

# Gummy Shark (2023)

*Mustelus antarcticus*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, Queensland, New South Wales	Eastern Australia	Undefined	
Commonwealth, Western Australia, Victoria, Tasmania, South Australia	Southern Australia	Sustainable	Estimated pup production (proxy for biomass)

## STOCK STRUCTURE

Gummy Shark (*Mustelus antarcticus*) is distributed along the east coast from Hinchinbrook Island in Queensland, through temperate waters including the Bass Strait and Tasmania, to Geraldton in Western Australia [CSIRO 2022; White et al. 2021].

There is most likely two biological stocks of Gummy Shark in Australia; one in southern Australia (extending from the lower west coast of Western Australia to Jervis Bay in New South Wales and a second in eastern Australia, extending northwards from Newcastle, New South Wales to around Hinchinbrook Island in Queensland [Last and Stevens 2009; White et al. 2021]. The lower fecundity and smaller total length at reproductive maturity of the eastern stock relative to the southern stock supports this division (see Biology Table).

Conventional tagging showed adult Gummy Sharks exhibit broad-scale displacements from tagging locations of up to 2,362 km in 6.8 years, yet only 15% of adults were recaptured more than 250 km from the tagging location. The mean displacement was approximately 150 km [Walker 2010]. Acoustic tagging in Western Australia showed comparable movements, with average long-distance displacements of 238 km and maximum displacements of more than 900 km [Braccini et al. 2017].

Here, assessment of stock status is presented at the biological stock level—Southern Australia and Eastern Australia.

## STOCK STATUS

### Eastern Australia

The Eastern Australian biological stock of Gummy Shark is caught by the Commonwealth, Queensland and New South Wales.

Total Commonwealth commercial catch averaged less than 1 tonne (t) per year during 2017–18 to 2021–22 financial years and was less than 1 t in the 2021–22 financial year. Commonwealth fishing is unlikely to be having a negative impact on the stock.

Very low and infrequent levels of Gummy Shark catch have been reported from the East Coast Inshore Fishery (ECIF), the main source of shark product on the Queensland east coast. Catch data for the ECIF indicates that Gummy Sharks have contributed to the annual ECIF catch eight times since 2005. In each instance, the total (annual) Gummy Shark catch was less than 1 t [Department of Agriculture and Fisheries 2019, 2022]. While Gummy Sharks are retained with more frequency in the charter fishery, catch levels remain below 1 t. Given the low levels of harvest, the level of fishing mortality in Queensland is unlikely to be having a negative impact on the stock.

Available information indicates that there is little catch of Gummy Shark (less than 50 t per year) off New South Wales [Peddemors 2015]. In the 2022 fiscal year, the total catch was around 34 t. Catch in New South Wales has remained relatively stable since 2014. There is insufficient information available to confidently classify the status of this stock.

On the basis of the evidence provided above, the Eastern Australia biological stock is classified as an **undefined stock**.

### Southern Australia

The Southern Australian biological stock is split into four stocks for modelling and assessment purposes. The first three; the continental shelf of Bass Strait, Tasmania, South Australia are assessed together by the Commonwealth [Thomson 2020]. The fourth in Western Australia is assessed and reported separately by Western Australia [Braccini et al. 2013]. The status presented here is for the entire biological stock and has been established using information from both jurisdictions.

Catch of Gummy Shark in the shark gillnet and shark hook sectors of the Commonwealth-managed Southern and Eastern Scalefish and Shark Fishery (SESSF) increased after 1970. These catches were initially taken as byproduct of the School Shark (*Galeorhinus galeus*) fishery, and then increasingly as a target when School Shark catches decreased from around 1986. Catch of Gummy Shark peaked at around 2,500 t in 2000.

Fishers in South Australia's commercial multi-species, multi-gear and multi-sectoral Marine Scalefish Fishery (MSF) take Gummy Shark as bycatch when targeting Snapper and other species using demersal long lines, gillnets and handlines. Gummy Shark catch within the MSF has averaged 84 t per annum since 2001–02, with the total reported catch of 51 t in 2021–22 [Smart et al. 2023]. Gummy Sharks are also targeted by clients of the South Australian Charter Fishery with 375 sharks harvested in 2020–21 [Durante et al. 2022].

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Gummy Sharks are also a popular target species for the recreational fishing sector [Beckmann et al. 2023]. The South Australian recreational fishery catch was estimated to be 8 t in 2021–22, with an estimated 3,926 Gummy Shark captured, and 1,359 released (35%) [Beckmann et al. 2023].

Gummy Shark landings were relatively high (500–1,000 t) in Victoria from 1978–97 until the development of the Commonwealth shark fishery and trip limits were subsequently introduced for most state fisheries [Bell et al. 2023]. In recent years, commercial Gummy Shark landings have remained low, (less than 30 t), and commercial fishing effort has decreased as a result of licence buy-outs [Bell et al. 2023]. Gummy Shark are also a popular target species for recreational anglers but there is no recent information about recreational landings.

Gummy Shark generally represents a by-product in Victorian commercial fisheries, and the transition to mixed species quota in the Port Phillip Bay longline fishery potentially results in discarding meaning catch rates may now be unreliable. Thus, there is little information from the Victorian Commercial fleet to supplement the Commonwealth assessment. Nevertheless, catch rates remain relatively high in the Port Phillip Bay longline fishery and catch rates derived from creel surveys undertaken in the main recreational Gummy Shark fishery in Victoria, Western Port Bay, are variable but show an increasing trend through time, both consistent with the Commonwealth assessment [Bell et al. 2023].

Commercial catch of Gummy Shark within the Tasmanian Scalefish Fishery (TSF) has shown a decline from 1996 to 2008 to values more aligned with the decadal average of 8.1 t. The annual landings for the TSF in 2022–23 have been recorded as 5.9 t [Sharples et al. 2023], whereas no recent recreational catch information is present.

Gummy shark landings in Western Australia peaked at 750 t in 2007–08 and declined in recent years due to effort reductions, fluctuating between 350–450 t since 2011–12. The first stock assessment was conducted in 2018 based on a risk-based weight of evidence approach using all available lines of evidence, including simulated biomass trajectories derived from a combination of demographic modelling and catch-only modelling [Braccini et al. 2018]. This assessment estimated a “Low” current risk level for the Gummy Shark stock [Braccini et al. 2018]. Updated stock assessments using a range of catch-only methods, a state-space biomass dynamics model [JABBA; Winker et al. 2018], integrated age-structured models [Stock Synthesis; Methot and Wetzel 2013], and time series of reconstructed catches, catch rates, abundance and length composition are underway (Braccini et al. unpublished). Preliminary findings, based on catch-only methods and the state space biomass dynamics model, indicate that for the last 15 years total catches have been below those required for maximum sustainable yield.

The Commonwealth stock assessment [Thomson 2020] for Gummy Shark uses estimated pup production as a proxy for biomass because of the expected close relationship between pup production and female spawning biomass. The three regions, Bass Strait, South Australia and Tasmania are treated as separate stocks in the model, with no movement of animals between these populations. Depletion was estimated to be 66% (range across sensitivities 66–107%) in South Australia and 69% (range across sensitivities 62–86%) in Tasmania. For Bass Strait, the base-case model estimated depletion at 48%, with the range across all sensitivities being 32–53%. The combined recommended biological catch (RBC) (across the 3 stocks) for 2020 was 1,899 t, and the estimated long-term RBC for the stock was 1,757 t [Thomson 2020].

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In an analysis of congruence between electronic monitoring (EM) and logbook reporting in the GHTS, Emery et al. [2023] concluded that discarded Gummy Shark within the gillnet sector displayed low congruence, with the logbook on average reporting higher numbers than EM across the period examined (2016–17 to 2019–20). Congruence between EM and logbook improved when Gummy Shark was examined at a higher taxonomic level (that is, Houndsharks – Triakidae), suggesting the EM analysts were having difficulty in identifying discarded Gummy Shark to species level. Consequently, the logbook records at the fleet level were considered a more accurate indication of discarded Gummy Shark than EM. The work by Emery et al. [2023] indicates that it would be reasonable to use the current logbook estimates of discards at the fleet level to understand total mortality for this stock.

Combined landed catch (from catch disposal records) of Gummy Shark for the Gillnet, Hook and Trap Sector (GHTS), the Commonwealth Trawl Sector (CTS) and the Great Australian Bight Trawl Sector (GABTS) in 2021–22 was 1,649 t, down from 1,874 t in 2020–21 and 1,781 t in 2019–20.

Logbook-reported discards in the GHTS for Gummy Shark in 2021–22 were 27.5 t (24.8 t in 2020–21, 28 t in 2019–20, 34.3 t in 2018–19 and 27.2 t in 2017–18). Post-release survival of discards is uncertain, meaning that the fishing mortality associated with discarded catch is also uncertain. For the purposes of status determination, all discards for this stock are assumed to be dead.

Althaus et al. [2021] estimated the 4-year weighted average of state catches to be 113.5 t for 2017 to 2020. They also provided estimates of trawl discards for 2017 to 2020. ABARES calculated a 4-year weighted average of trawl discards to be 24.6 t.

Using the combined landed catch from CDRs (1,649 t), the 4-year weighted average of state catch (113.5 t), logbook discards for the GHTS (27.2 t), and the 4-year weighted average of trawl discards (24.6 t), the total of catch and discards for the 2021–22 fishing season is estimated to be 1,814.3 t [Woodhams et al. 2022]. Recent catches have been in accordance with the harvest strategy and unlikely to drive the stock into an overfished state.

The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

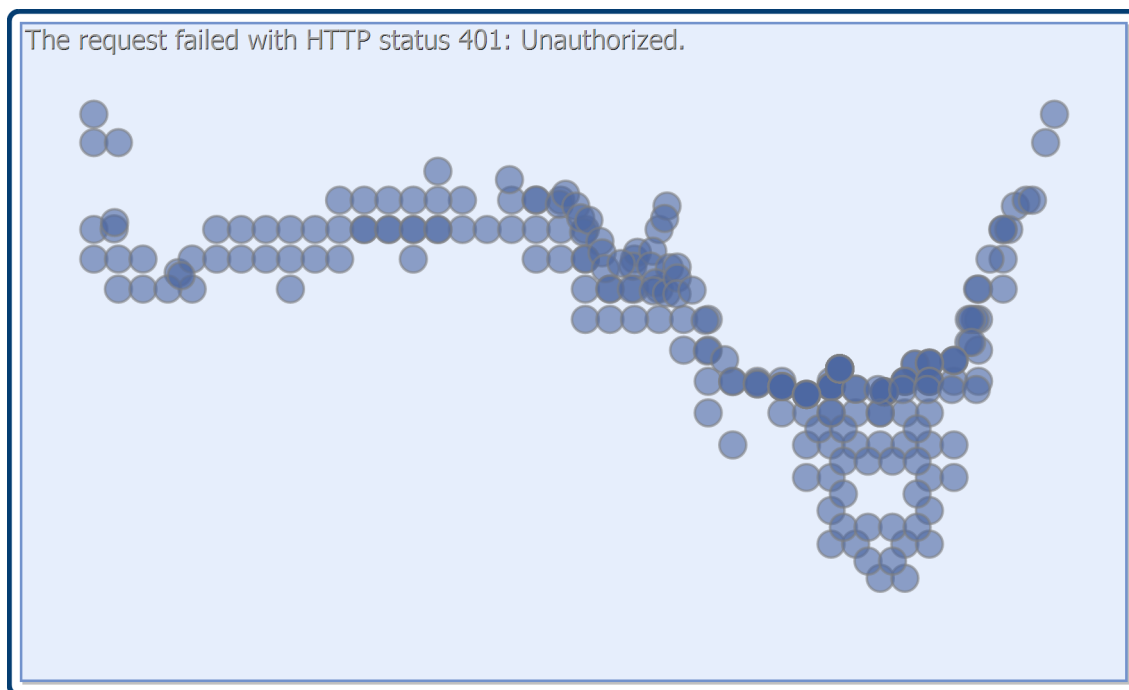
On the basis of the evidence provided above, the Southern Australia biological stock is classified as a **sustainable stock**.

## BIOLOGY

**Gummy Shark biology** [Moulton et al. 1992: Peddemors 2015: Walker 2007: Walker 2010]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Gummy Shark	Southern: 16 years, 1 850 mm TL (25 kg total body mass) Eastern: 1,000 mm TL	Southern: Females 1,105–1,253 mm TL Males 950–1,133 mm TL Eastern: 650–700 mm TL

**DISTRIBUTION**



Distribution of reported commercial catch of Gummy Shark

**TABLES**

<b>Fishing methods</b>	<b>Commonwealth</b>	<b>New South Wales</b>	<b>Queensland</b>	<b>South Australia</b>	<b>Tasmania</b>
<b>Charter</b>					
Hook and Line					
Rod and reel		✓			
Unspecified					
<b>Commercial</b>					
Danish Seine	✓	✓			
Demersal Gillnet	✓				
Demersal Longline	✓	✓			✓
Drifting longline					✓
Dropline	✓	✓			
Gillnet				✓	✓
Hand Line, Hand Reel or Powered Reels					✓

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Victoria	Western Australia
✓	
	✓
	✓
	✓

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Hook and Line					
Longline (Unspecified)					
Mesh Net		✓			
Net					
Otter Trawl	✓	✓			
Traps and Pots					
Unspecified			✓	✓	✓
Various		✓			
<b>Recreational</b>					
Demersal Longline					✓
Gillnet					✓
Hook and Line		✓		✓	✓
Unspecified					

<b>Management Methods</b>					
	<b>Commonwealth</b>	<b>New South Wales</b>	<b>South Australia</b>	<b>Tasmania</b>	<b>Victoria</b>
<b>Charter</b>					
Bag limits					✓
Licence (boat-based sector)					
Size limit					✓
Spatial closures					✓
<b>Commercial</b>					
Catch limits					
Effort limits (individual transferable effort)					
Gear restrictions	✓	✓	✓	✓	✓
Individual transferable quota	✓				
Licence (boat-based sector)		✓			

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✓	
	✓
✓	
✓	
✓	✓
	✓

<b>Western Australia</b>
✓
✓
✓
✓
✓
✓



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Limited entry	✓	✓	✓	✓	✓
Processing restrictions	✓	✓	✓		
Size limit	✓	✓	✓	✓	✓
Spatial closures	✓	✓		✓	✓
Total allowable catch	✓				✓
Trip limits			✓	✓	✓
<b>Recreational</b>					
Bag limits		✓	✓	✓	✓
Licence					✓
Licence (boat-based sector)					
Possession limit					✓
Size limit			✓	✓	✓
Spatial closures				✓	✓
Trip limits				✓	

Catch	Commonwealth	New South Wales	Queensland	South Australia	Tasmania
Charter					
Commercial	1507.37 t	34.2094 t	0 t	50.8024 t	5.7832 t
Indigenous		Unknown		Unknown	Unknown
Recreational		Unknown		8 t (in 2021–22)	Unknown

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✓
✓
✓
✓
✓
✓

Victoria	Western Australia
	1.08 t
17.0558 t	421.579 t
Unknown (No catch under permit)	Unknown but likely to be negligible
Unknown	934 individuals caught in 2015–16 (of which, 521 were kept). Shore-based catches are unknown

**Commonwealth – Commercial (Management Methods/Catch).** Data provided for the Commonwealth align with the 2021–22 financial year.

**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.

**Western Australia – Recreational (Management Methods).** A recreational fishing from boat licence is required for recreational fishing from a powered vessel in Western Australia.

**New South Wales -** The New South Wales EGF, OTF and OTLF fish both the Southern Australian and Eastern Australian stocks.

**New South Wales – Indigenous (Management Methods).**  
<https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

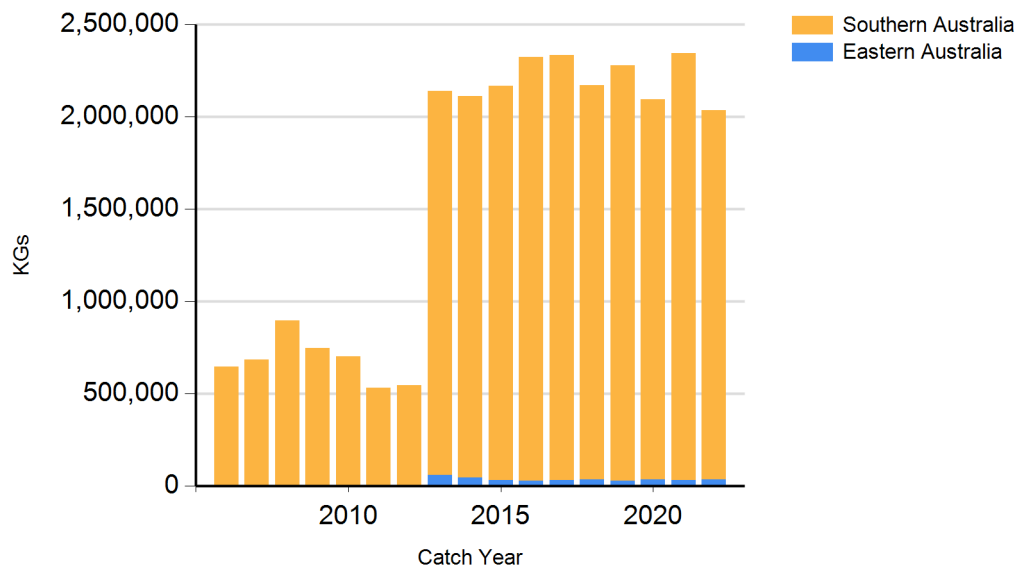
**Victoria – Indigenous (Management Methods).** A person who identifies as Aboriginal or Torres Strait Islander is exempt from the need to obtain a Victorian recreational fishing licence, provided they comply with all other rules that apply to recreational fishers, including rules on equipment, catch limits, size limits and restricted areas. Traditional (non-commercial) fishing activities that are carried out by members of a traditional owner group entity under an agreement pursuant to Victoria's *Traditional Owner Settlement Act 2010* are also exempt from the need to hold a recreational fishing licence, subject to any conditions outlined in the agreement. Native title holders are also exempt from the need to obtain a recreational fishing licence under the provisions of the Commonwealth's *Native Title Act 1993*.

**Tasmania – Recreational (Management Methods).** A recreational licence is required for fishers using dropline or longline gear, along with nets, such as gillnet or beach seine.

**Tasmania – Indigenous (Management Methods).** Indigenous people engaged in aboriginal fishing activities in marine waters are exempt from holding recreational fishing licences, but must comply with all other fisheries rules as if they were licensed. Recreational bag and possession limits also apply. If using pots, rings, set lines or gillnets, indigenous people must obtain a unique identifying code (UIC). The *Recognition of Aboriginal Fishing Activities* policy explains the process for issuing a UIC to a person for Aboriginal fishing.

## CATCH CHART

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Commercial catch of Gummy Shark - note confidential catch not shown

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