

Ocean Jacket (2020)

Nelusetta ayraudi



Amy Smoothey: NSW Department of Primary Industries, **Nils Krueck:** Institute for Marine and Antarctic Studies, University of Tasmania, **Victorian Fisheries Authority:** Victorian Fisheries Authority, **Anthony Fowler:** South Australian Research and Development Institute, **Timothy Emery:** Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth	Great Australian Bight Trawl Sector	Sustainable	Catch, effort, CPUE
Commonwealth	Southeast Scalefish and Shark Fishery	Sustainable	Catch, effort, CPUE
New South Wales	New South Wales	Sustainable	Catch, effort, CPUE
Victoria	Victoria	Undefined	Catch
Tasmania	Tasmania	Negligible	
South Australia	South Australia	Sustainable	Catch, effort, CPUE

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 are found in different habitats such as rocky reefs, sandy–mud benthos, or sponge–coralline algae gardens in waters from 2–250 m [Grove-Jones and Burnell 1991, Hutchins 1999], where they are known to aggregate seasonally in large schools.

Little is known about the biological structure of the Ocean Jacket 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 Ocean Jacket is a non-quota by-product species and has not been the subject of formal stock assessments or analyses under the SESSF Harvest Strategy Framework [AFMA 2019]. A bycatch survey of the Great Australian Bight (GAB) stock in 2001 indicated that Ocean Jacket is often discarded [Knuckey and Brown 2002], with logbook-reported discards since the 2006–07 fishing season ranging between 0 to 51 per cent of the total catch. It has been noted that high discards potentially limit the use of commercial catch-per-unit-effort (CPUE) as an index of abundance for this species [Moore et al. 2020].

In the GABTS, the standardised CPUE has been variable through time but the most recent CPUE (2017) was similar to that at the start of the time series (1986) and has remained relatively stable over the last seven years [Sporcic and Haddon 2018]. While there is a degree of uncertainty around the time series reflected by the 95 per cent confidence intervals, the CPUE has been above the mean of the time series since 2009 [Sporcic and Haddon 2018]. Landed catch of ocean jacket peaked in 2005 at 527 tonnes (t). It has decreased since, and been less than 250 t since 2008–09, with 148 t landed in the 2019–20 fishing season (170 t in 2018–19).

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 tonnes (t) per year 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 declining to 235 t in 2018–19. Since 2009–10 there has been no trend in median trap CPUE, though it peaked in 2013–14 and has slightly declined since then, 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, based on a survey of Recreational Fishing Licence (RFL) Households, was approximately 53 062 fish weighing approximately 22.8 t caught during 2017–18 with 83 per cent landed using line-bait [Murphy et al. 2020]. RFL households comprised at least one member who possessed a long-term (1 and 3 years duration) fishing licence and included other fishers resident within their households. Recreational fishing estimates

from 2017–18 are down from the previous estimates of 71 000 and 246 212 fish during 2013–14 and 2000–01, respectively [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 Jacket is considered a tertiary species of South Australia's commercial multi-species, multi-gear and multi-sectoral Marine Scalefish Fishery. The species is not heavily targeted by the recreational and charter boat fishers and no estimates of catch from these sectors are available. The primary measures for biomass and fishing mortality are commercial fish trap catch, effort and CPUE [Steer et al. 2020]. The commercial fishery for Ocean Jackets in South Australia commenced in 1984, when this species was first targeted using baited fish traps in offshore waters [Grove-Jones and Burnell 1991]. The targeted catches rose quickly through the 1980s until regulations to control fishing effort were introduced. Total annual 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 between 2006 and 2008 fell to very low levels. Since then commercial catch and effort have increased, although annual catch has generally remained relatively low at below 200 t and effort below 500 fisher days. The most recent assessment of Ocean Jackets used data to the end of December 2018 [Steer et al. 2020]. In that year, the total commercial catch was 95 t. Since 2017, the annual catch rates have generally been above the relatively high level of 400 kg.fisherday⁻¹. The above evidence regarding relatively low catches and high catch rates indicate 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 Commonwealth Trawl and Gillnet Hook and Trap sectors of the Southern and Eastern Scalefish and Shark Fishery (SESSF) (CTS and GHAT), ocean jacket is a non-quota by-product species and has not been the subject of formal stock assessments or analyses under the SESSF Harvest Strategy Framework [AFMA 2019].

Commonwealth landed catch in the 2019–20 fishing season was 173.6 t (140 t in 2018-19 fishing season), which is combined for the CTS and Scalefish Hook sector of the GHAT. While uncertainty over discarding of the species remains, discards were estimated to be 219.8 t based on the weighted average of the previous four fishing seasons (2015–16 to 2018–19) [Burch et al. 2019]. A standardised catch per unit effort (CPUE) time series suggests that the abundance of Ocean Jacket increased between 2003 and 2007. Since 2007, standardised CPUE has continued to remain relatively high, despite a slight decline since 2013 [Sporcic and Haddon 2018]. The standardised CPUE has remained above the mean of the time series since 2004 [Sporcic and Haddon, 2018]. 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 is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence presented above, Ocean Jacket in the south east SSSF (Commonwealth) management unit is classified as a **sustainable stock**.

Tasmania Although not differentiated from other leatherjacket species in either commercial or recreational landings, the stock status for Ocean Jacket in Tasmania is assumed to be **negligible**. Catches are likely to be low given that the Tasmanian stock does not appear to have been subject to targeted fishing.

Recent commercial catches of all leatherjacket species combined were below 5 t (2009–10 to 2018–19), with peaks of around 15 t recorded in the 1990s and early 2000s [Krueck et al. 2020]. Recreational harvest is likely to be similar, albeit with lower estimated peak catches of less than 10 t in the early 2000s [Krueck et al. 2020]. Given that adult Ocean Jacket primarily inhabit continental shelf and slope waters and that 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 minor proportion of commercial and recreational landings of all species of Leatherjacket in Tasmania. Fishing is unlikely to be having a negative impact on the stock.

Victoria Victoria does not play a significant role in the management of Ocean Jacket which is not differentiated from other species of leatherjacket caught commercially or recreationally. Regardless of the actual species landed, the quantity of leatherjackets reported in Victoria in 2019 was relatively small (17 t (~3 per cent) in comparison to catches in other jurisdictions, with the majority caught in traps within the Victorian Rock Lobster Fishery and by haul seine and mesh nets within the Corner Inlet Fishery. 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

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

Management Methods	Commonwealth	New South Wales	South Australia	Victoria
Commercial				

Effort limits				✓
Fishing gear and method restrictions		✓		
Gear restrictions	✓		✓	✓
Licence				✓
Limited entry	✓	✓	✓	✓
Marine park closures	✓			
Spatial closures	✓	✓		✓
Trip limits	✓			
Recreational				
Bag limits		✓		✓
Gear restrictions		✓	✓	✓
Licence		✓		✓
Spatial closures				✓
Spatial zoning		✓		

Catch	Commonwealth	New South Wales	South Australia	Tasmania	Victoria
Commercial	279.741 t	235.02 t	0 t	0 t	17.4759 t
Indigenous		Unknown	Unknown		Unknown (No catch under permit)
Recreational		53 062 fish during 2017–18	Unknown		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.

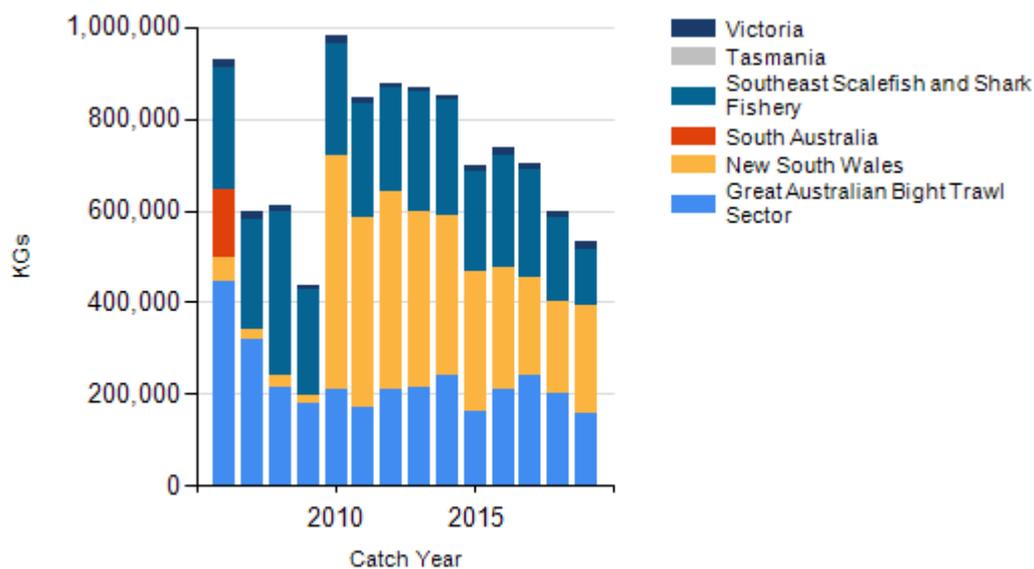
New South Wales – Indigenous (Management Methods)

<https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

New South Wales – Recreational (Catch) Murphy et al. [2020].

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*.

CATCH CHART



Commercial catch of Ocean Jacket - note confidential catch not shown

References	
Grove-Jones and Burnell 1991	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.
Sporcic and Haddon 2018	Sporcic M and Haddon, M, 2018, Statistical CPUE Standardizations for selected SESSF species (data to 2017). CSIRO Oceans and Atmosphere, Hobart.
Hutchins 1999	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.
Kailola et al. 1993	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.
Knuckey and Brown 2002	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.
Miller and Stewart 2009	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.

Miller et al. 2010	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
Miller and Stewart 2012	Miller, ME and Stewart, J 2012, Reproductive characteristics of the ocean leatherjacket, <i>Nelusetta ayraudi</i> . <i>Reviews of Fish Biology and Fisheries</i> .
Moore et al. 2018	Moore B, Lyle J and Hartmann K 2018, <i>Tasmanian Scalefish Fishery Assessment 2016/17</i> . Institute for Marine and Antarctic Studies, University of Tasmania.
Steer et al. 2020	Steer, MA, Fowler, AJ, Rogers, PJ, Bailleul, F, Earl, J, Matthews, D, Drew, M, Tsolos, A 2020, Assessment of the South Australian Marine Scalefish Fishery in 2018. Report to PIRSA Fisheries and Aquaculture. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2017/000427-3. SARDI Research Report Series No. 1049. 201 pp.
West et al. 2015	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.
Murphy et al. 2020	Murphy, J.J., Ochwada-Doyle, F.A., West, L.D., Stark, K.E. and Hughes, J.M., 2020, The NSW Recreational Fisheries Monitoring Program - survey of recreational fishing, 2017/18. NSW DPI - Fisheries Final Report Series No. 158.
AFMA 2019	AFMA 2019, Harvest strategy framework for the Southern and Eastern Scalefish and Shark Fishery 2009 (amended 2019), Australian Fisheries Management Authority, Canberra.
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.
Moore et al. 2020	Moore, A, Maloney, L and Mobsby, D 2020, Great Australian Bight Trawl Sector, in H Patterson, J Larcombe, J Woodhams and R Curtotti (ed.s), <i>Fishery status reports 2020</i> , Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra https://doi.org/10.25814/5f447487e6749 .
Krueck et al. 2020	Krueck N, Hartmann, K and Lyle J 2020, <i>Tasmanian Scalefish Fishery Assessment 2018/19</i> . Institute for Marine and Antarctic Studies, University of Tasmania.
Jones and West 2005	Jones MV and West, R.J 2005, Spatial and temporal variability of seagrass fishes in intermittently closed and open coastal lakes in southeastern Australia. <i>Estuarine, Coastal and Shelf Science</i> , 64: 277-288.
Jones and West 2005	Jones, MV and West, RJ, 2005, Spatial and temporal variability of seagrass fishes in intermittently closed and open coastal lakes in southeastern Australia. <i>Estuarine, Coastal and Shelf Science</i> , 64, 2–3, 277–288.