

# Yellowfin Tuna (2020)

*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, preliminary analysis from a recent genetics and otolith microchemistry study found evidence for two distinct groupings of yellowfin tuna [Davies et al. 2019]. However, as the spatial delineation of these groups remains unclear [Davies et al. 2019], the IOTC stock assessment for Yellowfin Tuna has continued on the assumption of a single biological stock.

Similarly, although a recent study provided evidence of genetically distinct populations of Yellowfin Tuna at three sites in the Pacific Ocean [Grewe et al. 2015], the findings are not sufficient to define biological stock boundaries, and thus stock assessments are based on the assumption of a single biological stock within the Western and Central Pacific Ocean [Tremblay-Boyer et al. 2017].

Further and more detailed studies of Yellowfin Tuna stock structure are underway for both the Indian and Pacific oceans, and will inform future stock assessments.

## 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 take into account information from all jurisdictions.

In the Indian Ocean, the most recent assessment [IOTC 2019] estimates that the biomass in 2017 of the biological stock was 30 per cent of unfished levels (range 27–33 per cent). The biological stock is not considered to be recruitment impaired [Williams et al. 2020]. However, the assessment estimated that fishing mortality was above the level associated with maximum sustainable yield (MSY) (120 per cent of fishing mortality at MSY; range 100–171 per cent). This level of fishing mortality is likely to cause the biological stock to become recruitment impaired [Williams et al. 2020].

On the basis of 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 take into account information from all jurisdictions that take Yellowfin Tuna in this region.

In the Western and central Pacific Ocean, the most recent assessment [Tremblay-Boyer et al. 2017] estimates that the median recent spawning stock biomass was 33 per cent of the unfished level (range 20–41 per cent). There was an eight per cent probability that the spawning stock biomass had breached the limit reference point [WCPFC 2019]. The biological stock is not considered to be recruitment impaired [Larcombe et al. 2020, WCPFC 2019]. This assessment estimated that current fishing mortality was below the level associated with MSY (74 per cent of mortality at MSY; probability interval 62–97 per cent). There was a four per cent probability that the recent fishing mortality was above the level associated with MSY [WCPFC 2019]. This level of fishing mortality is unlikely to cause the biological stock to become recruitment impaired [Larcombe et al. 2020].

Based on the evidence provided above, the Western and Central Pacific Ocean biological stock is classified as a **sustainable stock**.

**BIOLOGY**

**Yellowfin Tuna biology** [Froese and Pauly 2009]

| Species        | Longevity / Maximum Size | Maturity (50 per cent) |
|----------------|--------------------------|------------------------|
| Yellowfin Tuna | 9 years, ~1 800 mm FL    | ~2 years, 1 000 mm FL  |

**DISTRIBUTION**



Distribution of reported commercial catch of Yellowfin Tuna

**TABLES**

| <b>Fishing methods</b> |                     |                        |                   |                 |                          |
|------------------------|---------------------|------------------------|-------------------|-----------------|--------------------------|
|                        | <b>Commonwealth</b> | <b>New South Wales</b> | <b>Queensland</b> | <b>Victoria</b> | <b>Western Australia</b> |
| <b>Commercial</b>      |                     |                        |                   |                 |                          |
| Longline (Unspecified) | ✓                   |                        |                   |                 |                          |
| <b>Recreational</b>    |                     |                        |                   |                 |                          |
| Hook and Line          |                     | ✓                      | ✓                 | ✓               | ✓                        |

| <b>Management Methods</b>     |                     |
|-------------------------------|---------------------|
|                               | <b>Commonwealth</b> |
| <b>Commercial</b>             |                     |
| Area restrictions             | ✓                   |
| Catch limits                  | ✓                   |
| Gear restrictions             | ✓                   |
| Individual transferable quota | ✓                   |
| Limited entry                 | ✓                   |
| <b>Recreational</b>           |                     |
| Bag limits                    | ✓                   |
| Boat limits                   | ✓                   |

| Catch        | Commonwealth | New South Wales | Queensland | Victoria | Western Australia |
|--------------|--------------|-----------------|------------|----------|-------------------|
| Commercial   | 2135 t       |                 |            |          |                   |
| Recreational |              | unknown         | unknown    | unknown  | unknown           |

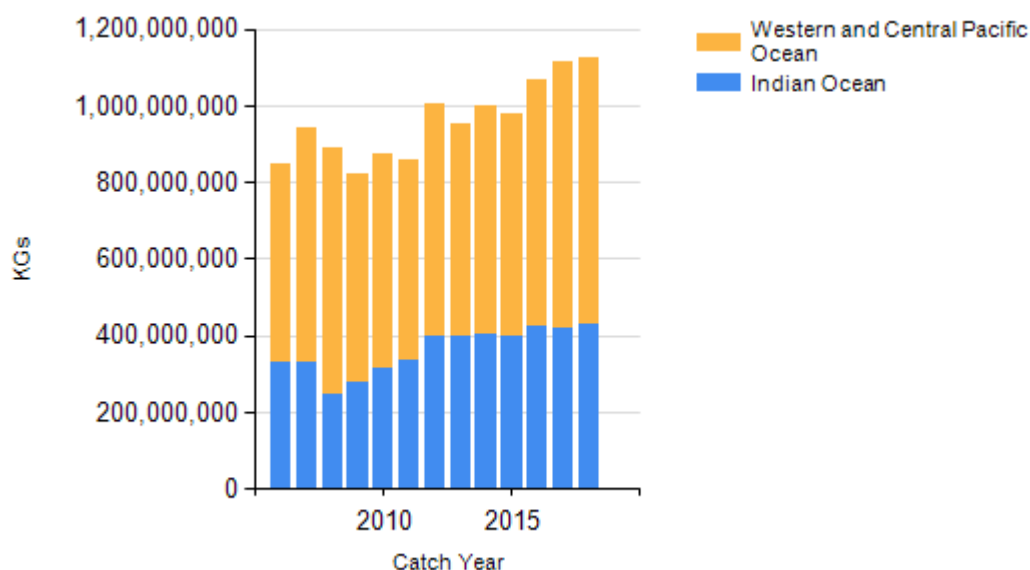
**Commercial (catch)** Catches reported for the Indian Ocean Tuna Commission and Western and Central Pacific Fisheries Commission are for 2018, the most recent year available; data for the Eastern Tuna and Billfish Fishery and Western Tuna Billfish Fishery are for 2018/2019.

**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 Recreational and Indigenous** Recreational and Indigenous fishing sectors in the Indian Ocean are Western Australia, South Australia and Victoria; recreational sectors in the Pacific Ocean are Queensland, New South Wales and Tasmania. Measures listed here exist in one of these jurisdictions.

**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

|                            |                                                                                                                                                                                                                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tremblay-Boyer et al. 2017 | Tremblay-Boyer, L, McKechnie, S, Pilling, G & Hampton, J 2017, 'Stock assessment of yellowfin tuna in the western and central Pacific Ocean, working paper WCPFC-SC13-2017/SA-WP-06, WCPFC Scientific Committee thirteenth regular session, Rarotonga, Cook Islands, 9–17 August 2017. |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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, Scientific Reports, 5: doi 10.1038/srep16916.                                                                                                                                                                                                                                                                                                                                                             |
| IOTC 2019             | Indian Ocean Tuna Commission 2019, Report of the twenty-second session of the Scientific Committee, Karachi, Pakistan, 2–6 December 2019.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Williams et al. 2020  | Williams, A, Patterson, H and Mobsby, D 2020, Western Tuna and Billfish Fishery, in H Patterson, J Larcombe, J Woodhams and R Curtotti (eds), Fishery status reports 2020, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, pp 421–438.                                                                                                                                                                                                                                                                                                                                                                                                        |
| WCPFC 2019            | Western and Central Pacific Fisheries Commission 2019, Summary report of the fifteenth regular session of the Scientific Committee for the Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia 12–20 August 2019.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Larcombe et al. 2020  | Larcombe, J, Patterson, H and Mobsby, D 2020, Eastern Tuna and Billfish Fishery, in H Patterson, J Larcombe, J Woodhams and R Curtotti (eds), Fishery status reports 2020, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, pp 377–399.                                                                                                                                                                                                                                                                                                                                                                                                        |
| Froese and Pauly 2009 | Froese, R and Pauly, DE 2009, FishBase, version 06/2016, FishBase Consortium. <a href="http://www.fishbase.org">www.fishbase.org</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Davies et al. 2019    | Davies, C, Marsac, F, Murua, H, Fraile, I, Fahmi, Z, Farley, J, Grewe, P, Proctor, C, Clear, N, Lansdell, M, Aulich, J, Feutry, P, Cooper, S, Foster, S, Rodríguez-Ezpeleta, N, Artetxe, I, Nikolic, N, Krug, I, Mendibil, I, Agostino, L, Labonne, M, Darnaude, A, Arnaud-Haond, S, Wudiano, Ruchimat, T, Satria, F, Lestari, P, Taufik, M, Priatna, A, & Zamroni, A 2019, 'Study of population structure of IOTC species and sharks of interest in the Indian Ocean using genetics and microchemistry: an update on progress and preliminary results', paper submitted to the Scientific Committee Meeting, IOTC-2019-SC22-INFO-05, Karachi, Pakistan, 2 to 6 December 2019. |