

School Shark (2023)

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	Estimated biomass, estimated total mortality.

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 information to suggest multiple stocks may occur (or may have occurred) 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 Most School Shark catch is now taken as bycatch by fishers targeting Gummy Shark (*Mustelus antarcticus*) in the Gillnet Hook and Trap Sector (GHTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF) managed by the Commonwealth. School Shark is also taken by trawl gears in the SESSF [Davis et al. 2023]. The total allowable catch (TAC) for School Shark in the SESSF is a

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bycatch TAC and targeting the species is not permitted. School Shark are also taken in state-managed fisheries in Western Australia, New South Wales, Victoria, Tasmania and South Australia.

Catch of School Shark in the GHTS peaked at more than 2 500 tonnes (t) around 1969 and then declined rapidly to around 700 t in 1973, in part driven by concerns about mercury content in large sharks [DCCEEW 2009]. Catch in the sector increased again to around 2 000 t in 1986 before declining steadily through the late 1980s and 1990s, stabilising at around 200 t per year from 2000 onwards, largely as a result of management controls on catch.

Assessments for School Shark indicate that the stock has been overfished since approximately 1990, and it has been classified as such since ABARES began status reporting in 1992 [Davis et al. 2023]. The 2009 stock assessment [Thomson and Punt 2009] used data to 2008 and estimated biomass to be at 12% of the unfished biomass. The catch data from 1998 to 2008 used in the assessment comprised low (per vessel) catch levels, and the catch-per-unit-effort derived was considered unlikely to accurately reflect the underlying stock dynamics.

AFMA implemented the first rebuilding strategy for School Shark in 2008. The 2008 rebuilding strategy did not specify a recovery time frame because of limited information at the time [AFMA 2015]. School Shark was listed as Conservation-Dependent under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) in 2009. The most recent School Shark rebuilding strategy was released in 2015. It specifies a recovery time frame to the limit reference point (LRP, 20% of the unfished biomass) of 66 years (in this case, set at 3 times the estimated generation time) from 2008 [AFMA 2015] and a maximum annual catch for the Commonwealth of 225 t. The 2015 rebuilding strategy states that the strategy will be reviewed 'when the results of the fishery independent measure of abundance using close-kin genetics techniques are available and in any case after five years.' ABARES understands that this review has been delayed until after an updated assessment is completed (scheduled for 2024) [Davis et al. 2023].

In the SESSF, School Shark has been subject to catch limits and other measures to reduce catch for some time. These measures include the implementation of a catch ratio of 20% School Shark to Gummy Shark– whereby a quota holder must hold 5 times more Gummy Shark quota than their School Shark catch (introduced from the 2011–12 season) and the requirement that all live-caught School Shark be released (introduced from the 2014–15 season).

In 2012, the 2009 assessment was re-run with additional catch data for 2009 to 2012 [Thomson 2012], specifically 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. Under a zero-catch scenario, the stock was projected to rebuild to 20% of the unfished biomass within 23 years. At a constant catch of 250 t, the stock was projected to rebuild to 20% of the unfished biomass in 80 years, and a constant catch of 275 t was projected to collapse the stock present in 2012, albeit over an extended period (more than 100 years). 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 Thomson [2012].

In 2018, a close-kin mark–recapture (CKMR) study, which uses a population dynamics model to interpret CKMR data (termed a 'close-kin model' [CKM])

provided an estimate of current absolute abundance and recent population trend (2000 to 2017) from a single region and population (that is, assuming 1 mixed stock) [Thomson et al. 2019]. In contrast to previous assessments, the CKM does not provide an estimate of biomass depletion compared with unfished biomass.

Thomson et al. [2019] undertook projections based on 4 constant exploitation scenarios (zero, 2016 rate, 2017 rate and mean exploitation rate for 2013 to 2017). All 4 exploitation rates resulted in a long-term upward trend in median population size, with the annual rate of population increase estimated to be approximately 11% under zero exploitation, 4% at the 2016 exploitation rate, 3% at the 2013–17 rate and 1% at the 2017 rate. Of the 4 exploitation rate scenarios explored, Shark Resource Assessment Group agreed to base its advice for future incidental catch allowances (up to the 2021–22 fishing season) on 'the mean exploitation rate for 2013 to 2017', because this scenario provided for consistent recovery [AFMA 2018]. The 2013 to 2017 exploitation rate resulted in total mortality recommendations of 270 t in 2021–22, 278 t in 2022–23 and 287 t in 2023–24.

Combined landed catch (from catch disposal records– CDRs) for the GHTS, the CTS and the GABTS in 2022–23 was 233.8 t, up from 192 t in 2021–22 and 184 t in both 2020–21 and 2019–20 [Davis et al. 2023].

Logbook reported discards of School Shark by gillnet and hook gears in 2022–23 were 53.5 t, up from 46.9 t in 2021–22 and 52.4 t in 2020–21 [Davis et al. 2023]. Althaus et al. [2022] also provide estimates of trawl discards for 2018 to 2021. ABARES calculated a 4-year weighted average of those discard estimates to derive a 4-year weighted average of trawl discards of 8.6 t [Davis et al. 2023].

Althaus et al. [2022] estimate the 4-year weighted average for state catches to be 27 t for 2018 to 2021. Although there are likely to be some discards associated with state catches (for reasons including state-based catch limits resulting from Offshore Constitutional Settlement and general damage or spoilage of fish), the level of discarding of School Shark by state fishers is uncertain.

Using the combined landed catch from CDRs (233.8 t), logbook discards for the GHTS (53.5 t), the 4-year weighted average of trawl discards (8.6 t) and the 4-year weighted average of state catch (27 t), total commercial catch and discards for the 2022–23 fishing season is estimated to be 322.9 t [Davis et al. 2023]. This is an increase in estimated total mortality from the 2021–22 fishing season [273.5 t; Woodhams et al. 2022].

This estimate of mortality (322.9 t) does not include recreational harvest. Estimates of recreational catch are not available for 2022–23 [Davis et al. 2023]. Although recreational catch of School Shark is known to occur in New South Wales, South Australia, Western Australia, Tasmania and Victoria, no estimates of recreational harvest are available for New South Wales or Victoria [Davis et al. 2023]. In South Australia, recreational harvest was estimated to be 9.14 t (SE 5.16 t) or 1 232 individuals (SE 696) in 2021–22 [Beckmann et al. 2023]. Harvest of School Shark in Western Australia is negligible [Braccini et al. 2021] and in Tasmania is uncertain, with an estimated 1,000–9,999 School Sharks caught by line and < 1 000 caught by set-line in 2017–18 [Lyle et al. 2019]. No estimate of weight or retention is provided for School Shark in Tasmania, but authors indicate release rates for sharks and rays as a group are high [greater than 50%; Lyle et al. 2019].

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There is no reliable modelling to indicate that the stock would recover at the rate of fishing mortality in 2022–23 and if recovery did occur, it would be very slow and unlikely to be consistent with the requirements of the Commonwealth Harvest Strategy Policy [Davis et al. 2023; DAWR 2018].

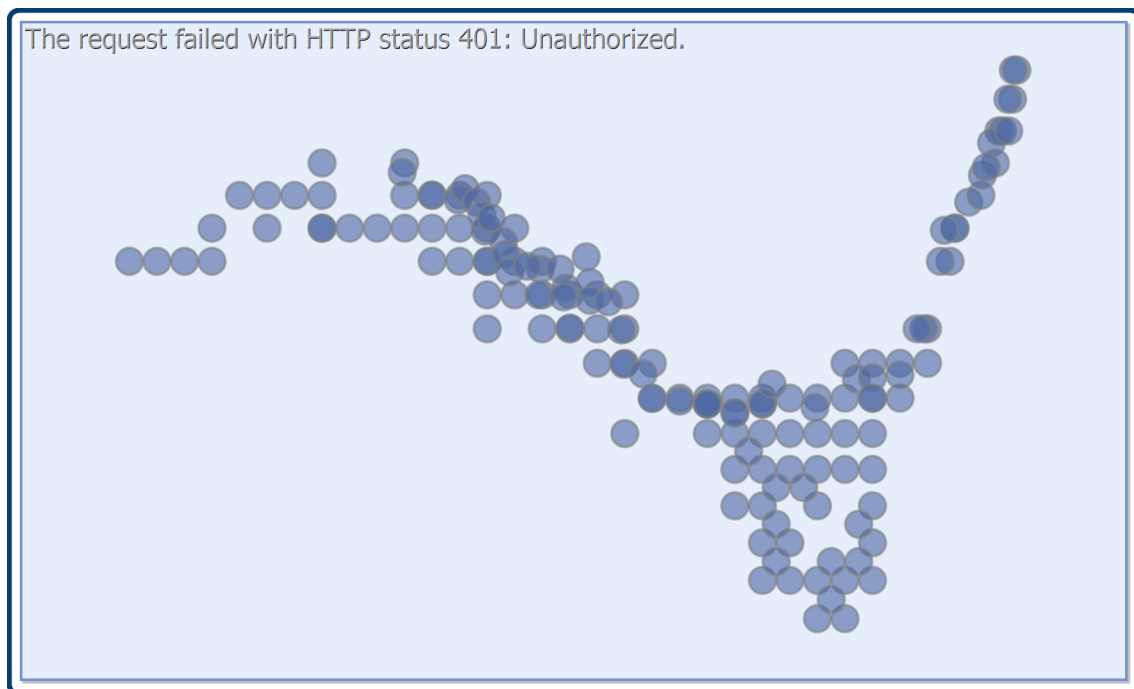
The above evidence indicates that the biomass of this stock is likely to be depleted and that recruitment is likely to be impaired. On the basis of the evidence provided above, the Southern Australia biological stock is classified as a **depleted stock**.

BIOLOGY

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

Species	Longevity / Maximum Size	Maturity (50 per cent)
School Shark	50 years, approximately 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

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Fishing methods					
	Commonweal th	New South Wales	South Australia	Tasmania	Victoria
Charter					
Hook and Line					
Commercial					
Danish Seine	✓				
Demersal Gillnet	✓				
Demersal Longline	✓	✓			
Dropline	✓				
Gillnet					
Hand Line, Hand Reel or Powered Reels				✓	
Haul Seine		✓			
Hook and Line		✓			✓
Longline (Unspecified)					
Mesh Net		✓			
Midwater Trawl	✓				
Net					✓
Otter Trawl	✓	✓			
Unspecified			✓	✓	
Various		✓			
Recreational					
Demersal Longline				✓	
Gillnet				✓	
Hook and Line		✓	✓	✓	✓
Unspecified					

Management Methods					
	Commonweal th	New South Wales	South Australia	Tasmania	Victoria
Charter					
Bag limits					✓

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Licence (boat-based sector)					
Spatial closures					✓
Commercial					
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			✓	✓	✓
Recreational					
Bag limits		✓	✓	✓	✓
Gear restrictions			✓		✓
Licence				✓	
Licence (boat-based sector)					
License					✓
Size limit		✓	✓	✓	✓
Spatial closures				✓	✓
Trip limits				✓	

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✓
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Catch	Commonwealth	New South Wales	South Australia	Tasmania	Victoria
Commercial	186.563 t	3.63768 t	23.7446 t	1.5436 t	0.2329 t
Indigenous		Unknown	Unknown	Unknown	
Recreational		Unknown	Estimated 9.14 t retained (2021–22)	Unknown	Unknown (No catch under permits)

Commonwealth – Commercial (Management Methods/Catch). Data provided for the Commonwealth align with the Commonwealth Southern and Eastern Scalefish and Shark Fishery for 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.

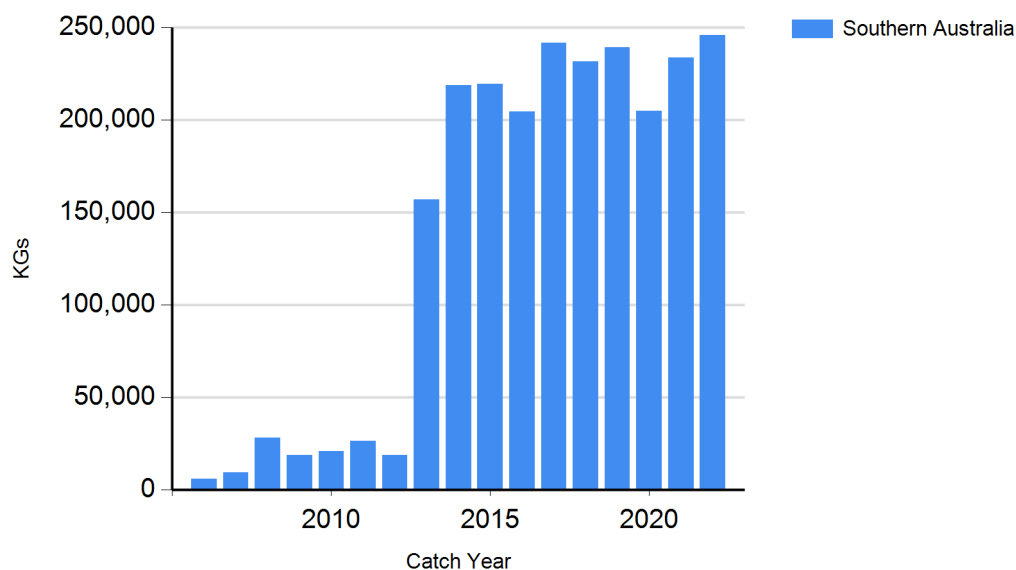
New South Wales – Indigenous (Management Methods).
<https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

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 (Management Methods). In Tasmania, Indigenous persons engaged in traditional 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. For details, see the policy document 'Recognition of Aboriginal Fishing Activities' (<https://fishing.tas.gov.au/Documents/Policy%20for%20Aboriginal%20tags%20and%20allotting%20an%20UIC.pdf>).

Western Australia
30.0955 t
Undetermined but likely to be negligible
No School Sharks caught from boats (Ryan et al. 2017), shore- based catches are undetermined

CATCH CHART



Commercial catch of School Shark - note confidential catch not shown

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