

Yellowtail Scad (2023)

Trachurus novaezelandiae



Matt Broadhurst: New South Wales Department of Primary Industries, **Rocio Noriega:** Australian Bureau of Agricultural and Resource Economics and Sciences, **Jeff Norriss:** Department of Primary Industries and Regional Development, Western Australia, **Brad Zeller:** Department of Agriculture and Fisheries, Queensland

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, Queensland, New South Wales	Eastern Australia	Sustainable	Historical catch and effort data, natural mortality, fishing mortality, fishing gear selectivity
Western Australia	Western Australia	Sustainable	Catch

STOCK STRUCTURE

Yellowtail Scad have an Australian distribution from southern Queensland to northern Western Australia (Stewart and Ferrell, 2001), and also occur off New Zealand (Horn, 1993; Horn and Maolagáin, 2020). Their biological stock structure remains unknown; but in New South Wales there is some evidence of geographical differences in growth rates which might indicate subpopulations (Stewart and Ferrell, 2001). Similar population variability has been observed for Yellowtail Scad off New Zealand (Horn, 1993).

Here, assessment of stock structure is presented at the biological stock level for eastern Australia. The Western Australia stock status remains jurisdictional.

STOCK STATUS

Eastern Australia This cross-jurisdictional biological stock has components in southern Queensland and New South Wales. Each jurisdiction assesses the part of the stock that occurs in its waters. The status presented here for the entire biological stock has been established using evidence from all jurisdictions.

In Queensland, Yellowtail Scad are caught by net and line in the East Coast

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Yellowtail Scad (2023)

Inshore (Net) Fishery, Commercial Trawl (Fin Fish) Fishery and Rocky Reef (Line) Fishery. No assessment of Yellowtail Scad has been completed in Queensland, with species-specific reporting of catches being unreliable because the species is often reported as "scad-unspecified". A peak catch of 84 tonnes (t) was reported in 2002–03; of which 60 t was specifically reported as Yellowtail Scad. The annual commercial catch has reduced to an average of 20 t over the last decade and was approximately 27 t in 2021–22. Effort has displayed the same trend, reducing from a peak of 579 days in 2006–07 to 241 days in 2021–22. The overall catch of Yellowtail Scad in Queensland contributes only a minor portion of the total Eastern Australia catch. The estimated recreational harvest of Yellowtail Scad in the 2019–20 Recreational Survey was 58,000 fish [Teixeira et al. 2021]. No recreational size limit exists for Yellowtail Scad, although a bag limit of 20 applies to all members of its family (Carangidae).

Most of the national landed catches (i.e harvest) of Yellowtail Scad are restricted to New South Wales, and typically have been between 327 and 650 t per year—up to 70% of which is harvested by small boats (5–15 m long) deploying purse seines with variable mesh sizes (stretched mesh openings) between 10 and 150 mm and headline lengths from 275 to 1,000 m long [Stewart and Ferrell 2001]. The Commonwealth catch of Yellowtail Scad is relatively small but has increased in recent years. During 2020–21, there were 1 and 27 t reported in the Southern and Eastern Scalefish and Shark Fishery and Small Pelagic Fishery, respectively. In 2021–22, catches in these fisheries were < 0.3 and 66 t. Operators in the Commonwealth-managed Eastern Tuna and Billfish Fishery take Yellowtail Scad as bait off New South Wales, but this is managed under permit, and with catches included in the New South Wales data below. The species is also caught in small quantities as a by-product by ocean prawn and fish trawlers [Kennelly et al. 1998; Broadhurst et al. 2022].

The New South Wales recreational harvest of Yellowtail Scad (often used as live bait; Lowry et al. [2006]) is substantially less at 16 to 40 t per year [Henry and Lyle 2003; West et al. 2015; Murphy et al. 2020, 2023]. The most recent estimate was 184,000 fish or 40 t during 2019–20 [Murphy et al. 2023]. This estimate was based on a survey of recreational fishing licence (RFL) households, which comprised at least one person with a long-term (one or three year) fishing licence, but also included other fishers within the household. Similar surveys of RFL households were done in 2013–14 and 2017–18, during which 61,000 and 160,000 Yellowtail Scad were recreationally harvested. There is no legal size for the species, although like for Queensland, recreational fishers in New South Wales are restricted to a generic daily personal bag limit of 20 fish.

Few Australian studies have assessed population parameters for Yellowtail Scad, and all work is limited to south eastern stocks [Stewart et al. 1999; Stewart and Ferrell 2001; Neira 2009; Neira et al. 2015; Broadhurst et al. 2018; Broadhurst 2023]. Spawning is assumed to occur along continental shelf waters during early spring, and potentially in response to discrete water masses with specific temperatures [Neira et al. 2015]. Size-at-age data derived from otoliths suggest that the species grows more slowly off southern than northern New South Wales, with mean sizes of 189 and 204 mm FL at two years and 231 and 272 mm FL at eight years, respectively [Stewart and Ferrell 2001]. Such growth variation is supported by a recent study on bioenergetics which showed an exponential increase in metabolic rate with temperature, implying twice the consumption requirements for northern vs southern fish [Dawson et al. 2020]. The estimated asymptotic fork lengths are 238 and 308 mm, respectively [Stewart and Ferrell 2001].

Most of the purse-seine catch is based on fish aged two or three years [Stewart

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Yellowtail Scad (2023)

and Ferrell 2001; Broadhurst et al. 2018]. There has been a broad temporal reduction in effort from a peak of approximately 2,289 boat days in 1999–2000 to 715 boat days in 2020–21, but an increase in nominal catch per unit effort from around 200 kg per boat day to between 300 and 400 kg per boat day in the most recent years [Broadhurst 2020]. As part of recent fisheries reforms, the stock is now subject to a total allowable catch (864 t for 2022–23). The above evidence indicates that the biomass of the stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Based on historical catches, along with size-at-age data, Broadhurst et al. [2018] modelled fishing mortality as low, while fleet selectivity was estimated to increase from nil at age zero to 100% at age seven, and with a 50% selection at age five. Natural mortality was estimated at 0.22 per year, comprising most of the total mortality [i.e. low fishing mortality; Broadhurst et al. 2018]. The above evidence indicates the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

While accurate estimates of biomass and recruitment are lacking, assuming correct reporting of catches and effort, the Eastern Australian population of Yellowtail Scad appears to be stable. On the basis of the evidence provided above, the Eastern Australia biological stock is classified as a **sustainable stock**.

Western Australia

Most of the Western Australia catch of yellowtail scad is taken by the commercial purse seine sector, which targets sardines and operates in limited areas, usually in coastal bays (e.g., King George Sound and Cockburn Sound). Thus, Yellowtail Scad is vulnerable to the fishery only when they enter these waters and comprise a negligible component of the sector’s total catch. The purse seine nominal annual catch rates (kg/boat day) fluctuate interannually, but the latter's decadal average in the 1980s, 1990s and 2000s ranged from 5 to 7 kg/boat day. It then increased to 11 kg/boat day in the 2010s, and in 2021/22 was 9 kg/boat day from an annual catch of 7 t. The boat based annual recreational catch was estimated to be < 1 t from a survey during 2020–21 [Ryan et al. 2022].

An ecological risk assessment [Blazeski et al. 2021] has rated all fishing to be a negligible risk to the Western Australia stock, and so it is classified as a **sustainable stock**.

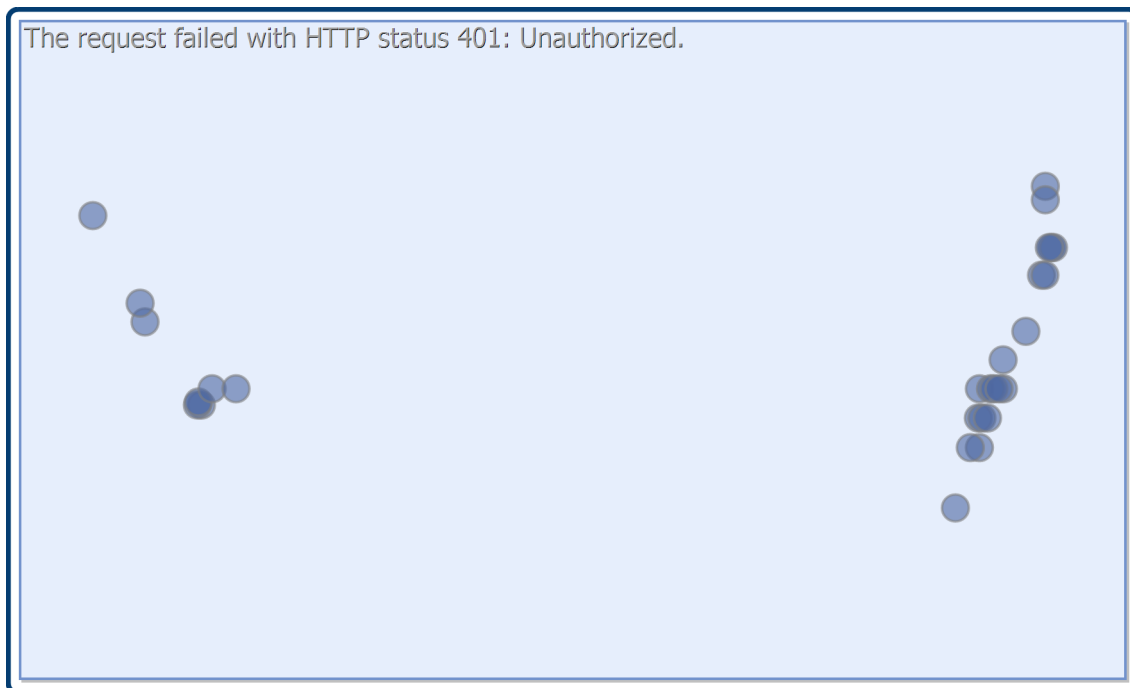
BIOLOGY

Yellowtail Scad biology [Stewart and Ferrell 2001; Broadhurst et al. 2018]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Yellowtail Scad	24 years, 330 mm FL	2–4 years, 200–220 mm FL

DISTRIBUTION

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Yellowtail Scad (2023)



Distribution of the reported commercial catch of Yellowtail Scad

TABLES

Fishing methods	Commonweal th	New South Wales	Queensland	Western Australia
Charter				
Hook and Line		✓		
Rod and reel				✓
Unspecified				✓
Various		✓		
Commercial				
Danish Seine			✓	
Gillnet				✓
Hand Line, Hand Reel or Powered Reels				✓
Hook and Line		✓		
Line			✓	
Net			✓	✓
Otter Trawl	✓	✓	✓	
Purse Seine	✓	✓		✓

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Yellowtail Scad (2023)

Various		✓		
Recreational				
Hook and Line		✓	✓	
Unspecified				✓
Various		✓		

Management Methods			
	New South Wales	Queensland	Western Australia
Charter			
Bag limits	✓		✓
Bag/possession limits		✓	
Fishing gear and method restrictions	✓		
Gear restrictions	✓	✓	
Licence	✓		✓
Limited entry	✓		✓
Possession limit	✓		
Seasonal or spatial closures		✓	
Spatial closures	✓		✓
Commercial			
Fishing gear and method restrictions	✓		✓
Gear restrictions		✓	
Harvest Strategy		✓	
Individual transferable quota		✓	
Limited entry	✓	✓	✓
Seasonal or spatial closures		✓	

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Yellowtail Scad (2023)

Spatial closures	✓		
Spatial zoning			✓
Total allowable catch	✓	✓	✓
Vessel restrictions		✓	✓
Recreational			
Bag limits	✓		✓
Bag/possession limits		✓	
Fishing gear and method restrictions	✓		
Gear restrictions		✓	
Licence (boat-based sector)			✓
Possession limit			✓
Seasonal or spatial closures		✓	
Spatial closures	✓		✓

Catch	Commonwealth	New South Wales	Queensland	Western Australia
Charter		Unknown		Unknown
Commercial	65.88 t	378.485 t	25.6564 t	9.9356 t
Indigenous		Unknown	Unknown	Unknown
Recreational		15–60t	Unknown	Unknown

Commonwealth – Commercial (Catch). Commonwealth data are presented for 2021–22 financial year.

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 non-commercial 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 license' is required when using a powered boat to fish, or transport catch or fishing gear to, or from, a land-based fishing location. Shore based catches are largely unknown.

Queensland – Indigenous (Management Methods). For more information see [Traditional fishing | Department of Agriculture and Fisheries, Queensland \(daf.qld.gov.au\)](https://www.daf.qld.gov.au/fishing)

Queensland – Commercial (Management Methods). Harvest strategies are available at: <https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/harvest-strategy>

Queensland – Commercial (Catch). Commercial and charter data have been sourced from the commercial fisheries logbook program. Further information is available through the [Fisheries Summary Report](#)

Queensland – Recreational Fishing (Catch). Data are based at the whole of Queensland level and derived from state-wide recreational fishing surveys. Where possible, estimates have been converted to weights (tonnes) using best known conversion multipliers. Conversion factors may display regional or temporal variability. In the absence of an adequate conversion factor, data are presented as the number of fish.

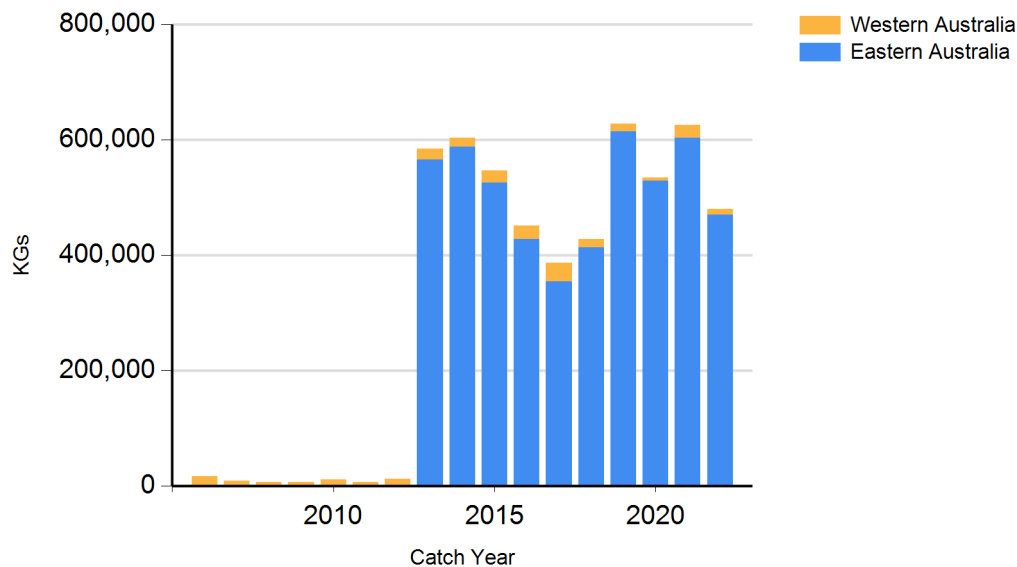
New South Wales – Recreational (Catch). Data have been sourced from surveys: Henry and Lyle [2003]; West et al. [2015]; Murphy et al. [2020, 2022].

New South Wales – <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>.

New South Wales – Indigenous (Management Methods).
(<https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>)

CATCH CHART

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Yellowtail Scad (2023)



Commercial catch of Yellowtail Scad - note confidential catch not shown

References	
Broadhurst et al. 2018	Broadhurst, MK, Kienzle, M and Stewart, J 2018, Natural mortality of <i>Trachurus novaezelandiae</i> and their size selection by purse seines off south-eastern Australia. <i>Fisheries Management and Ecology</i> 25: 332–338
Henry and Lyle 2003	Henry, GW and Lyle, JM 2003, The national recreational and indigenous fishing survey. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra, Australia. ISSN 1440–3544.
Horn 1993	Horn, PL 1993, Growth, age structure, and productivity of jack mackerels (<i>Trachurus</i> spp.) in New Zealand waters. <i>New Zealand Journal of Marine and Freshwater Research</i> , 27: 145–155.
Kennelly et al. 1998	Kennelly, SJ, Liggins, GW and Broadhurst, MK 1998, Retained and discarded by-catch from ocean prawn trawling in New South Wales, Australia. <i>Fisheries Research</i> , 36: 217–236.
Lowry et al. 2006	Lowry, M, Steffe, A and Williams, D 2006, Relationships between bait collection, bait types and catch: A comparison of the NSW trailer-boat and gamefish-tournament fisheries. <i>Fisheries Research</i> , 78: 266–275.
Neira 2009	Neira, FJ 2009, Provisional spawning biomass estimates of yellowtail scad (<i>Trachurus novaezelandiae</i>) off south-eastern Australia. New South Wales Department of Primary Industries Report, 32 pp
Neira et al. 2015	Neira, FJ, Perry, RA, Burrigge, CP, Lyle, JM and Keane, JP 2015, Molecular discrimination of shelf-spawned eggs of two co-occurring <i>Trachurus</i> spp. (Carangidae) in southeastern Australia: a key step to future egg-based biomass estimates. <i>ICES Journal of Marine Science</i> , 72: 614–624.
Stewart and Ferrell 2001	Stewart, J and Ferrell, DJ 2001, Age, growth and commercial landings of yellowtail scad (<i>Trachurus novaezelandiae</i>) and blue mackerel (<i>Scomber australasicus</i>) off the coast of New South Wales, Australia. <i>New Zealand Journal of Marine and Freshwater Research</i> , 35: 541–551.
Stewart et al. 1999	Stewart, J, Ferrell, D and Andrew, NL 1999, Validation of the formation and appearance of annual marks in the otoliths of yellowtail (<i>Trachurus novaezelandiae</i>) and blue mackerel (<i>Scomber australasicus</i>) in New South Wales. <i>Marine and Freshwater Research</i> , 50: 389–395.
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. ISSN 2204-8669.
Broadhurst 2023	Broadhurst, MK 2023, Stock assessment summary report 2019 – Yellowtail Scad (<i>Trachurus novaezelandiae</i>). NSW Department of Primary Industries. Fisheries NSW, Port Stephens Fisheries Institute. 7 pp

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Yellowtail Scad (2023)

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.
Dawson et al. 2020	Dawson, G, Suthers, IM, Brodie, S and Smith, JA 2020, The bioenergetics of a coastal forage fish: Importance of empirical values for ecosystem models. <i>Deep-Sea Res II.</i> 175 (104700).
Horn and Maolagáin 2020	Horn, PL and Maolagáin, CÓ 2020, The growth and age structure of Chilean jack mackerel (<i>Trachurus murphyi</i>) following its influx to New Zealand waters. <i>J. Fish. Biol.</i> 98: 1144–1154.
Murphy et al. 2023	Murphy, JJ, Ochwada-Doyle, FA, West, LD, Stark, KE, Hughes, JM and Taylor, MD 2023, Survey of recreational fishing in NSW, 2019/20 - Key results. NSW DPI - Fisheries Final Report Series No. 161.
Broadhurst et al. 2022	Broadhurst, MK and Millar, RB 2022, Validating a narrow codend cover and improving selectivity in south-eastern Australian fish trawls targeting eastern school whiting, <i>Sillago flindersi</i> . <i>Fish. Res.</i> 251, 106302.
Blazeski et al. 2021	Blazeski, S, Norriss, J, Smith, KA and Hourston, M 2021, Ecological Risk Assessment for the State-Wide Small Pelagic Scaefish Resource. Fisheries Research Report No. 320 Department of Primary Industries and Regional Development, Western Australia. 115 pp.
Ryan et al. 2022	Ryan, KL, Lai, EKM and Smallwood, CB 2022, Boat-based recreational fishing in Western Australia 2020/21. Fisheries Research Report No. 327. Department of Primary Industries and Regional Development, Western Australia. 221pp.
Teixeira et al. 2021	Teixeira, D, Janes, R, and Webley, J 2021, 2019–20 Statewide Recreational Fishing Survey Key Results. Project Report. State of Queensland, Brisbane.