Spanner Crab (2020)

Ranina ranina

Anthony Roelofs: Department of Agriculture and Fisheries, Queensland, **Daniel Johnson**: Department of Primary Industries, New South Wales, **Jason McGilvray**: Department of Agriculture and Fisheries, Queensland

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 80 per cent based on 2017 reported harvest).

Two separate indicators are used to infer stock status of Spanner Crabs in Queensland: standardised commercial fisher catch per unit effort (CPUE) and annual fishery independent survey (FIS) data [QDAF 2020a]. 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 2020b]. Both indicators showed moderate increases since 2017 when the fishery biomass was considered to be approaching the limit reference point of 0.5 kg per dilly lift, which represents a proxy for approximately 20 per cent biomass in the fishery [QDAF 2020b]. In 2019, both indicators were between the limit reference point and the target reference point (set at 60 per cent of the unfished biomass) and did not require a reduction in the existing TACC in Queensland under the Harvest Strategy.

A continued decline in harvests of Spanner Crabs was evident in Queensland and NSW from 1994 to 2017 calendar years [QFISH 2020]. 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 pot-lifts in 2015). The reduction was caused by a transition to quota management (2000), the expansion of Commonwealth and state marine parks (2004 and 2010), fishery economics and social factors. 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. The reductions in total catch could also represent lower crab abundance although performance indicators and harvest for the main fishery in Queensland have been above long-term averages from 2015 to 2019 indicating that biomass is within acceptable limits. Harvest levels in Queensland from 2017 to 2019 have been stable.

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 by more than 15 per cent. Despite a 26 per cent increase in reported net lifts in 2018—19, total reported landings and nominal catch rate (kg.FisherDay-1) declined by 18 per cent and 16 per cent, respectively. Nonetheless, standardised catch rates from the New South Wales commercial fishery in 2019 remained within the upper and lower deciles, which are calculated from a 10-year historical mean (of catch rate). Similarly, catch rates from fishery-independent surveys in NSW (2015–2019) have been greater than the target NSW-QLD reference catch rate and the NSW 10-year average catch rate, indicating a stable biomass [Johnson 2020]. Previous research has shown that several physical oceanographic parameters affect the catchability of Spanner Crabs [Spencer et al. 2019]. 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. The impact of recent management changes (i.e. quota management) on catch rates has not been quantified. Cumulatively, these variables are likely to have largely driven the declines in the two main performance indicators described above. Catch rates of undersized Spanner Crabs from fishery-independent surveys (2017–2019) were greater than the NSW average catch rate (2005–2019) indicating continued recruitment to the fishery [Johnson 2020]. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

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 catch rates (Queensland) and fishery-independent catch rates (Queensland and New South Wales) [O'Neill et al. 2010, QDAF 2020b]. The current TACC (891 t), introduced in 2018, reduced catches by about 150 t from the previous year in response to a decrease in the biomass index from 2015 to 2017.

In New South Wales, fishing mortality is controlled through a TACC set annually considering the status of the stock in both NSW and QLD. Catch during the most recent complete quota year (July 2018 to June 2019) was 114.4 t, indicating that the TACC (169 t) in NSW failed to operate as an effective fishery control that could be adjusted efficiently to optimise future catches. A revised TACC set at the realised catches over recent years (135.5 t) was implemented for the 2020–21 fishing period. Constraining catches to recent levels mean that minor adjustments to future TACCs should optimise the fishery when a more formal harvest strategy is implemented [TAFC 2020].

Fishing pressure from the recreational sector is negligible. The estimated harvest by recreational fishers in Queensland is less than one per cent of reported commercial catch [Webley et al. 2015] The most recent recreational survey completed in New South Wales did not report the capture of any Spanner Crabs [Murphy et al. 2020]. However, the survey methodology is potentially too broad to pick up 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 to protect spawning animals 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 such 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		
Crab Trap		✓
Tangle Net	✓	
Various	✓	
Recreational		
Traps and Pots	✓	✓

Management Methods		
	New South Wales	**Queensland**
Charter		
Gear restrictions	✓	✓
Possession limit	✓	✓
Protection of egg-bearing females	✓	✓
Size limit	✓	✓
Spatial closures	✓	✓
Temporal closures		✓
Commercial		
Daily catch limits		✓
Gear restrictions	✓	✓
Limited entry	✓	✓
Protection of egg-bearing females	✓	✓
Size limit	✓	✓
Spatial closures	✓	✓
Temporal closures	✓	✓
Total allowable catch	✓	✓
Vessel restrictions	✓	✓
Recreational		
Bag and possession limits	✓	
Gear restrictions	✓	✓

Possession limit		✓
Protection of egg-bearing females	✓	✓
Size limit	✓	✓
Spatial closures	✓	✓
Temporal closures		✓

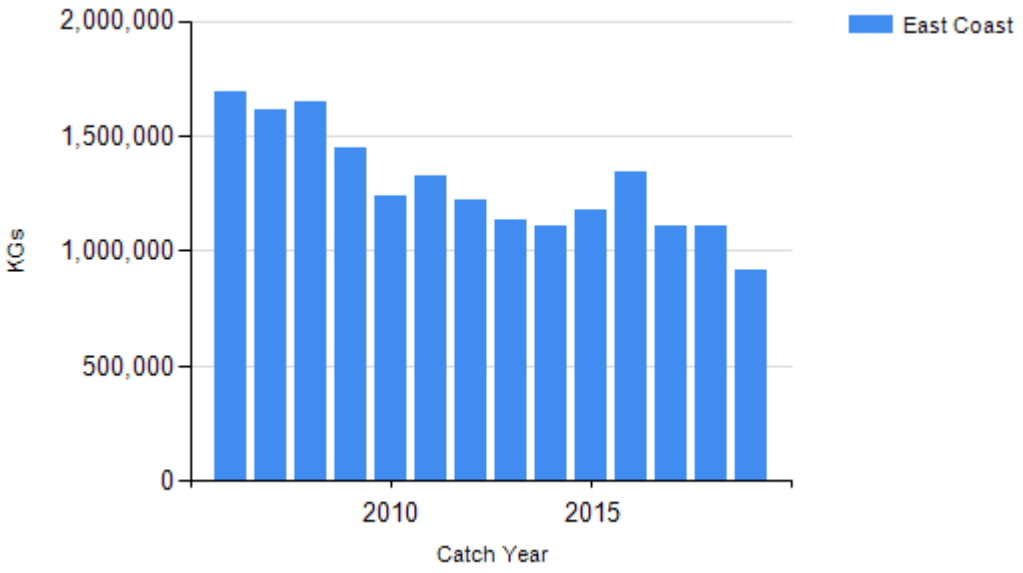
Catch		
	New South Wales	**Queensland**
Commercial	113.39 t	806.282 t
Indigenous	Unknown (2017-18)	Unknown
Recreational	Unknown (2017-18)	< 1 per cent of commercial

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. [2020].

CATCH CHART



Commercial catch of Spanner Crab - note confidential catch not shown

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