

Gould's Squid (2020)

Nototodarus gouldi



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, New South Wales, Tasmania	South-Eastern Australia	Sustainable	Catch rates, catch, effort

STOCK STRUCTURE

Genetic studies support the hypothesis of a single biological stock of Gould's Squid throughout south eastern Australian waters [Jackson and McGrath-Steer 2003]. Two techniques, statolith shape and statolith elemental composition, have also been used to determine dispersal patterns of Gould's Squid and evidence of separate stocks [Virtue et al 2011, Green et al. 2015]. Samples were collected from Victoria and the Great Australian Bight. Adult statolith shape provided evidence that adults caught in the two locations belonged to different stocks, however, statolith elemental composition suggested that Gould's Squid caught at each location had hatched throughout their distribution [Green et al. 2015]. Hence, genetic homogeneity of the species is suspected to be a function of egg mass and juvenile drift resulting from seasonal longitudinal ocean currents rather than large-scale migration between the two regions [Green et al. 2015]. Also, this drift appears to provide more juvenile squid from Victoria to the Great Australian Bight than occurs in the opposite direction. The current dominance of Victorian and Tasmanian regions in terms of fishing effort means that a single-stock approach to management is appropriate at this time [Green et al. 2015].

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

STOCK STATUS

South-Eastern Australia Gould's Squid is fished in Commonwealth, New South Wales and Tasmanian waters. The status presented here is for the entire biological stock and has been established using evidence from all jurisdictions.

No formal stock assessment is available for Gould's Squid in Australia. The species is short lived (less than one year), spawns multiple times during its life, and displays highly variable growth rates, and size and age at maturity [Jackson and McGrath-Steer 2003]. These characteristics mean that the population may

be less susceptible to fishing mortality than longer-lived species. However, their short life expectancy also implies that recruitment to the stock may be susceptible to environmental conditions and fishing pressures [Jackson & McGrath-Steer 2003, Noriega and Curtotti 2020]. The high historical catches taken by foreign vessels in the late 1970s and 1980s indicate that a high annual harvest can be taken from the stock in years of high abundance without greatly reducing recruitment and biomass for subsequent seasons. However, as the fishery targets a single year class there is potential for recruitment overfishing if insufficient animals survive long enough to reproduce. Given spawning occurs throughout the year [Jackson and McGrath-Steer 2003] there is minimal risk of recruitment overfishing in seasonal and localised fisheries such as those in South-Eastern Australia.

The majority of Commonwealth catch is taken by squid jigging and demersal trawling. In 2018–19, 721 tonnes (t) of squid were reported from two Commonwealth fisheries. In the Southern Squid Jig Fishery (SSJF), 246 t of squid catch was reported while in the Commonwealth Trawl Sector (CTS) and Great Australian Bight Trawl Sector (GABTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF), 428 t and 46 t of squid catch was reported, respectively.

Total fishing effort in the SSJF decreased from a peak of 15 600 jig hours in 1997 to 617 jig hours in 2010. High costs relative to revenue, combined with the highly variable biomass and/or availability of the stock, are understood to be the main reasons for the reduced effort since 2008 [Noriega and Curtotti 2020]. Following increased effort in 2015 and 2016, effort declined in 2017 (1 332 jig hours) due to the difficulty in locating squid, resulting in processors not able to source enough squid [AFMA 2017]. Effort in 2019 (2 234 jig hours) was similar to that in 2018 (2 281 jig hours), mostly due to higher domestic and international squid prices [AFMA 2019], yet anecdotal reports suggest the fleet experienced some difficulty in locating squid [AFMA 2020].

Fishing effort in the CTS and GABTS has decreased substantially since the mid-2000s when total trawl effort was around 140 000 hours. In 2018–19, combined fishing effort in these sectors was 66 384 trawl hours [Helidoniotis et al. 2019, Moore et al. 2019], down from 70 274 trawl hours in 2017–18.

Gould's Squid are taken in small quantities as byproduct of the New South Wales Ocean Trawl Fishery [Hall 2015]. Annual landings from New South Wales steadily decreased from 59 tonnes (t) in 1997–98 to a minimum of 4.9 t in 2012–13, and then have increased slightly to 11.9 t in 2018–19 [Hall 2020]. Most of the earlier decline was in catches from the prawn trawl sector along the northern coast in response to a concurrent rapid decrease in fishing effort from 9 905 fisher days in 1997–98 to 1 172 fisher days in 2012–13. Since then effort has increased slightly to 2 502 days fished in 2018–19. Over the same period, standardised commercial catch rates of the fish trawl and prawn trawl sectors of the Ocean Trawl Fishery fluctuated around a generally decreasing trend, but have increased steadily over the last five years and are currently near the long-term average [Hall 2020]. The level of harvest from NSW waters is relatively insignificant compared to amounts removed from the stock in other jurisdictions.

Gould's Squid are sporadically present in high abundances in Tasmanian waters between late summer and early autumn, especially off the south-east coast (for example, in years 2000, 2007, 2012, 2013). In such years of high local abundance, dual-endorsed automatic squid-jig vessels have commonly concentrated their fishing effort in Tasmanian state waters before moving back to more traditional fishing grounds in Commonwealth waters. In consequence, interannual variation in Tasmanian catches of Gould's Squid has been high [Krueck et al. 2020]. In 2018–19, 24 t of catch was reported under Tasmanian scalefish licences. [Krueck et al. 2020].

Combined total catch from the Commonwealth, New South Wales and Tasmania in 2018-19 was 756 t. Total catch has been below 3 000 t since 2000 and below

the historical peak catch of 7 914 t taken by foreign jig fishing vessels in 1979–80. Nominal catch rates from the Commonwealth Trawl Sector, the Tasmanian Scalefish Fishery and New South Wales Ocean Trawl Fishery have been relatively stable over time. This indicates that the biomass of this stock is unlikely to be depleted, that recruitment is unlikely to be impaired and that the current level of fishing mortality across jurisdictions is unlikely to cause the stock to become recruitment impaired.

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

BIOLOGY

Gould's Squid biology [Jackson and McGrath-Steer 2003]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Gould's Squid	< 1 year, 350–400 mm ML	6–9 months, 170–300 mm ML

DISTRIBUTION



Distribution of reported commercial catch of Gould's Squid

TABLES

Fishing methods	Commonwealth	New South Wales	Tasmania
Charter			
Hook and Line		✓	
Squid Jigging		✓	
Commercial			
Danish Seine	✓		
Midwater Trawl	✓		

Otter Trawl	✓		
Squid jigs (mechanised)	✓		
Trawl		✓	
Unspecified			✓
Recreational			
Hook and Line		✓	✓
Squid Jigging		✓	✓

Management Methods			
	Commonwealth	New South Wales	Tasmania
Charter			
Bag limits		✓	
Gear restrictions		✓	
Spatial closures		✓	
Commercial			
Effort limits	✓	✓	
Gear restrictions		✓	
Limited entry	✓	✓	✓
Spatial closures		✓	✓
Temporal closures			✓
Trigger limits	✓		
Vessel restrictions	✓	✓	✓
Recreational			
Bag and possession limits			✓
Bag limits		✓	✓
Gear restrictions		✓	✓
Spatial closures		✓	
Temporal closures			✓

Catch			
	Commonwealth	New South Wales	Tasmania

Charter		5 squid (in 2018–19)	
Commercial	720.882 t	11.0269 t	23.934 t
Indigenous		Unknown	Unknown
Recreational		Unknown	21 t in 2012–13

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.

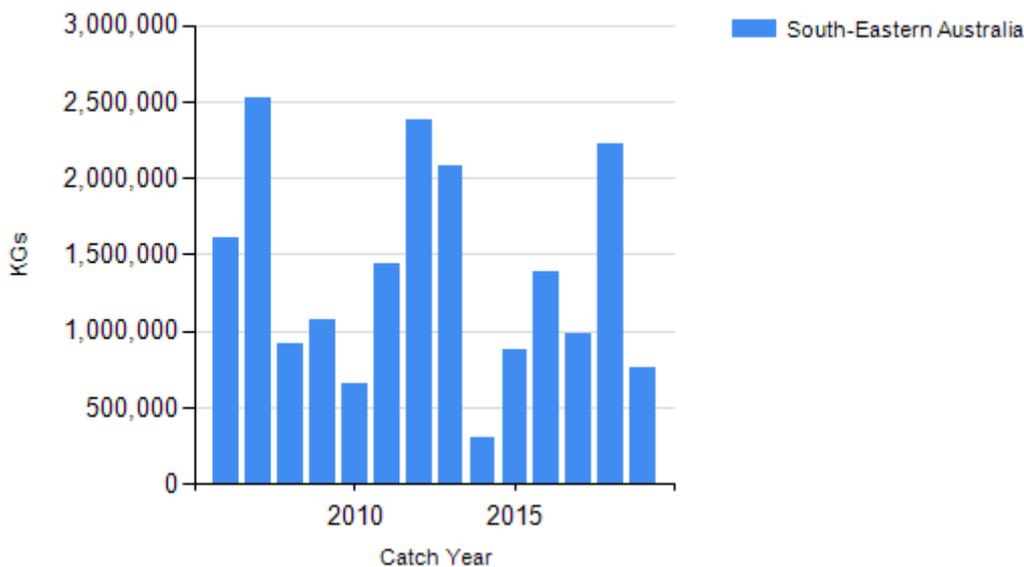
New South Wales – Indigenous (management methods) <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>.

Tasmania – Commercial (catch) Catches reported for the Tasmanian Scalefish Fishery are for the period 1 July to 30 June the following year. The most recent assessment available is for 2016–17.

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. A bag limit of 15 individuals and a possession limit of 30 individuals is in place for recreational fishers.

Tasmania – Indigenous (management methods) <https://dpipwe.tas.gov.au/Documents/Policy%20for%20Aboriginal%20tags%20and%20allotting%20an%20UIC.p>

CATCH CHART



Commercial catch of Gould's Squid - note confidential catch not shown

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