

Fisheries

Stock Status Report for the South Australian Giant Crab (*Pseudocarcinus gigas*) Fishery in 2021-22



L. McLeay

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**SARDI Aquatic and Livestock Sciences
PO Box 120 Henley Beach SA 5022**

May 2023

Final Report to PIRSA Fisheries and Aquaculture



**Government
of South Australia**

Primary Industries
and Regions SA



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Author(s): L. McLeay

Reviewer(s): K. Heldt and B. Stobart (SARDI)

Approved by: S. Mayfield (SARDI)
Science Leader - Fisheries

Signed: 

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South Australian Research and Development Institute - SARDI Aquatic and Livestock Sciences

2 Hamra Avenue West Beach SA 5024

PO Box 120 Henley Beach SA 5022

P: (08) 8207 5400 F: (08) 8207 5415

E: pirsa.sardiaquatics@sa.gov.au W: <http://www.pir.sa.gov.au/research>

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EXECUTIVE SUMMARY

This report provides an assessment of the status of the South Australian Giant Crab Fishery (GCF) using data to the end of the 2021 fishing season that extends from 1 October 2021 to 31 May 2022. It analyses fishery-dependent data at a State-wide scale, collected from two management zones, the Northern Zone (NZ) and Southern Zone (SZ), and from three commercial fishing sectors: (1) Miscellaneous Fishery sector; (2) South Australian Rock Lobster Fishery (SARLF) quota sector (RL-quota); and (3) SARLF by-product sector (RL by-product).

The long-lived and slow-growth life-history characteristics of the Giant Crab render the species susceptible to recruitment overfishing. Catch declines have been reported across core areas of the species' distribution in Victoria and Tasmania, despite multiple total allowable commercial catch (TACC) reductions in these states. In South Australia, the recent declines in catch, pre-recruit abundance and catch per unit effort (CPUE) to their lowest levels since TACC was introduced in 1999 signal uncertainty in relation to the future performance of the GCF.

The TACC of the GCF has been caught in only three seasons since its inception and has not been caught in the last nine seasons. Catches have declined since 2012. In 2021, the catch of 10.2 t comprised 46.2% of the 22.1 t TACC, which is the lowest catch on record since TACC was introduced. The amount of targeted catch in the Miscellaneous Fishery sector and RL-quota sector in 2021 was also the lowest on record. Seasonal estimates of pre-recruit (undersize Giant Crab) abundance have also steadily declined since 2008, with 2019–2021 returning the lowest estimates on record.

The primary biological performance indicator (PI) for the GCF is the five-year average CPUE (kg/potlift) of legal-size Giant Crab. Estimates for this PI have declined since 2008. In 2021, the index was 1.99 kg/potlift, which is 2.1% above the Trigger Reference Point ($RP_{\text{trig}}=1.95$ kg/potlift), and the lowest estimate on record. The low five-year average is a consequence of annual estimates of CPUE decreasing in recent years. If the current downward trend in annual CPUE continues in 2022, the five-year average commercial CPUE of legal-size Giant Crab would be expected to be below the RP_{trig} in 2022.

Within the management policy for the GCF, the status of the Giant Crab stock is defined in relation to how the primary biological PI, five-year average commercial CPUE of legal-size Giant Crab, aligns against its Trigger Reference Point (RP_{trig}) (PIRSA 2018). Under the decision rule within the management policy to categorise the status of the Giant Crab stock in South Australia (PIRSA 2018), the stock is classified as '**sustainable**' in 2021.

Table 1. Giant Crab Fishery statistics between 2018/19 and 2021/22. **Bold:** five-year average commercial CPUE of legal-size Giant Crab is the primary biological performance indicator (PI) listed in the management policy for the GCF. **Confidential data (<5 licence holders).

Statistic	2018/19	2019/20	2020/21	2021/22
Total Allowable Commercial Catch (TACC)	22.1 t	22.1 t	22.1 t	22.1 t
Total commercial catch	18.1 t	14.2 t	15.4 t	10.2 t
% of TACC caught	82%	64%	70%	46%
Target effort	8,141 potlifts	**	7,727 potlifts	**
Five-year average commercial CPUE of legal-size Giant Crab*	2.14 kg/potlift	2.10 kg/potlift	2.11 kg/potlift	1.99 kg/potlift
Pre-recruit abundance	0.67 pre-recruits/potlift	**	0.47 pre-recruits/potlift	**
Mean weight	3.15 kg	**	3.09 kg	**
Sex ratio ($N_{\text{♀}}/N_{\text{♀}+\text{♂}}$)	0.51	**	0.51	**
Status	Sustainable	Sustainable	Sustainable	Sustainable

Keywords: Giant Crab, King Crab, *Pseudocarcinus gigas*, fishery, South Australia.

1. INTRODUCTION

1.1. Overview

This status report for the South Australian Giant Crab (*Pseudocarcinus gigas*) Fishery (GCF) updates previous stock assessment and status reports for this species (Currie and Ward 2005; Currie *et al.* 2006; Currie 2008; Currie and Ward 2009; Currie 2010; Currie 2011a, b; Chick 2013; Stobart 2014; McLeay 2015; 2016; 2018; 2019; 2020; 2021; 2022) and is part of SARDI Aquatic and Livestock Sciences' assessment program for the fishery. The report provides a synopsis of the information available for the GCF collected from commercial logbook returns from 1 November 1986 to 31 May 2022, identifies uncertainty associated with the assessment, and assesses the current status of the Giant Crab resource in South Australia.

1.2. Biology

Giant Crab (*P. gigas*), also known as King Crab, is endemic to southern Australian waters and distributed from southern Western Australia to central New South Wales (Kailola *et al.* 1993). Giant Crab is considered to be a single biological stock across southern Australia (Levings *et al.* 2001). They are a long-lived (>30 years), slow growing xanthoid crab, reaching over 10 kg in weight with males growing to at least twice the size of females. While they occur at depths ranging from 20 to 600 m, the highest population densities are found at the edge of the continental shelf at depths of approximately 140 to 270 m (Levings *et al.* 1995). Mating occurs from June to July and females carry eggs for approximately four months before hatching occurs in October to November. Larval duration is approximately 50 days.

1.3. Management arrangements and harvest strategy

A detailed description of the history and management arrangements for the fishery is provided in Sloan (2002; 2003), PIRSA (2018), and previous stock assessment and status reports (Currie and Ward 2005; Currie *et al.* 2006; Currie 2008; Currie and Ward 2009; Currie 2010; Currie 2011a, b; Chick 2013; Stobart 2014; McLeay 2015; 2016; 2018; 2019; 2020; 2021; 2022; [Publications and reports - PIRSA](#)).

In summary, targeted fishing for Giant Crab began in South Australia in 1992 under Commonwealth licence arrangements. In 1997, management of the GCF was transferred solely to the Government of South Australia and separated into two zones, the Southern Zone (SZ) and Northern Zone (NZ), which are consistent with those designated for the South Australian Rock Lobster Fishery (SARLF). In 1999, an annual Total Allowable Commercial Catch (TACC) of 26 t was implemented for the GCF (NZ: 13.4 t and SZ: 12.6 t). In 2000, the TACC was reduced to 22.1 t (NZ: 13.4 t and SZ: 8.7 t) and has since remained unchanged (PIRSA 2009, 2018).

Commercial access to the Giant Crab resource is limited to licence holders in the South Australian Miscellaneous Fishery (Miscellaneous Fishery) and the SARLF. Within the SARLF, Giant Crab quota is allocated to some licence holders as a unit holding (RL-quota). In 2021, the TACC was allocated among 15 licence holders: one in the Miscellaneous Fishery and 14 in the SARLF. A total of 5% of the quota in each zone is held aside for SARLF fishers with no Giant Crab quota to account for Giant Crab taken as by-product (RL by-product)(non-targeted).

The Giant Crab fishing season is between 1 October–31 May, with the fishing season in the SZ between 1 October and 30 April, and in the NZ between 1 November and 31 May. Fishing in each zone is managed via a mix of input and output controls (refer to Table 1 in PIRSA 2018). Fishers use a maximum of 100 steel-framed pots that must comply with pot-dimension specifications. A minimum legal-size limit of 150 mm carapace length is set for the GCF and females with external eggs are protected and must be returned to the water as soon as possible following capture.

The management policy for the fishery describes the overarching management arrangements and harvest strategy for the fishery (PIRSA 2018). The harvest strategy developed for the fishery is consistent with the South Australian Harvest Strategy Policy and Guidelines (PIRSA 2015a, b) and the National Harvest Strategy Guidelines (Sloan *et al.* 2014), and considers an assessment of data sources and performance indicators (PIs) for the fishery conducted by SARDI in 2017 (summarised in McLeay 2018).

The harvest strategy identifies five-year average commercial catch per unit effort (CPUE) of legal-size Giant Crab as the primary biological PI, with reference points for this PI based on targeted catch and effort information from 2000/01 to 2009/10. To inform the harvest strategy, five-year average commercial CPUE of legal-size Giant Crab (kg/potlift), calculated as a moving average using CPUE of legal-size Giant Crab from the current and previous four fishing seasons, is applied within decision rules described in the management policy (PIRSA 2018).

Decision rules are linked to defined Limit, Trigger and Target Reference Points for this PI to guide management arrangements and TACC setting in the following season. The Target Reference Point (RP_{targ}) for commercial CPUE of legal-size Giant Crab is 2.60 kg/potlift. Consistent with the National Harvest Strategy Policy (Sloan *et al.* 2014), the Trigger Reference Point (RP_{trig}) is set at 75% of RP_{targ} (1.95 kg/potlift) and the Limit Reference Point (RP_{lim}) is set at 50% of RP_{targ} (1.30 kg/potlift) (PIRSA 2018).

Decision rules are outlined within the management policy (PIRSA 2018) as follows:

- When five-year average commercial CPUE of legal-size Giant Crab is ≥ 1.95 kg/potlift (i.e. above RP_{trig}) it is recommended the TACC be set at 22.1 t for the entire GCF with 13.4 t of that TACC set for the NZ and 8.7 t set for the SZ.
- When five-year average commercial CPUE of legal-size Giant Crab is < 1.95 kg/potlift and ≥ 1.30 kg/potlift (i.e. below RP_{trig} and above RP_{lim}) a review of the GCF will be undertaken.
- When five-year average commercial CPUE of legal-size Giant Crab is < 1.30 kg/potlift (i.e. below RP_{lim}) a review of the GCF will be undertaken and appropriate management arrangements may be introduced for the fishery in a timely fashion.

1.4. Stock status classification

A National Fishery Stock Status Reporting Framework (NFSRF) was developed to enable the consistent assessment of the status of Australian fish stocks (Pidcocke *et al.* 2021). The system combines information on both the current stock size and level of catch into a single classification for each stock using defined biological reference points. Each stock is then classified as 'sustainable', 'recovering', 'depleting', 'depleted', 'undefined' or 'negligible' (Table 2) ([FRDC 2023](#)). PIRSA has adopted this classification system to determine the status of all South Australian fish stocks.

Following the assessment of data sources and PIs undertaken for the fishery by SARDI in 2017, Giant Crab stock status is now defined in relation to how the single PI, five-year average commercial CPUE of legal-size Giant Crab, aligns against the reference points within the management policy (PIRSA 2018). Within the management policy, the Giant Crab stock status is categorised as 'sustainable' if the five-year average commercial CPUE of legal-size Giant Crab is at or above RP_{trig} (1.95 kg/potlift). Determination of stock status below RP_{trig} is not prescribed under the management policy.

Table 2. Stock status terminology for the status of key Australian fish stocks reports (Pidcocke *et al.* 2021).

	STOCK STATUS	DESCRIPTION	POTENTIAL IMPLICATIONS FOR MANAGEMENT OF THE STOCK
■	Sustainable	Biomass (or proxy) is at a level sufficient to ensure that, on average, future levels of recruitment are adequate (i.e. recruitment is not impaired) and for which fishing mortality (or proxy) is adequately controlled to avoid the stock becoming recruitment impaired (overfishing is not occurring).	Appropriate management is in place
■	Depleting	Biomass (or proxy) is not yet depleted and recruitment is not yet impaired, but fishing mortality (or proxy) is too high (overfishing is occurring) and moving the stock in the direction of becoming recruitment impaired	Management is needed to reduce fishing pressure and ensure that the biomass does not become depleted
■	Recovering	Biomass (or proxy) is depleted and recruitment is impaired, but management measures are in place to promote stock recovery, and recovery is occurring	Appropriate management is in place, and there is evidence that the biomass is recovering
■	Depleted	Biomass (or proxy) has been reduced through catch and/or fishing effects, such that recruitment is impaired. Current management is not adequate to recover the stock, or adequate management measures have been put in place but have not yet resulted in measurable improvements	Management is needed to recover this stock; if adequate management measures are already in place, more time may be required for them to take effect
■	Undefined	Not enough information exists to determine stock status	Data required to assess stock status are needed
■	Negligible	Catches are so low as to be considered negligible and inadequate information exists to determine stock status	Assessment will not be conducted unless catches and information increase

2. METHODS

2.1. Sources of data

Fishery-dependent data have been collected from the three commercial fishing sectors that have access to the Giant Crab resource (Miscellaneous Fishery, RL-quota and RL by-product) since 1986. Data are unavailable to identify SARLF licence holders that held Giant Crab quota between 1999 and 2005. Data within this period were allocated to the RL-quota sector by referencing SARLF licence holders who held Giant Crab quota in 2006, and an additional SARLF licence holder (between 1999 and 2002). From 2006, PIRSA has provided information to SARDI to identify licence holders among each fishing sector with Giant Crab entitlement. All other fishery-dependent data from SARLF licence holders without allocated Giant Crab quota are assigned to the RL by-product sector.

Prior to 2000, data relating to Giant Crab catch were reported via a mandatory daily logbook program implemented for the SARLF. From 2000, a separate logbook reporting system was implemented for the GCF. Data from quota holders (Miscellaneous Fishery, RL-quota sectors) are reported through this system. Data from Rock Lobster fishers who catch Giant Crab incidentally (RL by-product sector) are reported through the logbook program in the SARLF. Data for Giant Crab catch recorded by the Miscellaneous Fishery and RL-quota sectors since 2000 are considered the most robust in assessing the stock status of the GCF, as they more accurately capture targeted fishing effort towards Giant Crab (McLeay 2018).

All data are entered into a database and maintained by PIRSA. Data are checked for errors during data entry, and further validated during data entry and reporting operations. PIRSA staff contact licence holders to correct any errors or missing information identified in the quality assurance process. All references to a fishing season in this report refer to the year the fishing season started (e.g. data reported for 2020 includes data from 1 October 2020 to 31 May 2021). Due to confidentiality, where data are from <5 licence holders, data from each zone and sector are aggregated and presented at a State-wide scale. All means are reported \pm standard error.

2.2. Primary Performance Indicator

The primary biological PI for the GCF is the five-year average commercial catch per unit effort (CPUE) (kg/potlift) of legal-size Giant Crab (PIRSA 2018). This PI is calculated as the moving average of annual CPUE measured from the current and previous four fishing seasons. It uses data relating to targeted fishing collected through catch logs recorded by the Miscellaneous Fishery and RL-quota sectors in the NZ and SZ since 2000. Reference points for this PI are based on targeted catch and effort information from 2000/01 to 2009/10.

2.3. Additional Performance Indicators

Catch (total and % of TACC), effort, mean weight, pre-recruit abundance, sex ratio and spawning female abundance are additional indicators that provide context for assessing future performance of the GCF. Effort, mean weight, pre-recruit abundance, sex ratio and spawning female abundance are reported using data from targeted fishing for Giant Crab in the Miscellaneous Fishery and RL-quota sectors since 2000. Catch of Giant Crab includes all catch reported through both GCF and SARLF logbook programs and consequently includes non-targeted catch of Giant Crab by non-quota holders in the SARLF (RL by-product sector).

3. RESULTS

3.1. Total catch

State-wide catches of Giant Crab landed by all three fishing sectors were negligible prior to 1992. Thereafter, catches increased but varied annually, averaging 20.8 ± 4.1 t between 1992 and 1998, including a historical high of 34.1 t in 1997 (Figure 1). Following introduction of a TACC in 1999, catches remained relatively stable up until 2012, ranging from 18.0 t in 2003 to 27.0 t in 1999, whereafter they generally decreased, and in 2021 the total catch was 10.2 t. This is the lowest catch on record since TACC was implemented. The TACC has been caught in three seasons since its inception (1999, 2000 and 2012) and not been caught for the last nine seasons. In 2021, the catch comprised 46.2% of the 22.1 t TACC.

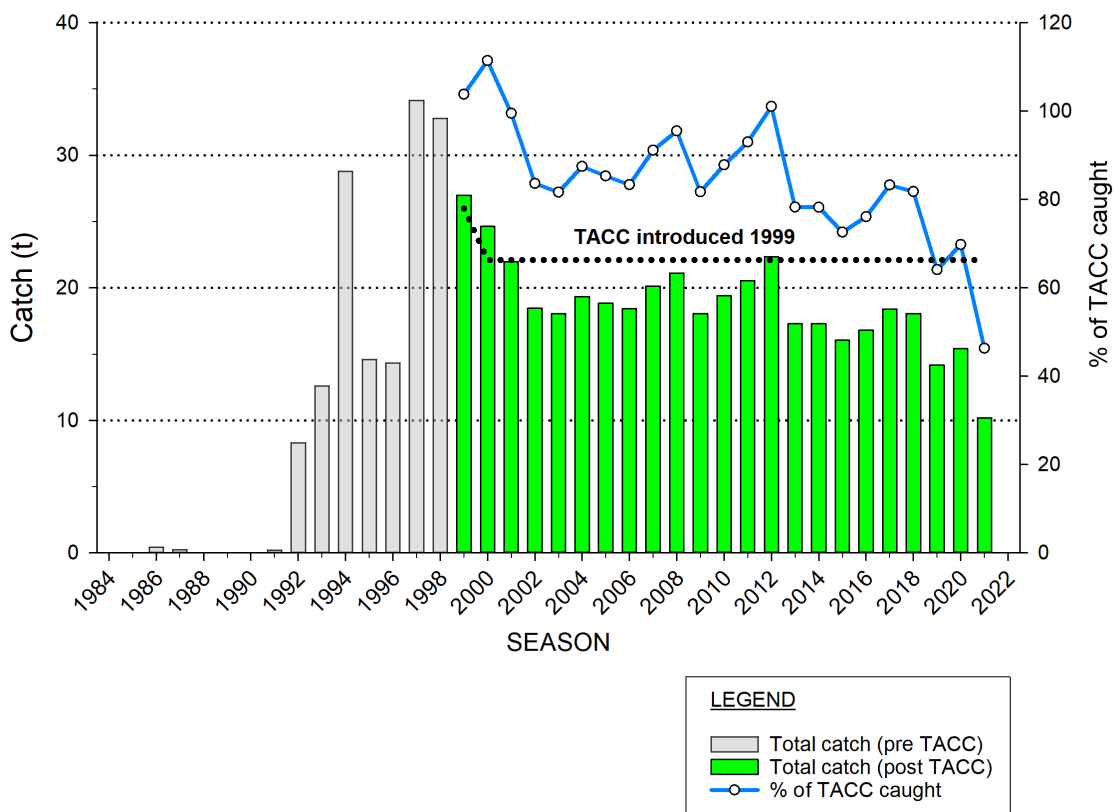


Figure 1. Total catch and TACC of Giant Crab and percentage of Giant Crab TACC caught State-wide in the GCF between 1986 and 2021.

3.2. Targeted catch and effort

Targeted catch of Giant Crab landed within the Miscellaneous Fishery and RL-quota sectors represents 90.9% of all catch reported in the GCF since 2000 and at least 75% of the total catch recorded in each season since 2000 (Table 3). In 2021, targeted catch landed by the Miscellaneous Fishery and RL-quota sectors was the lowest on record. Note, some data are not presented due to confidentiality requirements (<5 licence holders).

Table 3. Target catch versus total catch of Giant Crab between 2000 and 2021.
**Confidential data (<5 licence holders).

SEASON	Target catch (t)	Total catch (t)	% Target catch
2000	21.7	24.6	88.1
2001	17.6	22.0	80.2
2002	16.1	18.5	86.9
2003	**	18.0	**
2004	**	19.3	**
2005	**	18.9	**
2006	**	18.4	**
2007	**	20.1	**
2008	**	21.1	**
2009	16.1	18.1	89.3
2010	18.9	19.4	97.3
2011	19.7	20.6	96.0
2012	21.8	22.3	97.7
2013	16.4	17.3	95.0
2014	17.0	17.3	98.1
2015	15.1	16.0	93.9
2016	16.1	16.8	98.2
2017	17.2	18.4	93.6
2018	16.8	18.1	92.9
2019	**	14.2	**
2020	14.8	15.4	96.2
2021	**	10.2	**

Annual targeted fishing effort in the Miscellaneous Fishery and RL-quota sectors reached a maximum of 9,457 potlifts in 2009 (Figure 2). Since 2000, the average targeted fishing effort was $7,371 \pm 295$ potlifts per season. The annual targeted effort recorded in 2021 was lower than in 2020, and the third lowest on record since 2000 (2019: data confidential; 2020: 7,727 potlifts; 2021: data confidential).

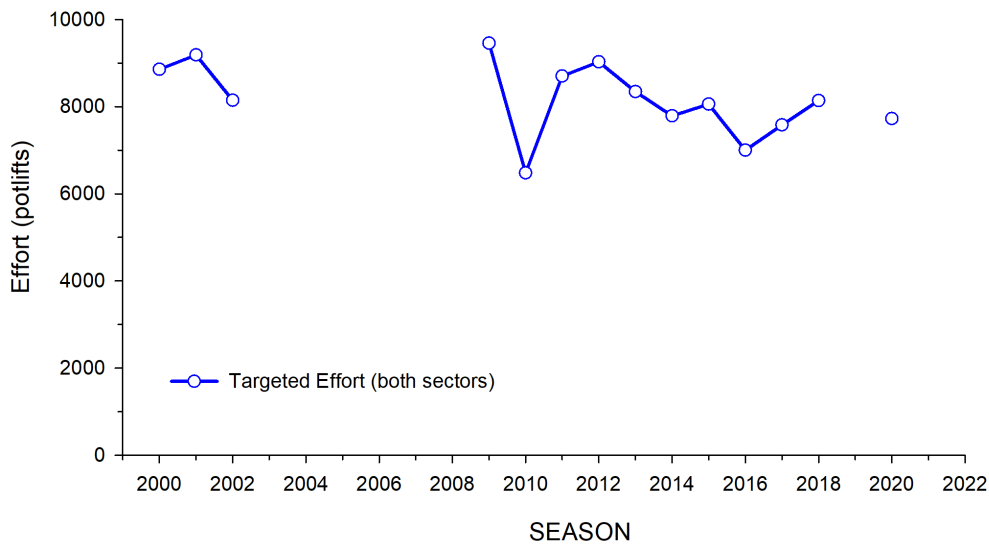


Figure 2. State-wide targeted fishing effort in the GCF between 2000 and 2021. Confidential data (<5 licence holders) not presented.

3.3. Catch per unit effort (CPUE)

Annual estimates of CPUE of legal-size Giant Crab increased from 2.45 kg/potlift in 2000, reaching a maximum in 2008 (data confidential). Annual CPUE then decreased reaching 1.87 kg/potlift in 2015 (Figure 3). From 2016 to 2020, annual CPUE remained between 1.92 and 2.30 kg/potlift. In 2021, annual commercial CPUE of legal-size Giant Crab was lower than in 2020 and the second lowest on record since 2000 (2019: data confidential; 2020: 1.92 kg/potlift; 2021: data confidential) (Figure 3).

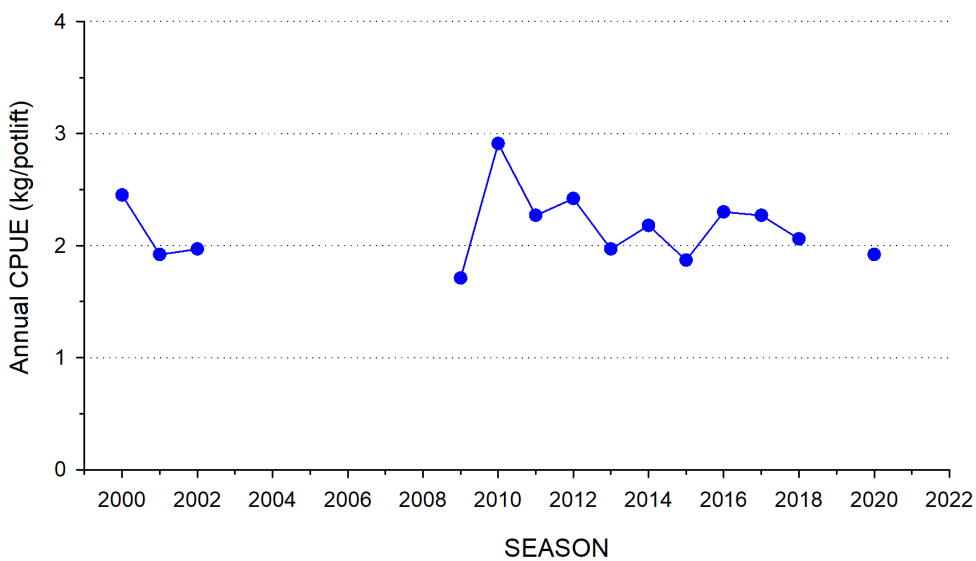


Figure 3. State-wide annual commercial CPUE of legal-size Giant Crab in the GCF between 2000 and 2021. Confidential data (<5 licence holders) not presented.

From 2004, five-year average commercial CPUE of legal-size Giant Crab increased from 2.32 kg/potlift reaching a peak in 2008 (data confidential), before decreasing to 2.14 kg/potlift in 2015 (Figure 4). From 2015 to 2020, five-year average commercial CPUE was relatively stable at 2.12–2.15kg/potlift and >80% of the Target Reference Point (RP_{targ} = 2.60 kg/potlift).

In 2021, five-year average commercial CPUE was 1.99 kg/potlift, which is the lowest estimate on record, 76.5% of RP_{targ} and 2.1% above the Trigger Reference Point (RP_{trig}=1.95 kg/potlift) (Figure 4).

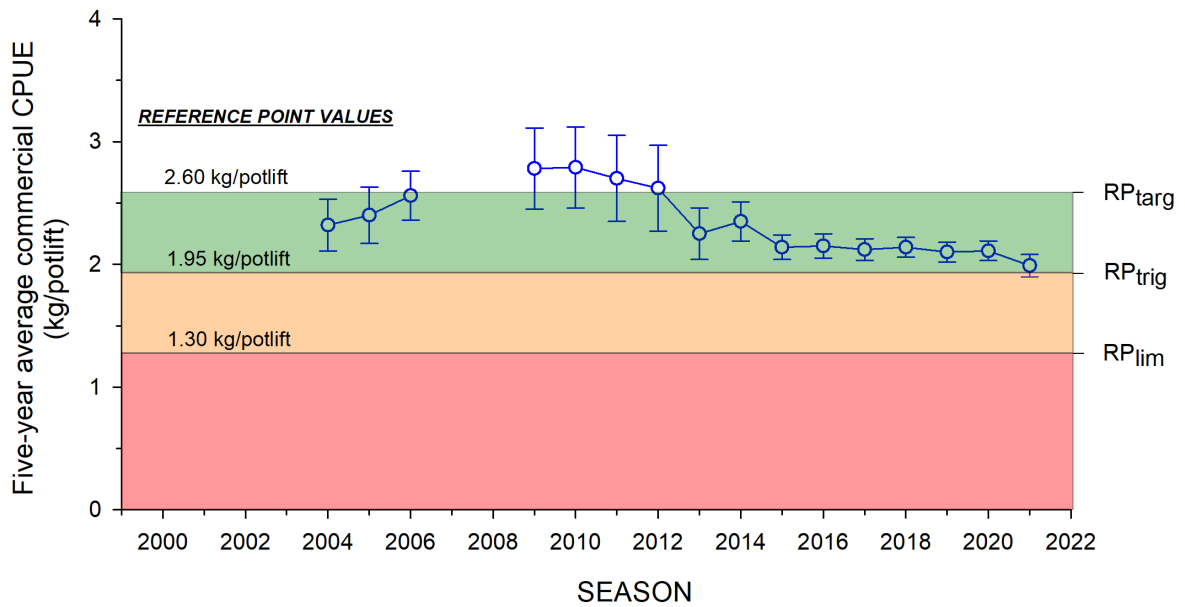


Figure 4. State-wide five-year average (\pm SE) commercial CPUE of legal-size Giant Crab in the GCF between 2004 and 2021. Target Reference Point = RP_{targ}; Trigger Reference Point = RP_{trig}; Limit Reference Point = RP_{lim}. Confidential data (<5 licence holders) not presented.

3.4. Pre-recruit abundance

State-wide seasonal estimates of pre-recruit (undersize Giant Crab) abundance have steadily declined since 2008 (data confidential), with 2019, 2020 and 2021 among the lowest estimates on record, and 2021 the lowest estimate on record (2019: data confidential; 2020: 0.47 pre-recruits/potlift; 2021: data confidential) (Figure 5).

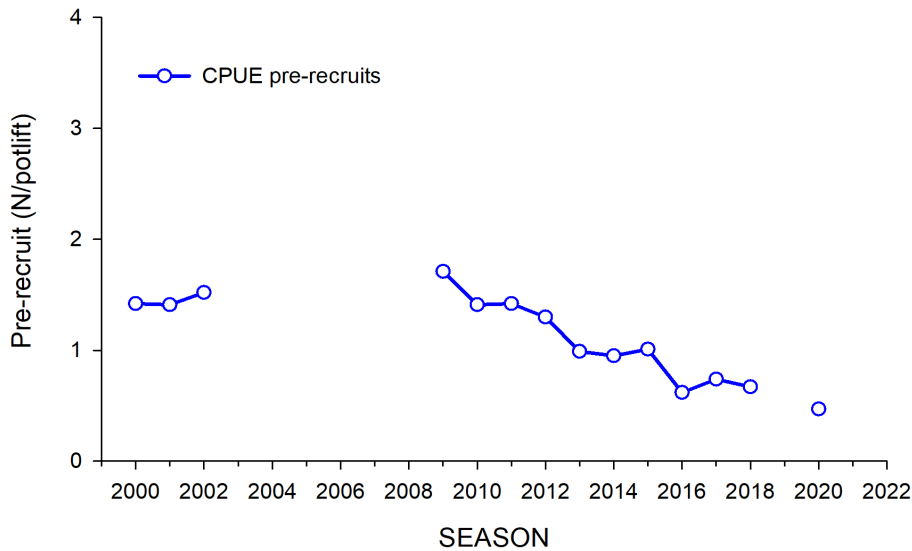


Figure 5. State-wide trends in the CPUE of Giant Crab pre-recruits caught in the GCF between 2000 and 2021. **Confidential data (<5 licence holders) not presented.

3.5. Sex ratio

State-wide seasonal trends in sex ratio averaged 0.55 ± 0.01 since 2000 with the highest number of females recorded in the catch in 2012 (0.64) (Figure 6).

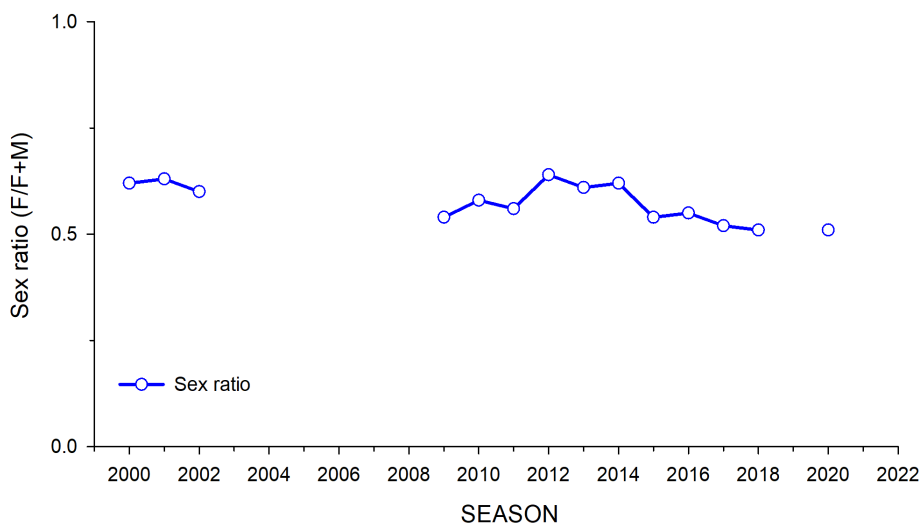


Figure 6. State-wide trends in the sex ratio of Giant Crab caught in the GCF between 2000 and 2021. A sex ratio of 0.5 equates to 50% of females in the catch. F = Female; M = Male. Confidential data (<5 licence holders) not presented.

3.6. Mean weight

Since 2000, State-wide seasonal estimates of the mean weight of legal-size Giant Crab have ranged between 2.85 and 3.20 kg per crab per season (average: 2.99 ± 0.02) (Figure 7). The estimate of mean weight of legal-size Giant Crab in 2021 was higher than in 2020 and the second highest on record.

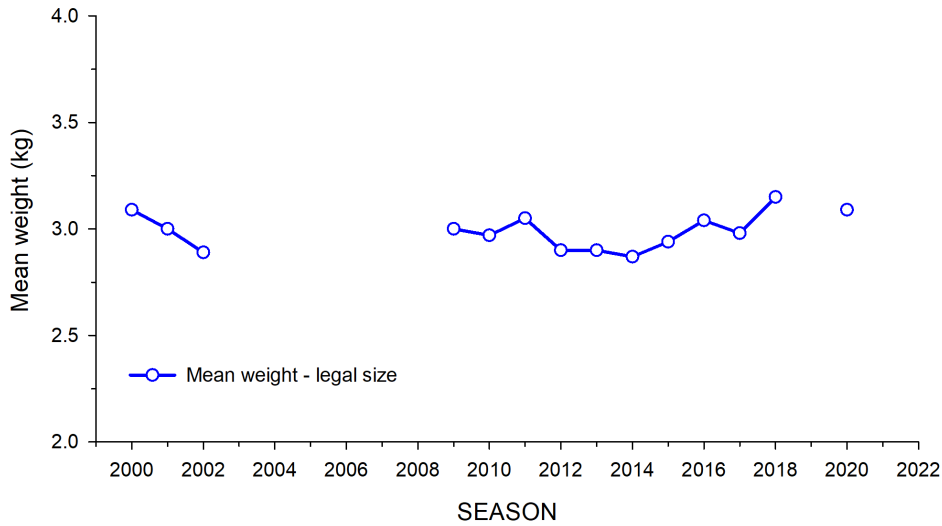


Figure 7. State-wide trends in the mean weight of legal-size Giant Crab caught in the GCF between 2000 and 2021. Confidential data (<5 licence holders) not presented.

3.7. Spawning female abundance

State-wide seasonal trends in the number of spawning females reported in the catch steadily increased from 2000 to 2016, reaching a maximum of 0.14 spawning females/potlift in 2016 before decreasing to 0.17 spawning females/potlift in 2020 (Figure 8).

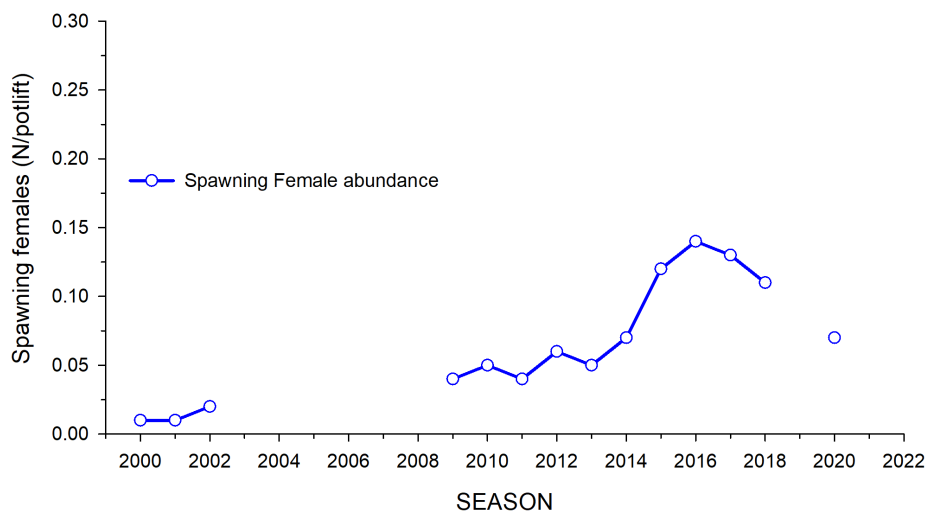


Figure 8. State-wide trends in Giant Crab female spawning abundance in the GCF between 2000 and 2021. Confidential data (<5 licence holders) not presented.

4. SUMMARY

4.1. Stock status

The 2021 season assessment of the South Australian Giant Crab stock builds on previous stock assessments for this species that are available online ([Publications and reports - PIRSA](#)). The assessment is supported by information on the species' fisheries biology and stock structure (Levings *et al.* 2001), implementation of recommendations made in SARDI's 2017 assessment of data sources and PIs for the GCF (McLeay 2018), and the management policy for the GCF (PIRSA 2018). The classification of stock status is determined using the single biological PI of five-year average commercial CPUE of legal-size Giant Crab, with reference points derived from 2000/01 to 2009/10. This approach does not consider the period immediately prior to the introduction of the TACC when catches were higher. Consequently, the current assessment is made in relation to a CPUE or stock biomass 'baseline' that may be different to that existing prior to 2000. The reliance on fishery-dependent data, and CPUE as the primary PI to inform stock status reflects the relatively small size of the fishery but increases uncertainty in the assessment. CPUE can also be influenced by gear selectivity or changes in fishing patterns, fleet efficiency or fleet dynamics (Quirijns *et al.* 2008; Maunder *et al.* 2006) that are not quantified in this assessment. In addition, data confidentiality requirements preclude presentation of data at relevant temporal and spatial scales.

The long-lived and slow-growth life-history characteristics of the Giant Crab render the species susceptible to recruitment overfishing. Catch declines have been reported across core areas of the species' distribution in Victoria and Tasmania, despite multiple TACC reductions in these states (Stewardson *et al.* 2018). In South Australia, the declines in catch, pre-recruit abundance and CPUE to their lowest levels since TACC was introduced in 1999 signal uncertainty in relation to the future performance of the GCF.

The TACC of the GCF has been caught in only three seasons since its inception and has not been caught in the last nine seasons. Catches have declined since 2012. In 2021, the catch of 10.2 t comprised 46.2% of the 22.1 t TACC, which is the lowest catch on record since TACC was introduced. The amount of targeted catch reported in 2021 was also the lowest on record. Reductions in the amount of catch reported reflect reduced catches in the SZ since 2005, and more recently in the NZ since 2018 (SARDI unpublished data). Seasonal estimates of pre-recruit (undersize Giant Crab) abundance have also steadily declined since 2008, with 2019, 2020 and 2021 returning the lowest estimates on record.

The primary biological performance indicator (PI) for the GCF is the five-year average CPUE (kg/potlift) of legal-size Giant Crab. Estimates for this PI have declined since 2008. In 2021, the index was 1.99 kg/potlift, which is 2.1% above the Trigger Reference Point ($RP_{\text{trig}}=1.95$ kg/potlift), and the lowest estimate on record. The low five-year average is a consequence of annual estimates of CPUE decreasing in recent years. If the downward

trend in annual CPUE continues at the current rate, in 2022, the five-year average commercial CPUE of legal-size Giant Crab would be expected to be below the RP_{trig} in 2022.

Within the management policy for the GCF, the status of the Giant Crab stock in 2021 is defined in relation to how five-year average (2017–2021) commercial CPUE of legal-size Giant Crab, aligns against its Trigger Reference Point (RP_{trig}) (PIRSA 2018). Under the decision rule within the management policy to categorise the status of the Giant Crab stock in South Australia (PIRSA 2018), the stock is classified as ‘**sustainable**’ in 2021.

4.2. Future research needs

Four sources of assessment uncertainty require addressing:

- Firstly, it is recommended that the efficacy of the current harvest strategy in reducing fishery exploitation rates and maintaining its operational objectives is reviewed;
- Secondly, statistical modelling procedures, such as Generalised Linear Modelling, should be developed to standardise estimates of commercial CPUE of legal-size Giant Crab to account for temporal, spatial, environmental and fishery-related factors that may influence CPUE;
- Thirdly, it is recommended that data confidentiality issues be resolved so that data can be presented at the spatial and temporal scales necessary to inform stock assessment and management; and
- Finally, future stock assessments may be enhanced through the implementation of cost-effective methods that yield additional data (e.g. length, sex, survival) to assess stock size. Vessel-based camera methods to collect this information are being developed under FRDC Project 2019/114 - *Giant Crab Enhanced Data Collection - Innovative approaches to enhance data collection in the Victorian, South Australian and Tasmanian Giant Crab fisheries*.

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