

Ocean Jacket (2018)

Nelusetta ayraudi



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth	Great Australian Bight Trawl Sector	SESSF (GABTS)	Sustainable	Catch, effort, CPUE
Commonwealth	Southeast Scalefish and Shark Fishery	SESSF (CTS)	Sustainable	Catch, effort, CPUE
New South Wales	New South Wales	N/A, OTF, OTLF	Sustainable	Catch, effort, CPUE
Victoria	Victoria	CIF, GLF, OF, PPBWPF, VRLF	Undefined	Catch
Tasmania	Tasmania	SF	Negligible	
South Australia	South Australia	MSF	Sustainable	Catch, effort, CPUE

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), N/A Not Applicable (NSW), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line Fishery (NSW), MSF Marine Scalefish Fishery (SA), SF Scalefish Fishery (TAS), CIF Corner Inlet Fishery (VIC), GLF Gippsland Lakes Fishery (VIC), OF Ocean Fishery (VIC), PPBWPF Port Phillip Bay and Western Port Bay Fishery (VIC), VRLF Victorian Rock Lobster Fishery (VIC)

STOCK STRUCTURE

Ocean Jackets are distributed along the southern half of Australia from Cape Moreton in Queensland around to North West Cape in Western Australia, including northern Tasmania [Kailola et al 1993]. Throughout their distribution, Ocean Jackets are found in many habitats. As juveniles they are found in estuaries and sheltered bays amongst seagrass beds of *Zostera sp.* and *Posidonia sp.* [Grove-Jones and Burnell 1991, Jones and West 2005]. Sub-adults and adults have been observed to move into different environments such as rocky reefs, sandy–mud benthos, or onto sponge–coralline algae gardens and can be found in waters from 2–250 m [Grove-Jones and Burnell 1991, Hutchins 1999], where they are known to aggregate

seasonally in large schools.

The Ocean Jacket stock comprises Ocean Jackets (*Nelusetta ayraudi*), which makes up most of the catch, and unspecified Leatherjackets. Little is known about the biological structure of this multispecies stock. Here, assessment of stock status is presented at the management unit level—Southeast Scalefish and Shark Fishery, Great Australian Bight Trawl Sector (Commonwealth); and at the jurisdictional level—New South Wales, Victoria, Tasmania and South Australia.

STOCK STATUS

Great Australian Bight Trawl Sector

A by-catch survey of the Great Australian Bight stock in 2001 indicated that Ocean Jacket is often discarded [Knuckey and Brown 2002], with discards since 2002 ranging between 10.1 per cent to 87.9 per cent of landed catch. High discards potentially limit the use of commercial catch-per-unit-effort as an index of abundance for this species.

In the GABTS the standardised CPUE has remained relatively high since 2009 and the most recent CPUE estimate of 2016 is above the mean of the time series (1985–2015), indicating the biomass is above the mean of the time series. The CPUE has been above the mean between the years 2009–16 [Haddon and Sporcic 2017], despite recent high catches. Ocean Jacket catches peaked between 2003 to 2007 ranging between 202.5–338.1 t with 498.63 t caught in 2004–05 fishing season and sharp decline since 2004–05 season. Since 2009, catches ranged between 224.73 t to 67.8 t in the 2017–18 fishing season.

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

On the basis of the evidence presented above, Ocean Jacket in the Great Australian Bight Trawl Sector (Commonwealth) management unit is classified as a **sustainable stock**.

New South Wales

In New South Wales, Ocean Jackets have a long history of commercial exploitation using oceanic demersal fish traps and demersal otter trawl. Records of reported landings indicate that substantial peaks of between 600 and 900 t per annum occurred during the 1920s and again during the 1950s. These peaks were followed by large declines, which suggest that this species is vulnerable to over-exploitation. Between 2000–01 to 2006–07, annual commercial landings using oceanic demersal fish traps and demersal otter trawl increased from 134 to 430 t. Since then, catch has been relatively stable, peaking in 2012 at 420 t and currently down to 211 t in 2017. Since 2009–10 there has been no trend in median trap CPUE, though it peaked in 2013–14 and has slightly declined in the last two years, but to similar levels experienced a decade ago. Ocean Jackets are important to New South Wales recreational and charter boat fishers. The most recent estimate of the recreational harvest of Leather Jackets (all species combined) in New South Wales, by residents of New South Wales, was approximately 71 000 fish during 2013–14, a substantial decrease from 246 212 fish in 2000–01 [West et al. 2015]. The decrease in commercial and recreational catches, coupled with the boom-bust history of the fishery, may indicate that the biomass is declining. However, the above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Miller and Stewart [2009] reported that between 2003 and 2005, Ocean Jacket in New South Wales landings ranged between 220 and 650 mm TL and were fully recruited to the fishery at two years of age, with most of the catch (83 per cent) aged either two or three years. The instantaneous total mortality

rate was estimated from an age-based catch curve as 1.1. Natural mortality was estimated at approximately 0.5, based on a maximum age of six years. Since then, there have been declines in commercial effort, from 6 000–7 000 days fished down to 2 000–3 000 days fished. Further, recreational fishing effort has declined by 37 per cent in ocean waters [inshore and offshore; West et al. 2015]. The above evidence indicates that the current level of fishing mortality in New South Wales is unlikely to cause the stock to become recruitment impaired.

Based on the evidence presented above, Ocean Jacket in New South Wales is classified as a **sustainable stock**.

**South
 Australia**

Ocean Jackets are considered a tertiary species of South Australia's commercial multispecies, multi-gear and multi-sectoral Marine Scalefish Fishery. The most recent assessment of Ocean Jackets used data to the end of December 2017 [Steer et al. 2018]. The primary measures for biomass and fishing mortality are commercial fish trap catch, effort and CPUE [Steer et al. 2018]. The commercial fishery for Ocean Jackets in South Australia commenced in 1984, when this species was first targeted using baited fish traps in off-shore waters [Grove-Jones and Burnell 1991]. The targeted catches rose quickly through the 1980s until regulations to control fishing effort were introduced. Total catch (972 t) and effort peaked during the early 1990s, before declining significantly until 2000 (269 t). From that time catch and effort stabilised for several years, but from 2006 onwards have fallen to very low levels (average 94 t). Four fishers retain endorsements for limited numbers of Ocean Jacket fish traps whose use is restricted to waters of > 60 m depth. Estimates of catch rates since 1984 have been highly variable but show no long-term decline. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence presented above, Ocean Jacket in South Australia is classified as a **sustainable stock**.

**Southeast
 Scalefish
 and Shark
 Fishery**

In the SESSF (CTS and GHAT) Ocean Jacket is a non-quota by-product species and has not been the subject of formal stock assessments. Commonwealth landed catch in the 2017–18 fishing season was 216.4 t [recorded in logbook data] with catch figure combined for the trawl and non-trawl sectors. There continues to be uncertainty over discarding of the species in the CTS and GHAT (gillnet, hook and trap) sectors and discards have not been recently reported for this species. A standardised catch per unit effort (CPUE) series shows a similar trend to landings, suggesting that in recent years abundance of Ocean Jacket increased after 2003 with a gradual decline since 2013 [Haddon and Sporcic 2017]. The recent landings for the CTS recorded in the logbook data are 312 t (2015–16 season), 289 t (2016–17 season), 216 t (2017–18 season). Logbook catches from the GHAT were 0.062 t (2015–16 season), 0.078 t (2016–17 season) and 0.239 t (2017–18 season). Annual commercial landings in the CTS and GHAT combined increased from 318.81 to 413.5 t between 2003 to 2012 with a peak of 448.57 t in 2009. Between 2013 to 2017, annual commercial landings in the CTS and GHAT decreased from 323.33 to 216.38 t. Similarly the standardised CPUE index in the CTS increased substantially between 2003 and 2012, peaking in 2009. The most recent CPUE estimate of 2016 is above the mean of the time series (1985–2015) indicating the biomass is above the mean of the time series. The CPUE has been above the mean between the years 2004–16 [Haddon and Sporcic 2017]. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Further, the above evidence indicates that the current level of fishing mortality in the Commonwealth Trawl Sector is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence presented above, Ocean Jacket in the Southeast Scalefish and Shark Fishery (Commonwealth) management unit is classified as a **sustainable stock**.

Tasmania Although not differentiated from other Leatherjacket species in either commercial or recreational landings, stock status for Ocean Jacket in Tasmania is reported as Negligible given the likely historically low catches in this jurisdiction and that the stock has generally not been subject to targeted fishing. The average annual commercial catch of all Leatherjacket species combined in 2010–16 averaged less than 2.4 t per annum. Given that adult Ocean Jacket primarily inhabit continental shelf and slope waters and the bulk of the Tasmanian Leatherjacket catch is harvested using fish traps from waters < 50 m depth [Moore et al. 2018], the species is considered to constitute only a very minor proportion of commercial and recreational landings of Leatherjacket in Tasmania. Fishing is unlikely to be having a negative impact on the stock.

Victoria In Victoria, Ocean Jackets are not differentiated from other species of Leatherjacket caught commercially or recreationally. The combined species of Leatherjackets landed in Victoria in 2017 was around 14 t; with the majority caught in traps within the Victorian Rock Lobster Fishery and by haul seine and mesh nets within the Corner Inlet Fishery. Regardless of the actual species landed, the quantity of Leatherjackets reported in Victoria in 2017 was relatively small in comparison to catches in other jurisdictions. There is insufficient information available to confidently classify the status of this stock.

On the basis of the evidence presented above, Ocean Jacket in Victoria is classified as an **undefined stock**.

BIOLOGY

Ocean Jacket biology [Kailola et al. 1993, Miller et al. 2010, Miller and Stewart 2012]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Ocean Jacket	≥ 9 years, 790 mm FL New South Wales 6 years, 656 mm TL	New South Wales 2.5 years

DISTRIBUTION



Distribution of reported commercial catch of Ocean Jacket

TABLES

Commercial Catch Methods	Commonwealth	New South Wales	South Australia	Tasmania	Victoria
Danish Seine	✓				
Demersal Pair Trawl	✓				
Fish Trap		✓	✓		
Hook and Line					✓
Midwater Trawl	✓				
N/A				✓	
Net					✓
Otter Trawl	✓	✓			
Traps and Pots					✓
Trawl	✓				
Unspecified		✓			✓

Fishing methods	Commonwealth	New South Wales	South Australia	Victoria
Commercial				
Danish Seine	✓			
Fish Trap		✓	✓	
Hook and Line				✓
Net				✓
Otter Trawl	✓	✓		
Traps and Pots				✓
Unspecified		✓		

Indigenous				
Hook and Line		✓	✓	
Spearfishing		✓		
Recreational				
Hook and Line		✓	✓	✓
Spearfishing		✓		✓
Management Methods				
	Commonwealth	New South Wales	South Australia	Victoria
Commercial				
Effort limits				✓
Fishing gear and method restrictions		✓		
Gear restrictions	✓		✓	✓
Individual transferable quota	✓			
Licence				✓
Limited entry	✓	✓	✓	✓
Quota	✓			
Spatial closures				✓
Total allowable catch	✓			
Trip limits	✓			
Indigenous				
Bag limits		✓		
Customary fishing permits				✓
Gear restrictions			✓	
Native Title		✓		
Section 37 (1d)(3)(9), Aboriginal cultural fishing authority		✓		
Recreational				
Bag limits		✓		✓
Gear restrictions		✓	✓	✓
Licence		✓		✓

Spatial closures				✓
Spatial zoning		✓		

Active Vessels				
	Commonwealth	New South Wales	South Australia	Victoria
	4 Fisher in SESSF (GABTS), 16 Fisher in SESSF (CTS),	7 Fishing Business in EGF, 48 Fishing Business in OTF, 60 Fishing Business in OTLF,	5 Licences in MSF,	14 Licence Holders in CIF, 8 Licence Holders in GLF, 10 Licence Holders in OF, 2 Licence Holders in PPBWPF, 18 Licence Holders in VRLF,

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)

EGF Estuary General Fishery(NSW)

OTF Ocean Trawl Fishery(NSW)

OTLF Ocean Trap and Line Fishery(NSW)

MSF Marine Scalefish Fishery(SA)

CIF Corner Inlet Fishery(VIC)

GLF Gippsland Lakes Fishery(VIC)

OF Ocean Fishery(VIC)

PPBWPF Port Phillip Bay and Western Port Bay Fishery (VIC)

VRLF Victorian Rock Lobster Fishery(VIC)

Catch	Commonwealth	New South Wales	South Australia	Tasmania	Victoria
Commercial	202.775t in SESSF (CTS), 242.905t in SESSF (GABTS),	8.748t in N/A, 20.126t in OTF, 197.852t in OTLF,	151.176t in MSF,		4.0208t in CIF, 1.62145t in GLF, 0.3115t in OF, 8.1892t in VRLF,
Indigenous	Unknown	Unknown	Unknown		Unknown (No catch under permit)
Recreational	Unknown	71 000 fish during 2013–14	Unknown		Unknown

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), N/A Not Applicable (NSW), OTF Ocean Trawl Fishery (NSW), OTLF Ocean Trap and Line Fishery (NSW), MSF Marine Scalefish Fishery (SA), SF Scalefish Fishery (TAS), CIF Corner Inlet Fishery (VIC), GLF Gippsland Lakes Fishery (VIC), OF Ocean Fishery (VIC), PPBWPF Port Phillip Bay and Western Port Bay Fishery (VIC), VRLF Victorian Rock Lobster Fishery (VIC),

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.

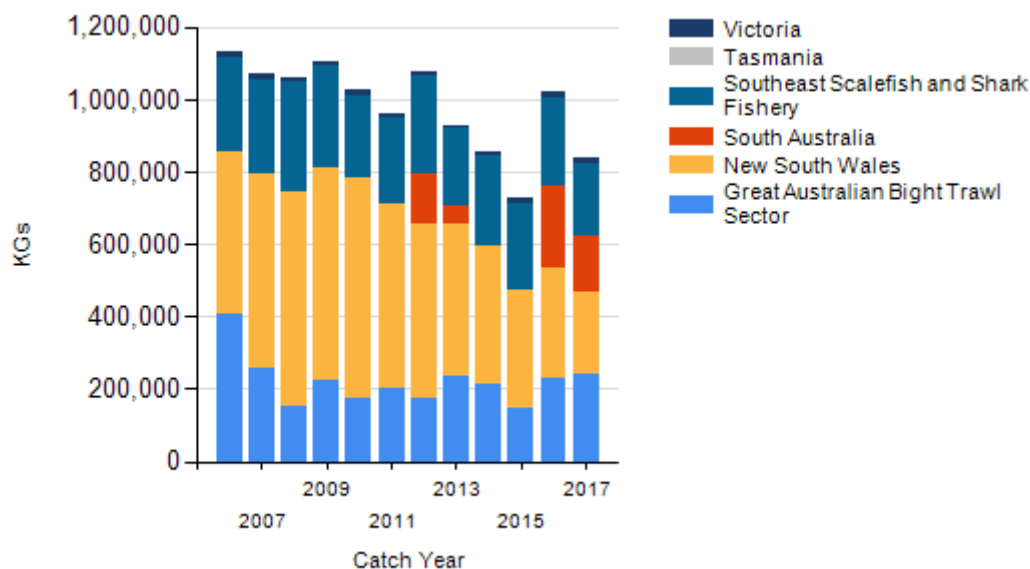
Commonwealth – Indigenous - The Australian government does not manage non-commercial Indigenous fishing in Commonwealth waters, with the exception of Torres Strait. In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters.

New South Wales – (Management Methods) The Aboriginal Cultural Fishing Interim Access Arrangement allows an Indigenous fisher in New South Wales to take in excess of a recreational bag limit in certain circumstances—for example, if they are doing so to provide fish to other community members who cannot harvest themselves. Section 37 (1d)(3)(9), Aboriginal cultural fishing authority - The Aboriginal cultural fishing authority is the authority that Indigenous persons can apply to take catches outside the recreational limits under the *Fisheries Management Act 1994* (NSW), Section 37 (1d)(3)(9), Aboriginal cultural fishing authority. In cases where the *Native Title Act 1993* (Cth) applies fishing activity can be undertaken by the person holding native title in line with S.211 of that Act, which provides for fishing activities for the purpose of satisfying their personal, domestic or non-commercial communal needs. In managing the resource where native title has been formally recognised, the native title holders are engaged with to ensure their native title rights are respected and inform management of the State's fisheries resources.

Victoria – Indigenous

In Victoria, regulations for managing recreational fishing may not apply to fishing activities by Indigenous people. Victorian traditional owners may have rights under the Commonwealth's *Native Title Act 1993* to hunt, fish, gather and conduct other cultural activities for their personal, domestic or non-commercial communal needs without the need to obtain a licence. Traditional Owners that have agreements under the *Traditional Owner Settlement Act 2010* (Vic) may also be authorised to fish without the requirement to hold a recreational fishing licence. Outside of these arrangements, Indigenous Victorians can apply for permits under the *Fisheries Act 1995* (Vic) that authorise fishing for specific Indigenous cultural ceremonies or events (for example, different catch and size limits or equipment). There were no Indigenous permits granted in 2017 and hence no Indigenous catch recorded.

CATCH CHART



Commercial catch of Ocean Jacket - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

ENVIRONMENTAL EFFECTS on Ocean Jacket

References	
1231	ABARES 2018. Fishery Status Reports 2018, Canberra.
1232	Grove-Jones RP, Burnell AF 1991, Fisheries biology of the Ocean Jacket (Monacanthidae: <i>Nelusetta ayraudi</i>) in the eastern waters of the Great Australian Bight. South Australian Department of Fisheries. FIRDC Project DFS01Z, Final report 107 pp.
1233	Haddon, M and Sporcic, M, 2017, Statistical CPUE Standardizations for selected SESSF species (data to 2016)
1234	CSIRO Oceans and Atmosphere, 31 July 2017, Prepared for the SESSFrag Data Meeting, 7–8 August 2017, Hobart, for the Australian Fisheries Management Authority.
1235	Hutchins, BJ 1999. Leatherjackets. In Andrew, NL Under southern Seas. The ecology of Australia's rocky reefs. University of New South Wales Press Ltd, Sydney. pp 195–202.
1236	Kailola PJ, Williams MJ, Stewart PC, Reichelt RE, McNee A and Grieve C, 1993, Australian Fisheries Resources. Australian Bureau of Resource Sciences and the Fisheries Research and Development Corporation. Canberra.
1237	Knuckey IA and Brown LP 2002. Assessment of bycatch in the Great Australian Bight Trawl Fishery, final report to FRDC, report 2000/169, FRDC, Canberra.
1238	Miller, ME and Stewart, J 2009, The commercial fishery for ocean leatherjackets (<i>Nelusetta ayraudi</i> , Monacanthidae) in New South Wales, Australia, <i>Asian Fisheries Science</i> , 22: 257–264.
1239	Miller, ME, Stewart, J and West, RJ 2010. Using otoliths to estimate age and growth of a large Australian endemic monacanthid, <i>Nelusetta ayraudi</i> (Quoy and Gaimard, 1824). <i>Environmental Biology of Fishes</i> , 88: 263–271
1240	Miller, ME and Stewart, J 2012, Reproductive characteristics of the ocean leatherjacket, <i>Nelusetta ayraudi</i> . <i>Reviews of Fish Biology and Fisheries</i> .
1241	Moore B, Lyle J and Hartmann K 2018, Tasmanian Scalefish Fishery Assessment 2016/17. Institute for Marine and Antarctic Studies, University of Tasmania.
1242	Steer, MA, Fowler, AJ, McGarvey, R, Feenstra, J, Westlake, EL, Matthews, D, Drew, M, Rogers, PJ and Earl, J 2018, Assessment of the South Australian Marine Scalefish Fishery in 2016. Report to PIRSA Fisheries and Aquaculture (PDF 7.9 MB). South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2017/000427-1. SARDI Research Report Series No. 974. 250 pp.
1243	West, LD, Stark, KE, Murphy, JJ, Lyle, JM and Ochwada-Doyle, FA 2015, Survey of Recreational Fishing in New South Wales and the ACT, 2013/14. NSW DPI – Fisheries Final Report Series No. 149.