

# Eastern School Prawn (2020)

*Metapenaeus macleayi*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Queensland	Queensland	Sustainable	Catch, CPUE, risk assessment
New South Wales	New South Wales	Sustainable	Catch, effort, standardised catch rate, environmental models
Victoria	Victoria	Sustainable	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 [2020] 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 marked rainfall variability and drought in recent years, and known effects on recruitment in Eastern School Prawn, standardised catch rates (as a proxy for stock biomass) approximated recent historic levels, and showed no indication of a downward trend. The Surplus Production Model estimated that biomass has remained above  $B_{\text{targ}}$  for the previous 12 years, and the depletion ratio is increasing. The current biomass estimate for the stock of  $\sim 7\,500$  tonnes (t) is well above  $B_{\text{targ}}$  (4 337 t), and the highest in the time series analysed, as is the lower CI ( $\sim 6100$  t) for this value. 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  $F_{\text{targ}}$  for around 16 years. The harvest rate has been decreasing during the last 10 years, but has appeared to stabilise during the last two years in this time series. 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 is primarily derived from the River and Inshore Beam Trawl Fishery (RIBTF), which targets this species. Catch and effort within the East Coast Otter Trawl Fishery is opportunistic and highly variable, and has not been used to determine stock status. Annual catches in the RIBTF have tended to be variable, peaking at more than 130 tonnes (t) in 1991, 1995 and 2004, but averaging 52 t over the entire period 1990–2019 [QFISH 2020]. The mean annual catch (4 t) in recent years (2013–19) has been well below the long-term average. Nominal catch rates were reasonably stable over the early part of the fishery and then increased from 47 kg per day in 2000 (64 per cent of the 1990–2019 long-term average of 82 kg per day) to more than 183 kg per day in 2018 and 2019 (>123 per cent above the long-term average). 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. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Fishing effort has declined steadily over the history of the fishery, particularly since 2009, following several licence reduction schemes. After fluctuating around an average of about 930 days fished per year from 1990–2010, effort decreased to around 280 days fished per year over the 2011–13 period, declining further to average about 26 days fished per year in 2014–19 [QFISH 2020]. An ecological risk assessment established that Eastern School Prawn had a high resilience to fishing pressure [QDAF 2018], and found that the species was at a low risk of being overfished at 2009 effort levels (760 days, 20 vessels). Current effort (days fished) is substantially less than 2009 effort levels and the number of licences reporting catch is also at historically low levels. This 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, mainly off the Gippsland coast of eastern Victoria. The Eastern School Prawn fishery is seasonal with effort concentrated in the warmer months. This status report is focused on the Inshore Trawl Fishery, which represents 97 per cent of the total catch since 2000. The remaining catch was from the Gippsland Lakes Fishery (GLF), which closed at the end of March 2020 following a buy-out of all commercial netting licences, implemented to improve recreational fishing access by hook and line methods. Recreational catch is unknown.

Catch has generally increased since the early 2000s. A substantial increase in catch occurred between 2013 and 2016. Average annual catch since 2000/01 was 28.8 t. Although CPUE has undergone several large fluctuations every 3–5 years since 2000–01, this performance measure has generally shown an increasing trend, and has remained above the long-term average of 7.31 kg/shot since 2010. Declines in CPUE and catch may be due to periods where drifting seaweed obstructed nets.

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

## BIOLOGY

**Eastern School Prawn biology** [Rowling et al. 2010]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Eastern School Prawn	Male 32 months, 32 mm CL Female 32 months, 32 mm CL	Male 97 mm TL Female 132 mm TL

## DISTRIBUTION



Distribution of reported commercial catch of Eastern School Prawn

## 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	✓		✓
Gear restrictions		✓	✓
Possession limit		✓	
Recreational fishing licence	✓		✓
Spatial closures			✓

Catch	New South Wales	Queensland	Victoria
<b>Commercial</b>	470.061 t	2.5338 t	35.2535 t
<b>Indigenous</b>	Unknown	Unknown	Unknown (No catch under permit)
<b>Recreational</b>	<328 000 prawns (all Penaeidae combined, 2017-18)	Unknown	Unknown

**Queensland – Indigenous (management methods)** for more information see <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

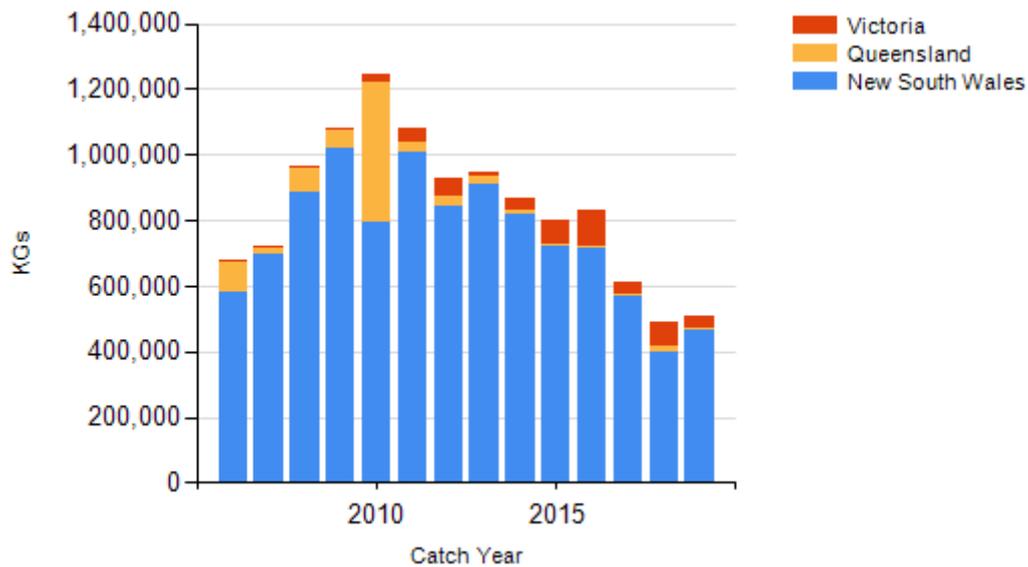
**New South Wales – Commercial (Management Methods)** Size limit – Prawn counts apply to commercial fisheries in NSW and serve as a proxy to size limit.

**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



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

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Taylor 2020	Status of Australian Fish Stocks 2020 – NSW Stock Status Summary – Eastern School Prawn ( <i>Metapenaeus macleayi</i> )
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