

# Bight Redfish (2018)

*Centroberyx gerrardi*



**Cher Harte:** Australian Bureau of Agricultural and Resource Economics and Sciences, **Bradley Moore:** Institute for Marine and Antarctic Studies, University of Tasmania, **Paul Rogers:** South Australian Research and Development Institute, **Jeff Norriss:** Department of Primary Industries and Regional Development, Western Australia

## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth, Western Australia, Tasmania, South Australia	Southern Australia	FBLC74, FBLC74    JASDGDMF    WCDSIMF    WL (SC), JASDGDMF, MSF, N/A, SESSF (GABTS), WCDSIMF, WL (SC)	Sustainable	Fishery-independent biomass surveys, estimated spawning stock biomass, fishing mortality rate, spawning potential ratio, length and age composition, catch

SESSF (GABTS) Southern and Eastern Scalefish and Shark Fishery (Great Australian Bight Trawl Sector) (CTH), MSF Marine Scalefish Fishery (SA), N/A Not Applicable (TAS), JASDGDMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), WCDSIMF West Coast Demersal Scalefish (Interim) Managed Fishery (WA), WL (SC) Open Access in the South Coast (WA), FBLC74 Fishing Boat Licence Conditions (WA), FBLC74 || JASDGDMF || WCDSIMF || WL (SC) Various Fisheries combined due to 3 boat rule (WA)

## STOCK STRUCTURE

Bight Redfish is endemic to southern Australia and occurs from Bass Strait to Lancelin in Western Australia [Gomon et al. 2008]. The biological stock structure of Bight Redfish is currently unknown [Bertram et al. 2015, Moore and Mobsby 2018] and is treated as a single biological stock in the Great Australian Bight Trawl Sector.

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

## STOCK STATUS

**Southern Australia** Bight Redfish are caught in Commonwealth, Western Australian, South Australian and Tasmanian fisheries, and stock status is assessed here using evidence from each of these jurisdictions.

The most recent quantitative assessment conducted in 2015 for the

Commonwealth Southern and Eastern Scalefish and Shark Fishery (SESSF) [Haddon 2015] updated the 2011 stock assessment for the Great Australian Bight management area by Klaer [2012]. The base-case assessment estimated female spawning biomass at the start of 2015–16 to be 5 451 tonnes (t), or 63 per cent of unexploited female spawning stock biomass, which was above the target reference point of 0.41 SBO.

A reduction in the estimated female spawning biomass between assessments is supported by results of fishery-independent trawl surveys. Surveys conducted annually between 2006 and 2011 (with the exclusion of 2010) provide relative abundance estimates of the main target and byproduct species on the shelf [Knuckey and Hudson 2007, Knuckey et al. 2008, 2009, 2011]. The 2015 fishery-independent trawl survey estimated that relative biomass had decreased by 80 per cent from the 2011 estimate [Knuckey et al. 2015]. The Great Australian Bight Trawl Sector (GABTS) has also noted a decrease in availability in recent years, with catches well below recommended biological catches [Moore and Mobsby 2018]. Age composition data indicates some reduction in the abundance of older Bight Redfish in recent years, which is supported by length frequency information that suggests a reduction in larger individuals between 2011 and 2013 [Moore and Mobsby 2018].

In Western Australia, Bight Redfish are taken mainly by commercial line fishing off the lower west and south coasts. Catch-at-age sampling of 5 672 south coast Bight Redfish from the commercial line, demersal gillnet, recreational and charter sectors during 2013 and 2014 showed variable age compositions between those sectors and spatially [Norriss *et al.* 2016]. The commercial line sample from the western sub-region of the south coast, considered to be the most representative sector, included numbers of fish aged in their 40s, 50s and 60s, the maximum observed age being 84 years, suggesting low mortality rates. Two alternative methods were used to generate median estimates of female spawning potential ratio at (SPR  $\pm$  95 per cent ci): 0.45 (0.28–0.66) and 0.40 (0.22–0.63), respectively, being on or above the target reference point (SPR=0.40). There was a 7 per cent and 25 per cent chance, respectively, of breaching the threshold reference point (SPR=0.30) and < 1 per cent chance of breaching the limit. Estimates of natural mortality  $M$  and fishing mortality  $F$  year<sup>-1</sup> were 0.067 (0.050–0.084) and 0.045 (0.025–0.065), giving a point estimate of  $F/M$  of 0.67, on the target reference level. There was a 20 per cent chance of  $F$  breaching the threshold level of  $F=M$ , and almost zero probability of breaching the limit of  $F=1.5M$ .

According to logbook returns, Bight Redfish are not commercially harvested in Tasmanian waters, with zero catch reported since the commencement of recording. It is possible, although unlikely, that catches of Bight Redfish may have been reported as Redfish (*Centroberyx affinis*). However this latter species has only been sporadically caught in Tasmanian waters, with no catch in 2016 and 2017, and an average annual catch for the period 2010–11 to 2016–17 of only 0.002 t. Historical catches of Redfish in Tasmanian waters have been similarly low, with an average annual commercial catch for the 10 year period 1995–96 to 2004–05 of 0.047 t. Neither Bight Redfish nor Redfish are caught recreationally in Tasmania and were not reported in the 2007–08 or 2012–13 surveys of recreational fishing in the State [Lyle et al. 2009, Lyle et al. 2014].

Bight Redfish is taken using demersal gear types in South Australia's commercial multispecies, multi-gear and multi-sectoral Marine Scalefish Fishery. In 2017, the total commercial catch in South Australia was 19.8 t, which was above the average annual catch for the 10 year period from 2008–2017 of around 10.7 t. Bight Redfish is an important recreational fishery species in South Australia and is targeted with rod and line. The State-wide recreational survey, which included the charter sector [Rogers *et al.* 2017], estimated that 18.99 t of *Centroberyx* species (three species) were harvested in 2013–14, most of which were thought to be Bight Redfish [Giri and Hall 2015]. There is no published information on the cultural importance of Bight Redfish to Indigenous people in South Australia.

The above evidence indicates that the biomass of this stock is unlikely to be depleted and recruitment is unlikely to be impaired. The evidence furthermore indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

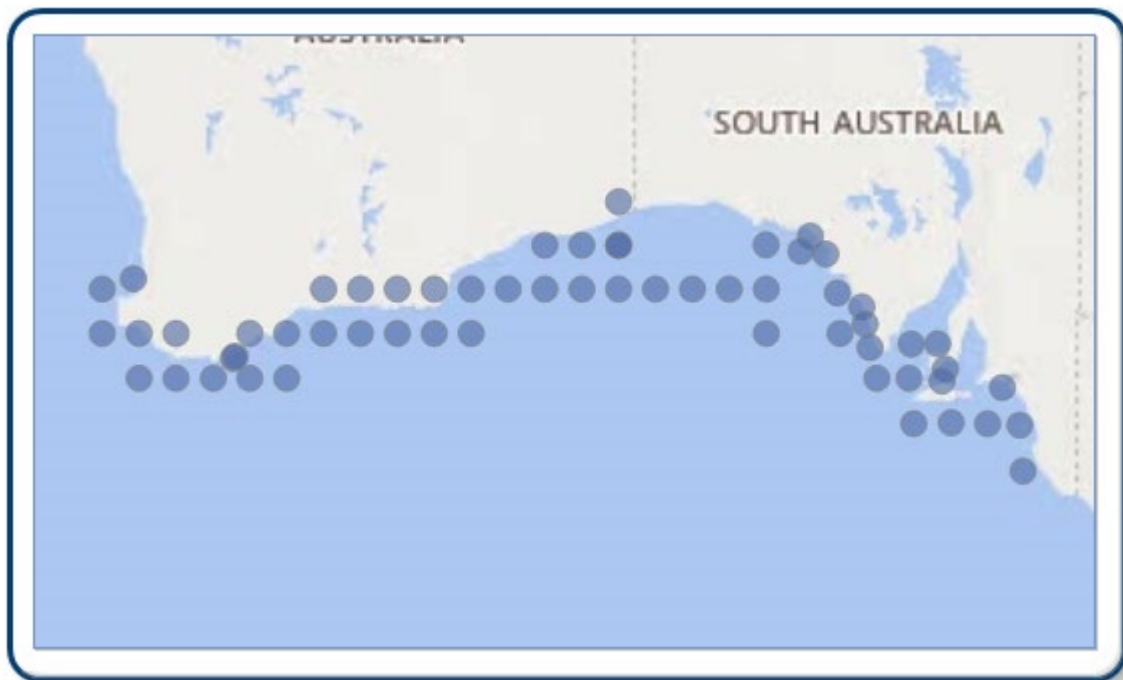
On the basis of available evidence above, the Southern Australia biological stock is classified as a **sustainable stock**.

## BIOLOGY

**Bight Redfish biology** [Brown and Sivakumaran 2003, Norriss et al. 2016, Stockie and Krusic-Golub 2005]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Bight Redfish	84 years, 590 mm CL	5–14 years, 430 mm TL

## DISTRIBUTION



Distribution of reported commercial catch of Bight Redfish

## TABLES

Commercial Catch Methods	Commonwealth	South Australia	Tasmania	Western Australia
Danish Seine	✓			
Demersal Pair Trawl	✓			
Dropline				✓
Fish Trap				✓
Gillnet				✓
Hand Line, Hand Reel or Powered Reels				✓
Longline (Unspecified)				✓

Midwater Trawl	✓			
Otter Trawl	✓			✓
Trawl	✓			
Unspecified		✓	✓	✓

<b>Fishing methods</b>					
	<b>Commonwealth</b>	<b>South Australia</b>	<b>Tasmania</b>	<b>Victoria</b>	<b>Western Australia</b>
<b>Charter</b>					
Hook and Line		✓		✓	
<b>Commercial</b>					
Danish Seine	✓				
Dropline					✓
Fish Trap					✓
Gillnet					✓
Hand Line, Hand Reel or Powered Reels					✓
Longline (Unspecified)					✓
Otter Trawl	✓				
Unspecified		✓	✓		✓
<b>Indigenous</b>					
Hook and Line		✓			
<b>Recreational</b>					
Hook and Line		✓			✓

<b>Management Methods</b>				
	<b>Commonwealth</b>	<b>South Australia</b>	<b>Tasmania</b>	<b>Western Australia</b>
<b>Charter</b>				
Bag limits		✓		✓
Licence				✓
Limited entry				✓
Seasonal closures				✓
Spatial closures				✓
<b>Commercial</b>				
Effort limits		✓		✓
Gear restrictions	✓	✓	✓	✓
Individual transferable quota	✓			

Licence				✓
Limited entry	✓		✓	✓
Size limit		✓		✓
Spatial closures	✓	✓		
Spatial zoning				✓
Total allowable catch	✓			
Trigger limits	✓			
<b>Indigenous</b>				
Bag limits		✓		
<b>Recreational</b>				
Bag limits		✓		✓
Licence (Recreational Fishing from Boat License)				✓
Possession limit				✓
Seasonal closures				✓
Spatial closures				✓

<b>Active Vessels</b>				
	<b>Commonwealth</b>	<b>South Australia</b>	<b>Tasmania</b>	<b>Western Australia</b>
	1 Vessels in SESSF (CTS), 5 Vessels in SESSF (GABTS),	45 Licences in MSF,	0 in SF,	12 in JASDGLMF, 6 in WCDSIMF, 29 in WL (SC), &3 in FBLC74,

**SESSF (CTS)** Southern and Eastern Scalefish and Shark Fishery (Commonwealth Trawl Sector)(CTH)

**SESSF (GABTS)** Southern and Eastern Scalefish and Shark Fishery (Great Australian Bight Trawl Sector)(CTH)

**MSF** Marine Scalefish Fishery(SA)

**SF** Scalefish Fishery(TAS)

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

**WCDSIMF** West Coast Demersal Scalefish (Interim) Managed Fishery(WA)

**WL (SC)** Open Access in the South Coast(WA)

**Charter** Tour Operator(WA)

**FBLC74** Fishing Boat Licence Conditions(WA)

<b>Catch</b>				
	<b>Commonwealth</b>	<b>South Australia</b>	<b>Tasmania</b>	<b>Western Australia</b>
<b>Charter</b>		Unknown		4.0255t in Tour

				Operator
<b>Commercial</b>	329.242t in SESSF (GABTS),	19.8019t in MSF,		52.4902t in FBLC74    JASDGDMF    WCDSIMF    WL (SC),
<b>Indigenous</b>	Unknown	Unknown	Unknown, likely negligible	Unknown
<b>Recreational</b>	Unknown	18.99 t in 2013/14	Unknown, likely negligible	South Coast: 12.5 t ± 1.8 (s. e.) West Coast: 1.9 t ± 0.3 Boast-based 2015/16

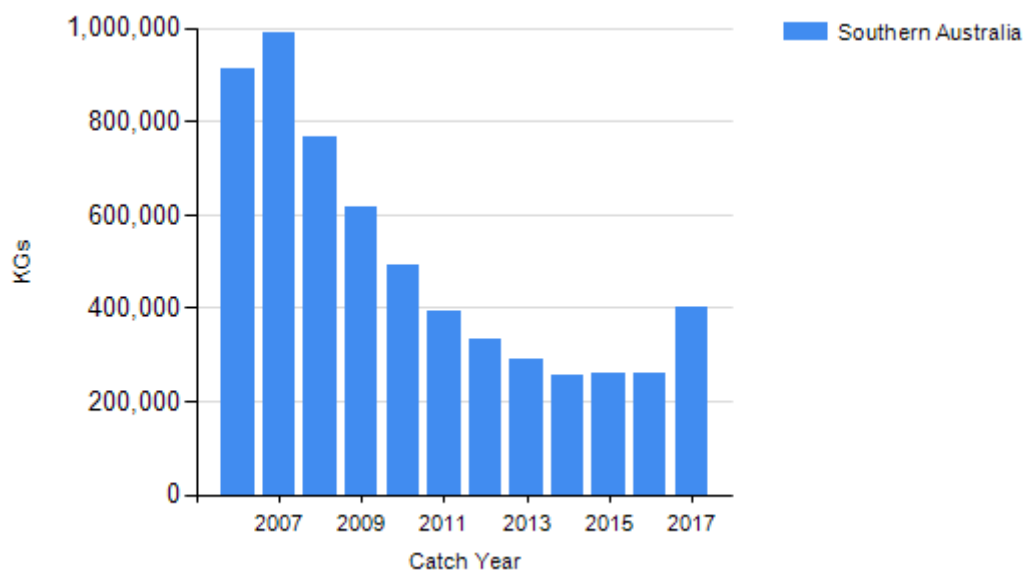
SESSF (GABTS) Southern and Eastern Scalefish and Shark Fishery (Great Australian Bight Trawl Sector) (CTH), MSF Marine Scalefish Fishery (SA), N/A Not Applicable (TAS), JASDGDMF Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2) (WA), WCDSIMF West Coast Demersal Scalefish (Interim) Managed Fishery (WA), WL (SC) Open Access in the South Coast (WA), FBLC74 Fishing Boat Licence Conditions (WA), FBLC74 || JASDGDMF || WCDSIMF || WL (SC) Various Fisheries combined due to 3 boat rule (WA),

**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 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 use of a powered boat to fish or to transport catch or fishing gear to or from a land-based fishing location.

**CATCH CHART**



Commercial catch of Bight Redfish- note confidential catch not shown

**EFFECTS OF FISHING ON THE MARINE ENVIRONMENT**

**ENVIRONMENTAL EFFECTS on Bight Redfish**

<b>References</b>	
94	Bertram, A, Dias, JP, Lukehurst, S, Kennington, JW, Fairclough, D, Norriss J and Jackson G 2015, Isolation and characterisation of 16 polymorphic microsatellite loci for bight redfish, <i>Centroberyx gerrardi</i> (Actinopterygii: Berycidae), and cross-amplification of two other <i>Centroberyx</i> species. <i>Australian Journal of Zoology</i> (63), 275–278.
95	Brown, L and Sivakumaran, K 2003, Spawning and reproductive characteristics of bight redfish and deepwater flathead in the Great Australian Bight trawl fishery. FRDC Project No. 2003/03. Queenscliff, Victoria: Primary Industries Research.
96	Giri, K, and Hall, K 2015, South Australian Recreational Fishing Survey. Fisheries Victoria Internal Report Series No. 62. 75 pp.
97	Gomon, M, Bray D and Kuitert, R. (Eds.) 2008, Fishes of Australia's Southern Coast. Museum Victoria.
98	Haddon, M 2015, Bight redfish ( <i>Centroberyx gerrardi</i> ) stock assessment using data to 2014/2015. In G. Tuck (Ed.), Stock Assessment for the Southern and Eastern Scalefish and Shark Fishery 2015. Part 1 (pp. 9–50). Hobart, Tasmania: Australian Fisheries Management Authority and CSIRO Oceans and Atmosphere.
99	Klaer, N 2012, Bight redfish ( <i>Centroberyx gerrardi</i> ) stock assessment based on data up to 2010/2011. In G. N. Tuck (Ed.), Stock assessment for the Southern and Eastern Scalefish and Shark Fishery 2012, part 1 (pp. 330-345). Hobart, Tasmania: AFMA and CSIRO Marine and Atmospheric Research.
100	Knuckey, IA and Hudson, R 2007, Resource survey of the Great Australian Bight Trawl Fishery 2006, report to AFMA, Canberra.
101	Knuckey, IA, Hudson, R and Koopman, M 2008, Resource survey of the Great Australian Bight Trawl Fishery 2008, report to AFMA, Canberra.
102	Knuckey, IA, Koopman, M and Hudson, R 2009, Resource survey of the Great Australian Bight Trawl Fishery 2009, report to AFMA, Canberra.
103	Knuckey, IA, Koopman, M and Hudson, R 2011, Resource survey of the Great Australian Bight Trawl Sector 2011, report to AFMA, Canberra.
104	Knuckey, IA, Koopman, M and Hudson, R 2015, Resource survey of the Great Australian Bight Trawl Sector 2015, report to AFMA, Canberra.
105	Lyle, JM, Tracey, SR, Stark, KE and Wotherspoon, S, 2009, 2007-08 survey of recreational fishing in Tasmania. Tasmanian Aquaculture and Fisheries Institute, Hobart
106	Lyle, JM, Stark, KE, and Tracey, SR (2014). 2012–13 survey of recreational fishing in Tasmania. Institute for marine and Antarctic Studies, Hobart.
107	Moore, A and Mobsby, D 2018, Chapter 11: Great Australian Bight Trawl Sector in Patterson, H., Noriega, R., Georgeson, L., Larcombe, J., and Curtotti, A., (2018) Fishery Status Reports 2017, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.
108	Norriss, JV, Fisher, EA, Hesp, SA, Jackson, G, Coulson, PG, Leary, T and Thomson, AW 2016, Status of inshore demersal scalefish stocks on the South Coast of Western Australia. Fisheries Research Report No. 276, Department of Fisheries, Western Australia.
109	Rogers, PJ Tsolos, A, Boyle, M and Steer, M 2017, Data summary South Australian Charter Boat Fishery. Final Report to PIRSA Fisheries and Aquaculture. 25 pp.