REVIEW OF STATISTICAL DATA REPORTED BY CPCS EXHIBITING SIGNIFICANT CHANGES IN RECENT YEARS

Author: IOTC Secretariat

Purpose

This paper reviews fleets for which substantial changes in reported catch data have recently been identified. The analysis examines the magnitude and causes of these changes and evaluates their impacts on catches by species, fisheries, and overall regional catch statistics.

Abstract

Catch, effort, and size data are submitted annually to the Secretariat by CPCs. However, there are occasions when CPCs revise previously submitted datasets, resulting in the submission of one or more updated versions. Such revisions are commonly associated with improvements in data processing methodologies, the incorporation of additional information into estimation procedures, or the resolution of issues identified during Secretariat validation processes. In some instances, revisions result in substantial changes to historical catch estimates that are readily apparent at the fleet, species, or regional level. In other cases, CPCs have strengthened their fisheries data management systems through improvements in estimation methodologies, sampling designs, and data collection procedures, resulting in significant changes to previously reported catch levels. Recent improvements in data management by India, Oman, and Somalia have led to substantial revisions in catches of several IOTC-managed species. In contrast, the comprehensive catch re-estimation undertaken by Indonesia affected both IOTC-managed and non-IOTC species, including sharks. Collectively, these revisions have altered the understanding of historical catch trends and, in some cases, have substantially increased reported catches for particular species and fisheries, with implications for regional catch statistics and stock assessments.

Introduction

Fisheries statistics collected by countries vary depending on the methodologies used for data collection. In industrial fisheries, logbooks, whether electronic or paper-based, are widely used as the primary means of recording fishing activities and catches on board vessels. In contrast, data collection in small-scale fisheries presents greater challenges, as fishers often have limited capacity to record information during fishing operations and logbook systems are generally not implemented. Consequently, catch and effort data are typically collected by enumerators at landing sites through sample-based surveys, where coverage can be as low as 5% of fishing activities.

Such limitations in data collection can hinder the ability to detect and understand changes in fishing patterns, including variations in catch levels, species composition, and fishing practices. In addition to routine landing surveys, several countries conduct catch-at-size sampling programmes to collect biological information. Regular boat frame surveys are also essential for estimating fishing capacity and raising sampled data to fleet-wide estimates. However, financial, logistical, and human resource constraints often prevent countries from conducting these surveys at regular intervals.

The lack of comprehensive data collection systems and the infrequent implementation of key fisheries surveys are among the main factors contributing to substantial interannual changes in reported catches for some fleets. In the datasets submitted to the Secretariat, significant revisions or changes were identified in the catch data reported by India, Indonesia, Oman, and Somalia. These changes affect not only catches of IOTC-managed species but also catches reported for non-IOTC species, including sharks, many of which are incidentally caught in tuna fisheries. While some countries have reported substantial increases in shark catches following improvements in data collection and estimation methodologies, others continue to underreport or omit pelagic shark catches associated with tuna fisheries.

Concerns regarding substantial changes in reported catches have been raised repeatedly during meetings of the IOTC scientific working parties, particularly when such changes are not accompanied by corresponding changes in fishing practices, management measures, or documented revisions to data collection and estimation methodologies. This paper examines the underlying causes of these changes, where supporting information is available, and evaluates their impact on reported catches at both national and regional levels.

Material and methods

The information used in this document was obtained from the IOTC databases and supplemented with information from published literature, national reports, and other country-specific documentation. The analysis focuses on countries undergoing transitions in fisheries data collection and catch estimation methodologies, including the implementation of digital reporting systems and electronic monitoring programmes. Nevertheless, the dispersed nature of fisheries operations and the remoteness of many landing sites continue to hinder data collection efforts and the development of robust fisheries monitoring systems. As a result, observed changes in reported catches may, in part, reflect improvements in data collection and estimation procedures rather than changes in fishing activity or stock abundance.

Results

India

India has participated in most of the workshops recently organized by the Secretariat. In addition, a short technical mission was conducted in 2025 to discuss in detail the issues associated with fisheries data reported by India.

During the mission, several key topics were addressed, including the importance of reporting catch data disaggregated by species and fishery and geo-referenced catch and effort, in accordance with IOTC requirements.

The large number of fishing vessels and landing sites, coupled with the fact that many vessels use multiple gears during a single fishing trip, presents significant challenges for the collection of data at the level of detail required by the Commission. During the mission, it was observed that data collection at landing sites is largely conducted manually by enumerators. Species identification is generally undertaken at the species level during sampling; however, in the final datasets many species, particularly billfishes, sharks, and neritic tunas, are reported in aggregated categories. A key objective of the mission was therefore to identify practical solutions to improve data collection, processing, and reporting practices.

India's participation in IOTC scientific meetings has declined in recent years. Increased engagement in Working Parties and other scientific forums is encouraged to ensure that India remains informed of developments in IOTC data management requirements and scientific activities. Active participation would also provide an opportunity for India to present its specific circumstances, challenges, and ongoing developments in fisheries management and data collection.

During recent Working Party meetings, India has presented several initiatives aimed at strengthening fisheries monitoring and management, including systems that are currently being piloted or remain under development (Varghese et al. 2025; Rajesh K.M., et al. 2026). Since 2025, the Secretariat has received revised catch datasets from India that demonstrate notable improvements in reporting standards, including the disaggregation of catch data for most IOTC species, and shark species. Nevertheless, the reporting of geo-referenced catch data remains a significant challenge. While still limited in coverage, geo-referenced size-frequency data have also been submitted for some species.

The revised catch data indicate substantially higher reported catches compared with previous submissions (**Fig 1**). This increase may reflect the gradual refinement of India's catch estimation methodologies, together with improvements in data collection practices and the completeness of fisheries data reported to the Secretariat.

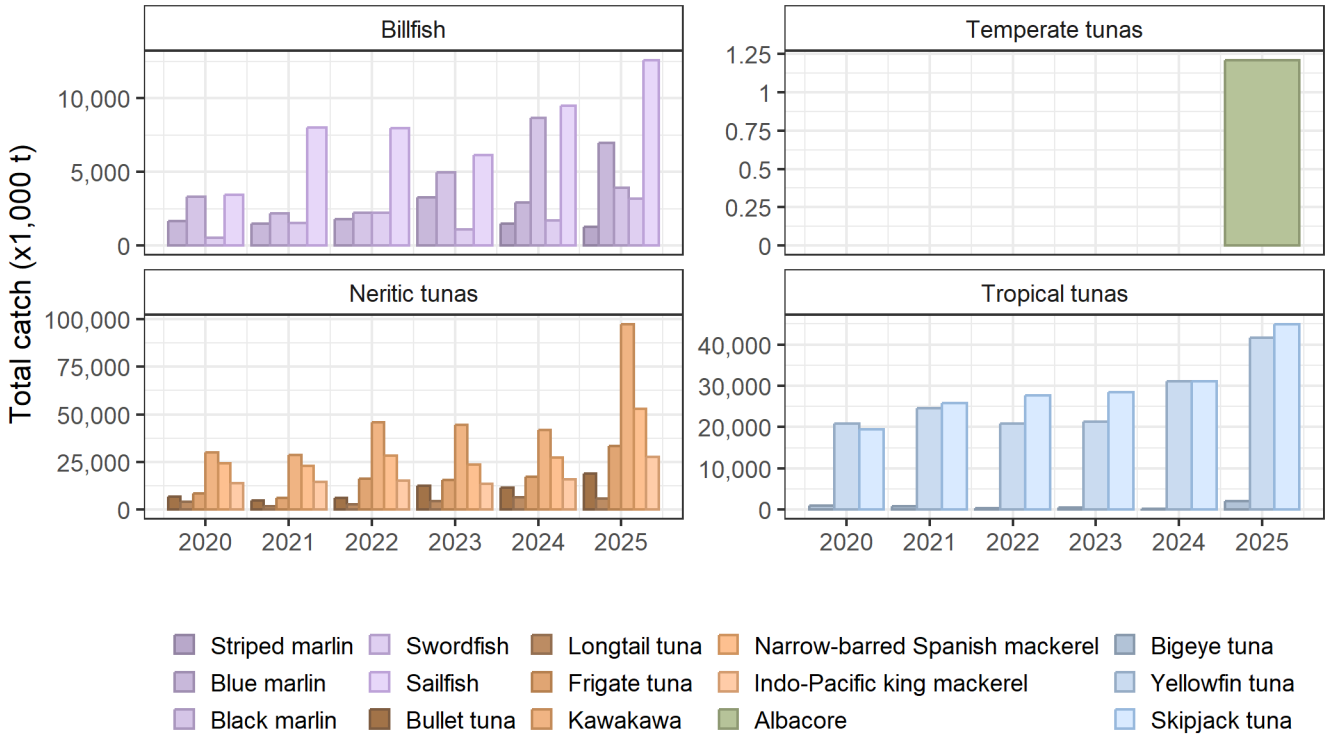

Fig. 1. Catch data of India between 2020 and 2025 by IOTC species

Fig 1 shows a substantial increase in reported catches of neritic tuna species in 2025, rising from approximately 120,000t to 236,000t in 2025. The largest increase was observed for kawakawa (*Euthynnus affinis*), with reported catches increasing by 133% between 2024 and 2025. As a result, India's contribution to the total IOTC-reported kawakawa catch increased from 26% in 2024 to 48% in 2025. Overall, reported catches of kawakawa across the IOTC area increased by 27% during the same period.

In addition to IOTC-managed species, substantial increases were also observed in reported shark catches. Historically, shark catches reported by India were largely aggregated either under the category "various sharks" (SKH) or reported as a single species. In contrast, the dataset submitted for 2025 included several shark species identified separately across multiple fisheries. Total reported shark catches in 2025 were approximately double those reported in 2024, with silky shark accounting for the majority of the reported catches (**Fig 2**).

Prior to 2025, catches of silky shark (*Carcharhinus falciformis*) reported by India were negligible or absent from the datasets submitted to the Secretariat. The reporting of more than 10,000 t of silky shark in 2025 consequently made India the largest reported contributor to catches of this species within the IOTC area. Reported catches of silky shark increased sharply from less than 2,000 t in 2024 to over 13,000 t in 2025. This substantial increase likely reflects a combination of improved awareness of shark-reporting requirements, enhanced monitoring and data-collection practices, more detailed species-level identification, and refinements in catch estimation and reporting methodologies, rather than solely a sudden increase in catches.

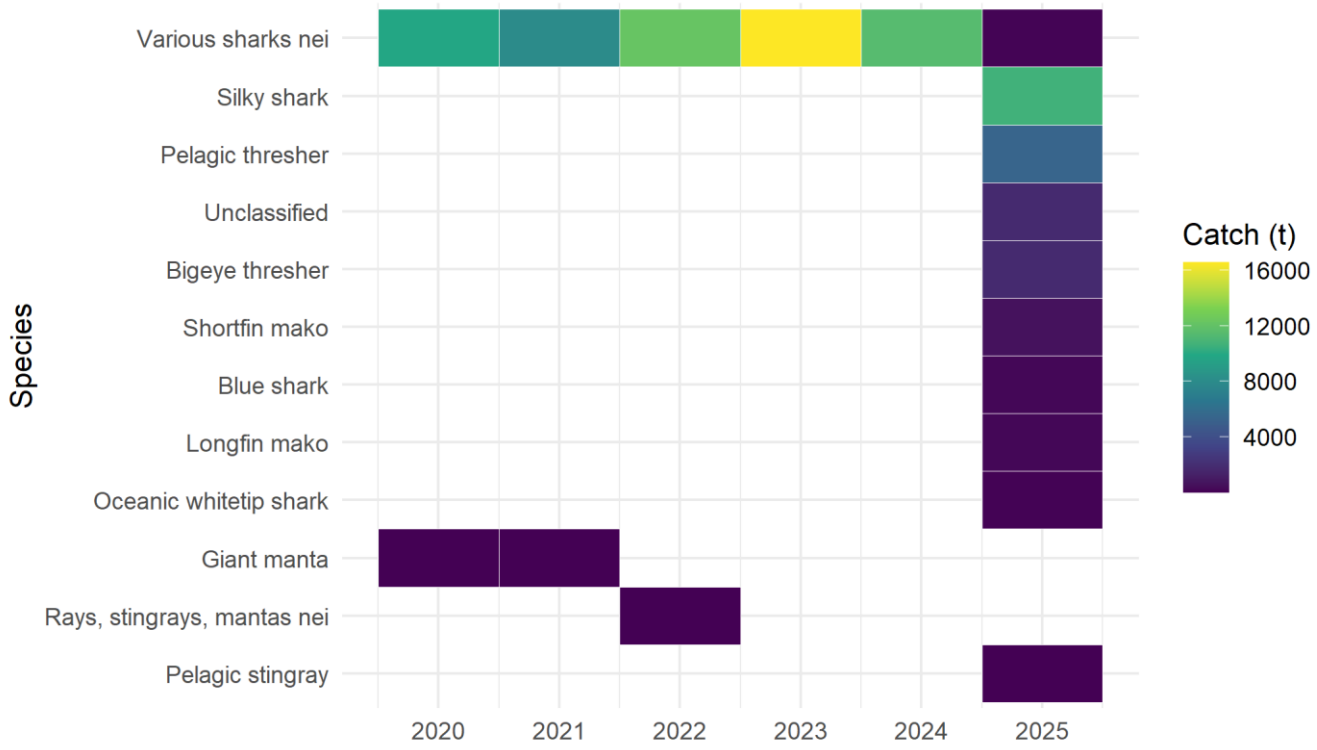

Fig. 2. Catch data shark species of India between 2020 and 2025

Indonesia

Indonesia conducted a comprehensive historical re-estimation of catches across all fisheries through an extensive process undertaken in collaboration with the IOTC Secretariat. The revision was based on multiple data sources and estimation parameters that had been used by Indonesia over time. The exercise, which concluded in 2023, resulted in revised catch estimates for IOTC species covering the period 1950-2022. Prior to this revision, the Secretariat estimated Indonesian catches by species and fishery using proportional allocation methods based on recommendations from an expert consultant's review. Consequently, the updated estimates substantially changed

the historical distribution of catches among species and fisheries compared with previous estimates. Although total catches reported by industrial fisheries were generally retained from the original submissions, their allocation among species and fisheries was also revised.

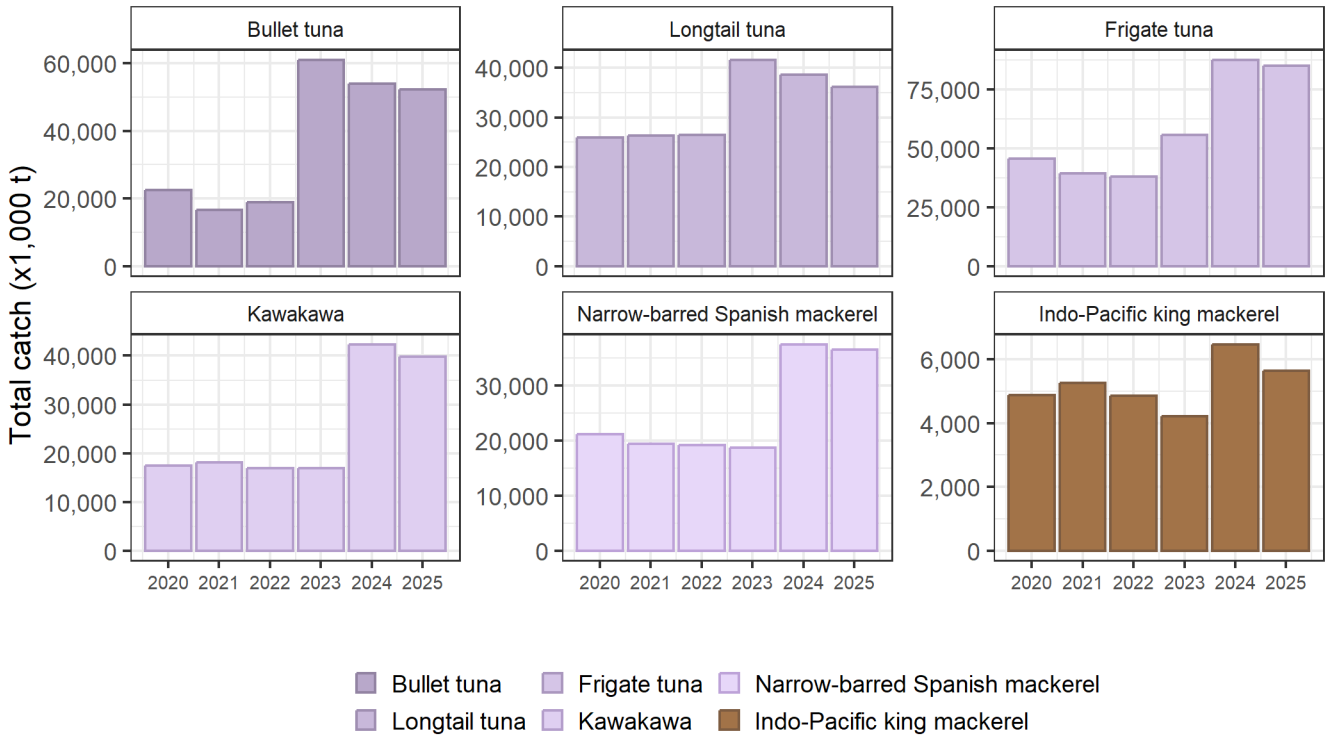

Fig. 3. Catch data of Neritic tunas reported by Indonesia between 2020 and 2025

Following the completion of the revision, the Secretariat has maintained the catch statistics reported by Indonesia. However, catches reported since 2023 show substantial changes for several IOTC species, particularly neritic tunas. Between 2022 and 2023, catches of bullet tuna (*Auxis rochei*) and longtail tuna (*Thunnus tonggol*) increased by approximately 221% and 57%, respectively. In addition, catches of kawakawa (*Euthynnus affinis*) increased by 149% between 2023 and 2024 (**Fig 3**). Indonesia indicated that catch revisions remain ongoing and that more reliable data sources are being incorporated into recent estimates (KKP, Ministry of Marine Affairs and Fisheries 2025). The substantial increase in bullet tuna catches observed in 2023 was recorded across all fisheries. Since 2024, although overall catch levels have remained high, the fisheries contributing most to these catches have shifted, suggesting potential differences in fishery classification or allocation compared with previous years. Furthermore, catches reported as "other species", which accounted for approximately 25% of Indonesia's total catch in 2022, disappeared from the statistics from 2023 onwards. This reallocation may partly explain the marked increases observed in reported catches of neritic tuna species.

Indonesia accounted for approximately 70% of the total bullet tuna catch reported in the Indian Ocean. Given this dominance, the sharp increase in Indonesian bullet tuna catches resulted in a corresponding increase of nearly 200% in the total Indian Ocean catch of the species between 2022 and 2023. Since then, reported bullet tuna catches have remained consistently high, averaging approximately 85,000 t annually.

Oman

Oman is one of the CPCs that has experienced sustained growth in its fisheries sector, which plays a critical role in supporting livelihoods, food security, and employment in coastal communities (Al Abri et al. 2026). Reported catches of yellowfin tuna from Oman's small-scale fisheries, which are dominated by handline operations, increased substantially between 2019 and 2020.

The increase occurred in 2020, the same year that IOTC yellowfin tuna catch limits were introduced. Reported catches rose from approximately 37,000t in 2019 to around 69,000t in 2020. Between 2020 and 2022, annual yellowfin tuna catches from Oman's coastal fisheries averaged approximately 72,000 t. Catch levels subsequently fluctuated, declining to below 66,000t in 2023, increasing to more than 86,000t in 2024, and decreasing again to approximately 61,000 t in 2025 (**Fig 4**).

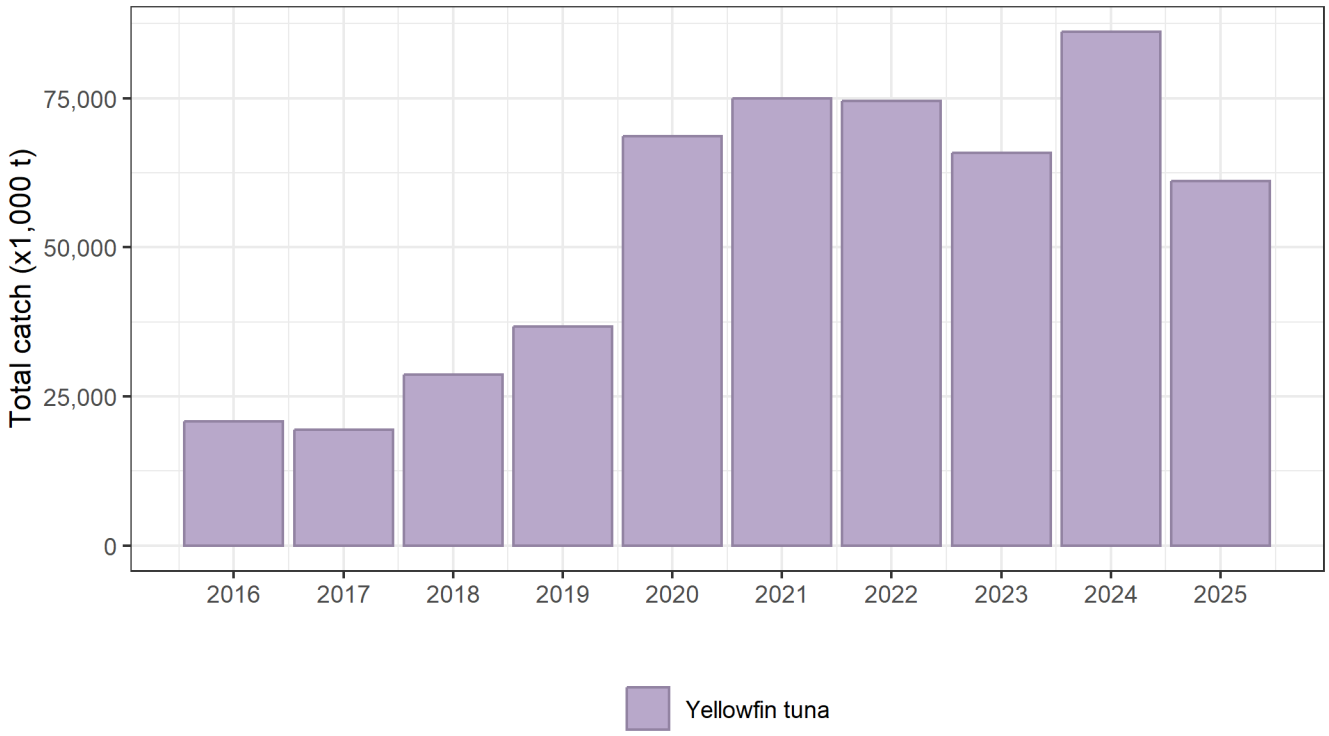

Fig. 4. Catch data of yellowfin tunas reported by Oman between 2016 and 2025

During meetings of the Working Party on Data Collection and Statistics (WPDCS), Oman indicated that historical catch estimates from its coastal fisheries may be revised following the implementation of an updated catch estimation methodology and broader improvements in fisheries statistics systems (Oman, n.d.; Oman 2026). These discussions highlighted the potential implications of methodological changes for the interpretation of recent catch trends. The substantial increase in reported catches therefore appears more likely to reflect improvements in catch estimation and reporting practices than changes in fishing capacity, as the number of fishing crafts reported nationally increased only modestly from about 24,000 in 2019 to 28,000 in 2025.

Prior to 2020, Oman's reported yellowfin tuna catches represented less than 10% of the total Indian Ocean catch. However, following the sharp increase in catches reported in 2020, Oman's share rose to an average of approximately 17% of the total catch. This increase contrasted with trends observed in several other CPCs, which reduced catches following the introduction of yellowfin tuna catch limits. Oman reported an 86% increase in catch between 2019 and 2020, making it one of the few CPCs to exhibit substantial growth during this period. Nevertheless, the overall Indian Ocean yellowfin tuna catch remained relatively stable, averaging about 430,000 t annually from 2020 to 2023, suggesting that the increase in Oman's reported catches was largely offset by reductions elsewhere.

Somalia

Despite being an IOTC member and having an EEZ encompassing one of the most productive upwelling systems in the Indian Ocean, Somalia's fisheries sector has remained underdeveloped owing to decades of political instability (Cashion et al. 2018). A catch reconstruction study covering 1950-2015 estimated that total removals by domestic

and foreign fleets exceeded 100,000 t in 2015 and revealed substantial underreporting of domestic fisheries catches, particularly from the small-scale sector (Cashion et al. 2018). These findings suggest that official catch statistics may have considerably underestimated total fisheries removals from Somali waters. While the reconstruction provides the most comprehensive historical assessment currently available, much of the fishery's information for Somalia remained difficult to access through published sources and official reporting channels, limiting independent verification of historical catch estimates.

Recognising these limitations and the need to comply with reporting requirements, Somalia has undertaken a series of initiatives since 2019 to strengthen fisheries data collection and management systems (SHEIKHEILE et al. 2019). Initial efforts focused on establishing an inventory of fishing vessels and commonly landed species. Subsequent developments included the introduction of digital data collection in 2021 and the implementation of a centralized fisheries database in 2022 (MFBE 2024). These efforts culminated in the submission of fisheries statistics to the Scientific Committee in 2024, covering the period 2019-2023. Reported catches included tropical tunas, longtail tuna, and several non-IOTC species. Sampling coverage expanded from six landing sites at the start of the programme to 16 landing sites by 2025, increasing the representativeness of the data and contributing to improved catch estimation (MFBE 2024).

Somalia formally commenced annual fisheries data submissions to the IOTC in 2025 for fishing activities conducted in 2024. However, catch estimates presented in the national report were not fully consistent with the catch-by-species datasets subsequently submitted to the Secretariat. Such discrepancies are not unexpected given the ongoing development of data collection, processing, and estimation procedures. As methodologies continue to mature, revisions and fluctuations in reported catches are likely to occur.

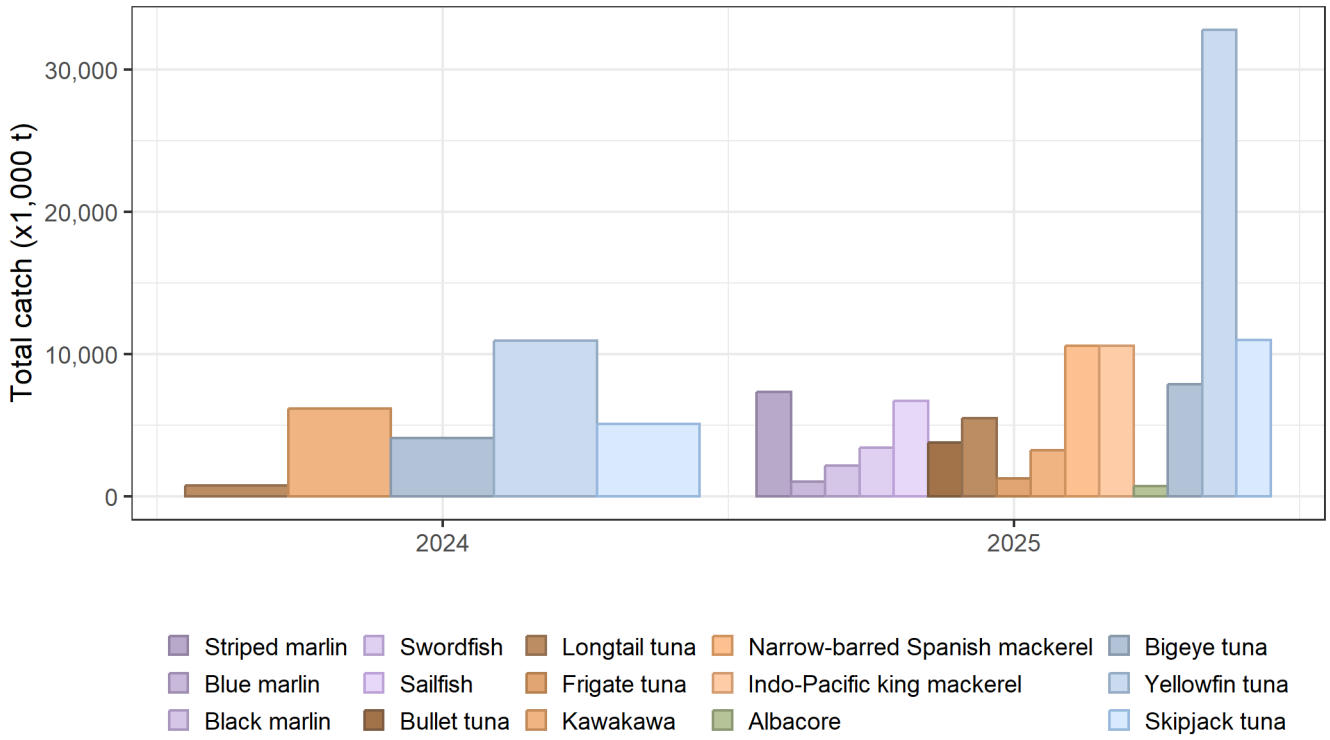

Fig. 5. Somalia reported catch by species 2024-2025

In addition to differences between catch estimates reported through national reports and official submissions, the total reported catch increased substantially in 2025, reaching 108206 t compared with approximately 27125 t in 2024. Reporting for the 2024 fishing year was limited to tropical tunas and two neritic tuna species, whereas the 2025 submission included a broader range of IOTC species, including sharks (**Fig 5**).

According to Somalia's national report submitted to SC29, the national fisheries monitoring programme has been undergoing systematic development since 2019. Particular progress was reported during Phases 3 and 4 of the programme, during which sampling coverage expanded substantially in terms of both the number of fishing trips monitored and landing sites surveyed, representing approximately 26% coverage of the estimated total fishing trips (MFBE 2026). Although species- and gear-specific stratification remained a key challenge, the 2026 submission (reporting 2025 fishing activities) was considerably more detailed than previous submissions, with catches reported by species and fishing gear, and a broader range of species represented. In addition, catch and effort data were stratified by month and by geo-referenced spatial grids across the Somali EEZ, with effort expressed as the number of fishing days within each stratum. Catch estimates were derived using the sample-based raising methodology described by Stamatopoulos (2002) (MFBE 2026). Catch estimates were derived using the sample-based raising methodology described by Stamatopoulos (2002) (MFBE 2026). Consequently, the substantial increase in reported catches should be interpreted primarily as the result of improved fisheries monitoring and catch estimation systems rather than as evidence of a sudden expansion in fishery production or stock abundance.

The latest published catch data from Somalia are presented alongside catches reported for the previous year (**Fig 6**). The comparison clearly illustrates the substantial increase in reported catches in 2025 relative to 2024. At present, only data for 2024 and 2025 are available in the IOTC database. Earlier catch estimates have not been officially submitted as national fisheries statistics. Nevertheless, the documented development of Somalia's fisheries data management system described in (MFBE 2026), together with the historical catch reconstruction undertaken by (Cashion et al. 2018), suggests that substantial opportunities exist to reconstruct historical catches and address remaining data gaps in the national catch time series.

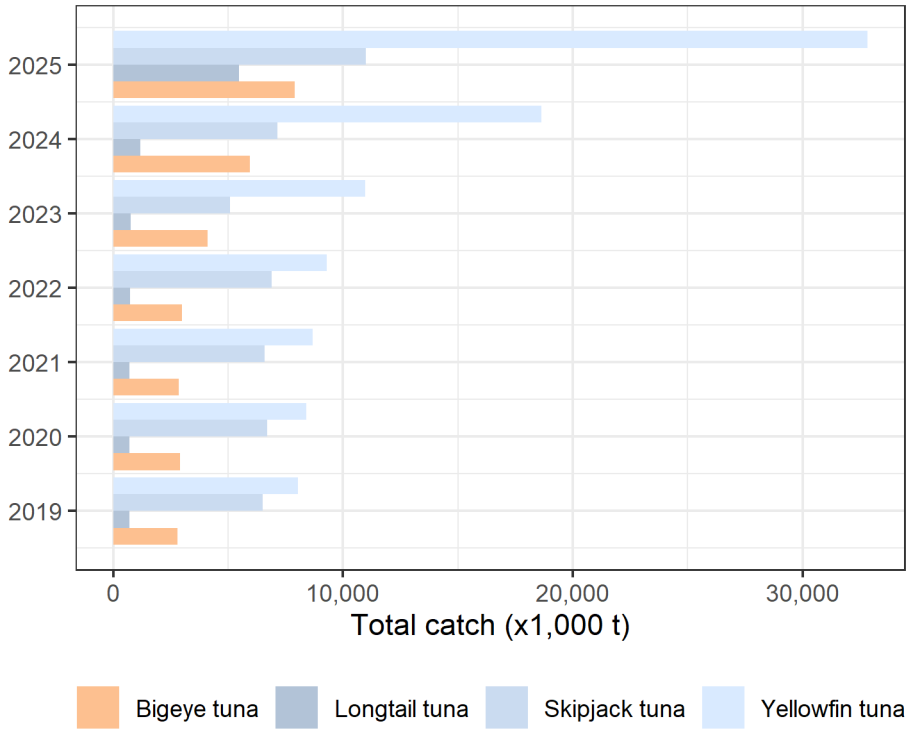

Fig. 6. Catch data published by Somalia in national report: 2020 and 2025

The inclusion of Somali catches increased the overall reported catches of tropical and neritic tunas by less than 10%. In contrast, the proportional contribution to total catches was considerably higher for billfish species, suggesting that improvements in Somali fisheries reporting may have a greater impact on catch time series and subsequent stock assessments for billfish than for tuna species. The catches of striped marlin from Somalia

accounted for 50% of the striped marlin catch of Indian Ocean. Hence, previous year estimate of striped marlin in the Indian Ocean doubled in 2025 (**Table 1**)

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Tab. 1. Contribution of Somali catches to Indian Ocean total catch, by species

Species Group	SPECIES	2024		2025	
		Catch	%	Catch	%
Billfish	Striped marlin	0	0	7,370	57
	Blue marlin	0	0	1,058	7
	Black marlin	0	0	2,174	10
	Swordfish	0	0	3,438	10
	Sailfish	0	0	6,725	14
Temperate tunas	Albacore	0	0	744	2
Neritic tunas	Bullet tuna	0	0	3,782	4
	Longtail tuna	760	1	5,489	4
	Frigate tuna	0	0	1,281	1
	Kawakawa	6,200	4	3,241	2
	Narrow-barred Spanish mackerel	0	0	10,585	5
	Indo-Pacific king mackerel	0	0	10,600	15
Tropical tunas	Bigeye tuna	4,100	5	7,907	8
	Yellowfin tuna	10,965	2	32,816	6
	Skipjack tuna	5,100	1	10,996	1

Conclusion

Despite substantial increases in reported catches in some fisheries, the effect on overall catch statistics remains limited for species to which these fisheries contribute only a small proportion of the total catch. Nevertheless, this review indicates that further revisions of historical catches may be expected for several fleets as countries continue to improve their fisheries monitoring and estimation systems. Such revisions could have a significant impact on catch time series, particularly where revised estimates result in substantial increases for individual species.

Although catch estimates from Indonesia are generally considered stable, ongoing revisions continue to affect catch levels, particularly for neritic tuna species. Similar patterns have been observed in India, where reported catches of neritic tunas have shown notable changes in recent years. In addition, catches of tropical tunas reported by Oman and Somalia have exhibited increasing trends, reflecting ongoing improvements in fisheries data collection, coverage, and estimation methodologies. As these systems continue to mature, future revisions, whether for historical periods or newly reported years, may result in further increases in estimated catches.

The Secretariat continues to monitor these developments closely and, where appropriate, provides technical assistance to support the implementation of robust fisheries monitoring, data collection, and catch estimation systems. Consequently, changes in reported catches should be interpreted in the context of evolving data collection frameworks, which may influence reported trends independently of changes in fishing activity or stock abundance.

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