

Spanner Crab (2023)

Ranina ranina



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Queensland, New South Wales	East Coast	Sustainable	Catch, fishery dependent CPUE, fishery independent CPUE

STOCK STRUCTURE

Mitochondrial DNA analysis indicates that Spanner Crabs on the east coast of Australia comprise a single biological stock [Brown et al. 1999]. Here, assessment of stock status is presented at the biological stock level—East Coast.

STOCK STATUS

East Coast The East Coast Spanner Crab stock is shared between Queensland and New South Wales, with Queensland accounting for the largest harvest (about 85% based on 2021–22 reported harvest).

Two main indicators are used to infer stock status of Spanner Crabs in Queensland: standardised commercial fisher catch per unit effort (CPUE) and an annual fishery independent survey (FIS). These indicators provide empirical input into decision rules used to determine the Total Allowable Commercial Catch (TACC) as described in the Spanner Crab Harvest Strategy [QDAF 2020]. Standardised catch rates for both indicators increased between 2019 and 2020, but then decreased in 2021, only reaching 62% of the target reference point for the fishery [O'Neill et al 2022]. These overall upward trends are a positive shift from the limit reference point of 0.5 kg per dilly lift, which represents a proxy for approximately 20% biomass in the fishery.

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In the NSW part of the stock, oceanographic parameters and recent management changes may have affected key performance indicators used to assess stock status. The two performance indicators (average fishery and survey standardised catch rates in the most recent two complete years) have declined in recent years. From the historical peak of standardised commercial catch rates (CPUE) in 2016–17 (approximately 206 kg per fisher day), catch rates declined by approximately 40% to 115 kg per fisher day in 2020–21 [Johnson 2023]. Standardised catch rate increased in 2021–22 (121.7 kg per fisher day) but remained below the long-term average (139.2 kg per fisher day). For catch-rates standardised per net-lift, CPUE in 2020–21 (1.499 kg per net lift) and 2021–22 (1.590 kg per net lift) were lower than the long-term average (2.190 kg per net lift) [Johnson 2023]. The observed decline in standardised catch rates indicates a decline in Spanner Crab abundance over the last five years in NSW. This decline in abundance is further reflected by an increase in the mean number of net-lifts reported per fisher-day during a period with declining landings. Similarly, catch rates of legal-sized crabs from fishery-independent surveys in NSW reached a peak in 2016 (22.2 crabs per groundline) after which they declined and fluctuated around the mean from 2017 to 2021 before declining below the long-term average in 2022 [Johnson 2023].

A continued decline in harvests of Spanner Crabs was evident in Queensland and NSW from 1994 to 2021 calendar years [O'Neill et al. 2022]. In Queensland, much of the decrease can be attributed to large reductions in effort (3–3.5 million pot-lifts in the mid-1990s compared to 1.1 million net-lifts in 2014–15 and 0.63 million net lifts in 2021–22). Effort reduction is largely attributed to management changes which included a transition to quota management (2000), significant quota adjustments (2018), and the expansion of Commonwealth and state marine parks (2004 and 2010). In New South Wales, reductions in effort are explained by the transition of the fishery to share management, loss of fishing area and removal of endorsements with the creation of marine parks in the north-east.

Previous research has shown that several physical oceanographic parameters, such as freshwater inundation, affect the catchability of Spanner Crabs [Spencer et al. 2019]. Additionally, the most productive fishing areas in NSW are adjacent to the mouth of the Richmond River, which is subject to periodic flooding events, the most recent occurring in 2018 and 2022. Following freshwater inundation reported catches from the most productive areas have been observed to decline for up to 12 months [Johnson 2023]. The impact of factors other than changed population dynamics, including changed fishing practices, locations, catch reporting and catchability need to be investigated further.

The above evidence indicates that the biomass of this stock in NSW is likely to be depleting. However, larval settlement and survival patterns presented in Schilling et al. [2022] suggest that the East Coast biological stock is highly likely to be supported by larvae spawned within the northern half of the available fishing area (K'gari to the Gold Coast). Correlations between CPUE and the proportion of total harvest taken within the NSW fishery and predicted lagged larval settlement combined with the limited predicted survival of larvae spawned in NSW suggest that the NSW fishery is heavily subsidised by the QLD spawning stock [Schilling et al. 2022]. The QLD harvest strategy includes a target spawning biomass ratio of 60% based on a maximum economic yield [QDAF 2020]. This target should provide continued larval supply for both QLD and NSW fisheries and is aided by the protection of adults through temporal closures which align with periods of peak reproductive activity [Kennelly 1992]. Therefore, recruitment at a stock level is unlikely to be impaired.

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Fishing pressure in Queensland is controlled through a total allowable commercial catch (TACC). The TACC is set biennially, using an empirical model based on fishery and fishery independent catch rates [O'Neill et al. 2022; QDAF 2020]. In 2018, and in response to a decrease in the biomass index from 2015 to 2017, the TACC was reduced to 891 tonnes (t), which was approximately 100 t less than the average harvest in the fishery for the previous 10 years. This change resulted in harvests of 805 t and 728 t for the subsequent financial years. The current TACC (847 t), introduced for the 2020–21 financial year resulted in a reduced harvest of 638 t.

In New South Wales, fishing mortality is controlled through a TACC set annually that considers the status of the stock in both NSW and QLD [T AFC 2023]. Reported quota usage during the most recent fishing period (July 2021 to June 2022) was 95.5 t, indicating the current TACC (140 t) was not constraining total catches in NSW [Johnson 2023]. Based on a declining CPUE and evidence from fishery-independent surveys about both short-term recruitment to the fishery and low standardised catch rates, the NSW total allowable fishing committee concluded a reduction in the TACC from 140 to 100 tonnes was necessary for 2023–24.

Fishing pressure from the recreational sector is negligible. The two most recent surveys in Queensland provided no reliable estimates of recreational harvest [Webley et al. 2015; Teixeira et al. 2021], and it is assumed to be less than 1% of the commercial harvest. The most recent recreational survey completed in New South Wales did not report the capture of any Spanner Crabs [Murphy et al. 2022]. It is likely that the survey methodology used by both states is too broad to obtain data about species, such as Spanner Crabs, which tend to be caught by relatively few fishers.

The spawning biomass of the East Coast stock is protected through temporal (spawning) closures and minimum size limits, aimed at allowing mature individuals to spawn at least once. Egg-bearing females are rarely caught and cannot be retained. These regulations apply to both commercial and recreational fishers. Spanner Crabs are caught through entanglement and there is evidence that limb damage during removal from the fishing gear leads to increased mortality of discarded crabs [Kennelly et al. 1990; Brown et al. 1999], which may offset the benefits of the minimum legal size. Current fishing practices in New South Wales and Queensland aim to minimise damage to discarded crabs to limit post-release mortality [Kennelly et al. 1990; Brown et al. 2003]. The above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

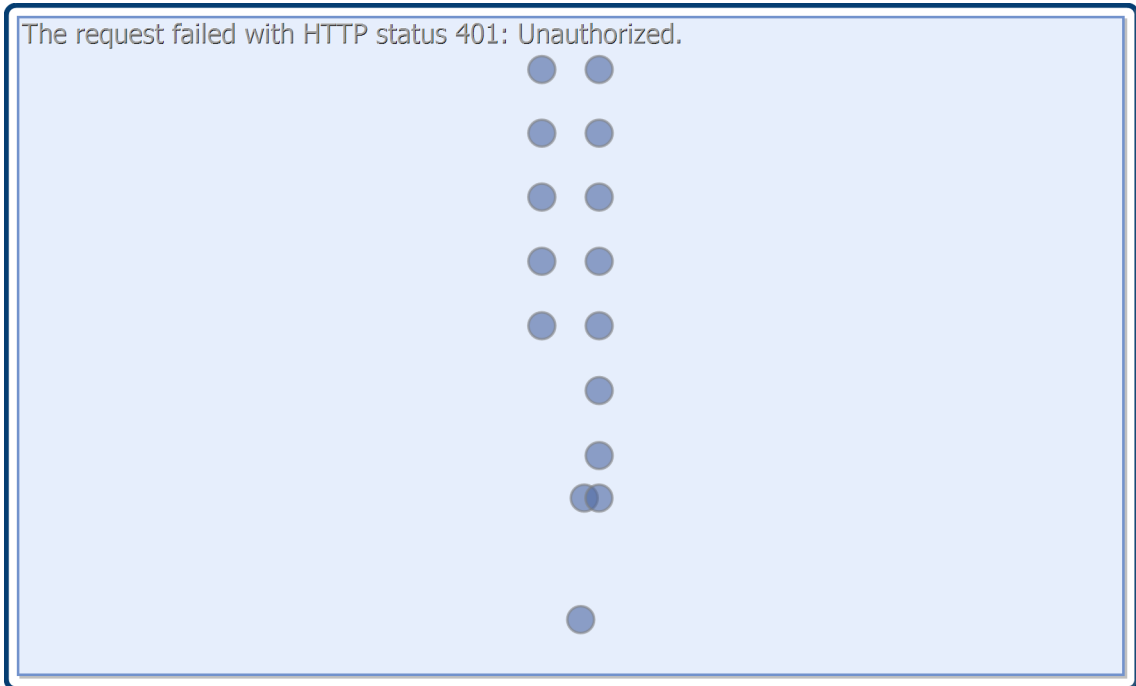
On the basis of the evidence provided above, the East Coast biological stock is classified as a **sustainable stock**.

BIOLOGY

Spanner Crab biology [Brown 1986; Baylon and Tito 2012]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Spanner Crab	10–15 years, 160 mm RCL	Females 70 mm RCL

DISTRIBUTION



Distribution of reported commercial catch of Spanner Crab

TABLES

Fishing methods	New South Wales	Queensland
Charter		
Traps and Pots	✓	✓
Commercial		
Tangle Net	✓	✓
Recreational		
Traps and Pots	✓	✓

Management Methods	New South Wales	Queensland
Charter		
Egg bearing females protected		✓
Gear restrictions	✓	✓

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Possession limit	✓	✓
Protection of egg-bearing females	✓	
Size limit	✓	✓
Spatial closures	✓	✓
Temporal closures	✓	✓
Commercial		
Gear restrictions	✓	✓
Harvest Strategy	✓	✓
Individual transferable quota	✓	✓
Limited entry	✓	✓
Protection of egg-bearing females	✓	✓
Size limit	✓	✓
Spatial closures	✓	✓
Temporal closures	✓	✓
Vessel restrictions	✓	✓
Recreational		
Gear restrictions	✓	✓
Possession limit	✓	✓
Protection of egg-bearing females	✓	✓
Size limit	✓	✓
Spatial closures	✓	✓
Temporal closures	✓	✓

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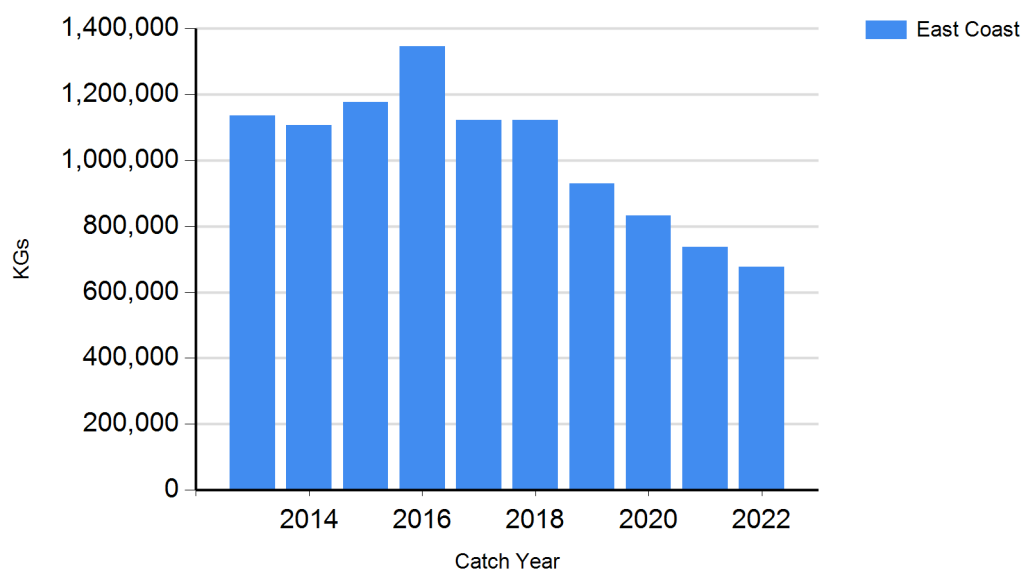
Catch	New South Wales	Queensland
Commercial	89.8295 t	587.753 t
Indigenous	None	Unknown
Recreational	Unknown (2020-21)	< 1 per cent of commercial

Queensland – Indigenous (Management Methods). For more information see: <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

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

New South Wales – Recreational (Catch). Murphy et al. [2022].

CATCH CHART



Commercial catch of Spanner Crab - note confidential catch not shown

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