

# School Shark (2020)

*Galeorhinus galeus*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, Western Australia, New South Wales, Victoria, Tasmania, South Australia	Southern Australia	Depleted	Estimate of biomass (relative pup production)

## STOCK STRUCTURE

School Shark has a broad distribution throughout temperate waters of the eastern North Atlantic, western South Atlantic, and north-eastern and south-eastern Pacific, off South Africa, New Zealand and southern Australia. There is some uncertainty about the stock structure for School Shark in Australia. While a single Australian biological stock has historically been assumed for assessment and management purposes, there is some emerging information to suggest multiple stocks may occur in Southern Australia (Thomson et al 2019).

Given that stock structure remains uncertain, here assessment of stock status is presented for a single biological stock—Southern Australia.

## STOCK STATUS

**Southern Australia** The majority of School Shark catch is taken as bycatch by fishers targeting Gummy Shark in the Gillnet Hook and Trap Sector (GHTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF) managed by the Commonwealth. The total allowable catch (TAC) for School Shark in the SESSF is a bycatch TAC and targeting the species is not permitted. A bycatch ratio rule is implemented so operators cannot land quantities of School Shark greater than 20 per cent of their Gummy Shark (*Mustelus antarcticus*) holdings. Additional regulations were implemented in the SESSF in 2015 to reduce fishing mortality of School Shark and animals deemed to be alive at capture must be released [AFMA 2018]. Minor catches of School Shark are also taken in state waters of Western

Australia, New South Wales, Victoria, Tasmania and South Australia.

School shark is listed as Conservation Dependant under the Environment Protection and Biodiversity Conservation Act 1999. The species is managed under a rebuilding strategy (AFMA 2015).

Assessments since 1991 have consistently estimated that the School Shark stock is less than 20 per cent of the unfished biomass. The last full stock assessment for School Shark was published in 2009 [Thomson and Punt 2009]. At that time, the base-case model estimated biomass to be at 12% of unfished levels. The catch data from 1998 to 2008 used in the assessment comprised low (per vessel) catch levels, and the CPUE derived was considered unlikely to accurately reflect the underlying stock dynamics.

In 2012, the 2009 assessment was re-run with additional catch data between 2009 and 2012. This modelling aimed to estimate recovery time frames for the stock under a range of future incidental catch levels and to investigate the impact of a proposed auto-longline shark fishery in South Australia [Thomson 2012]. Under a zero-catch scenario, the stock was projected to rebuild to 20% of unfished levels within 23 years. At a constant catch of 250 t, the stock was projected to rebuild to 20% of unfished levels in 80 years, and a constant catch of 275 t was projected to collapse the stock. These projections were based on assumptions that the gear selectivity, and spatial and temporal distribution of catches remain similar to those in 2011. Uncertainties around these median projections were not provided by the assessment.

The outputs of the 2012 assessment were used to support the development of the 2015 rebuilding strategy. The 2015 rebuilding strategy specifies a maximum catch of 225 t, which would allow recovery to the 0.2B0 limit reference point in 66 years (3 times the estimated generation time) (AFMA 2015b).

In 2018, a close-kin mark-recapture study and a population dynamics model that makes use of those data (termed a 'close-kin model' [CKM]) provided an estimate of current absolute abundance and recent population trend (2000 to 2017), assuming a single mixed stock (Thomson et al. 2019). The abundance of school shark (in numbers) estimated by the CKM (c. 50,000 adults; Thomson et al. 2019) was lower than the 2012 assessment model projections (c. 250,000 adults; Thomson 2012).

Thomson et al. (2019) undertook projections based on four constant exploitation scenarios (zero, 2016 rate, 2017 rate and the mean exploitation rate for 2013 to 2017). All four exploitation rates resulted in a long-term upward trend in population size. SharkRAG agreed to use the mean exploitation rate for 2013 to 2017 to recommend the incidental catch allowance for the stock. The median trend for the stock response to the 2013 to 2017 exploitation rate was upwards; however, the confidence interval was wide enough to allow a downward trend, and Thomson et al. (2019) note that there was no guarantee of the sustainability of these catches. Thomson et al. (2019) note that the collection of close-kin samples for an additional four years is expected to greatly reduce these confidence intervals. The 2013 to 2017 exploitation rate resulted in total catch recommendations of 256 t in 2019–20, 263 t in 2020–21 and 270 t in 2021–22.

The CKM model considers the period 2000 to 2017, since this was the period over which the juveniles sampled would have been born. The approach is unable to evaluate biomass relative to an unfished state, as required under the School Shark Rebuilding Strategy (AFMA 2015b). Additionally, Thomson et al. (2019) propose that there are likely to be a number of school shark stocks (that is, units that are reproductively isolated, at least to some degree, and that show differing, but almost certainly overlapping, spatial distribution), some of which are severely depleted. As such, there remains a significant uncertainty associated with assessing the status of the school shark stock as it is currently

defined (that is, a single SESSF stock).

The recent CKM work does not provide an estimate of biomass depletion compared with unfished biomass, so the most recent indication of depletion is the last full stock assessment in 2009 (Thomson & Punt 2009) which estimated biomass at 12% of unfished levels. Projections undertaken as part of the 2012 update indicated that recovery to 20% of the unfished level would take 23 years under a zero-catch scenario (Thomson 2012). Catches have not been zero in the intervening period.

The above evidence indicates that the biomass of this stock is likely to be depleted and that recruitment is likely to be impaired. Furthermore, the above evidence indicates that current fishing mortality has been reduced by management to a level that should allow the stock to recover from its recruitment impaired state; however, measurable improvements are yet to be detected.

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

## BIOLOGY

**School Shark biology** [Last and Stevens 2009, Moulton et al. 1992, Punt and Walker 1998, Walker 2005]

Species	Longevity / Maximum Size	Maturity (50 per cent)
School Shark	50 years, ~1 750 mm TL , 32.5 kg	12–16 years, mean length at female maturity and pupping are 1 240 and 1 420 mm TL, respectively

## DISTRIBUTION



Distribution of reported commercial catch of School Shark

## TABLES

### Fishing methods

STATUS OF AUSTRALIAN FISH STOCKS REPORT  
School Shark (2020)

	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
<b>Charter</b>						
Hook and Line						✓
<b>Commercial</b>						
Danish Seine	✓					
Demersal Gillnet	✓					
Demersal Longline	✓					
Dropline	✓					
Gillnet						✓
Hand Line, Hand Reel or Powered Reels				✓		
Hook and Line					✓	
Line		✓				
Mesh Net		✓				
Midwater Trawl	✓					
Net					✓	
Otter Trawl	✓	✓				
Pelagic Longline	✓					
Traps and Pots					✓	
Trawl	✓					
Unspecified			✓	✓		
Various		✓				
<b>Recreational</b>						
Demersal Longline				✓		
Gillnet				✓		
Hook and Line		✓	✓	✓	✓	✓
<b>Management Methods</b>						
	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
<b>Charter</b>						
Bag limits						✓
Licence (boat-based sector)						✓
Spatial closures						✓
<b>Commercial</b>						

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

Catch	Commonwealth	New South Wales	South Australia	Tasmania	Victoria	Western Australia
<b>Commercial</b>	202.669 t	7.0972 t	24.4132 t	1.39558 t	0.2985 t	0.860018 t
<b>Indigenous</b>			Unknown	Unknown		Undetermined but likely to be negligible
<b>Recreational</b>		Unknown	Unknown. The most recent (2013–14) estimate is 7 749 individuals (SE 5 596) captured, with 7 208 (SE 5 496) of these harvested and 541 (SE 469)	Unknown	Unknown (No catch under permits)	No catches of School Sharks by boat-based recreational fishers were recorded by Ryan et al. [2019], shore-based catches are undetermined.

released.

**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** - 'other' fisheries = commercial fisheries with less than seven active fishers are not presented due to the Privacy Act.

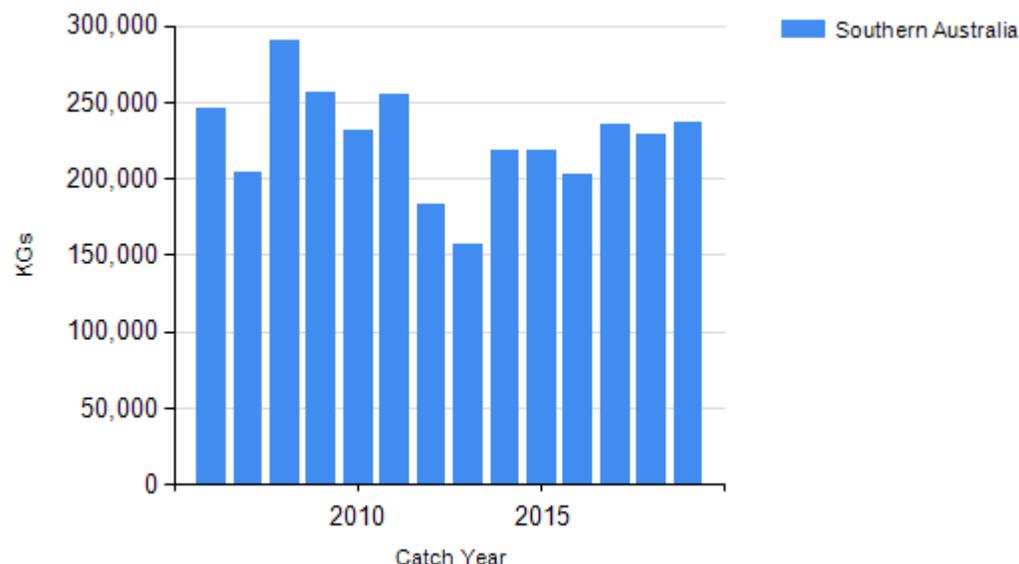
**New South Wales – Indigenous (Management Methods)**

<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 – 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 UIC to a person for Aboriginal Fishing activity explains the steps to take in making an application for a UIC.

## CATCH CHART



Commercial catch of School Shark - note confidential catch not shown

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