REVIEW OF FISHERIES STATISTICAL DATA AVAILABLE FOR INDIAN OCEAN INDO-PACIFIC KING MACKEREL
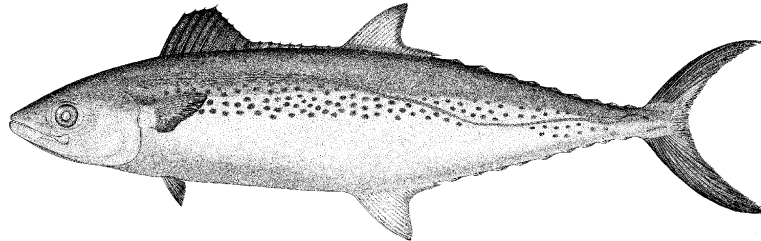
Author: IOTC Secretariat

Introduction

The overarching objective of the paper is to provide participants at the 13th Session of the IOTC Working Party on Neritic Tunas (WPNT13) with a review of the status of fisheries information available on Indo-Pacific mackerel (*Scomberomorus guttatus*) (Bloch et al. 1801) 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 Indo-Pacific king 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).
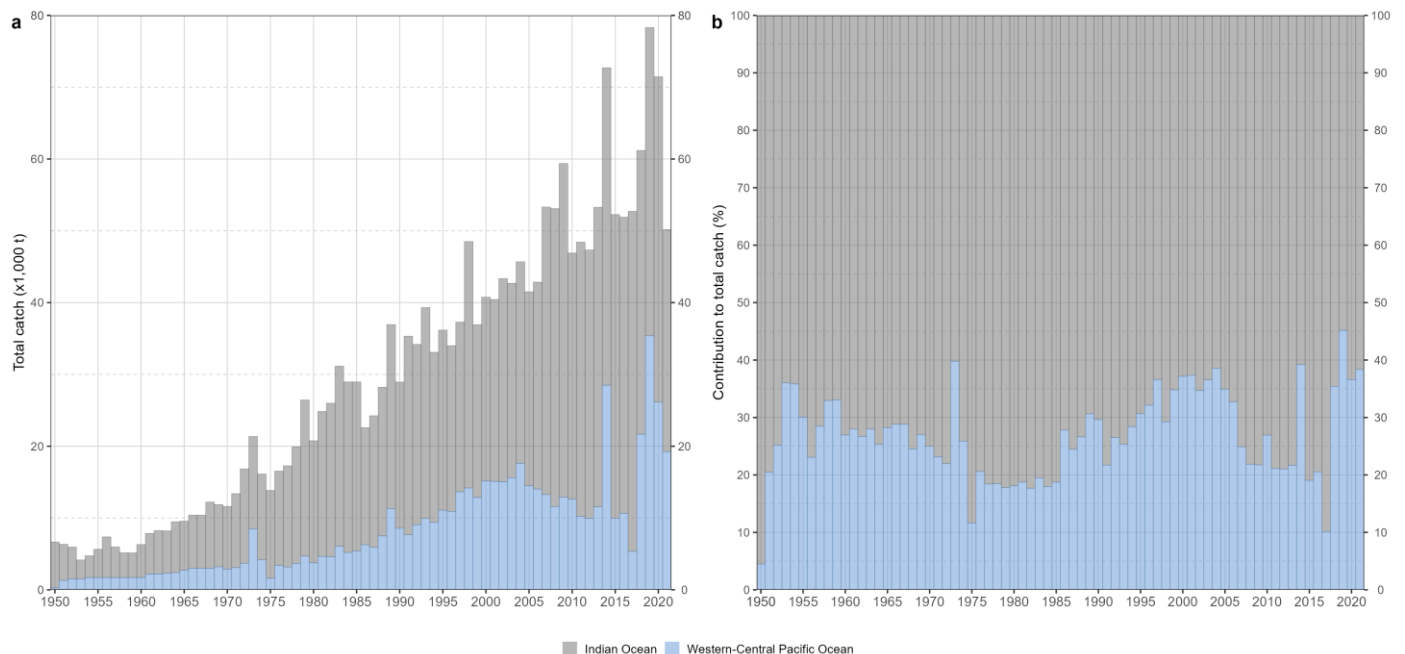
Global catches

Figure 1: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) contribution to the total retained catches (percentage; %) of Indo-Pacific king 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 Indo-Pacific king 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	0	34	585	774	1,042	1,315
**Longline	Fresh**	0	0	0	0	0	0	12
**Longline	Deep-freezing**	0	0	0	14	6	3	3
**Line	Coastal longline**	0	0	7	110	223	478	766
**Line	Trolling**	240	335	733	1,169	1,410	1,804	3,048
**Line	Handline**	11	15	33	56	202	222	154
Gillnet	4,366	6,896	13,944	16,488	19,435	21,687	28,985
Other	13	21	48	3,865	5,099	9,353	10,555
Total	4,630	7,268	14,798	22,287	27,149	34,588	44,838
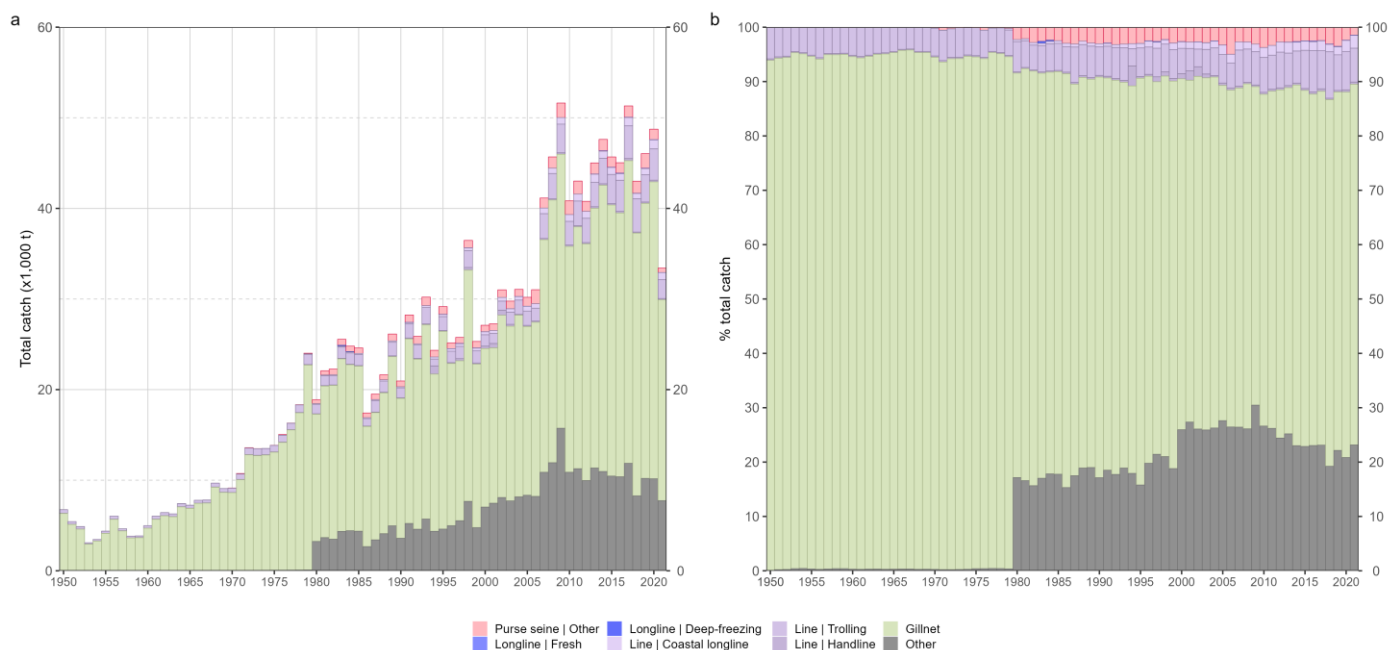
Figure 2: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) cumulative contribution to the total retained catches (percentage; %) of Indo-Pacific king mackerel by fishery for the period 1950-2021. Data source: best scientific estimates of retained catches

Table 2: Annual retained catches (metric tonnes; t) of Indo-Pacific king 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	1,105	1,247	1,265	1,153	1,161	1,275	1,345	1,626	1,173	492
Longline | Fresh	0	2	35	12	21	11	10	27	5	4
Longline | Deep-freezing	0	0	0	1	20	1	4	3	8	3
Line | Coastal longline	766	895	788	775	737	919	585	680	995	793
Line | Trolling	2,683	2,695	2,816	3,217	3,439	3,614	3,676	3,019	3,448	2,081
Line | Handline	144	167	152	148	163	226	112	138	190	136
Gillnet	26,121	28,671	31,602	29,925	29,122	33,408	29,010	30,363	32,774	22,172
Other	9,960	11,343	10,958	10,450	10,378	11,859	8,266	10,195	10,156	7,737
Total	40,779	45,021	47,617	45,682	45,043	51,313	43,007	46,053	48,748	33,418
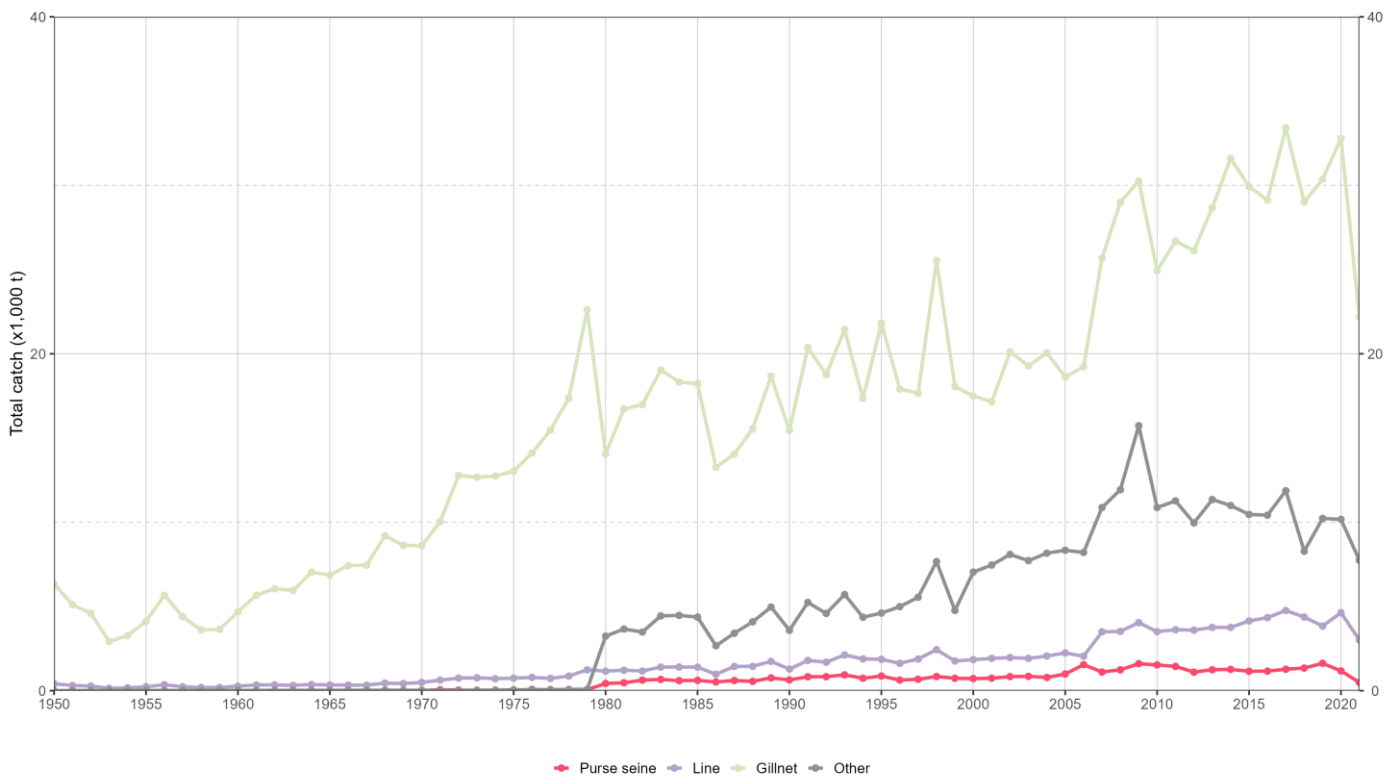
Figure 3: Annual time series of retained catches (metric tonnes; t) of Indo-Pacific king mackerel by fishery group for the period 1950-2021. Data source: best scientific estimates of retained catches
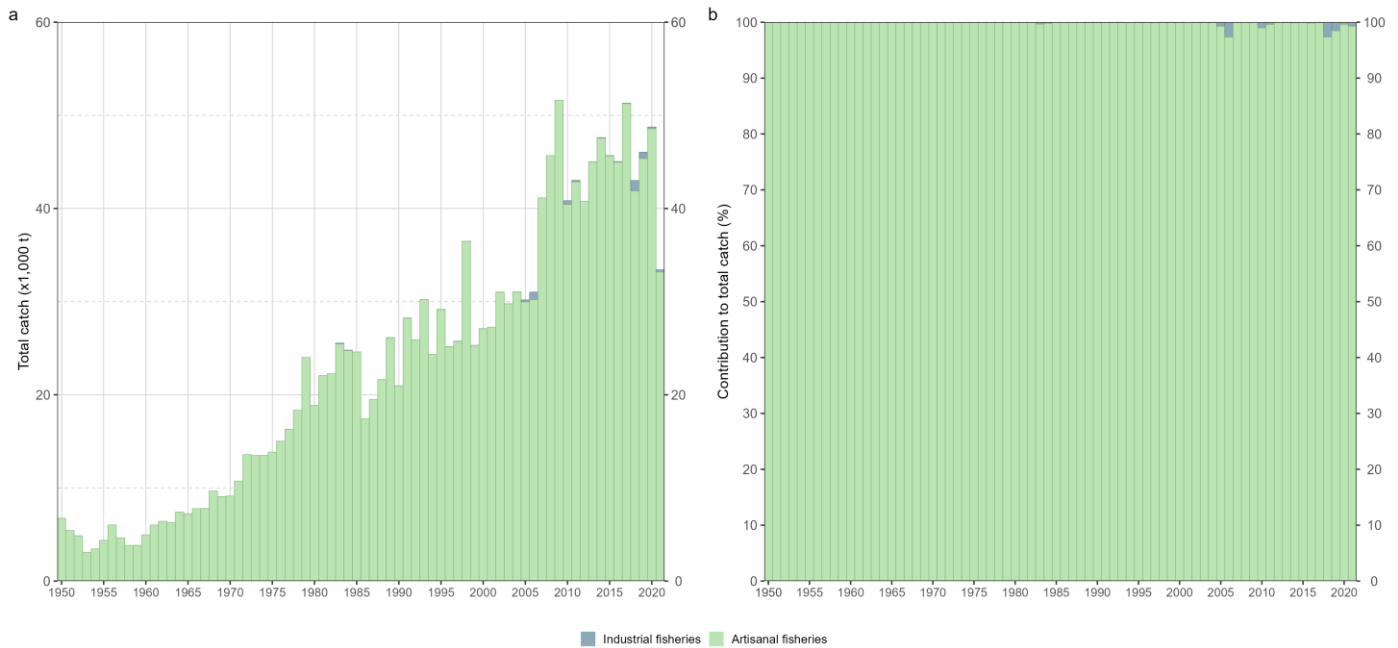
Figure 4: Annual time series of (a) cumulative retained catches (metric tonnes; t) and (b) cumulative contribution to the total retained catches (percentage; %) of Indo-Pacific king mackerel by type of fishery for the period 1950-2021. Data source: best scientific estimates of retained catches

Recent fishery features (2017-2021)

Table 3: Mean annual retained catches (metric tonnes; t) of Indo-Pacific king mackerel by fishery between 2017 and 2021. Data source: best scientific estimates of retained catches

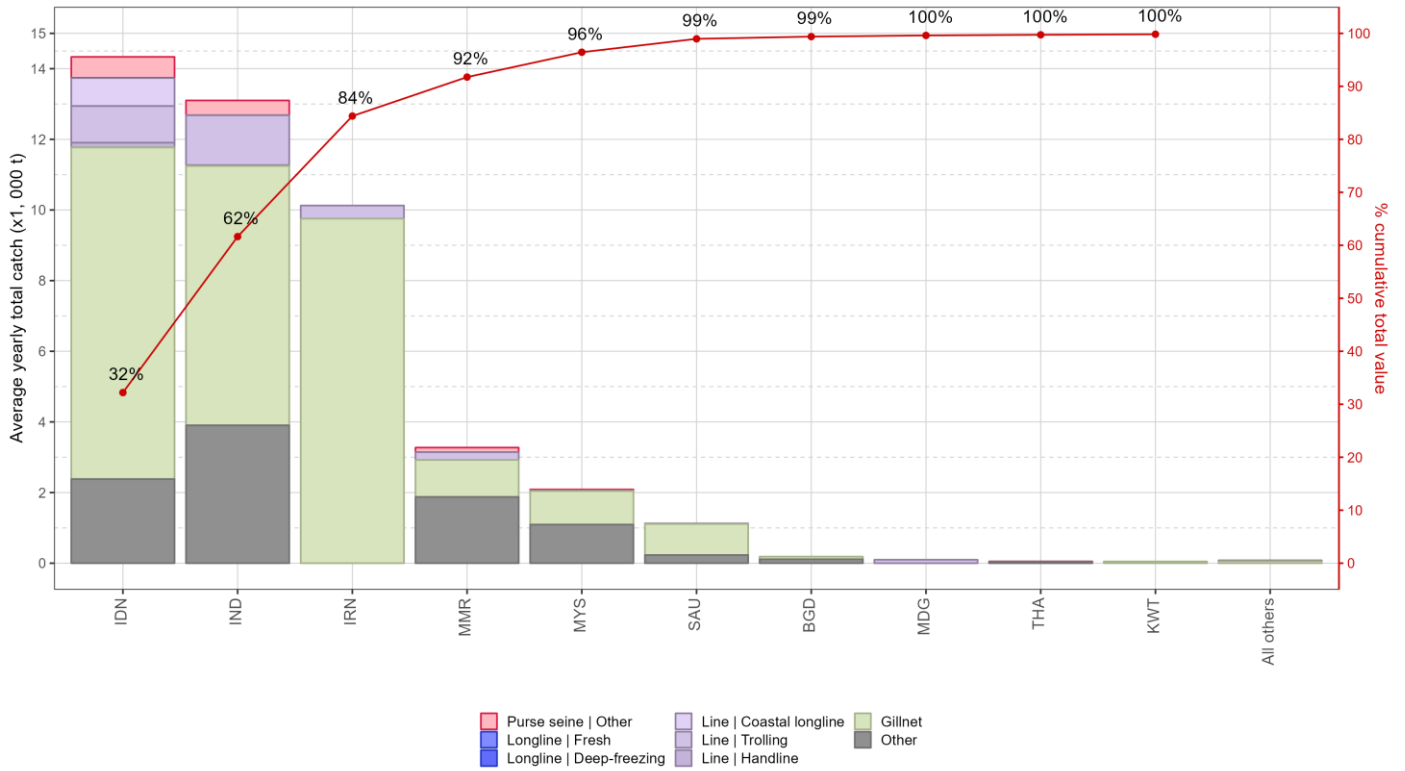| Fishery	Fishery code	Catch	Percentage
Gillnet	GN	29,545	66.4
Other	OT	9,643	21.7
Line | Trolling	LIT	3,167	7.1
Purse seine | Other	PSOT	1,182	2.7
Line | Coastal longline	LIC	794	1.8
Line | Handline	LIH	160	0.4
Longline | Fresh	LLF	11	0.0
Longline | Deep-freezing	LLD	4	0.0

Figure 5: Mean annual retained catches (metric tonnes; t) of Indo-Pacific king 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
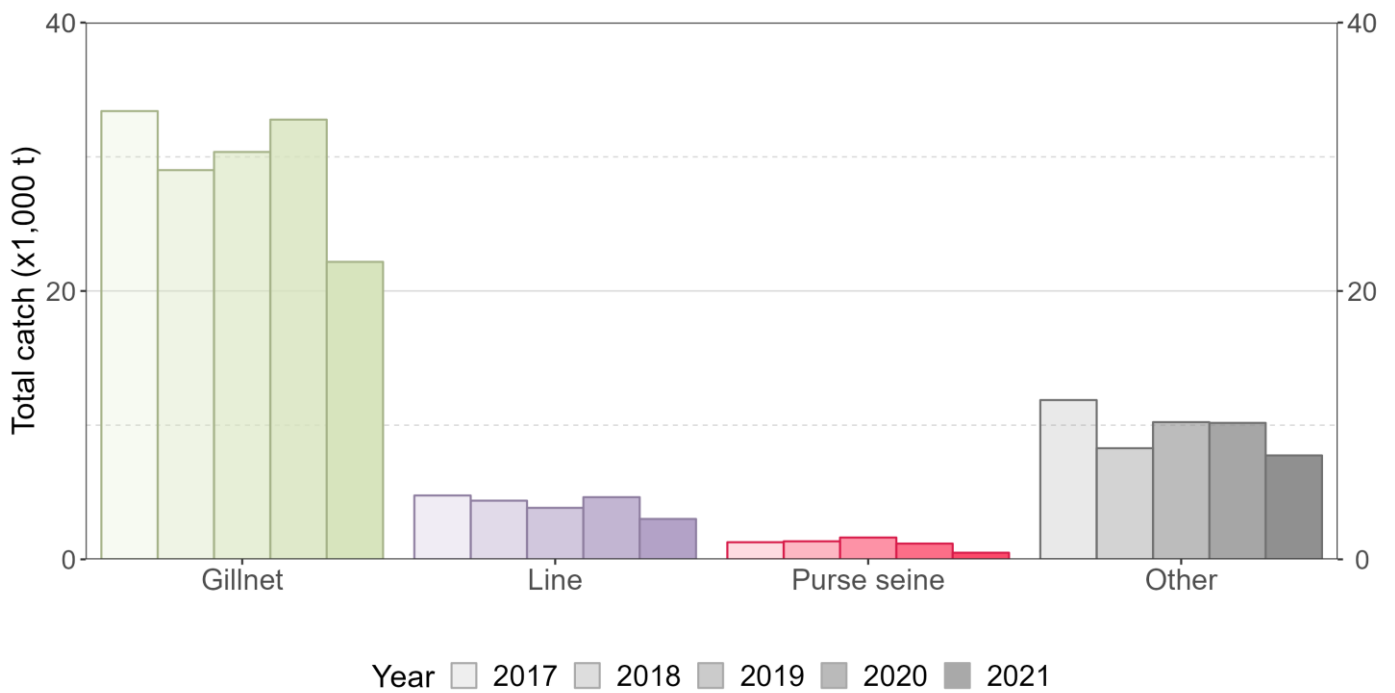

Figure 6: Annual trends in retained catch (metric tonnes; t) of Indo-Pacific king mackerel by fishery group between 2017 and 2021. Data source: best scientific estimates of retained catches
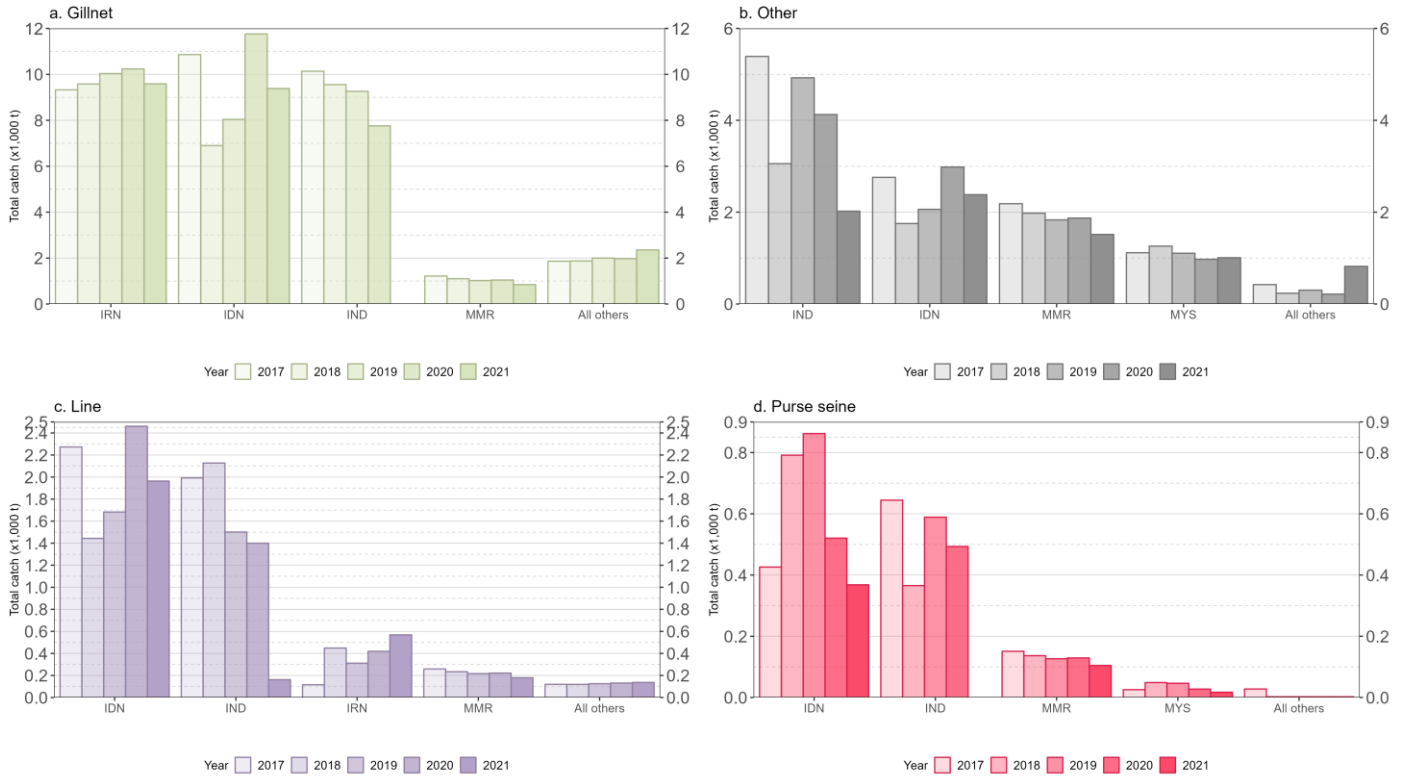
Figure 7: Annual trends in retained catch (metric tonnes; t) of Indo-Pacific king mackerel by fishery group and fleet between 2017 and 2021. Data source: best scientific estimates of retained catches

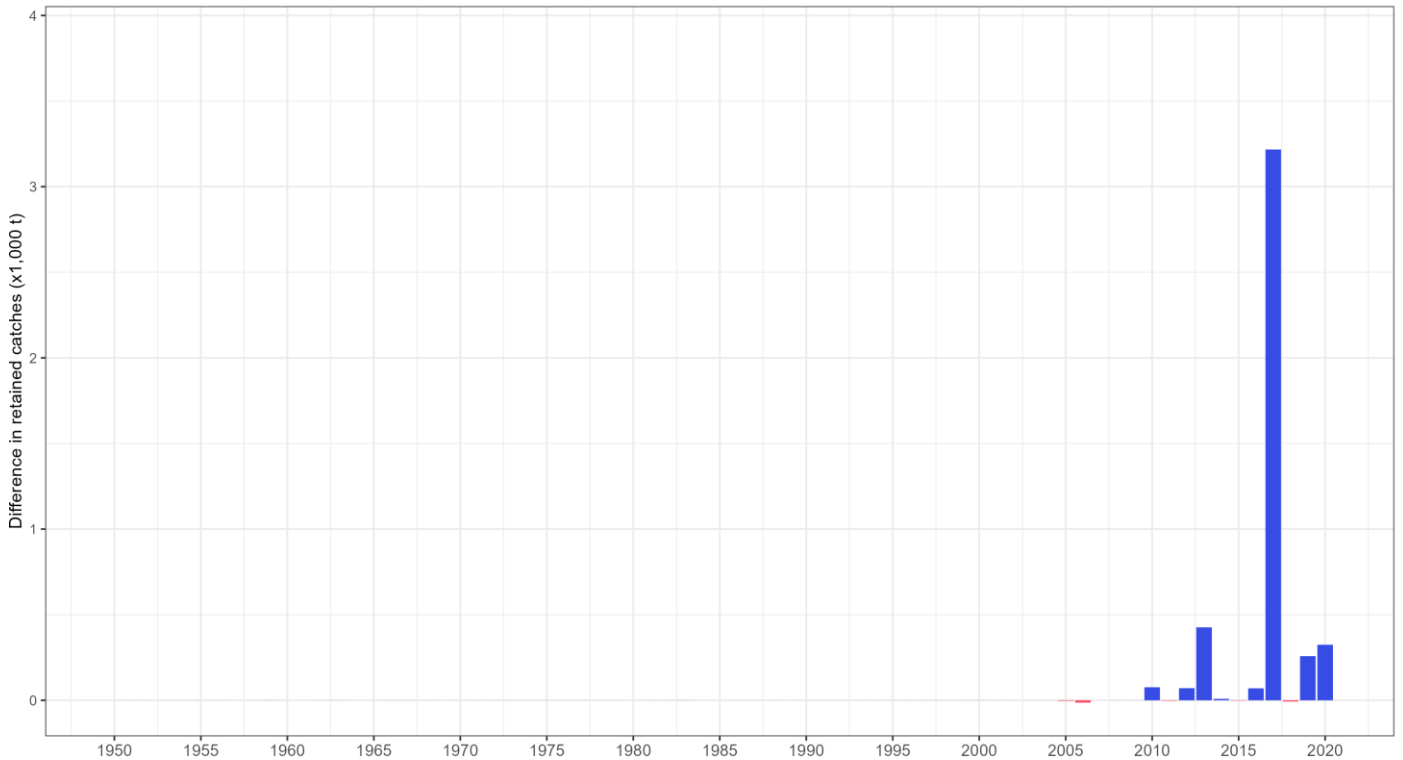## Changes from previous Working Party

Figure 8: Differences in the annual retained catches (metric tonnes; t) of Indo-Pacific king 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
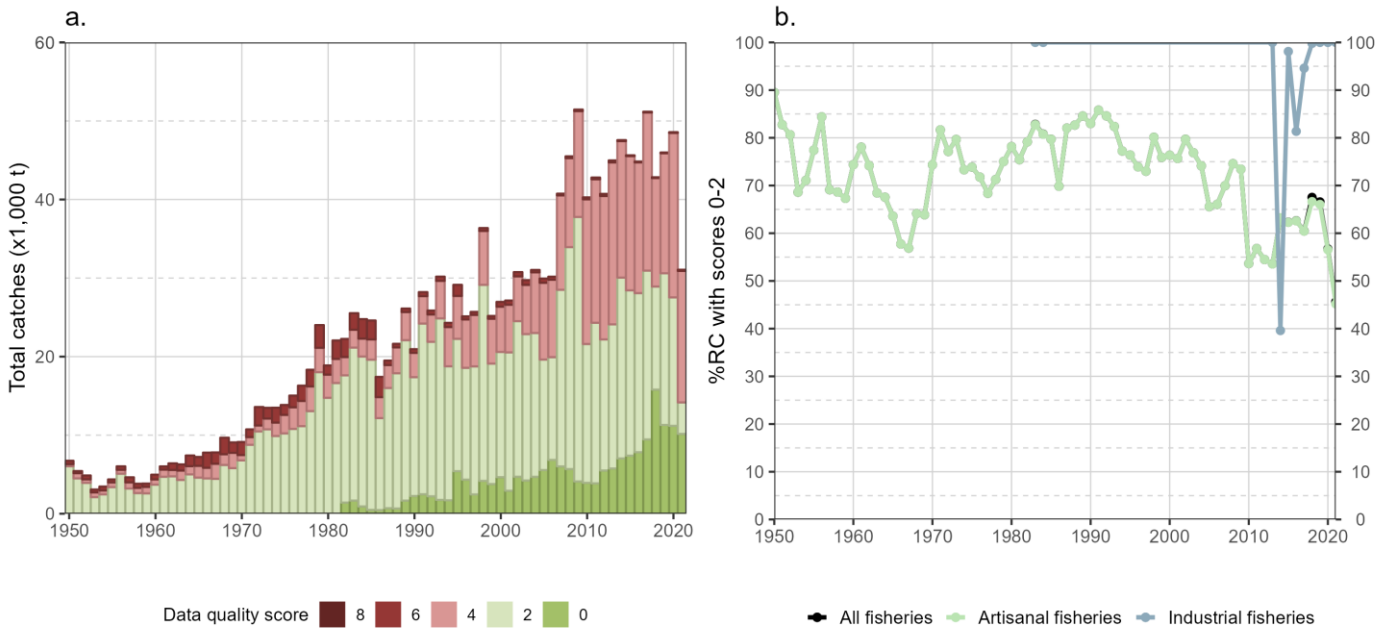
Uncertainties in retained catch data

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 Indo-Pacific king 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)
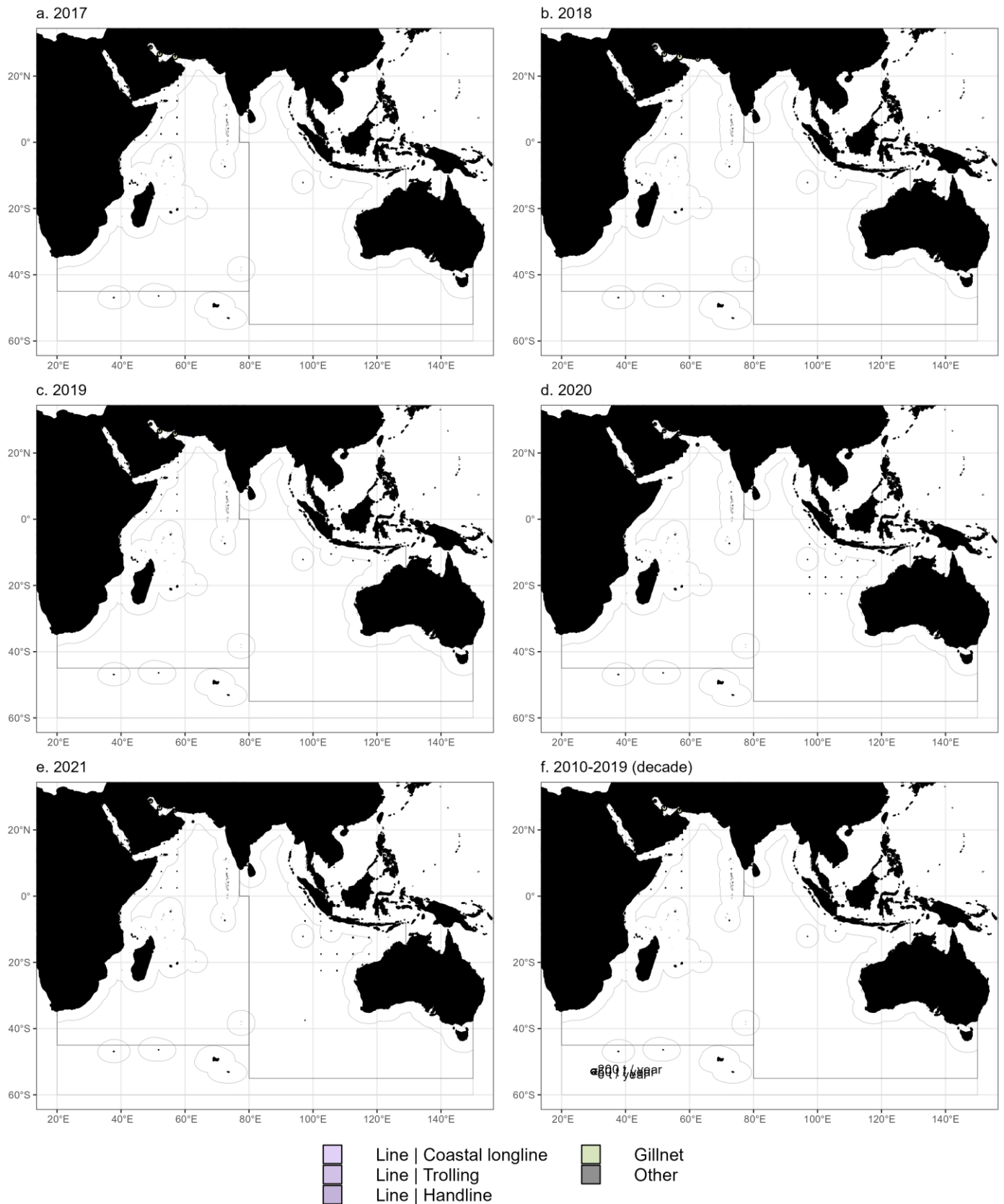

Figure 10: Mean annual time-area catches (metric tonnes; t) of Indo-Pacific king mackerel, by year and decade, 5-degree grid area, and fishery. Solid lines delineate areas beyond national jurisdiction. Data source: time-area catches

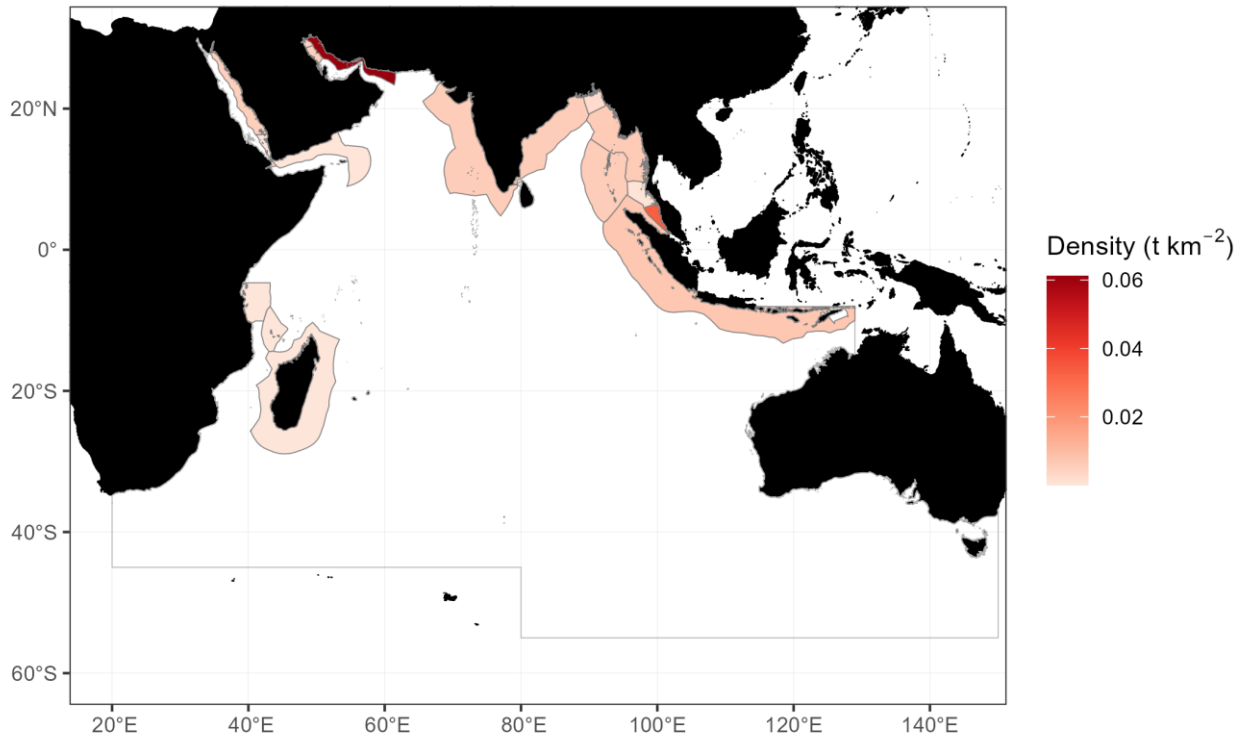## Domestic catches within areas under national jurisdiction (2017-2021)

Figure 11: Mean annual density of catch (t km⁻²) of Indo-Pacific king 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 Indo-Pacific king 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 Indo-Pacific king mackerel as (left) absolute and (right) relative number of samples per year and fishery group. Data source: standardized size-frequency dataset

Gillnet fisheries

Figure 14: Availability of size-frequency data for Indo-Pacific king mackerel as absolute number of samples per year in gillnet fisheries. Data source: standardized size-frequency dataset

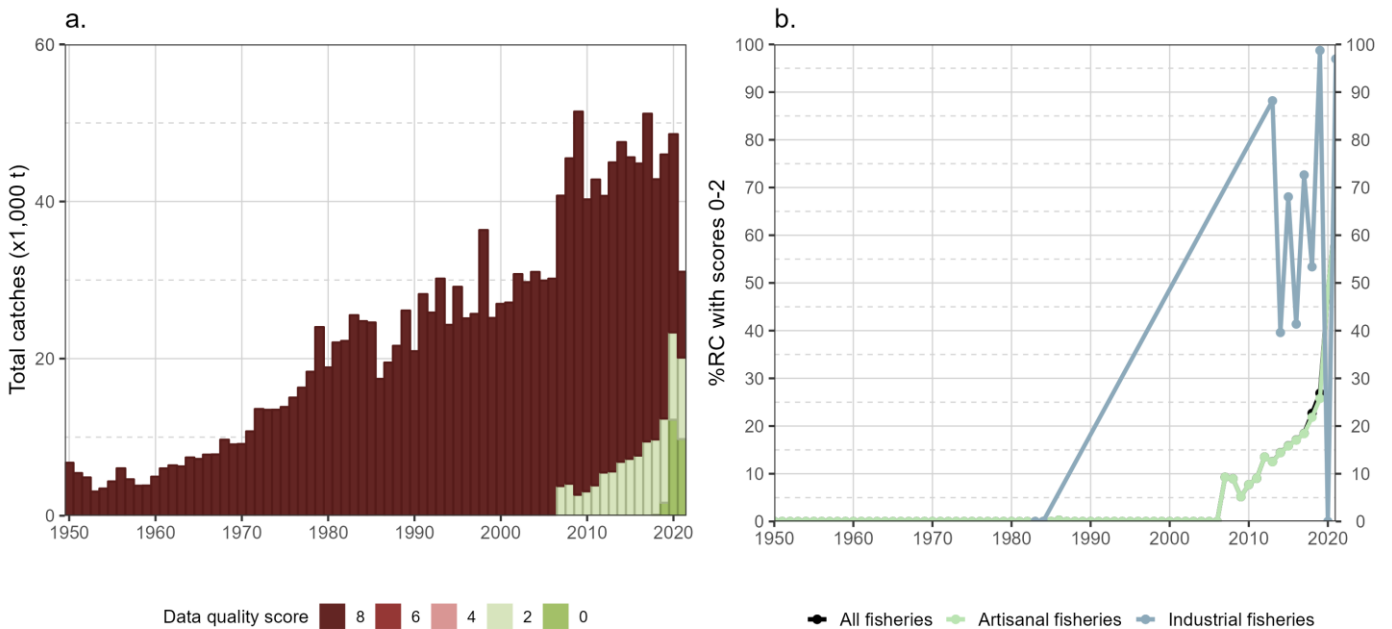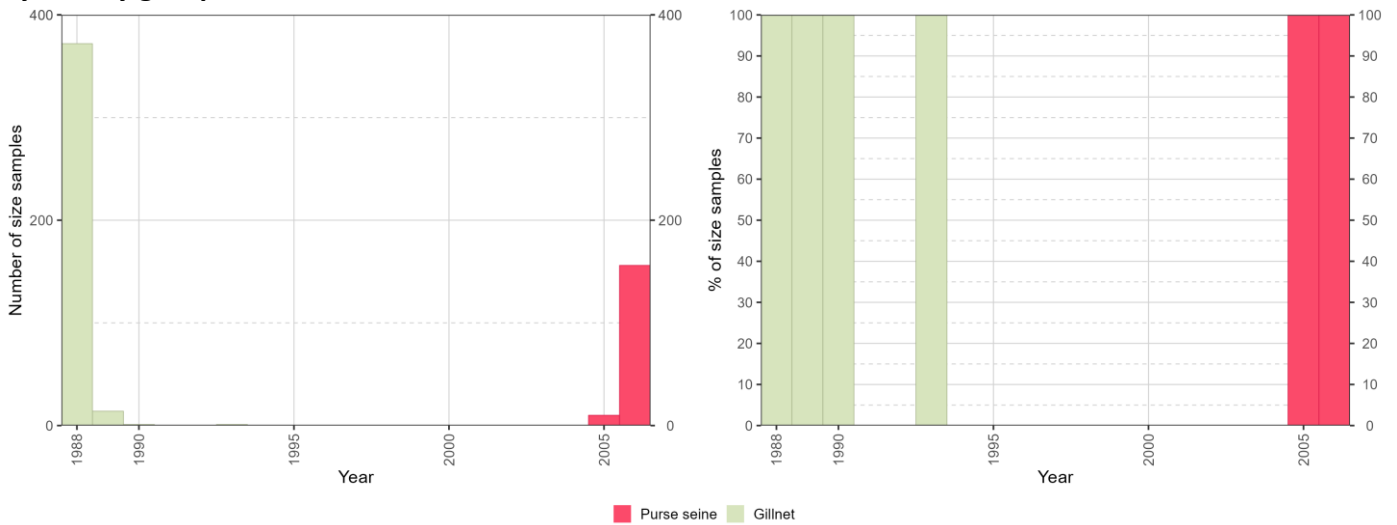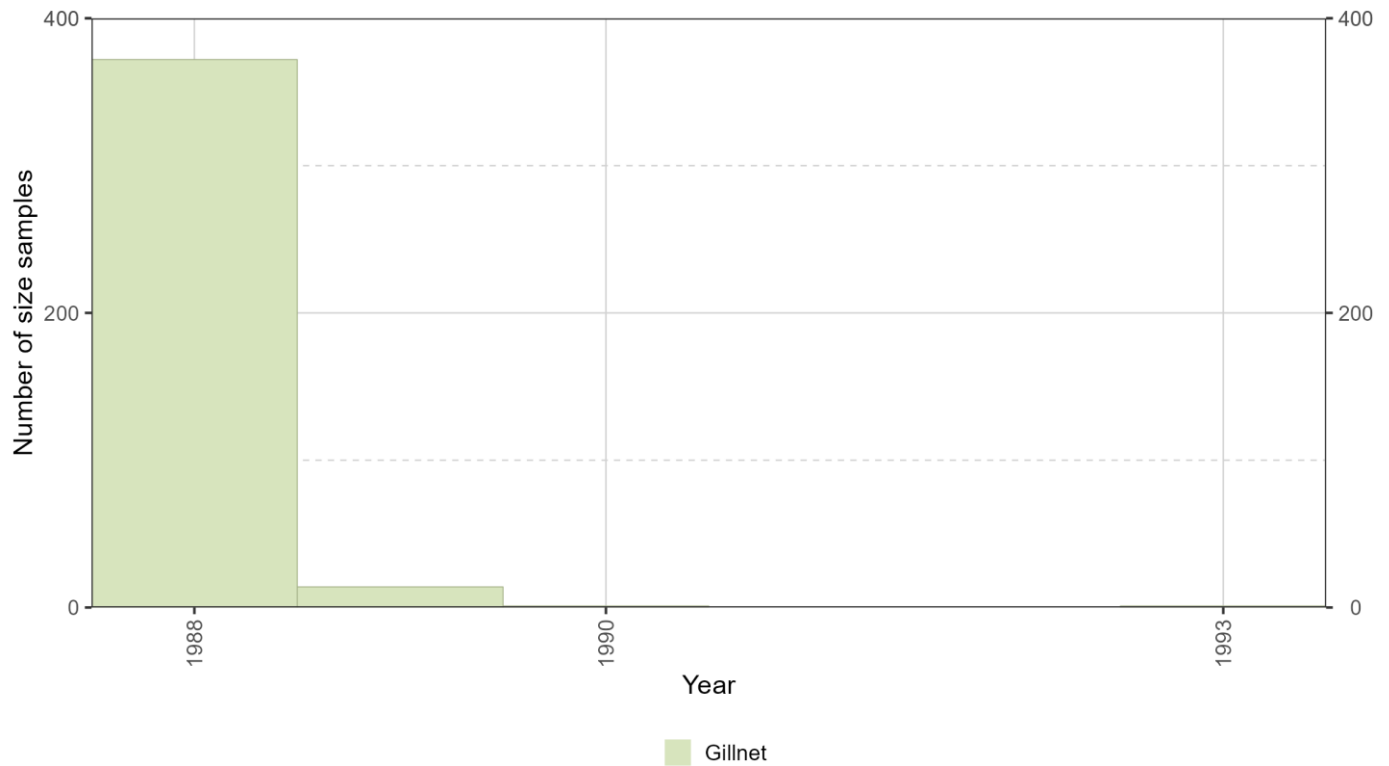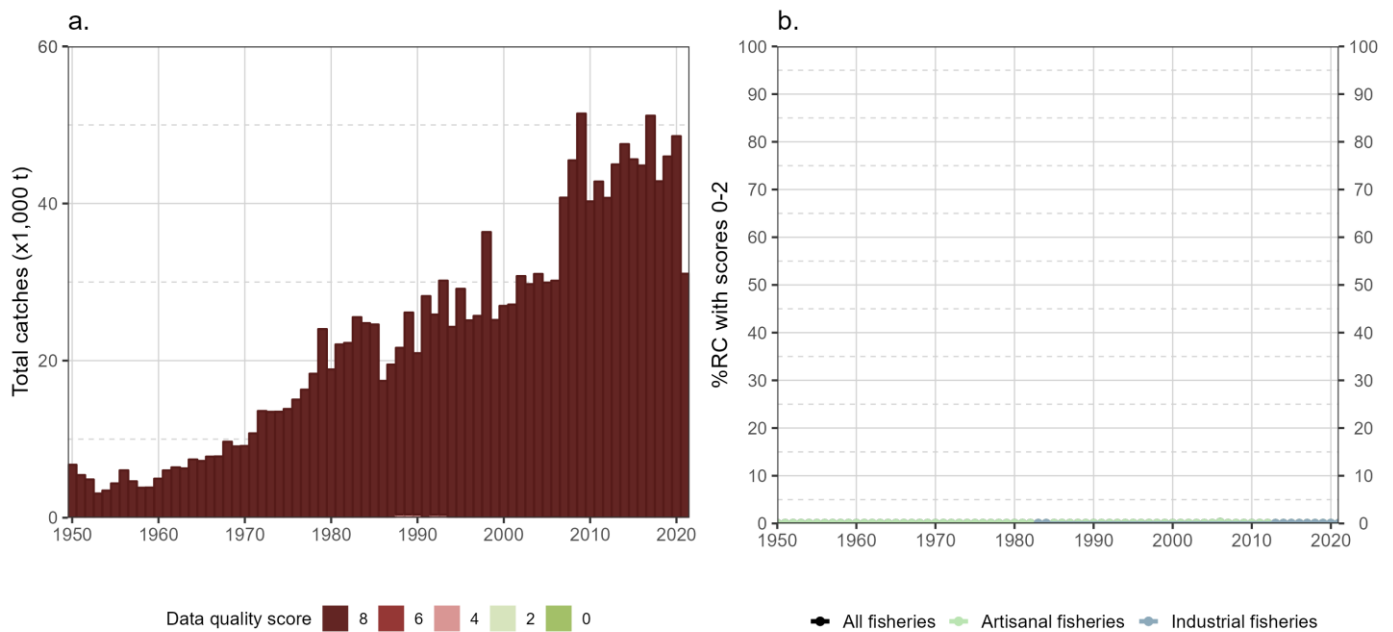## Uncertainties in geo-referenced size-frequency data

Figure 15: 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 caches (percentage; %) of Indo-Pacific king mackerel for all fisheries and by type of fishery, for the period 1950-2021

References

Bloch ME, Hennig JF, Schneider JG (1801) M.E. Blochii ... Systema ichthyologiae iconibus CX illustratum. Sumtibus auctoris impressum et Bibliopolio Sanderiano commissum, Berolini.

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

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Appendix

Appendix I: Taxonomy

Table 4: Taxonomic hierarchy of Indo-Pacific king mackerel. Source: Integrated Taxonomic Information System

Rank	Taxon
Kingdom	*Animalia*
Subkingdom	*Bilateria*
Infrakingdom	*Deuterostomia*
Phylum	*Chordata*
Subphylum	*Vertebrata*
Infraphylum	*Gnathostomata*
Superclass	*Actinopterygii*
Class	*Teleostei*
Superorder	*Acanthopterygii*
Order	*Perciformes*
Suborder	*Scombroidei*
Family	*Scombridae*
Subfamily	*Scombrinae*
Tribe	*Scomberomorini*
Genus	*Scomberomorus*
Species	*Scomberomorus guttatus*

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 Indo-Pacific king 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	IRN	Gillnet	Western Indian Ocean	10,237	10,445	-208
		Line	Western Indian Ocean	419	211	208
	MMR	Gillnet	Eastern Indian Ocean	1,044	971	73
		Line	Eastern Indian Ocean	222	206	16
		Other	Eastern Indian Ocean	1,871	1,740	131
	SAU	Gillnet	Western Indian Ocean	828	718	110
		Other	Western Indian Ocean	203	218	-16
2019	IRN	Gillnet	Western Indian Ocean	10,035	10,113	-78
		Line	Western Indian Ocean	312	226	85
	SAU	Gillnet	Western Indian Ocean	1,013	805	208
		Other	Western Indian Ocean	292	245	47
2018		Gillnet	Western Indian Ocean	837	820	18
		Other	Western Indian Ocean	223	250	-27
2017	IDN	Gillnet	Eastern Indian Ocean	10,861	8,701	2,161
		Line	Eastern Indian Ocean	2,273	1,821	452
		Other	Eastern Indian Ocean	2,755	2,207	548
		Purse seine	Eastern Indian Ocean	426	341	85
	SAU	Other	Western Indian Ocean	185	219	-34
2016		Gillnet	Western Indian Ocean	798	720	77
		Other	Western Indian Ocean	199	219	-20
2014	IDN	Gillnet	Eastern Indian Ocean	9,325	9,341	-16
	MMR	Gillnet	Eastern Indian Ocean	1,074	1,064	11
		Other	Eastern Indian Ocean	1,925	1,906	19
2013	IDN	Gillnet	Eastern Indian Ocean	10,586	10,256	330
		Line	Eastern Indian Ocean	2,215	2,146	69
		Other	Eastern Indian Ocean	2,685	2,602	84
		Purse seine	Eastern Indian Ocean	415	402	13
	MMR	Gillnet	Eastern Indian Ocean	1,039	1,061	-23

Year	Fleet	Fishery group	Area	Current (t)	Previous (t)	Difference (t)
		Other	Eastern Indian Ocean	1,861	1,902	-41
2012	IDN	Gillnet	Eastern Indian Ocean	9,061	8,986	75
		Line	Eastern Indian Ocean	1,896	1,880	16
		Other	Eastern Indian Ocean	2,298	2,279	19
	MMR	Gillnet	Eastern Indian Ocean	1,087	1,102	-14
		Other	Eastern Indian Ocean	1,948	1,974	-26
2010	IDN	Gillnet	Eastern Indian Ocean	8,826	8,771	55
		Line	Eastern Indian Ocean	1,847	1,835	12
		Other	Eastern Indian Ocean	2,239	2,225	14
2006	AUS	Purse seine	Eastern Indian Ocean	826	840	-14