

Yellowfin Tuna (2023)

Thunnus albacares



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth	Indian Ocean	Depleting	Spawning stock biomass, fishing mortality
Commonwealth	Western and Central Pacific Ocean	Sustainable	Spawning stock biomass, fishing mortality

STOCK STRUCTURE

Yellowfin Tuna in the Indian Ocean, and Western and Central Pacific Ocean are considered to be two distinct biological stocks and are managed by separate regional fisheries management organisations. The Indian Ocean stock falls under the jurisdiction of the Indian Ocean Tuna Commission (IOTC) while the Western and Central Pacific Ocean stock falls under the jurisdiction of the Western and Central Pacific Fisheries Commission (WCPFC). These two commissions are international organisations established to manage a number of highly migratory fish species within their defined geographic ranges.

In the Indian Ocean, analysis from a recent genetics and otolith microchemistry study found evidence for two distinct groupings of Yellowfin Tuna [Davies et al. 2020]. However, as the spatial delineation of these groups remains unclear [Davies et al. 2020], the IOTC stock assessment for Yellowfin Tuna [Nishida and Kitakado 2021] has continued on the assumption of a single biological stock. More detailed studies of Yellowfin Tuna stock structure in the Indian Ocean are underway and will inform future stock assessments.

Similarly, although there is some evidence of genetically distinct populations of Yellowfin Tuna in the Pacific Ocean [Grewe et al. 2015; Evans et al. 2021], the findings are not sufficient to define biological stock boundaries, and thus stock assessments assume a single biological stock within the Western and Central Pacific Ocean (defined as west of 150 °W) [Vincent et al. 2020].

Here, status is presented at the biological stock level—Indian Ocean and Western and Central

Pacific Ocean.

STOCK STATUS

Indian Ocean

The Indian Ocean biological stock of Yellowfin Tuna is fished by Australian fishers endorsed to operate in the Western Tuna and Billfish Fishery (Commonwealth), and members of the Indian Ocean Tuna Commission. The regional stock assessments undertaken by the Indian Ocean Tuna Commission account for information from all jurisdictions.

In the Indian Ocean, the most recent assessment [IOTC 2021] estimates that the biomass in 2020 of the biological stock was 31% of the 1950 (assumed unfished) levels (80% confidence interval 24–38% across the grid of models used). The biological stock is not considered to be recruitment impaired.

The assessment estimated that fishing mortality was above the level associated with maximum sustainable yield (MSY) (132% of fishing mortality at MSY; 80% confidence interval 68–195%). This level of fishing mortality increases the likelihood of the stock becoming recruitment impaired.

Due to ongoing technical challenges and issues associated with the assessment, the IOTC Scientific Committee has recommended that the most recent assessment be subject to an independent peer review [IOTC 2021].

Based on the evidence provided above, the Indian Ocean biological stock is classified as a **depleting stock**.

Western and Central Pacific Ocean

The Western and Central Pacific Ocean biological stock of Yellowfin Tuna is fished by Australian fishers endorsed to operate in the Eastern Tuna and Billfish Fishery (Commonwealth), and members of the Western and Central Pacific Fisheries Commission. The assessments undertaken for the Western and Central Pacific Fisheries Commission account for information from all jurisdictions that take Yellowfin Tuna in this region.

In the Western and Central Pacific Ocean, the most recent assessment [Vincent et al. 2020] estimates that the median recent spawning stock biomass was 58% of the levels predicted to occur in the absence of fishing (80% confidence interval 51–64% across the grid of models used). The probability that the recent spawning stock biomass had breached the limit reference point (LRP) of 20% of unfished levels was zero [WCPFC 2021]. The biological stock is not considered to be recruitment impaired. This assessment estimated that median recent fishing mortality was below the level associated with MSY (36% of mortality at MSY; 80% confidence interval 27–47%). The probability that the recent fishing mortality was above the level associated with MSY was zero. This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

Significant concerns and problems were found with the 2020 Yellowfin Tuna assessment and modelling approach and a cautionary approach was applied when interpreting the assessment outcomes to guide management decisions. Though the assessment was accepted, an independent review was recommended [WCPFC 2020]. An updated assessment addressing the concerns raised is currently being finalised.

Based on the evidence provided above, the Western and Central Pacific Ocean

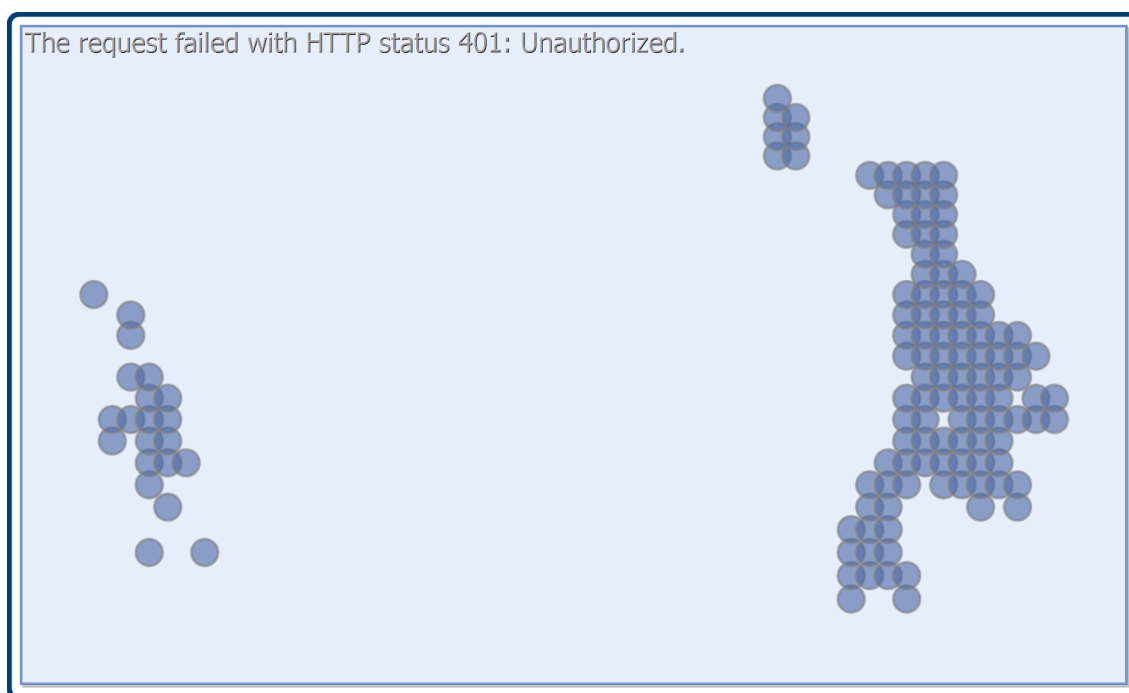
biological stock is classified as a **sustainable stock**.

BIOLOGY

Yellowfin Tuna biology [Itano 2000; Froese and Pauly 2009; Farley et al. 2020]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Yellowfin Tuna	Greater than 15 years, approximately 1,800 mm FL	Approximately 2 years, 1,000 - 1,100 mm FL

DISTRIBUTION



Distribution of reported Australian commercial catch of Yellowfin Tuna in 2021

TABLES

Fishing methods	Commonwealth	New South Wales	Queensland	Victoria	Western Australia
Commercial					
Danish Seine	✓				
Gillnet	✓				
Handline	✓				
Handline (mechanised)	✓				

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Haul Seine/Beach Seine	✓				
Hook and Line	✓				
Lift nets	✓				
Longline (Unspecified)	✓				
Pole and Line	✓				
Purse Seine	✓				
Spearfishing	✓				
Trawl	✓				
Trolling	✓				
Unspecified	✓				
Various	✓				
Recreational					
Hook and Line		✓	✓	✓	✓

Management Methods	
	Commonwealth
Commercial	
Area restrictions	✓
Catch limits	✓
Individual transferable quota	✓
Licence	✓
Recreational	
Bag limits	✓
Boat limits	✓

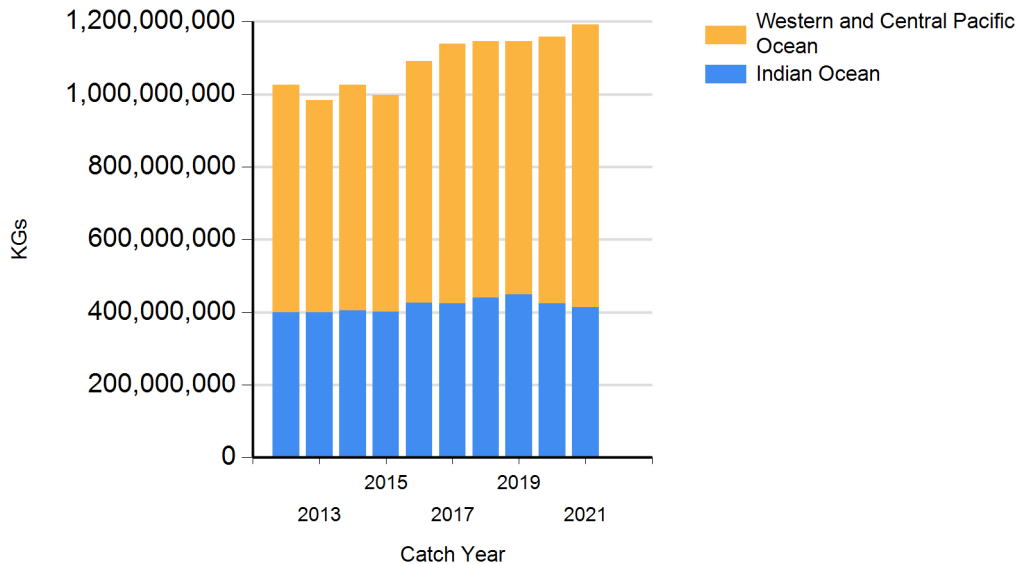
Catch					
	Commonwealth	New South Wales	Queensland	Victoria	Western Australia
Commercial	0 t				
Recreational		unknown	unknown	unknown	10.4 t (+/- 3 t se, 2020–21)

Commercial (catch). Catches reported for the Indian Ocean Tuna Commission and Western and Central Pacific Fisheries Commission are for 2021, the most recent year available.

Commonwealth – Recreational. The Australian Government does not manage recreational fishing in Commonwealth waters. Recreational fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters, under its management regulations.

Commonwealth – Indigenous. The Australian Government does not manage non-commercial Indigenous fishing in Commonwealth waters, with the exception of the Torres Strait. In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters.

CATCH CHART



Commercial catch of Yellowfin Tuna - note confidential catch not shown

References	
Grewe et al. 2015	Grewe, P, Feutry, P, Hill, PL, Gunasekera, RM, Schaefer, KM, Itano, DG, Fuller, DW, Foster, SD and Davies, CR 2015, Evidence of discrete yellowfin tuna (<i>Thunnus albacares</i>) populations demands rethink of management for this globally important resource, <i>Scientific Reports</i> , 5: doi 10.1038/srep16916.
IOTC 2021	IOTC 2021, Report of the 24th session of the Scientific Committee, online meeting, 6 to 10 December 2021, IOTC-2021-SC24-R[E], Indian Ocean Tuna Commission.
WCPFC 2021	Western and Central Pacific Fisheries Commission 2021, Scientific Committee—WCPO Yellowfin Tuna (<i>Thunnus albacares</i>)—stock status and management advice.
Froese and Pauly 2009	Froese, R and Pauly, DE 2009, FishBase, version 06/2016, FishBase Consortium.

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Davies et al. 2020	Davies, C, Marsac, F, Murua, H, Fahmi, Z and Fraile, I, Fahmi, Z, Farley, J, Grewe, P, Proctor, C, Clear, N, Eveson, P, Lansdell, M, Aulich, J, Feutry, P, Cooper, S, Foster, S, Rodríguez-Ezpeleta, N, Artetxe-Arrate, I, Krug, I, Mendibil, I, Agostino, L, Labonne, M, Nikolic, N, Darnaude, A, Arnaud-Haond, S, Devloo-Delva, F, Rougeux, C, Parker, D, Diaz-Arce, N, Wudiano, Ruchimat, T, Satria, F, Lestari, P, Taufik, M, Priatna, A and Zamroni, A 2020, Summary of population structure of IOTC species from PSTBS-IO project and recommended priorities for future work and sharks of interest in the Indian Ocean using genetics and microchemistry: 2020 final report to IOTC, final report submitted to the Indian Ocean Tuna Commission, online meeting, 7 to 11 December 2020, IOTC-2020-SC23-11_Rev1, Indian Ocean Tuna Commission.
Itano 2000	Itano D 2000, The reproductive biology of yellowfin tuna (<i>Thunnus albacares</i>) in Hawaiian waters and the western tropical Pacific Ocean: Project summary, JIMAR Contributions 00-328 SOEST 00-01.
Farley et al. 2020	Farley, J, Krusic-Golub, K, Eveson, P, Clear, N, Rouspard, F, Sanchez, C, Nicol, S & Hampton, J 2020, Age and growth of yellowfin and bigeye tuna in the western and central Pacific Ocean from otoliths, Technical report SC16-SA-WP-02, WCPFC Scientific Committee 16th regular session, online meeting, 12 to 19 August 2020.
Vincent et al. 2020	Vincent, M, Ducharme-Barth, N, Hamer, P, Hampton, J, Williams, P and Pilling, G 2020, Stock assessment of yellowfin tuna in the western and central Pacific Ocean, working paper WCPFC-SC16-2020/SA-WP-04 (Rev 3), WCPFC Scientific Committee 16th regular session, online meeting, 12 to 19 August 2020.
Blake et al. 2022	Blake, S, Bromhead, D, Patterson, H and Dylewski, M 2022, Western Tuna and Billfish Fishery, in Patterson, H, Bromhead, D, Galeano, D, Larcombe, J, Timmiss, T, Woodhams, J and Curtotti, R (eds), Fishery status reports 2022, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.
WCPFC 2020	Western and Central Pacific Fisheries Commission 2020, Sixteenth Regular Session of the Scientific Committee – Summary Report, electronic meeting, 12 to 19 August 2020, WCPFC17-2020-SC16, WCPFC.
Evans et al. 2021	Evans, K, Grewe, P, Foster, S, Gunasekera, R and Lansdell, M 2021, Determination of the spatial dynamics and movement rates of the principal target species within the Eastern Tuna and Billfish Fishery and connectivity with the broader western and central Pacific Ocean – beyond tagging, FRDC Project No 2016/018. Final Report April 2021. https://www.frdc.com.au/project/2016-018