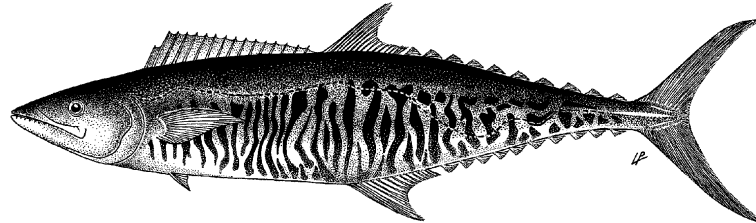


# REVIEW OF FISHERIES STATISTICAL DATA AVAILABLE FOR INDIAN OCEAN NARROW-BARRED SPANISH MACKEREL

Author: [IOTC Secretariat](#)



## Introduction

The overarching objective of the paper is to provide participants at the 13<sup>th</sup> Session of the IOTC Working Party on Neritic Tunas ([WPNT13](#)) with a review of the status of fisheries information available on narrow-barred Spanish mackerel (*Scomberomorus commerson*) ([Lacepède 1800](#)) occurring in the Indian Ocean. The document describes the temporal and spatial trends in retained catches at global and ocean-basin scale and the main characteristics of the fisheries catching narrow-barred Spanish mackerel in the Indian Ocean, as well as providing an assessment of the reporting quality of the data sets available at the IOTC Secretariat. A full description of the data sources, processing steps to generate the data sets, and key for reporting quality scores is available in IOTC ([2023](#)).

## Global catches

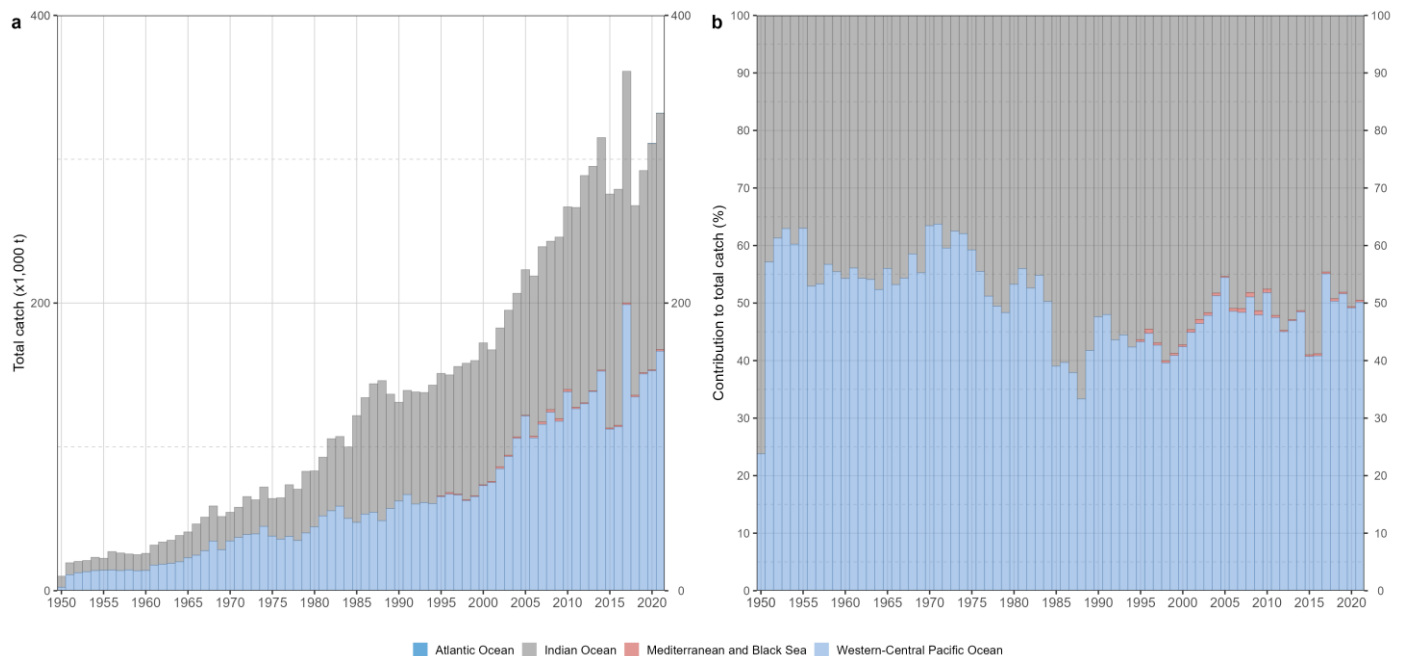


Figure 1: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) contribution to the total retained catches (percentage; %) of narrow-barred Spanish mackerel by ocean basin for the period 1950-2021. Source: [FAO global capture production database](#)

## Indian Ocean retained catches

### Historical trends (1950-2021)

Table 1: Mean annual retained catches (metric tonnes; t) of narrow-barred Spanish mackerel by decade and fishery for the period 1950-2019. The background intensity colour of each cell is directly proportional to the catch level. Data source: [best scientific estimates of retained catches](#)

Fishery	1950s	1960s	1970s	1980s	1990s	2000s	2010s
Purse seine   Other	0	2	285	2,355	4,143	5,506	8,890
Longline   Other	0	0	0	0	0	0	0
Longline   Fresh	0	0	0	0	0	0	85
Longline   Deep-freezing	0	0	0	11	7	2	101
Line   Coastal longline	96	143	287	1,004	1,795	3,048	6,407
Line   Trolling	1,140	1,789	2,364	4,973	6,452	10,928	14,813
Line   Handline	506	548	2,021	5,382	3,792	3,334	6,123
Baitboat	0	0	244	0	0	0	0
Gillnet	9,519	17,699	32,168	55,500	65,042	70,961	98,484
Other	57	96	224	5,592	9,738	21,351	25,986
<b>Total</b>	<b>11,318</b>	<b>20,277</b>	<b>37,593</b>	<b>74,816</b>	<b>90,969</b>	<b>115,130</b>	<b>160,890</b>

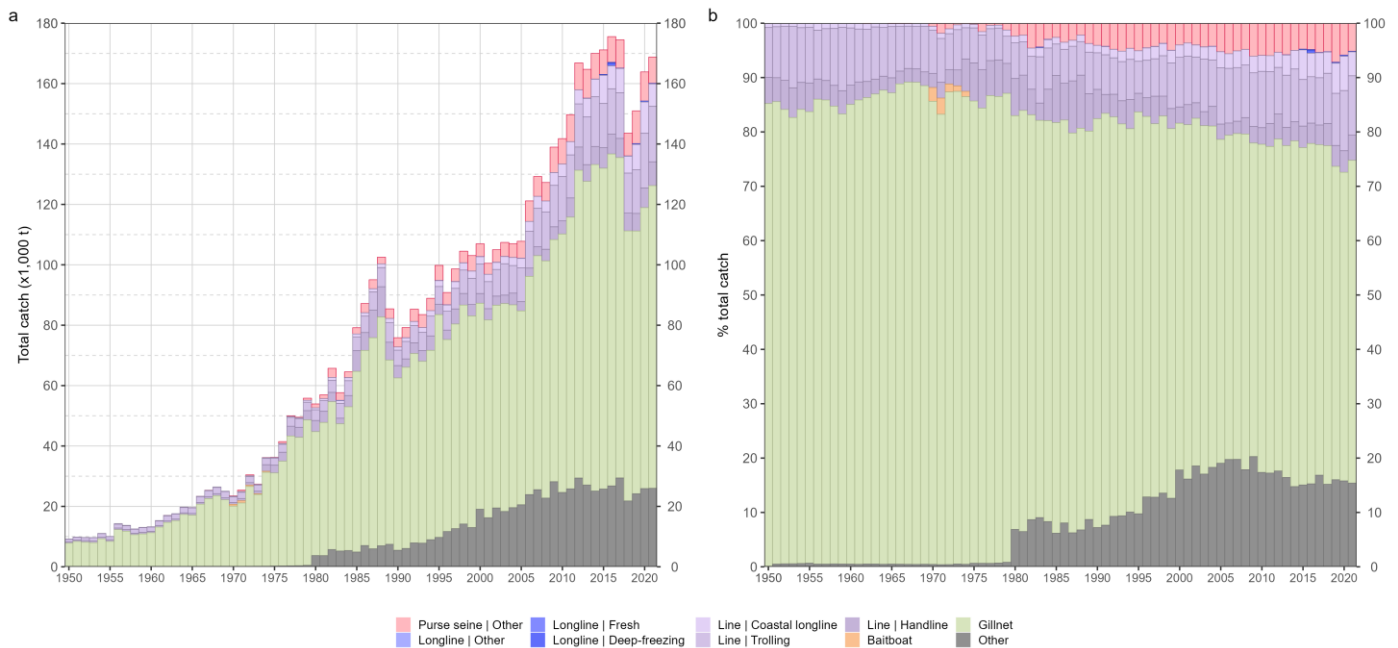


Figure 2: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) cumulative contribution to the total retained catches (percentage; %) of narrow-barred Spanish mackerel by fishery for the period 1950-2021. Data source: [best scientific estimates of retained catches](#)

Table 2: Annual retained catches (metric tonnes; t) of narrow-barred Spanish mackerel by fishery for the period 2012-2021. The background intensity colour of each cell is directly proportional to the catch level. Data source: [best scientific estimates of retained catches](#)

Fishery	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Purse seine   Other	8,931	9,582	8,535	8,168	8,533	9,405	7,558	10,852	9,632	8,730
Longline   Other	0	0	0	0	0	0	0	0	0	0
Longline   Fresh	0	60	3	236	153	90	56	256	326	171
Longline   Deep-freezing	0	0	0	9	984	8	4	8	4	4
Line   Coastal longline	4,653	6,138	5,793	9,310	7,605	8,015	5,622	8,362	10,340	7,427
Line   Trolling	14,300	15,811	16,515	14,683	15,004	15,157	13,237	14,476	18,152	18,384
Line   Handline	7,680	5,520	5,954	6,784	6,576	6,344	5,890	5,807	6,483	7,874
Gillnet	101,910	100,560	108,116	106,227	109,916	106,087	89,440	87,027	93,045	100,237
Other	29,393	27,066	25,078	25,748	26,788	29,414	21,791	24,173	25,890	25,982
<b>Total</b>	<b>166,867</b>	<b>164,736</b>	<b>169,995</b>	<b>171,166</b>	<b>175,559</b>	<b>174,520</b>	<b>143,597</b>	<b>150,963</b>	<b>163,872</b>	<b>168,807</b>

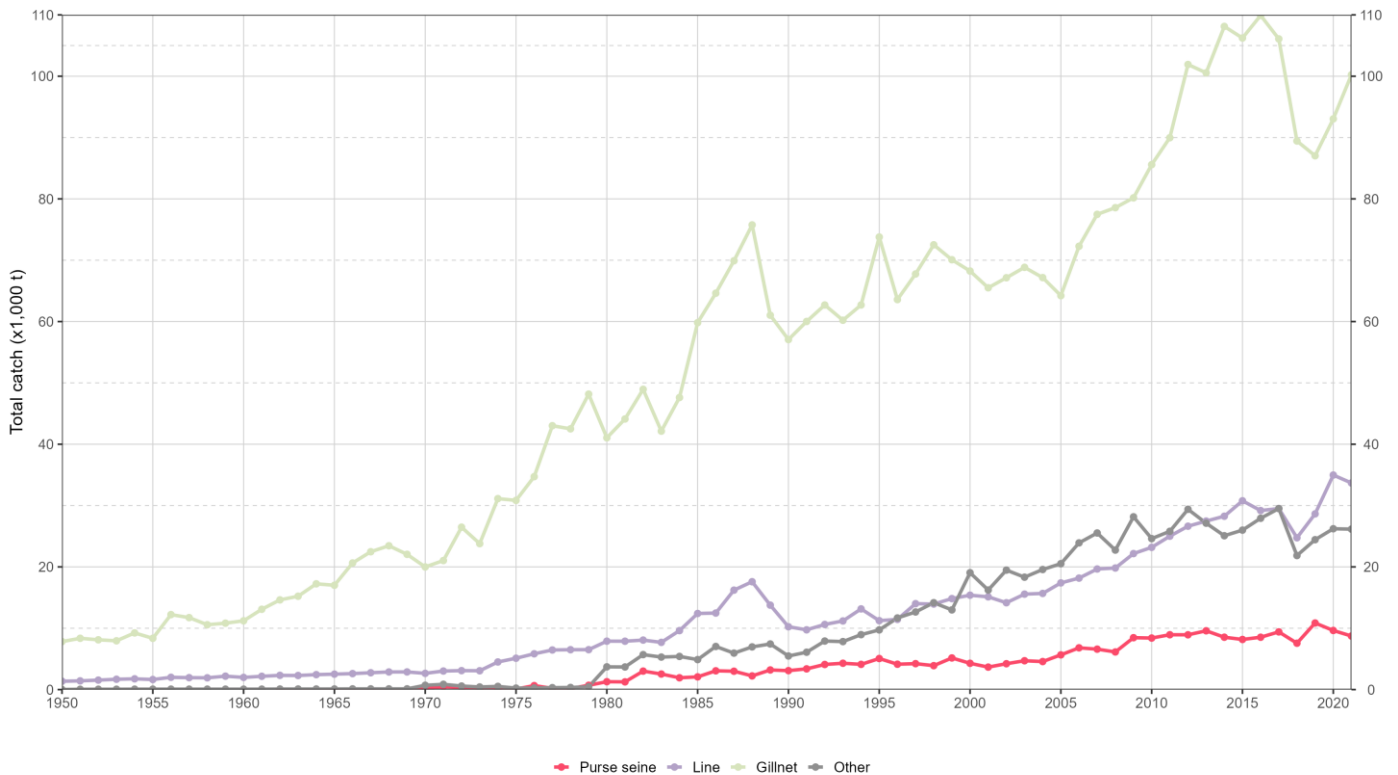


Figure 3: Annual time series of retained catches (metric tonnes; t) of narrow-barred Spanish mackerel by fishery group for the period 1950-2021. Data source: [best scientific estimates of retained catches](#)

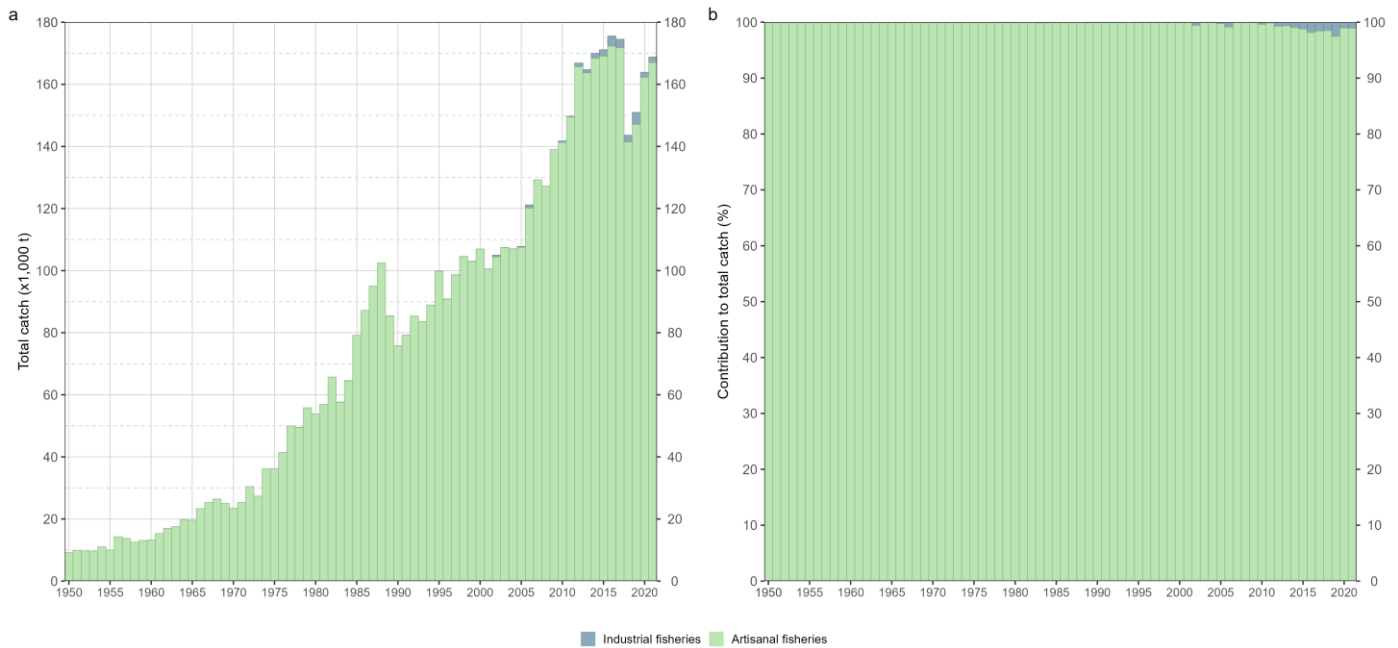


Figure 4: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) cumulative contribution to the total retained catches (percentage; %) of narrow-barred Spanish mackerel by type of fishery for the period 1950-2021. Data source: [best scientific estimates of retained catches](#)

### Recent fishery features (2017-2021)

Table 3: Mean annual retained catches (metric tonnes; t) of narrow-barred Spanish mackerel by fishery between 2017 and 2021. Data source: [best scientific estimates of retained catches](#)

Fishery	Fishery code	Catch	Percentage
Gillnet	GN	95,167	59.3
Other	OT	25,450	15.9
Line   Trolling	LIT	15,881	9.9
Purse seine   Other	PSOT	9,236	5.8
Line   Coastal longline	LIC	7,953	5.0
Line   Handline	LIH	6,480	4.0
Longline   Fresh	LLF	180	0.1
Longline   Deep-freezing	LLD	6	0.0

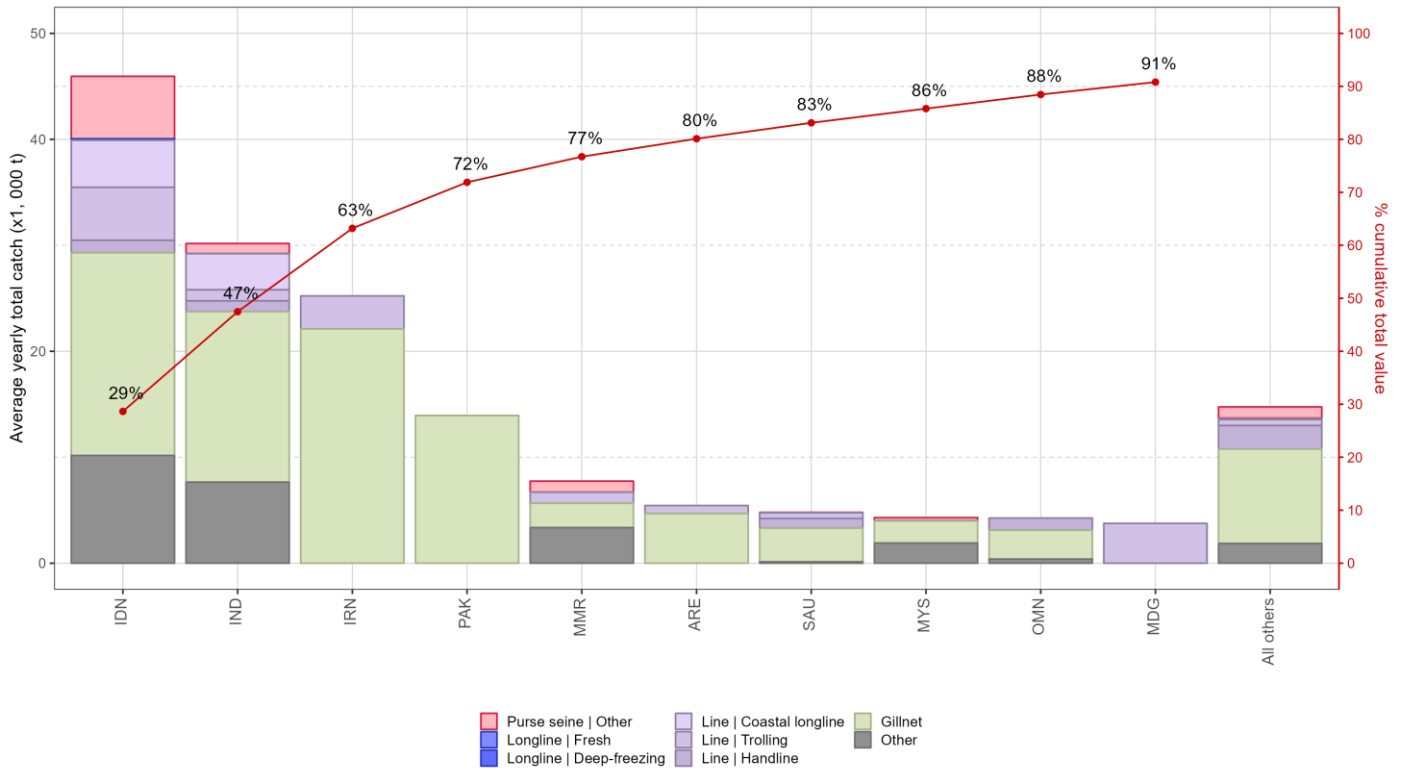


Figure 5: Mean annual retained catches (metric tonnes; t) of narrow-barred Spanish mackerel by fleet and fishery between 2017 and 2021, with indication of cumulative contribution (percentage; %) of catches by fleet. Data source: [best scientific estimates of retained catches](#)

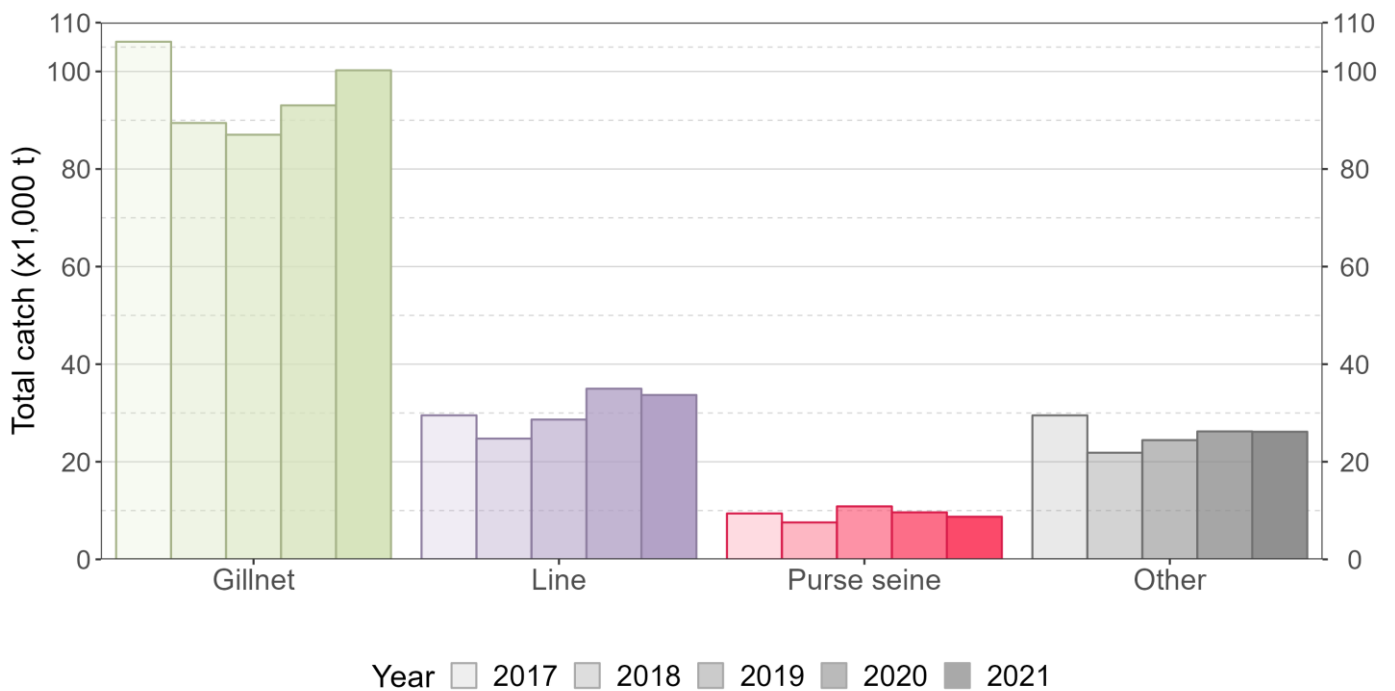


Figure 6: Annual trends in retained catch (metric tonnes; t) of narrow-barred Spanish mackerel by fishery group between 2017 and 2021. Data source: [best scientific estimates of retained catches](#)

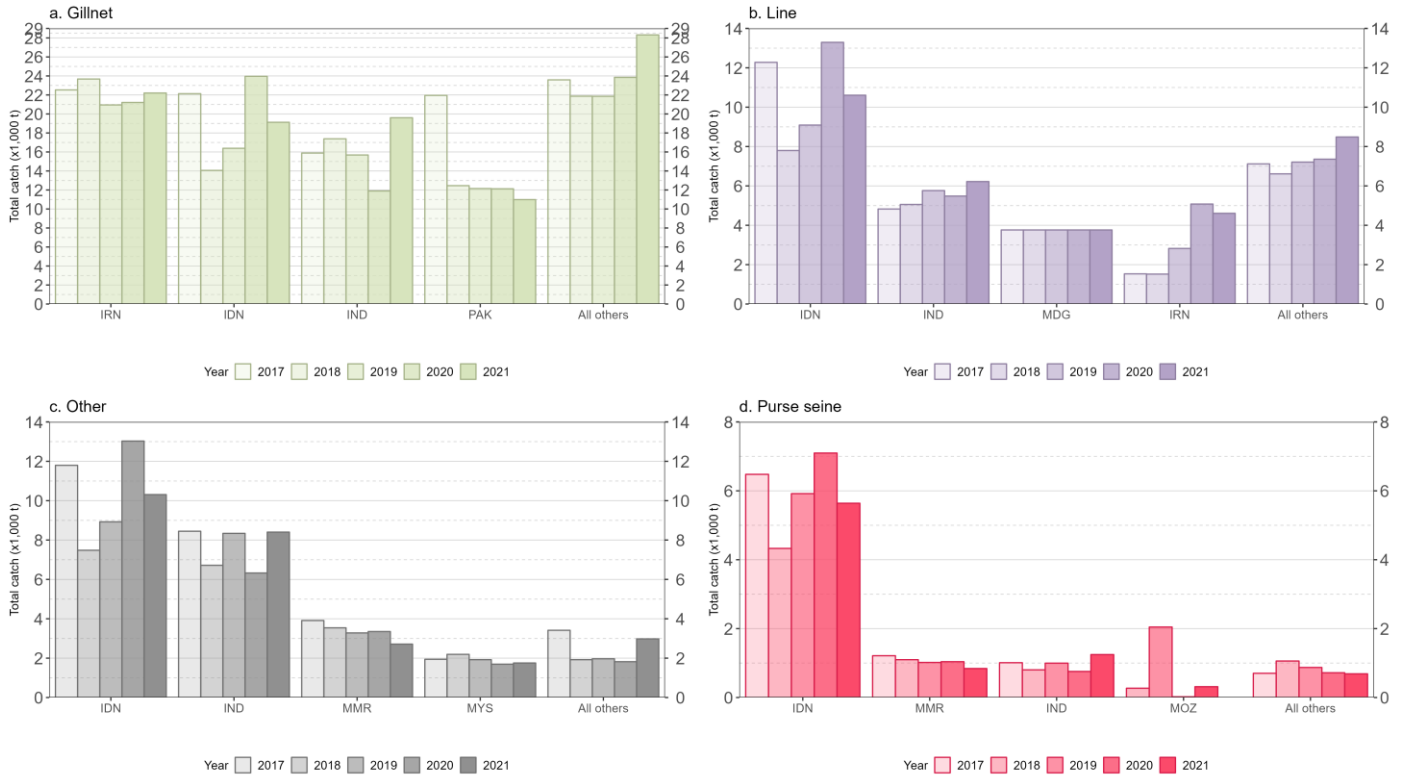


Figure 7: Annual trends in retained catch (metric tonnes; t) of narrow-barred Spanish mackerel by fishery group and fleet between 2017 and 2021. Data source: [best scientific estimates of retained catches](#)

### Changes from previous Working Party

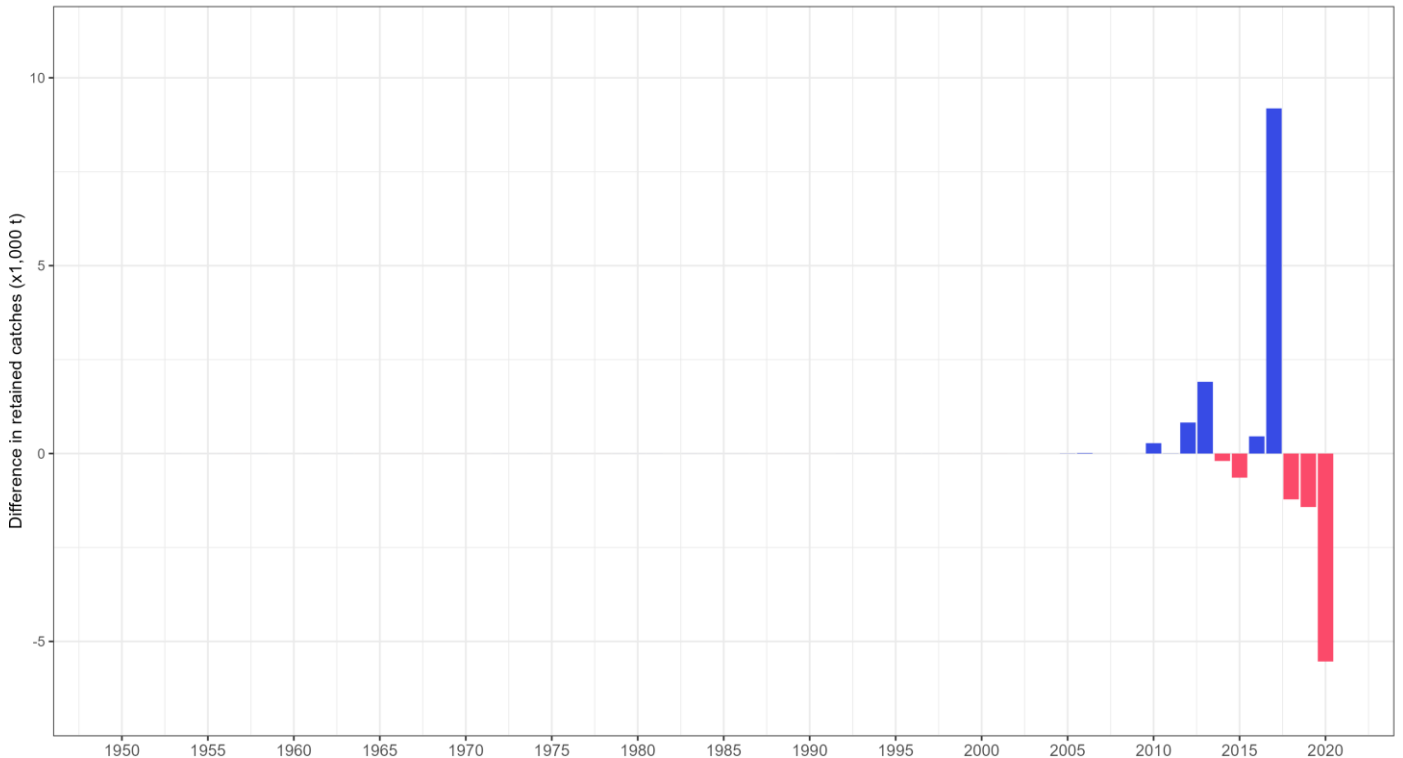


Figure 8: Differences in the annual retained catches (metric tonnes; t) of narrow-barred Spanish mackerel available at this WPNT and its previous session (WPNT12 meeting held in July 2022). Details by year, fleet, fishery group, and Indian Ocean major area given in [Appendix II](#)

### Uncertainties in retained catch data

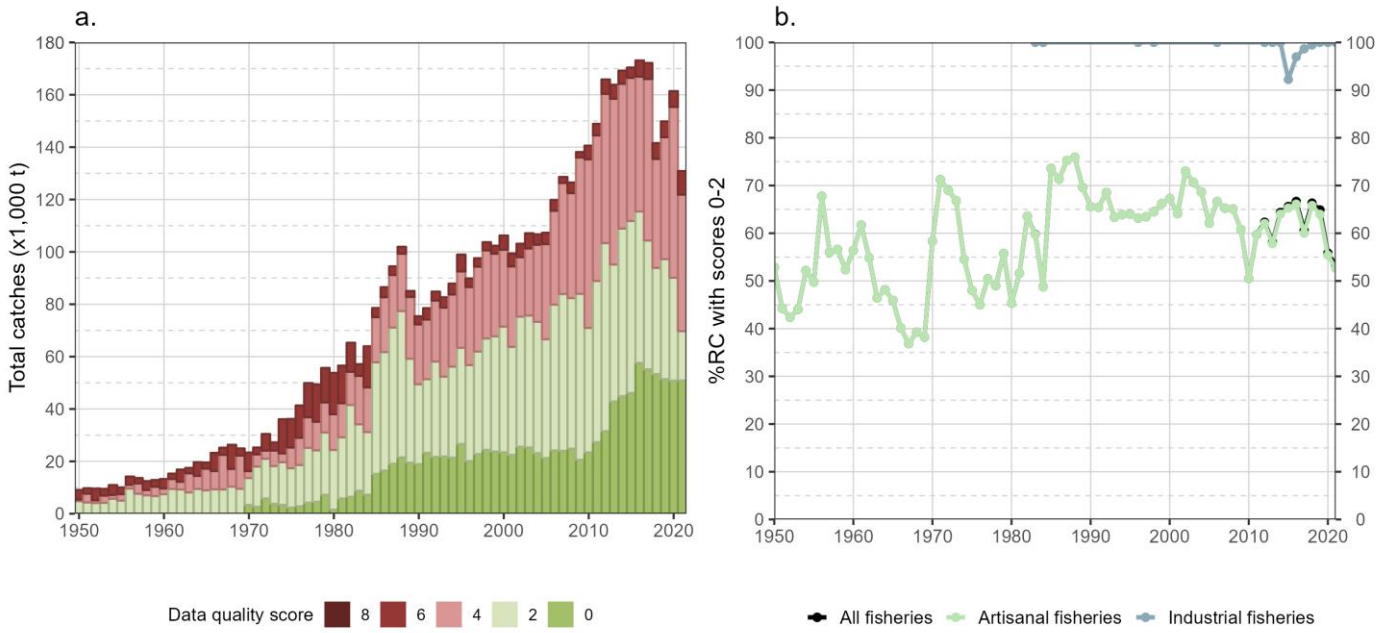
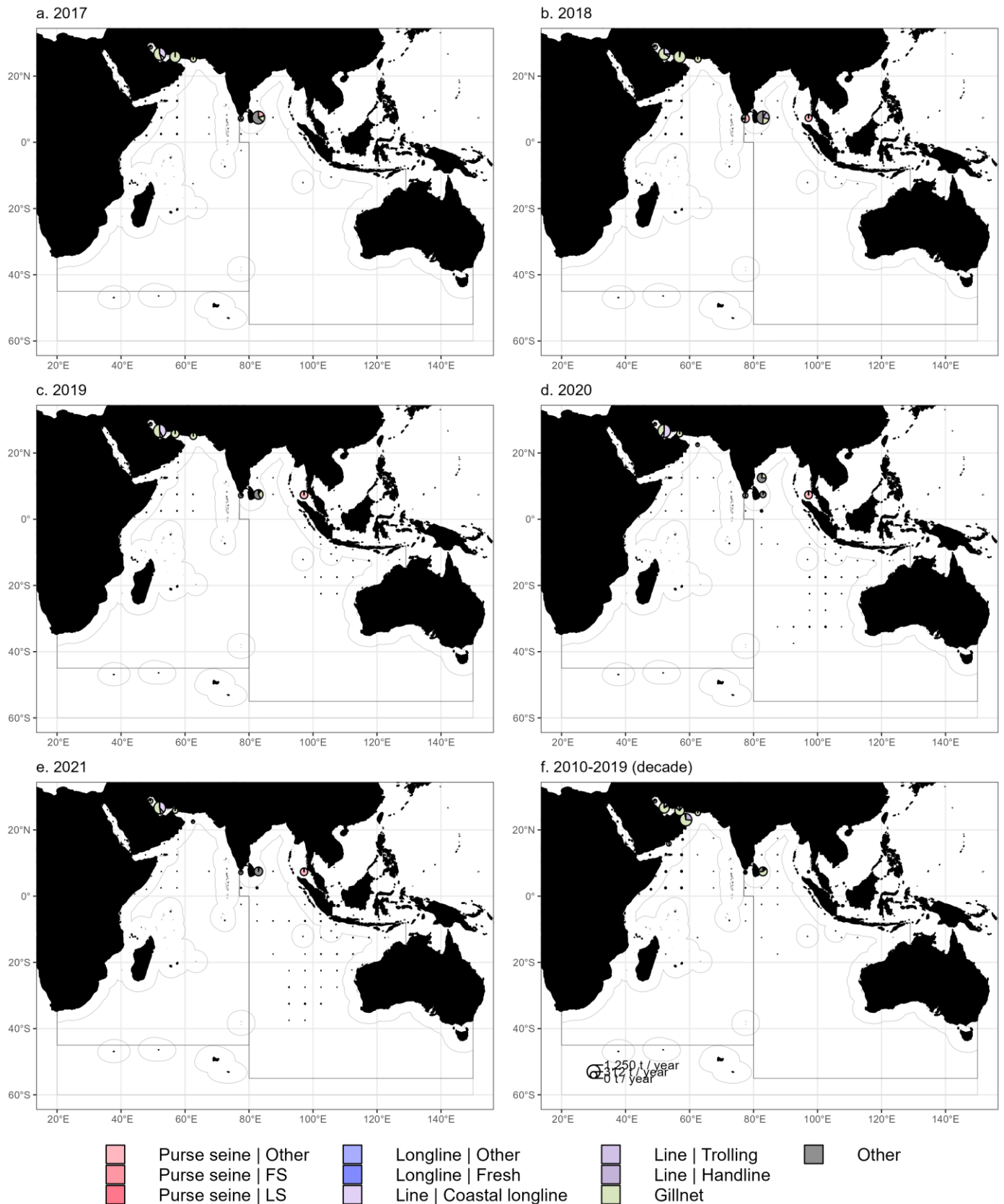


Figure 9: Annual time series of (a) cumulative retained catches (metric tonnes; t) estimated by quality score and (b) contribution of retained catches fully or partially reported to the IOTC Secretariat to all retained catches (percentage; %) of narrow-barred Spanish mackerel for all fisheries and by type of fishery, for the period 1950-2021

# Spatial distribution of catch

## Geo-references catches

### Geo-referenced catches by fishery, last years (2017-2021) and decade (2010-2019)





### Domestic catches within areas under national jurisdiction (2017-2021)

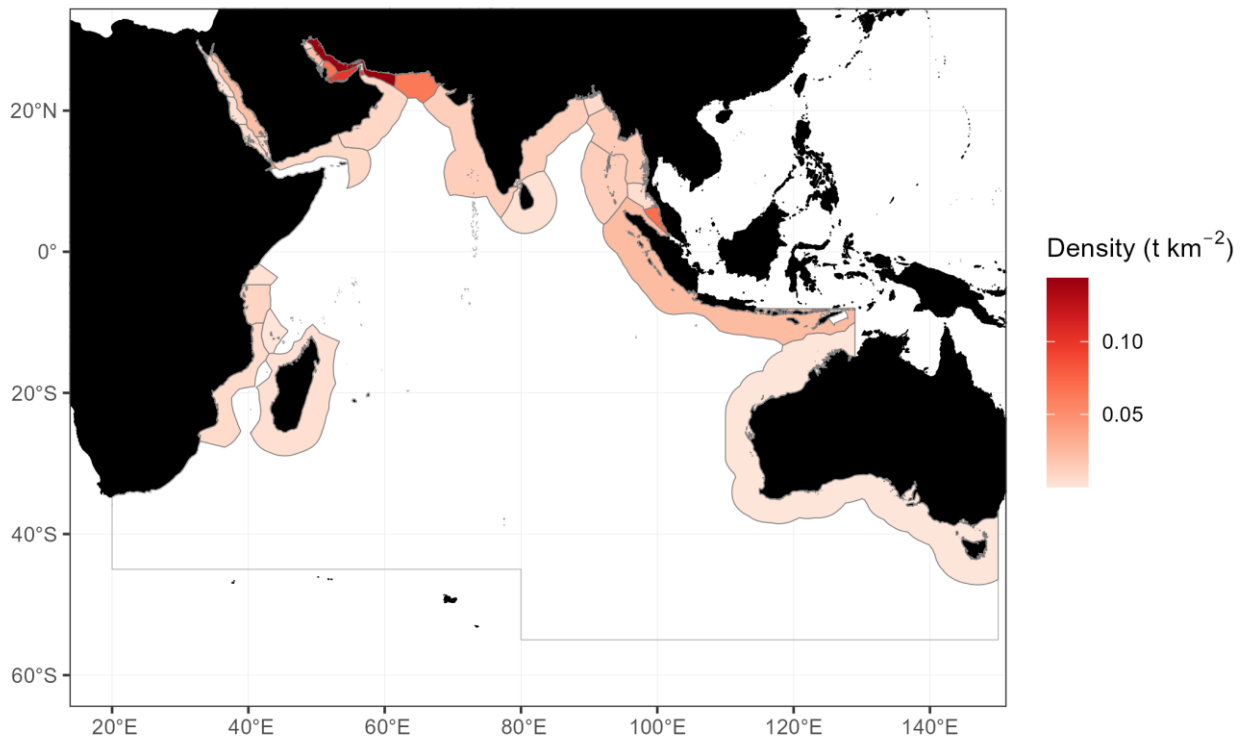


Figure 11: Mean annual density of catch ( $t\ km^{-2}$ ) of narrow-barred Spanish mackerel reported for domestic fisheries operating in areas under national jurisdiction of IOTC coastal states between 2017 and 2021. Data source: [best scientific estimates of retained catches](#)

### Uncertainties in geo-referenced catch and effort data

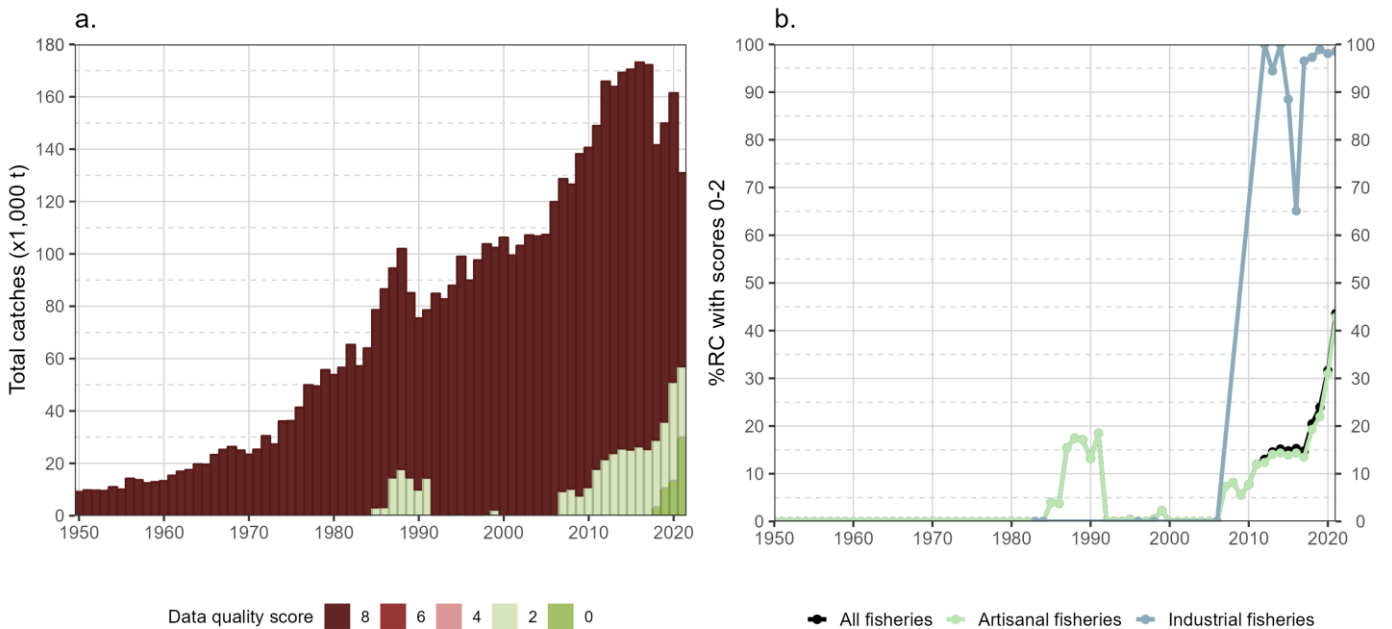


Figure 12: Annual time series of (a) cumulative retained catches (metric tonnes; t) estimated by quality score and (b) contribution of retained catches (percentage; %) with corresponding geo-referenced catch and effort data reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02) to all retained catches of narrow-barred Spanish mackerel for all fisheries and by type of fishery, for the period 1950-2021

## Size composition of the catch

### Samples availability

#### By fishery group

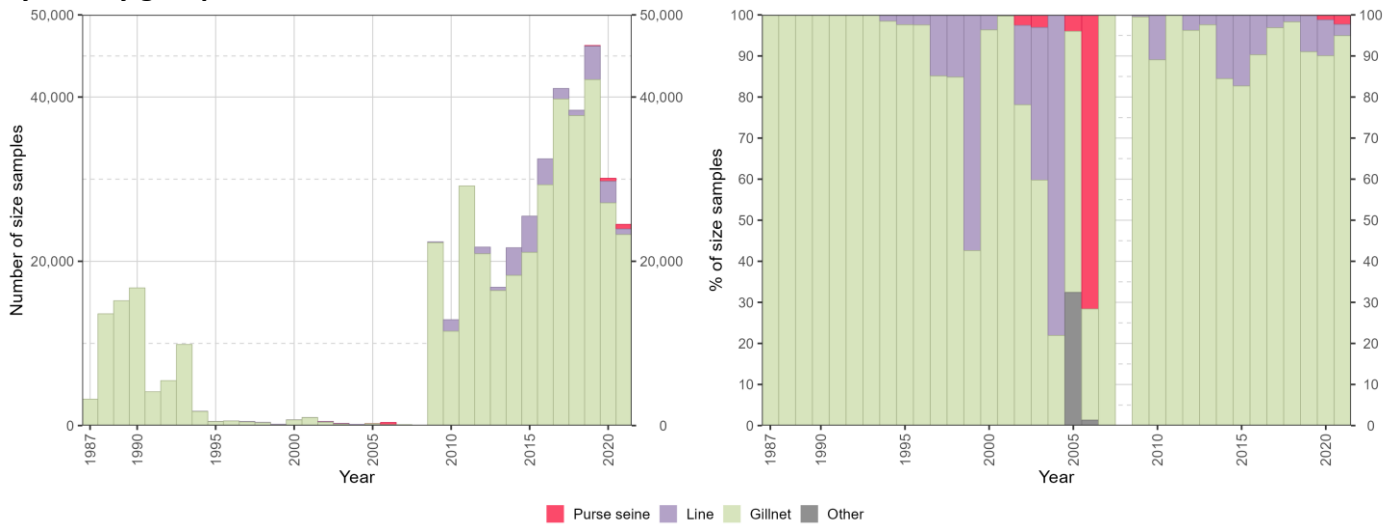


Figure 13: Availability of size-frequency data for narrow-barred Spanish mackerel as (left) absolute and (right) relative number of samples per year and fishery group. Data source: [standardized size-frequency dataset](#)

#### Purse seine fisheries

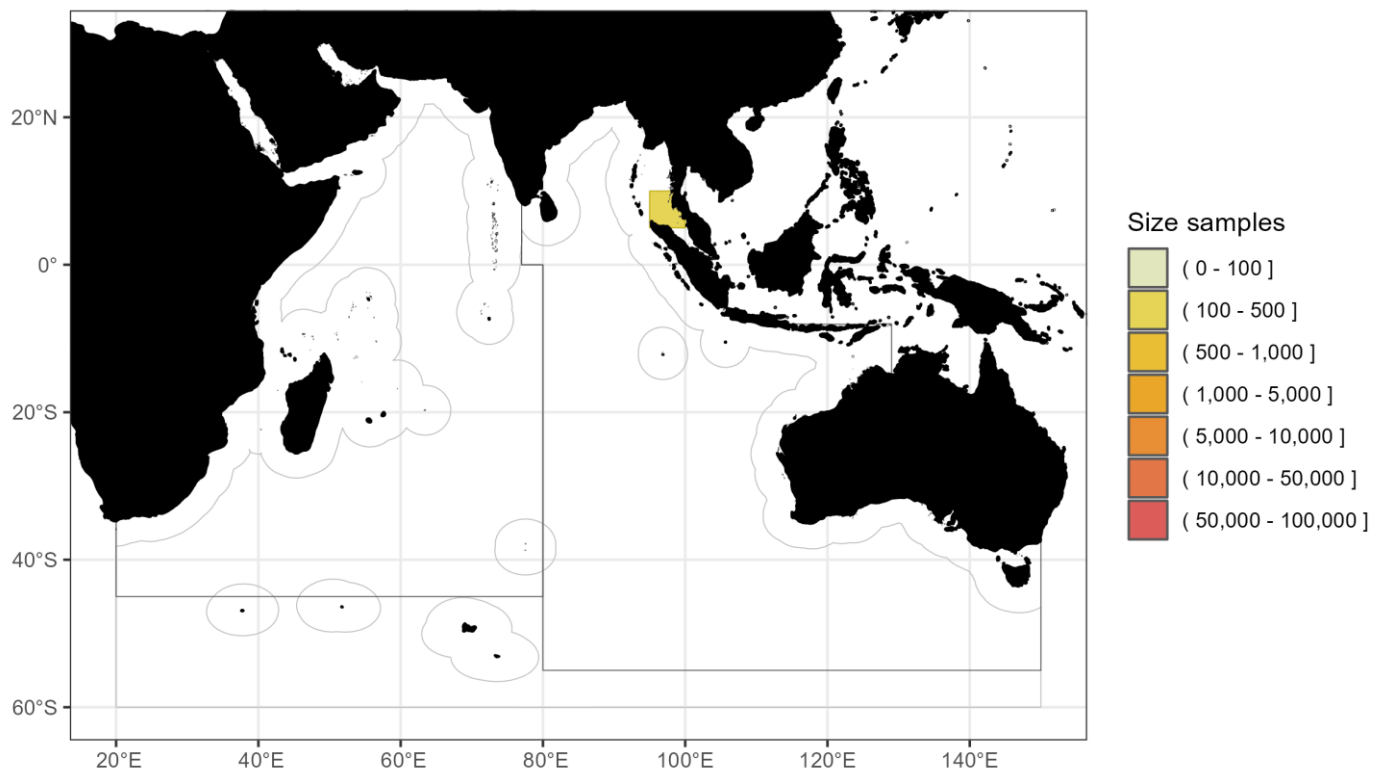


Figure 14: Spatial distribution (mean annual number of samples per 5-degree grid area) of available size-frequency data for narrow-barred Spanish mackerel caught in purse seine fisheries during 2017-2021. Light grey solid lines delineate areas beyond national jurisdiction. Data source: [standardized size-frequency dataset](#)

Gillnet fisheries

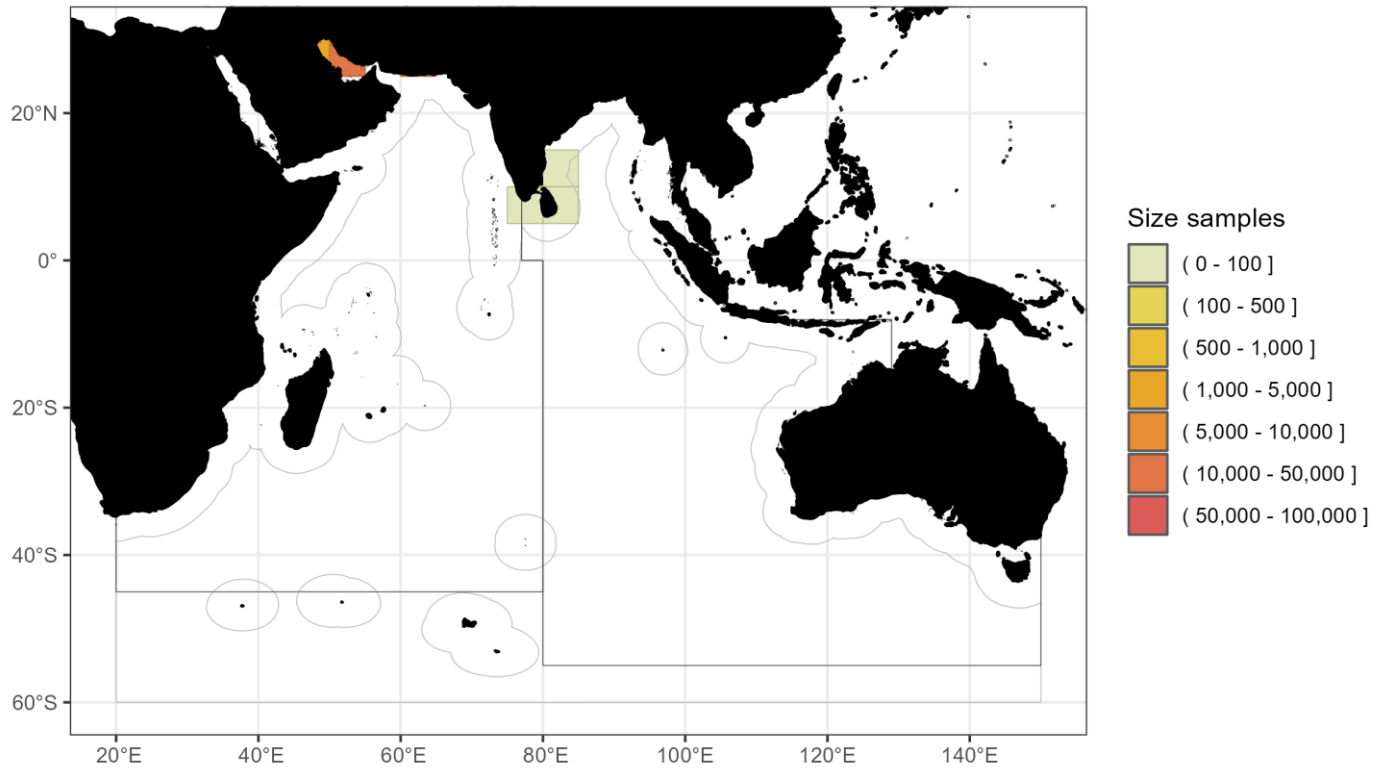


Figure 15: Spatial distribution (mean annual number of samples per 5-degree grid area) of available size-frequency data for narrow-barred Spanish mackerel caught in gillnet fisheries during 2017-2021. Light grey solid lines delineate areas beyond national jurisdiction. Data source: [standardized size-frequency dataset](#)

Line fisheries

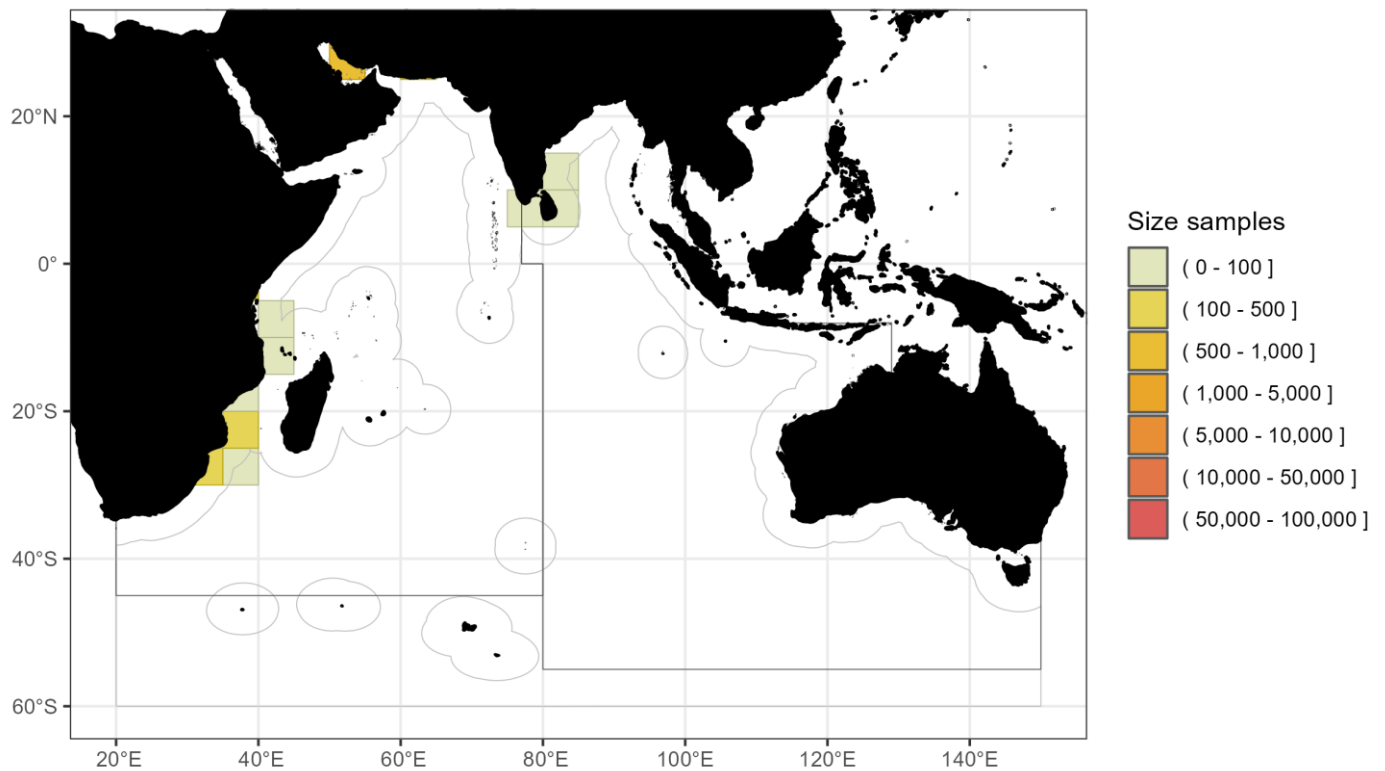


Figure 16: Spatial distribution (mean annual number of samples per 5-degree grid area) of available size-frequency data for narrow-barred Spanish mackerel caught in line fisheries during 2017-2021. Light grey solid lines delineate areas beyond national jurisdiction. Data source: [standardized size-frequency dataset](#)

By fishery

Purse seine fisheries

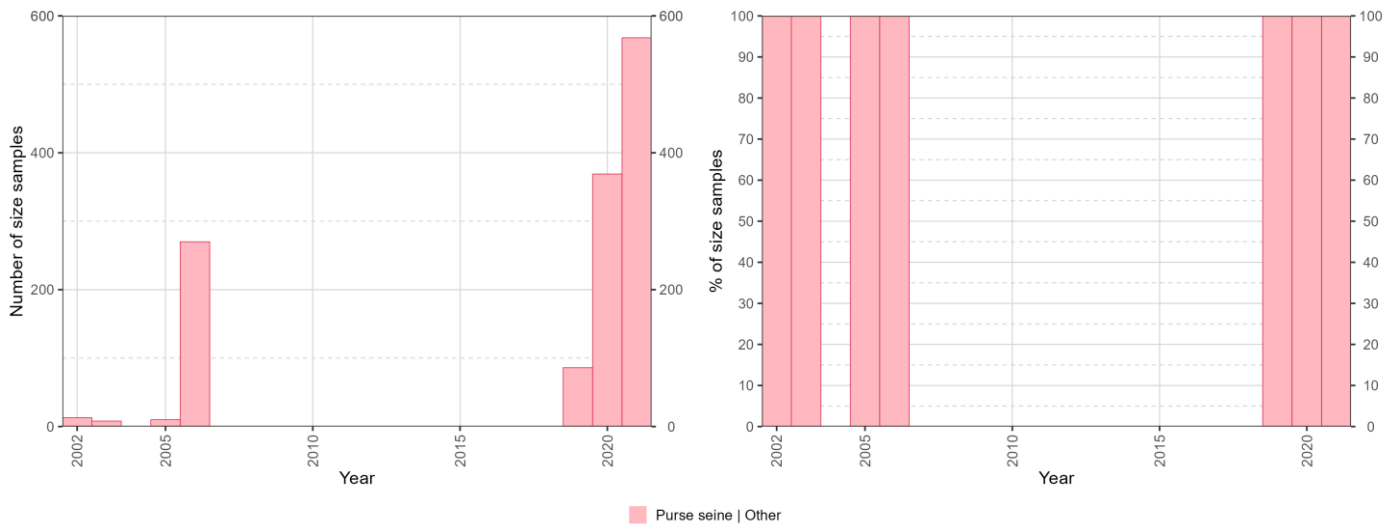


Figure 17: Availability of size-frequency data for narrow-barred Spanish mackerel as (left) absolute and (b) relative number of samples per year and type of purse seine fishery. Data source: [standardized size-frequency dataset](#)

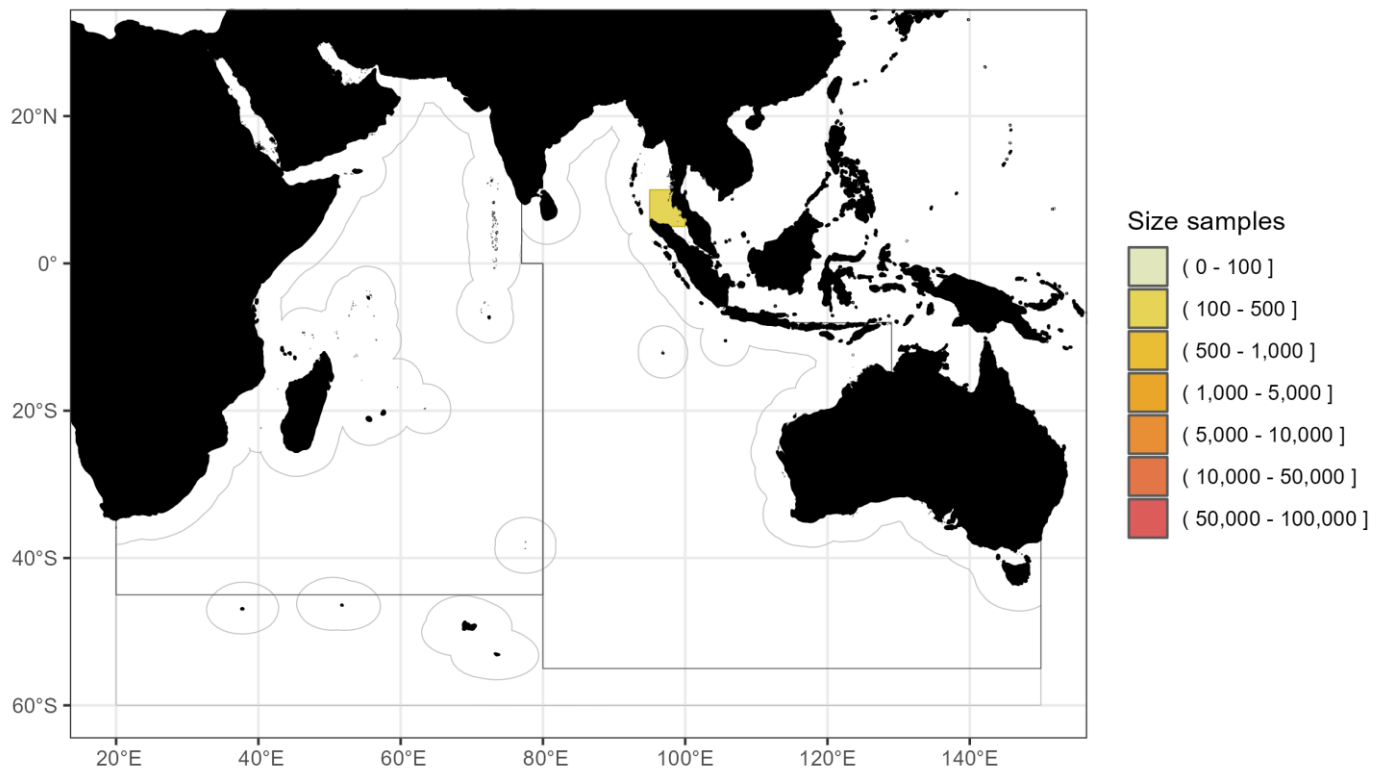


Figure 18: Spatial distribution (mean annual number of samples per 5-degree grid area) of available size-frequency data for narrow-barred Spanish mackerel caught in coastal and ringnet purse seine fisheries (Purse seine|Other) during 2017-2021. Data source: [standardized size-frequency dataset](#)

Gillnet fisheries

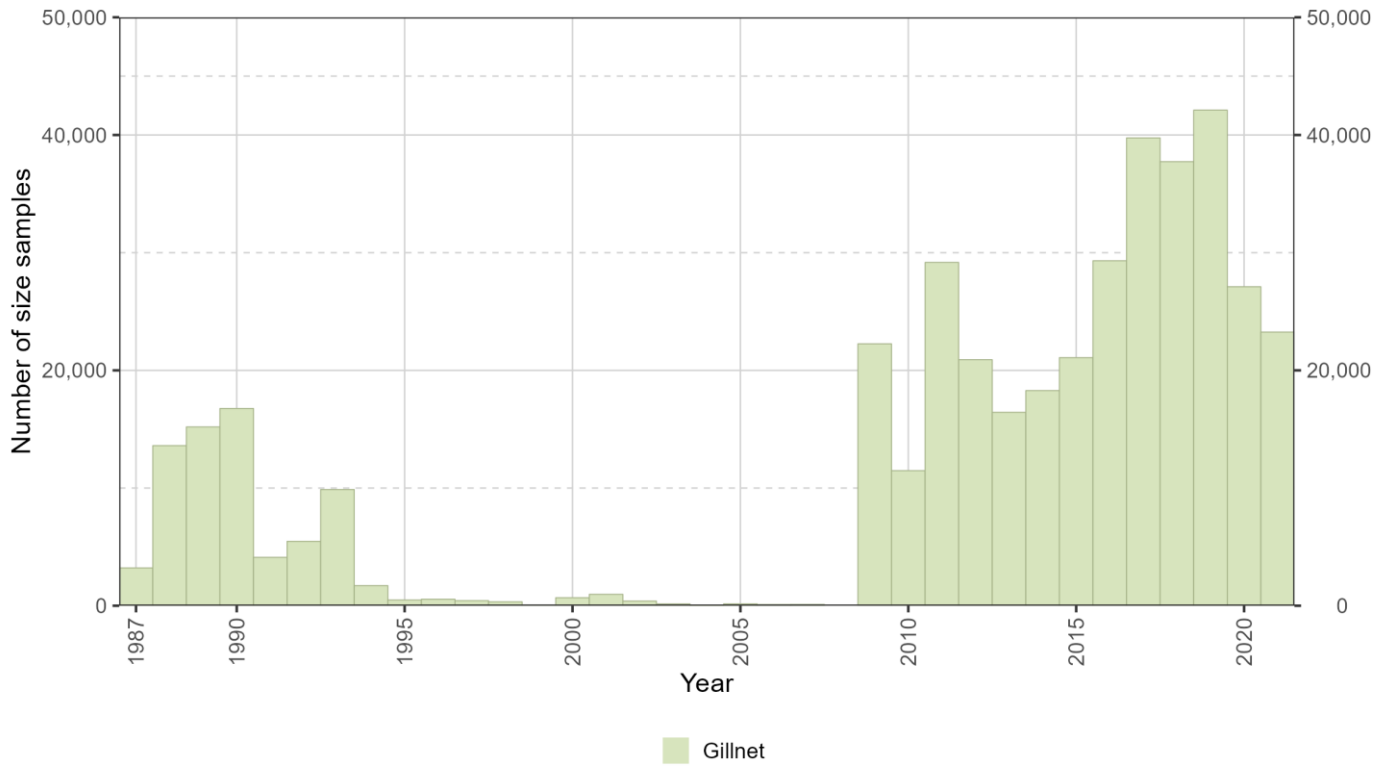


Figure 19: Availability of size-frequency data for narrow-barred Spanish mackerel as absolute number of samples per year in gillnet fisheries. Data source: [standardized size-frequency dataset](#)

Line fisheries

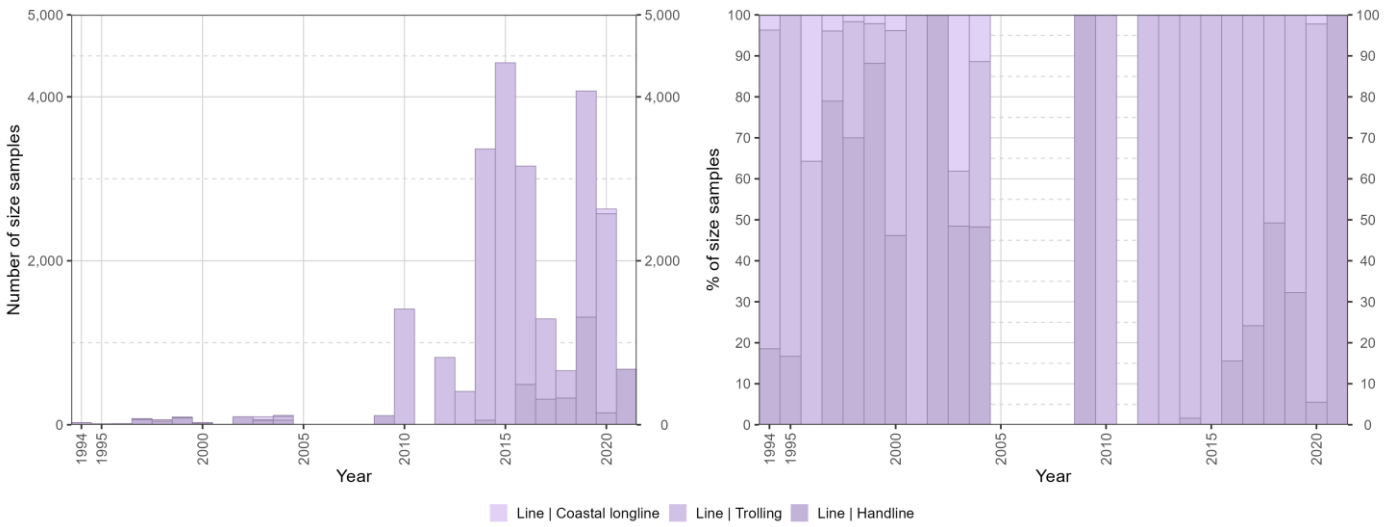


Figure 20: Availability of size-frequency data for narrow-barred Spanish mackerel as (left) absolute and (right) relative number of samples per year and line fishery type. Data source: [standardized size-frequency dataset](#)

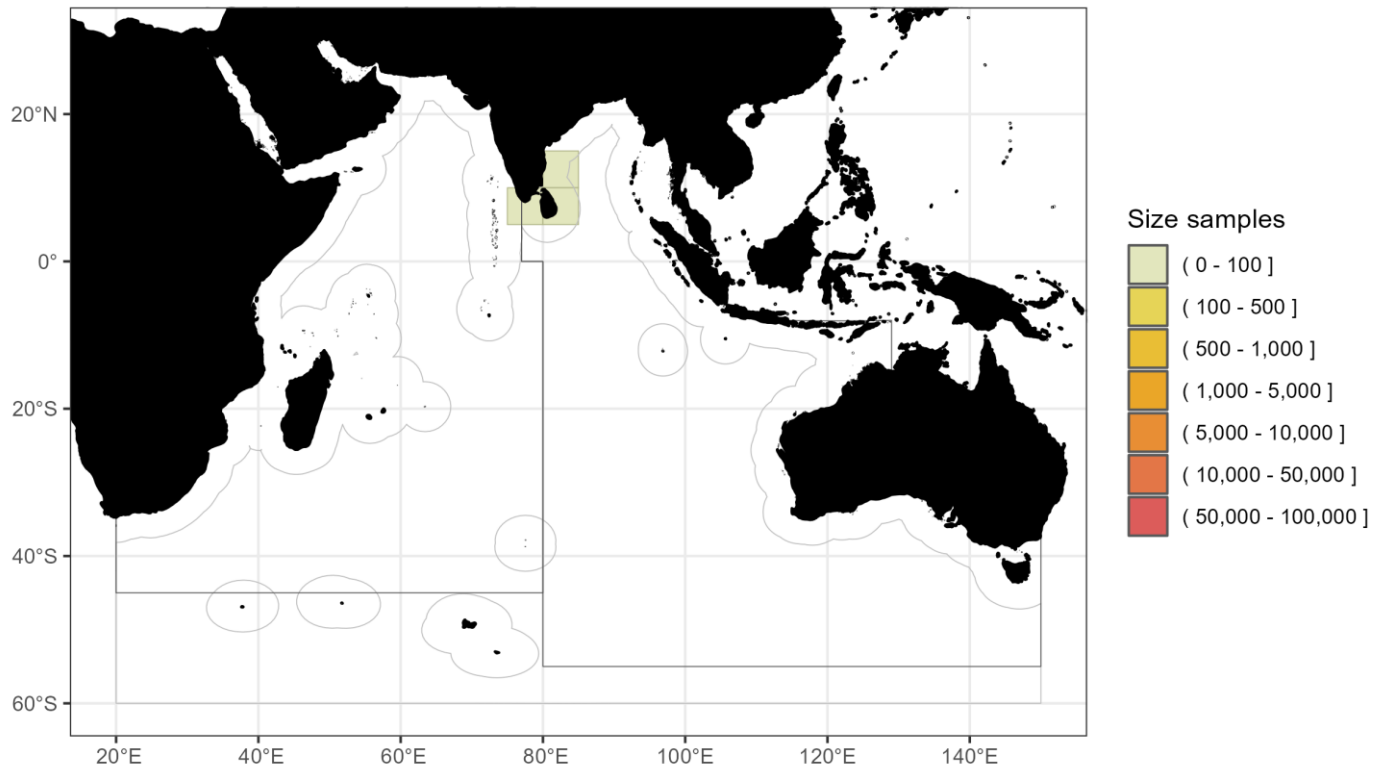


Figure 21: Spatial distribution (mean annual number of samples per 5-degree grid area) of available size-frequency data for narrow-barred Spanish mackerel caught in coastal longline fisheries during 2017-2021. Light grey solid lines delineate areas beyond national jurisdiction. Data source: [standardized size-frequency dataset](#)

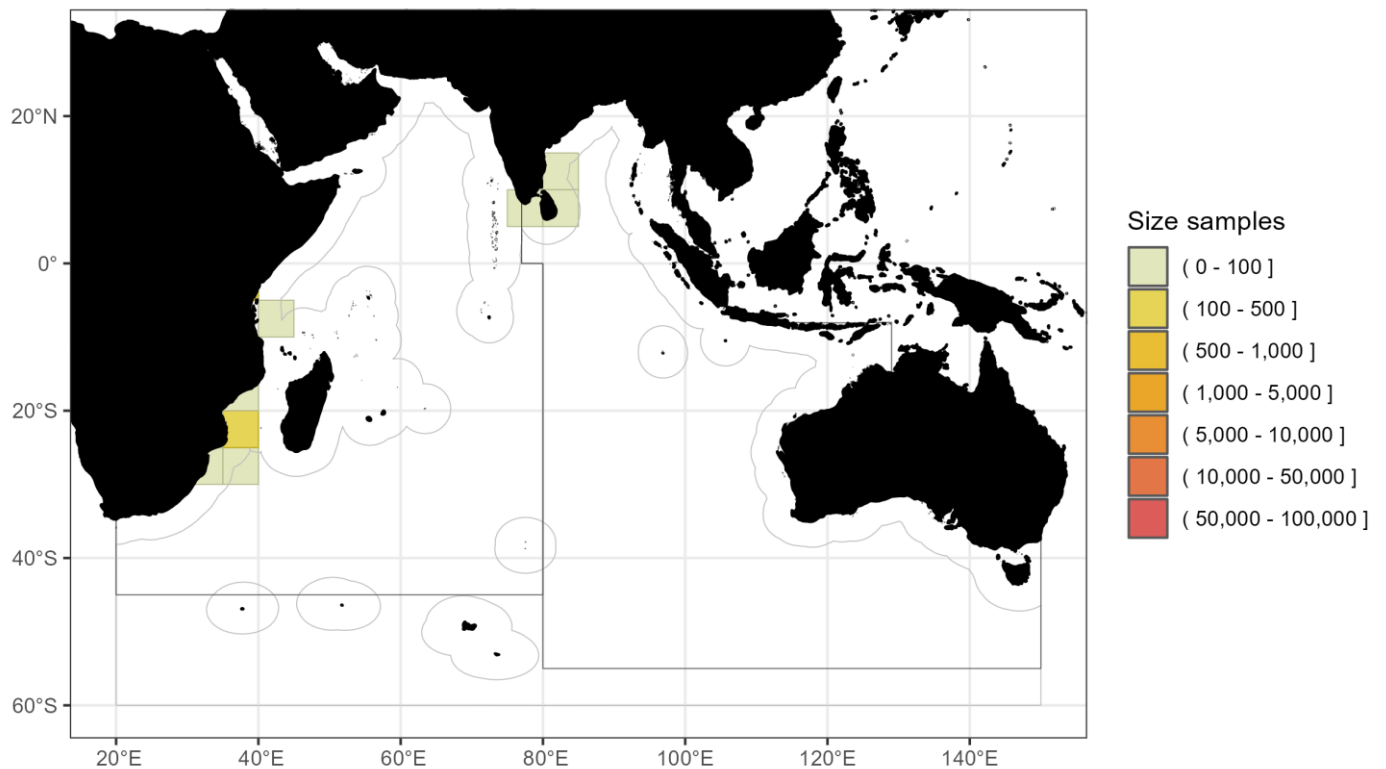


Figure 22: Spatial distribution (mean annual number of samples per 5-degree grid area) of available size-frequency data for narrow-barred Spanish mackerel caught in handline fisheries during 2017-2021. Light grey solid lines delineate areas beyond national jurisdiction. Data source: [standardized size-frequency dataset](#)

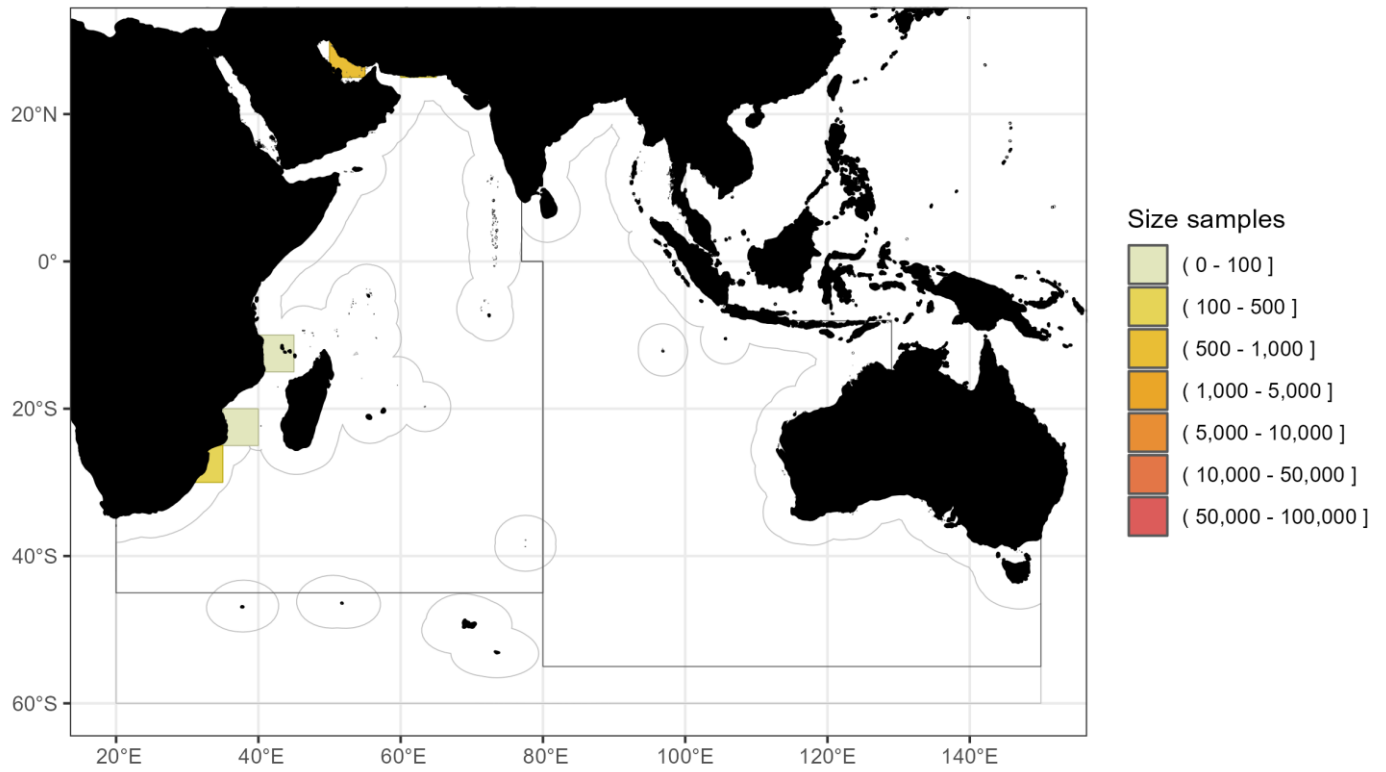


Figure 23: Spatial distribution (mean annual number of samples per 5-degree grid area) of available size-frequency data for narrow-barred Spanish mackerel caught in trolling fisheries during 2017-2021. Light grey solid lines delineate areas beyond national jurisdiction. Data source: [standardized size-frequency dataset](#)

### Temporal patterns and trends in size distributions

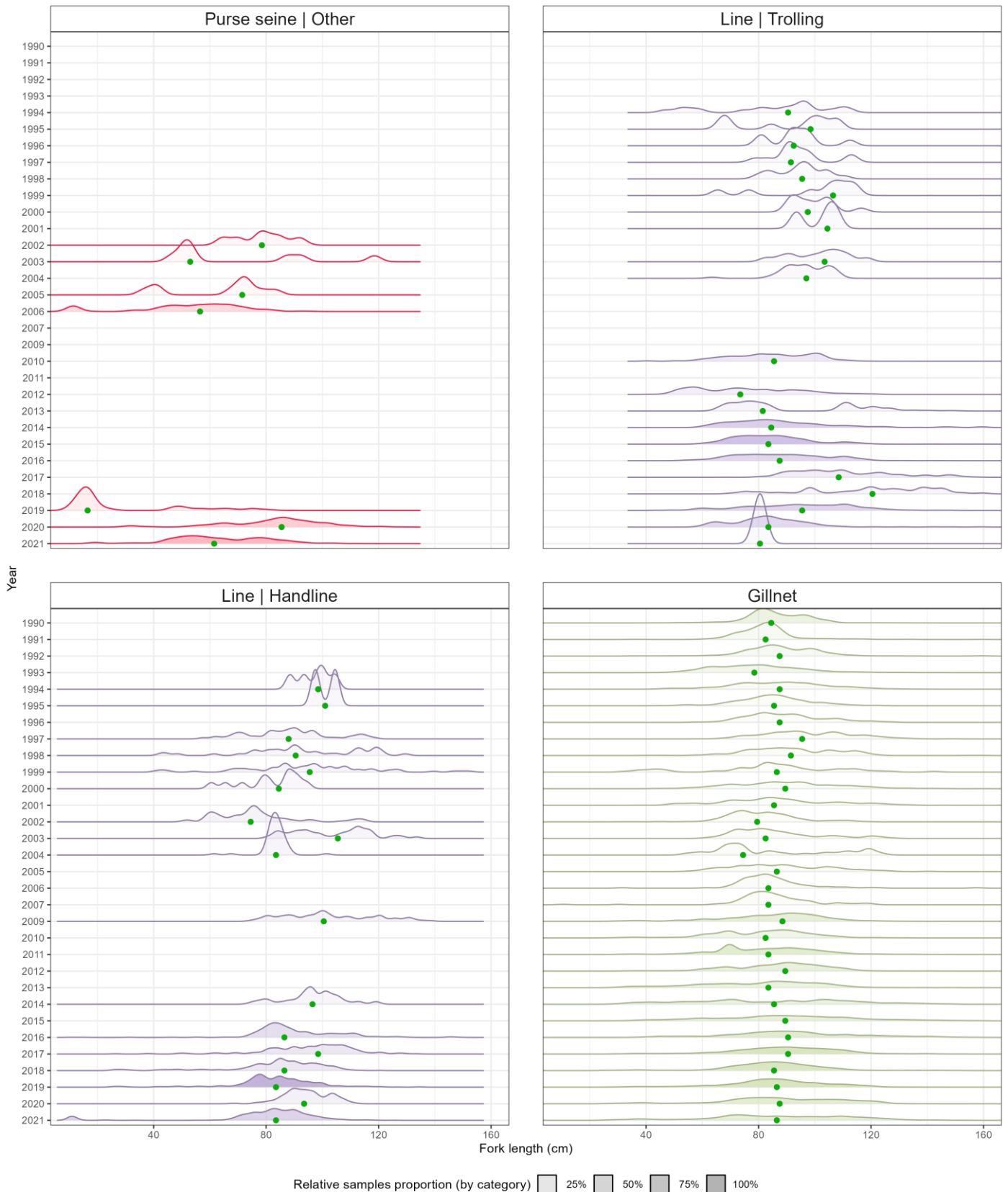


Figure 24: Relative size distribution (fork length; cm) of narrow-barred Spanish mackerel caught in coastal and ringnet purse seine fisheries (Purse seine|Other), gillnet fisheries, and other fisheries (unclassified). Fill intensity is proportional to the number of samples recorded for the year, while the green dot corresponds to the median value. Data source: [standardized size-frequency dataset](#)



Size distribution by fishery and fleet

Purse seine fisheries (other)

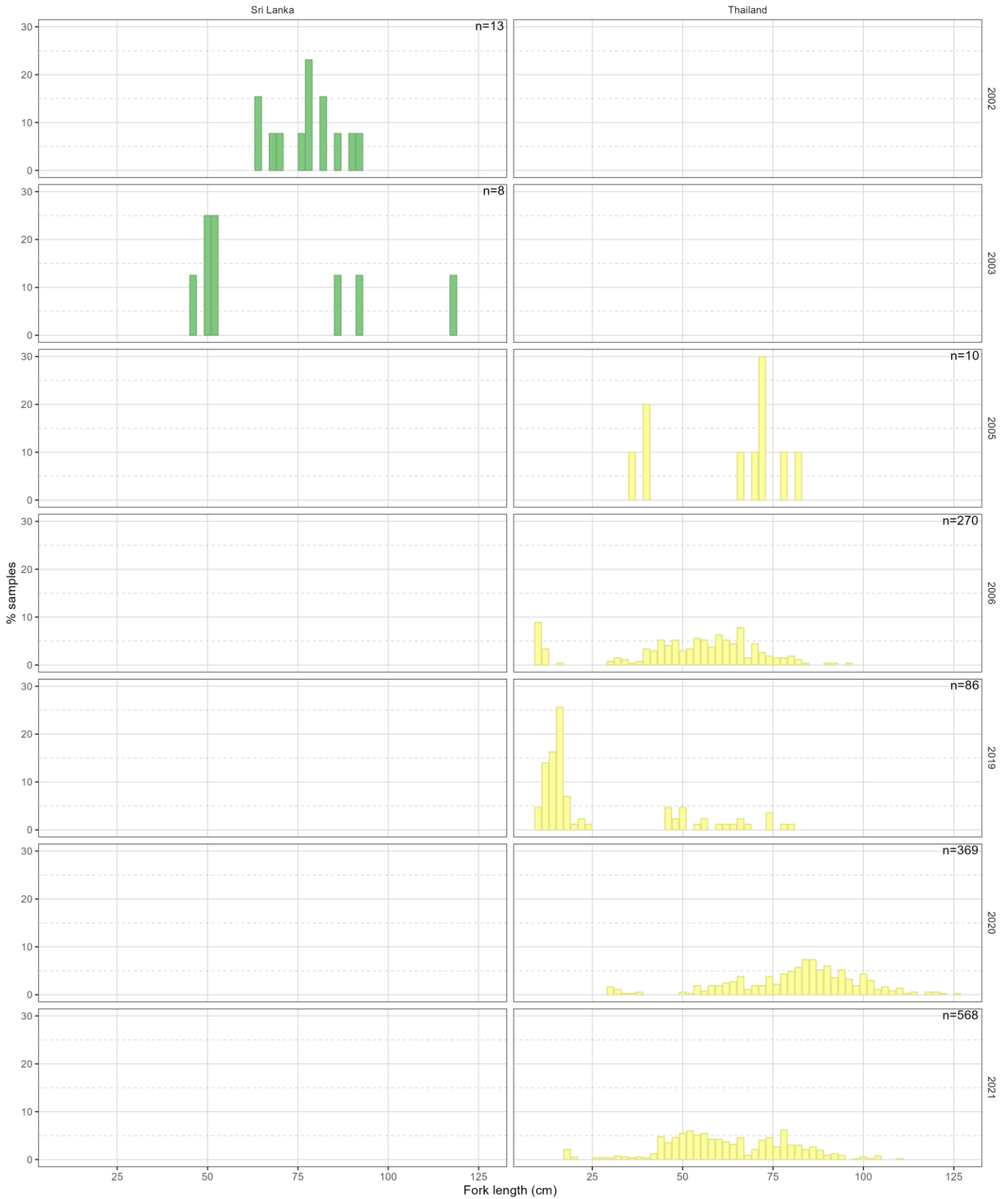


Figure 25: Relative size distribution of narrow-barred Spanish mackerel (fork length; cm) caught in coastal purse seine and ringnet fisheries (Purse seine|Other) by year and main fleet. Data source: [standardized size-frequency dataset](#)

Gillnet fisheries

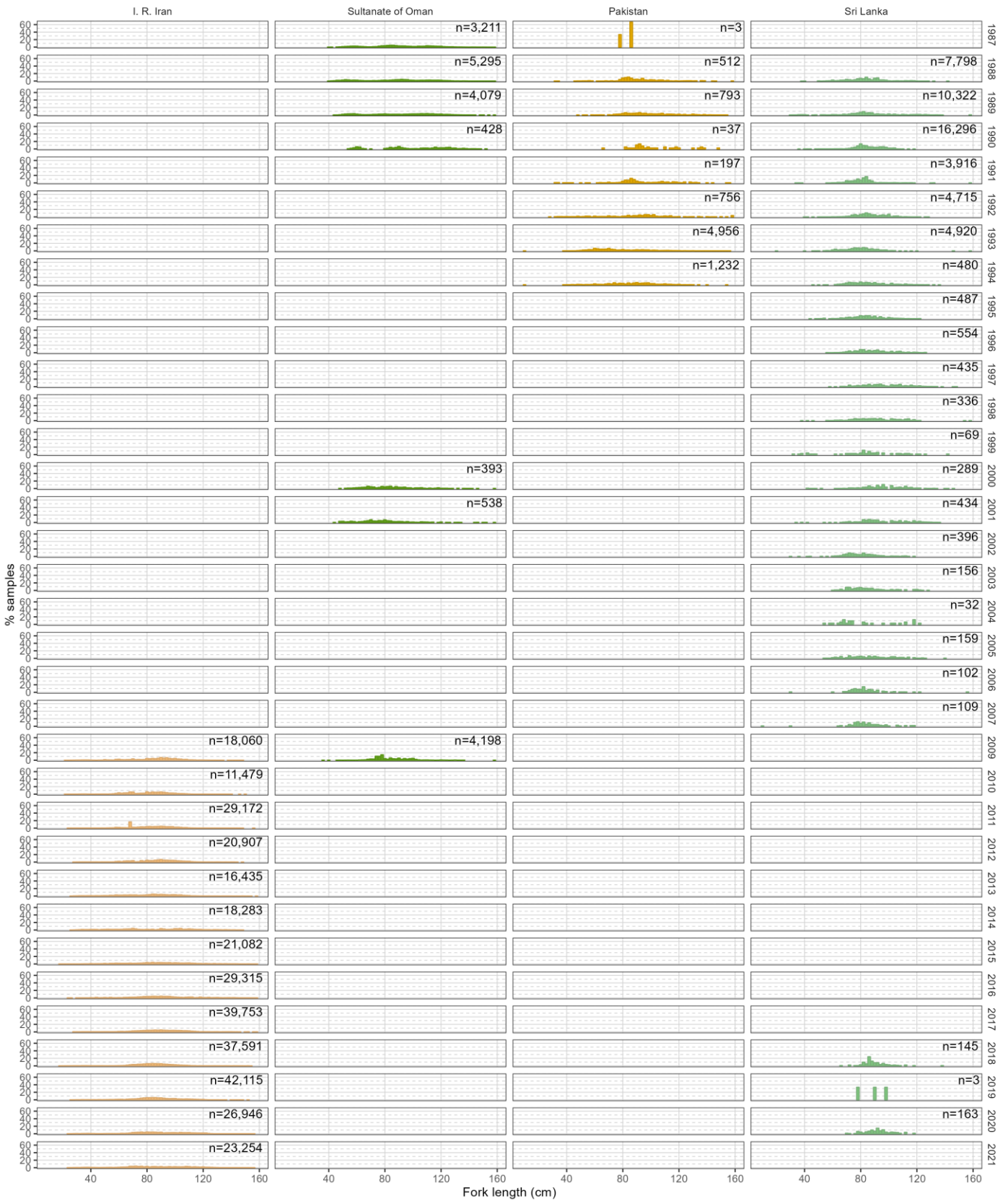


Figure 26: Relative size distribution of narrow-barred Spanish mackerel (fork length; cm) caught in gillnet fisheries by year and main fleet. Data source: [standardized size-frequency dataset](#)

## Uncertainties in geo-referenced size-frequency data

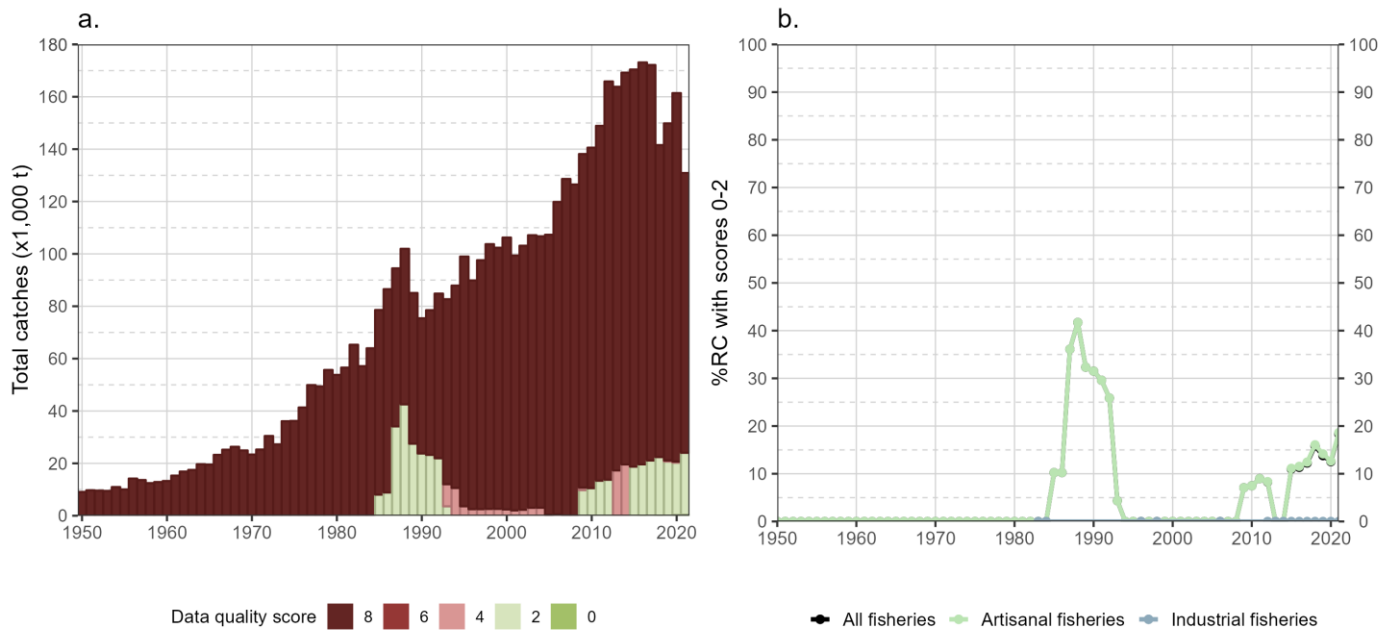


Figure 27: Annual time series of (a) cumulative retained catches (metric tonnes; t) estimated by quality score and (b) contribution of retained catches with corresponding geo-referenced size-frequency data reported to the IOTC Secretariat in agreement with the requirements of Res. 15/02 to all retained catches (percentage; %) of narrow-barred Spanish mackerel for all fisheries and by type of fishery, for the period 1950-2021

## References

IOTC (2023) [Review of the statistical data available for Indian Ocean neritic tuna and seerfish species under IOTC management](#). IOTC, Virtual meeting, 03-07 July 2023, p 39

Lacepède BGE (1800) *Histoire naturelle des poissons*, Paris, 2. Plassan, Paris, France.

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## Appendix

### Appendix I: Taxonomy

Table 4: Taxonomic hierarchy of narrow-barred Spanish mackerel. Source: [Integrated Taxonomic Information System](#)

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>Scombroidei</i>
Family	<i>Scombridae</i>
Subfamily	<i>Scombrinae</i>
Tribe	<i>Scomberomorini</i>
Genus	<i>Scomberomorus</i>
Species	<i>Scomberomorus commerson</i>

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

Table 5: Changes in best scientific estimates of annual retained catches (metric tonnes; t) of narrow-barred Spanish mackerel by fleet, fishery group, and main Indian Ocean area, limited to absolute values higher than 10 t

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
2020	ARE	Gillnet	Western Indian Ocean	4,293	5,087	-794
		Line	Western Indian Ocean	686	813	-127
	EGY	Gillnet	Western Indian Ocean	161	173	-12
		Line	Western Indian Ocean	34	22	12
	IRN	Gillnet	Western Indian Ocean	21,210	23,749	-2,539
		Line	Western Indian Ocean	5,078	2,539	2,539
	KEN	Gillnet	Western Indian Ocean	324	0	324
		Line	Western Indian Ocean	139	0	139
		Purse seine	Western Indian Ocean	21	0	21
	MMR	Gillnet	Eastern Indian Ocean	2,295	2,134	161
		Line	Eastern Indian Ocean	1,042	968	73
		Other	Eastern Indian Ocean	3,352	3,117	235
		Purse seine	Eastern Indian Ocean	1,040	967	73
	MOZ	Gillnet	Western Indian Ocean	63	1,398	-1,335
		Line	Western Indian Ocean	166	2,061	-1,895
		Other	Western Indian Ocean	42	991	-949
		Purse seine	Western Indian Ocean	21	2,046	-2,025
	SAU	Gillnet	Western Indian Ocean	3,525	2,578	947
		Line	Western Indian Ocean	1,461	1,767	-306
		Other	Western Indian Ocean	124	181	-58
Purse seine		Western Indian Ocean	26	38	-12	
SDN	Gillnet	Western Indian Ocean	132	151	-19	
2019	ARE	Gillnet	Western Indian Ocean	4,662	5,259	-597
		Line	Western Indian Ocean	746	841	-95
	IDN	Gillnet	Eastern Indian Ocean	16,387	16,399	-12
	IRN	Gillnet	Western Indian Ocean	20,949	21,549	-600
		Line	Western Indian Ocean	2,822	2,227	595
	MOZ	Line	Western Indian Ocean	2,159	2,061	98

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)	
	SAU	Gillnet	Western Indian Ocean	2,500	2,734	-234	
		Line	Western Indian Ocean	1,383	1,874	-491	
		Other	Western Indian Ocean	133	192	-59	
		Purse seine	Western Indian Ocean	28	40	-13	
2018	ARE	Gillnet	Western Indian Ocean	5,032	5,604	-572	
		Line	Western Indian Ocean	805	896	-91	
	SAU	Gillnet	Western Indian Ocean	2,881	2,786	95	
		Line	Western Indian Ocean	1,345	1,909	-565	
		Other	Western Indian Ocean	120	196	-75	
		Purse seine	Western Indian Ocean	25	41	-16	
2017	ARE	Gillnet	Western Indian Ocean	5,173	5,859	-686	
		Line	Western Indian Ocean	827	937	-110	
	IDN	Gillnet	Eastern Indian Ocean	22,133	17,731	4,403	
		Line	Eastern Indian Ocean	12,278	9,835	2,442	
		Other	Eastern Indian Ocean	11,759	9,420	2,339	
		Purse seine	Eastern Indian Ocean	6,479	5,190	1,289	
	SAU	Gillnet	Western Indian Ocean	3,098	2,894	204	
		Line	Western Indian Ocean	1,394	1,985	-591	
		Other	Western Indian Ocean	123	203	-81	
		Purse seine	Western Indian Ocean	26	43	-17	
	2016	ARE	Gillnet	Western Indian Ocean	5,313	5,703	-390
			Line	Western Indian Ocean	850	912	-62
IDN		Gillnet	Eastern Indian Ocean	17,747	17,731	16	
KEN		Gillnet	Western Indian Ocean	569	217	353	
		Line	Western Indian Ocean	244	32	212	
		Purse seine	Western Indian Ocean	37	0	37	
SAU		Gillnet	Western Indian Ocean	3,596	2,894	702	
		Line	Western Indian Ocean	1,620	1,985	-365	
		Other	Western Indian Ocean	143	203	-61	
		Purse seine	Western Indian Ocean	30	43	-13	

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
2015	ARE	Gillnet	Western Indian Ocean	5,186	5,763	-578
		Line	Western Indian Ocean	829	922	-92
	MOZ	Line	Western Indian Ocean	1,352	1,321	31
2014	ARE	Gillnet	Western Indian Ocean	5,442	5,682	-241
		Line	Western Indian Ocean	870	909	-38
	IDN	Gillnet	Eastern Indian Ocean	19,002	19,034	-33
		Line	Eastern Indian Ocean	10,541	10,559	-18
		Other	Eastern Indian Ocean	10,096	10,113	-17
	MMR	Gillnet	Eastern Indian Ocean	2,361	2,338	23
		Line	Eastern Indian Ocean	1,072	1,061	11
		Other	Eastern Indian Ocean	3,449	3,415	34
	MOZ	Line	Western Indian Ocean	1,836	1,756	80
	2013	IDN	Gillnet	Eastern Indian Ocean	21,571	20,899
Line			Eastern Indian Ocean	11,966	11,593	373
Other			Eastern Indian Ocean	11,461	11,104	357
Purse seine			Eastern Indian Ocean	6,314	6,117	197
MMR		Gillnet	Eastern Indian Ocean	2,283	2,333	-50
		Line	Eastern Indian Ocean	1,036	1,059	-23
		Other	Eastern Indian Ocean	3,334	3,407	-73
		Purse seine	Eastern Indian Ocean	1,034	1,057	-23
QAT		Gillnet	Western Indian Ocean	2,221	1,734	487
2012		IDN	Gillnet	Eastern Indian Ocean	18,464	18,311
	Line		Eastern Indian Ocean	10,242	10,157	85
	Other		Eastern Indian Ocean	9,810	9,729	81
	Purse seine		Eastern Indian Ocean	5,405	5,360	45
	MMR	Gillnet	Eastern Indian Ocean	2,390	2,421	-32
		Line	Eastern Indian Ocean	1,085	1,099	-14
		Other	Eastern Indian Ocean	3,490	3,537	-46
		Purse seine	Eastern Indian Ocean	1,082	1,097	-14
	QAT	Gillnet	Western Indian Ocean	2,366	1,808	558

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
2010	IDN	Gillnet	Eastern Indian Ocean	17,986	17,873	113
		Line	Eastern Indian Ocean	9,977	9,915	63
		Other	Eastern Indian Ocean	9,556	9,496	60
		Purse seine	Eastern Indian Ocean	5,265	5,232	33
2006	AUS	Purse seine	Eastern Indian Ocean	1,071	1,057	14