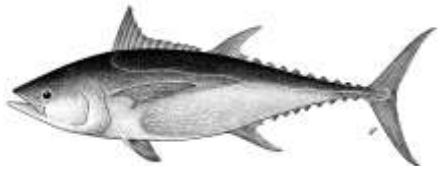
DRAFT: EXECUTIVE SUMMARY: LONGTAIL TUNA

Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien
iotc ctoi



Status of the Indian Ocean longtail tuna (LOT: *Thunnus tonggol*) resource

TABLE 1. Longtail tuna: Status of longtail tuna (*Thunnus tonggol*) in the Indian Ocean

Area[1]	Indicators		2013 stock status determination
Indian Ocean	Catch[2] 2012: Average catch[2] 2008–2012:	155,603 t 133,890 t	
	MSY: F_{2011}/F_{MSY}: B_{2011}/B_{MSY}: SB_{2011}/SB_0:	110,000–123,000 t 1.11–1.77 1.11–1.25 unknown	

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence.
[2]Nominal catches represent those estimated by the IOTC Secretariat. If these data are not reported by CPCs, the IOTC Secretariat estimates total catch from a range of sources including: partial catch and effort data; data in the FAO FishStat database; catches estimated by the IOTC from data collected through port sampling; data published through web pages or other means; data reported by other parties on the activity of vessels; and data collected through sampling at the landing place or at sea by scientific observers.

Colour key	Stock overfished($SB_{year}/SB_{MSY} < 1$)	Stock not overfished ($SB_{year}/SB_{MSY} \geq 1$)
Stock subject to overfishing($F_{year}/F_{MSY} > 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY} \leq 1$)		
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. There remains considerable uncertainty about stock structure and about the total catches in the Indian Ocean. Stock Reduction Analysis techniques indicate that the stock is being exploited at rates that exceed F_{MSY} in recent years. Whether a four quadrant stock structure of catches in the Indian Ocean or a one stock assumption is used in the analysis, the conclusions remain the same. However, further exploratory analysis of the data available should be undertaken in preparation for the next WPNT meeting before the assessment results are used for stock status determination. More traditional methods of stock assessment need to be conducted by developing indices of abundance using catch and effort series from I.R. Iran and Indonesia. Given estimated values of current biomass are above the estimated abundance to produce B_{MSY} in 2011, and that fishing mortality has exceeded F_{MSY} values in recent years, the stock is considered to be **not overfished**, but **subject to overfishing** (Table 1).

Outlook. The continued increase of annual catches for longtail tuna in recent years has further increased the pressure on the Indian Ocean stock as a whole. The apparent fidelity of longtail tuna to particular areas/regions is a matter for concern as overfishing in these areas can lead to localised depletion. Research emphasis on improving indicators and exploration of stock structure and stock assessment approaches for data poor fisheries are warranted. The following should be noted:

- the Maximum Sustainable Yield estimate is likely being exceeded in recent years.
- annual catches urgently need to be reviewed.
- improvement in data collection and reporting is required to assess the stock status, primarily abundance index series from I.R. Iran, Oman and Indonesia.

SUPPORTING INFORMATION

(Information collated from reports of the Working Party on Neritic Tunas and other sources as cited)

CONSERVATION AND MANAGEMENT MEASURES

Longtail tuna (*Thunnus tonggol*) in the Indian Ocean is currently subject to a number of Conservation and Management Measures adopted by the Commission:

- Resolution 13/03 on the recording of catch and effort by fishing vessels in the IOTC area of competence
- Resolution 13/07 concerning a record of licensed foreign vessels fishing for IOTC species in the IOTC area of competence and access agreement information
- Resolution 12/11 *on the implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties*
- Resolution 10/02 *mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's)*
- Resolution 10/08 *concerning a record of active vessels fishing for tunas and swordfish in the IOTC area*

FISHERIES INDICATORS

Longtail tuna: General

Longtail tuna (*Thunnus tonggol*) is an oceanic species that forms schools of varying sizes. It is most abundant over areas of broad continental shelf. Table 2 outlines some key life history parameters relevant for management.

TABLE 2. Longtail tuna: Biology of Indian Ocean longtail tuna (*Thunnus tonggol*)

Parameter	Description
Range and stock structure	An oceanic species that forms schools of varying sizes. It is most abundant over areas of broad continental shelf. Feeds on a variety of fish, cephalopods, and crustaceans, particularly stomatopod larvae and prawns. No information is available on the stock structure of longtail tuna in the Indian Ocean.
Longevity	~20 years
Maturity (50%)	**Age**: n.a.; females n.a. males n.a. **Size:** females and males ~40 cm FL (Pacific Ocean).
Spawning season	The spawning season varies according to location. Off the west coast of Thailand there are two distinct spawning seasons: January-April and August-September.
Size (length and weight)	Maximum: Females and males 145 cm FL; weight 35.9 kgs. Most common size in Indian Ocean ranges 40–70 cm. Grows rapidly to reach 40–46 cm in FL by age 1.

n.a. = not available. Sources: Chang et al. 2001, Froese & Pauly 2009, Griffiths et al. 2010a, b, Kaymaran et al. 2011

Longtail tuna – Fisheries and catch trends

Longtail tuna is caught mainly by using gillnets and to a lesser extent, seine nets and trolling (Table 3; Fig. 1). The catch estimates for longtail tuna were derived from small amounts of information and are therefore uncertain[1]. The catches provided in Table 3 are based on the information available at the IOTC Secretariat and the following observations on catches cannot currently be verified. Estimated catches of longtail tuna increased gradually from the mid 1950's to the year 2000 when over 90,000 t were landed. Catches then declined until 2005 (67,600 t). Since 2005, catch have increased continually with the highest catches ever recorded at around 165,100 t, landed in 2011.

In recent years (2010–12), the countries attributed with the highest catches of longtail tuna are Iran (49%) and Indonesia (15%) and Pakistan (9%), and to a lesser extent, Malaysia, India, Oman and Thailand (23%) (Table3; Fig. 2). In particular, Iran has reported large increases in the catch of longtail tuna since 2008. The increase in catches of longtail

[1] The uncertainty in the catch estimates has been assessed by the IOTC Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of non-reporting fisheries for which catches had to be estimated.

tuna coincides with a decrease in the catches of skipjack tuna and is thought to be the consequence of increased gillnet effort in coastal waters due to the threat of Somali piracy in the western tropical Indian Ocean.

TABLE 3. Longtail tuna: Best scientific estimates of the catches of longtail tuna by type of fishery for the period 1950–2012 (in metric tonnes) (Data as of October 2013)

Fishery	By decade (average)						By year (last ten years)									
	1950s	1960s	1970s	1980s	1990s	2000s	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Purse seine	44	204	1,092	4,833	8,984	11,505	11,585	9,319	7,714	11,138	15,456	11,329	13,381	9,697	20,591	21,765
Gillnet	2,593	5,849	8,964	24,808	39,081	57,846	54,510	45,981	43,133	51,455	59,699	67,332	83,142	101,057	120,406	112,429
Line	909	1,160	2,530	5,084	7,217	14,094	11,510	14,093	14,219	16,519	17,667	15,332	15,679	16,629	17,897	17,427
Other	0	0	125	1,091	1,987	3,241	2,384	2,823	2,516	3,132	4,057	4,932	4,777	5,466	6,201	3,981
Total	**3,546**	**7,213**	**12,711**	**35,814**	**57,269**	**86,686**	**79,989**	**72,216**	**67,582**	**82,244**	**96,879**	**98,924**	**116,980**	**132,849**	**165,096**	**155,603**

The size of longtail tuna taken by IOTC fisheries typically ranges between 20 and 100 cm depending on the type of gear used, season and location (Fig. 5). The fisheries operating in the Andaman Sea (coastal purse seines and troll lines) tend to catch longtail tuna of small size (20–45cm) while the main gillnet fisheries operating in the Arabian Sea (Iran and Pakistan) catch larger specimens (50–100cm).

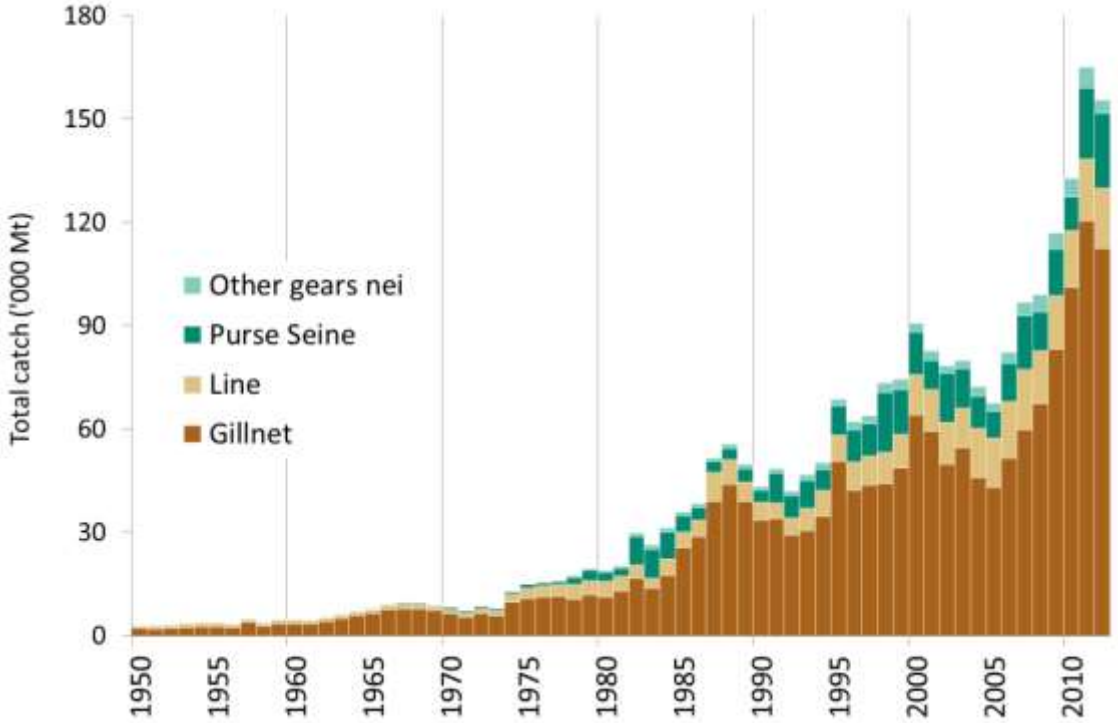


Fig. 1. Longtail tuna: Annual catches of longtail tuna by gear recorded in the IOTC Database (1950–2012) (Data as of October 2013).

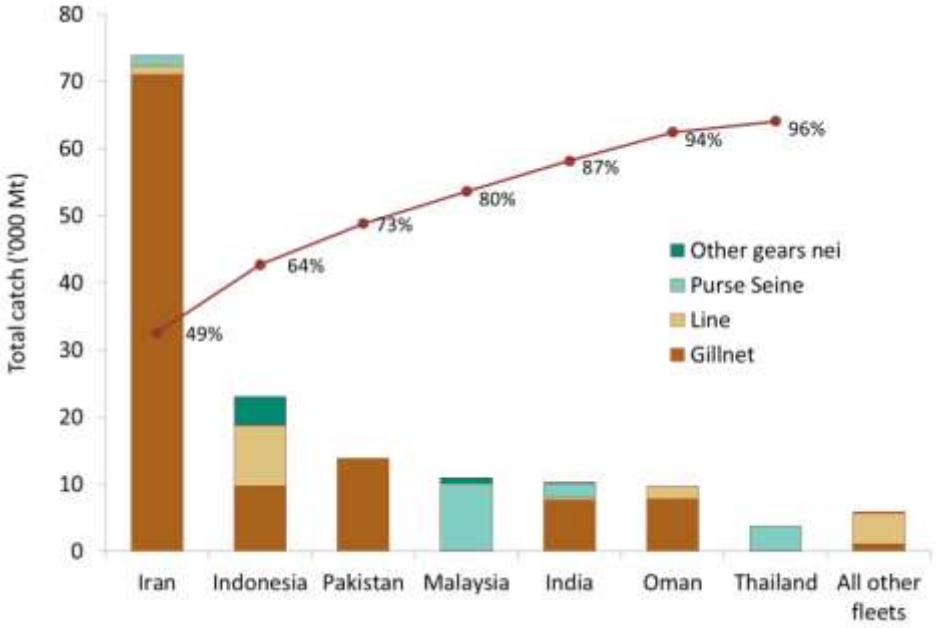


Fig. 2. Longtail tuna: Average catches in the Indian Ocean over the period 2010–12, by country. Countries are ordered from left to right, according to the importance of catches of longtail reported. The red line indicates the (cumulative) proportion of catches of longtail tuna for the countries concerned, over the total combined catches of this species reported from all countries and fisheries (Data as of October 2013).

Longtail tuna: uncertainty of catches

Retained catches are uncertain (Fig. 3), notably for the following fisheries:

- Artisanal fisheries of Indonesia: Indonesia did not report catches of longtail tuna by species or by gear for 1950–2004; catches of longtail tuna, kawakawa and other species were reported aggregated for this period. In the past, the IOTC Secretariat used the catches reported since 2005 to break the aggregates for 1950–2004 by gear and species. However, in a recent review of the data (2012) it was identified that the catches of longtail tuna had been overestimated by Indonesia. While the new catches estimated for longtail tuna in Indonesia remain uncertain, representing around 15% (30% in the past) of the total catches of this species in the Indian Ocean in recent years (2010–12), the new figures are considered more reliable than those existing in the past.
- Artisanal fisheries of India and Oman: Although these countries report catches of longtail tuna, until recently the catches have not been reported by gear. The IOTC Secretariat used alternative information to assign the catches reported by Oman by gear. The catches of India were also reviewed in 2012 and assigned by gear on the basis of official reports and information from various alternative sources. The catches of longtail tuna from Oman and India represented 13% of the total catches of this species in recent years (2010–12).
- Artisanal fisheries of Mozambique, Myanmar (and Somalia): None of these countries have ever reported catches of longtail tuna to the IOTC Secretariat. Catch levels are unknown but are not considered substantial.
- Other artisanal fisheries: The IOTC Secretariat had to estimate catches of longtail tuna for the artisanal fisheries of Yemen (no data reported to the IOTC Secretariat) and Malaysia for years before 2012. The catches estimated for the longtail tuna represent 7% of the total catches of this species, across all years and fleets, in recent years.
- Discard levels are believed to be very low although they are unknown for most fisheries.
- Changes to the catch series: There have been significant changes to the catches of longtail tuna since the WPNT meeting in 2012, following major reviews of catch time series for Indonesia, India, and Sri Lanka.

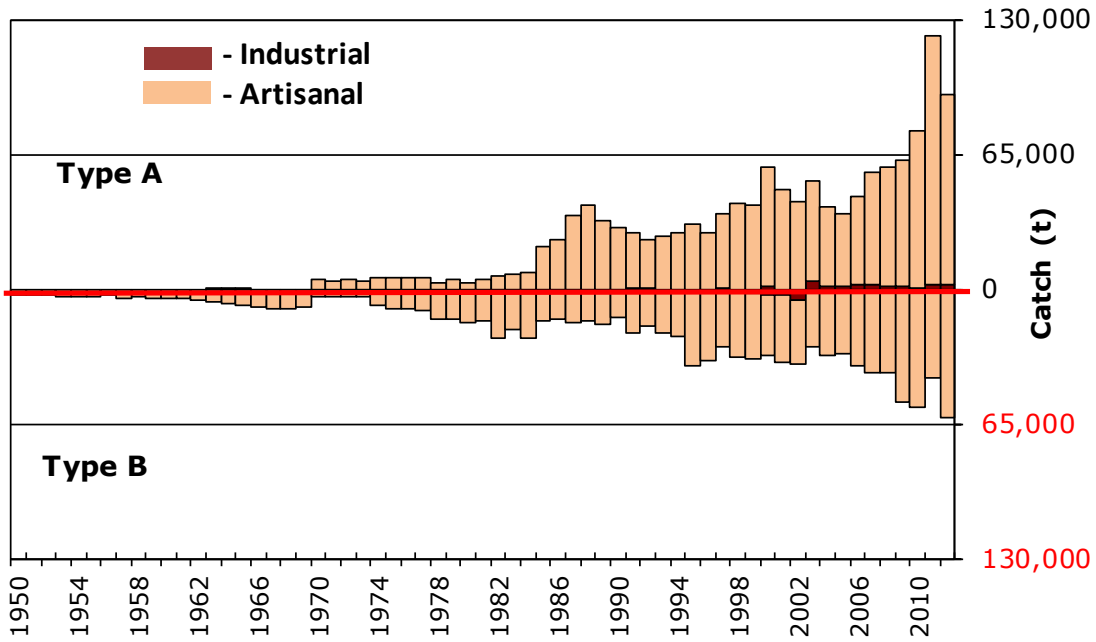


Fig. 3. Uncertainty of annual catch estimates for longtail tuna (1950–2012). Catches below the zero-line (Type B) refer to fleets that do not report catch data to the IOTC (estimated by the IOTC Secretariat), do not report catch data by gear and/or species (broken by gear and species by the IOTC Secretariat) or any of the other reasons provided in the document. Catches over the zero-line (Type A) refer to fleets for which no major inconsistencies have been found to exist. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets (Data as of October 2013)

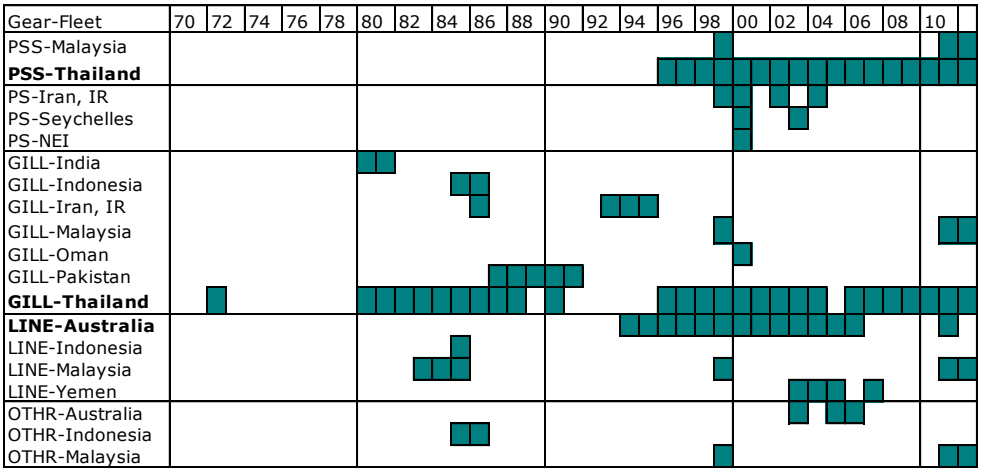
Longtail tuna – Effort trends

Effort trends are unknown for longtail tuna in the Indian Ocean.

Longtail tuna – Catch–per–unit–effort (CPUE) trends

Nominal CPUE series are available from some fisheries but they are considered highly incomplete (Table 4). In most cases catch-and-effort data are only available for short periods of time. Reasonably long catch and effort series (extending for more than 10 years) are only available for Thailand small purse seines and gillnets (Fig. 4). No catch and effort data are available from sports fisheries, other than for partial data from the sports fisheries of Kenya.

TABLE 4. Longtail tuna: Availability of catches and effort series, by fishery and year (1970–2012)[2]. Note that no catch and effort data are available for the period 1950–1971 in the IOTC Secretariat databases



[2] Note that the above list is not exhaustive, showing only the fisheries for which catches and effort are available in the IOTC database. Furthermore, catch-and-effort data are sometimes incomplete for a given year, existing only for short periods.

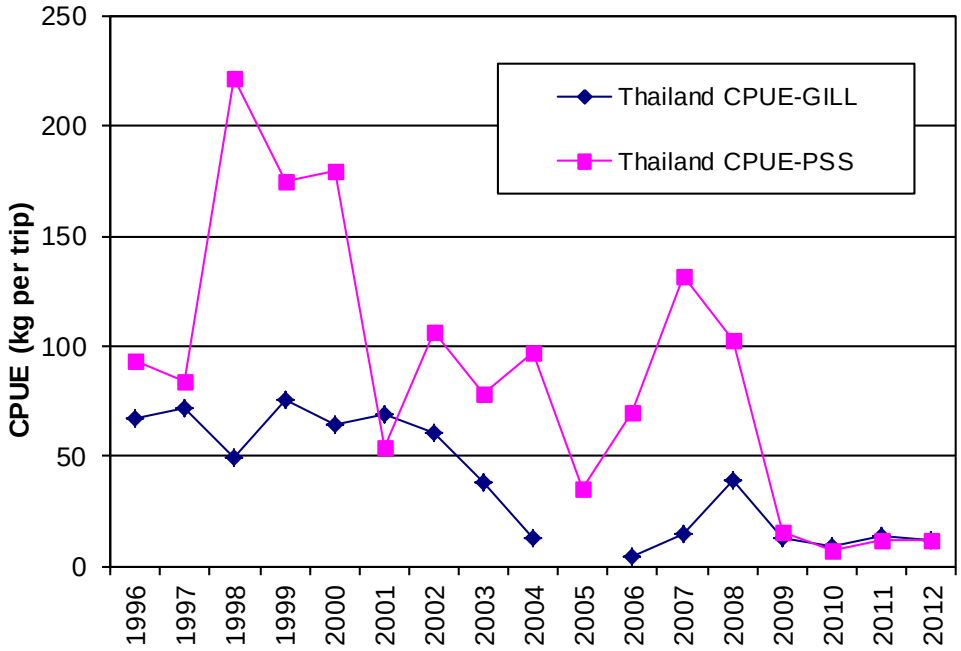
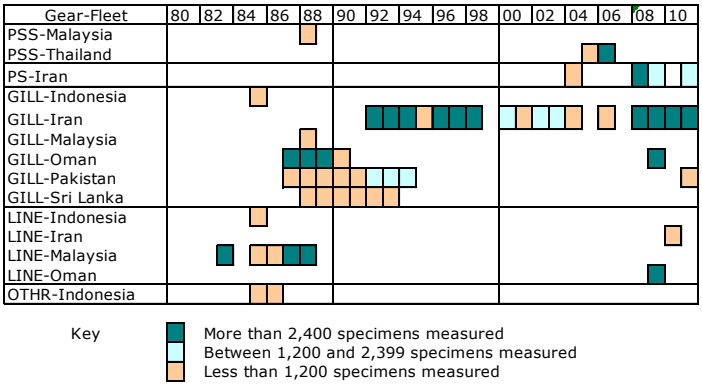


Fig. 4. Longtail tuna: Nominal CPUE series for the gillnet (GILL) and coastal purse seine (PSS) fisheries of Thailand derived from the available catches and effort data (1996–2012)

Longtail tuna – Fish size or age trends (e.g. by length, weight, sex and/or maturity)

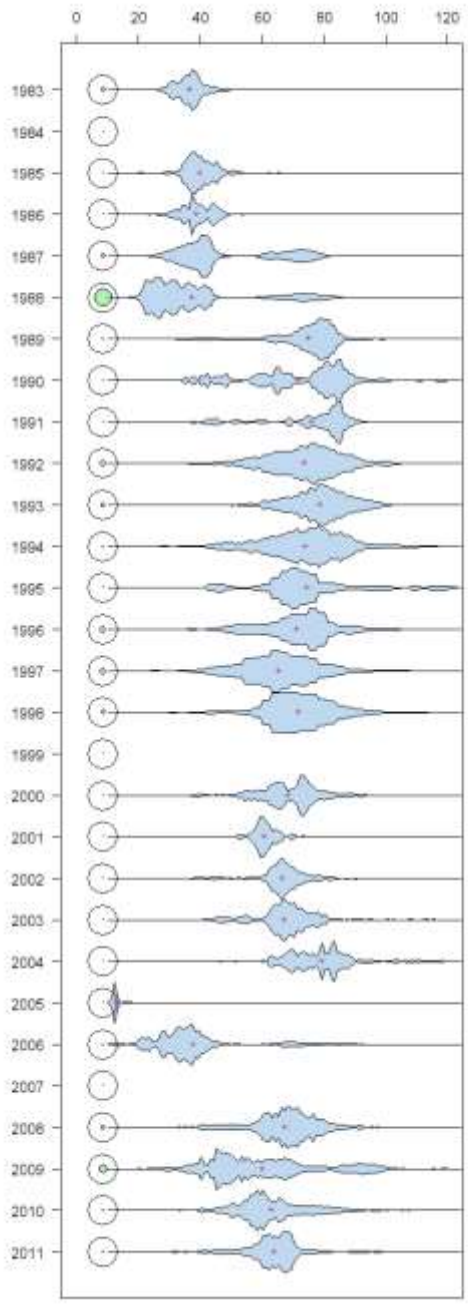
- The size of longtail tuna taken by the Indian Ocean fisheries typically ranges between 15–120 cm depending on the type of gear used, season and location. The fisheries operating in the Andaman Sea (coastal purse seines and troll lines) tend to catch longtail tuna of small size (20–45cm) while the drifting gillnet fisheries operating in the Arabian Sea catch larger specimens (50–100cm).
- Trends in average weight can only be assessed for I.R. Iran drifting gillnets but the amount of specimens measured has been very low in recent years (Table 5). The length frequency data available from the mid-eighties to the early nineties was obtained with the support of the IPTP (Indo-Pacific Tuna Programme). Unfortunately, data collection did not continue after the end of the IPTP activities.
- Catch-at-Size(Age) tables are not available for the longtail tuna due to the paucity of size data available from most fleets and the uncertain status of the catches for this species (Table 5). Length distributions derived from the data available for some selected fisheries are shown in Fig. 5.
- Sex ratio data have not been provided to the Secretariat by CPCs.

TABLE 5. Longtail tuna: Availability of length frequency data, by fishery and year (1980–2012)[3]. Note that no catch and effort data are available for the period 1950–1982 in the IOTC Secretariat databases



[3] Note that the above list is not exhaustive, showing only the fisheries for which size data are available in the IOTC database. Furthermore, when available size data may not be available throughout the year existing only for short periods

LOT (All samples): size (in cm)



LOT (Gillnet samples): size (in cm)

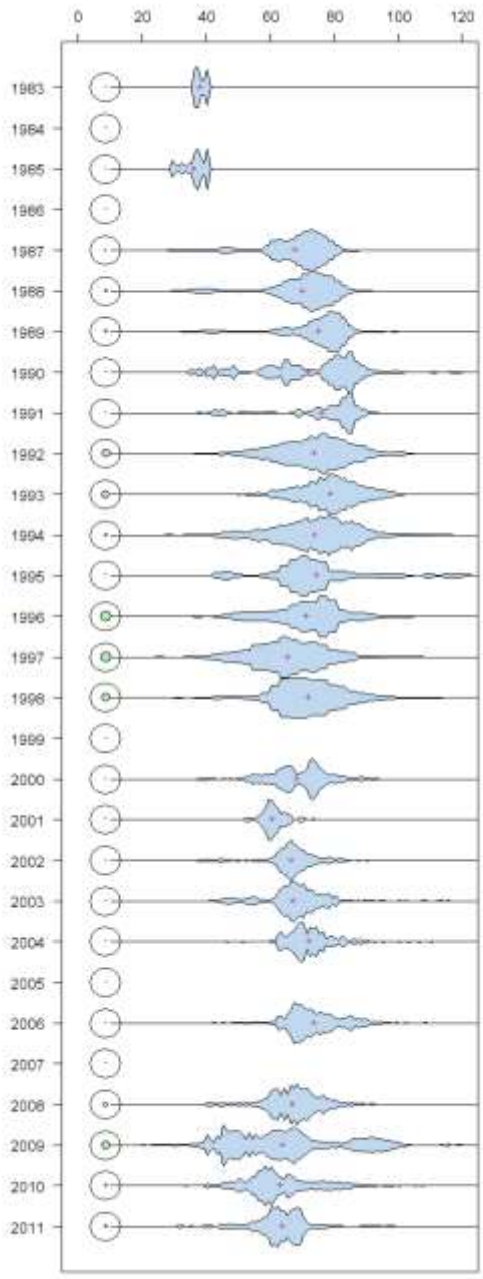


Fig. 5: Longtail tuna: Length frequency distributions (total amount of fish measured by 1cm length class) derived from the data available at the IOTC Secretariat for selected fisheries, by gear and year. The black outline circles (to the left of each chart) indicate the minimum sampling standard set by IOTC of one fish per metric tonne; the green proportional circles indicate the relative sampling coverage in each year (i.e., circles with areas greater than the minimum sampling standard indicate relatively high sampling coverage in a given year).

STOCK ASSESSMENT

There are limited stock status indicators available for longtail tuna (although preliminary work by the IOTC secretariat, on a surplus production model in the Indian Ocean indicate that the stock may be fully exploited/overexploited and spawning stock size levels currently may exceed SMSY by 50%) and further work is urgently required in 2013. The preliminary estimation of stock indicators was attempted on the catch and effort datasets from the Indian and Thailand gillnet and purse seine fisheries (described above). However, there is considerable uncertainty about the degree to which this and

other indicators represent abundance as factors such as changes in targeting practices, discarding practices, fishing grounds and management practices are likely to interact in the depicted trends. Further work must be undertaken to derive additional stock indicators for this species, because in the absence of a quantitative stock assessment, such indicators represent the only means to monitor the status of the stock and assess the impacts of fishing (Table 6).

TABLE 6. Longtail tuna (*Thunnus tonggol*) stock status summary

Management Quantity	**Aggregate Indian Ocean**
2012 catch estimate	155,603 t
Mean catch from 2008–2012	133,890 t
MSY (80% CI)	110,000–123,000 t
Data period used in assessment	1950–2011
F_{2011}/F_{MSY} (80% CI)	1.11–1.77
B_{2011}/B_{MSY} (80% CI)	1.11–1.25
SB_{2011}/SB_{MSY}	–
B_{2011}/B_0 (80% CI)	–
SB_{2011}/SB_0	–
$B_{2011}/B_{0,\ F=0}$	–
$SB_{2011}/SB_{0,\ F=0}$	–

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