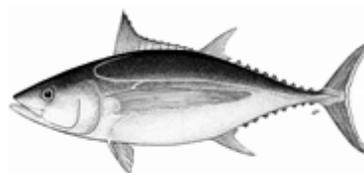


EXECUTIVE SUMMARY: ALBACORE



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



Status of the Indian Ocean albacore (ALB: *Thunnus alalunga*) resource

TABLE 1. Albacore: Status of albacore (*Thunnus alalunga*) in the Indian Ocean.

Area ¹	Indicators – 2014 assessment			2015 stock status determination
		SS3	ASPIC	2012 ²
Indian Ocean	Catch 2014:	40,981 t	40,981 t	
	Average catch 2010–2014:	38,181 t	38,181 t	
	MSY (1,000 t) (80% CI):	47.6 (26.7–78.8)	34.7 (28.8–37.4)	
	F _{MSY} (80% CI):	0.31 (0.21–0.42)	0.50 (n.a.)	
	SB _{MSY} (1,000 t) (80% CI):	39.2 (25.4–50.7)	68.6 (n.a.)*	
	F ₂₀₁₂ /F _{MSY} (80% CI):	0.69 (0.23–1.39)	0.94 (0.68–1.61)	
	SB ₂₀₁₂ /SB _{MSY} (80% CI):	1.09 (0.34–2.20)	1.05 (0.73–1.35)*	
	SB ₂₀₁₂ /SB ₁₉₅₀ (80% CI):	0.21 (0.11–0.33)	0.43 (n.a.)*	

¹Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence.

²The stock status refers to the most recent years' data used for the assessment, in this case 2012.

*Total exploitable Biomass (B)

Colour key	Stock overfished (SB _{year} /SB _{MSY} < 1)	Stock not overfished (SB _{year} /SB _{MSY} ≥ 1)
Stock subject to overfishing (F _{year} /F _{MSY} > 1)		
Stock not subject to overfishing (F _{year} /F _{MSY} ≤ 1)		
Not assessed/Uncertain		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. Trends in the Taiwan,China CPUE series suggest that the longline vulnerable biomass has declined to about 47% of the level observed in 1980–82. There were 20 years of moderate fishing before 1980, and the catch has more than doubled since 1980. Catches have increased substantially since 2007, attributed to the Indonesian and Taiwan,China longline fisheries although there is substantial uncertainty remaining on the catch estimates. It is considered that recent catches have been above the MSY level for one of the models (ASPIC) examined and approaching MSY levels for the other model (SS3). Fishing mortality represented as F₂₀₁₂/F_{MSY} is between 0.70 (Median: SS3) and 0.94 (Point estimate: ASPIC). Biomass is considered to be at or very near to the SB_{MSY} level (SB₂₀₁₂/SB_{MSY} = 1.09) from the SS3 model, and also for the B_{MSY} level (B₂₀₁₂/B_{MSY} = 1.05) from the ASPIC model (Table 1, Fig. 1). Thus, stock status in relation to the Commission's B_{MSY} and F_{MSY} target reference points indicates that the stock is **not overfished** and **not subject to overfishing** (Table 1), although considerable uncertainty remains in the SS3 and ASPIC assessments, indicating that a precautionary approach to the management of albacore should be applied by reducing fishing mortality or capping total catch levels to 34,000 t.

Outlook. Maintaining or increasing effort in the core albacore fishing grounds is likely to result in further declines in albacore biomass, productivity and CPUE. The impacts of piracy in the western Indian Ocean has resulted in the displacement of a substantial portion of longline fishing effort into the traditional albacore fishing areas in the southern and eastern Indian Ocean. It is therefore unlikely that catch and effort on albacore will decline in the near future unless management action is taken. There is a high risk of exceeding MSY-based reference points by 2015 if catches increase further (above 2012 levels) (50% risk that SB₂₀₁₅ < SB_{MSY}, and 39% risk that F₂₀₁₅ > F_{MSY} (Table 2).

Management advice. If catch remains below the estimated MSY levels, then immediate management measures are not required. However, continued monitoring and improvement in data collection, reporting and analysis is required to reduce the uncertainty in assessments.

The following should be noted:

- **Maximum Sustainable Yield (MSY):** Current catches (40,981 t in 2014; 33,671 t in 2013) are below the current estimated MSY levels from both models ([Table 1](#)). However, maintaining or increasing effort will likely result in further declines in biomass, productivity and CPUE.
- **Interim reference points:** Noting that the Commission has agreed to Resolution 15/10 *on target and limit reference points and a decision framework*, the following should be noted:
 - **Fishing mortality:** Current fishing mortality is considered to be below the provisional target reference point of F_{MSY} , and the provisional limit reference point of $1.4 \cdot F_{MSY}$ ([Fig. 1](#)).
 - **Biomass:** Current spawning biomass is considered to be near the target reference point of SB_{MSY} , and therefore above the limit reference point of $0.4 \cdot SB_{MSY}$ ([Fig. 1](#)).
- **Main fishing gear** (2009–13): Longline $\approx 93\%$ (fresh $\approx 56.4\%$, Frozen $\approx 36.6\%$).
- **Main fleets:** Taiwan,China $\approx 36\%$; Indonesia $\approx 32\%$; Japan $\approx 9\%$; China $\approx 7\%$.
- The available evidence indicates considerable risk to the stock status at current effort levels.
- The two primary sources of data that drive the assessment, total catches and CPUE are highly uncertain and should be investigated further as a priority.
- The use of aggregated data versus fine-scale operational data in the CPUE standardisations by the main fleet (Taiwan,China) introduces substantial uncertainty.
- The preliminary catch estimates for 2013, as of 2014 WPTmT05 meeting ($\sim 43,000$ t) are one of the highest catches on record, and may be a cause for concern for the long-term sustainability of the stock if it remains at these levels. Note, a preliminary ASPIC analysis accounting for the larger catches in 2013 indicated no change in stock status from 2012.
- In 2014 the IOTC Secretariat raised questions on the preliminary 2013 catches of albacore submitted by Indonesia (at around 16,000 t – the highest catches recorded) compared to alternative information, including data from exports and purchasing supply chains collected by ISSF participating companies. Following discussions with Indonesia, final catches for 2013 were submitted by Indonesia in December 2014 to around 6,000 t).
- A Kobe 2 Strategy matrix was calculated to quantify the risk of different future catch scenarios, using the projections from the SS3 model ([Table 2](#)). The projections indicated that there is a 50% chance of violating the biomass based reference point by 2015 if catches are maintain or increased up to 20% (i.e. below SB_{MSY}) ([Table 2](#)).

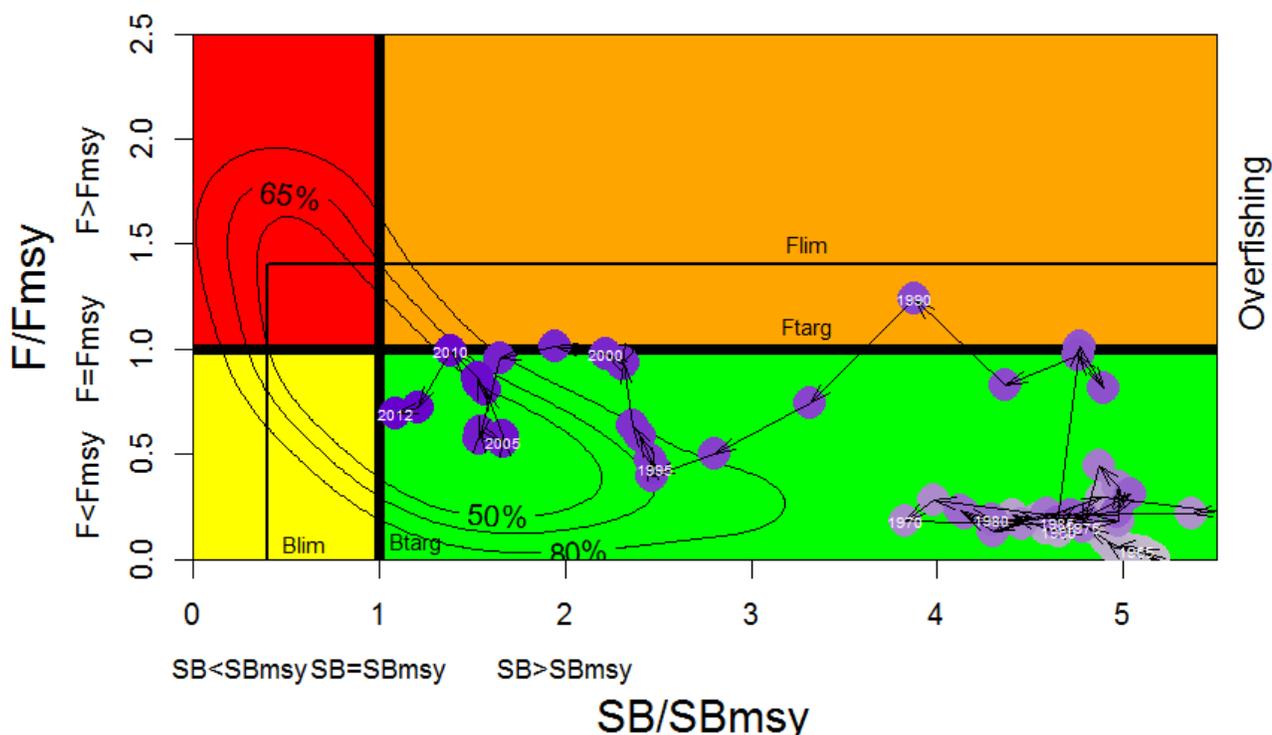


Fig. 1. Albacore: SS3 Aggregated Indian Ocean assessment Kobe plot (contours are the 50, 65 and 80 percentiles of the 2012 grid runs). Blue circles indicate the trajectory of the point estimates for the SB ratio and F ratio for each year 1950–2012. Target (F_{targ} and SB_{targ}) and limit (F_{lim} and SB_{lim}) reference points are shown.

TABLE 2. Albacore: SS3 aggregated Indian Ocean assessment Kobe II Strategy Matrix. Probability (percentage) of violating the MSY-based target (top) and limit (bottom) reference points for nine constant catch projections (average catch level from 2011–013, $\pm 10\%$, $\pm 20\%$, $\pm 30\%$ $\pm 40\%$) projected for 3 and 10 years.

Reference point and projection timeframe	Alternative catch projections (relative to the average catch level from 2011–13) and probability (%) of violating MSY-based target reference points ($SB_{\text{targ}} = SB_{\text{MSY}}$; $F_{\text{targ}} = F_{\text{MSY}}$)								
	60% (22,084 t)	70% (25,764 t)	80% (29,445 t)	90% (33,125 t)	100% (36,806 t)	110% (40,487 t)	120% (44,167 t)	130% (47,848 t)	140% (51,528 t)
$SB_{2015} < SB_{\text{MSY}}$	31	33	39	42	50	50	50	53	61
$F_{2015} > F_{\text{MSY}}$	11	19	22	36	39	44	50	53	56
$SB_{2022} < SB_{\text{MSY}}$	11	19	22	33	39	44	47	53	56
$F_{2022} > F_{\text{MSY}}$	6	11	22	31	36	44	47	53	56
Reference point and projection timeframe	Alternative catch projections (relative to the average catch level from 2011–13) and probability (%) of violating MSY-based limit reference points ($SB_{\text{lim}} = 0.4 B_{\text{MSY}}$; $F_{\text{lim}} = 1.4 F_{\text{MSY}}$)								
	60% (22,084 t)	70% (25,764 t)	80% (29,445 t)	90% (33,125 t)	100% (36,806 t)	110% (40,487 t)	120% (44,167 t)	130% (47,848 t)	140% (51,528 t)
$SB_{2015} < SB_{\text{Lim}}$	0	0	6	8	17	22	28	33	33
$F_{2015} > F_{\text{Lim}}$	0	6	14	19	25	31	39	42	44
$SB_{2022} < SB_{\text{Lim}}$	0	6	14	19	28	33	36	42	47
$F_{2022} > F_{\text{Lim}}$	0	6	14	22	31	36	42	44	50