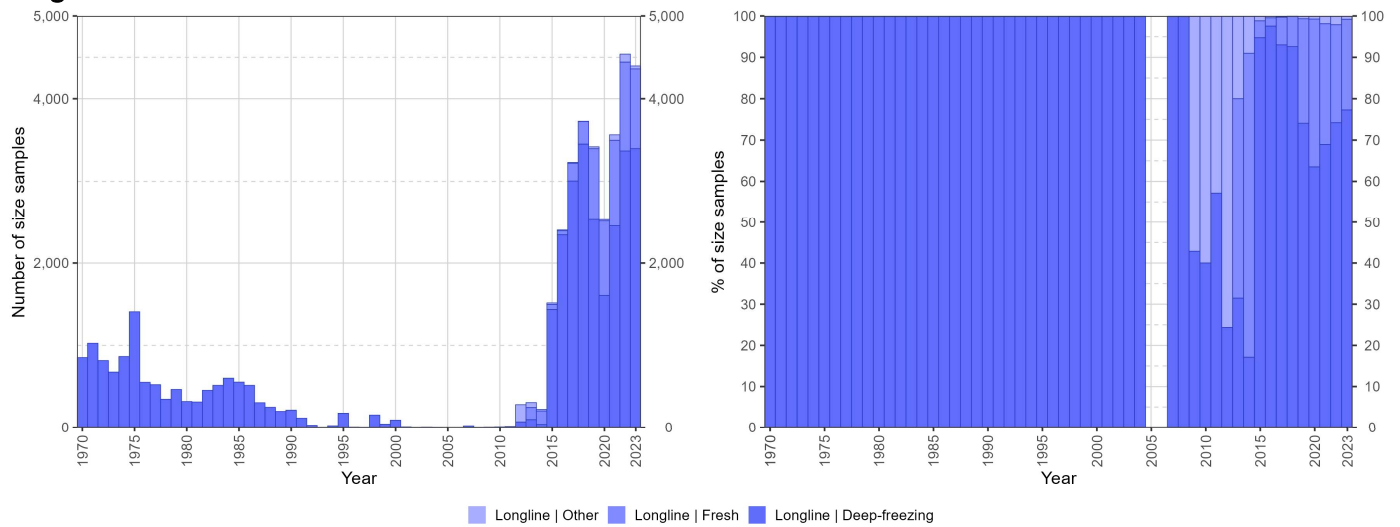


Figure 22: Availability of Indo-Pacific sailfish size-frequency data as absolute number of samples per year in longline fisheries. Data source: [standardized size-frequency dataset](#)

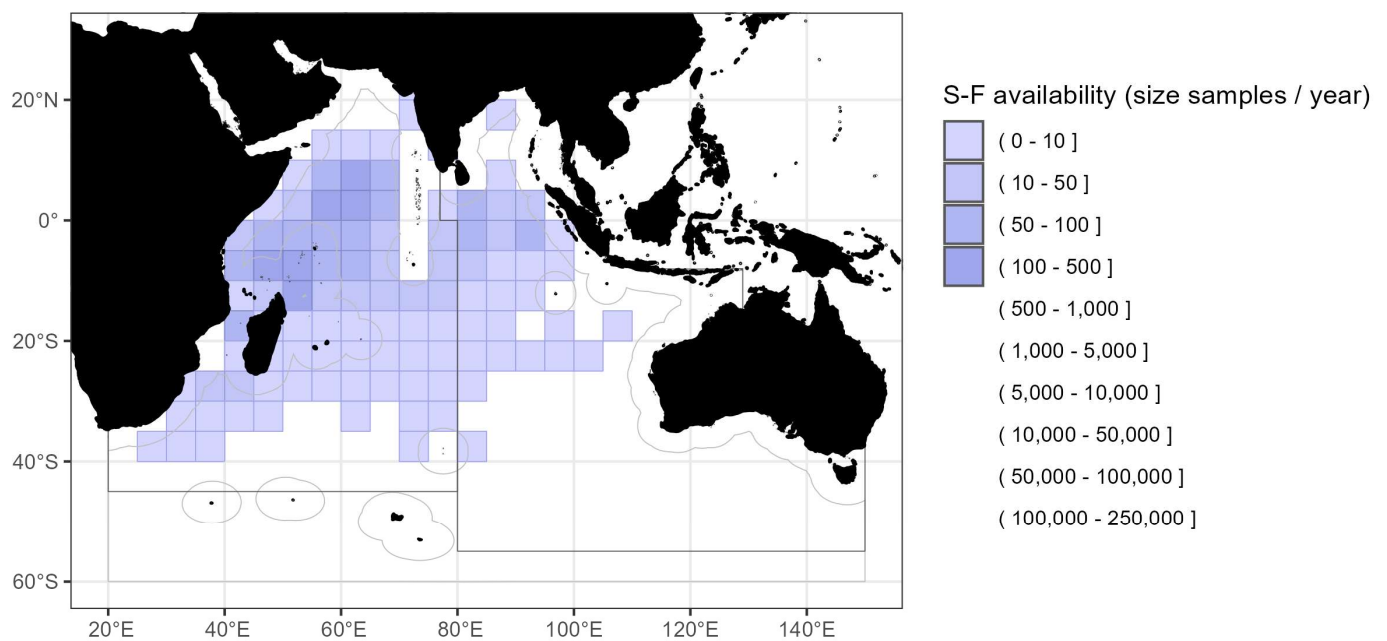


Figure 23: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data by longline (deep-freezing longline) fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

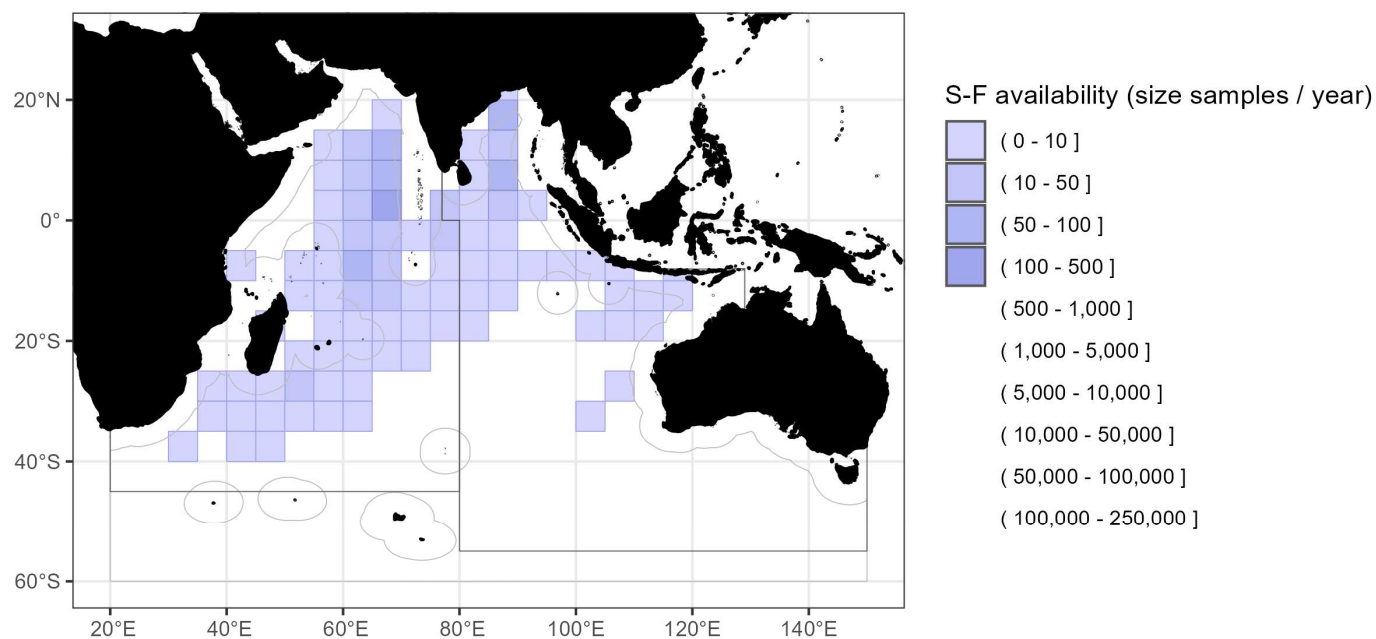


Figure 24: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data by longline (fresh longline) fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

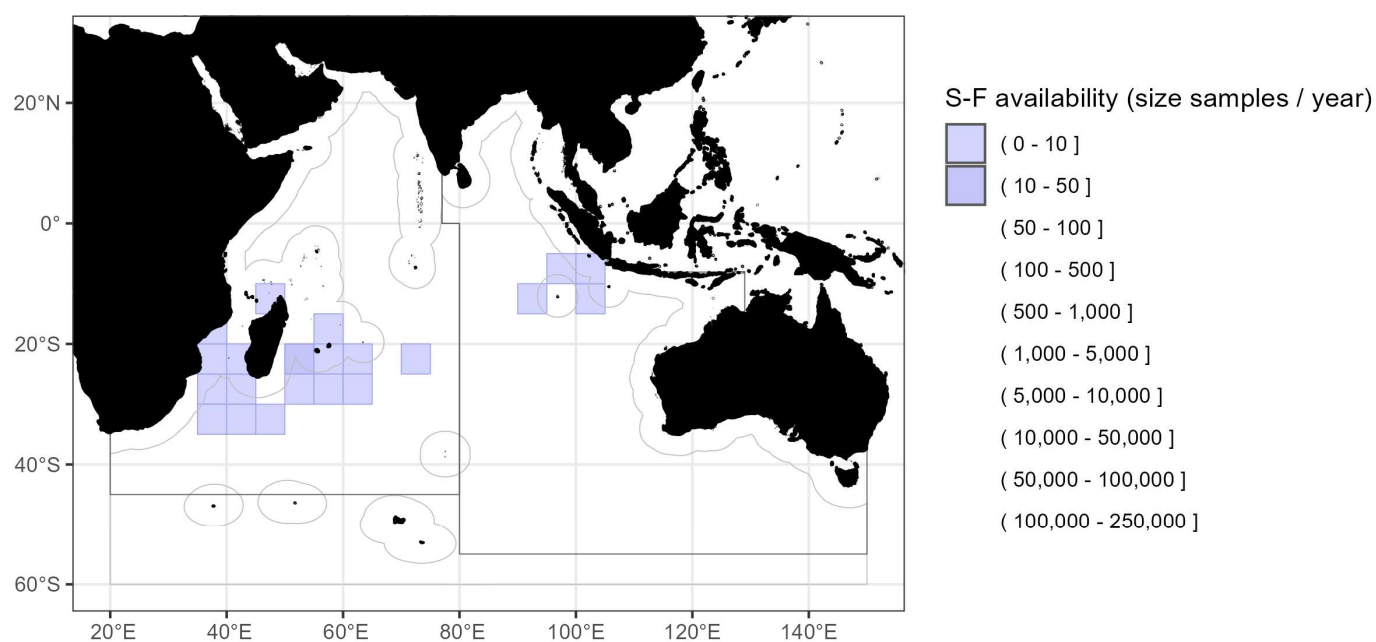


Figure 25: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data by longline (other longline) fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

Gillnet fisheries

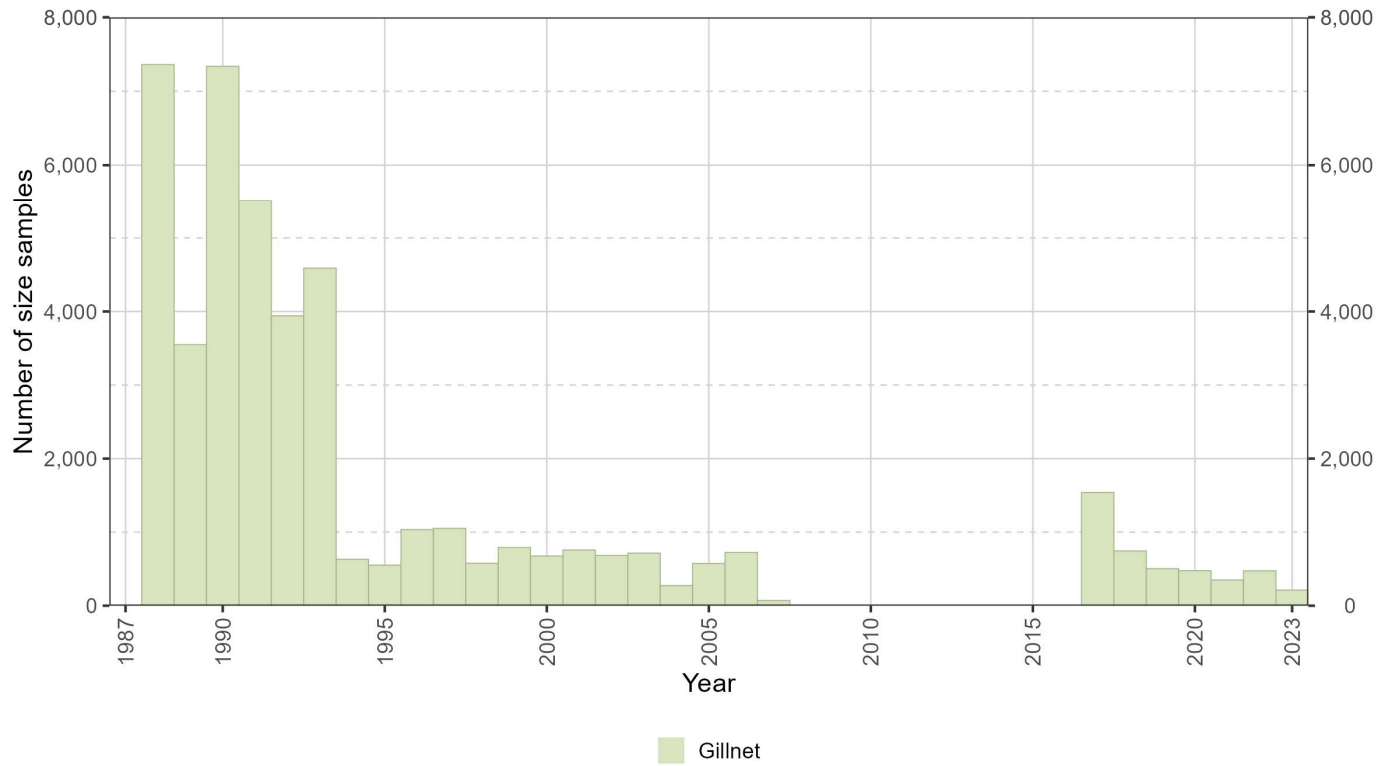


Figure 26: Availability of Indo-Pacific sailfish size-frequency data as absolute number of samples per year in gillnet fisheries. Data source: [standardized size-frequency dataset](#)

Line fisheries

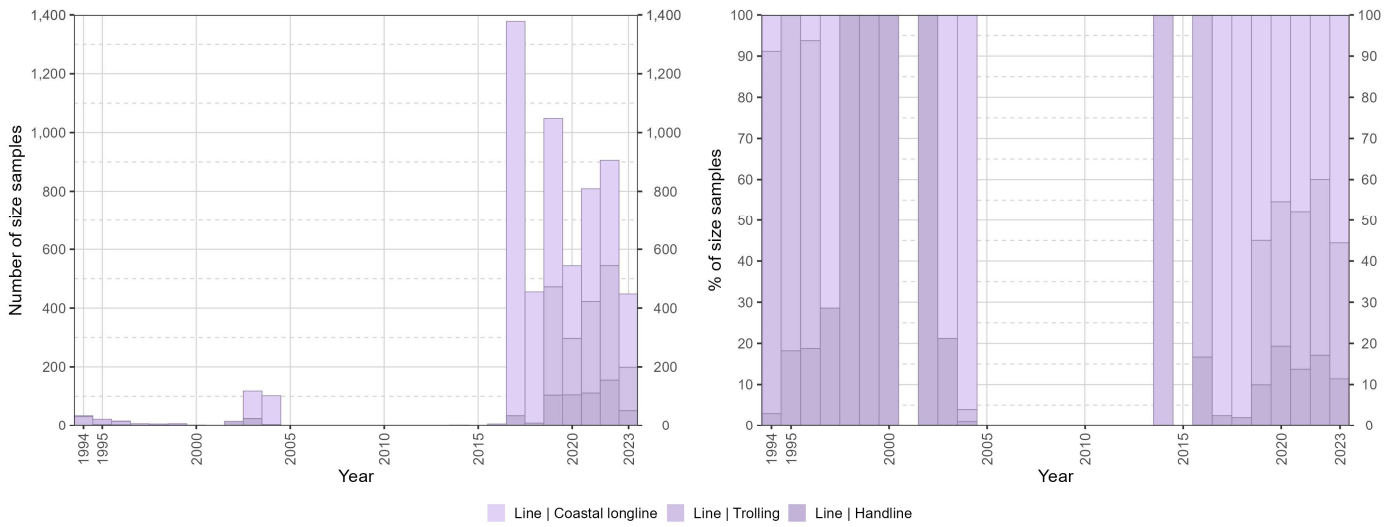


Figure 27: Availability of Indo-Pacific sailfish size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and line fishery type. Data source: [standardized size-frequency dataset](#)

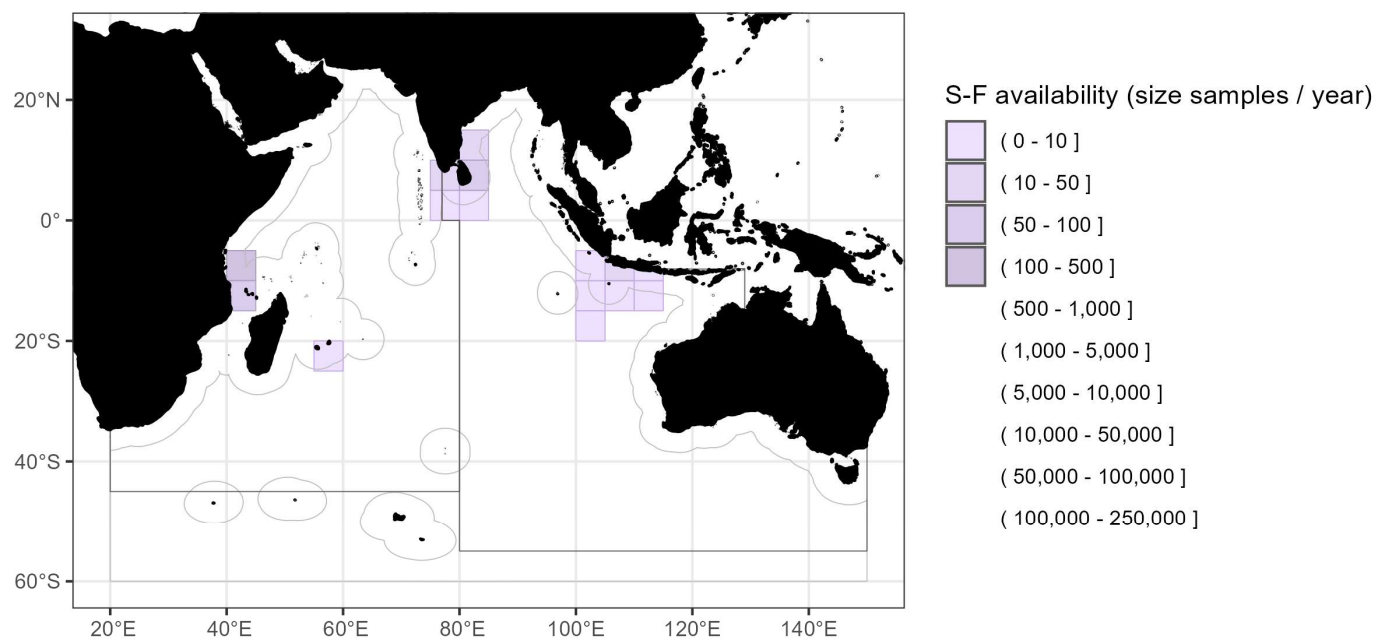


Figure 28: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data by line (coastal longline) fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

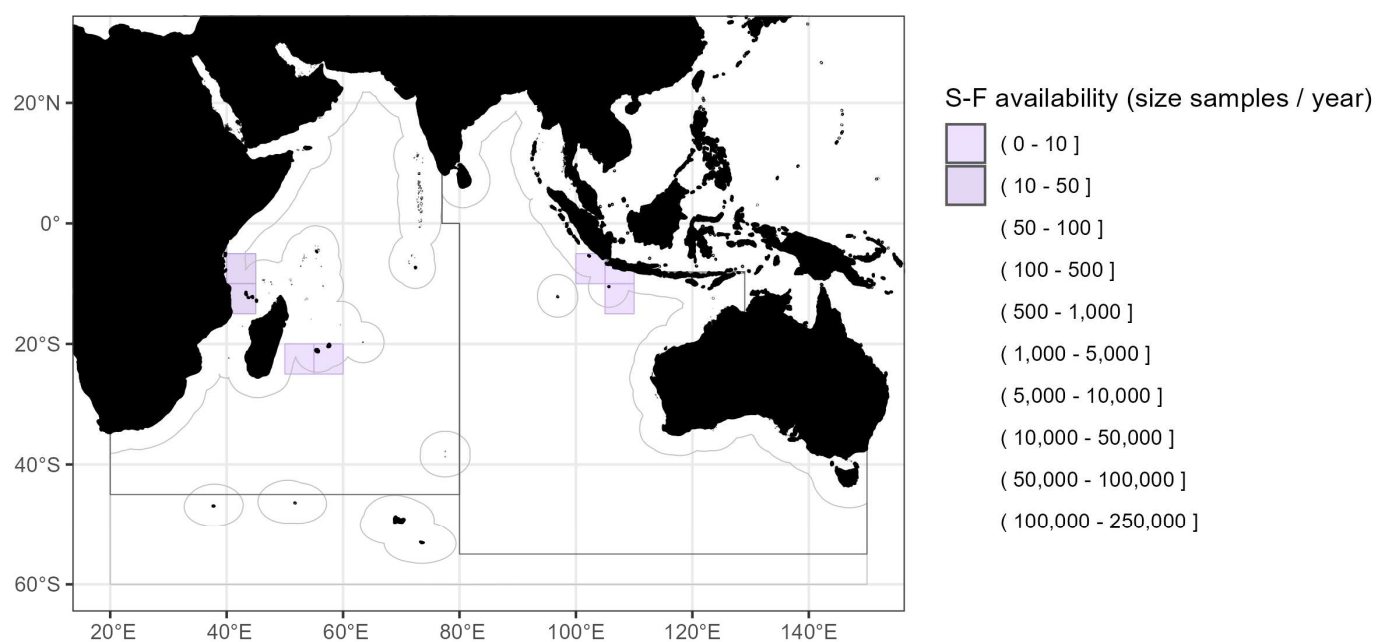


Figure 29: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data by line (handline) fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

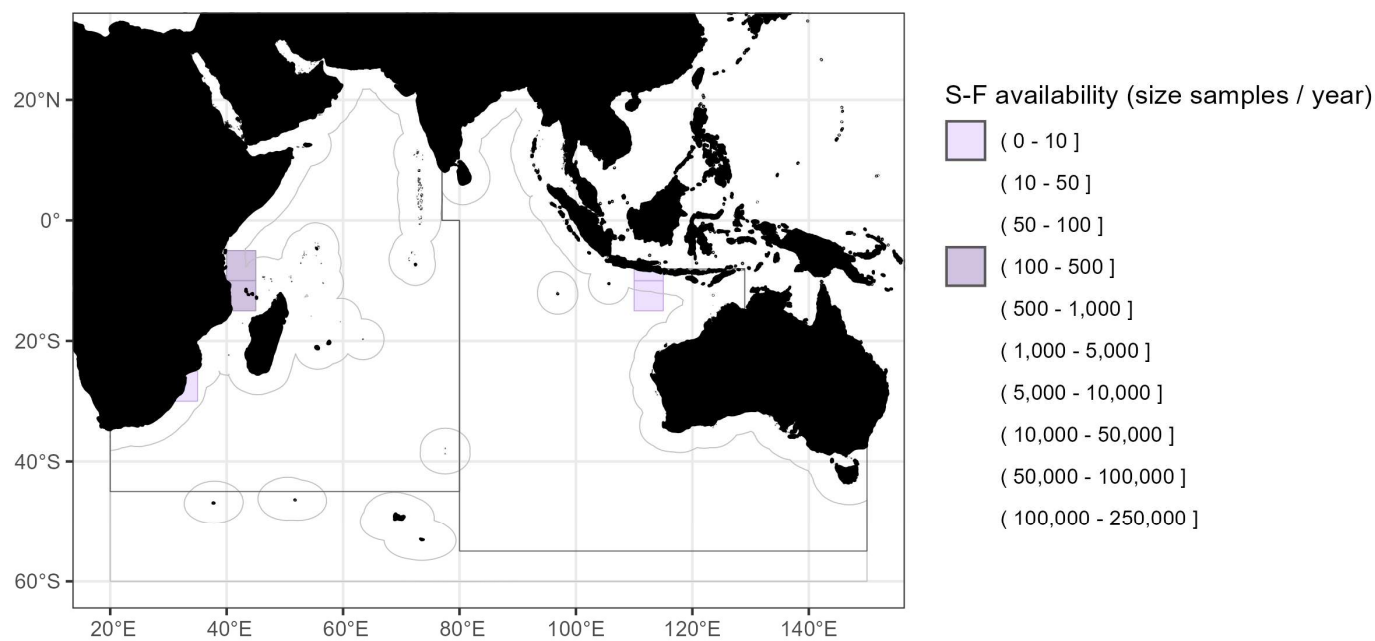


Figure 30: Spatial distribution (average number of samples per grid per year) of available Indo-Pacific sailfish size-frequency data by line (trolling) fisheries in the period 2019-2023. Data source: [standardized size-frequency dataset](#)

Other fisheries

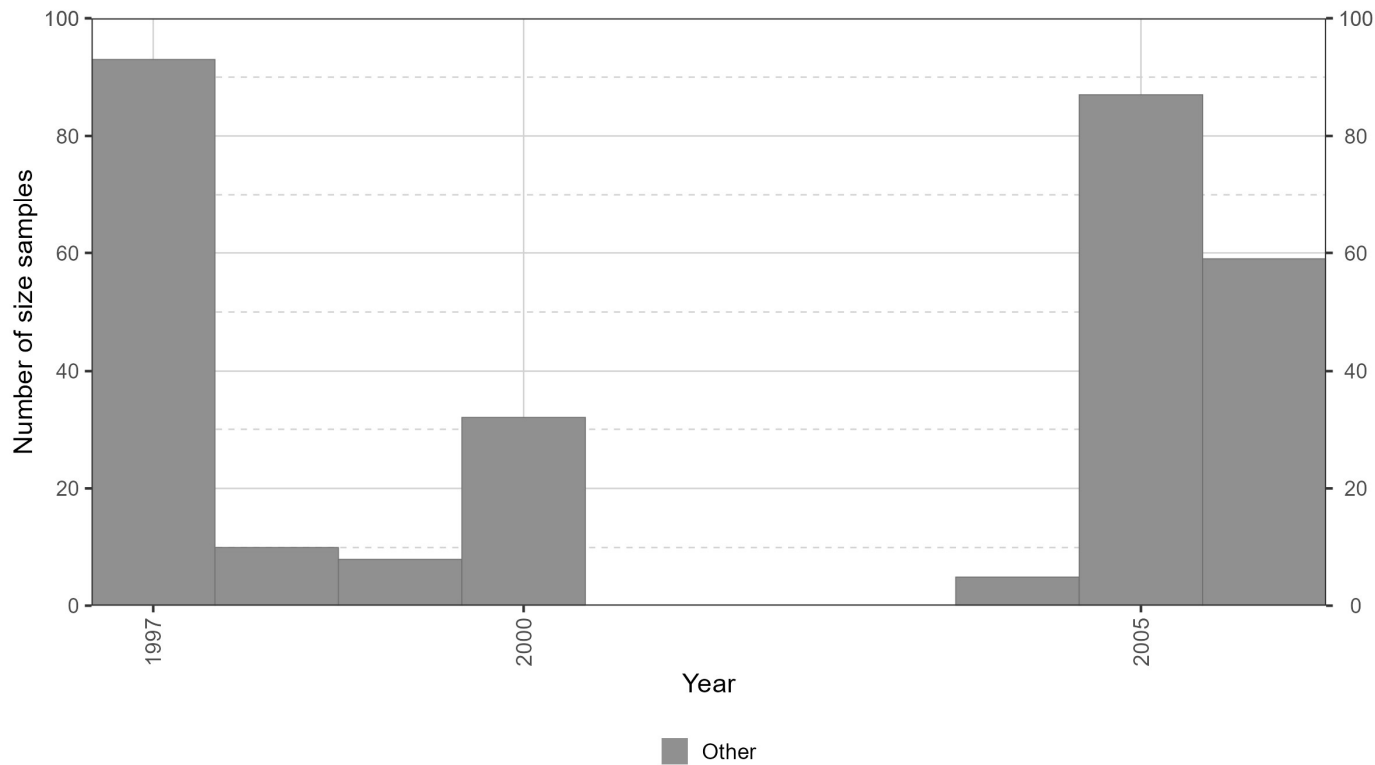


Figure 31: Availability of Indo-Pacific sailfish size-frequency data as absolute number of samples (left) and relative number of samples (right) per year and 'other' fishery type. Data source: [standardized size-frequency dataset](#)

## Temporal patterns and trends in size distributions

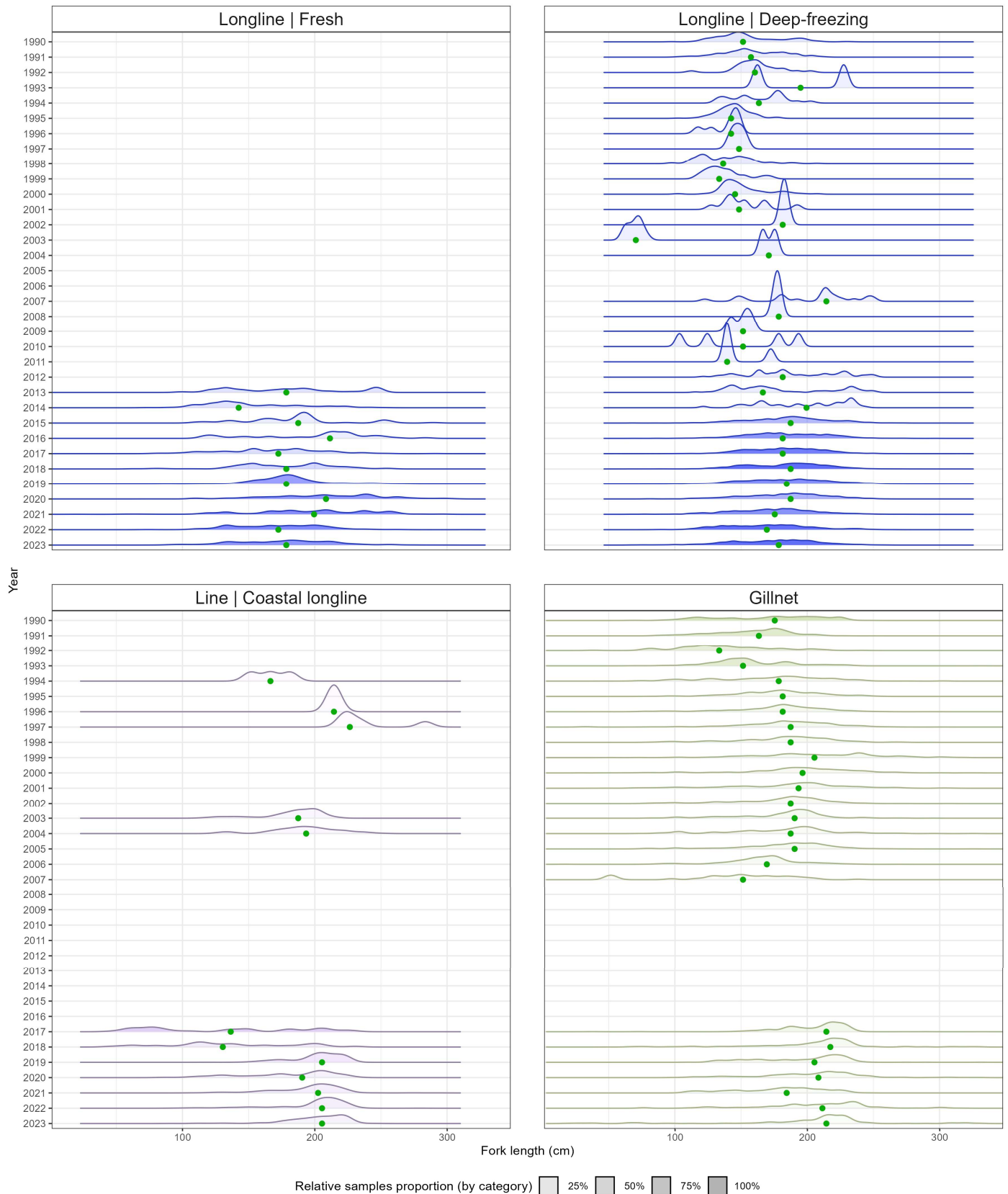


Figure 32: Relative size distribution (fork length; cm) of Indo-Pacific sailfish caught in purse seine (Other) and gillnet fisheries. Other = no information provided on school association. Fill intensity is proportional to the number of samples recorded for the year, while the green dot corresponds to the median value. Data source: [standardized size-frequency dataset](#)



## Size distribution by fishery and fleet

## Longline fisheries

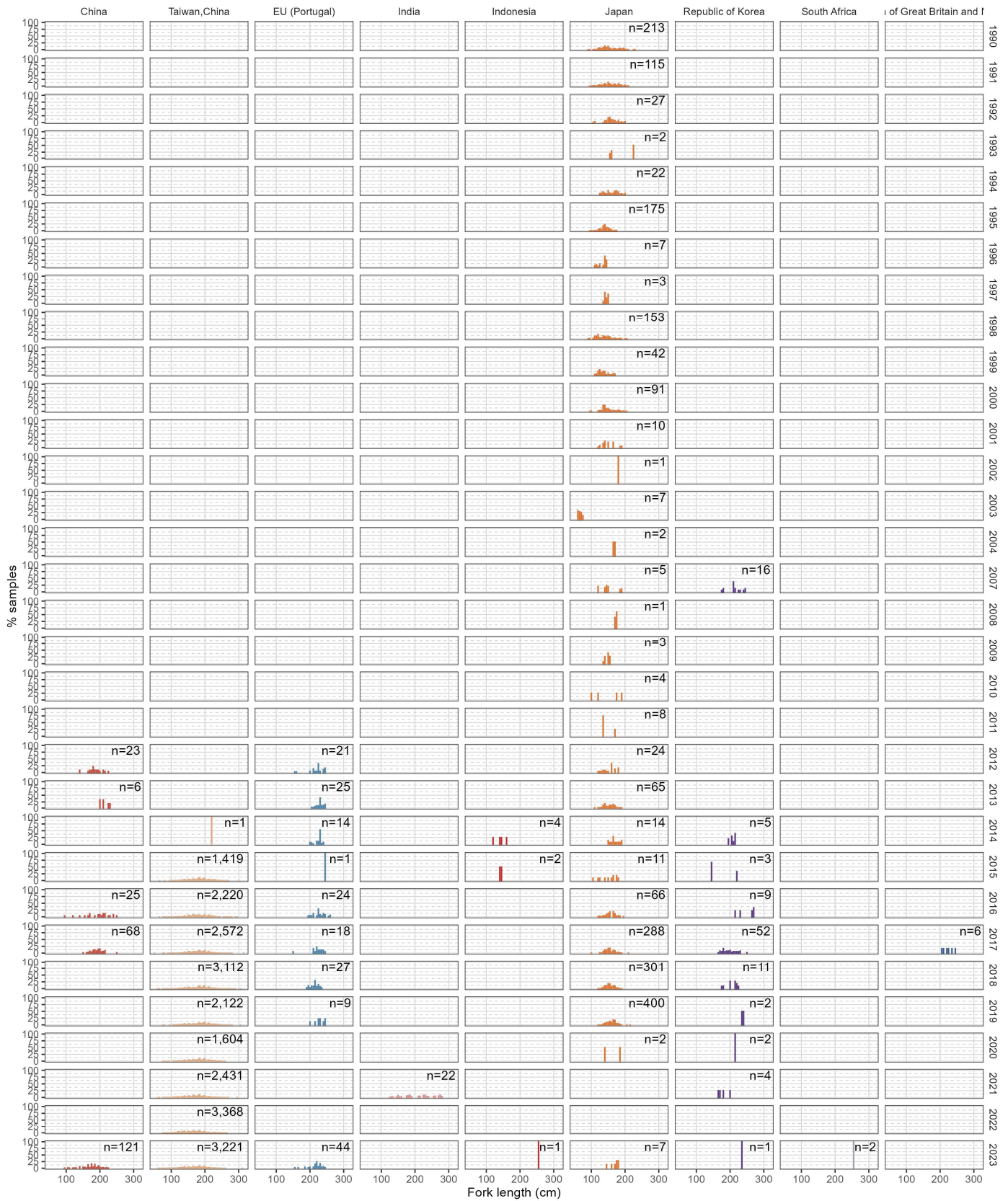


Figure 33: Relative size distribution of Indo-Pacific sailfish (fork length; cm) recorded for deep-freezing longline fisheries by year and main fleet.  
Data source: [standardized size-frequency dataset](#)



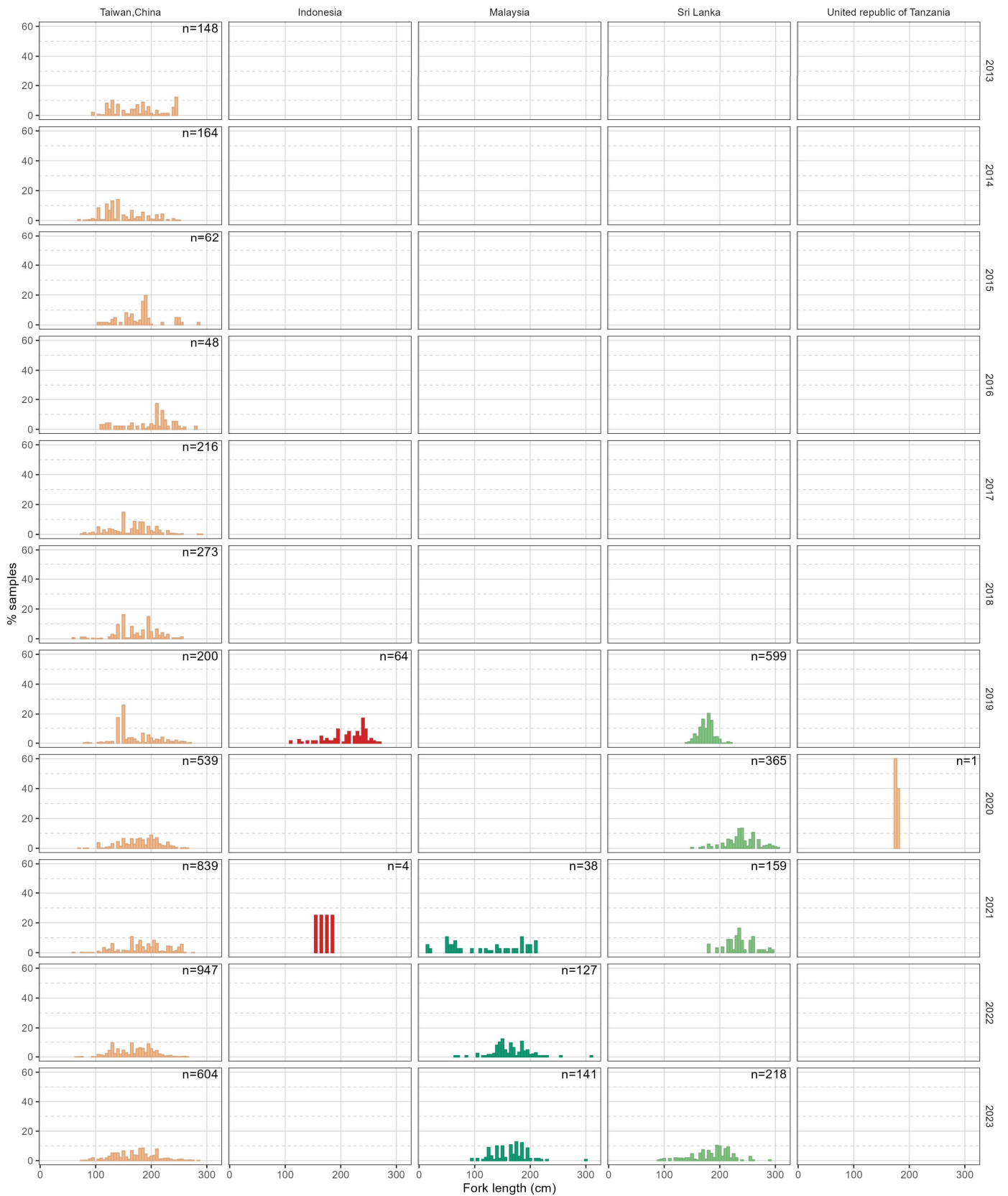


Figure 34: Relative size distribution of Indo-Pacific sailfish (fork length; cm) recorded for fresh longline fisheries by year and main fleet. Data source: [standardized size-frequency dataset](#)

## Gillnet fisheries

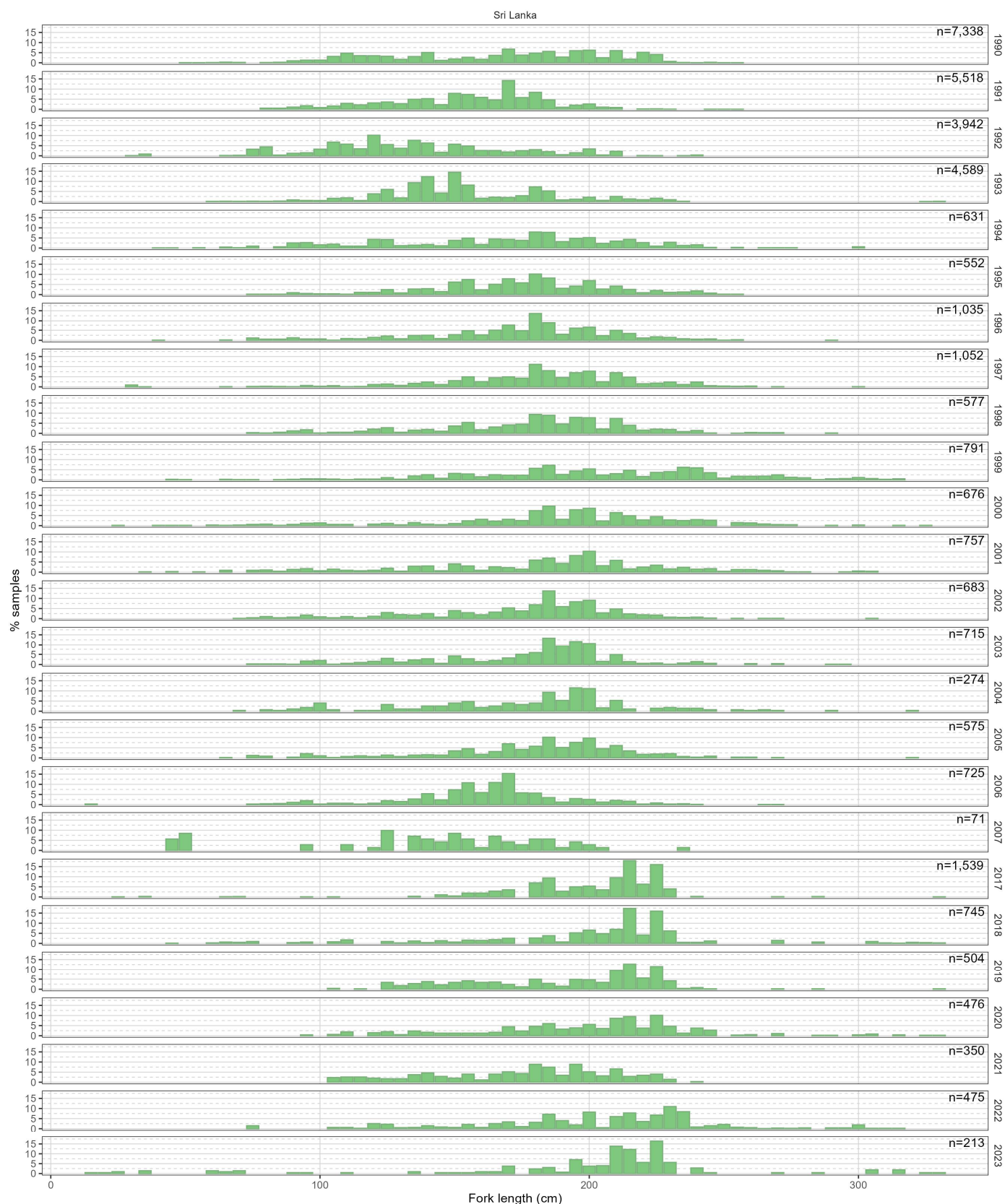


Figure 35: Relative size distribution of Indo-Pacific sailfish (fork length; cm) recorded for gillnet fisheries by year and main fleet. Data source: [standardized size-frequency dataset](#)

## Line fisheries

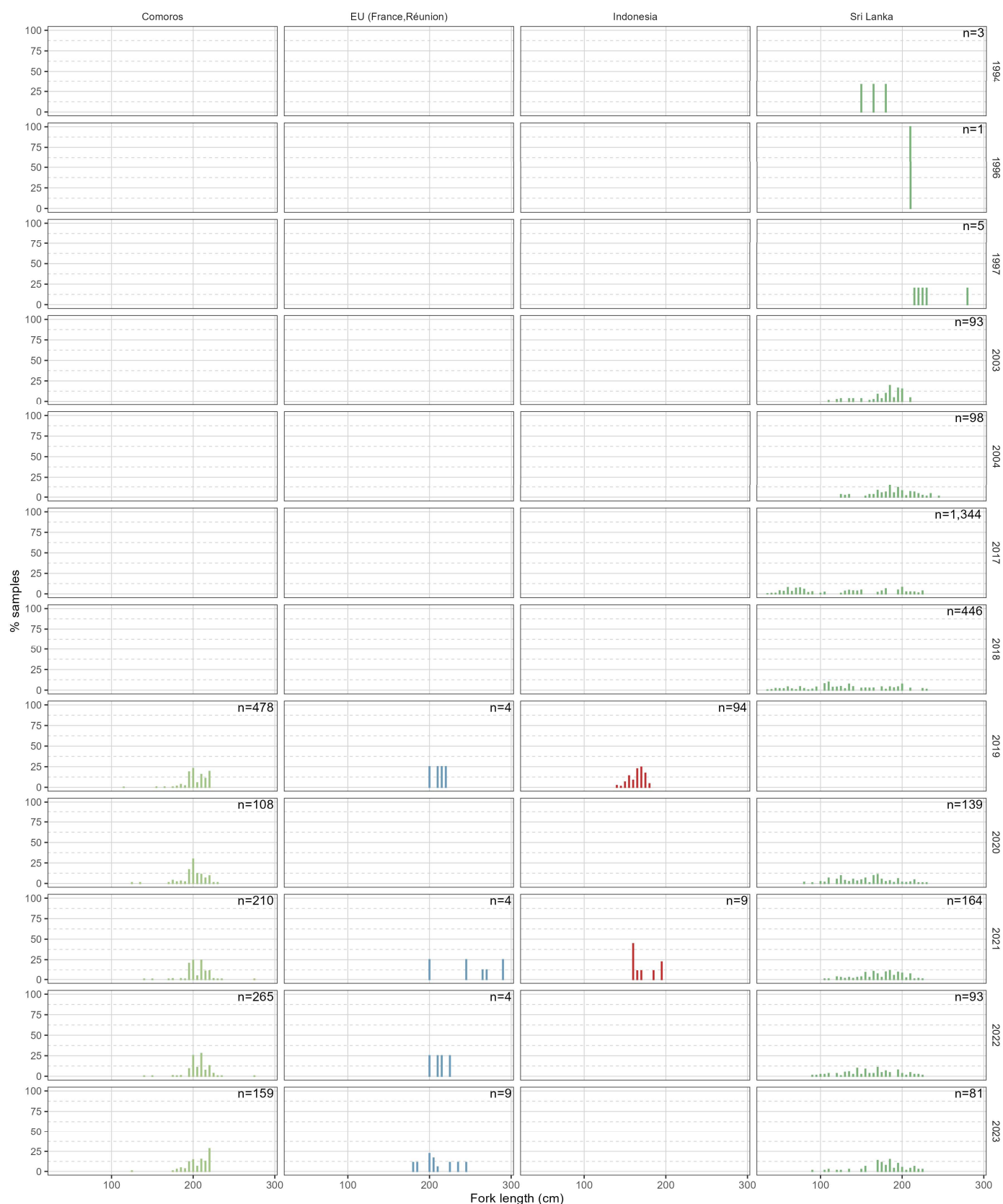


Figure 36: Relative size distribution of Indo-Pacific sailfish (fork length; cm) recorded for line fisheries (coastal longline) by year and main fleet. Data source: [standardized size-frequency dataset](#)

### Uncertainties in size-frequency data

Size-frequency data are characterized by the lowest quality among the primary data sets that have to be reported to the Secretariat. As previously indicated (see section [Size composition of the catch](#)) few size data are available for Indo-

Pacific sailfish overall, and while retained catch data are already available since the mid-1950s size-frequency data have only become available from the 1970s for industrial longline fisheries.

Contrarily to what happens in the case of other billfish species, the increase in longline fishing activities from the 1980s did not result in an increase in sampling of size data for Indo-Pacific sailfish, which in the period 1988-2006 was mostly measured in the context of gillnet fisheries initially under the supervision of the ITPP sampling programme. Notwithstanding this, the overall quality of size-frequency data recorded for Indo-Pacific sailfish by the gillnet fisheries operating in this period is still low due to the non-standard reporting of the spatial information for the samples, which is an issue also affecting the overall quality of longline fisheries sampling data at the beginning of the available time series.

The quality of size data from industrial fisheries further declined between 1990 and 2007 when some fleets stopped collecting size data, and in particular some non reporting fleets or fleets operating with both fresh and deep-freezing longline vessels (**Fig. 37**).

Overall, there is little-to-no size-frequency sample of Indo-Pacific sailfish that is deemed to be of good quality until 2007, when strata covering around 10% of total reported catches for the species begun to be sampled regularly and according to IOTC standards (**Fig. 37b**). In recent years, Sri Lanka, Indonesia and Reunion improved the quality of the size-frequency data submitted to the Secretariat, as did some industrial longline fisheries that benefited from on-board scientific observers to collect samples of the species (e.g., Taiwan,China). In 2023, size frequency data is further uncertain, with less coverage relative to retained catches, around 10%.

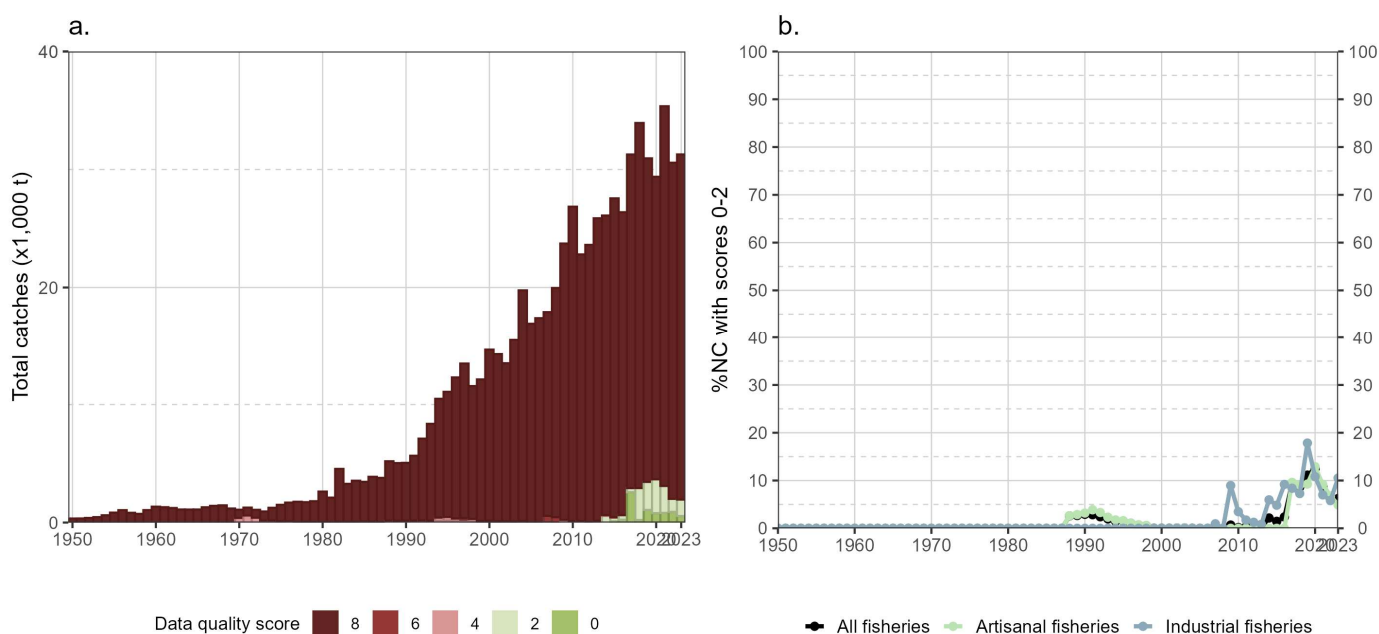


Figure 37: (a) Annual retained catches (metric tonnes; t) of Indo-Pacific sailfish estimated by quality score and percentage of total retained catches for which geo-referenced size-frequency data were reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02 (lines with dots) for all fisheries and by type of fishery in the period 1950–2023

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Appendices

Appendix I: Taxonomy

Rank	Taxon
Kingdom	<i>Animalia</i>
Subkingdom	<i>Bilateria</i>
Infrakingdom	<i>Deuterostomia</i>
Phylum	<i>Chordata</i>
Subphylum	<i>Vertebrata</i>
Infraphylum	<i>Gnathostomata</i>
Superclass	<i>Actinopterygii</i>
Class	<i>Teleostei</i>
Superorder	<i>Acanthopterygii</i>
Order	<i>Perciformes</i>
Suborder	<i>Xiphoidei</i>
Family	<i>Istiophoridae</i>
Genus	<i>Istiophorus</i>
Species	<i>Istiophorus platypterus</i>

## Appendix II: Changes in best scientific estimates of retained catches from previous WPB

Estimates of retained catches available for Indo-Pacific sailfish at the 21<sup>st</sup> session of the Working Party on Billfish (WPB21) show small changes relative to the time series available at the WPB20 as only minimal updates to past data occurred in the meantime. In particular, Jordan and United Arab Emirates, reflect the consequence of new data affecting the results of catch disaggregation for IOTC species aggregates (e.g., BILL) regularly performed by the IOTC Secretariat as part of the process producing the IOTC best scientific estimates; and (iv) updates of Kenya catches for the fisheries based on data new available (**Table 4**).

Table 4: Changes in best scientific estimates of annual retained catches (metric tonnes; t) of Indo-Pacific sailfish by year, fleet, fishery group and main Indian Ocean area between 2019 and 2022, limited to absolute values higher than 10 t

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
2022	BGD	Gillnet	Eastern Indian Ocean	539	138	400
		Other	Eastern Indian Ocean	101	0	101
	IDN	Baitboat	Eastern Indian Ocean	34	0	34
		Gillnet	Eastern Indian Ocean	1,619	433	1,185
		Line	Eastern Indian Ocean	1,205	602	603
		Longline	Eastern Indian Ocean	191	415	-224
		Other	Eastern Indian Ocean	244	9	235
		Purse seine	Eastern Indian Ocean	10	299	-289
	YEM	Gillnet	Western Indian Ocean	152	112	40
		Line	Western Indian Ocean	113	84	29
2021	BGD	Gillnet	Eastern Indian Ocean	466	94	372
		Other	Eastern Indian Ocean	66	0	66
	IDN	Baitboat	Eastern Indian Ocean	100	0	100
		Gillnet	Eastern Indian Ocean	1,752	420	1,332
		Line	Eastern Indian Ocean	1,425	494	931
		Other	Eastern Indian Ocean	178	9	170
		Purse seine	Eastern Indian Ocean	9	186	-177
	YEM	Gillnet	Western Indian Ocean	213	182	32
2020	IDN	Baitboat	Eastern Indian Ocean	170	0	170
		Gillnet	Eastern Indian Ocean	1,267	527	740
		Line	Eastern Indian Ocean	1,434	619	815
		Longline	Eastern Indian Ocean	48	180	-132
		Other	Eastern Indian Ocean	408	11	397
		Purse seine	Eastern Indian Ocean	156	246	-89

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
	TMP	Gillnet	Eastern Indian Ocean	47	0	47
2019	IDN	Baitboat	Eastern Indian Ocean	97	0	97
		Gillnet	Eastern Indian Ocean	1,553	360	1,193
		Line	Eastern Indian Ocean	1,245	423	822
		Longline	Eastern Indian Ocean	75	321	-247
		Other	Eastern Indian Ocean	210	7	203
		Purse seine	Eastern Indian Ocean	38	174	-136
	JPN	Longline	Western Indian Ocean	48	33	15
	TMP	Gillnet	Eastern Indian Ocean	26	0	26