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MANAGEMENT POLICY FOR THE SOUTH AUSTRALIAN COMMERCIAL GIANT CRAB FISHERY

SEPTEMBER 2017

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Management Policy for the South Australian Commercial Giant Crab Fishery

Information current as of September 2017

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1 Description of the fishery

This policy applies to the South Australian Giant Crab Fishery (GCF) which is formally constituted by the *Fisheries Management (Miscellaneous Fishery) Regulations 2015* and the *Fisheries Management (Rock Lobster Fishery) Regulations 2006*.

1.1 Commercial fishery

1.1.1 History

Targeted commercial fishing for Giant Crab (*Pseudocarcinus gigas*) was initiated in Tasmanian waters in 1990/91. Targeted commercial fishing for Giant Crabs began in South Australian waters in 1992 as a by-product of rock lobster fishing operations. Initially the South Australian fishery was jointly managed by Commonwealth and State arrangements. In 1992 two dedicated Giant Crab fishers began fishing under Commonwealth licences in South Australian waters, Rock Lobster Fishery (RLF) licence holders were permitted to take Giant Crab in Commonwealth waters. In 1997 the GCF was separated into two zones, the Southern Zone and Northern Zone consistent with zones designated for the RLF (see PIRSA 2013 and PIRSA 2014 for description of these zones).

In 1997 an Offshore Constitutional Settlement (OCS) arrangement was made between the South Australian and Commonwealth governments and the GCF was then managed by the South Australian Government. The two Commonwealth Giant Crab licence holders were issued with Miscellaneous Fishery licences with access to take Giant Crabs. Initially their access was limited to the waters of the Southern Zone but was subsequently extended to include the Northern Zone. Rock Lobster fishers who had previously held a Commonwealth permit with Giant Crab access were provided with unrestricted access to Giant Crab under their South Australian licence. Licence holders without any access to Giant Crab under a Commonwealth permit were permitted a by-catch limit of five Giant Crabs per trip.

An annual Total Allowable Commercial Catch (TACC) of 26 t was introduced for the GCF in 1999 as a competitive TACC. In 2000 the quota became an individual transferable quota with 1000 quota units in each zone allocated to licence holders. The TACC was reduced to 22.1 t with 60.6% of the quota provided to the Northern Zone and the remainder provided to the Southern Zone based on historical average annual catches in each zone between 1997/98 and 1999/2000 (Sloan 2002). The TACC levels have remained at the same level since 2000.

A review of the performance indicators included in the previous management policy for the GCF (Sloan 2002) was conducted in 2017 (SARDI 2017). The review recommended new performance indicators for measuring the performance of the fishery. The recommendations of this review were taken into account in developing the harvest strategy and will allow for greater certainty in determining stock status for the resource in the future.

1.1.2 Management arrangements

The commercial fishery is managed through a mix of input and output controls. These controls are aimed at matching harvesting capacity with resource availability. These management arrangements are summarized in Table 1.

Regulatory arrangements for the GCF are contained in the *Fisheries Management (Miscellaneous Fishery) Regulations 2015*, the *Fisheries Management (Rock Lobster Fisheries) Regulations 2006* and the *Fisheries*

Management (General) Regulations 2007. Any amendments to these regulations could change the regulatory arrangements listed in this section. Appropriate consultation will be undertaken should any changes to regulation be required. Management arrangements may also be implemented through licence conditions. The Minister reserves the right to amend licence conditions for the GCF if required to meet sustainability objectives of the *Fisheries Management Act 2007*.

Commercial access to the Giant Crab resource in South Australia is limited to 245 licence holders in the Southern Zone RLF, the Northern Zone RLF and the Miscellaneous Fishery. Two licence holders¹ in the Miscellaneous Fishery with access to both zones and all licence holders in the RLF can access Giant Crab for commercial purposes through Giant Crab quota entitlements, or for non-quota holders in the RLF through an allowance of up to five individual Giant Crabs per fishing trip as by-product. There are 15 licence holders who hold Giant Crab quota units: one in the South Australian Miscellaneous Fishery and 14 in the RLF. A total of 229 RLF licence holders can retain Giant Crab as by-product.

The TACC is allocated among licence holders who hold Giant Crab quota units with 5% of quota in each fishing zone held aside to account for Giant Crab taken as by-product by RLF licence holders that do not hold Giant Crab quota. The TACC is set by determination of a value in kilograms for each giant crab unit in each fishing zone. Quota units may be transferred between Rock Lobster and Miscellaneous Fishery licences with access to harvest Giant Crab in the fishing zone to which the quota unit relates. All harvest of Giant Crab must be consigned to a registered fish processor to support the quota monitoring system and reported in the catch and effort logbooks and catch disposal records.

Fishing in each zone is subject to a seasonal closure. The fishing season in the Southern Zone is between 1 October and 30 April, while in the Northern Zone the fishing season runs between 1 November and 31 May.

Vessels and masters must be registered on a fishery licence when accessing the GCF. Vessels operating with a Northern Zone RLF licence or under a Miscellaneous licence are required to operate vessel monitoring systems.

Fishers use steel-framed pots similar to (or the same as) rock lobster pots, fitted with a molded plastic neck and covered in mesh. All pots must comply with regulations specifying maximum dimensions, weight, escape gaps etc. The number of pots that each licence may use to commercially harvest Giant Crab is regulated to limit the amount of effort expended in the fishery and limit incidental impacts on non-target species.

A minimum legal size limit is in place for the GCF to maximize the opportunity for individual Giant Crab to reproduce at least once before being available to the fishery. The minimum legal size for Giant Crab is 150mm carapace length. Females with external eggs are also protected and must be returned to the water as soon as possible.

¹ One licence holder in the Miscellaneous Fishery has a licence that allows for access to the GCF however has not Giant Crab quota entitlements and therefore may not fish pursuant to this licence at the time of writing this policy.

Table 1: Management arrangements for the fishery in 2017

Management Arrangements	Northern Zone	Southern Zone
Limited entry (number of licences with access to the fishery)	Miscellaneous (with quota) - 2 Rock Lobster (with quota) - 5 Rock Lobster (by-catch) - 58	Miscellaneous (with quota) - 2 Rock Lobster (with quota) - 9 Rock Lobster (by-catch) – 171
Minimum legal size limit	150 mm carapace length	
Commercial gear	Pots Limit on number of pots Escape gaps Sea lion exclusion devices in waters <100 m	Pots Limit on number of pots Escape gaps (optional)
Protected species	No retention of females with external eggs	No retention of females with external eggs
TACC (2017/18)	13.4 t	8.7 t
Spatial Closures	Yes	Yes
Fishing season	1200 hrs 1 November to 1800 hrs 31 May of the following year	0600 hrs 1 October to 1800 hrs 30 April of the following year
Vessel Monitoring System	Yes	Yes for Miscellaneous Licence holders only
Catch and effort reporting	Yes	Yes
Catch disposal reporting	Yes	Yes

1.1.3 Economic Characteristics

Due to the small size of the fishery, the socio-economic information for the GCF is currently not reported. In 2012/13 the fishery was estimated to have a gross value of production of around \$690,000 (SARDI unpublished).

1.1.4 Co-management

There was no association formally representing the GCF licence holders at the time this policy was developed. Consultation on issues related to the GCF are conducted directly with the one Miscellaneous licence holder and with RLF licence holders with Giant Crab quota units endorsed on their licences. Consultation with Rock Lobster fishers is also referred to fishing associations for the RLF being the South Eastern Professional Rock Lobster Fishermen's Association and the South Australian Northern Zone Rock Lobster Fishermen's Association or directly with RLF licence holders.

If a formal association representing the GCF is formed in the future, PIRSA may consult with this body on fisheries management issues in the future if appropriate.

1.1.5 Cost-recovery

South Australian commercial fisheries operate in accordance with the Government's cost recovery policy which provides that costs attributed to the management of the commercial fishery are recovered from industry. The costs of policy development, research and compliance programs are fully cost recovered through legislated licence fees. An annual plan for service delivery for the GCF and the costs associated with delivery of these services is developed each year considering the long term objectives for the fishery and the work programs required to meet these objectives. Licence fees are collected through a base licence fee and an additional fee per unit of quota endorsed on individual licences (where applicable).

1.1.6 Export Approval

The GCF was assessed under Part 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* in 2015 and is currently approved as a wildlife trade operation until 2025 (see <http://www.environment.gov.au/marine/fisheries/sa/giant-crab>).

1.2 Recreational fishery

Recreational fishers are permitted to take Giant Crabs in South Australian waters; however, due to the depth in which this species is found, recreational take of Giant Crabs is insignificant Giri and Hall (2015). Management arrangements for recreational fishers include minimum size limits, closed seasons and gear restrictions. There are no recreational bag or boat limits. The costs of non-commercial sectors are funded by Government from consolidated revenue.

1.3 Traditional fishing

While it is known Aboriginal People have fished the coastal waters of South Australia since long before European settlement (Cann et al. 1991) there are no documented records of harvest of Giant Crab by Traditional Fishers. Any further information on Aboriginal traditional harvest of Giant Crabs that becomes available in the future will be included in reviews of this Management Policy.

1.4 Biology

Giant Crab are large crabs reaching to at least 13 kg. They have a heavy exoskeleton with large crushing claws. Giant Crabs are long-lived and slow growing (up to 15 years between moults) and therefore may be susceptible to fishing pressure. Giant Crab is endemic to southern Australia at depths from 20 m to 600 m (Kailola et al. 1993); however, the highest population densities are found at depths of approximately 100-200 m, noting this is based on catch and effort records from the commercial fishery (Levings et al. 2001). The structure of the population is not well defined It is believed that there is a homogenous genetic population throughout southern Australia (Levings et al. 2001).

In Tasmania, research indicates that undersized Giant Crab occupied the same depth range as legal sized crabs; however, a concentration of undersized crabs in one area was identified possibly due to a larval "sink" (Williams et al. 2009). Migration patterns for Giant Crabs is not clear in South Australia. It is believed Giant Crab movement may be driven by water temperatures, with crabs moving to deep water in summer to escape higher surface temperatures (S. Clark pers comm.).

Mating occurs in June-July with females only bearing eggs in non-moult years. Giant crab can have long periods between moults with females moulting ever 5-15 years. Females carry eggs for approximately four months with hatching occurring in October to November. Larval settlement patterns are poorly understood. (Kailola et al. 1993). Males grow to at least twice the size of females.

1.5 By-catch

Research on by-catch in the Tasmanian GCF identified the main by-catch species in this fishery as antlered crab, hermit crab and draftboard shark with these species considered to have a high chance of post-release survival (Hobday et al. 2008). Observers in the Victorian GCF reported that in that fishery 95% of by-catch was hermit crabs that also have a high probability of survival on release (Fisheries Victoria 2009). Information related to by-catch in the South Australian GCF is less certain with no monitoring of by-catch in the fishery; however, are likely to include hermit crabs, other crabs, leather jackets, bearded rock cod and octopus.

1.6 Current status of the fishery

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 most recent classification of the status of the South Australian GCF, based on a weight of evidence approach, classified the stock as “undefined”. This classification took into account the contrasting inferences of stock status between the (then) performance indicators for the fishery resulting in high levels of uncertainty in the assessment (McLeay 2016).

In 2016 the Western Australia GCF was classified as “sustainable”, while in Victoria the stock was classified as “undefined” and “overfished” in Tasmania. Given the significant difference in the relative performance of the fisheries in the various jurisdictions, it was not possible in 2016 to determine a single stock status for the southern Australian Giant Crab biological stock (Hartmann et al. 2016).

2 Ecosystem impacts

The *Fisheries Management Act 2007* requires that fisheries are managed to protect, use and develop the aquatic resources of the state in a manner consistent with ecologically sustainable development (ESD). In particular, that aquatic habitats are protected and conserved and ecosystems and genetic diversity is maintained and enhanced. Consistent with this requirement, management of the GCF is considered as part of the broader ecosystem using an ecosystem-based fisheries management approach.

The ecological impacts associated with the fishery considered in development of this management policy have been identified and assessed through the process of conducting an ESD risk assessment for the GCF, using the National Ecologically Sustainable Development Reporting Framework for Australian Fisheries (Fletcher et al. 2002) to guide the assessment. In accordance with the ESD object in the Act, this approach was used to identify and prioritise important ecological, social and economic factors that affect the management of the fishery. Full details about the risks identified and their relevant priority are provided in the report entitled *Ecologically Sustainable Development Risk Assessment of South Australia’s Giant Crab Fishery* (PIRSA, in draft). A summary of this report is in described in section 9.

A High risk rating was identified for climate change. Moderate risk ratings were identified for the Giant Crab resource, as well as external factors effecting the performance of the fishery including oceanographic influences, economic, mining and other activities and other commercial fisheries. Specific management objectives and strategies listed in Table 2 have been developed to address risks identified as ‘moderate’ from the ESD risk assessment. Development of objectives and management strategies that directly mitigate the effects of climate change is limited and therefore this risk is not referred to in fishery objectives and strategies.

3 Goals and objectives

Section 7 of the *Fisheries Management Act 2007* sets out objects for the Act including principles to protect, manage, use and develop the aquatic resources of the State in a manner that is consistent with ESD. Management of South Australia’s fisheries must be consistent with these objects. A number of biological, social and economic factors are identified in the objects of the Act that must be balanced in pursuing ESD, however, the principle of avoiding over-exploitation of resources and ensuring that those resources are not endangered is specified as the primary consideration.

Four key goals have been identified for the GCF linked to operational objectives for the fishery. Performance indicators and reference points for each objective are provided to allow future assessment of this policy in meeting the identified goals as described in Table 2.

Goal 1 – The Giant Crab resource is maintained at ecologically sustainable levels

This goal relates to the sustainability of the target stock. The objectives of this management policy in relation to sustainability are:

- Giant Crab stocks are maintained at sustainable levels based on performance indicators in the harvest strategy
- Information collected is sufficient to manage the fishery to sustainable levels

These objectives aim to ensure that Giant Crab resources in South Australia are harvested within sustainable limits as defined by performance indicators relative to reference points described in the harvest strategy at Section 5.

Goal 2 – Enable Optimum utilisation and equitable distribution

This goal relates to the economic and social benefits derived from the fishery and aims to optimise the economic benefits of the fishery. Optimising the use of the fishery focuses on allowing for economic efficiency of fishing operations. The objective of this management policy in relation to optimum utilisation is:

- Optimise economic performance within biologically sustainable limits
- Manage the resource to allow for equitable distribution within biologically sustainable limits

It is noted that the fishery is predominately a commercial activity by virtue of the depth that Giant Crabs inhabit. The objectives in the policy allows for access of the resource in line with requirements under the *Fisheries Management Act 2007*.

Goal 3 – Protect and conserve aquatic resources, habitats and ecosystems

This goal relates to the management of the fishery using an ecosystem-based fisheries management approach. The objectives of this management policy to achieve this goal are:

- Fishery impacts on by-catch, by-product, threatened, endangered and protected species (TEPS) are within sustainable levels
- Fishery impacts on benthic habitat and associated species communities are within ecologically sustainable levels

Goal 4 – Enable cost effective and participative management of the fishery

This goal relates to co-management of the fishery, planning of management activities and the recovery of the costs of management of the fishery. The overall objectives of this goal are to ensure that stakeholders and government fisheries administration share responsibility and have involvement in the decision-making processes for developing and implementing management arrangements, and to ensure that management arrangements are complied with. The cost effectiveness of these arrangements also needs to be considered in the development process as the management costs are recovered from fishers in accordance with the Government's cost recovery policy for fisheries.

The operational objectives of this management policy are:

- Industry participation in management through the appropriate consultation with licence holders with access to the Giant Crab resource
- Maximise stewardship of fisheries resources
- Management costs of the fishery are funded by relevant licence holders

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Table 2: Goals, Objectives and strategies for the Giant Crab Fishery

Objective	Strategies	ESD risk addressed	Performance indicator	Description	Reference point
Goal 1: The Giant Crab resource is maintained at ecologically sustainable levels					
1a Giant Crab stocks are maintained at sustainable levels based on performance indicators in the harvest strategy	1ai. TACC set annually informed by the harvest strategy 1aii. Set input and output controls that support sustainable use of the resource 1aiii. Controls on number of licences	Impacts on Giant Crab	5-year average commercial catch rate (CPUE)	5-year average commercial catch rate (CPUE) calculated from the average of the current and previous four fishing seasons. Commercial catch rate is weight (kilograms) of legal sized Giant Crabs/potlift	5-year average commercial catch rate (CPUE) is ≥ 1.30 kg/potlift
1b: Information is collected sufficient to manage commercial harvest operations to sustainable levels.	1bi. Fishery dependent information collected through commercial harvest and effort logbooks (periodic returns) and catch disposal records		Provision of periodic returns and catch disposal records	Spatial and temporal catch and effort data provided by all commercial operators	Total catch and effort in the GCF are reported and monitored
Goal 2: Enable Optimum utilisation and equitable distribution					
2a Economic performance is optimised within biologically sustainable limits	2ai. TACC set annually informed by the harvest strategy 2aii. Management arrangements allows for commercial activities that take into account sustainability objectives	Economics	TACC set annually informed by the harvest strategy		TACC set annually informed by the harvest strategy

Objective	Strategies	ESD risk addressed	Performance indicator	Description	Reference point
Goal 3: Impacts on aquatic resources, habitats and ecosystems are sustainable.					
3a Fishery impacts on by-catch, by-product, threatened, endangered and protected species (TEPS) are within sustainable levels	3ai. Control of the number of licences in the GCF 3aii. Escape gaps are fitted to pots where required 3aiii. Interactions with TEPS are reported and monitored		Number of fishing licences with access to Giant Crab Interactions with TEPS reported in the Wildlife Interaction Logbook		Number of fishing licences with access to Giant Crab does not exceed the number of licences when this management policy was implemented Interactions with TEPS is monitored
3b Fishery impacts on benthic habitat and associated species communities are within ecologically sustainable levels	3bi. Total number of pots in the GCF is not increased		Number of pots that can be used to harvest Giant Crabs		Number of pots that can be used to harvest Giant Crab does not exceed the number of pots when this management policy was implemented

Goal 4: Enable effective and participative management of the fishery.					
Objective	Strategies	ESD risk addressed	Performance indicator	Description	Reference point
4a Industry participation in management through the appropriate consultation with licence holders with access to the Giant Crab resource	<p>4ai. Stakeholder have input to the management of the commercial GCF through appropriate consultative processes</p> <p>4a.ii. Arrangements are communicated to the wider community</p>	External factors affecting fishery	<p>Consultation with relevant industry members where appropriate</p> <p>Management information is available on PIRSA website</p>	Information related to management of the fishery is correct and relevant on PIRSA website	<p>Consultation with relevant industry members where appropriate is conducted to provide input into management decisions</p> <p>PIRSA website information is updated as required</p>
4b Maximise stewardship of fisheries resources	<p>4bi. Cost-effective compliance and monitoring program implemented to address identified risks</p> <p>4b.ii. Management arrangements are communicated to the wider community</p>		<p>Number of prosecutions.</p> <p>Management information is available on PIRSA website.</p>	<p>Number of prosecutions related to the GCF</p> <p>Information related to management of the fishery is correct and relevant on PIRSA website</p>	<p>Number of prosecutions over three years does not increase significantly.</p> <p>PIRSA website information is updated as required</p>
4c Management costs of the fishery are funded by relevant licence holders	4ci. Recover licence fees from commercial licence holders in accordance with the Government's cost recovery policy		Costs attributed to managing the GCF are recovered through licence fees		Costs attributed to managing the GCF are recovered through licence fees

4 Research and monitoring

PIRSA Fisheries and Aquaculture contracts research services for each fishery. SARDI Aquatic Sciences is currently the primary research provider for core scientific stock assessment and reporting for the GCF. Costs of the annual research program for the fishery are recovered through licence fees. This is done in accordance with the government's cost recovery policy. External funding sources, such as the Fisheries Research and Development Corporation (FRDC) may also provide funding for specific research projects.

4.1 Data collection and analysis

To achieve the research and monitoring needs for the fishery, a variety of fishery dependent data are collected and analysed (McLeay 2016).

- Commercial catch and effort logbook data
- Wildlife interaction logbook data
- Catch disposal records

There are currently no fishery independent data available for the South Australian GCF.

4.2 Fishery dependent monitoring

Licence holders are required to complete a daily catch and effort logbook report detailing their fishing activities and harvest. The data from these logbooks are entered into a database maintained by SARDI Aquatic Sciences and validated (McLeay 2016). Fishers are also required to complete catch disposal records on each offload of Giant Crab from commercial vessels in the fishery. The data from these records are entered and maintained by PIRSA Fisheries and Aquaculture in order to monitor the quota for the fishery.

PIRSA Fisheries and Aquaculture implemented a generic data recording logbook in 2007 for recording wildlife interactions (including TEPS) for all South Australian commercial fisheries. The wildlife interaction logbook was implemented to ensure consistent reporting practices for interactions with TEPS. SARDI Aquatic Sciences collate and archive the data from the wildlife logbooks and summarise these in an annual report (see Mackay et al. 2017).

4.3 Reporting

SARDI Aquatic Sciences provide stock status reports for the GCF annually. The stock status synthesises information available for the fishery, assesses the status of the resource, and evaluates the performance of the fishery with respect to performance indicators and reference points in this management policy's harvest strategy detailed in section 5. Stock status reports are available on the PIRSA website at http://www.pir.sa.gov.au/fishing/commercial_fishing/fisheries/miscellaneous_fishery

5 Harvest Strategy

5.1 Background

This harvest strategy has been developed on the basis that the fishery has been largely operating in a sustainable manner for many years under similar management arrangements including an annual Total Allowable Commercial Catch (TACC) of 22.1 tonnes since 2000. The harvest strategy has been developed to be consistent with the South Australian Harvest Strategy Policy and Guidelines (PIRSA 2015a and b).

SARDI conducted a review of performance indicators for the GCF in 2017 (SARDI internal report) and the outcomes from this review were considered in developing this harvest strategy. The key recommendations from this review were:

- Commercial catch per unit effort (CPUE) from 2000 is likely to provide reliable information related to abundance of harvestable (legal-sized) Giant Crab and is recommended as a single primary biological performance indicator (PI).
- A suitable target reference point is proposed as the mean estimate of CPUE from 2000/01 to 2009/10 being a relatively stable period within the data time series available.

5.2 Defined operational objectives

The primary aim of this harvest strategy is sustainability of the Giant Crab resource in South Australia consistent with the goals of this management policy to maintain ecologically sustainable Giant Crab biomass in South Australia.

Operational objective: Maintain the 5-year average commercial catch rate (Catch Per Unit Effort – CPUE) at or above 1.30 kg per potlift.

5.3 Performance indicators

The primary biological performance indicator used in this harvest strategy is 5-year average commercial catch rate defined as: CPUE calculated from the average of the current and previous four fishing seasons. Commercial catch rate is weight (kilograms) of legal sized Giant Crabs/potlift.

5.4 Reference points

The Target Reference Point (RP_{targ}) is set at the average CPUE for the years 2000-2009 as these years were considered to represent a stable and sustainable period of fishing (Figure 1) and represents a level of biomass at maximum sustainable yield (B_{MSY}). Consistent with the National Harvest Strategy Policy (Sloan et al. 2014) the Limit Reference Point (RP_{lim}) is set at 50% of RP_{targ} . The Trigger Reference Point is set at 75% of RP_{targ} as a level below B_{MSY} but well above RP_{lim} (Table 3).

Table 3: Five-year average catch rate reference points

5-year average commercial catch rate	Reference point	Description
Target Reference Point (RP_{targ})	2.60 kg/potlift	Average commercial CPUE for 2000-2009
Trigger Reference Point (RP_{trig})	1.95 kg/potlift	75% of the Target Reference Point
Limit Reference Point (RP_{lim})	1.30 kg/potlift	50% of the Target Reference Point

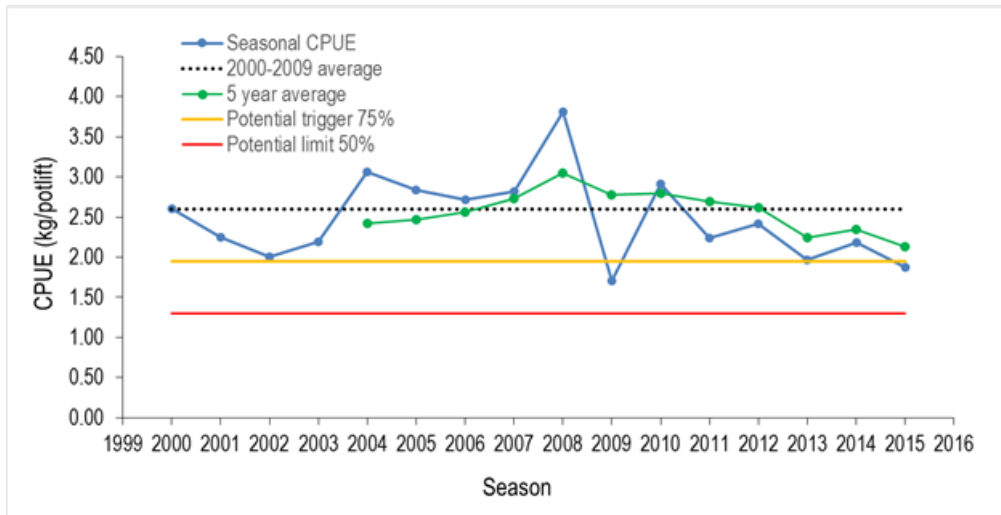


Figure 1: Five-year average catch rate showing reference points

5.5 Monitoring strategy

Commercial CPUE is derived from catch and effort data reported in commercial GCF catch and effort logbooks from commercial licences endorsed with Giant Crab quota units throughout the fishing season. SARDI report commercial catch rate data and the five-year average CPUE in the annual stock status report or Advice Note prior to the beginning of the next fishing season. Further details about the reporting of commercial catch and effort is provided in section 4.

5.6 Assessment of fishery performance

The stock status of the fishery is defined consistent with the National Status of Fish Stocks framework (Stewardson et al. 2016). The stock status for the South Australian Giant Crab resources is categorised as sustainable if the five-year average catch rate is ≥ 1.95 kg/potlift.

5.7 Decision rules

In consideration of the primary performance indicator being the most recently available estimate of the Five-year average catch rate for the fishery, the following decision rules will be considered to guide the setting of management arrangements and TACC for the GCF in the following fishing season.

1. When the Five-year average catch rate is ≥ 1.95 kg/potlift 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 Northern Zone and 8.7 t set for the Southern Zone.
2. When the Five-year average catch rate is < 1.95 kg/potlift and ≥ 1.30 kg/potlift a review of the GCF will be undertaken.
3. When the Five-year average catch rate is < 1.30 kg/potlift a review of the GCF will be undertaken and appropriate management arrangements may be introduced for the fishery in a timely fashion.

5.8 Review process

If the Trigger Reference Point is breached, a review of the GCF will be conducted by PIRSA in consultation with relevant key stakeholders in the fishery, including industry stakeholders (licence holders). The review should consider (but not be limited to) any relevant factual information as well as external factors that may have impacted on the fishery that are not related to stock abundance such as market fluctuations, environmental conditions, higher grading etc.

A review would be conducted in a timely manner, and in normal circumstances would be completed within one year. Amendments to management arrangements identified in the review including changes to TACC may be considered for implementation.

5.9 Review of the harvest strategy

A process to review this management policy, including the harvest strategy is set out in Section 8.

At the time of developing this harvest strategy consideration was given to the use of CPUE standardised for soak time as a performance indicator consistent with a recommendation from the review of performance indicators for the fishery conducted in 2017 (SARDI internal report). To enable this consideration soak time was introduced as a reporting field in the GCF catch and effort logbooks to be recorded by fishers from the 2017/18 fishing season. In the future, if data are available to inform a decision on inclusion of CPUE standardised for soak time in the harvest strategy, this harvest strategy may be amended.

6 Other commercial fishing

Some research activities are undertaken as part of a commercial enterprise, where the fish caught as part of the research fishing are sold for the purposes of funding the research. The *Fisheries Management (Miscellaneous Research Fishery) Regulations 2013* under the *Fisheries Management Act 2007* have provisions to issue permits for research activities with a commercial element. Other non-commercial research activities may be authorised by exemption. These activities are not covered in this management policy.

Broodstock and seedstock collection is the taking of aquatic resources or part of resources for the purposes of commercial aquaculture. Only low levels of this type of activity are permitted. Large scale collection must be done under a fishery licence by arrangement between a fishery licence holder and aquaculture licence holder on a commercial basis. If the species is part of an existing commercial fishery, broodstock and seedstock collection activities will be considered through a permit system under the *Fisheries Management Act 2007*.

Applications for exploratory and developmental fishing for species that are not part of the existing fishery are dealt with under the *Fisheries Management (Miscellaneous Developmental Fishery) Regulations 2013* under the *Fisheries Management Act 2007*. Exploratory and developmental fishing in the area of the GCF, is not considered under this management policy.

7 Compliance and monitoring

Objectives

PIRSA Fisheries and Aquaculture runs a compliance program consistent with the National Fisheries Compliance Policy that has dual objectives:

- To maximise voluntary compliance with fisheries rules²; and
- To create effective deterrence to breaching fisheries rules.

Voluntary compliance is maximised by ensuring that fishers are aware of the rules that apply to their fishing activities, understand the rules and the purpose of those rules and operate in a culture of compliance. Effective deterrence is created through the presence of Fisheries Officers and awareness of compliance operations, as well as through detection and prosecution of illegal activity³.

Planning

PIRSA Fisheries and Aquaculture compliance programs are developed through a three-year planning cycle. This planning cycle is designed to ensure that compliance programs:

- support the fisheries management objectives for each fishery;
- identify compliance risks in each fishery;
- respond to key risks within each three-year period;
- have an appropriate mix of tools designed to maximise voluntary compliance and create effective deterrence; and
- establish benchmarks against which to measure responses to risks.

A compliance risk assessment is undertaken every year for each fishery. A major risk assessment is undertaken periodically (approximately every three years) or is triggered by a major change in management arrangements. In intervening years that risk assessment is updated. The risk assessment identifies and prioritise the compliance risks that exist in the fishery ranked according to the likelihood and consequence of the risk occurring. This risk assessment is used to inform annual compliance planning processes.

Compliance activities are planned to respond to the risks identified in each fishery, with an emphasis on the most serious risks. Responses must include measures aimed at both maximising voluntary compliance and creating effective deterrence.

Benchmarks are established by which to measure compliance activities. These benchmarks are used to guide the allocation of resources in compliance planning.

Each year a report is to be prepared assessing the compliance status of the GCF. This report:

- Describes the compliance program for the previous three years including an overview of activities and relevant statistics;

² Rules include regulations, licence conditions, closure notices or any other enforceable instrument under the *Fisheries Management Act 2007*.

³ Prosecution may include the issuing of a formal caution or an expiation notice, in addition to prosecution through the courts.

- Describes how the program has been implemented to achieve both voluntary compliance and create effective deterrence;
- Describes the risks that have been addressed as a priority over that period;
- Comments on any changes to the risk profile of the fishery during that period;
- Analyses the compliance status of the fishery (including information about intelligence reports received); and
- Makes suggestions for future compliance planning.

8 Review of the management policy

This management policy, including the harvest strategy, may be reviewed at any time to incorporate such measures into the management framework of the fishery required to address any significant issues that were not anticipated when this policy and harvest strategy were developed. A review of this management policy will be conducted within five years of its implementation if a review has not been conducted earlier.

A review of the management policy may include a review of the performance indicators against the policy objectives as described in Table 2 to ascertain the performance of the management arrangements in the fishery to meet the identified objectives. In the absence of a recognized management advisory committee for the fishery PIRSA would coordinate the review process. In conducting this review PIRSA may consult with relevant stakeholders including licence holders and other non-industry stakeholders including conservation groups, recreational fishers and other government departments.

9 Appendices

9.1 Summary of ESD Reporting

A summary table of identified risks is provided in Table 4

Table 4: Summary of National ESD Reporting Framework outcomes for Giant Crab Fishery.

Component Trees	Extreme	High	Moderate	Low	Negligible	Total
Retained Species			1	1	1	3
Non-retained species				3	6	9
General Ecosystem					2	2
General Community				1	7	8
Governance				3		3
External Factors		1	7	3	4	15
Total		1	8	11	20	40

Issue	Risk Priority	Objective Developed	Indicator Measured	Performance Measure	Current Performance	Robustness	Actions
Retained Species							
Giant Crab	Moderate	Yes	Yes	Yes	Undefined	High	*
Non-Retained Species							
N/A							
General Ecosystem Impacts of Fishing							
N/A							
Community							
N/A							
Governance							
N/A							
External factors affecting performance of the fishery							
Oceanographic	Moderate	No	No	No	N/A	N/A	**
Climate change	High	No	No	No	N/A	N/A	**
Temperature	Moderate	No	No	No	N/A	N/A	**

Weather	Moderate	No	No	No	N/A	N/A	**
Upwellings	Moderate	No	No	No	N/A	N/A	**
Mining / exploration activities	Moderate	No	No	No	N/A	N/A	**
Economic	Moderate	No	No	No	N/A	N/A	**
Other commercial fishing	Moderate	No	No	No	N/A	N/A	**

Table 5 Performance report for Extreme, High and Moderate Risk elements of Giant Crab ESD Risk Assessment. ; * = Review under new Management Policy, scheduled for 2017; ** = Review at next major ESD assessment,

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