



Giant Crab

Pseudocarcinus gigas

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STOCK STATUS OVERVIEW

Stock status determination

Jurisdiction	Stock	Fisheries	Stock status	Indicators
South Australia	South Australia	NZGCF, SZGCF	Undefined	Catch, Effort, CPUE, mean weight, pre-recruit abundance, sex ratio
Western Australia	Western Australia	ESRLF, SCCMF, SCDSCF	Sustainable	CPUE, proportion of habitat unexploited
Victoria	Giant Crab Fishery (Victoria)	GCF	Undefined	CPUE, proportion of spawning stock protected by minimum size limits
Tasmania	Giant Crab Fishery (Tasmania)	GCF	Overfished	Percentage of egg production relative to unfished level, CPUE

ESRLF Esperance Southern Rock Lobster Fishery (WA)

GCF Giant Crab Fishery (VIC)

GCF Giant Crab Fishery (TAS)

NZGCF, SZGCF Miscellaneous Fishery and Southern Rock Lobster Fishery (SA)

SCCMF South Coast Crustacean Managed Fishery (WA)

SCDSCF South Coast Deep Sea Crab Fishery (WA)

STOCK STRUCTURE

Giant Crab is considered to be a single biological stock from Western Australia to Tasmania because the species occurs in a continuous distribution across this range. The larval duration is around 50 days, with larval release occurring along the edge of the continental shelf. The shelf is a high current area, facilitating dispersal. Oceanographic modelling has indicated that Giant Crab dispersal occurs over large spatial scales¹⁻³. Commercial catches off Tasmania occur in two distinct areas, although video sampling has shown that Giant Crab occurs at non-commercial densities between these areas³.

Both previous Status of Australian Fish Stocks reports on Giant Crab provided an overall assessment for this biological stock. However, there have been significant changes in the relative performance of the various fisheries operating across this stock since 2014. New information indicates that the stock is now considered overfished in Tasmania and sustainable at the opposite, Western Australian, end of its range. With current understanding of Giant Crab population dynamics, it was not possible to reconcile these differences and determine a single stock status for the entire Southern Australian stock. Management arrangements vary across jurisdictions (for example, size limits) and the fishing fleets in each jurisdiction consist of a small number of vessels with very different characteristics, resulting in different patterns of exploitation.

These factors, combined with the need for more information to assess the status of Giant Crab in some jurisdictions, have resulted in this status report providing different status determinations for Giant Crab at the jurisdictional level—Western Australia and South Australia; and the management unit level—Giant Crab Fishery (Victoria) and Giant Crab Fishery (Tasmania).

STOCK STATUS

The Southern Australian biological stock has components in Western Australia, Victoria, Tasmania and South Australia. Each jurisdiction assesses the part of the biological stock that occurs in its waters. Historically, the Victorian and Tasmanian fisheries have constituted the bulk of the Giant Crab Fishery; however, both these states have had substantial reductions in total allowable commercial catch (TACC) over the past decade.

Western Australia

Specific targeted fishery data is not available for Giant Crab in Western Australia, with catches either a by-product of Southern Rock Lobster fishing, or as part of a combined catch of other deep sea crabs. Catches of Giant Crabs in Western Australia steadily increased from 2009–10 to 2012–13 and then declined slightly thereafter, while catch rates have remained steady. Large portions of the stock in Western Australia (particularly east of longitude 125 °E) are not being exploited, with the current landings also coming from across a broad geographic range relative to the stock in other

jurisdictions. The above evidence indicates that the biomass of this stock is unlikely to be recruitment overfished and that the current level of fishing pressure is unlikely to cause the stock to become recruitment overfished.

On the basis of the evidence presented above, Giant Crab in Western Australia is classified as a **sustainable stock**.

Giant Crab Fishery (Victoria)

Management of fishing mortality in Victoria is through a TACC, and legal minimum lengths (LML) to protect mature undersized crabs. The LML aim to ensure that egg production remains at no less than 40 per cent of unfished levels⁴. However, there is considerable uncertainty around the population dynamics of larger females and hence the degree of protection provided by these limits. Setting of an annual TACC occurs according to the performance measures and strategies specified in the Victorian Giant Crab Fishery Management Plan⁵. Catch per unit effort (CPUE) is the primary indicator of Giant Crab biomass and is expressed as the catch taken per 24-hour pot-lift, by fishers landing more than 1 tonne (t) in a fishing year. The TACC was set at 25 t from 2002–09, but was decreased over several years in response to declining catch rates, to 10.5 t in 2014–15. A recent review of standardisation methods to account for soak time has translated to a doubling in CPUE since 2010–11, and CPUE has been above the limit reference point for the past four fishing seasons⁶. Despite this, a number of factors, including the spatial contraction of the Giant Crab fishery, the reduced number of participants (less than five fishers) and no fishery-independent data, have meant that there is insufficient information available to confidently classify the Victorian component of the stock.

On the basis of the evidence presented above, Giant Crab Fishery (Victoria) management unit is classified as an **undefined stock**.

Giant Crab Fishery (Tasmania)

A length-based model has been developed to estimate annual levels of biomass and egg production. The model is based on data that include catch and effort data from commercial fisheries⁷. This model was used to develop the current sex-specific size limits to afford greater protection to mature female crabs, which are also protected whilst berried and through female spawning closures. Nevertheless, egg production has decreased to an estimated 14 per cent of unfished levels⁸. This is inadequate relative to benchmarks in most crustacean fisheries⁹. CPUE has decreased continually since the inception of the Tasmanian fishery. Due to its slow growth and longevity, Giant Crab is particularly susceptible to becoming recruitment overfished. The above evidence indicates that the stock is likely to be recruitment overfished.

With the objective of increasing abundance and catch rates, the TACC for the Tasmania has been reduced in several steps from 104 t in 2003–04 to 38.3 t in 2014–15. The TACC has been routinely under-caught by approximately 10 per cent because of limited quota trading and leasing. Since the 2012–13 quota year this under-catch has increased to approximately 40 per cent, which is partly attributable to changes in regulation relating to the unloading of Giant Crab interstate, low beach price and low CPUE⁴. The ongoing decline in catch rates, despite substantial TACC and even more substantial catch reductions, indicates that the Tasmanian TACC has not been reduced to a sufficient level to allow for recovery. To address this issue, for the 2017/18 season the Giant Crab TAC has been reduced to 20.7 t, with additional measures to maintain an average annual catch of 15 t. The stock assessment model indicates this will provide significant future biomass increases. The above evidence indicates that fishing pressure at the 2015 level is expected to prevent the stock recovering from a recruitment overfished state.

On the basis of the evidence provided above, Giant Crab Fishery (Tasmania) management unit is classified as an **overfished stock**.

South Australia

Fishing mortality in South Australia is managed through TACCs and a LML. Measures of CPUE in South Australia have been within the upper and lower reference points in both management zones since 2010, however, there are some concerns about the reliability of these data given the low level of targeted effort¹⁰. A review to assess the suitability of the current performance indicators in determining Giant Crab stock status in South Australia is being undertaken in 2017. This means that insufficient information is available to confidently classify the status of this part of the biological stock.

On the basis of the evidence presented above, Giant Crab in South Australia is classified as an **undefined stock**.

BIOLOGY

Giant Crab biology^{1,3,4}

Biology

Species	Longevity / Maximum Size	Maturity (50 per cent)
Giant Crab	30+ years; >200 mm CL ; ~10 kg	125–140 mm CL, depending on region

DISTRIBUTIONS



Distribution of reported commercial catch of Giant Crab

TABLES

Fishing methods

	Western Australia	Victoria	Tasmania	South Australia
Commercial				
Various	✓	✓		
Giant Crab Trap			✓	✓
Indigenous				
Giant Crab Trap	✓		✓	✓
Recreational				
Giant Crab Trap	✓		✓	✓

Management methods

Method	Western Australia	Victoria	Tasmania	South Australia
Commercial				
Limited entry	✓	✓	✓	✓
Quota	✓	✓	✓	✓
Size limit	✓	✓	✓	✓
Spatial closures	✓	✓	✓	✓
Temporal closures	✓	✓	✓	✓
Indigenous				
Possession limit			✓	
Size limit	✓	✓	✓	✓
Temporal closures	✓	✓	✓	✓
Recreational				
Possession limit			✓	
Size limit	✓	✓	✓	✓
Temporal closures	✓	✓	✓	✓

Active vessels

	Western Australia	Victoria	Tasmania	South Australia
				6 in NZGCF, SZGCF

NZGCF, SZGCF Miscellaneous Fishery and Southern Rock Lobster Fishery (SA)

Catch

	Western Australia	Victoria	Tasmania	South Australia
Commercial	2.01t in ESRLF, 2.93t in SCCMF, 4.65t in SCDS CF	10.50t in GCF	21.10t in GCF	16.98t in NZGCF, SZGCF
Indigenous	Zero	Zero	Negligible	Negligible
Recreational	Negligible		Negligible	Negligible

ESRLF Esperance Southern Rock Lobster Fishery (WA)

GCF Giant Crab Fishery (TAS)

GCF Giant Crab Fishery (VIC)

NZGCF, SZGCF Miscellaneous Fishery and Southern Rock Lobster Fishery (SA)

SCCMF South Coast Crustacean Managed Fishery (WA)

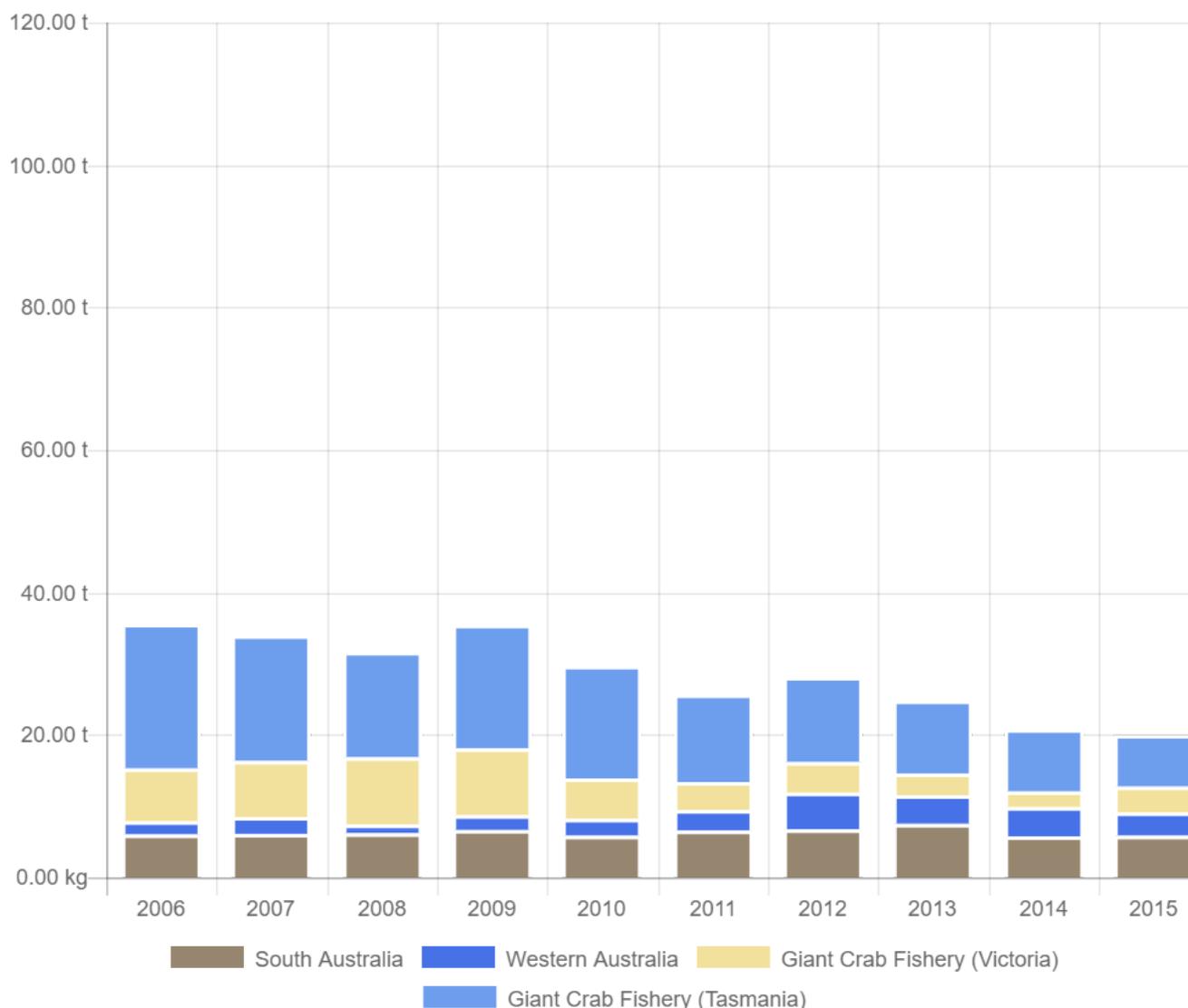
SCDS CF South Coast Deep Sea Crab Fishery (WA)

a Western Australia, Victoria, Tasmania and South Australia Tasmanian and West Coast Deep Sea Crustacean Fishery (Western Australia) data are for the 2015 calendar year; South Australian data are from quota holders in the 2014–15 fishing season (October 2014–May 2015), Victorian data are for the 2014–15 fishing season (November 2014–September 2015) and South Coast Deep Sea Crustacean Fishery (Western Australia) data are for the 2014–15 financial year.

b Victoria – Indigenous (management methods) In Victoria, regulations for managing recreational fishing are also applied to fishing activities by Indigenous people. Recognised Traditional Owners (groups that hold native title or have agreements under the Traditional Owner Settlement Act 2010 [Vic]) are exempt (subject to conditions) from the requirement to hold a recreational fishing licence, and can apply for permits under the Fisheries Act 1995 (Vic) that authorise customary fishing (for example, different catch and size limits, or equipment). The Indigenous category in Table 3 refers to customary fishing undertaken by recognised Traditional Owners. In 2014–15, there were no applications for customary fishing permits to access Giant Crab.

c Victoria – Indigenous (management methods) Subject to the defence that applies under Section 211 of the Native Title Act 1993 (Cth), and the exemption from a requirement to hold a recreational fishing licence, the non-commercial take by indigenous fishers is covered by the same arrangements as that for recreational fishing.

CATCH CHART



Commercial catch of Giant Crab

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- Bycatch in the Giant Crab fishery was sampled from more than 3000 traps. This research concluded that the fishery is of low risk to other species because of the small amount of trapping effort. Further, the majority of the bycatch consists of species (mainly Antlered Crab, Hermit Crab and Draftboard Shark) that do not have swim bladders and are returned to the sea with a high chance of survival².
- The Giant Crab fishery is based mainly in habitats found along the edge of the continental shelf. This bryzoan turf habitat is formed from encrusting filter-feeding organisms growing on sandy and muddy sediments³. The risk to this habitat from Giant Crab fishing gear is considered to be low because gear is not dragged and has minimal drift, and the fishing footprint is insignificant relative to the size of the habitat area³.

- o No interactions with protected species have been reported by observers or fishers targeting Giant Crab. Because Giant Crab is targeted in deep water, species that are distributed in coastal waters, such as juvenile seals and cormorants, are unlikely to interact with Giant Crab fishing operations⁸. Interaction rates with marine mammal species inhabiting offshore waters remain unquantified.

ENVIRONMENTAL EFFECTS ON GIANT CRAB

- o Recruitment is not distributed evenly, and some areas appear to have higher juvenile abundance than others. This is not a function of habitat but appears to be related to larval drift and thus movement by ocean currents³. Changes in ocean currents resulting from climate change or upwelling events may affect this process and recruitment. Increases in ocean temperature may also potentially decrease larval development times.

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