

REVIEW OF THE STATISTICAL DATA AVAILABLE FOR IOTC BYCATCH SPECIES

Prepared by [IOTC Secretariat](#)¹

Purpose

To provide participants to the 22nd Session of the IOTC Working Party on Ecosystems and Bycatch (WPEB22) with a review of the status of the information available on bycatch species associated, and dependent of IOTC fisheries. According the IOTC Scientific Committee:

“All species, other than the 16 species listed in Annex B of the IOTC Agreement, caught or interacted with by fisheries for tuna and tuna-like species in the IOTC area of competence. A bycatch species includes those non-IOTC species which are (a) retained (byproduct), (b) incidentally taken in a fishery and returned to the sea (discarded); or (c) incidentally affected by interacting with fishing equipment in the fishery but not taken.”

The document summarises the current information received for species or species groups other than the 16 IOTC species listed in the IOTC Agreement, in accordance with relevant Resolutions adopted by the Commission. It provides an overview of the data available in the IOTC Secretariat databases as of August 2026 focusing on Silky shark (*Carcharhinus falciformis*), Oceanic whitetip shark (*Carcharhinus longimanus*) and scalloped hammerhead shark (*Sphyrna lewini*) species under review this year in line with the WPEB Program of work (IOTC, 2025a). The document describes the progress achieved in relation to the collection and verification of data, identifies problem areas and proposes actions that could be undertaken to improve them.

Materials

Several fisheries datasets must be reported to the IOTC Secretariat by the Contracting Parties and Cooperating Non-Contracting Parties (CPCs) as per the [IOTC Conservation and Management Measures](#) (CMMs) and following the standards and formats defined in the [IOTC Data Reporting Guidelines](#). Although not mandatory, the use of the [IOTC reporting forms](#) is recommended to facilitate data curation and management.

Retained catch data

The [retained catch data](#) correspond to the amount of fish caught and retained (in live weight) per year, Indian Ocean major area, fleet, fishing gear, and species and should be reported through [Form 1RC](#).

Two datasets of retained catches are made available by the Secretariat: (1) the [raw estimates](#) which include both the 16 IOTC species (prior to the breakdown of species and gear aggregates) and all other species considered as bycatch and (2) the [best scientific estimates](#) only available for the 16 IOTC species (e.g., [IOTC 2022](#)).

Changes in the IOTC consolidated datasets of retained catches (i.e., raw and best scientific estimates) may be required as a result of:

- i. Updates received by December 30th each year, of the preliminary data for longline fleets submitted by June 30th of the same year;
- ii. Revisions of historical data by CPCs following corrections of errors, addition of missing data, changes in data processing, etc.

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- iii. Changes in the estimation process performed by the Secretariat based on evidence of improved methods and/or assumptions (e.g., selection of proxy fleets, updated morphometric relationships) and upon endorsement by the Scientific Committee.

Geo-referenced catch and effort data

[Catch and effort data](#) refer to finer-scale data, usually from logbooks, reported in aggregated format and stratified per year, month, grid, fleet, gear, type of school, and species. The legacy [Forms](#) designed for reporting geo-referenced catch and effort data vary according to IOTC fishery categories, i.e., surface, longline, and coastal gears. In addition, information on the use of drifting floating objects and satellite-tracked buoys in large-scale purse seine fisheries using drifting Fish Aggregating Devices (DFADs) should be collected and reported to the Secretariat through [Form 3DA](#).

Geo-referenced catches of sharks and rays are reported in both number of fish and total weight and generally represent only a subset of the nominal catches reported by fleet and gear for each species. Due to the general lack of information on the size composition of the catch, these cannot be converted into a common unit and therefore spatial distribution maps of catches are provided both in numbers and in weight.

Discard data

The IOTC follows the definition of discards adopted by FAO in previous reports ([Alverson et al. 1994](#); [Kelleher 2005](#)) which considers all non-retained catch, including individuals released alive or discarded dead. Estimates of [total annual discard levels](#) in live weight (or number) by Indian Ocean major area, species and type of fishery must be reported to the Secretariat as per [IOTC Res. 15/02](#). [Form 1DI](#) has been designed for the reporting of discards and the data contained shall be extrapolated at the source to represent the total level of discards for the year, gear, fleet, Indian Ocean major area, and species concerned, including turtles, cetaceans, and seabirds.

A discards dataset compiled with the data reported by the IOTC form 1DI is presented. Nevertheless, discard data reported to the Secretariat have limitations due not complying with all IOTC reporting standards and inconsistencies across form generations.

Size-frequency data

The size composition of catches may be derived from [size-frequency data](#) collected at sea and during the unloading of fishing vessels. [IOTC Form 4SF](#) provides all fields requested for a complete reporting of size-frequency data to the stratification by fleet, year, gear, type of school, month, grid and species. While the great majority of size data reported through IOTC Form 4SF are for retained catches, CPCs can also use the same form to report size data of discarded individuals. Furthermore, additional size data (including those for individuals discarded at sea) may be collected through onboard observer programs and reported to the Secretariat as part of the ROS (see below).

Regional Observer Scheme

[Resolution 25/06](#) on a *Regional Observer Scheme* (ROS) makes provision for the development and implementation of national observer schemes among the IOTC CPCs starting from July 2010 with the overarching objective of collecting “*verified catch data and other scientific data related to the fisheries for tuna and tuna-like species in the IOTC area of competence*”. The ROS aims to cover “*at least 5% of the number of operations/sets for each gear type by the fleet of each CPC while fishing in the IOTC Area of competence of 24 meters overall length and over, and under 24 meters if they fish outside their EEZs shall be covered by this observer scheme*”. Observer data collected as part of the ROS include: (i) fishing activities and vessel positions, (ii) catch estimates with a view to identifying catch composition and monitoring discards, bycatch and size frequency, (iii) gear type, mesh size and attachments employed by the master, and (iv) information to enable the cross-checking of entries made to the logbooks (i.e., species composition and quantities, live and processed weight and location). A first technical description of the ROS data requirements is available in the reference file [IOTC Regional Observer Scheme \(ROS\) Data Collection Fields](#)

Morphometric data

The current length-length and length-weight [IOTC reference relationships](#) for pelagic sharks mostly come from historical data collected in the Atlantic Ocean or Western-Central Pacific Ocean ([Skomal and Natanson 2003](#); [Francis](#)

[and Duffy 2005](#)). However, several morphometric datasets have been collected for sharks through different research and monitoring programs conducted in the Indian Ocean over the last decades, including measurements taken at sea and on land ([García-Cortés and Mejuto 2002](#); [Ariz et al. 2007](#); [Romanov and Romanova 2009](#); [Espino et al. 2010](#); [Filmlalter et al. 2012](#)). Hence, different statistical relationships have been established for several Indian Ocean pelagic sharks based on data that may cover different size ranges as well as different areas and time periods ([Appendix I](#)).

Methods

Data available for bycatch species

The data reporting requirements for bycatch species vary according to species categories and fishing gears and changed over time with the adoption of new resolutions. In the case of sharks, last year [Res 25/08](#) condense the reporting requirements, mitigation measures, handling practices or retention bans that were previously set by several other shark-focused Resolutions.

Information available on the estimates of total discards collated through IOTC form 1DI was not used in the present report as the data are currently very limited, often provided using heterogeneous formats (not fully compliant with IOTC standards) which do not include several metadata fields (e.g., reason for discard, fate) as well as the detailed information on sampling coverage and raising procedures adopted (if any).

Data processing

First, standard controls and checks are performed to ensure that the metadata and data submitted to the Secretariat are consistent and include all mandatory fields (e.g., dimensions of the strata, etc.). The controls depend on each data set and may require the submission of revised data from CPCs if the original ones are found to be incomplete.

Second, when retained catches are not reported by a CPC, catch data from the previous year may be repeated or derived from a range of sources, e.g., the [FAO FishStat database](#). In addition, for some specific fisheries characterized by well-known, outstanding issues in terms of data quality, a process of re-estimation of species and/or gear composition may be performed based on data available from other years or areas, or by using proxy fleets, i.e., fleets occurring in the same strata which are assumed to have a very similar catch composition (Moreno et al. [\(2012\)](#)).

Finally, filtering and conversions are applied to the size data reported for the most common shark and ray species in order to harmonize their format and structure, and remove data which are non-compliant with IOTC standards, e.g., provided with size bins exceeding the maximum width considered meaningful for the species ([IOTC 2020](#)). All samples collected using types of measurement other than fork length (FL; straight distance from the tip of the upper snout to the fork of the tail) are converted into FL by using the [IOTC equations](#) and binned by constant intervals of 5 cm in size. If no IOTC-endorsed equations exist to convert from a given length measurement for a species to the standard FL measurement, the original size-frequency data are not disseminated although they are kept within the IOTC databases for future reference.

Results

Shark catches levels & trends

When considered alongside the total catches reported to the IOTC across all species categories, sharks represent a comparatively small, though non-negligible, proportion of this total. In absolute terms, the reported shark catch increased from a few thousand tonnes in the 1950s to a peak of around 150,000 tonnes in the early 2000s. This was followed by a decline, but the catch increased again from the early 2010s onwards, reaching over 300,000 tonnes in the early 2020s, before dropping sharply in 2023 (Figure 1).

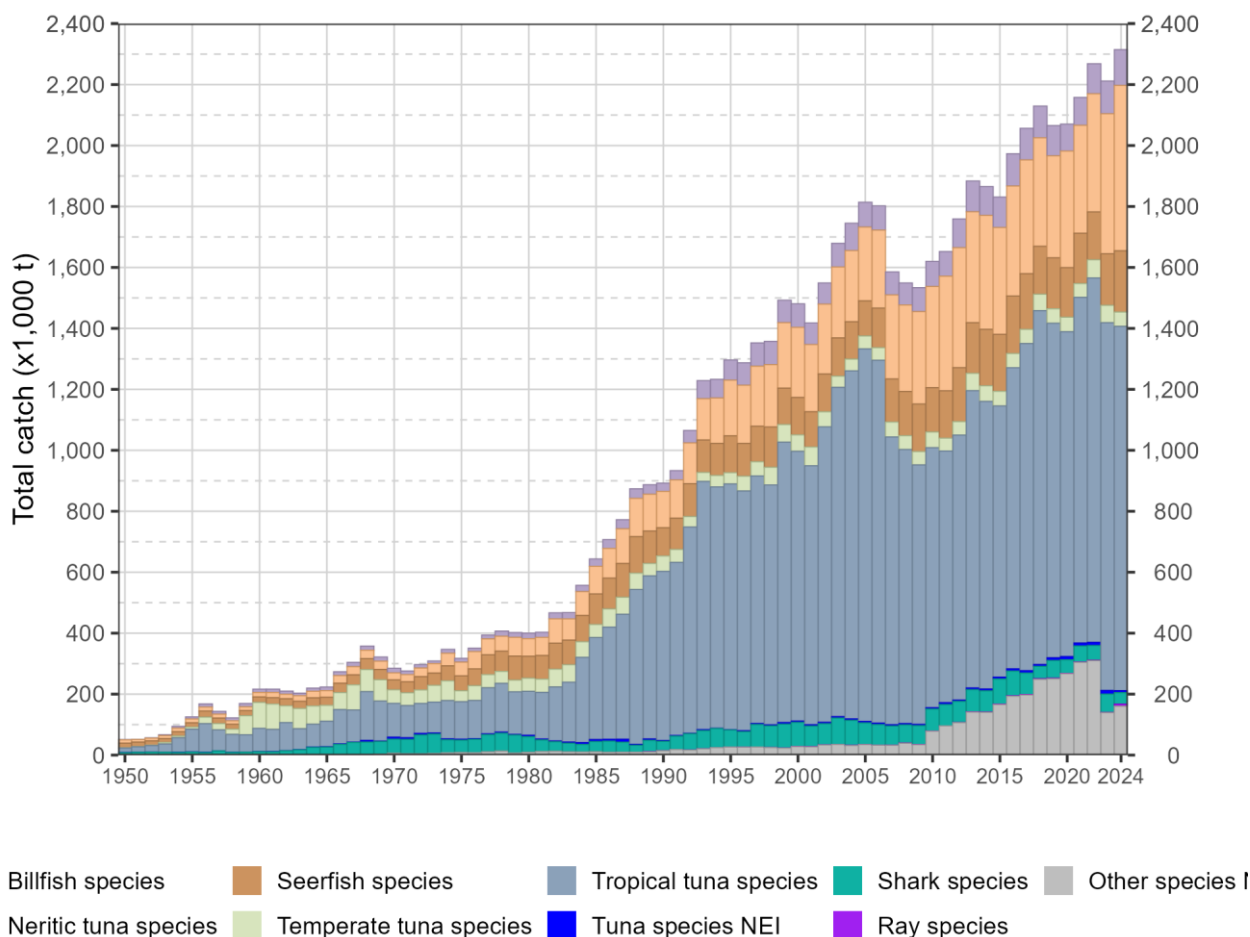


Figure 1: Annual cumulative absolute time series of retained catches (metric tonnes; t) of IOTC catches by species groups for the period 1950-2024

Reported shark catches increased substantially from approximately 8,000 t in 1950 to a peak of nearly 87,000 t around 2003–2004, followed by a gradual decline through the late 2010s and a partial recovery in the most recent years (Figure 2). Throughout the time series, catches classified only to the family or order level (“Various sharks nei” and “Unclassified”, hereafter aggregated as SKH/UNCL) have consistently dominated the reported composition, exceeding 90% of total catch for most of the period prior to the mid-1980s and remaining above 50% in relative terms even in recent decades. Species-specific reporting became more prominent from the 1990s onward, with silky shark (*Carcharhinus falciformis*) and blue shark (*Prionace glauca*) emerging as the most consistently identified taxa, while mako (*Isurus* spp.) and hammerhead (*Sphyrna* spp.) shark groups show a more marginal but steady presence in the catch composition from the same period (Figure 2).

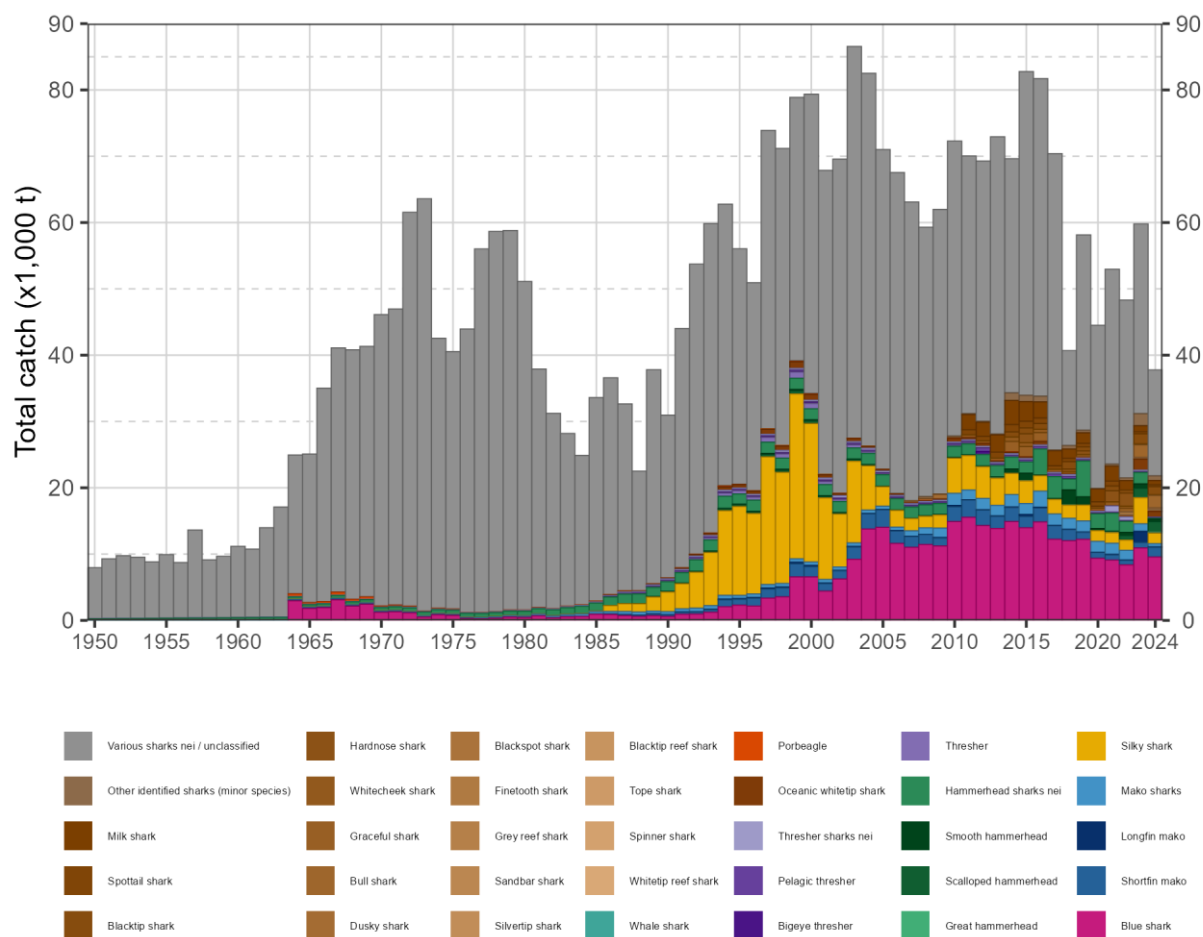


Figure 2: Annual cumulative absolute time series of retained catches (metric tonnes; t) of sharks for the period 1950-2024

Species Composition by Fishery and Gear

Disaggregating catch composition by fishery group reveals substantial differences in species composition among gear types. Gillnet fisheries account for the largest cumulative shark catch of any fishery group in the dataset (approximately 1.79 million t) (Figure 3), exceeding longline (approximately 584,000 t) for the complete data series. Longline and line fisheries show broadly similar species composition, dominated by blue shark, with smaller but consistent contributions from silky shark, mako sharks, and hammerhead species (Figures 4 and 5).

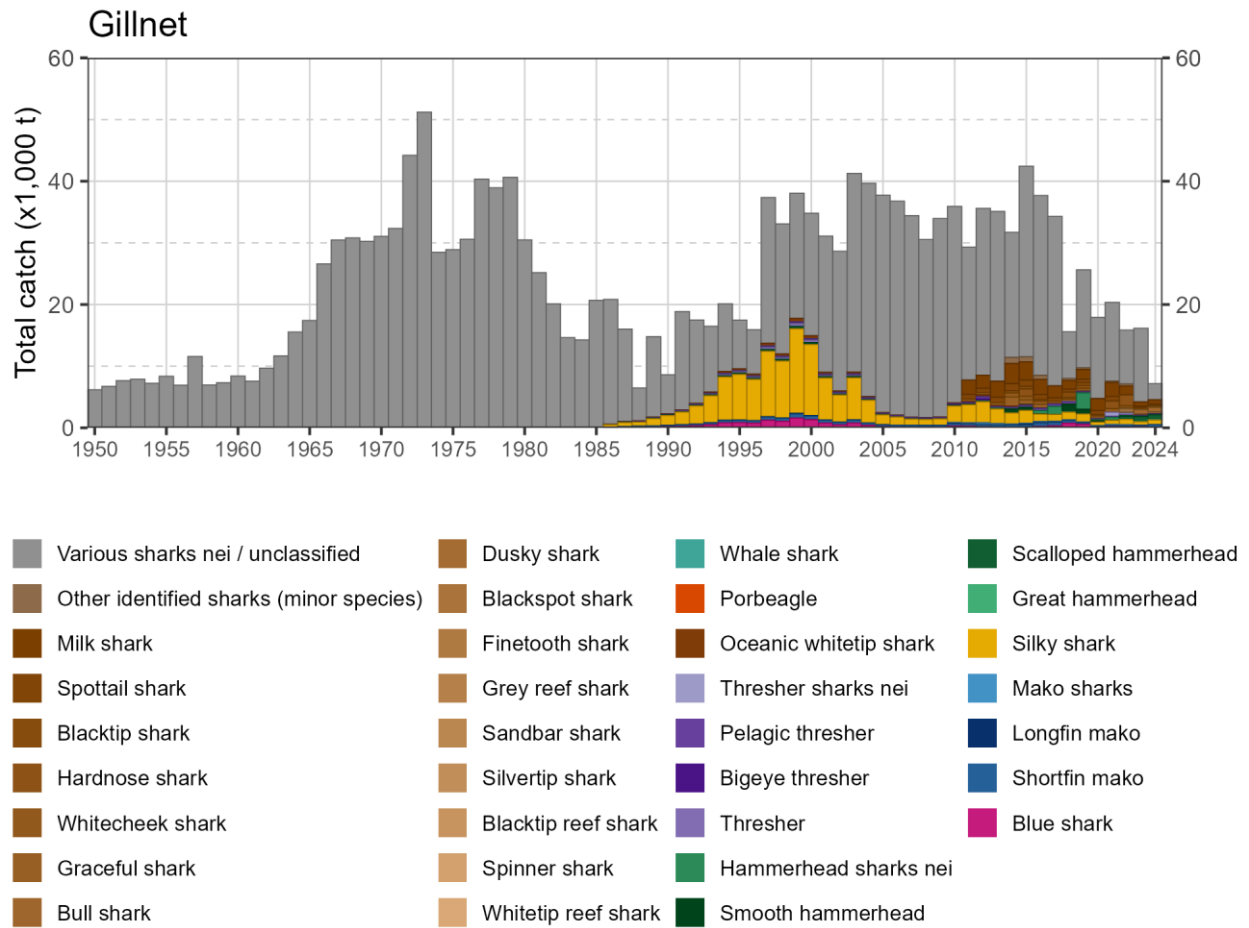


Figure 3. Catch composition by species within the gillnet fisheries, 1950–2024.

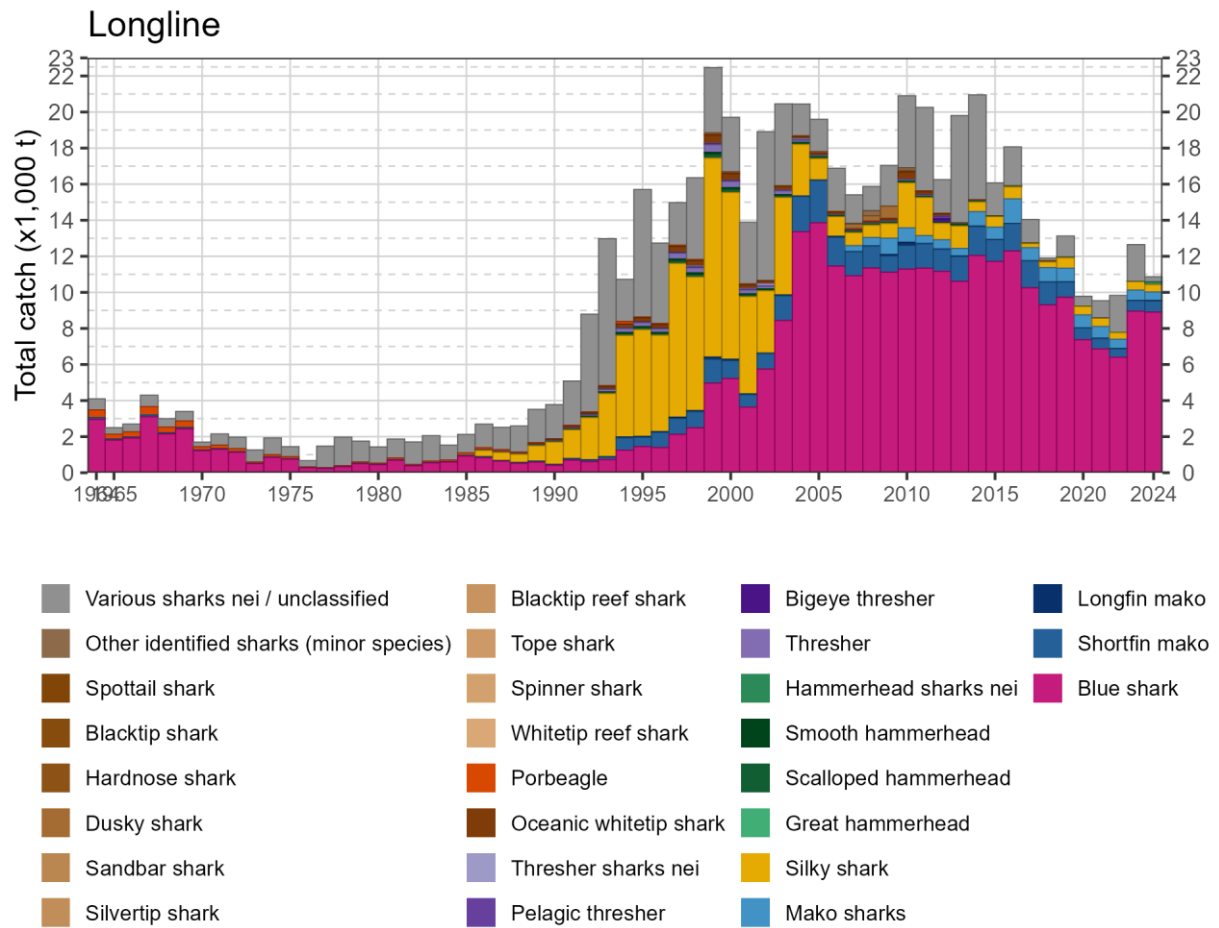


Figure 4. Catch composition by species within the longline fisheries 1950–2024.

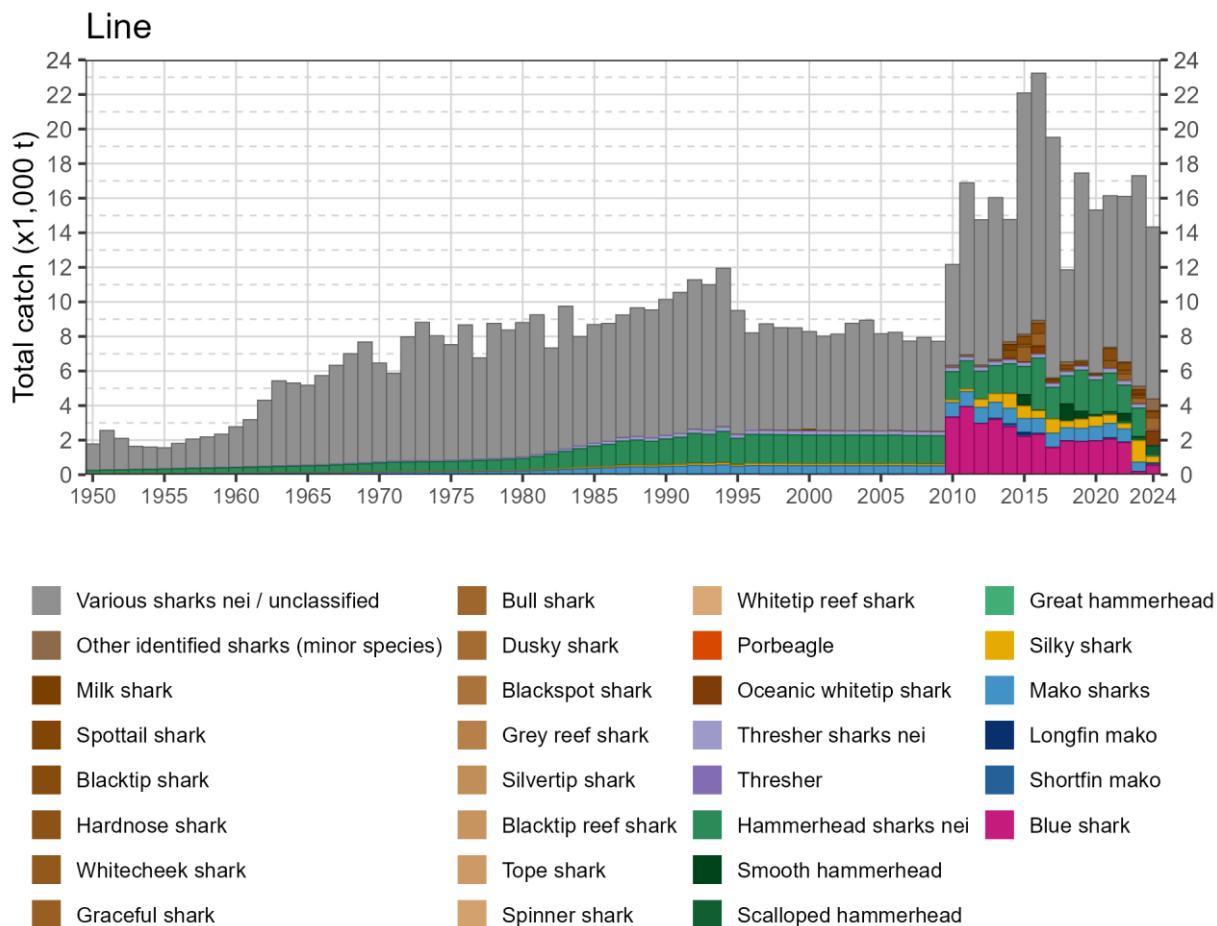


Figure 5. Catch composition by species within the line fisheries 1950–2024.

Shark Length Data Availability by Species and Fishery

Length-frequency data extracted from the IOTC size-frequency database (fork length, the dominant measurement type, representing 282,516 of approximately 358,000 individual shark measurements available across all measurement types) show highly uneven sampling coverage across species (Table 1). Blue shark alone accounts for approximately 82% of all length measurements, followed by silky shark, shortfin mako, mako sharks (undifferentiated *Isurus* spp.), and porbeagle. The remaining twelve species categories each have fewer than 500 recorded length measurements, and several — including great hammerhead, thresher, and “Hammerhead sharks, etc. nei” — are represented by fewer than 20 individuals across the entire 2005–2024 period (Table 1).

Table 1. Number of individual shark length measurements (fork length) available by species, IOTC size-frequency database, 2005–2024

Species	N fish measured	N unique length classes	Length min (cm)	Length max (cm)	Years
Blue shark	232,451	730	10	399	2005–2024
Silky shark	19,941	396	23	325	2005–2024
Shortfin mako	13,251	458	35	351	2005–2024
Mako sharks (<i>Isurus</i> spp.)	7,709	137	50	352	2013–2023
Porbeagle	1,262	131	52	306	2007–2024
Oceanic whitetip shark	406	144	60	241	2007–2024
Smooth hammerhead	290	41	20	230	2016–2023
Hammerhead sharks nei	173	74	33	294	2014–2023
Pelagic thresher	151	32	79	295	2015–2022
Scalloped hammerhead	137	53	40	308	2014–2024
Bigeye thresher	114	76	14	326	2005–2024
Various sharks nei	60	29	45	401	2017–2023
Longfin mako	26	26	50	255	2012–2024
Great hammerhead	19	8	122	257	2021–2022
Thresher	7	6	150	295	2017–2022
Thresher sharks nei	3	2	122	214	2015–2022
Hammerhead sharks, etc. nei	1	1	250	251	2024

Gear composition of the length samples mirrors the pattern observed in the catch data: longline gear accounts for most size measurements across four of the five species with sufficient coverage (Porbeagle: 100%; mako sharks: 100%; shortfin mako: 99.9%; blue shark: 98.7%). Silky shark is the only species with a more mixed gear composition (longline: 81.2%; gillnet: 10.4%; line: 4.6%; purse seine: 3.9%) (Table 2).

Table 2. Number of individual shark length measurements (fork length) by species and fishery group. “Unclassified” specimens (n = 6,515) excluded.

Species	Purse seine	Longline	Line	Gillnet	Other	Total
Blue shark	0	229,275	1,076	1,928	0	232,279
Silky shark	779	16,185	909	2,066	2	19,941
Shortfin mako	0	13,233	18	0	0	13,251
Mako sharks	0	7,709	0	0	0	7,709
Porbeagle	0	1,262	0	0	0	1,262
Oceanic whitetip shark	9	364	33	0	0	406
Smooth hammerhead	0	68	50	172	0	290
Hammerhead sharks nei	0	88	26	59	0	173

Species	Purse seine	Longline	Line	Gillnet	Other	Total
Pelagic thresher	0	151	0	0	0	151
Scalloped hammerhead	0	11	11	115	0	137
Bigeye thresher	0	77	0	36	1	114
Various sharks nei	0	52	8	0	0	60
Longfin mako	0	26	0	0	0	26
Great hammerhead	0	0	19	0	0	19
Thresher	0	7	0	0	0	7
Thresher sharks nei	0	2	1	0	0	3
Hammerhead sharks, etc. nei	0	1	0	0	0	1
TOTAL	788	268,510	2,101	4,236	3	275,638

Shark spatial information

Mapping the geographic distribution of available length measurements by species highlights substantial spatial gaps in size data collection, particularly for species of elevated conservation concern. Sampling coverage for blue shark, silky shark, and shortfin mako spans a broad area of the western and central equatorial Indian Ocean, concentrated along the main longline fishing grounds. In contrast, coverage for hammerhead species is markedly restricted. Great hammerhead (*Sphyrna mokarran*) is particularly poorly represented: all 19 recorded length measurements for this species originate from a single 5°×5° grid cell across the entire time series.

Cross-referencing the resulting spatial footprint of reported catch (2005–2024, matching the period covered by the size-frequency database) against the footprint of length sampling shows that the best-sampled pelagic species reach reasonably high, though still incomplete, spatial overlap. Blue shark the most heavily reported species in the database, show correspondingly extensive geographic overlap between catch and length-sampling footprints (Figure 6). Shortfin mako (SMA) also shows relatively good overlap (Figure 7). Longfin mako (LMA), by contrast, has limited catch and almost no spatial overlap with sampling; this is broadly consistent with the species' recognized rarity in fisheries and research records globally and its status as a genuinely uncommon, frequently misidentified lamnid shark (Mas & Domingo, 2022).

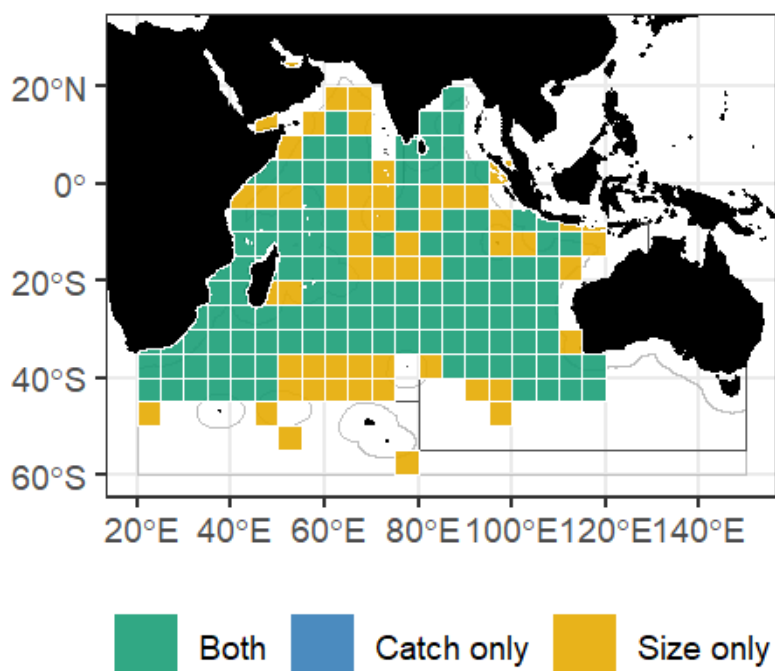


Figure 6. Grid cells with reported catch only or length sampling only, 2005–2024, for blue shark.

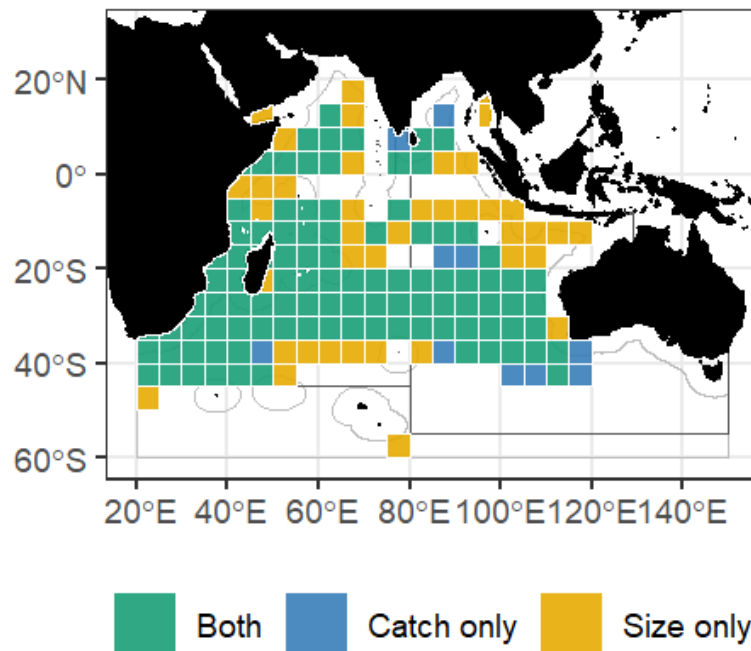


Figure 7. Grid cells with reported catch only, length sampling only, or both, 2005–2024, for shortfin mako.

For hammerhead species, there is a spatial mismatch identified and, in several cases, shown to be a matter of adjacency rather than simple absence: length-sampling cells for scalloped hammerhead (SPL) frequently sit immediately next to, but not overlapping, cells where catch of the same taxon is reported (Figure 8). Smooth hammerhead (SPZ) shows the most pronounced version of this pattern, with catch and sampling cells positioned in immediately adjacent but never coincident grid cells along the southwest Indian Ocean coast (Figure 9).

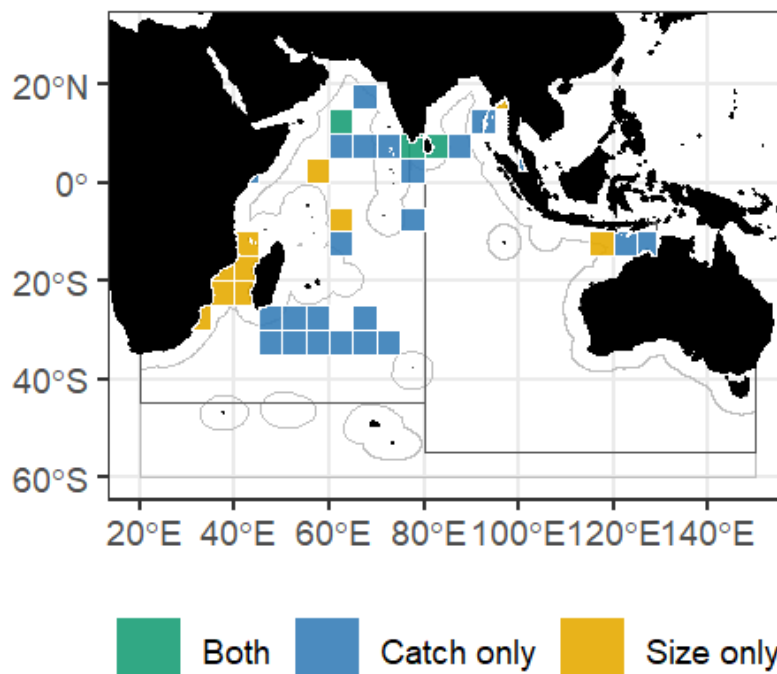


Figure 8. Grid cells with reported catch only, length sampling only, or both, 2005–2024, for scalloped hammerhead.

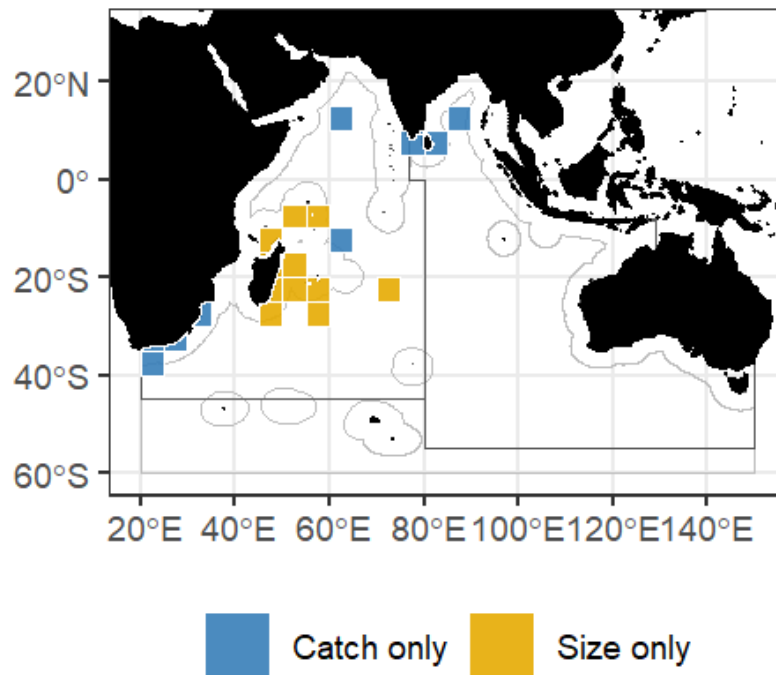


Figure 9. Grid cells with reported catch only, length sampling only, or both, 2005–2024, for smooth hammerhead.

Porbeagle (POR) presents a distinct spatial signature: catch and sampling cells are both concentrated in the southern, higher-latitude portion of the IOTC area of competence, well south of the core tropical fishing grounds for the other species considered here. This is consistent with the species' cold-water affinity and its documented occurrence as bycatch in longline fisheries targeting southern bluefin tuna in southern hemisphere waters, including the southeastern and southwestern Indian Ocean (Semba et al., 2013), rather than in the tropical tuna and swordfish longline fisheries that drive most reported shark catch elsewhere in the IOTC area.

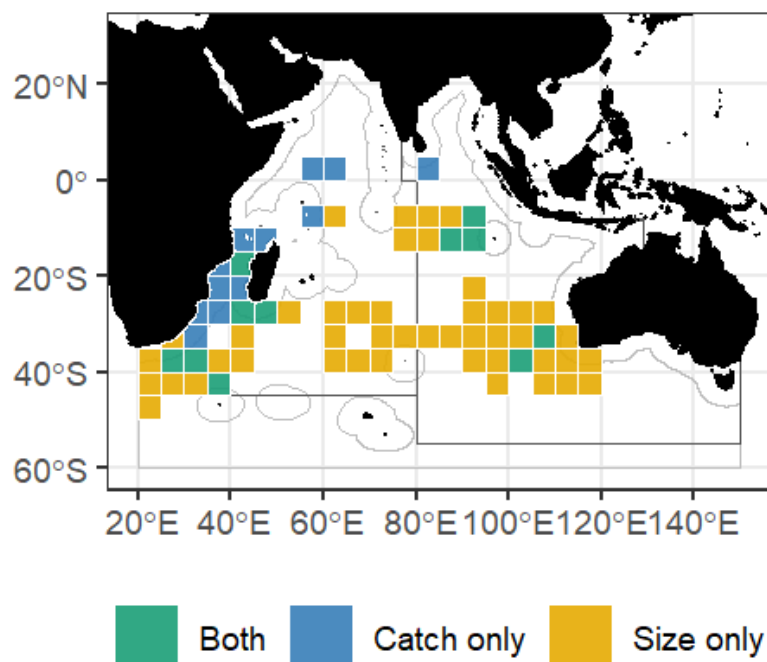


Figure 10. Grid cells with reported catch only, length sampling only, or both, 2005–2024, for porbeagle.

Oceanic whitetip shark (OCS) shows some concentrate overlap. The species is currently assessed as Critically Endangered globally by the IUCN, following major population declines attributed largely to fishing mortality in tuna longline and other pelagic fisheries (Rigby et al., 2019). Its retention has been prohibited under IOTC Resolution 13/06 since 2013; from that point onward, live oceanic whitetip sharks caught by IOTC vessels must be released, and biological sampling is only possible from animals already dead at haulback.

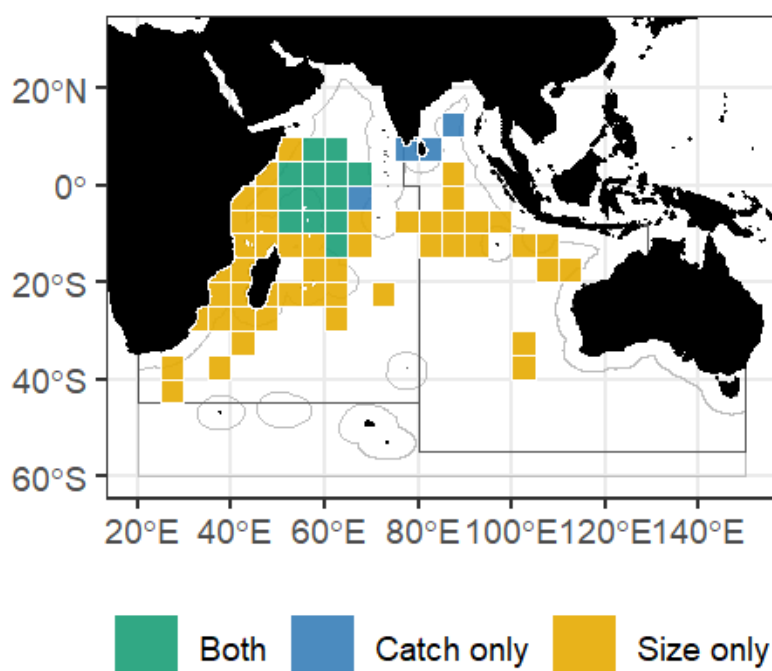


Figure 11. Grid cells with reported catch only, length sampling only, or both, 2005–2024, for porbeagle and oceanic whitetip shark.

Discard Data Availability by Species and Gear

Discard reporting to IOTC is a mandatory obligation for all CPCs, reported through the form 1DI. The resulting compilation reflects sampling or logbook data collection systems in place. Discard records in this compilation are not extrapolated (raised) to fleet-wide totals: each record represents what was actually collected and submitted, not an estimate of total fleet discards. As a result, differences in reported discard volume between fleets reflect a mix of genuine differences in discarding practice, differences in the scale of each fleet’s data collection effort, and differences in reporting completeness.

Reporting density by species and gear mirrors the taxonomic and gear-level patterns already established for retained catch: blue shark dominates with its highest concentration of records under the generic “LL” (longline) gear code, alongside consistently high reporting for silky shark, oceanic whitetip shark, shortfin mako, and the aggregated mako/thresher/hammerhead “nei” categories. Reporting is concentrated in a small number of gear codes — principally the generic longline code and its named variants (targeting swordfish, deep-freezing, combined with gillnet, exploratory) together with purse seine and its sub-types — while gillnet-specific codes show only sparse reporting, limited mainly to whale shark and thresher, and entirely absent for blue shark, silky shark, and most other frequently retained species (Figure 12).

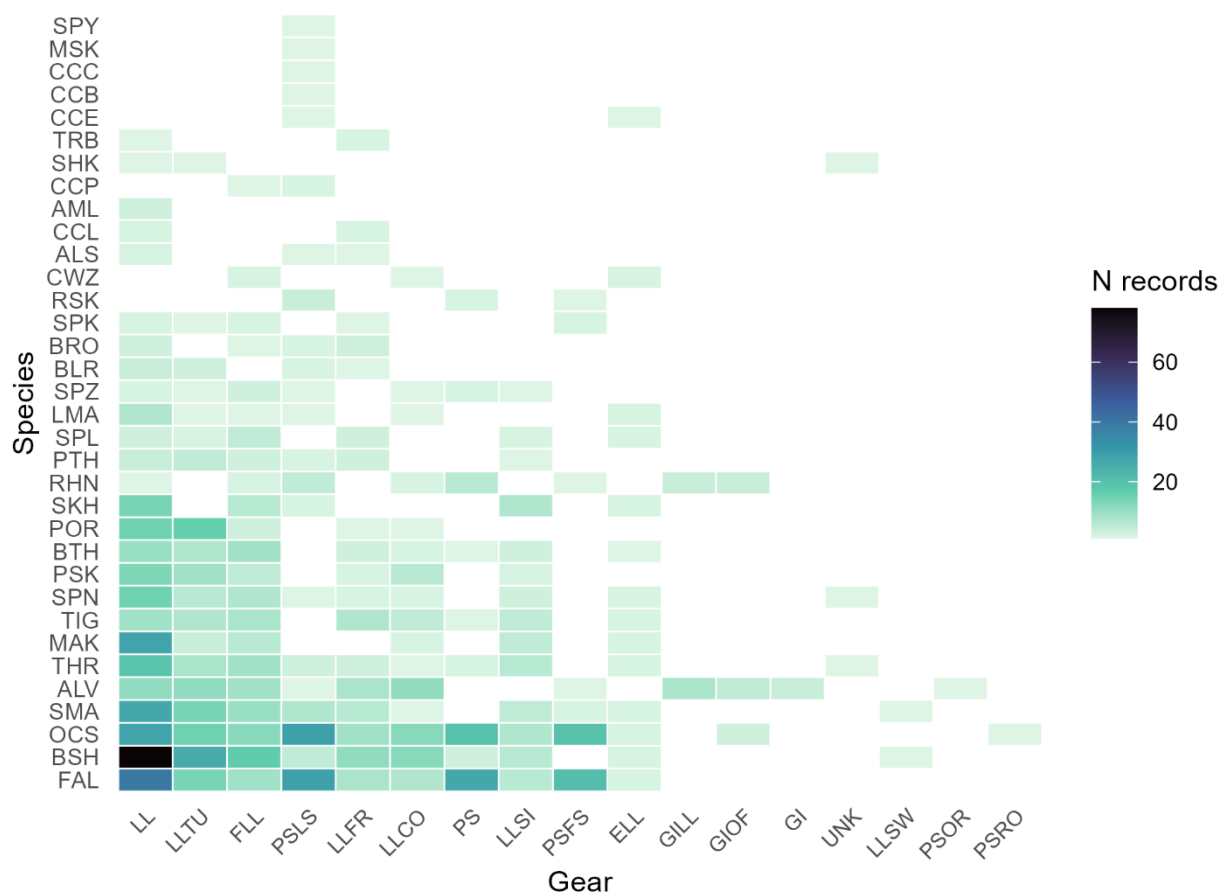


Figure12. Cumulative discard records of sharks by species and specific gear.

Regional observer scheme

Data from observers on board purse seine vessels has been reported since 2005, with contributions from the EU, France, Spain and the Seychelles. Although ten species of shark have been recorded (blue shark, great hammerhead shark, oceanic whitetip shark, pelagic thresher shark, scalloped hammerhead shark, shortfin mako shark, silky shark, smooth hammerhead shark, thresher shark and whale shark), only silky shark and oceanic whitetip shark have been reported consistently over time, while records of the other species are sparse or occasional.

In the case of longline fisheries, the limited observer data from observations at sea on the IOTC database only covers a small part of the longline fishing grounds, and is mostly composed with data of EU France, with some years of data from Japan and Sri Lanka. Additionally, the Secretariat compiled data from observer trip reports from Australia, United Kingdom, Korea, Taiwan, China, and South Africa and progress is made on the observer data consolidation.

In longline, retention is high for the main commercially valuable species — blue shark (92.2% retained), shortfin mako (99.0%), silky shark (83.4%), porbeagle (86.1%), while the large majority of aggregated “nei” categories (various sharks nei, thresher sharks nei, hammerhead sharks nei, hammerhead sharks etc. nei, Carcharhinus sharks nei, dogfishes nei, mackerel sharks/porbeagles nei, sharks/rays/skates etc. nei) are reported as essentially 100% discarded.

Rays catch levels & trends

Ray catches have been recorded since 1987, averaging 100 tonnes up to 2007. Although the data has been patchy, catches have increased since 2010, averaging around 1,000 tonnes and peaking in 2018 at 2,092 tonnes. Last year, unusually high catches of over 6,000 tonnes were recorded and are currently under review (Fig 13).

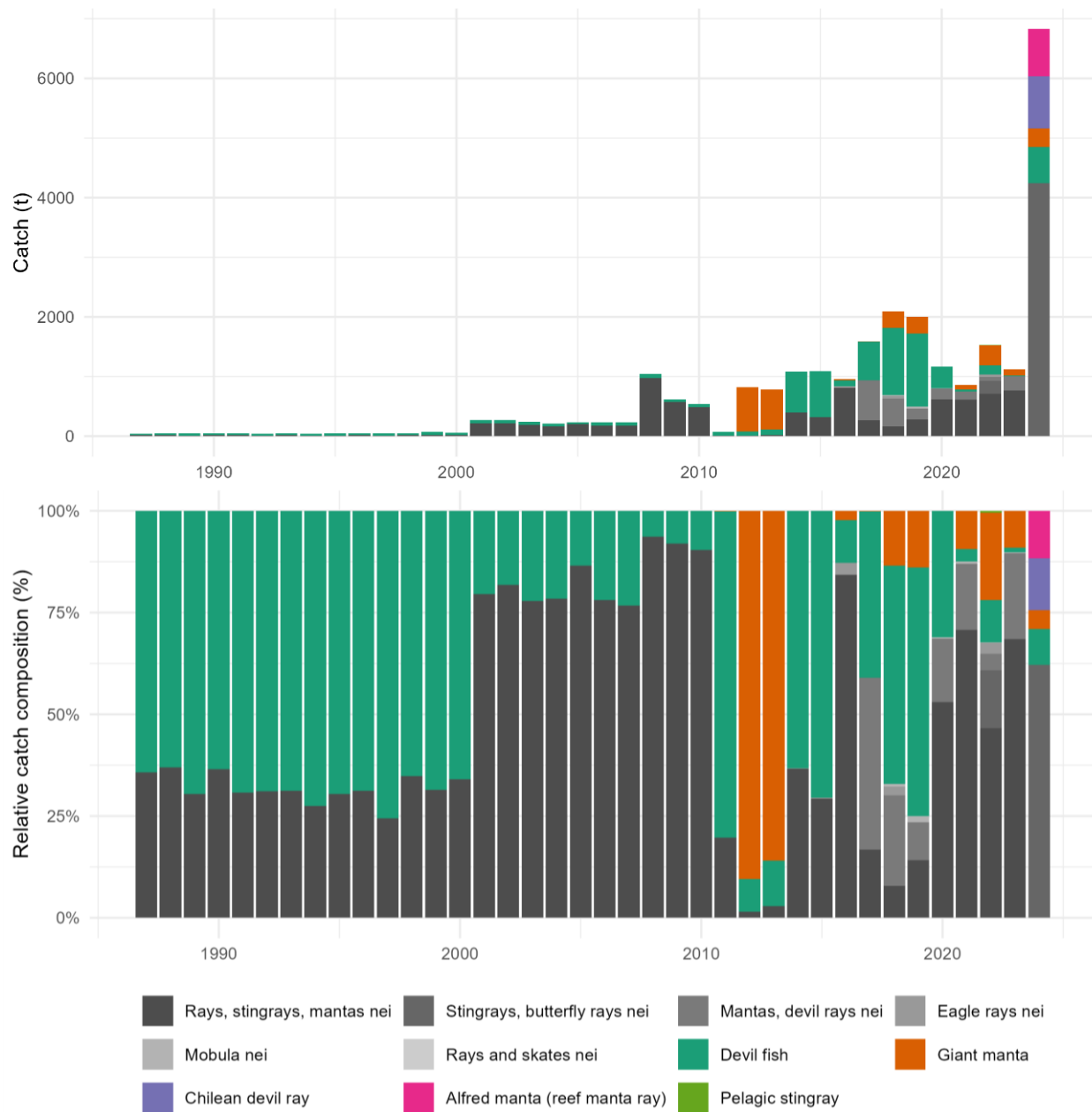


Figure 13. Reported ray catch by species, 1987–2024: (top) absolute catch (t) and relative catch (bottom).

On the data available eleven categories are identified, six of which are generic aggregates ("nei" categories: Rays, stingrays, mantas nei (SRX); Mantas, devil rays nei (MAN); Stingrays, butterfly rays nei (STT); Eagle rays nei (EAG); Mobula nei (RMV); Rays and skates nei (RAJ) and five of which are identified to species level: Devil fish (RMM); Giant manta (RMB); Chilean devil ray (RMT); Alfred manta (RMA) and Pelagic stingray (PLS).

The data are mostly aggregated and both total catch and the share reported at generic level show substantial year-to-year volatility rather than a smooth trend, indicating that this dataset is sensitive to single-fleet or single-year reporting changes.

Ray Species Composition by Fishery and Gear

Gillnet is the dominant retaining fishery for rays by volume across nearly every species/category and is also the only fishery with consistently continuous reporting (38/38 years) for the two largest categories, SRX and Devil fish.

Longline and Line show retained ray catch concentrated in specific species (notably Giant manta and Devil fish for Longline), while Other (Purse seine + Baitboat) shows more sporadic reporting across most species (Fig.14).

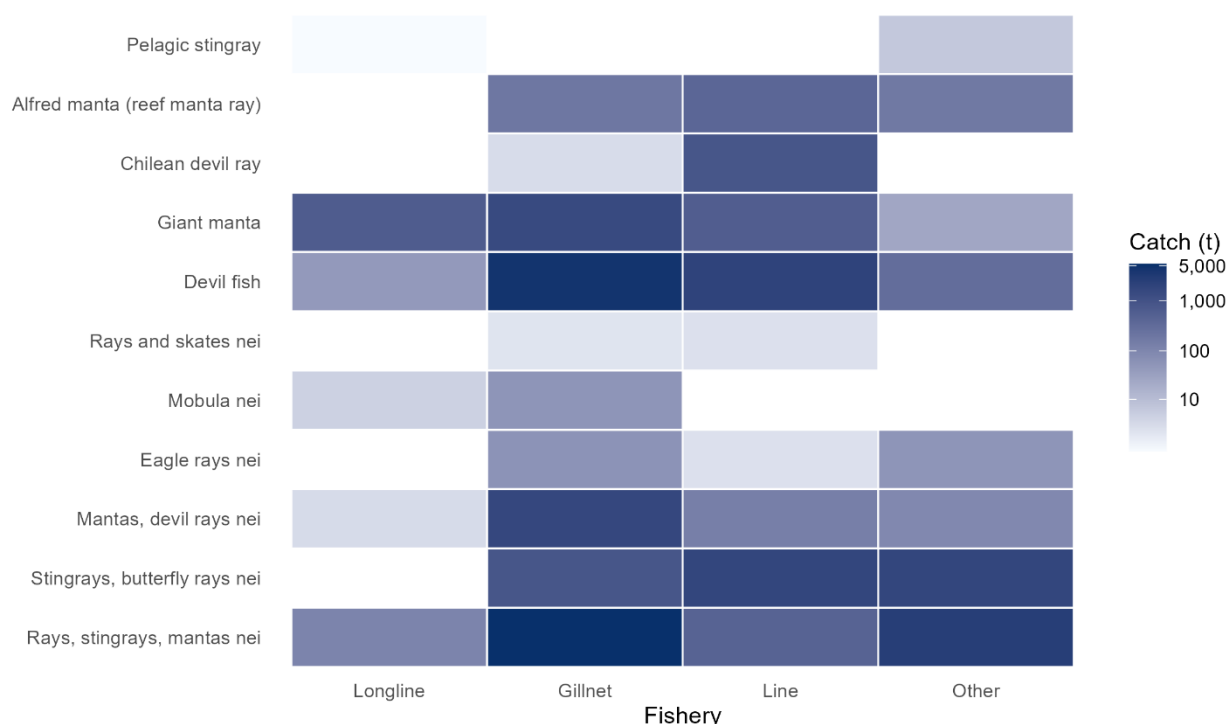


Figure 14. Cumulative catch of rays by species and gear.

Rays' spatial information

For six of the species/categories identified some geo-referenced records are available and concentrate along the western and northern Indian Ocean (East Africa, Arabian Sea, Bay of Bengal / Sri Lanka), consistent with the fleets identified as the main contributors to ray catch in the retained catch dataset (Fig 15). Mantas, devil rays nei (MAN), Mobula nei (RMV), and Rays and skates nei (RAJ) have no geo-referenced data reported.

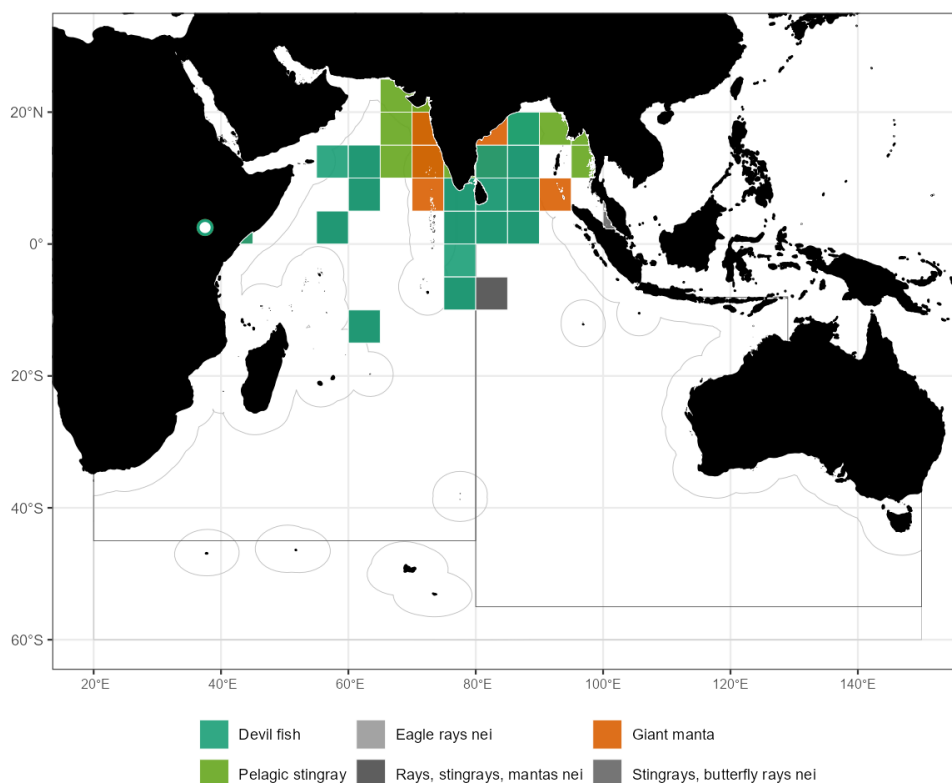


Figure 15. Reported georeferenced ray catch, by species or species categories.

Rays Length Data Availability

Nine species/categories have at least one size measurement: Pelagic stingray (PLS), Devil fish (RMM), Giant manta (RMB), Chilean devil ray (RMT), Longhorned mobula (RME — not previously encountered in the retained-catch or georeferenced datasets), Mantas devil rays nei (MAN), Mobula nei (RMV), Stingrays butterfly rays nei (STT), and Rays stingrays mantas nei (SRX).

Pelagic stingray alone accounts for 1,193 of 1,252 measurements (95%) across 8 fleets and both Longline and Purse Seine fisheries, 2013–2024. Every other species/category has between 1 and 31 measurements total, concentrated in 1–4 fleets. Therefore, only Pelagic stingray currently has size data sufficient to support any size-composition analysis; all other ray species/categories lack usable size data at present (Fig. 16).

In the Pelagic stingray size data, no single measurement type is used consistently: Disc width (507 measurements), Fork length (237), and Total length (32), suggesting that a ray-specific size-measurement protocol (specifying Disc width as the standard metric, with clear guidance for species where it does not apply) and targeted training for at-sea and port samplers would likely improve data quality and comparability more than volume alone.



Figure 16. Pelagic stingray size distribution, Disc width and Fork length measurement.

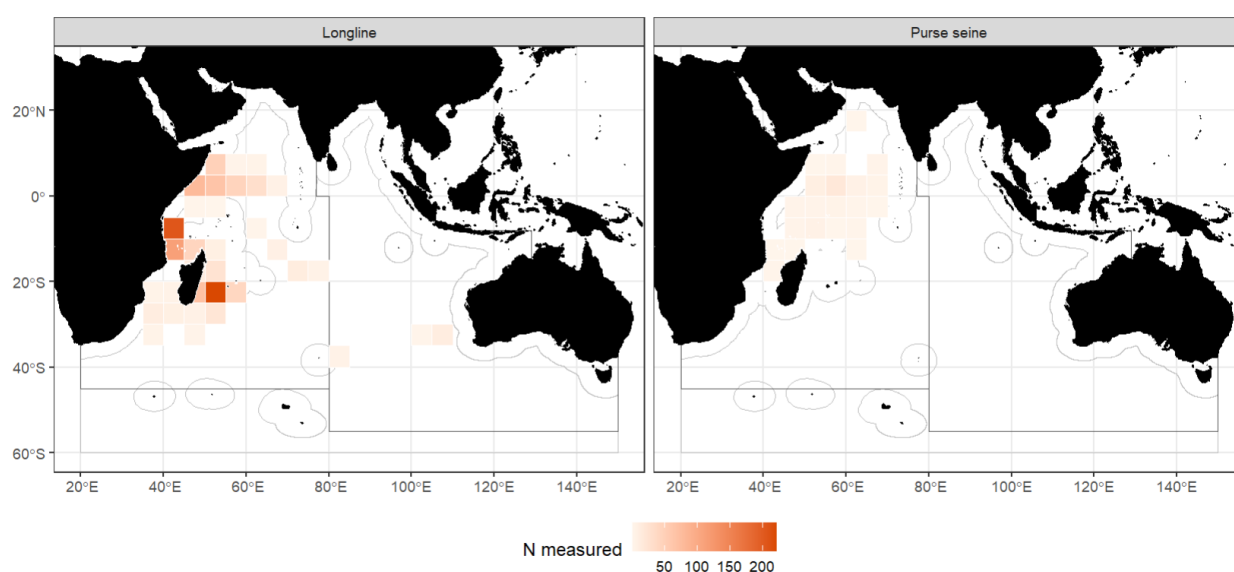


Figure 17. Spatial distribution of Pelagic stingray size measurements, by fishery (Longline, Purse Seine).

Discard Data Availability for rays

Thirteen ray species/categories appear in the discard dataset, including Mobulidae (family Mobula/Manta, subject to the retention ban under Resolution 19/03): Giant manta, Chilean devil ray, Devil fish, Spinetail mobula, Mobula nei, Mantas devil rays nei, Smoothtail mobula, and Alfred manta. These account for 152 of 256 records (59%) and the large majority of discarded weight (Giant manta, Chilean devil ray, Devil fish, and Spinetail mobula together account for roughly 68 of ~80 t total discarded weight). Pelagic stingray dominates the discards recorded in numbers.

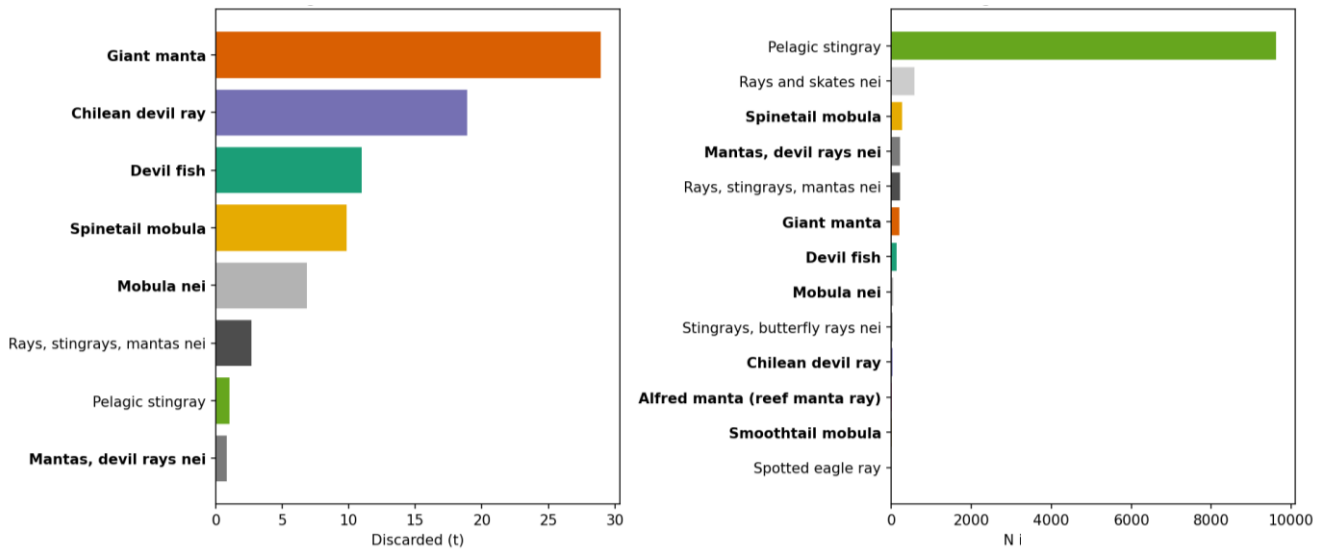


Figure 18. Rays discarded weight (t) and number of individuals discarded, by species/category, 2015–2024

Regional observer scheme - rays

Purse Seine observer records span seven species/categories: Pelagic stingray (339 interactions), Devil fish (171), Mobula nei (116), Giant manta (74), Chilean devil ray (8), Alfred manta (4), and Rays/stingrays/mantas nei (2). Longline observer records span nine species/categories, overwhelmingly dominated by Pelagic stingray (24,990 of ~25,196 total individuals).

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