

Gummy Shark (2016)

Mustelus antarcticus



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth, Western Australia, New South Wales, Victoria, Tasmania, South Australia	Southern Australia	CIF, EGF, GCF, ITF, JASDGLMF, LCF, MSF, OF, OTF, OTLF, PPBF, SESSF (GHTS), SF, VRLF, WBF, WCDGLIMF	Sustainable	Biomass (pup production), catch
New South Wales	Eastern Australia	EGF, EPTF, OTF, OTLF	Undefined	

SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), EGF Estuary General Fishery (NSW), EPTF Estuary Prawn Trawl Fishery (NSW), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line (NSW), LCF Lakes and Coorong Fishery (SA), MSF Marine Scalefish Fishery (SA), SF Scalefish Fishery (TAS), CIF Corner Inlet Fishery (VIC), GCF Giant Crab Fishery (VIC), OF Ocean Fishery (VIC), PPBF Port Phillip Bay Fishery (VIC), ITF Inshore Trawl Fishery (VIC), VRLF Victorian Rock Lobster Fishery (VIC), WBF Western Port Bay Fishery (VIC), JASDGLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), WCDGLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WA)

STOCK STRUCTURE

Gummy Shark (*Mustelus antarcticus*) is distributed throughout the temperate waters of Australia, from at least Port Stephens in New South Wales, to Geraldton in Western Australia (including Tasmania)[1,2]. The most recent research on biological stock structure for Gummy Shark[3] suggests there is most likely one biological stock in southern Australia (extending from the lower west coast of Western Australia to Jervis Bay in New South Wales) and a second biological stock in eastern Australia (extending from Newcastle to the Clarence River in New South Wales). The Southern Australian biological stock is considered to comprise four separate subpopulations for formal stock assessment purposes: the continental shelf of Bass Strait, Tasmania, South Australia and Western Australia. The first three are assessed by the

Commonwealth, within an integrated assessment by the Shark Resource Assessment Group[4,5]. Due to management differences and the way the stock is modelled, the fourth is assessed separately by Western Australia[6].

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

STOCK STATUS

Eastern Australia Available information indicates that there is little catch of Gummy Shark (less than 50 t per year) from the Eastern Australian biological stock[11]. In the 2015 calendar year, the total catch was around 20 t. There is insufficient information available to confidently classify the status of this stock.

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

Southern Australia The Bass Strait, Tasmania and South Australia components of the stock were assessed using a sex and age structured model[5]. The most recent assessment[5] treats Bass Strait, South Australia and Tasmania as separate subpopulations, with no movement of animals between these regions and no density-dependent effects of one population on another. Gillnet closures off South Australia have been implemented to reduce interactions with marine mammals (particularly Australian Sea Lions and dolphins), including buffers around breeding colonies and trigger limits, with observed levels of bycatch above the trigger limits resulting in an 18 month closure of larger areas[7]. These closures have reduced catch and catch per unit effort (CPUE) off South Australia. As a result of the large changes in operating conditions, the South Australian CPUE data after 2010 was considered to be a poor indicator and was not included in the assessment. The South Australian closures may have also reduced the CPUE off Victoria, as operators moved from South Australia to Victoria[5]. However, as these impacts were considered minor, catch and CPUE data up to 2012 from Victoria (and Tasmania) were retained in the model.

There is a close relationship between the number of pups and both the number, and length, of females[4] and so the Commonwealth assessment uses pup production as an indicator of biomass. The assessment estimated pup production to be more than 48 per cent of the unfished level of pup production (1927) for all three Gummy Shark populations[5]. Some model sensitivities that explored density dependence estimated pup production to be as low as 31 per cent (for the Bass Strait population)[5], which is below the target reference point for the Commonwealth Harvest Strategy Policy, but above the limit reference point. These results indicate that the three populations examined (Bass Strait, South Australia and Tasmania) are unlikely to be recruitment overfished[8].

The stock assessment gave a recommended biological catch of 2010 tonnes (t) however; this was above the historical average catch for the fishery. As a result, the Commonwealth Shark Resource Assessment Group recommended retaining the (lower) 2013–14 total allowable catch (TAC) of 1836 t for the 2014–15 to 2016–17 seasons, as a 3-year (multi-year) TAC[9]. Total combined commercial

catch (state and Commonwealth) for the three subpopulations in 2015 was 1780 t. This level of fishing pressure is unlikely to cause this part of the biological stock to become recruitment overfished[8].

The Western Australian component of the stock was assessed using an age structured model developed in the mid-1990s to estimate total and breeding stock biomass[10]. Since then, catches and CPUE have been monitored in reference to those biomass estimates. A new assessment model incorporating movement rates within Western Australian waters is due to be completed by 2016.

The most recent assessment[6] concluded that reductions in demersal gillnet fishing effort since biomass was estimated to be 42.7 per cent of the unfished (1975) level, in 1997–98, should have ensured that biomass has remained above this level. Therefore, this part of the biological stock is not considered to be recruitment overfished.

These conclusions are supported by an increasing trend in standardised CPUE between the mid-1990s and 2005–06. This is thought to be the result of reductions in demersal gillnet fishing effort in Western Australia from 1992 onwards, leading to increases in breeding stock biomass. A subsequent increase in CPUE to unprecedented levels, peaking in 2007–08, was followed by a rapid decline to 2011–12 and an increase between 2012–13 and 2013–14. The CPUE in 2011–12 was still at historically high levels. Despite the recent unusual spike and subsequent decline in CPUE, current levels of fishing pressure are unlikely to cause this part of the biological stock to become recruitment overfished[6].

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

BIOLOGY

Gummy Shark biology[4,12–14]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Gummy Shark	16 years; 1 850 mm <u>TL</u> (25 kg total body mass)	Females: 1 105–1 253 mm <u>TL</u> Males: 950–1 133 mm <u>TL</u>

DISTRIBUTION



Distribution of reported commercial catch of Gummy Shark

TABLES

Commercial Catch Methods	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
Coastal, Estuary and River Set Nets			✓	✓		
Danish Seine					✓	
Demersal Gillnet	✓					
Demersal Longline	✓		✓	✓		
Dropline	✓		✓			
Gillnet			✓	✓		
Hand Line, Hand Reel or Powered Reels	✓		✓	✓		
Haul Seine			✓			
Line					✓	
Mesh Net					✓	
Otter Trawl		✓			✓	
Setline		✓	✓	✓		
Traps and Pots					✓	
Trotline	✓	✓				
Unspecified		✓	✓		✓	
Various				✓		✓
Fishing methods						

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	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
Commercial						
Coastal, Estuary and River Set Nets			✓			
Danish Seine					✓	
Demersal Gillnet	✓					
Demersal Longline	✓		✓	✓		
Dropline	✓		✓			
Gillnet			✓	✓		
Hand Line, Hand Reel or Powered Reels			✓	✓		
Haul Seine			✓			
Line					✓	
Mesh Net					✓	
Otter Trawl		✓			✓	
Setline		✓	✓	✓		
Traps and Pots					✓	
Trotline		✓				
Unspecified		✓	✓		✓	
Various				✓		✓
Recreational						
Demersal Longline				✓		
Gillnet				✓		
Hand Line, Hand Reel or Powered Reels		✓	✓	✓	✓	✓
Management Methods						
	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
Commercial						
Effort limits (individual transferable effort)						✓
Gear restrictions	✓	✓	✓	✓	✓	✓
Individual	✓					

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transferable quota						
Limited entry	✓	✓	✓	✓	✓	✓
Processing restrictions	✓	✓	✓			✓
Size limit	✓	✓	✓	✓	✓	
Spatial closures	✓	✓		✓	✓	✓
Total allowable catch	✓					
Trip limits			✓	✓	✓	
Indigenous						
Bag limits			✓		✓	
Size limit			✓		✓	
Recreational						
Bag limits		✓	✓	✓	✓	✓
Size limit			✓	✓	✓	
Spatial closures				✓	✓	
Trip limits				✓		
Active Vessels						
	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
	61 Vessel in SESSF (GHTS),	11 License in EGF, 62 License in OTF, 38 License in OTLF, 446 Vessel in EGF, 92 Vessel in EPTF, 102 Vessel in OTF, 217 Vessel in OTLF,	143 Vessel in MSF,	49 Vessel in SF,	16 Fisher in CIF, 10 Fisher in ITF, 30 Fisher in OF, 31 Fisher in PPBF, 5 Fisher in VRLF,	21 License in JASDGLMF, 5 License in WCDGLIMF,

SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector)(CTH)

EGF Estuary General Fishery(NSW)

EPTF Estuary Prawn Trawl Fishery(NSW)

OTF Ocean Trawl Fishery(NSW)

OTLF Ocean Trap and Line(NSW)

MSF Marine Scalefish Fishery(SA)

SF Scalefish Fishery(TAS)

CIF Corner Inlet Fishery(VIC)

OF Ocean Fishery(VIC)

PPBF Port Phillip Bay Fishery(VIC)

ITF Inshore Trawl Fishery(VIC)

VRLF Victorian Rock Lobster Fishery(VIC)

JASDGLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2)(WA)

WCDGLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery(WA)

Catch						
	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
Commercial	1668.2t in SESSF (GHTS),	2.0785t in EGF, 0.004t in EPTF, 10.391t in OTF, 13.5915t in OTLF,	85.5544t in MSF,	7.84715t in SF,	9.955t in CIF, 0.015t in GCF, 0.492t in ITF, 2.501t in OF, 6.189t in PPBF, 0.055t in VRLF, 0.087t in WBF,	402.251t in JASDGLMF, 4.70465t in WCDGLIMF,
Indigenous		Unknown	Unknown	Unknown	Zero	Unknown but likely to be negligible
Recreational		Unknown	11 597 individuals caught in 2013–14 (of which, 8822 were kept)	Unknown	Unknown	2265 individuals caught in 2011–12 (of which, 1722 were kept), Shore-based catches are unknown

SESSF (GHTS) Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) (CTH), EGF Estuary General Fishery (NSW), EPTF Estuary Prawn Trawl Fishery (NSW), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line (NSW), LCF Lakes and Coorong Fishery (SA), MSF Marine Scalefish Fishery (SA), SF Scalefish Fishery (TAS), CIF Corner Inlet Fishery (VIC), GCF Giant Crab Fishery (VIC), OF Ocean Fishery (VIC), PPBF Port Phillip Bay Fishery (VIC), ITF Inshore Trawl Fishery (VIC), VRLF Victorian Rock Lobster Fishery (VIC), WBF Western Port Bay Fishery (VIC), JASDGLMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), WCDGLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WA),

a New South Wales Data provided for New South Wales align with the 2015 calendar year with all vessels active in the fishery included (irrespective of whether they reported landing this species). The New South Wales EGF, OTF and OTLF fish both the Southern Australian and Eastern Australian stocks

b 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.

c 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.

d Victoria – Indigenous In Victoria, regulations for managing recreational fishing are also applied to fishing activities by Indigenous people. Recognised Traditional Owners (groups that hold native title or have agreements under the Traditional Owner Settlement Act 2010 [Vic]) are exempt (subject to conditions) from the requirement to hold a recreational fishing licence, and can apply for permits under the Fisheries Act 1995 (Vic) that authorise customary fishing (for example, different catch and size limits or equipment). The Indigenous category in Table 3 refers to customary fishing undertaken by recognised Traditional Owners. In 2015, there were no applications for customary fishing permits to access Gummy Shark.

e New South Wales – Indigenous Aboriginal Cultural Fishing Interim Access Arrangement - allows an Aboriginal fisher in New South Wales to take in excess of a recreational bag limit in certain circumstances, for example, if they are doing so to provide fish to other community members who cannot harvest themselves.

f New South Wales – Indigenous The Aboriginal cultural fishing authority is the authority that Indigenous persons can apply to take catches outside the recreational limits under the Fisheries

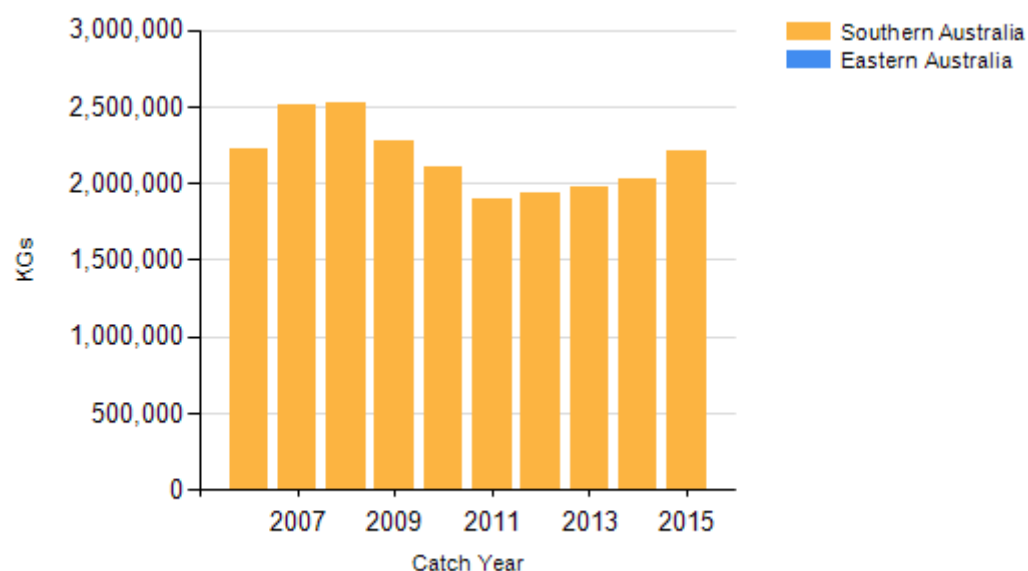
Management Act 1994 (NSW), Section 37 (1)(c1), Aboriginal cultural fishing authority.

h Tasmania – Recreational (management methods) In Tasmania, a recreational licence is required for fishers using dropline or longline gear, along with nets, such as gillnet or beach seine.

i Tasmania – Indigenous In Tasmania, 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. Additionally, recreational bag and possession limits also apply. If using pots, rings, set lines or gillnets, Aborigines must obtain a unique identifying code (UIC). The policy document Recognition of Aboriginal Fishing Activities for issuing a Unique Identifying Code (UIC) to a person for Aboriginal Fishing activity explains the steps to take in making an application for a UIC.

j Victoria – Indigenous Subject to the defence that applies under Section 211 of the Native Title Act 1993 (Cth), and the exemption from a requirement to hold a Victorian recreational fishing licence, the non-commercial take by indigenous fishers is covered by the same arrangements as that for recreational fishing.

CATCH CHART



Commercial catch of Gummy Shark - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- Interactions with marine mammals (Australian Sea Lions, Australian Fur Seals, Long-nosed Fur Seals and dolphins) in some gillnet fisheries continue to be an issue. Mitigation actions that have been implemented include spatial and temporal closures, increased monitoring[17] and implementation of the Australian Sea Lion Management Strategy[7]and Dolphin Strategy[18]. The Australian Fisheries Management Authority has closed areas where most interactions occur and increased observer coverage to 100 per cent in adjacent areas. These management measures were revised through the Dolphin Strategy for the 2014–15 fishing season[18].
- Offal management strategies, introduced in April 2011, include requirements for gillnet operators to remove any biological materials from nets before they are set. This has been effective in reducing seabird interactions in other fisheries[17].
- The use of auto-longlines in the Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector) has raised concerns about the potential for interactions with seabirds, including albatrosses and shearwaters[19]. New measures have been implemented to assist industry to meet the Seabird Threat Abatement Plan[20] and Performance Criteria[21].
- Demersal gillnets are known to interact with a number of threatened and protected species, including marine mammals and seabirds, in areas of Western Australia where

they are used to catch Gummy Shark. However, such interactions occur at a very low frequency and have been assessed as posing low–negligible risks to these populations[6].

- Recent analysis of potential changes in ecosystem structure of finfish in the South and West Coast Bioregions of Western Australia[22] found no evidence of any systematic change in species diversity or richness, or trophic index, indicating that the Western Australian fisheries are not having a measurable impact on the food chain or trophic structure in these regions.

ENVIRONMENTAL EFFECTS on Gummy Shark

- Sea level rise and changes in sea temperature associated with climate change may negatively affect Gummy Shark stocks because the habitats that Gummy Shark use as nursery and feeding grounds are potentially sensitive to such effects[23]. Habitat modification, for example through installation of pipelines and outfalls, construction of piers, sewerage and industrial outlets, and land run-off may also affect nursery/pupping grounds[23].

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