ENDEAVOUR PRAWNS (2020)

Metapenaeus endeavouri, Metapenaeus ensis

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STOCK STATUS OVERVIEW

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

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

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 2019, there has been a general upward trend in the nominal catch rate [QFISH 2020, 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 increased to near average levels in 2019. 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 (2014–19) was 53 kg per day and slightly higher than the long-term average of 52 kg per day (1990–2018). 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 stable over the last ten years (2010–19). 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 (2014–19) was 472 t, which is close to half the long-term average of 940 t for the period from 1990–2018. Fishing effort for endeavour prawns in 2019 catch (8 652 days) was 56 per cent less than the long-term average of 19 940 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 16°S) and southern (16–22°S) parts of the fishery area [QFISH 2020]. 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 on 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 2019, the mean survey catch rate for the Blue Endeavour Prawn spawning stock was 28.5 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 2019 of 18.0 kg per hour was above the 10 year mean (2009–18) of 14.3 kg per hour but within the catch rate index range of 4.4–31.7 kg per hour. The preliminary catch prediction was 215–325 t and landings (208 t) were just below 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 2019 was within the target catch range and 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 Prawn)

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 implemented for the key target species in these fisheries provide added protection to Blue Endeavour Prawns. In the past 10 years (2009–18) the landings of Blue Endeavour Prawn in these minor fisheries combined has been between 2 and 15 t. The total combined catch for all the fisheries in 2019 was 5 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 ((Western Australia) Blue Endeavour management unit is classified as a **sustainable stock**.

Northern Prawn Fishery (Blue Endeavour Prawn)

Blue Endeavour Prawn is assessed as part of the integrated bio-economic model for the Northern Prawn Fishery (Commonwealth) Tiger Prawn sector [Deng et al. 2018]. 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 2017 to be at 44 per cent of the spawner stock size that would be required for maximum sustainable yield (SMSY) [Deng et al. 2018]. This is a substantial drop in biomass since the 2015 assessment (77%). However, the 5-year moving average of S/SMSY (the agreed performance indicator) was estimated at 67% which is above the limit reference point (LRP) of 50 per cent SMSY (0.5SMSY) (Deng et al. 2018). As a result, the stock is not considered to be recruitment impaired [Parsa et al. 2020].

The commercial catch in recent years has generally not exceeded 400 tonnes (t), with the exception of 2019 where catch was 509 t. This is below the estimate of maximum sustainable yield (base-case estimate of 752 t) [Deng et al. 2018]. This level of fishing pressure is unlikely to cause the management unit to become recruitment impaired [Parsa et al. 2020].

On the basis of the evidence provided above, the Northern Prawn Fishery (Blue Endeavour Prawn) (Commonwealth) management unit is classified as a **sustainable stock**.

Northern Prawn Fishery (Red Endeavour Prawn)

There is currently no reliable assessment to confidently classify the status of this stock [Parsa et al. 2020]. Catches over recent years have been quite low compared with historical highs and have not exceeded 300 t. The catch in 2019 was 147 t. Red Endeavour Prawns are caught as a by-product of effort directed at Tiger Prawns and these recent lower catches are most likely related to the decrease in fishing effort directed at Tiger Prawn, rather than any indication of a decline in Red Endeavour Prawn biomass. There is insufficient information available to confidently classify the status of this stock.

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

Shark Bay Prawn Managed Fishery (Blue Endeavour Prawn)

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 (2009–18) have been between one and 23 t. Landings in 2019 were 1 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.

Based on the evidence provided above, the Shark Bay Prawn Managed Fishery (Blue Endeavour Prawn) (Western Australia) management unit is classified as a **sustainable stock**.

Torres Strait Prawn

The most recent stock assessment for blue endeavour prawn was completed in 2009, using survey and catch data to the end of 2007 [Turnbull et al. 2009]. The 2009 assessment indicated that endeavour prawn biomass was around

Fishery (Blue Endeavour Prawn)

80% of unfished biomass (0.8B0), and considerably higher than the calculated BMSY of 0.43B0. Effort in the fishery has been well below historic levels since the last stock assessment [Turnbull & Cocking 2019].

Catches of Blue Endeavour Prawn in the TSPF over the recent decade have been quite low compared with historical highs and, with exception of 2019 (299t), have not exceeded 200 t [Butler and Steven 2020]. Mean annual CPUE for endeavour prawn has largely remained at low levels (30–31 kg/day), though it rose to around 117 kg/day in 2019. This most recent CPUE is similar to CPUE from earlier years, when blue endeavour prawn was a higher-value, targeted species (Turnbull & Cocking 2019). Since 2002, catches have been below the estimated MSY (1 060 t) and effort has been below MSY (9 667 nights)[Butler and Steven 2020; Turnbull and Cocking 2019].

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 prawn 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 2019]. 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.

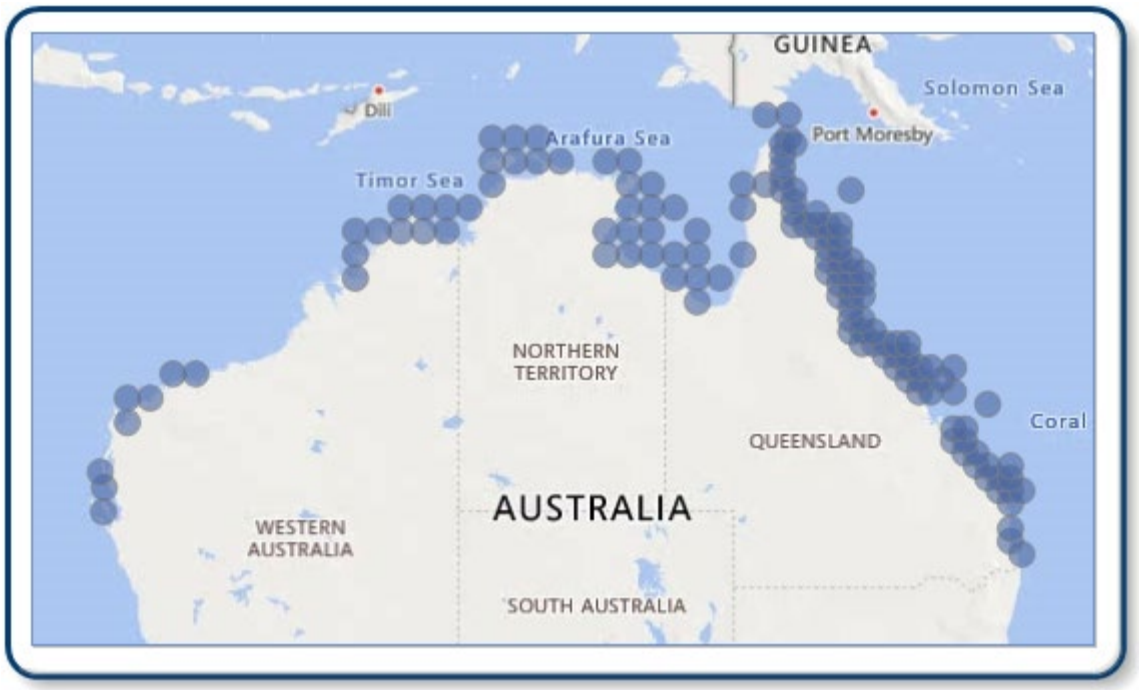
On the basis of the evidence provided above, the Torres Strait Prawn Fishery (Blue Endeavour Prawn) (Commonwealth) management unit is classified as an **undefined stock.**

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

Fishing methods			
	Commonwealth	Queensland	Western Australia
Commercial			
Otter Trawl	✓	✓	✓
Recreational			
Cast Net		✓	
Unspecified			✓

Management Methods			
	Commonwealth	Queensland	Western Australia
Commercial			
Effort limits	✓	✓	✓
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Spatial closures	✓	✓	✓
Temporal closures	✓	✓	✓
Vessel restrictions	✓	✓	✓
Recreational			
Gear restrictions		✓	
Possession limit		✓	

Catch			
	Commonwealth	Queensland	Western Australia
Commercial	954.587 t	430.393 t	290.923 t
Indigenous	Unknown	Unknown	0 t
Recreational		Unknown	0 t

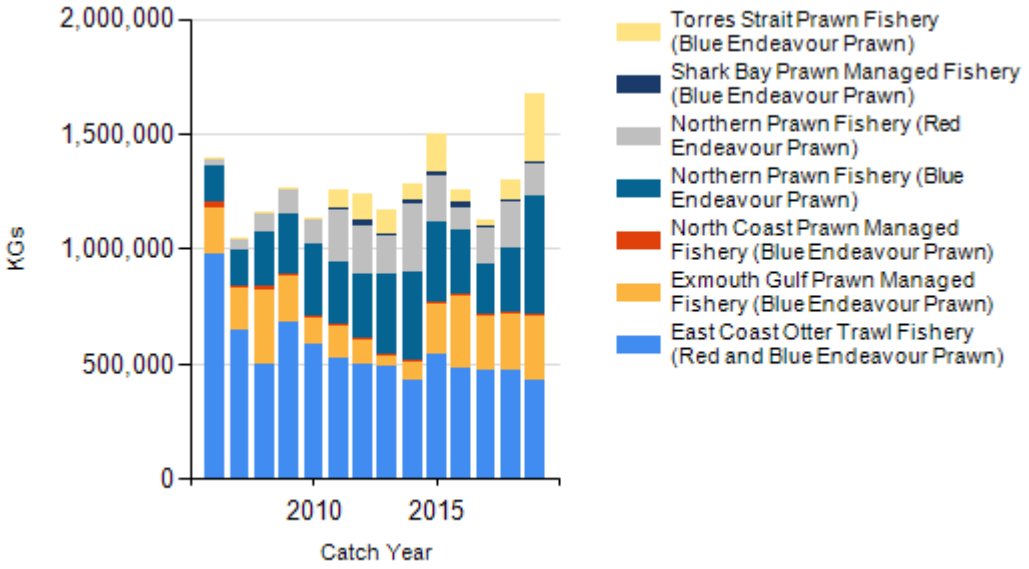
Commonwealth – Indigenous (management methods) The Commonwealth Government does not manage non-commercial Indigenous fishing (with the exception of the Torres Strait). In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the states or territory immediately adjacent to those 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.

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.

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

CATCH CHART



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

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