

# Striped Marlin (2023)

*Kajikia audax*



**Trent Timmiss:** Australian Bureau of Agricultural and Resource Economics and Sciences,  
**Alistair Becker:** New South Wales Department of Primary Industries

## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth	Indian Ocean	Depleted	Spawning stock biomass, fishing mortality
Commonwealth, New South Wales	South-West Pacific Ocean	Depleted	Spawning stock biomass, fishing mortality

## STOCK STRUCTURE

Striped Marlin in the Indian Ocean is considered to be separate from the stocks in the Western and Central Pacific Ocean, where separate stocks north and south of the equator occur. Here we consider the Indian Ocean stock and the South-West Pacific stock which are managed by the Indian Ocean Tuna Commission (IOTC) and Western and Central Pacific Fisheries Commission (WCPFC) respectively. These two commissions are international organisations established to manage a number of highly migratory fish species within their defined geographic ranges.

Here, stock status is presented at the biological stock level—Indian Ocean and South-West Pacific Ocean.

## STOCK STATUS

### Indian Ocean

The Indian Ocean biological stock is fished by Australian fishers endorsed to fish in the Western Tuna and Billfish Fishery (WTBF) (Commonwealth), and members of the Indian Ocean Tuna Commission (IOTC). The assessments undertaken by the IOTC take into account information from all jurisdictions that take Striped Marlin in this region.

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A 2021 stock assessment of the Indian Ocean-wide stock used 2 assessment models: JABBA, a Bayesian state-space production model, and Stock Synthesis 3 (SS3) [IOTC 2021; Blake et al. 2022]. These models estimated total biomass to be 6–12% of unfished (1950) biomass and well below the biomass necessary to produce maximum sustainable yield.

Catches of Striped Marlin in the WTBF have been relatively low (< 50 t) since the mid-1980s and very low (< 5 t) since 2000, with about 1 t taken in 2021. Total international catches in the IOTC area of competence declined from around 6,000 t in 1996 to around 2,000–4,000 t per year since 1999. Catch in 2020 was 2,540 t.

Both stock assessment models indicate that the Indian Ocean-wide stock has been heavily depleted and is below the Commonwealth's biomass limit reference point (0.2B0). The above evidence indicates that the biomass of this stock is likely to be depleted and that recruitment is likely to be impaired.

Despite extremely small domestic catches of Striped Marlin in the WTBF which are unlikely to be contributing to the depletion of the stock, fishing mortality for the Indian Ocean-wide stock was estimated to be well above FMSY.

On the basis of the evidence provided above, the Indian Ocean biological stock is classified as a **depleted stock**.

**South-West Pacific Ocean** The South-West Pacific Ocean (SWPO) biological stock of Striped Marlin is fished by Australian fishers endorsed to operate in the Eastern Tuna and Billfish Fishery (ETBF) (Commonwealth), and members of the Western and Central Pacific Fisheries Commission (WCPFC). The assessments undertaken for the WCPFC take into account information from all jurisdictions that take Striped Marlin in this region.

The most recent stock assessment for Striped Marlin in the SWPO (0–40°S, 140°E to 130°W) was in 2019 [Ducharme-Barth et al. 2019; Larcombe et al. 2022]. Influential changes from the previous (2012) assessment included use of standardised catch-per-unit-effort for the Japanese and Chinese Taipei fisheries, calculated using a geostatistical model, and updating the biological information on maturity and defining maturation as a function of length rather than age.

The median results indicated that stock biomass (SB) was 19.8% of the levels predicted to occur in the absence of fishing in 2018. There was a 50.3% probability that the recent spawning stock biomass had breached the Commonwealth default limit reference point (LRP) (0.2SB0). This was more pessimistic than the previous (2012) assessment, in which spawning biomass (2006 to 2009) was estimated to be 34% of the levels predicted to occur in the absence of fishing. The stock was estimated to be below the size required to produce maximum sustainable yield.

Catch in the ETBF is reported to 2021 for all stocks, while international catch from the WCPFC is only available up until 2020. Striped Marlin catch in the ETBF increased slightly in 2021 to 207 t, while catch in the WCPFC (south of the equator) increased slightly from 1,053 t in 2019 to 1,100 t in 2020.

The most recent median estimate of the SWPO spawning biomass (SB) of Striped Marlin [Ducharme-Barth et al. 2019] is very close to, but just below, the 0.2SB0 LRP adopted in the Commonwealth Harvest Strategy Policy and in the WCPFC for tunas (specifically 20% of the levels predicted to occur in the

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absence of fishing). The above evidence indicates that the biomass of this stock is likely to be depleted and that recruitment is likely to be impaired.

The most recent median estimate of fishing mortality was below the level associated with MSY (FMSY).

There is no commercial catch of Striped Marlin by fishers operating under NSW jurisdiction, but it is a highly regarded gamefish species targeted by recreational anglers, although the total recreational catch is believed to be small relative to commercial catches [Ducharme-Barth et al. 2019]. Since 1974 over 32,000 Striped Marlin have been caught and tagged within the NSW Gamefish Tagging Program, mostly off the NSW coast. Estimating the total recreational catch is difficult as anglers targeting this species are a relatively small percentage of the broader recreational fishing population, so they are poorly represented in recreational catch surveys [Murphy et al. 2022]. Although 90% of Striped Marlin are released [Lowry and Murphy 2003], mortality rates for post-released fish captured using recreational fishing tackle off Mexico have been estimated as high as 26% [Domeier et al. 2003].

On the basis of the evidence provided above, the South-West Pacific Ocean biological stock of Striped Marlin is classified as a **depleted stock**.

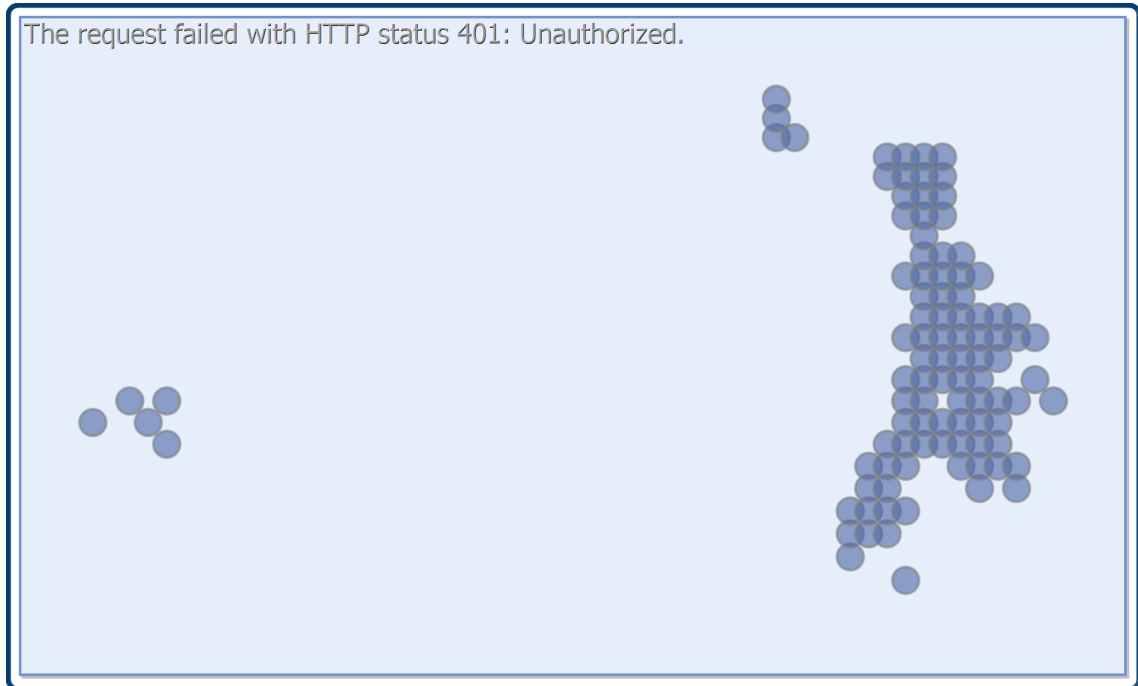
## BIOLOGY

[Kopf et al. 2011, 2012]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Striped Marlin	8.5 years, 4,200 mm	2–3 years, females 2,100 mm, males 1,668 mm

## DISTRIBUTION

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Distribution of reported commercial catch of Striped Marlin

TABLES

Fishing methods	Commonwealth	New South Wales	Queensland	Victoria	Western Australia
<b>Commercial</b>					
Danish Seine	✓				
Gillnet	✓				
Handline	✓				
Hook and Line	✓				
Longline (Unspecified)	✓				
Purse Seine	✓				
Trolling	✓				
Unspecified	✓	✓			
Various	✓				
<b>Recreational</b>					
Hook and Line		✓	✓	✓	✓

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Management Methods	
	Commonwealth
<b>Commercial</b>	
Area restrictions	✓
Catch limits	✓
Gear restrictions	✓
Individual transferable quota	✓
Limited entry	✓

Catch					
	Commonwealth	New South Wales	Queensland	Victoria	Western Australia
<b>Commercial</b>	0 t	0 t			
<b>Recreational</b>		Unknown	Unknown	Unknown	Unknown

**Commonwealth – 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.

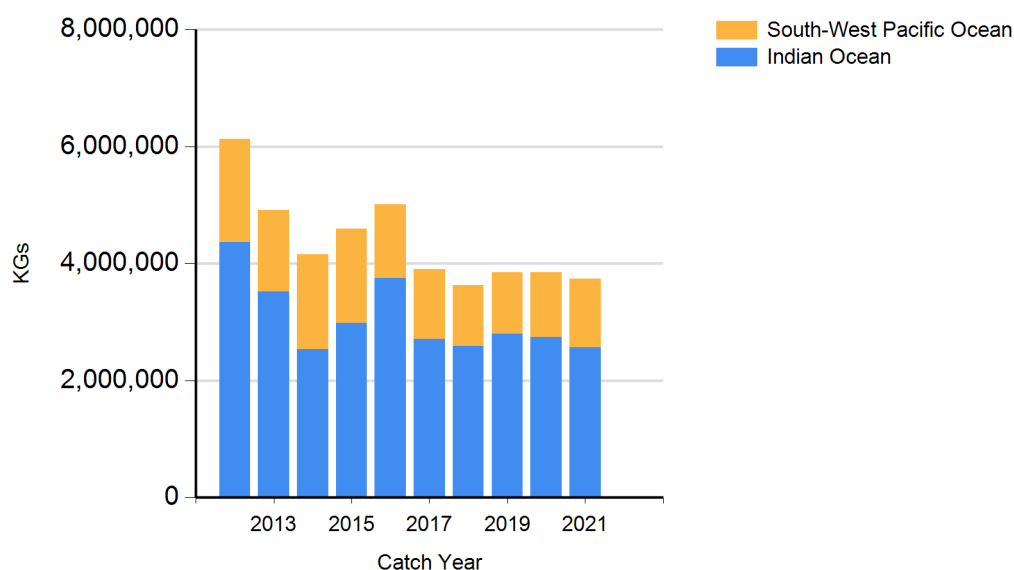
**Commonwealth – Recreational** The Australian Government does not manage recreational fishing in Commonwealth waters. Recreational fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters, under its management regulations. Recreational fishing sectors in the Indian Ocean are South Australia, Victoria and Western Australia. Recreational sectors in the Pacific Ocean are New South Wales, Queensland and Tasmania.

**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. Indigenous fishing sectors in the Indian Ocean are South Australia, Victoria and Western Australia.

**New South Wales – Recreational** Murphy et al. [2022].

## CATCH CHART

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Commercial catch of Striped Marlin - note confidential catch not shown

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