

# Swordfish (2023)

*Xiphias gladius*



**Steph Blake:** Australian Bureau of Agricultural and Resource Economics and Sciences

## STOCK STATUS OVERVIEW

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

## STOCK STRUCTURE

Swordfish in the Indian Ocean, and Western and Central Pacific Ocean are considered to be two distinct biological stocks [Grewe et al. 2020] and are managed by separate regional fisheries management organisations: the Indian Ocean Tuna Commission (IOTC) and the 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.

In the Indian Ocean, genetic [Grewe et al. 2020] and otolith microchemistry [Darnaude et al. 2020] analyses have indicated the potential for more than one biological stock. However, additional sampling and analyses are needed to confirm this [Darnaude et al. 2020; Davies et al. 2020; Grewe et al. 2020]. Currently, Indian Ocean Swordfish are assessed as a single biological stock [Muths et al. 2013; IOTC 2021].

In the Pacific Ocean, stock structure remains somewhat uncertain. Genetic studies [Reeb et al. 2000; Alvarado Bremer et al. 2006] have suggested the presence of several biological stocks, with additional evidence from catch rates, tagging and larval surveys for separation of south-west and north-west Pacific Swordfish, but with some potential connectivity of both to swordfish in the central and eastern Pacific. In contrast, Kasapidis et al. [2008] found the degree of genetic variation throughout the Pacific to be low. Electronic (popup satellite archival) tagging has also indicated limited connectivity between the eastern and western parts of the Tasman and Coral Seas within the Pacific Ocean, with few individuals crossing the 170°W longitudinal line from west to east [Evans et al. 2012]. Noting the uncertainty around stock structure, two sub-stocks are currently assessed in the Western and Central Pacific Ocean: the South-west

Pacific stock (defined as south of the Equator between 140 °E and 130 °W) and the North Pacific stock. Only the South-west Pacific stock is fished by Australian fishers.

Here, status is presented at the management unit level—Indian Ocean and South-west Pacific Ocean.

## STOCK STATUS

**Indian Ocean** The Indian Ocean biological stock of Swordfish 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 assessments undertaken by the Indian Ocean Tuna Commission take into account information from all jurisdictions.

In the Indian Ocean, the most recent assessment [IOTC 2021] estimates that biomass in 2018 was 42% of the 1950 (assumed unfished) level (80% confidence interval 36–47%). The biological stock is not considered to be recruitment impaired. The assessment also estimated that fishing mortality in 2018 was below the level associated with maximum sustainable yield (MSY) (60% of fishing mortality at MSY; 80% confidence interval 40–83%). This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

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

**South-West Pacific Ocean** The South-West Pacific Ocean management unit of Swordfish 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 (WCPFC) account for information from all jurisdictions that take Swordfish in this region.

In the South-West Pacific Ocean, the most recent assessment [Ducharme-Barth et al. 2021] estimates median 2019 spawning biomass at 39% of unfished levels (80% confidence interval 18–79%). There was a very low probability that the recent spawning biomass has breached the limit reference point (LRP) of 20% unfished levels. The stock is therefore not considered to be recruitment impaired.

Recent (2015–2018) median fishing mortality was estimated as 47% of the level of fishing associated with MSY (80% confidence interval 25–129%). There was a 20% probability that the recent level of fishing mortality was above the level that results in MSY [WCPFC 2022]. This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

Based on the evidence provided above, the South-West Pacific Ocean stock is classified as a **sustainable stock**.

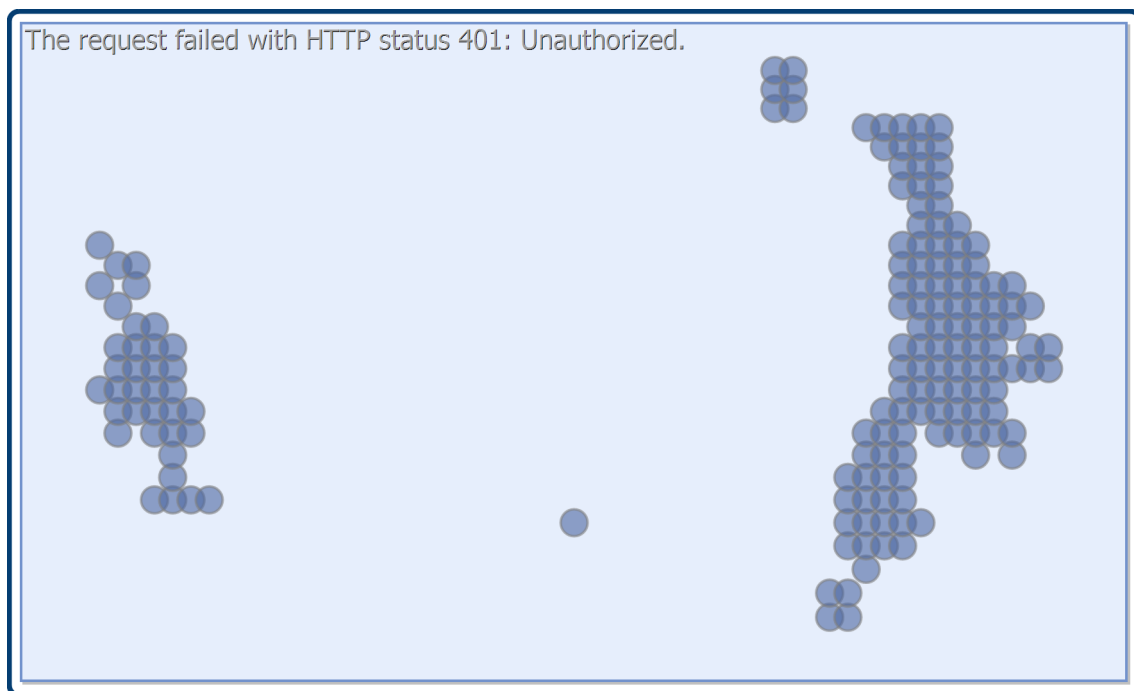
## BIOLOGY

**Swordfish biology** [Froese and Pauly 2009; Farley et al. 2016, 2022]

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Species	Longevity / Maximum Size	Maturity (50 per cent)
Swordfish	20+ years, 4,550 mm	Females: 4–5 years, approximately 1,700 mm FL Males: 2–3 years, approximately 1,200 mm FL (Fork length is measured from the tip of the lower jaw for Swordfish)

**DISTRIBUTION**



Distribution of reported Australian commercial catch of Swordfish in 2021

**TABLES**

Fishing methods	Commonwealth
Commercial	
Various	✓

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Management Methods	Commonwealth
<b>Commercial</b>	
Area restrictions	✓
Catch limits	✓
Individual transferable quota	✓
Licence	✓
<b>Recreational</b>	
Bag limits	✓

Catch	Commonwealth	New South Wales	Queensland	Tasmania	Victoria
<b>Commercial</b>	0 t				
<b>Recreational</b>		unknown	unknown	unknown	unknown

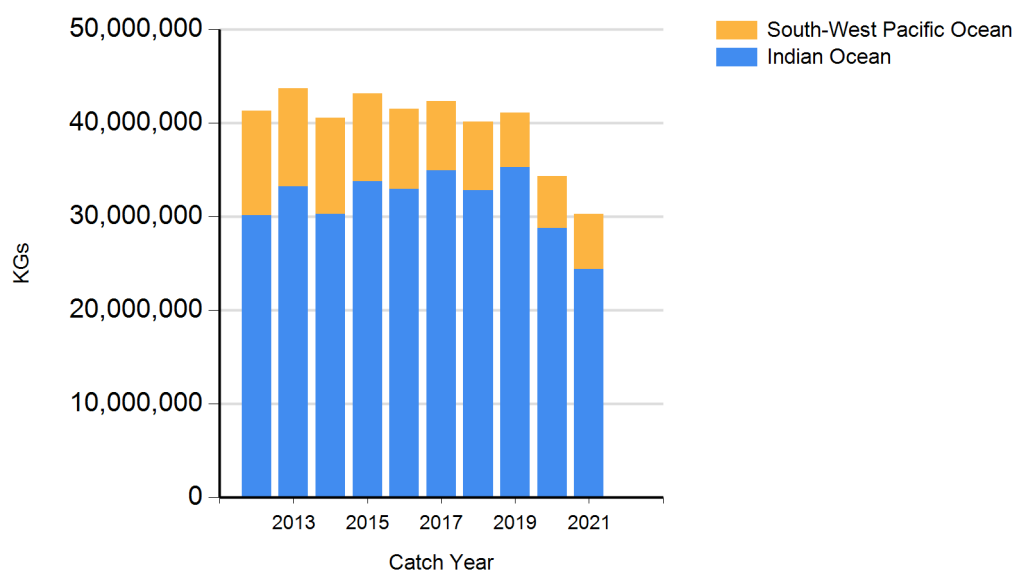
**Commonwealth Commercial (catch).** Catches reported for the Indian Ocean Tuna Commission and Western and Central Pacific Fisheries Commission are for 2021, the most recent year available. Western and Central Pacific Fisheries Commission catches are for the entire South Pacific Ocean (south of the equator).

**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

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Commercial catch of Swordfish - note confidential catch not shown

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