

# ENDEAVOUR PRAWNS (2018)

*Metapenaeus endeavouri*, *Metapenaeus ensis*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Commonwealth	Northern Prawn Fishery (Blue Endeavour Prawn)	NPF	Sustainable	Spawning biomass, fishing mortality, catch
Commonwealth	Northern Prawn Fishery (Red Endeavour Prawn)	NPF	Undefined	
Commonwealth	Torres Strait Prawn Fishery (Blue Endeavour Prawn)	TSPF	Undefined	Biomass, effort, catch
Western Australia	Exmouth Gulf Prawn Managed Fishery (Blue Endeavour Prawn)	EGPMF	Sustainable	Catch, survey catch rate
Western Australia	North Coast Prawn Managed Fishery (Blue Endeavour Prawn)	KPMF, KPMF    NBPMF, NBPMF	Sustainable	Catch
Western Australia	Shark Bay Prawn Managed	SBPMF	Sustainable	Catch

	Fishery (Blue Endeavour Prawn)			
Queensland	East Coast Otter Trawl Fishery (Red and Blue Endeavour Prawn)	ECOTF	Sustainable	Catch rate, catch, effort

NPF Northern Prawn Fishery (CTH), TSPF Torres Strait Prawn Fishery (CTH), ECOTF East Coast Otter Trawl Fishery (QLD), EGPMF Exmouth Gulf Prawn Managed Fishery (WA), KPMF Kimberley Prawn Managed Fishery (WA), NBPMF Nickol Bay Prawn Managed Fishery (WA), SBPMF Shark Bay Prawn Managed Fishery (WA), KPMF || NBPMF Various Fisheries combined due to 3 boat rule (WA)

## STOCK STRUCTURE

Endeavour Prawns includes two species, Blue Endeavour Prawn *Metapenaeus endeavouri*, and Red Endeavour Prawn *M. ensis* that are generally not distinguished in fisheries. Although the two species are caught in differing proportions in different regions.

Endeavour Prawn fisheries are located in Shark Bay, Exmouth Gulf, the north coast of Western Australia, the Gulf of Carpentaria, the Torres Strait and the east coast of Queensland. Little is known about the biological stock structure of the populations of Blue and Red Endeavour Prawns that make up these fisheries. The majority of catch reported in this chapter is Blue Endeavour Prawn. Red Endeavour Prawn represents less than 20 per cent of the catch in the East Coast Otter Trawl Fishery [Turnbull and Atfield 2007]) and between 20–40 per cent in the Northern Prawn Fishery.

Here, assessment of stock status is presented at the management unit level—Northern Prawn Fishery (Blue Endeavour Prawn), Northern Prawn Fishery (Red Endeavour Prawn), Torres Strait Prawn Fishery (Blue Endeavour Prawn) (Commonwealth); Exmouth Gulf Prawn Managed Fishery (Blue Endeavour Prawn), North Coast Prawn Managed Fishery (Blue Endeavour Prawn), Shark Bay Prawn Managed Fishery (Blue Endeavour Prawn) (Western Australia); and East Coast Otter Trawl Fishery (Red and Blue Endeavour Prawn) (Queensland).

## STOCK STATUS

**East Coast Otter Trawl Fishery (Red and Blue Endeavour Prawn)** From 1998 to 2015, there has been a general upward trend in the nominal catch rate [Wang et al. 2015] for Endeavour Prawns (species combined, as they are not differentiated in commercial logbooks). The harvest ratio between Blue and Red Endeavour Prawns has been reasonably stable at approximately 80:20. The overall catch rate was close to historical low levels in 2017 however this has fluctuated since 2005 with no overall trend evident [QDAF 2018]. Effort in this fishery stabilized in 2007, following management changes, marine park closures and the rising operational costs. The average annual catch rate for the past five years (2012–17) was 59 kg per day, which is 13 per cent higher than the long-term average (1990–2015). Current harvest levels are significantly lower than 2001 levels when an assessment concluded that Endeavour Prawns were fully exploited [Turnbull and Gribble 2004] although catches have been reasonably stable over the last ten years (2008–17). The above evidence indicates that the biomass of this stock is unlikely to be depleted and recruitment is unlikely to be impaired.

The average annual commercial harvest of Endeavour Prawns in the past five years (2012–17) was 489 t, which is roughly half of the long-term average of 959 t for the period from 1990–2017. The fishing effort associated with 2017 catch (9 943 days) was only 51 per cent of the long-term average of 20 329 fishing days. Current effort levels are below both effort at maximum sustainable yield (EMSY) and effort at maximum economic yield (EMEY) predictions for both the northern (above latitude 16°S) and southern (latitude 16–22°S) parts of the

fishery area [QDAF 2018]. This level of fishing pressure is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the multispecies East Coast Otter Trawl Fishery (Red and Blue Endeavour Prawn) (Queensland) management unit is classified as a **sustainable stock**.

**Exmouth  
Gulf Prawn  
Managed  
Fishery  
(Blue  
Endeavour  
Prawn)**

The Exmouth Gulf Prawn Managed Fishery (Western Australia) contributes the majority of the commercial landings of Blue Endeavour Prawns in Western Australia. Blue Endeavour Prawns are a secondary target species whose distribution partly overlaps with that of Brown Tiger and Western King Prawns and are caught when fishers are targeting these two species [Gaughan and Santoro 2018]. In 2017, the Harvest Strategy for the Exmouth Gulf Prawn Managed Fishery was modified to include Blue Endeavour Prawns [DPIRD 2018] with specific limit (4.5 kg/hr) and target (9 kg/hr) reference levels based of fishery independent surveys for the spawning stock and overall stock assessment of this species is based on a weight-of-evidence (WOE) approach as for Western King and Brown Tiger prawns in this fishery.

Fishery-independent spawning stock and recruitment surveys of Brown Tiger and Western King Prawn grounds also record the abundance of Blue Endeavour Prawns that provide an annual spawning stock and recruitment abundance index expressed in terms of survey catch rate. In 2017, the mean survey catch rate for the Blue Endeavour Prawn spawning stock was 26.6 kg per hour, well above the target. A secondary performance indicator is the annual recruitment survey catch rate which indicates recruitment strength. A preliminary catch prediction has been developed for this species based on the mean annual recruitment index and landings since 2012 when Blue Endeavour Prawns have been retained more consistently due to improved markets. The recruitment catch rate index in 2017 of 12.7 kg per hour was below the 10 year mean (2007–16) of 16.7 kg per hour but within the cate rate index range of 4.4–43.2 kg per hour. The preliminary catch prediction was 160–240 t and landings (217 t) were within this range. There has been no declining trend in the fishery-independent survey catch rates over the periods sampled in either of these fishing grounds for either the spawning stock or recruitment. The above evidence indicates that the biomass of the stock is unlikely to be recruitment impaired.

A target catch range is set at 120–300 t, based on historical catches between 1989 and 1998, a period when the stock was considered to be moderately exploited [Gaughan and Santoro 2018] and retention rates varied due to the abundance of the key target species (Brown Tiger and Western King Prawns) as well as market demand. Total catch in 2017 was within the target catch range and just above the average catch over the past 15 years (191 t) [Gaughan and Santoro 2018]. In the Exmouth Gulf Prawn Managed Fishery management unit, a significant portion of the breeding biomass is protected by the Brown Tiger Prawn spawning closures [Kangas et al. 2015] and an additional portion of the Blue Endeavour Prawn biomass occurs inshore of the key fishing grounds for Brown Tiger Prawns, which are permanently closed. The above evidence indicates that the current level of fishing pressure is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the Exmouth Gulf Prawn Managed Fishery (Blue Endeavour Prawn) (Western Australia) management unit is classified as a **sustainable stock**.

**North Coast  
Prawn  
Managed  
Fishery  
(Blue  
Endeavour)**

Blue Endeavour Prawns are landed in low numbers in the North Coast Prawn Managed Fisheries, as they are a minor retained species when targeting Banana Prawn or Brown Tiger and Western King Prawns. Permanent and temporal spatial closure implement for the key target species in these fisheries provide added protection to Blue Endeavour Prawns. In the past 10 years (2007–16) the landings of Blue Endeavour Prawn in these minor fisheries combined has been

<b>Prawn)</b>	<p>between 2 and 15 t. The total combined catch for all the fisheries in 2017 was 4 t. The low level of catch of this species and the maintenance of these catches over time suggest that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired and also unlikely to become recruitment impaired. Based on the evidence provided above, the North Coast Prawn Managed Fishery (Blue Endeavour Prawn) (Western Australia) Blue Endeavour management unit is classified as a <b>sustainable stock</b>.</p>
<b>Northern Prawn Fishery (Blue Endeavour Prawn)</b>	<p>Blue Endeavour Prawn is assessed as part of the integrated bioeconomic model for the Northern Prawn Fishery (Commonwealth) Tiger Prawn sector [Buckworth et al. 2016]. Commercial catch of Endeavour Prawn is disaggregated into separate species using a model incorporating historical fishery-independent survey data [Venables and Dichmont 2004]. Blue Endeavour Prawn is assessed using a biomass dynamic model, which estimated the spawner stock size at the end of 2015 to be at 77 per cent of the spawner stock size that would be required for maximum sustainable yield (SMSY) [Buckworth et al. 2016]. This is above the limit reference point of 50 per cent (0.5SMSY). As a result, the stock is not considered to be recruitment impaired [Larcombe et al. 2018].</p> <p>The commercial catch in recent years has not exceeded 400 tonnes (t) and in 2017 was 219 t, which is below the estimate of maximum sustainable yield (base-case estimate of 813 t) [Buckworth et al. 2016]. This level of fishing pressure is unlikely to cause the management unit to become recruitment impaired [Larcombe et al. 2018].</p> <p>On the basis of the evidence provided above, the Northern Prawn Fishery (Blue Endeavour Prawn) (Commonwealth) management unit is classified as a <b>sustainable stock</b>.</p>
<b>Northern Prawn Fishery (Red Endeavour Prawn)</b>	<p>There is currently no reliable assessment to confidently classify the status of this stock [Larcombe et al. 2018]. Catches over recent years have been quite low compared with historical highs and have not exceeded 300 t. The catch in 2017 was 161 t. These lower catches are most likely related to a decrease in fishing effort directed at Tiger Prawn, rather than any indication of a decline in Red Endeavour Prawn biomass, as Red Endeavour Prawns are caught as a by-product species by effort directed at Tiger Prawns. There is insufficient information available to confidently classify the status of this stock.</p> <p>On the basis of the evidence provided above, the Northern Prawn Fishery (Red Endeavour Prawn) (Commonwealth) management unit is classified as an <b>undefined stock</b>.</p>
<b>Shark Bay Prawn Managed Fishery (Blue Endeavour Prawn)</b>	<p>Blue Endeavour Prawns are landed in low numbers in the Shark Bay Prawn Managed Fishery, as they are a minor retained species when targeting Brown Tiger or Western King Prawns. The landings in the past 10 years (2007–16) have been between one and 23 t. Landings in 2017 were 2 t; that is, within this range. The low level of catch of this species and the maintenance of these catches over time provide evidence that the biomass of this stock is unlikely to be recruitment impaired. The above evidence indicates that the current level of fishing pressure is unlikely to cause the stock to become recruitment impaired.</p> <p>Based on the evidence provided above, the Shark Bay Prawn Managed Fishery (Blue Endeavour Prawn) (Western Australia) management unit is classified as a <b>sustainable stock</b>.</p>
<b>Torres Strait Prawn Fishery</b>	<p>The most recent assessment was conducted in 2009 [Larcombe et al. 2018] and applied a deterministic size- and age-structured model with a fixed stock–recruitment steepness value of 0.5. Biomass in 2007 was estimated to be 80 per cent of the unfished (1967) level, with biomass at <u>MSY</u> estimated at</p>

**(Blue Endeavour Prawn)**

43 per cent of unfished. MSY was estimated to be 1105 t (90 per cent confidence interval (CI) 1 060–1 184 t) and fishing effort at MSY was estimated to be 10 079 nights (90 per cent CI 9 667–10 800 nights). The Torres Strait Prawn Fishery (Commonwealth) has an objective of maintaining biomass above the biomass level associated with MSY.

Since 2002, catch has been below the range of estimated MSY (1 060 t), and effort has been below the range associated with MSY (9 667 nights). The 2007 biomass estimate of 80 per cent unfished biomass above the estimated BMSY of 43 per cent and well above the proxy limit reference point of 20 per cent unfished levels.

The outputs from the 2009 stock assessment for Blue Endeavour prawn have become less relevant over time, with increased uncertainty in current status due to highly variable recruitment, short life span, changes in fleet dynamics and vessel efficiency, and changes in catch and effort. Furthermore, nominal catch rates for Blue Endeavour prawn have declined by over 50 per cent since 2008 [Turnbull and Cocking 2018]. The 2009 stock assessment is no longer regarded as a sound basis for determining stock status, hence there is insufficient information available to confidently classify the status of this stock.

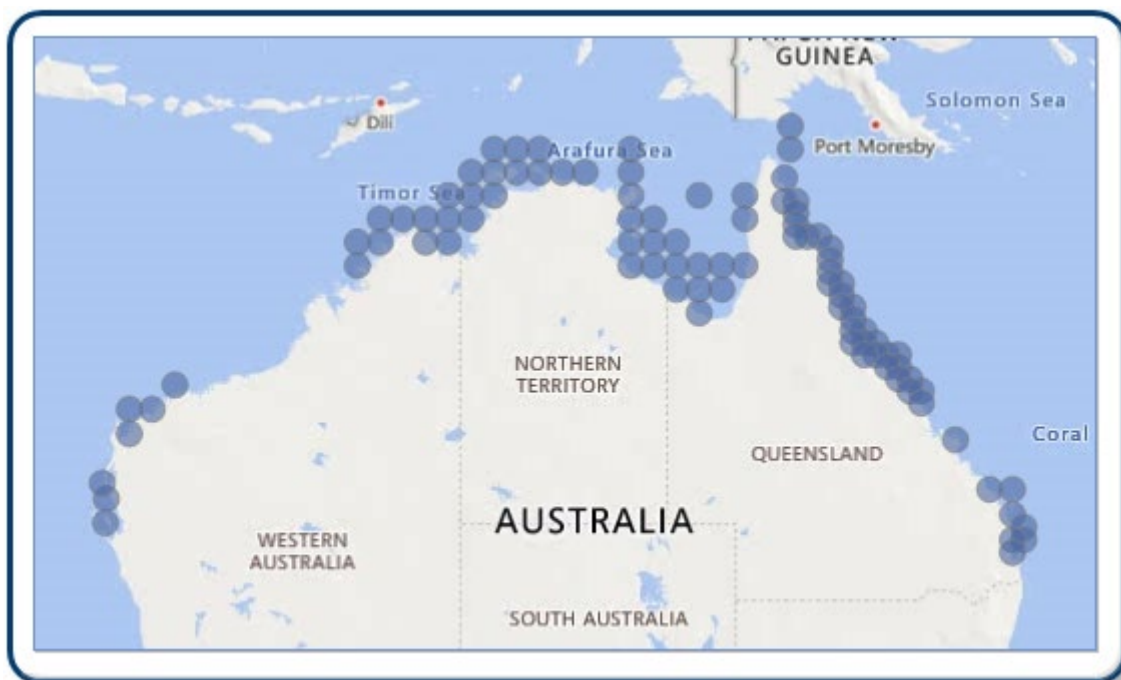
On the basis of the evidence provided above, the Torres Strait Prawn Fishery (Blue Endeavour Prawn) (Commonwealth) management unit is classified as an **undefined stock**.

**BIOLOGY**

**Red and Blue Endeavour Prawn biology** [Courtney et al. 1989, Kailola et al. 1993, Keating et al. 1990, Kangas et al. 2015, Somers et al. 1987, Yearsley et al. 1999]

Species	Longevity / Maximum Size	Maturity (50 per cent)
ENDEAVOUR PRAWNS	1–2 years, 200 mm TL	~6 months Females 24–26 mm CL Males ~18 mm CL

**DISTRIBUTION**



Distribution of reported commercial catch of Red and Blue Endeavour Prawns

**TABLES**

<b>Commercial Catch Methods</b>	<b>Commonwealth</b>	<b>Queensland</b>	<b>Western Australia</b>
Otter Trawl	✓	✓	✓
<b>Fishing methods</b>			
	<b>Commonwealth</b>	<b>Queensland</b>	<b>Western Australia</b>
<b>Commercial</b>			
Otter Trawl	✓	✓	✓
<b>Indigenous</b>			
Unspecified			✓
<b>Recreational</b>			
Cast Net		✓	
Unspecified			✓
<b>Management Methods</b>			
	<b>Commonwealth</b>	<b>Queensland</b>	<b>Western Australia</b>
<b>Charter</b>			
Possession limit		✓	
<b>Commercial</b>			
Effort limits	✓	✓	✓
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Spatial closures	✓	✓	✓
Temporal closures	✓	✓	✓
Vessel restrictions	✓	✓	✓
<b>Recreational</b>			
Possession limit		✓	
<b>Active Vessels</b>			
	<b>Commonwealth</b>	<b>Queensland</b>	<b>Western Australia</b>
	52 Vessels in NPF, 13 Vessels in TSPF,	186 in ECOTF,	6 in EGPMF, 9 in KPMF, 5 in NBPMF, 16 in SBPMF,

**NPF** Northern Prawn Fishery(CTH)

**TSPF** Torres Strait Prawn Fishery(CTH)

**ECOTF** East Coast Otter Trawl Fishery(QLD)

**EGPMF** Exmouth Gulf Prawn Managed Fishery(WA)

**KPMF** Kimberley Prawn Managed Fishery(WA)

NBPMF Nickol Bay Prawn Managed Fishery(WA)

SBPMF Shark Bay Prawn Managed Fishery(WA)

Catch			
	Commonwealth	Queensland	Western Australia
<b>Commercial</b>	380t in NPF, 24.817t in TSPF,	399.786t in ECOTF,	216.562t in EGPMF, 3.866t in KPMF    NBPMF, 1.885t in SBPMF,
<b>Indigenous</b>	Unknown	Negligible	0 t
<b>Recreational</b>		Negligible	0 t

NPF Northern Prawn Fishery (CTH), TSPF Torres Strait Prawn Fishery (CTH), ECOTF East Coast Otter Trawl Fishery (QLD), EGPMF Exmouth Gulf Prawn Managed Fishery (WA), KPMF Kimberley Prawn Managed Fishery (WA), NBPMF Nickol Bay Prawn Managed Fishery (WA), SBPMF Shark Bay Prawn Managed Fishery (WA), KPMF || NBPMF Various Fisheries combined due to 3 boat rule (WA),

**Commonwealth – Indigenous (management methods)** The Commonwealth Government does not manage non-commercial Indigenous fishing (with the exception of the Torres Strait). In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the states or territory immediately adjacent to those waters. In the Torres Strait both commercial and non-commercial Indigenous fishing is managed by the Torres Strait Protected Zone Joint Authority (PZJA) through the Australian Fisheries Management Authority (Commonwealth), Department of Agriculture Fisheries and Forestry (Queensland) and the Torres Strait Regional Authority. The PZJA also manages non-Indigenous commercial fishing in the Torres Strait.

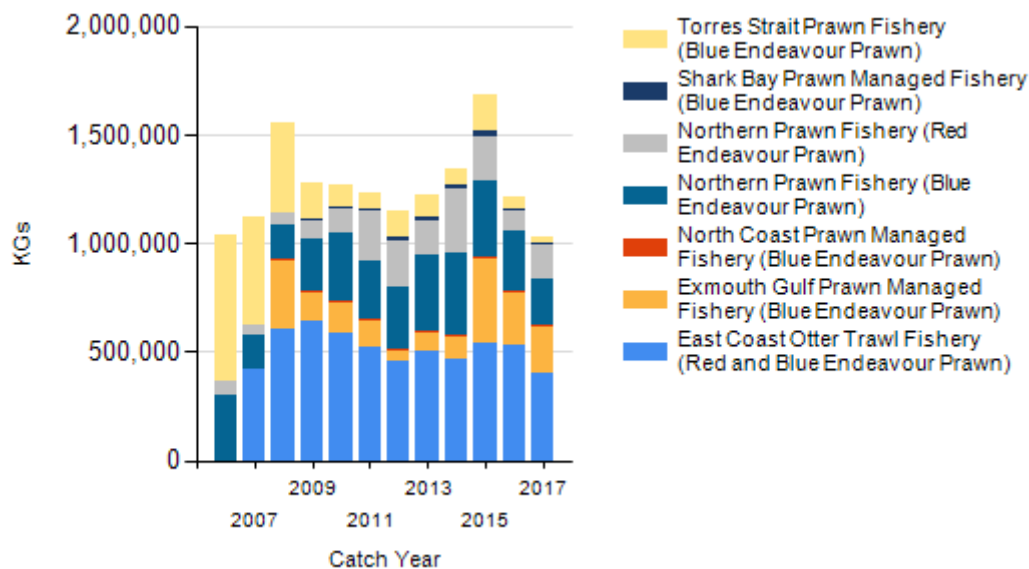
**Queensland – Commercial (fishing methods)** Recreational fishers are permitted to catch Endeavour Prawn, but are unlikely to catch them in large amounts due to the distribution of this species group.

**Queensland – Indigenous (management methods)** In Queensland, under the *Fisheries Act 1994* (Qld), Indigenous fishers are entitled to use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and possession limits and seasonal closures do not apply to Indigenous fishers. Full exemptions to fishery regulations may be applied for through permits.

**Commonwealth – Recreational (fishing methods)** The Commonwealth Government does not manage recreational fishing. Recreational fishing in Commonwealth waters is managed by the states or territory immediately adjacent to those waters, under their management regulations.

## CATCH CHART





Commercial catch of Red and Blue Endeavour Prawns - note confidential catch not shown

## EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

### ENVIRONMENTAL EFFECTS on ENDEAVOUR PRAWNS

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