

Redfish (2020)

Centroberyx affinis



Timothy Emery: Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), **Geoffrey Liggins:** New South Wales Department of Primary Industries, **Nils Krueck:** Institute for Marine and Antarctic Studies, University of Tasmania

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, New South Wales, Tasmania	South Eastern Australia	Depleted	Estimated spawning stock biomass, fishing mortality rate, catch

STOCK STRUCTURE

No stock delineation studies of Redfish have been undertaken in Australia. Tagging studies suggested a single stock of Redfish off New South Wales [Morison et al. 2013]. However, studies of mean length at age suggest differences in growth rates of Redfish from the ‘northern’ and ‘southern’ areas of the fishery off eastern Australia [Morison et al. 2013]. Previous Redfish assessments have assumed that the fishery exploits two separate populations, with the boundary between these being 36°S (immediately north of Montague Island in New South Wales) [Morison et al. 2013]. However, following a review of the evidence for separate stocks, ShelfRAG considered the evidence to be insufficient, and the most recent stock assessment [Tuck et al. 2017] assumes a single stock across regions. Status is determined for a single stock on the east coast of Australia.

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

STOCK STATUS

South Eastern Australia

Redfish has only been sporadically fished in Tasmanian waters, with confirmed catches of *C. affinis* available only from the 2018–19 season. These first species-level records of catch were very low but remain confidential. Annual catches for unspecified Redfish species in previous years, which include but are not restricted to *C. affinis*, were generally below 300 kg. A single outstandingly high but confidential catch record for unspecified Redfish in 2008–09 is likely due to misreporting of Redbait (*Emmelichthys nitidus*). Redfish is not harvested recreationally in Tasmania, as indicated by surveys of recreational fishing in the State [Lyle et al. 2009, Lyle et al. 2014, Lyle et al. 2019].

The annual commercial catch from New South Wales waters has declined during the past decade from 29.5 t in 2009–10 to 4.4 t in 2018–19. These catches have represented between 10 per cent and 20 per cent of total commercial landings during this decade. Annual catches from the Ocean Trap and Line Fishery have been between 2 and 6 t over this decade while catches from the Ocean Trawl Fishery have declined from about 27 t in 2009–10 to 2.7 t in 2018–19. In contrast to 10 years ago, catches from the Ocean Trap and Line Fishery now represent about 40 per cent of New South Wales commercial landings. The majority of commercial catches from New South Wales waters come from areas adjacent to the Commonwealth fishery, inside 3 nm on the south coast of New South Wales and to the north of Barrenjoey Headland on the mid-north coast of New South Wales. Given this proximity to the Commonwealth fishery and the New South Wales catch representing less than 20 per cent of the total fishing mortality, assessment status for the component of the Redfish stock under New South Wales jurisdiction is based on the Commonwealth assessment, which includes catch data from New South Wales.

Redfish have been assessed by the Commonwealth to be depleted to below the limit reference point (0.2B₀) since 1992 [Tuck et al. 2017] and are currently managed under the Commonwealth redfish stock rebuilding strategy 2016–21 [AFMA 2016]. The main objective of the strategy is to rebuild redfish to, or above the limit reference point (0.2B₀) by or before 2042 (one mean generation time plus 10 years) [AFMA, 2016]. The rebuilding strategy prescribes that the TAC will be set at the minimum incidental catch allowance required to cover the catch of redfish taken incidentally, while targeting other species. This amount has been set at 50 t since 2019–20 fishing season.

Redfish landings in the Commonwealth Southern and Eastern Scalefish and Shark Fishery peaked in the late 1970s and early 1980s, with significant discards recorded on top of landed catch. Landed catch steadily declined in the 1990s and 2000s as TACs were steadily reduced and the species became subject to an incidental catch allowance under the rebuilding strategy [AFMA 2016]. Commonwealth landed catch in the trawl and scalefish hook sectors of the Commonwealth Southern and Eastern Scalefish and Shark Fishery was 29.4 t in the 2019–20 fishing season (30.8 t in 2018-19 fishing season). Discards have been estimated to be 21.4 t based on the weighted average of the previous four fishing seasons (2015–16 to 2018–19) [Burch et al., 2019].

Redfish was last assessed in 2017 [Tuck et al. 2017]. The Tier 1 assessment used catch rate data, length data and conditional age-at-length data up to 2016. The base-case model estimated the spawning stock biomass to be 4% (0.04SB₀) of the unfished level (SB₀) in 2016. It also projected that the spawning stock biomass in 2018 would be 8% (0.08SB₀) of the unfished level (SB₀) (assuming the same catches in 2017 as in 2016). The assessment highlighted that estimates of recruitment since the early 2000s have been lower than average (except for 2011 and 2012), potentially due to environmental changes influencing productivity [Tuck et al. 2017]. Standardised CPUE (excluding discards) has declined steadily since 2000, and has remained low in recent years [Haddon and Sporic 2017]. It has been previously noted that as fishers become more skilled in avoiding redfish, CPUE may become less informative as an index of abundance for the stock [AFMA 2019, 2020].

The above evidence indicates that the stock is depleted and that recruitment is

likely to have been impaired.

The 2017 Tier 1 assessment included projections of redfish biomass that were based on two recruitment (low and average) scenarios. Under the low recruitment scenario (recruitment from 2001 to 2010), the spawning stock biomass took a considerably long (>40 years) time to recover to the limit reference point of 0.2SB0, at average annual catches of 50 t, while catches above 150 t were unsustainable [Tuck et al. 2017]. Under the average recruitment scenario (recruitment from the stock-recruitment curve), the spawning stock biomass was estimated to reach the limit reference point of 0.2SB0 by 2024 based on an annual catch of 0 t [Tuck et al. 2017]. Total Commonwealth and State catches and discards in the 2019-20 fishing season were estimated to be 57.7 t, which is above the incidental catch allowance of 50 t, however there are no reliable indicators to determine if this level of fishing mortality will allow the stock to rebuild from its recruitment impaired state.

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

BIOLOGY

Redfish biology [Kailola et al. 1993]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Redfish	Males 11 years, 330 mm FL Females 16 years, 380 mm FL	4 years, 200–250 mm

DISTRIBUTION



Distribution of reported commercial catch of Redfish

TABLES

Fishing methods

	Commonwealth	New South Wales	Tasmania
Charter			
Hook and Line		✓	
Rod and reel		✓	
Commercial			
Danish Seine	✓		
Demersal Gillnet	✓		
Demersal Longline	✓		
Dropline	✓		
Fish Trap		✓	
Line		✓	
Otter Trawl	✓	✓	
Unspecified			✓
Various		✓	
Recreational			
Hook and Line		✓	
Rod and reel		✓	

Management Methods			
	Commonwealth	New South Wales	Tasmania
Charter			
Bag and possession limits		✓	
Gear restrictions		✓	
Licence		✓	
Marine park closures		✓	
Commercial			
Bag and possession limits			✓
Catch limits		✓	✓
Gear restrictions	✓	✓	
Limited entry	✓	✓	✓
Marine park closures	✓	✓	
Mesh size regulations		✓	
Quota	✓		

Spatial closures	✓	✓	
Total allowable catch (incidental)	✓		
Vessel restrictions		✓	
Recreational			
Bag and possession limits		✓	
Gear restrictions		✓	
Licence		✓	
Marine park closures		✓	

Catch	Commonwealth	New South Wales	Tasmania
Commercial	31.8286 t	4.3994 t	0 t
Indigenous		Negligible (2013–14)	Unknown
Recreational		6.5 t (2013–14)	Unknown

Commonwealth – Commercial (Management Methods/Catch) Data provided for the Commonwealth align with the Commonwealth Southern and Eastern Scalefish and Shark Fishery for the 2018-19 financial year.

Commonwealth – Recreational The Commonwealth 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 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 – Recreational Recreational catch estimate of 6.5 t is based on (i) an estimated recreational catch of 21 450 redfish by NSW resident recreational anglers in 2013–14 [West et al. 2015]; and (ii) an assumed mean weight of kept redfish of 0.304 kg/fish.

This remains the most reliable estimate of annual recreational catch because the 2017-18 survey estimate of 4.39 t [Murphy et al. 2020] applies only to 1-3 year recreational licence holders.

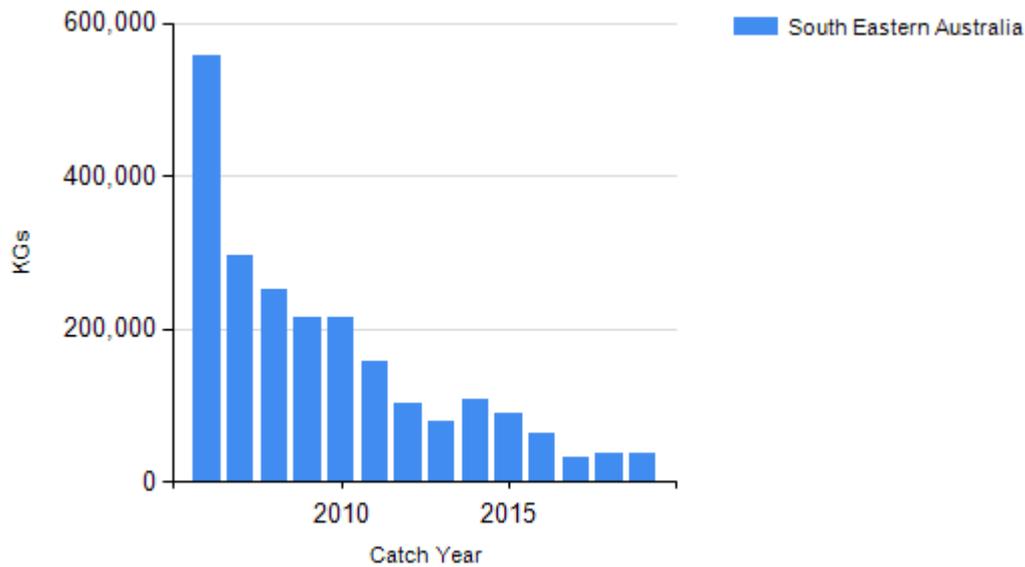
New South Wales - Indigenous Customary Fishing Management Arrangements. See <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

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 – Commercial (Management Methods) The holder of a fishing licence (personal) who is not operating in accordance with a Commonwealth authority must not take, or be in possession of, more than 50 kg of Redfish.

CATCH CHART



Commercial catch of Redfish - note confidential catch not shown. Discards are not included

References	
Lyle et al. 2014	Lyle, JM, Stark, KE and Tracey, SR 2014, 2012–13 survey of recreational fishing in Tasmania. Institute for Marine and Antarctic Studies, Hobart.
AFMA 2016	AFMA 2016, Redfish (<i>Centroberyx affinis</i>) stock rebuilding strategy 2016–2021, AFMA, Canberra.
Haddon and Sporcic 2017	Haddon M and Sporcic M 2017, Statistical CPUE Standardizations for selected SESSF species (data to 2016). CSIRO Oceans and Atmosphere, 31 July 2017, Prepared for the SESSFRAG Data Meeting, 7–8 August 2017, Hobart, for the Australian Fisheries Management Authority
Kailola et al. 1993	Kailola PJ, Williams MJ, Stewart PC, Reichelt R.E, McNee A and Grieve C, 1993. Australian Fisheries Resources. Australian Bureau of Resource Sciences. Canberra
Lyle et al. 2009	Lyle, JM, Tracey, SR, Stark, KE and Wotherspoon, S, 2009, 2007-08 survey of recreational fishing in Tasmania. Tasmanian Aquaculture and Fisheries Institute, Hobart
Morison et al. 2013	Morison A, Knuckey IA, Simpfendorfer CA and Buckworth RC 2013, South East Scalefish and Shark Fishery: draft 2012 stock assessment summaries for species assessed by GABRAG, ShelfRAG and Slope/DeepRAG, Report for AFMA, Canberra
Tuck et al. 2017	Tuck GN, Day J, Haddon M. and Castillo-Jordan C 2017, DRAFT - Redfish (<i>Centroberyx affinis</i>) stock assessment based on data up to 2016, CSIRO Oceans and Atmosphere. Technical paper presented for discussion at SERAG, December 2017, Hobart, Tasmania for the Australian Fisheries Management Authority
West et al. 2015	West LD, Stark KE, Murphy JJ, Lyle JM and Doyle FA 2015, Survey of recreational fishing in New South Wales and the ACT, 2013/14, Fisheries Final Report Series No. 149, NSW Department of Primary Industries.
Murphy et al. 2020	Murphy, JJ, Ochwada-Doyle, FA, West, LD, Stark, KE and Hughes, JM, 2020, The NSW Recreational Fisheries Monitoring Program - Survey of recreational fishing, 2017/18. NSW DPI - Fisheries Final Report Series No. 158.
Lyle et al. 2019	Lyle, JM, Stark, KE, Ewing, GP and Tracey, SR 2019, 2017-18 Survey of recreational fishing in Tasmania. Institute for Marine and Antarctic Studies, Hobart, Tasmania.
Burch et al. 2019	Burch, P, Althaus, F & Thomson, R 2019, Southern and Eastern Scalefish and Shark Fishery (SESSF) catches and discards for TAC purposes using data until 2018, Prepared for the SERAG Meeting, 3-4 December 2019, Hobart, CSIRO Oceans and Atmosphere, Hobart, Tasmania.

AFMA, 2019	AFMA 2019, Southern and Eastern Scalefish and Shark Fishery (SESSF) South East Resource Assessment Group (SERAG), minutes, 22-23 October 2019 Australian Fisheries Management Authority, Canberra, Australia.
AFMA, 2020	AFMA 2020, Total Allowable Catch recommendations for the Southern and Eastern Scalefish and Shark Fishery (SESSF) 2020-21 fishing year - advice to SEMAC, Australian Fisheries Management Authority, Canberra.