

Assessment Authors and Year

Smoothey, A.F. 2023. NSW Stock Status Summary 2021/22 – Ocean Jacket – (*Nelusetta ayraud*).
NSW Department of Primary Industries. Fisheries NSW. 7 pp.

Stock Status

Current stock status	On the basis of the evidence contained within this assessment, Ocean Jacket is currently assessed as Sustainable for the NSW component of the stock.
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Stock structure & distribution

Ocean Jackets occur along the southern half of Australia from Cape Moreton in Queensland across to the North West Cape in Western Australia, including northern Tasmania (Kailola et al. 1993). Throughout their range, Ocean Jackets are found in many habitats. Juveniles 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), while sub-adults and adults are found in around rocky reefs, sandy–mud benthos, or sponge–coralline algae gardens in waters from 2 to 250 m (Grove-Jones and Burnell 1991, Hutchins 1999). Ocean Jackets are known to aggregate seasonally in large schools.

The Ocean Jacket stock comprises Ocean Jackets (*Nelusetta ayraud*), which makes up most of the catch, and unspecified Leatherjackets. Little is known about the biological structure of this multi-species stock. Here, assessment of the stock status is presented at the jurisdictional level.

The data presented in this summary relates to the New South Wales (NSW) part of the stock.

Biology

Ocean Jackets grow rapidly, attaining approximately 240 mm total length (TL) in 1 year (Miller et al. 2010). Growth is significantly faster during the summer months. Ocean Jackets can reach over 600 mm in length (Miller et al. 2010); with the largest fish sampled being 656 mm TL and it was six years old (Miller et al. 2010). The reproductive biology of Ocean Jacket is not well understood, however, Miller et al. (2012) reported a spawning period in winter peaking during July/August on the mid and far north coast of NSW, with a 50% maturity of stock occurring at around 350 mm or 2.5 years of age for both sexes. There are no differences in growth rates or size at maturity between males and females.

FISHERY STATISTICS

Catch information

Catch trends

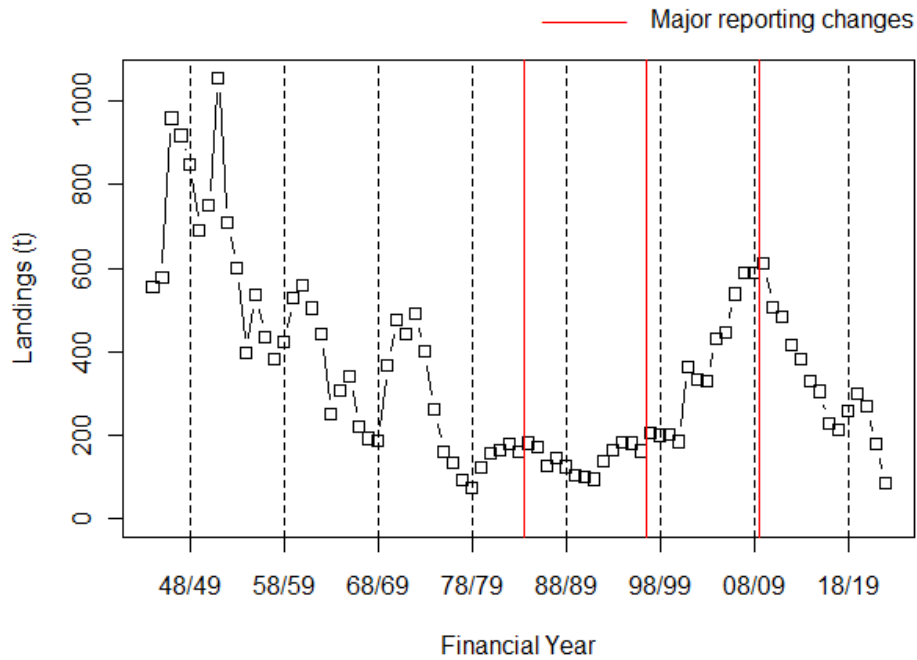


Figure 1. Commercial landings (including available historical records) of Ocean Jackets for NSW from 1944/45 to 2022/23 for all fishing methods.

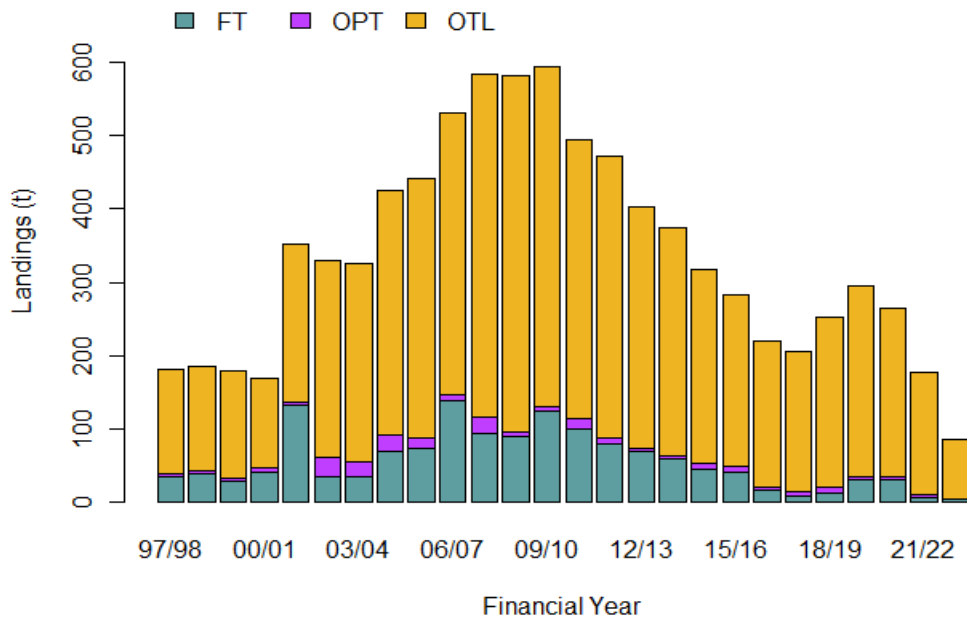


Figure 2. Landings by Fishery (including available historical records) of Ocean Jackets in NSW for years 1997/98 to 2022/23. FT = Fish Trawl; OPT = Ocean Prawn Trawl and OTL = Ocean Trap and Line.

Recreational and Indigenous

Ocean Jackets are important to New South Wales recreational and charter boat fishers. Since 2015–16, an average of 4499 Ocean Jackers have been caught by charter boat fishers (range: 1256–7527 fish). The most recent estimate of the recreational harvest of Leather Jackets (all species combined) in NSW, based on a survey of Recreational Fishing Licence (RFL) Households, was approximately 38 111 with 52% released alive caught during 2019–20 with the majority landed using line-bait (Murphy et al. 2022). 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 2019–20 are down from the previous estimates of 53 062 and 71 000 fish during 2017–18 and 2013–14, respectively (West et al. 2015, Murphy et al. 2020).

There are no data on aboriginal harvest.

Fishing effort trends

Commercial fishing effort on Ocean Jackets is difficult to estimate prior to 2009/10 as the monthly catch returns listed days fished per month by method and had no direct link to the number of days within a month that a particular species was landed. The number of days fish trapping reported for when Ocean Jackets were also reported in a month have declined from nearly 13,412 during 1997/98 to 2060 days during since 2021/22 (Fig. 3). More accurate estimates of fishing effort are available after 2009/10 and show that the number of days using fish trapping on which Ocean Jackets were landed have declined slightly from approximately 4,276 in 2009/10 to 2,060 in 2021/22.

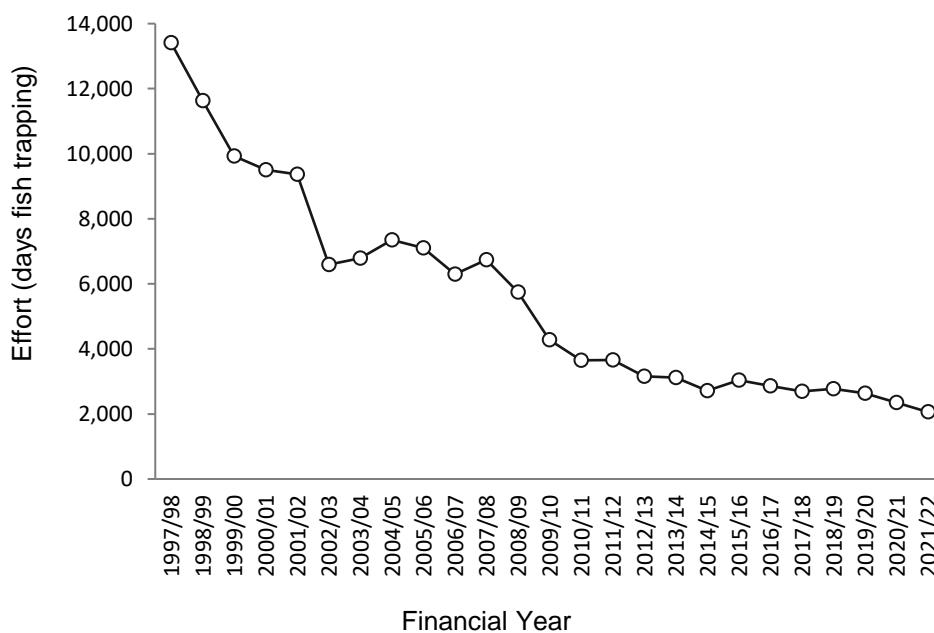


Figure 3. Annual reported days fished for months when Ocean Jackets were landed by fish trapping 1997/98 to 2021/22.

Catch rate trends

Nominal catch rates of Ocean Jackets using the method of fish trapping have increased steadily since 1997/98 peaking in 2009/10 and have declined since 2010/11 with similar catch rates experienced between 2013/14 to 2018/19 (Figure 4). Lower catch rates since 2009 could reflect the introduction of escape panels of 50 x 75 mm welded mesh, resulting in traps selecting ocean jackets at sizes > 350 mm in total length.

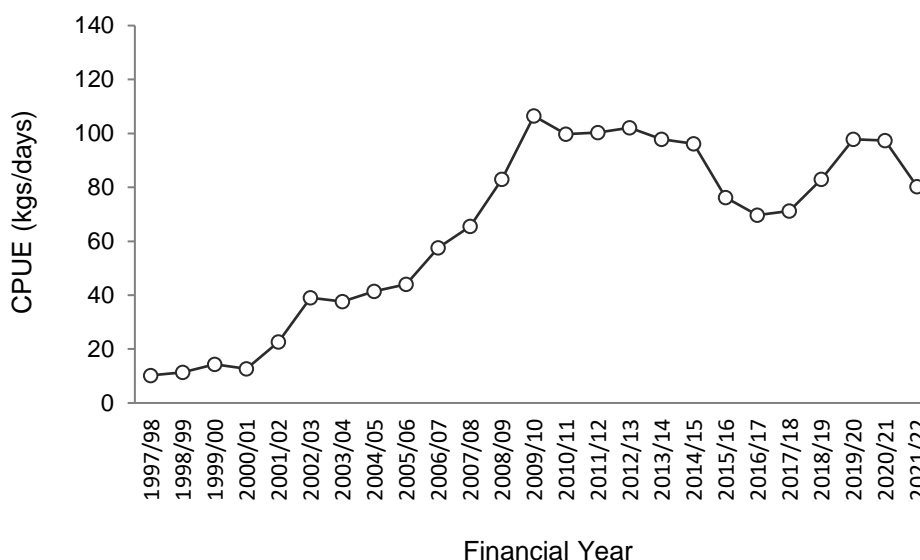


Figure 4. Commercial catch rates of Ocean Jackets using fish trapping for years 1997/98 to 2021/22 in NSW.

Stock Assessment Methodology

Year of most recent assessment	2023
Assessment method	Weight of Evidence: <ol style="list-style-type: none"> Catch rates. Size composition in landed commercial catch. Age composition in commercial catch in 2003/04. Mortality estimates.
Main data inputs	<ol style="list-style-type: none"> Annual total landed catch of Ocean Jacket by the NSW commercial fishery from 1944/45 to 2021/22. Catch rates fish trapping 1997/98 to 2021/22. Size composition in landed commercial catch 2003 and 2005. Age composition in commercial catch during 2003/04. Mortality estimates derived from catch curves and empirical equations (Miller et al. 2010).

Stock Status Summary – 2022/23



NSW Stock Status Summary – Ocean Jacket (*Nelusetta ayraud*)

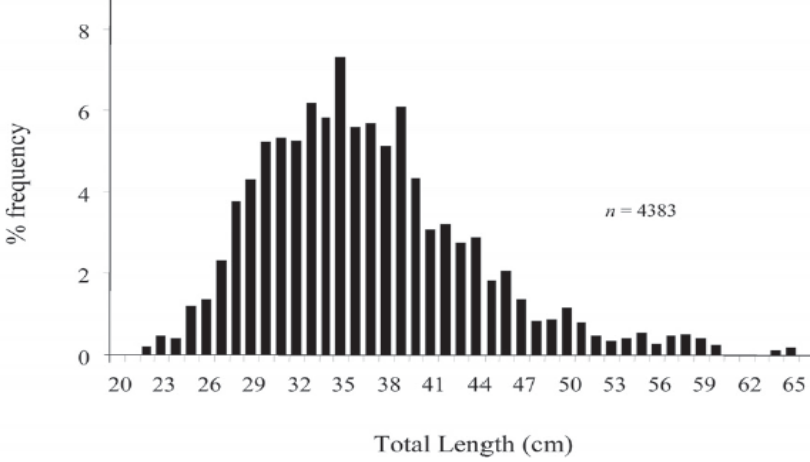
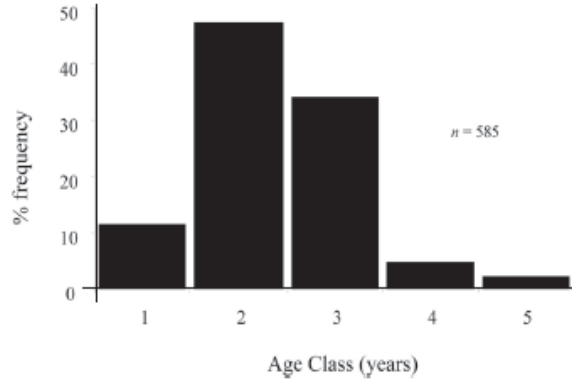
Key model structure and assumptions	<ol style="list-style-type: none"> 1. Trends in size composition in the landed commercial catch between 2003 and 2005 – assuming these are representative of the fishable stock. 2. Pattern of age composition in commercial 2003/04 – assuming this is representative of the fishable stock. 3. Mortality estimates – assuming the catch curves were based on a sample representative of the fishable stock and that the empirical estimates of natural mortality are accurate.
Sources of uncertainty evaluated	Nil

Status Indicators and Limits Reference Levels

Biomass indicator or proxy	Nominal catch rates
Biomass Limit Reference Level	None defined in a formal harvest strategy
Fishing mortality indicator or proxy	<ol style="list-style-type: none"> 1. Nominal catch rates 2. Landed catch 3. Fishing effort 4. Size composition in landed catch 5. Age composition 6. Mortality
Fishing mortality Limit Reference Level	None defined in a formal harvest strategy

Stock Assessment Results

1. Catch rates fish trapping 1997 to 2022.	See Figure 4 above.
2. Size composition in landed commercial catch	

	 <p>Figure 5. The sizes of Ocean Jackets landed by the NSW demersal trap fishery between 2003 and 2005 (Miller and Stewart, 2009).</p>				
<p>3. Age composition in commercial catch</p>	 <p>Figure 6. The age composition of Ocean Jackets in landings of the NSW demersal trap fishery during 2003/04 (Miller and Stewart, 2009).</p>				
<p>4. Mortality estimates derived from catch curves</p>	<p>Miller and Stewart (2009) reported that between 2003 and 2005, Ocean Jackets 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%) 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.</p>				
<p>Previous SAFS stock status</p>	<p>SAFS 2018 – Sustainable SAFS 2020 – Sustainable</p> <p>Within the NSW assessment framework, Ocean Jackets were previously assessed as:</p> <table border="1" data-bbox="758 1904 1157 2004"> <thead> <tr> <th>Year</th> <th>Exploitation Status</th> </tr> </thead> <tbody> <tr> <td>2014/15</td> <td>Fully Fished</td> </tr> </tbody> </table>	Year	Exploitation Status	2014/15	Fully Fished
Year	Exploitation Status				
2014/15	Fully Fished				

Stock Status Summary – 2022/23



NSW Stock Status Summary – Ocean Jacket (*Nelusetta ayraudi*)

Current SAFS stock status	Sustainable
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Qualifying Comments

The recent decreases in commercial and recreational catches of Ocean Jackets in NSW, 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. Furthermore, 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**.

References

- Grove-Jones RP, Burnell AF (1991). Fisheries biology of the Ocean Jacket (Monacanthidae: *Nelusetta ayraudi*) in the eastern waters of the Great Australian Bight. South Australian Department of Fisheries. FIRDC Project DFS01Z, Final report 107 pp.
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