

# Eastern School Prawn (2023)

*Metapenaeus macleayi*



**Matthew D. Taylor:** New South Wales Department of Primary Industries, **Brad Zeller:** Department of Agriculture and Fisheries, Queensland, **Victorian Fisheries Authority:** Victorian Fisheries Authority

## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Queensland	Queensland	Sustainable	Catch, effort, nominal catch rate, risk assessment
New South Wales	New South Wales	Sustainable	Catch, effort, standardised catch rate, environmental models
Victoria	Victoria	Undefined	Catch, CPUE

## STOCK STRUCTURE

Eastern School Prawn fisheries occur along the east coast of Australia, in Queensland, New South Wales and Victoria. Genetic work on the biological stock structure of this species is limited. There is evidence for some minor genetic differentiation of Eastern School Prawn in the Tweed River and Noosa River from Eastern School Prawn in other estuaries, but estuaries within New South Wales appear to be generally genetically homogenous [Mulley and Latter 1981]. No genetic information is available for Victorian populations.

As a result of uncertainty regarding the biological stock structure of Eastern School Prawn, assessment of stock status is presented at the jurisdictional level—Queensland, New South Wales and Victoria.

## STOCK STATUS

**New South  
Wales**

Eastern School Prawn is commercially fished throughout most of its range in New South Wales, although there has been limited harvest south of latitude 35°S in recent years. Eastern School Prawn is a fast-growing, fast-maturing and short-lived species which generally exhibits high productivity [Racek 1959], but observations of recruitment and catch indicate substantial influence of environmental conditions (especially rainfall) [Ruello 1973; Pinto and Maheshwari 2012]. Simulation modelling has also established that environmental factors can have a strong influence on Eastern School Prawn catches [Ives et al. 2009]. These traits mean this species displays large inter-annual variations in recruitment. Taylor [2023] reports the outcomes of analysis of standardised catch rates, as well as a Surplus Production Model fitted using the datalowSA R package [Haddon et al. 2018]. A summary of these outcomes is provided below.

Taking into account environmental variability (including drought) and potential effects of these factors on recruitment in Eastern School Prawn, standardised catch rates (as a proxy for stock biomass) were stable and showed no indication of a downward trend in recent years. For both the Estuary Prawn Trawl and Ocean Prawn Trawl, standardised CPUE substantially increased during the period post-FY2006, and despite some variability, recent Estuary Prawn Trawl CPUE has remained at a level that is well elevated to the geometric mean for the FY1985–FY2022 time series. There was however a sharp dip in FY2018 that was likely to be drought-related, and a sharp dip in FY2022 that was likely due to protracted and catastrophic flooding across the NSW coast during the summer-autumn of this period. The Surplus Production Model [Taylor 2023] estimated that mean predicted biomass has remained above  $B_{\text{targ}}$  for the previous 17 years, and the depletion ratio is currently estimated at 0.76. The current biomass estimate for the stock of approximately 8,300 tonnes (t) is well above  $B_{\text{targ}}$  (5,218 t). The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

The estimated harvest rate has remained below  $F_{\text{targ}}$  (0.2) for the past two decades, and is currently approximately half this value. The harvest rate declined from 2012–18, but increased slightly following this. The low harvest rate has likely contributed to an increase in the stock biomass over this period. 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 provided above, Eastern School Prawn in New South Wales is classified as a **sustainable stock**.

**Queensland**

Biomass and fishing pressure evidence for the status of Eastern School Prawn in Queensland has primarily been derived from the River and Inshore Beam Trawl Fishery (RIBTF), which targets this species. Eastern School Prawn catch and effort within the East Coast Otter Trawl Fishery are generally lower and more opportunistic but, in some years, (e.g., 2009–10, 2020–21 and 2021–22), comprise more than 69% of the Eastern School Prawn total catch and 42% to 93% of Eastern School Prawn total effort, with catch rates at historical highs. These increases appear to occur when an extended period of below average freshwater flows in major southern coastal Queensland streams is replaced by well above average flows of shorter duration [BoM 2022]. Stronger flow-mediated recruitment from a major NSW estuary to the adjacent ocean trawl fishery has been reported for this species [Glaister 1978; Ives et al. 2009].

Annual catches in the RIBTF were higher during the period 1990–2010 with the fishery reporting an average of 70 t of Eastern School Prawn catch each year.

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This period though included several high-catch years with operators harvesting more than 100 t of Eastern School Prawns in 1991, 1995, 2004, 2005, and 2010. The mean annual catch (8 t) in recent years (2011–22) is well below the long-term 1990–2022 average (48 t). Nominal catch rates for Eastern School prawns in the RIBTF have displayed a high degree of inter-annual variability. This is particularly evident in the post-2011 period where nominal catch rates ranged from just 6 kg per day in 2016 to 214 kg per day in 2019. Across this period, the average nominal catch rate for Eastern School Prawns was 110 kg per day compared to the historical average of 72 kg per day (1990–2010). In 2021–22, the RIBTF catch rate was higher at 145 kg per day.

While noting the above variability, a weight-of-evidence approach indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Further, Eastern School Prawn inhabit numerous estuarine habitats in Queensland and a portion of this biomass remains unfished, with fishing effort being confined to accessible sections of larger river systems due to vessel size. This provides the Queensland Eastern School Prawn stock with additional protection from trawl fishing activities.

Fishing effort (days fished) declined steadily over the history of the RIBTF attributed to management reforms. For example, several licence reduction schemes have been implemented in this fishery since 2009. These had a direct and substantial effect on participation rates and effort levels [Walton et al. 2019]. After fluctuating at or around an annual average of 928 days fished (1990–2010), Eastern School Prawn fishing effort in the RIBTF decreased to an average of 280 days fished per year (2011–13) then averaged 113 days fished per year (2014–22). An ecological risk assessment established that Eastern School Prawn had a high resilience to RIBTF fishing pressure [QDAF 2018] and found that the species was at a low risk of being overfished at the 2009 level (760 days, 20 boats). In 2022, RIBTF fishing effort and number of licences reporting catch were substantially less than the 2009 level (64 days, 6 boats). The current low level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, Eastern School Prawn in Queensland is classified as a **sustainable stock**.

## Victoria

Eastern School Prawn is caught primarily as part of the commercial Inshore Trawl Fishery, operating mainly off the Gippsland coast of eastern Victoria and accounting for 97% of the total Victorian catch of this species since 2000. The Eastern School Prawn fishery is seasonal with effort concentrated in the warmer months, mostly occurring while targeting king prawns. The balance of the catch used to come from the Gippsland Lakes Fishery, which closed at the end of March 2020 following a buy-out of all commercial netting licences. Recreational catch is unknown.

Average annual catch since 2000–01 was 27.8 t. Since the early 2000s annual catch has generally increased to a peak of 113.7 t in 2016–17 but then declined and since 2020–21 has been between 16.2 and 24 t.

CPUE (kg/trawl hour) has undergone several large fluctuations in the nominal data every 3–5 years since 2000–01, and since 2020–21 has been below the mean CPUE of 2.46 kg/trawl hour) for the period 1986–2015 which is used as an arbitrary target reference point. CPUE prior to mid to late 2000s are unreliable, but the reporting is considered to be accurate from 2010 onwards. Biomass now appears to be depleting over the last five years following a peak value coincident

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with the unprecedented peak in reported catch during 2016.

Despite explanations other than declining biomass for the recent trend in CPUE, including that it is mainly a by-product species, that there are likely to be very strong environmental drivers influencing recruitment independently of fishing mortality, and uncertainty about the quality of data influencing the trend prior to 2010, the quantitative evidence since indicates that the stock is depleting, but is currently not far below the target reference point and it is unclear if the much reduced catch is sufficiently low for the stock biomass to increase in future years.

The above evidence indicates that the biomass of this stock is not yet depleted and recruitment is not yet impaired, but although the current level of fishing mortality might cause the stock to become recruitment impaired, this is uncertain.

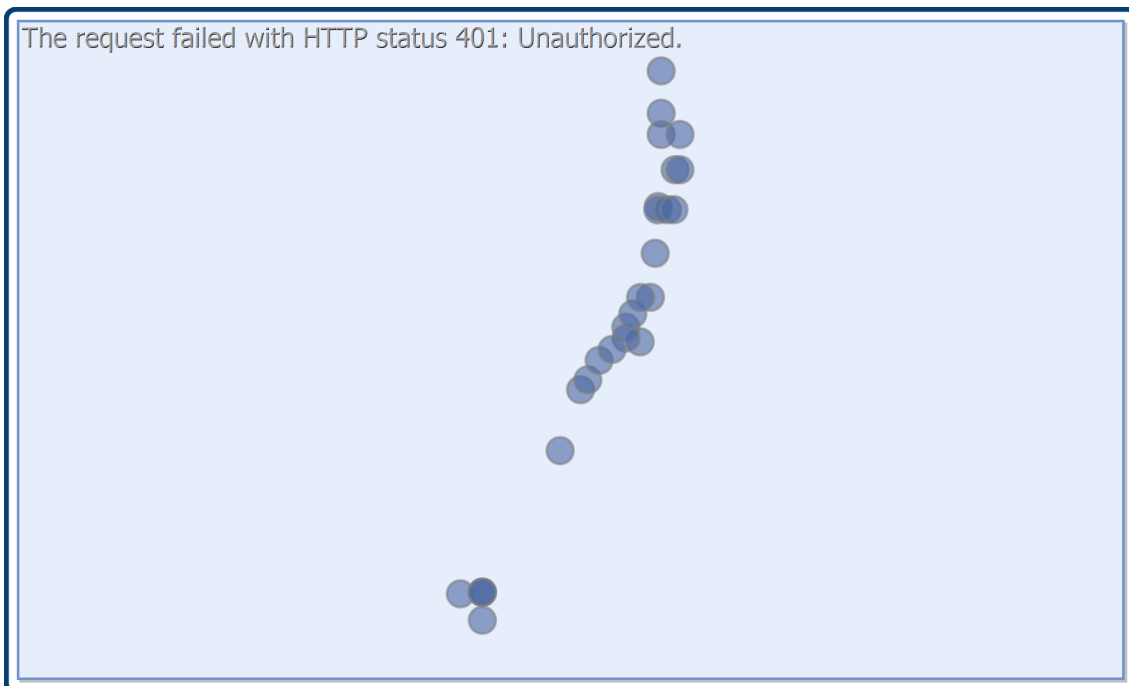
On the basis of the evidence provided above, Eastern School Prawn in Victoria is classified as an **undefined stock**.

## BIOLOGY

**Eastern School Prawn biology** [Ruello 1971, Taylor and Johnson 2021]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Eastern School Prawn	Male 32 months, 32 mm CL; Female 32 months, 35 mm CL	Male 23 mm CL; Female 27 mm CL

## DISTRIBUTION



Distribution of reported commercial catch of Eastern School Prawn

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TABLES

<b>Fishing methods</b>			
	<b>New South Wales</b>	<b>Queensland</b>	<b>Victoria</b>
<b>Commercial</b>			
Beam Trawl		✓	
Haul Seine	✓		
Net			✓
Otter Trawl	✓	✓	
Running Net	✓		
Stow Net	✓		
Various	✓		
<b>Recreational</b>			
Beach Seine		✓	
Cast Net		✓	
Dip Net	✓	✓	✓
Haul Seine	✓		✓

<b>Management Methods</b>			
	<b>New South Wales</b>	<b>Queensland</b>	<b>Victoria</b>
<b>Commercial</b>			
By-catch reduction devices	✓	✓	
Effort limits		✓	
Gear restrictions			✓
Limited entry	✓	✓	✓
Size limit	✓		
Spatial closures	✓	✓	✓
Temporal closures	✓	✓	
Vessel number restrictions	✓	✓	
<b>Recreational</b>			
Bag limits	✓	✓	✓
Boat limits		✓	

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<b>Gear restrictions</b>	✓	✓	✓
<b>Possession limit</b>		✓	
<b>Recreational fishing licence</b>	✓		✓
<b>Spatial closures</b>			✓

<b>Catch</b>	<b>New South Wales</b>	<b>Queensland</b>	<b>Victoria</b>
<b>Commercial</b>	790.433 t	108.545 t	16.259 t
<b>Indigenous</b>	Unknown	Unknown	Unknown (No catch under permit)
<b>Recreational</b>	398,068 prawns (all Penaeidae combined, 2019-20)	Unknown	Unknown

**Queensland – Indigenous (management methods)** for more information see [Traditional fishing | Department of Agriculture and Fisheries, Queensland \(daf.qld.gov.au\)](http://www.daf.qld.gov.au)

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

**New South Wales – Commercial (Management Methods)** Size limit – Prawn counts apply to commercial fisheries in NSW and serve as a proxy to size limit.

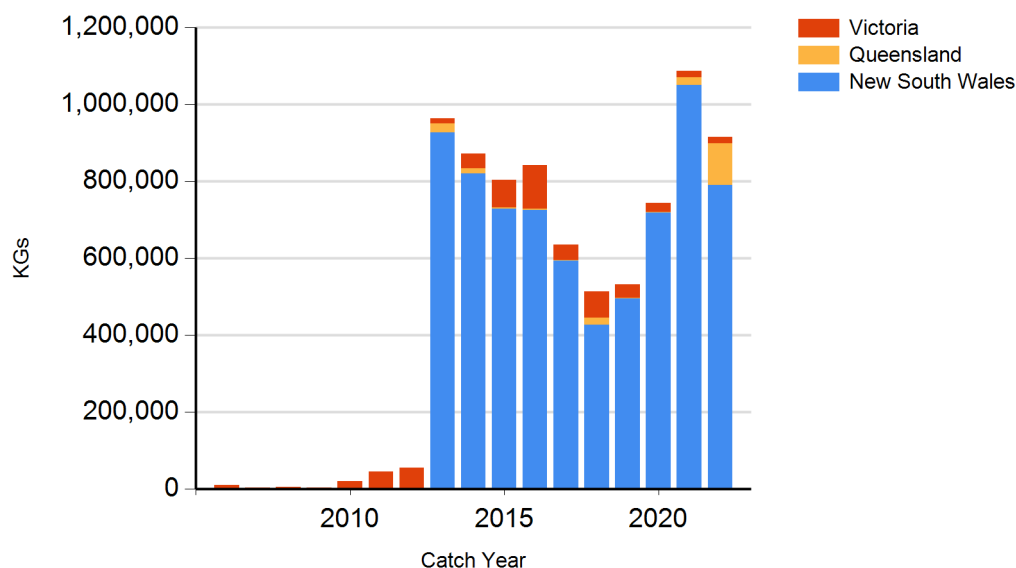
**New South Wales – Indigenous (Management Methods)** see <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>.

**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

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Commercial catch of Eastern School Prawn - note confidential catch not shown

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