



PIRSA

Management Plan for the South Australian Commercial Southern Zone Rock Lobster Fishery

1 July 2020



**Government
of South Australia**

Primary Industries
and Regions SA

Management Plan for the South Australian Commercial Southern Zone Rock Lobster Fishery

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1 Fishery to which this plan applies

This plan applies to the commercial Southern Zone Rock Lobster Fishery which is formally constituted by the *Fisheries Management (Rock Lobster Fisheries) Regulations 2017*. The regulations constitute the fishery as:

- the taking of rock lobster in the waters of the Southern Zone; and
- the taking of aquatic resources specified in Schedule 1 in the waters of the Southern Zone; and
- the taking of Razorfish (*Pinna bicolor*) in the waters of the Southern Zone for the purpose of bait.

The aquatic resources specified in Schedule 1 of the regulations are shown in Appendix 1.

The waters of the Southern Zone are described as the waters adjacent to South Australia easterly of a line commencing at Mean High Water Springs closest to 35°37'03.86" South, 139°00'00.00" East, then southerly to 36°20'00.00" South, 139°00'00.00" East, then westerly to 36°20'00.00" South, 138°40'00.00" East, then southerly to 36°40'00.00" South 138°40'00.00" East, then westerly to 36°40'00.00" South 138°20'00.00" East, then southerly to 37°00'00.00" South 138°20'00.00" East, then westerly to 37°00'00.00" South 138°00'00.00" East.

2 Consistency with other management plans

This management plan has been developed so that is consistent with other fishery management plans. In particular, the provisions relating to the allocation of the Rock Lobster resource between each fishing sector in the Southern Zone are consistent with other relevant plans and the allocation of species listed in Schedule 1 of the *Fisheries Management (Rock Lobster Fisheries) Regulations 2017* are consistent with the *Management Plan for the South Australian Commercial Marine Scalefish Fishery* (PIRSA 2013a).

This management plan has been developed so that it can be integrated with any future Aboriginal traditional fishing management plans that are made in the future that apply to the waters of this management plan.

3 Term of the plan

The management plan applies from 1 July 2020 for a period of ten years. Part 5 of the *Fisheries Management Act (2007)* prescribes the requirements for replacing or extending this management plan upon expiry.

4 Description of the fishery

The South Australian Rock Lobster Fishery is primarily based on the capture of Southern Rock Lobster, *Jasus edwardsii* (Hutton 1875), although commercial licence holders are permitted to land and sell Giant Crabs (*Pseudocarcinus gigas*) and Octopus taken as by-product in rock lobster pots and have one of three levels of access to the South Australian Marine Scalefish Fishery.

Southern Rock Lobster supports important commercial and recreational fishery in Tasmania, Victoria, Western Australia and New Zealand.

In South Australia, the Rock Lobster fishery is separated into two fishing zones, known as the Southern and Northern Zones. This management plan applies to the Southern Zone Rock Lobster Fishery. The Southern Zone Rock Lobster Fishery is divided into seven Marine Fishing Areas (MFAs) but the majority of the fishing occurs in MFAs 51, 55, 56 and 58 (Linnane et al. 2018).

The Southern Zone Rock Lobster Fishery stretches along approximately 425 km South Australian coastline from the River Murray mouth to the Victorian Border and covers an area of 22,000 km². The area of the fishery extends from the low water mark out to edge of the Australian Fishing Zone 200 nautical miles from shore¹ except in aquatic reserves, sanctuary and restricted access zones of marine parks and dedicated Rock Lobster sanctuaries of Cape Jaffa, Margaret Brock Reef and Rivoli Bay. The coordinates of these areas can be found in the *Fisheries Management (Aquatic Reserves) Regulations 2016*, *Fisheries Management (General) Regulations 2017* and the *South Australian Marine Parks Act 2007*.

4.1 Commercial Fishery

Rock Lobster have been harvested in South Australian waters since the 1890s, but the commercial fishery did not develop until the late 1940s-early 1950s. Since then, a series of management arrangements have been introduced to control the catch of Rock Lobster in South Australia. These included introduction of effort controls by way of closed seasons in 1966, pot and boat limits introduced in 1967 and quota management through implementation of individual transferable quota units and setting of annual Total Allowable Commercial Catch (TACC) in 1993. There have been various amendments to these arrangements through years as summarised in Table 1. The first management plan for the fishery was adopted in 1997. Subsequent management plans were adopted in 2007 and 2013. A more detailed synopsis

¹ The South Australian Government has management jurisdiction for Rock Lobster from the low water mark out to three nautical miles in all waters adjacent to South Australia. Under an Offshore Constitutional Settlement (OCS) with the Commonwealth Government of Australia, South Australia has jurisdictional control of Rock Lobster in all waters adjacent to South Australia from three nautical miles to the edge of the Australian Fishing Zone.

of these changes to management arrangements up to 2013 is provided in PIRSA (2013b).

Since 2013, the major management changes includes voluntary surrender of 41 Southern Zone quota units and one licence through the *Marine Parks: Commercial Fisheries Voluntary Catch/Effort Reduction Program*², to account for areas that were closed to fishing following implementation of marine park sanctuary zones in October 2014. The TACC was subsequently reduced in 2014/15 to account for the removal of these quota units.

The harvest strategy for the Southern Zone Rock Lobster Fishery incorporated in the management plan for the fishery adopted in October 2013 was reviewed in 2014/15. A revised harvest strategy included TACC levels that took into account the surrendered Southern Zone quota units and one licence through the *Marine Parks: Commercial Fisheries Voluntary Catch/Effort Reduction Program* and revised Total Allowable Commercial Catch (TACC) when fishery performance measures indicated reduced levels of stock abundance to avoid the fishery becoming overfished.

Electronic reporting of commercial fishing activities including catch, effort and quota monitoring was implemented in 2017 following trialling over several fishing seasons. Electronic reporting is facilitated by use of an industry-developed app (Deckhand) and a PIRSA reporting portal (eCatch).

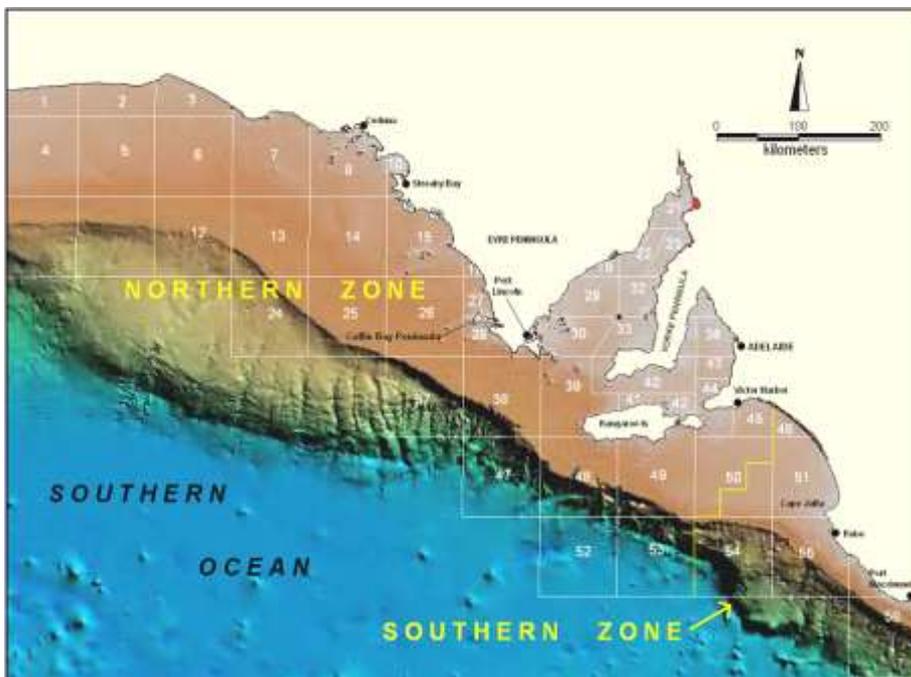


Figure 1: The Northern and Southern Zones of the South Australian Rock Lobster Fishery. The numbered boxes represent Marine Fishing Areas (MFAs).

² Further details about the *Marine Parks: Commercial Fisheries Voluntary Catch/Effort Reduction Program* can be found at http://pir.sa.gov.au/fishing/commercial_fishing/licensing_registration/catch_effort_reduction_program

Table 1 A chronology of major management milestones in the commercial Southern Zone Rock Lobster Fishery of South Australian since 1966.

Year	Major management milestones
1966	<ul style="list-style-type: none"> Winter closure introduced (June, July and October)
1967	<ul style="list-style-type: none"> Pot and boat limit introduced No new boats to operate in the “South-Eastern Zone”
1968	<ul style="list-style-type: none"> South Australia Rock Lobster Fishery separated into Northern and Southern Zones and limited entry declared Compulsory commercial catch log introduced
1978	<ul style="list-style-type: none"> 1st major review of fishery undertaken June, July and October closed to fishing
1980	<ul style="list-style-type: none"> Winter closure varied (May and August closed, but October opened)
1984	<ul style="list-style-type: none"> 15% pot reduction Upper (80) and lower (40) pot limits introduced
1987	<ul style="list-style-type: none"> Buyback of 45 licences (2455 pots)
1992	<ul style="list-style-type: none"> 2nd major review of fishery undertaken
1993	<ul style="list-style-type: none"> April closed to fishing TACC implemented for 1993/94 season at 1720 tonnes
1997	<ul style="list-style-type: none"> 1st management plan for the fishery published (Zacharin 1997)
2002	<ul style="list-style-type: none"> TACC increased by 50 tonnes to 1770 tonnes
2003	<ul style="list-style-type: none"> TACC increased by 130 tonnes to 1900 tonnes May opened on trial basis
2005	<ul style="list-style-type: none"> May opened to fishing on a permanent basis Fishery-independent monitoring surveys began
2006	<ul style="list-style-type: none"> Introduction of electronic and video monitoring of catch weighing process in all ports
2007	<ul style="list-style-type: none"> 2nd management plan for the fishery published (Sloan and Crosthwaite 2007)
2008	<ul style="list-style-type: none"> TACC reduced to 1770 tonnes
2009	<ul style="list-style-type: none"> TACC reduced to 1400 tonnes
2010	<ul style="list-style-type: none"> TACC reduced to 1250 tonnes October 2010 and May 2011 closed to both commercial and recreational fishing May 2011 opened to fishing in December 2010
2011	<ul style="list-style-type: none"> Month of October opened to fishing
2013	<ul style="list-style-type: none"> 3rd management plan for the Fishery adopted (PIRSA 2013b)
2014	<ul style="list-style-type: none"> 41 quota units and one licence were voluntarily surrendered through the <i>Marine Parks: Commercial Fisheries Voluntary Catch/Effort Reduction Program</i> to account for areas that were closed to fishing following implementation of marine park sanctuary zones in October 2014. TACC reduced to 1245.7 tonnes to account for the 41 quota units surrendered.
2015	<ul style="list-style-type: none"> Revised harvest strategy adopted
2017	<ul style="list-style-type: none"> Electronic reporting introduced
2018	<ul style="list-style-type: none"> Management Plan extended until 30 June 2020
2020	<ul style="list-style-type: none"> Mechanism for Minister to vary the length of the winter fishing closure introduced

4.2 Recreational Fishing

Recreational fishing contributes significantly to the well-being of many South Australians as well as State and regional economies through tourism, the purchase of fishing equipment, vessels, bait supplies and fuel. In recognition of the importance of recreational fishing to the community of South Australia, a *Management Plan for Recreational Fishing in South Australia* was adopted in 2017 (PIRSA 2017).

The first comprehensive survey of recreational catch and effort levels for Rock Lobster in South Australia was undertaken in the 1998/99 fishing season (McGlennon 1999). Subsequent surveys were carried out in 2001/02 (Venema et al. 2003); 2004/05 (Currie et al. 2006); 2007/08 (Jones 2009).

The most recent survey of recreational fishing in South Australia conducted in 2013/14 estimated the recreational take of Rock Lobster was around 75 tonnes, with almost two thirds of this catch landed in the Southern Zone (Giri and Hall 2015). A review of the size, bag and boat limits for the recreational sector, conducted in 2016 taking into account the most recent estimated recreational catch from a survey undertaken in 2013/14, noted that recreational harvest was around 4.5% of the commercial catch in that year (PIRSA 2016).

4.3 Aboriginal traditional fishing sector

Aboriginal People have fished the coastal waters of South Australia since long before European settlement (Cann et al. 1991) While there are no known documented historical accounts of Aboriginal traditional harvest of Rock Lobster this does not preclude the traditional use of this resource by Aboriginal Peoples in the past. The State Government, Native Title parties and the commercial fishing industry are currently involved in negotiations of Indigenous Land Use Agreements (ILUAs) with a view to resolving native title claims. The future involvement in existing commercial fisheries by Aboriginal traditional fishers or communities may be considered in this process. Further information about Traditional Fishing activities and practices will be described in Aboriginal Traditional Fishing management plans that are made in the future that apply to the area of the Southern Zone Rock Lobster Fishery.

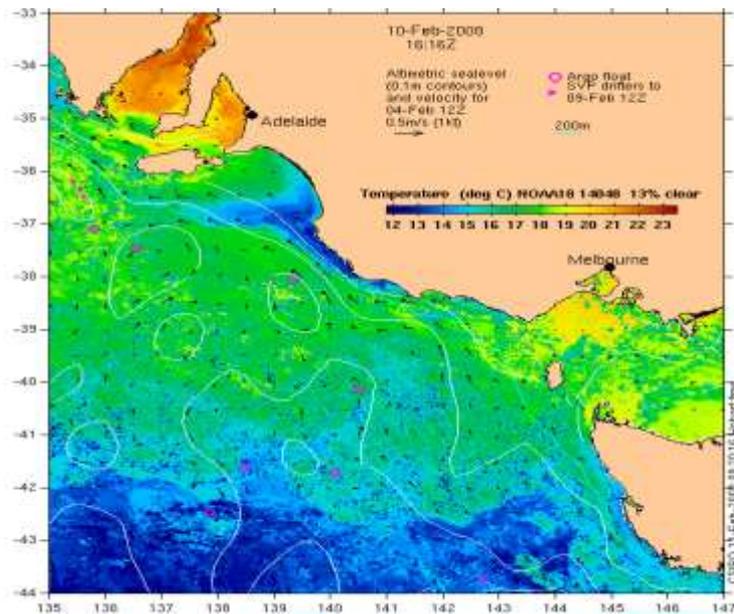
4.4 Ecosystem and habitat

The sea floor of the waters of the Southern Zone consists mainly of reefs made of bryzoan or aeolianite limestone. The limestone matrix has eroded to form ledges, crevices, undercuts and holes which provide ideal habitat for lobsters. These reefs are almost continuously separated by small stretches of sand substrate (Lewis 1981). Densities of Rock Lobsters on the limestone reefs of

the Southern Zone are generally higher than those of the granite reefs of the Northern Zone (Lewis 1981).

The fishery is influenced by upwelling events that can occur during summer. During summer, south-easterly winds transport warm surface water offshore and cold (11-12°C) nutrient-rich water is upwelled from below (Middleton and Platov 2003 and intrudes onto the continental shelf (Schahinger 1987). Known locally as the Bonney Upwelling (Figure 2), this results in an increase in productivity of phytoplankton, which is believed to contribute to the high densities of Rock Lobster in the Southern Zone Rock Lobster Fishery (Rochford 1977; Lewis 1981).

Figure 2: Satellite remote sensing image of sea surface temperature showing the extensive cold water Bonney Upwelling system across the Southern Zone Rock Lobster Fishery in February, 2008 (source: CSIRO)



4.5 Biology

Rock Lobster (*Jasus edwardsii*) is distributed around New Zealand and the southern Australia coast from Geraldton in Western Australia to Coffs Harbor in northern New South Wales including Tasmania (Booth et al. 1990). The northerly limits of distribution are however the bulk of the population can be found in South Australia, Victoria, and Tasmania, where they occur in depths from 1 to 200 m (Brown and Phillips 1994).

Mating occurs from April to July and eggs are brooded over the winter for about 3-4 months (MacDiarmid 1989). The larvae hatch in early spring, pass through a brief (10-14 days) nauplius phase into a planktonic, leaf-like phase called phyllosoma. Phyllosoma develop over 12-23 months in offshore waters before they metamorphose into the puerulus (settlement) stage near the continental shelf break (Booth et al. 1991). The puerulus actively swims inshore to settle onto reef habitat in depths from 50 m to the intertidal zone (Booth et al. 1991). Oceanographic conditions during the long offshore phyllosoma phase are

thought to play an important part in their dispersal of this species (Booth and Stewart 1992).

The widespread transport of phyllosoma in the open ocean is likely to result in the genetic mixing of Rock Lobster populations and helps explain why mitochondrial DNA analysis has failed to detect any population sub-structuring in Rock Lobster across southern Australian and New Zealand (Ovenden et al. 1992). McGarvey and Matthews (2001) have suggested that the strength of westerly winds in South Australia during late winter and early spring may play a role in the inter-annual variation in recruitment to the Southern Zone Rock Lobster Fishery.

Rock Lobsters grow through a cycle of moulting and thus increase their size incrementally (Musgrove 2000). Males undergoing moulting between October and November, and females during April to June. A tagging study demonstrated there was substantial variation in growth rates among locations (McGarvey et al. 1999a), with a general trend of higher growth rates in the Northern Zone compared to the Southern Zone (Linnane et al. 2005) resulting in spatial variation in size of maturity (Linnane et al. 2008; 2011c).

Further details on the biology of Rock Lobster in the Southern Zone can be found in Linnane et al. (2018).

4.6 Stock Status and Export Approval

Stock status of the Southern Zone Rock Lobster management unit is assessed regularly reported in annual stock assessment reports³ published by SARDI. The most recent stock assessment report available at the time of developing this management plan assessed the stock in 2016/17 (Linnane et al 2018) and classified the fishery as “Sustainable” using the national fish stock status classification framework described in Stewardson et al (2018).

The Commonwealth Department of Agriculture, Water and the Environment requires that all commercial fisheries that export product be assessed under the *Environment Protection and Biodiversity Conservation Act 1999*. Product from the Rock Lobster Fishery was re-assessed under this framework in 2015⁴. The fishery was assessed as being managed in an ecologically sustainable way and the fishery was granted export approval for a period of ten years to 2025. PIRSA will work with industry to continue export approval as required.

³ Annual stock assessment reports for the Southern Zone Rock Lobster Fishery are available at http://www.pir.sa.gov.au/research/publications/research_reports

⁴ The reassessment report for the South Australian Rock Lobster Fishery may be found at <http://www.environment.gov.au/marine/fisheries/sa/rock-lobster>

4.7 Stock assessment and research

4.7.1 Research services

PIRSA Fisheries & Aquaculture contracts research services for each fishery. SARDI Aquatic Sciences is currently the research provider for core research for the fishery.

The Commonwealth Fisheries Research and Development Corporation (FRDC) provides funding for specific research projects. In order to gain access to such funds, States currently contribute voluntarily 0.25% of the value of fisheries production (average over the preceding three years). South Australia's Southern Zone Rock Lobster Fishery's contribution for 2017/18 was around \$253,000 which was collected from licence holders as part of their license fee. Other sources of funding for research are also pursued if appropriate including the Australian Research Council, Department of Agriculture and AusAid Australia.

4.7.2 Data collection

To achieve the research and monitoring needs for the fishery, a variety of data types are collected and analysed on an annual basis. These are:

- Fishery-dependent data
- commercial catch and effort logbook data
- wildlife interaction logbook data
- At-sea voluntary catch sampling
- Fishery-independent data
- Puerulus sampling
- Fisher-independent monitoring surveys (FIMS)
- Observer catch sampling

4.7.3 Fishery-Dependent Data

4.7.3.1 Commercial logbooks

CPUE of legal-sized Southern Rock Lobster is the key performance indicator used to underpin the stock assessment (i.e. assess the performance) of the Southern Zone Rock Lobster Fishery, and to inform the TACC. The collection of the catch and effort data used to measure CPUE is facilitated by a logbook program, which requires all commercial fishers to compulsorily record daily information on catch and effort levels and other details on daily fishing operations. Trends in CPUE are summarised and published in the annual stock status and fishery stock assessment reports. Collection of logbook catch and

effort data is now undertaken through electronic platforms including Deckhand and eCatch.

Information collected through the logbook program is periodically reviewed to accommodate changes in the fishery and ensure data collection meets management and research needs. For instance, the logbook was modified in 1998 to include specific details about Giant Crab (*Pseudocarcinus gigas*) fishing and again in 2000 so that the recording of numbers of undersize, spawning and dead Rock Lobsters, along with numbers of octopus, became voluntary. Logbook returns are submitted monthly and are entered into the SARL database, which is currently maintained by SARDI Aquatic Sciences. Details currently recorded in the daily logbook include:

- the MFA within which the fishing took place
- depth in which the pots were set
- number of pots set
- weight of retained legal-sized Southern Rock Lobsters - reported at the end of each trip or as a daily estimated weight
- landed number of legal-sized Southern Rock Lobsters
- number of undersized Southern Rock Lobsters caught
- number of dead Southern Rock Lobsters caught
- number of spawning Southern Rock Lobsters caught
- weight of octopus caught
- number of octopus caught
- number of Giant Crab pots
- depth of Giant Crab pots
- landed weight of Giant Crabs
- landed number of Giant Crabs
- species of Marine Scalefish retained

4.7.3.2 Wildlife interactions logbook

PIRSA Fisheries and Aquaculture implemented a generic data recording logbook in 2007 for wildlife interactions (including threatened, endangered and protected species – TEPS) for all South Australian commercial fisheries. The TEPS logbook was implemented to ensure consistent reporting practices for interactions with TEPS and to fulfil requirements of the *Environmental Protection and Biodiversity Conservation Act 1999*. PIRSA Fisheries & Aquaculture currently contracts SARDI Aquatic Sciences to collect and archive the data from the TEPS logbooks and provide an annual summary report.

4.7.3.3 At-sea voluntary sampling

Commercial fishers and researchers have collaborated in an at-sea voluntary pot-sampling program for the Southern Zone Rock Lobster Fishery since 1991, with the main aim of providing temporal and spatial data on pre-recruit indices, length frequencies, reproductive status, sex ratios and estimates of lobster mortality. Fishers participating in the program record the number, size and reproductive condition (females only) of both undersized and legal lobsters from three pots where the escape gaps are closed.

The program is recognised as being important because the information collected is used in the stock assessment of the fishery and plays a part in the TACC decision making process. For this reason, participation in the program is strongly encouraged to ensure that future decisions for the fishery are based on reliable and robust data.

These data are supported by research staff who undertake trips to sea on commercial vessels to encourage more fishers to participate in the program and to demonstrate the methods to new participants.

4.7.4 Fishery-Independent data

4.7.4.1 Fishery independent monitoring survey

Fishery Independent Monitoring Survey (FIMS) has been conducted in the Southern Zone Rock Lobster Fishery since 2005 to provide an index of abundance that is unaffected by factors such as fishing behaviour, market volatility and other external issues impacting on commercial catch rate. It also provides a long-term data series that could be used to compare historical catch rates with surveys undertaken in the event of a fishery closure.

The survey design consists of 29 transects, that run from inshore (~10 m) to offshore (~120 m) grounds (Figure 3). Each transect line consists of 10 pots set at predetermined locations that are independent of known fishing effort. All

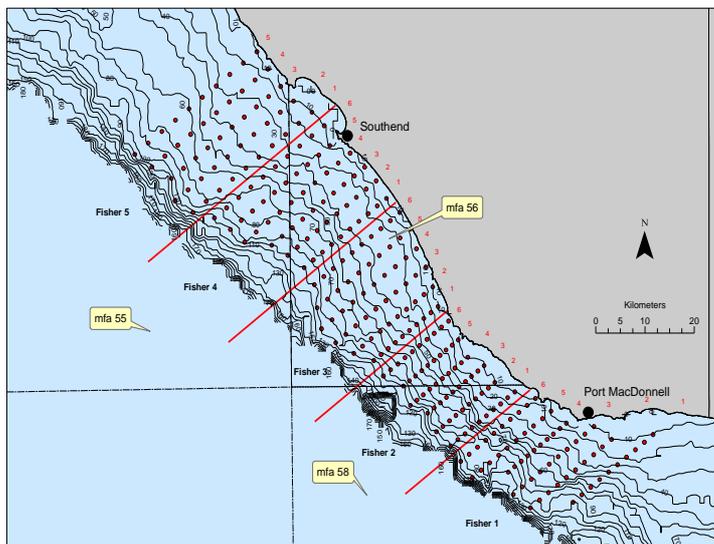


Figure 3: Location of Fishery Independent Monitoring Survey (FIMS) transects in the Southern Zone Rock Lobster Fishery

Rock Lobster caught during the survey are sexed, measured, staged (females only) and tagged. Between the 2005/06 and 2010/11 seasons, sampling was undertaken during September, January and May. Since 2012/13, sampling has been undertaken during the months of September and January. Further information related to the FIMS is documented in Linnane et al (2018).

4.7.4.2 Puerulus sampling

Rates of puerulus and post-puerulus settlement have been monitored at four main sites in the Southern Zone Rock Lobster Fishery since 1991 as an indicator of potential settlement and recruitment 4-5 years into the future. These sites are located at Blackfellows Caves, Livingstons, Beachport, Cape Jaffa and Kingston, with the collectors set in groups of 10 or 12.

The annual puerulus settlement index is calculated as the mean monthly settlement on these collectors and is used to estimate future biomass in the fishery using a 4-5 year time span between settlement and recruitment. PSI is a third tiered performance measure in the harvest strategy.

4.7.4.3 Observer sampling

Observers are deployed on operating vessels in the Southern Zone Rock Lobster Fishery to record the same information as that reported by participants in the at-sea voluntary sampling (refer to section 4.7.3). This sampling program supplements and validates the fishery-dependent at-sea sampling information. Observers may be SARDI research officers or other independent observers.

4.7.5 Reporting

Two types of published reports are currently prepared and delivered on an annual basis for the Southern Zone Rock Lobster Fishery that provide an assessment of current stock status (and evaluation of the performance of the fishery against key performance indicators and reference points outlined in the harvest strategy). These are:

1. *Stock status report*-this report documents, analyses and interprets the available catch and effort data. It formally provides the information required to make decisions in accordance with the TACC decision rules provided in the harvest strategy of this management plan (refer to section 9);
2. *Stock assessment report*-this is a major report that is published and provides a comprehensive synopsis of information available for the Southern Zone Rock Lobster Fishery and to assess the current status of the resource in relation to the performance indicators provided in the management plan.

In addition, fishery statistics are presented and considered by the Rock Lobster Fishery Management Advisory Committee (RLFMAC) as part of their management advisory function during the setting of the TACC.

4.7.6 Strategic research plan

The RLFMAC has prepared a strategic plan to guide its advice on the undertaking of research and development projects for the Southern Zone Rock Lobster Fishery. This research and development plan aims to achieve the following objectives:

1. To ensure that all RLFMAC members have a clear description of the current structure for development, approval and management of Rock Lobster fishery research and research and development projects at the two key levels;
 - a. The national level, via Southern Rocklobster Limited (SRL) - funded by the voluntary FRDC 0.25% gross value production levy plus any additional contributions across South Australia, Tasmania and Victoria.
 - b. The core fishery research level in South Australia - this relates to the program of fishery research conducted by SARDI Aquatic Sciences to inform fisheries management and funded directly by licence holders via the cost recovered licence fee⁵.
2. To ensure research is directed towards the information needs of management (promotes effective management of the resource), stock status (including research which contributes to a better understanding of the stock and which can in turn, inform the setting of the TACC), minimising environmental impacts, people development and industry development.
3. To ensure that the Southern Zone Rock Lobster Fishery continues to have robust data feeding into the Harvest Strategy Decision Rules and, in particular, to encourage increased industry engagement in programs such as routine pot sampling.
4. To ensure a coordinated and collaborative approach to all Rock Lobster fishery research and development in South Australia and that the

⁵ This annual research program analyses data generated by, and gathered from, the following sources:

Commercial logbook information

Voluntary catch sampling

Puerulus monitoring

Fishery Independent Monitoring Surveys (FIMS) - Southern Zone only.

Fishery Models

This research delivers information to inform the fishery management decision making framework (including the harvest strategy)

RLFMAC is kept informed of current and proposed research of relevance to the management of the fishery, including Rock Lobster Fishery Status and Stock Assessment Reports, via regular reports to RLFMAC meetings.

The Strategic Research and Monitoring Plan is not intended to be a definitive list of all research needs for the fishery over the life of the plan. A review of research priorities will be undertaken regularly to assess research needs, priority and timing.

4.8 Economic characteristics

The Southern Zone Rock Lobster Fishery is South Australia's most valuable commercial fishery with an estimated Gross Value of Production in 2017/18 of \$98.2 million. The fishery contributes around \$157 million annually to the Gross State Product, most in the Limestone Coast region (Econsearch 2019). Around 1,189 full time equivalent jobs are generated by the fishery.

Further information about the economic characteristics of the Southern Zone Rock Lobster Fishery are described in economic indicator reports available at <https://www.bdo.com.au/en-au/econsearch/safisheriesreports>.

5 Co-management arrangements

Co-management is an arrangement whereby responsibilities and obligations for sustainable fisheries management are negotiated, shared and delegated between government, the commercial fishing industry, recreational fishers, Aboriginal traditional fishers and other key stakeholders such as conservation groups (Neville 2008). Co-management is recognised as a collection of positions – starting from centralised government regulation with no industry input at one end to more autonomous management by industry groups and key stakeholders at the other, where government plays more of an audit role. Co-management is designed to achieve efficient regulatory practice (among many other things) and is by no means a way of industry or other key stakeholders avoiding regulatory scrutiny and influence.

PIRSA has adopted a *Policy for the Co-Management of Fisheries in South Australia*⁶ to inform discussion with the wider commercial fishing industry and other stakeholder groups as to how best to promote and implement co-management arrangements. The policy proposes that implementation of a preferred co-management model should be through a phased approach through

⁶ The *Policy for the Co-Management of Fisheries in South Australia* is available on http://www.pir.sa.gov.au/_data/assets/pdf_file/0008/262538/Co-management_policy.pdf

which industry and key stakeholders build their capacity over time and which allows for a government audit process to measure performance and success.

In 2015, the RLFMAC was established by the South Australian Rock Lobster Advisory Council (SARLAC) as an advisory committee.

The role of the RLFMAC is to provide advice to PIRSA on the commercial Rock Lobster fisheries in relation to management of the fishery and any other matter referred to it. At the time of writing this management plan the commercial fishing industry funded the operation of RLFMAC through licence fees collected from both the Northern Zone and Southern Zone Rock Lobster fisheries.

In addition, co-management arrangements have been established between PIRSA Fisheries & Aquaculture and the South Eastern Professional Fishermen's Association (SEPFA), the representative industry body for the Southern Zone Rock Lobster Fishery. The current arrangements recognise SEPFA as the representative body for the industry. Through this arrangement SEPFA undertake co-management services on behalf of PIRSA in relation to communicating, educating and consulting with industry members on fisheries policy related to administration of the *Fisheries Management Act 2007*.

6 Allocation

6.1 Current allocated shares of the resource

The *Fisheries Management Act 2007* provides that a management plan must specify the share of the fishery to be allocated to each fishing sector. The Act also provides that, in determining the share of aquatic resources to be allocated to a particular fishing sector for an existing fishery, the share of aquatic resources to which that fishing sector had access at the time the Minister requested the plan (based on the most recent information available to the Minister) must be taken into account. The Minister formally requested preparation of the previous management plan in 2010. Therefore, the 2013 plan took into account the share of the key target species in the Southern Zone Rock Lobster Fishery that the commercial, recreational and Aboriginal traditional fishing sectors had access to at that time. The information used to allocate the shares are described in the 2013 management plan for the fishery (PIRSA 2013b).

The shares allocated to each fishing sector in the Southern Zone Rock Lobster Fishery are set out in Table 2.

Commercial access to Southern Rock Lobster in the Southern Zone is restricted to licence holders in the Southern Zone Rock Lobster Fishery.

Table 2: Shares of Southern Rock Lobster allocated to the commercial, recreational and Aboriginal traditional fishing sectors in the Southern Zone Rock Lobster Fishery.

Species	Commercial	Recreational	Aboriginal traditional
Southern Rock Lobster	95.5%	3.5%	1%

6.1.1 Recreational fishing sector

Recreational access to Southern Rock Lobster is primarily managed using minimum legal size limits and recreational daily bag and boat limits. Any catch taken by the Charter Boat Fishery is considered to be recreational catch and is allocated as part of the broader recreational fishing sector.

The most recent survey of recreational fishing in South Australia conducted in 2013/14 estimated recreational take of Rock Lobster was around 75 tonnes, with almost two thirds of this catch landed in the Southern Zone (Giri and Hall 2015). This catch corresponded to around 4.5% of the commercial catch in that year (PIRSA 2016) and within allocations.

6.1.2 Aboriginal traditional fishing sector

Access to South Australia's fisheries resources by Aboriginal communities under the *Fisheries Management Act 2007* may be provided through Aboriginal traditional fishing management plans. These plans may be developed when an Indigenous Land Use Agreement (ILUA), agreed to resolve a native title claim, is in place in relation to a native title claim area. The State is currently engaged in ILUA negotiations with native title claimants and other stakeholder groups including the fishing industry. It is also possible that agreements may be made with Aboriginal communities in relation to traditional fishing arrangements before an ILUA is finalised. The agreements arising from these negotiation processes may inform the way that access to fisheries resources by Aboriginal communities is defined and implemented. Currently, Aboriginal traditional fishing under the Act only relates to fishing agreed through the ILUA process. Aboriginal people are also recreational fishers outside of these arrangements.

There is little available information on the take of Southern Rock Lobster by the Aboriginal traditional fishing sector; however, the small number of claims with fishery-related interests and negotiations to date has informed the share that has been put aside for this purpose. A nominal share of 1% was made to the Aboriginal traditional sector in the 2013 management plan (PIRSA 2013).

If a traditional fishing related agreement is negotiated within the timeframe of this management plan, at the appropriate review of this management plan, any difference between the nominal share put aside and the actual share agreed through the agreement can be calculated. Any difference would then be re-allocated to or from the recreational sector.

6.1.3 Commercial fishing sector

Licence holders in the Southern Zone Rock Lobster Fishery are also permitted to land and sell Giant Crabs and Octopus taken as by-product in Rock Lobster pots. At the time of writing this management plan, they also had one of three levels of access to the South Australian Marine Scalefish Fishery. The list of permitted fish species and fish families for the commercial Marine Scalefish Fishery is provided in Appendix 1, with over 60 species recorded as landed in logbooks annually. Not all eligible marine scalefish species will be allocated within this management plan. Only species for which there is an identified need, have been allocated. The same classifications of species described in the *Management Plan for the South Australian Commercial Marine Scalefish Fishery* (the Marine Scalefish Fishery Management Plan) (primary, secondary, tertiary and other) have been used for determining and managing sector allocations. These classifications separate the species based on:

- Importance to the fishery (both commercial and recreational);
- Production (total catch);
- Commercial value;
- Level of exploitation; and
- Inter-annual variability in catches and reliability of catch estimates.

King George Whiting, Snapper, Southern Garfish and Southern Calamari are the highest ranked commercial species of the Marine Scalefish Fishery in terms of total production and value. The allocations for these four species are set out in Table 3.

Allocations for secondary species such as Vongole, Snook, Mullet, Mulloway, and Sand Crab, as well as tertiary and other species are provided in the Marine Scalefish Fishery Management Plan (PIRSA 2013a).

Table 3: Allocated shares of the four primary species of the Marine Scalefish Fishery for the commercial, recreational and Aboriginal traditional fishing sectors

Species	Commercial		Recreational		Aboriginal traditional
King George Whiting	Marine Scalefish	49.5%	Recreational	45.5%	1%
	SZ Rock Lobster	0.0%	Charter Boat	3.0%	
	NZ Rock Lobster	1.0%			
Total	50.5%		48.5%		1%
Snapper	Marine Scalefish	79%	Recreational	8%	1%
	SZ Rock Lobster	1.45%	Charter Boat	10%	
	NZ Rock Lobster	0.55%			
	Lakes and Coorong	0.03%			
Total	81%		18%		1%
Southern Garfish	Marine Scalefish	79.33	19.5		1%
	SZ Rock Lobster	0.13			
	NZ Rock Lobster	0.04			
Total	79.5%		19.5%		1%
	Marine Scalefish	56%	37.4		1%

Southern Calamari	NZ Rock Lobster	0.45%		
	Gulf St Vincent Prawn	0.45%		
	Spencer Gulf Prawn	4.6%		
	West Coast Prawn	0.1%		
Total	61.6%		37.4%	1%

6.2 Review of allocations

Allocations between sectors may be reviewed periodically in accordance with the criteria set out in the Allocation Policy. The following scenarios may be considered during a review of allocations;

1. A review of the management plan, which will reassess the appropriateness of shares and may trigger an adjustment; or
2. One or more sectors exceed their allocation of Southern Rock Lobster in Table 2 or in accordance with the allocation triggers for Marine Scalefish Fishery species described in the Marine Scalefish Fishery Management Plan (PIRSA 2013b); or
3. A major change in the management of a species and or a sector that results in a shift of allocations to a sector(s).

The declaration of a marine protected area that would result in reallocation of shares may be given effect through the *Marine Parks Act 2007* and policies applying under that Act. The *Marine Parks Act 2007* requires the Government to pay fair and reasonable compensation to commercial fishers whose statutory rights are affected by marine park zoning.

6.2.1 Review process

An initial assessment of allocations may be conducted by PIRSA Fisheries and Aquaculture in consultation with relevant sectors of the fishery. Once the need for a review has been recognised an assessment committee will be established. The committee may be required to assess the need for a second-stage assessment based on consideration of the following questions:

- Has there been a shift in the access value of the fishery or is new information available that suggests a reallocation of shares would bring additional social and economic benefits to the State?
- If a trigger limit has been breached, can the breach be readily explained and justified?
- Is the potential change in shares significant and considered long term? A minor shift/anomaly may not require a full review.

A written report is to be prepared by the committee, with a recommendation to proceed to a full assessment or not. PIRSA Fisheries and Aquaculture will

determine whether to move to a full assessment or may refer a recommendation to the Minister.

6.2.2 Full assessment

As with the initial assessment, a full assessment of allocation will be conducted by PIRSA Fisheries and Aquaculture in consultation with relevant stakeholders. An evaluation panel is to be established including independent experts as required.

The panel needs to evaluate how the value of one or more sectors is changing and the likely trends in the future. In the context of these changes, all options being considered should be evaluated against the option of maintaining the status quo and the potential flow-on effects with regard to:

- Contribution to Gross State Product
- Contribution to employment
- Access for consumers to fresh seafood
- Maintenance, growth and wellbeing of regional communities
- Health impacts
- Sport and recreation opportunities
- Consistency with tourism policies
- Other criteria relevant to the fishery

6.2.3 Assessment outcomes

Following the full assessment, the review panel may recommend to the Minister one of two actions, either:

- (a) manage each sector within the existing allocated shares; or
- (b) proceed to adjust shares.

6.2.3.1 Managing within existing shares

If shares are to be maintained it may be necessary, depending on the circumstances, to alter the catch of one or more sectors to maintain the existing shares between all sectors. To determine the appropriate mechanism to re-establish initial allocations, the existing co-management arrangements will be used to develop a preferred option. Adjusting commercial shares may be achieved through quota units for Southern Rock Lobster and a variety of controls such as; seasonal and temporal closures, gear restrictions, catch limits and size limits for the Marine Scalefish Fishery. Recreational adjustments are likely to be made through alterations to existing bag and boat limits, seasonal closures and size limits.

6.2.3.2 Adjusting allocations of shares

Any future adjustment of shares will be consistent with the requirements of the *Fisheries Management Act 2007*. Adjustment may be from the commercial sector to the non-commercial sector, a voluntary scheme would seek to be pursued in the first instance. If a voluntary adjustment scheme is not able to be implemented in the fishery, a second voluntary option/step may be considered, including an incentive-based scheme for share adjustment.

The adjustment of shares from the commercial sector to a non-commercial sector can be summarised by the following options:

- Purchase commercial access (i.e. quota units) to the resource on the open market;
- Create incentives for the commercial sector to trade access to the resource;
- A process of compulsory acquisition may occur (through regulations) if necessary. Any compulsory acquisition of entitlements would include compensation to the commercial sector in accordance with the provisions of the Allocation Policy. Adjustments are to be finalised within two years.

6.3 Allocation triggers

6.3.1 Marine scalefish

Currently, catch estimates for marine scalefish are available annually for all commercial fisheries and estimates of recreational catch of the primary and secondary species of the Marine Scalefish Fishery are currently available about every five years. Sector catches may be assessed when data are available in order to detect a change in share value, thresholds have been determined for each sector's percentage allocation. Exceeding this allocation may trigger a review of allocations.

Triggers for a review of allocations are currently developed for primary and secondary species. The allocations, how they are calculated and the process for adjusting allocations will be consistent with the Marine Scalefish Fishery Management Plan (PIRSA 2013b) or any subsequent review of the Marine Scalefish Fishery or replacement of that plan.

7 Ecosystem impacts

The *Fisheries Management Act 2007* currently requires that the following ecological impacts be identified and assessed as the first step in developing a management plan:

- current known impacts of the fishery on the ecosystem;
- potential impacts of the fishery on the ecosystem; and
- ecological factors that could have an impact on the performance of the fishery including climate change.

The ecological impacts associated with the South Australian Southern Rock Lobster Fishery were considered through a review of a previous ecologically sustainable development (ESD) risk assessment conducted in 2013. The review (and initial assessment) was guided by the *National ESD Reporting Framework for Australian Fisheries* of Fletcher et al. (2002). The ecological, economic and social factors that affect the management of the South Australian Southern Rock Lobster Fishery were prioritised by stakeholders using risk ratings from negligible to extreme. A report describing the outcomes of the assessment are available in PIRSA (2020).

8 Goals and objectives

This management plan provides a set of management goals and objectives for the Southern Zone Rock Lobster Fishery that meet the objects prescribed in Section 7 of the *Fisheries Management Act 2007*. These goals and objectives take into account policy drivers, such as the principles of ecologically sustainable development, the precautionary principle and the guidelines for the ecologically sustainable management of fisheries set out in the *Environment Protection and Biodiversity Conservation Act 1999*. Within the framework provided by ESD, the primary consideration for this plan is Section 7(1)(a) of the *Fisheries Management Act 2007*, relating to the avoidance of over-exploitation. Economic and social objectives will be pursued to the extent possible, where stock sustainability objectives have been demonstrably achieved.

The key goals for the fishery are implemented through operational objectives and management strategies contained in this management plan. These key goals are

1. Southern Rock Lobster stocks in South Australia are sustainable
2. Southern Zone Rock Lobster Fishery businesses operate efficiently and are viable
3. South Australian Rock Lobster Fishery minimises impacts on the ecosystem
4. Economic and social benefits of the South Australian Rock Lobster Fishery are equitably distributed
5. Management of the fishery is cost effective and participatory

Management Plan Objective	Strategies	PIs	Reference Point	Description	ESD Risk
Goal 1 – Southern Rock Lobster stocks in South Australia are sustainable					
1a Stocks of Southern Rock Lobster are sustainable	<p>1a(i) Set the TACC annually, in accordance with the harvest strategy</p> <p>1a(ii) Ensure other input and output controls support sustainable use of the resource</p> <p>1a(iii) Management strategies for all fishing sectors limit the take of Rock Lobster to within sustainable levels and within sector allocations</p> <p>1a(iv) Adopt Precautionary Principle when robust information is lacking to make informed decisions</p>	Commercial Catch Rate (CPUE)	CPUE \geq 0.40kg/potlift in each year of rolling two year periods.	Commercial CPUE in lobster fisheries is accepted as being representative of seasonal lobster abundance and is recognised by industry and managers as a measure of fishery performance that is reliable and well-understood.	Retained Species - Rock Lobster
1b There is reliable data and information to use the harvest strategy to guide TACC setting and to inform management decisions.	<p>1b(i) Collect fine scale fishery-dependent data through commercial reporting</p> <p>1b(ii) Maintain a voluntary pot sampling program to collect data on the size distribution of the commercial catch and number of undersize</p> <p>1b(iii) Maintain a fishery-independent monitoring survey to collect data on relative abundance, the size distribution of the commercial catch and number of undersize</p> <p>1b(iv) Assess the status of the stock using the harvest strategy and quantitative stock assessment techniques</p> <p>1b(v) Review and update the strategic research and monitoring plan regularly</p> <p>1b(vi) Monitor the catch and effort of the recreational and traditional fishing sectors across the State</p>	<p>Commercial catch and effort is reported appropriately in electronic logbooks adequately verified using SARDI data quality assurance processes.</p> <p>Fishery-independent surveys undertaken each year</p> <p>Voluntary pot sampling/observer program</p> <p>To ensure data available for fishery model inputs.</p>	<p>Fishery-independent surveys undertaken each year</p> <p>Harvest Strategy utilised to guide TACC setting each year</p> <p>Voluntary pot sampling/observer program in place</p>	<p>Consistent, high quality and measureable data and information is available</p> <p>Where possible data and information is captured using efficient, cost-effective and usable methodologies e.g. electronic logbooks.</p> <p>Voluntary pot sampling and observer program provides data for fishery model inputs</p>	<p>External factors affecting performance</p> <p>Other</p>

Management Plan Objective	Strategies	PIs	Reference Point	Description	ESD Risk
Goal 2 – Southern Zone Rock Lobster Fishery businesses operate efficiently and are viable					
2a Southern Zone Rock Lobster stock are at levels that allow fishing businesses to operate efficiently and within ecologically sustainable limits	2a Optimise catch within ecologically sustainable limits	CPUE	CPUE at or greater than long term average for the fishery (1.0 kg/potlift).	Stock abundance is considered an important aspect in ensuring efficiency for the SZRLF. CPUE is considered in this objective as an indicator of stock abundance.	External factors affecting performance – other drives - Economic
2b: Management arrangements aim to build rock lobster stocks when fishery performance indicators indicate improving fishery performance	2b Optimise catches within ecologically sustainable limits	%UEP	Egg production in the Southern Zone Rock Lobster Fishery increases towards a target of 20% unfished egg production (%UEP) by 2035	The performance indicator relates to maintenance of stock abundance being accepted under fishery conditions/indicators considered to be status quo (at the time of management plan development). At times where fishery conditions/indicators improve it is accepted that stock abundance should be built upon.	Retained Species - Rock Lobster
2c: There is sufficient economic information to make informed management decisions	2c Maintain a flow of economic benefit from the fishery to the broader community	Economic performance reports Price information is available regularly Catch and effort information is available	Economic performance reports for fishery published regularly	Economic indicator reports provide economic and social information related to each zone of the fishery. The current economic indicator reports are published annually and at the time this management plan was developed this timing was considered appropriate.	External factors affecting performance - Other – Economic Human Induced – Oil Spills and Seismic Surveys

Management Plan Objective	Strategies	PIs	Reference Point	Description	ESD Risk
Goal 3 - South Australian Rock Lobster Fishery minimises impacts on the ecosystem					
3: Fishery impacts of by-catch and by-product species are monitored and managed appropriately; interactions with threatened, endangered and protected species are minimised and aquatic habitats, ecosystems and biodiversity are conserved.	3(i) Maintain the current cap on the total number of licences used in the commercial fishery 3(ii) Maintain escape gaps for pots to minimise by-catch of undersize and non-target species 3(iii) Continue periodic fishery-independent surveys to collect information on by-catch 3(iv) Manage take of key by-product species to ensure catches remain at precautionary levels 3(v) Undertake ESD Risk Assessments as required 3(vi) Develop management measures to minimise impact of interactions with endangered, threatened and protected species should any new issues arise in the fishery.	ESD Risk rating for by product and by-catch species	ESD Risk ratings for by product and by-catch species are medium, low or negligible	In the absence of stock assessments of all by-catch and by-product species and noting that there may be impacts external to the fishery on these species it is considered appropriate that the ESD risk rankings are a suitable as a performance indicator.	
		ESD Risk rating for TEPS Industry approved Code Of Practices (where available) Interactions with TEPS monitored	Interactions with TEPS monitored (SZ) Adherence with industry approved codes of practice if developed and required ESD Risk rating for TEPS does not increase		
		ESD risk rating for environmental health	ESD risk ratings for broader environmental health are medium, low or negligible		

Management Plan Objective	Strategies	PIs	Reference Point	Description	ESD Risk
Goal 4 – Economic and social benefits of the South Australian Rock Lobster Fishery are equitably distributed					
4a Economic and social benefits from the fishery flow to the broader community and are maintained	<p>4a(i) Develop and implement management arrangements that allow commercial operators to maximise operational flexibility, economic efficiency, value and returns</p> <p>4a(iii) Communicate the sustainability and economic outcomes of the fishery to the wider community.</p> <p>4a(iv) Where there is demonstrable, and measureable disruption to fishing operations that are not related to stock abundance, and fish stocks are classified as 'sustainable' that emergency arrangements for management of the fishery may be considered</p>	Economic Rent	Economic rent is > zero in 90% of years covered in this management plan	Economic rent represents a return to the value of the licences.	Community – Fishing Industry and Dependent communities
4b: Access and fishing opportunities for non-commercial users of the fishery resources is maintained	<p>4b(i) Allocate access to Rock Lobster resource to commercial, recreational and Aboriginal traditional fishing sectors, in accordance with the <i>Fisheries Management Act 2007</i></p> <p>4b(ii) Develop mechanisms for adjusting shares in the future that utilise market tools, in accordance with the <i>Fisheries Management Act 2007</i></p> <p>4b(iii) Integrate traditional access prescribed in Aboriginal traditional fishing management plans with the management of other fishing sectors</p>	Recreational catch and effort Aboriginal Traditional fishing access	<p>Recreational fishing surveys conducted regularly approximately every five years using most efficient methodology available.</p> <p>Recreational catch and effort monitored against other sectors when available Recreational fishers have access to the fishery</p> <p>Aboriginal Traditional fishing access maintained</p>	Allocation policy guides monitoring of, review and adjustments to allocation shares if required.	External factors affecting performance – Human Induced – Other Fisheries (recreational)

Management Plan Objective	Strategies	PIs	Reference Point	Description	ESD Risk
Goal 5 - Management of the fishery is cost effective and participatory					
5a: Promote cost-effective and efficient management of the fishery, in line with government's cost-recovery policy	<p>5a(i) Develop and implement management arrangements that are effective at achieving management objectives whilst minimising costs.</p> <p>5a(ii) Determine and discuss the real costs of management, compliance and research for the fishery on an annual basis</p> <p>5a(iii) Recover licence fees from commercial licence holders, sufficient to cover the attributed management costs of management of the fishery in accordance with the Government's cost-recovery policy</p> <p>5a(iv) Explore methods for all stakeholders to share management costs</p>	Licence fee% of gvp	Commercial licence fees less than 10% of GVP in at least 3 years of the past five.		Community – Fishing Industry
5b: Management arrangements implemented in the fishery are best practice	5b(1) Influence other management processes that impact on access security	<p>Number of RLFMAC meetings</p> <p>Other consultative processes</p> <p>RLFMAC strategic plan actively promotes best practice</p>	<p>RLFMAC meet twice a year</p> <p>The RLFMAC maintains membership including Industry, Government, scientific, conservation and recreational fishing interests.</p>		<p>External factors effecting performance of the fishery - Social Licence – Attitudes of Recreational Fishers, Relationship with local communities, NGOs</p> <p>Community –Dependent Communities</p>
5c: Co-management of the fishery promotes stewardship.		Co-management arrangements are in place and are effective	<p>Co-management arrangements are in place</p> <p>Industry participate in consultative processes such as RLFMAC, SEPFA, and SANZRLFA meetings</p>	Performance indicator aim to demonstrate that co-management activities resulting in increased stewardship by industry members	Governance – PIRSA
5d Management arrangements are voluntarily complied with.		Number of prosecutions in the fishery are monitored	Number of prosecutions in the fishery are monitored		

9 Harvest strategy

9.1 Background

This harvest strategy provides a structured framework for decision making in terms of setting Total Allowable Commercial Catch (TACC) levels that aim to meet the ecologically sustainable development object of the *Fisheries Management Act 2007*. The Minister or his/her delegate has responsibility for determining the value of a quota unit on an annual basis under the *Fisheries Management (Rock Lobster Fisheries) Regulations 2017* by dividing the TACC for the fishery by the total number of rock lobster quota units in the fishery.

At the time of developing this harvest strategy, the RLFMAC was the recognised advisory committee to PIRSA. Reference to an “established consultative group” in this harvest strategy refers to the RLFMAC unless that group is no longer fulfilling the role as the advisory committee to PIRSA.

This harvest strategy was developed following a review of a harvest strategy included in the 2013 management plan and amended in 2015. This harvest strategy was developed in 2018/19 by the RLFMAC with advice from a Harvest Strategy Review Working Group (HSWG) and industry feedback.

This harvest strategy aims to achieve the following three broad objectives as follows:

1. Optimum utilisation within ecologically sustainable limits
2. Improve stock towards levels giving long-term optimum utilisation
3. Avoid stock over-exploitation

The operational objectives of this harvest strategy are:

1. Increase egg production in the Southern Zone Rock Lobster Fishery towards a stock improvement target of 20% unfished egg production (%UEP) by 2035.
2. Maintain commercial catch rate (CPUE) at or greater than the long term average of the fishery (1.0 kg/potlift)

9.2 Performance indicators

9.2.1 Primary indicator

Commercial CPUE in lobster fisheries is accepted as being representative of seasonal lobster abundance.

The indicator used is the nominal CPUE = legal sized lobster (kilograms) per pot lift:

- Rounded to two decimal places;
- Inclusive of all records from 1 October to 31 May from the current quota period⁷;

Catch and effort records recorded and submitted through eCatch reporting to PIRSA.

The reference points for this indicator are:

- Trigger Reference Point (TrRP) for CPUE = 0.60 kg/potlift; and
- Limit Reference Point for CPUE (LRP) = 0.40 kg/potlift.

It should be noted that standardised catch rate outputs for the Southern Zone Rock Lobster Fishery were presented in Linnane et al. (2018). These outputs were reviewed by the HSWG, which noted the close agreement between nominal and standardised time-series. The HSWG recommended that periodic catch rate standardisation should be continued, but that in the context of this harvest strategy, nominal catch rate would remain as the primary indicator of lobster abundance unless the results of future standardisation trigger review and amendment of the Harvest Strategy (see section 9.8).

The TrRP of 0.60 kg/potlift is the level below which exploitation rate is reduced linearly until the fishery is closed at a catch rate of 0.40 kg/potlift (the LRP). This TrRP was chosen as the lowest catch rate that has been observed in the fishery in the period for which reliable records were available.

9.2.2 Secondary indicator

Pre-recruit index (PRI) is a key performance indicator for monitoring recruitment predicted to enter the fishery in the following year/s. Decision rules related to PRI are aimed at ensuring that TACC increases will only occur when recruitment levels are sufficient to support and sustain the increase.

PRI = number of undersized lobster per pot lift

⁷ The quota period for the Southern Zone Rock Lobster Fishery is a period of 12 months commencing on 1 October in any year.

- Rounded to two decimal places.
- Inclusive of records from 1 October to 31 March from the current quota period⁷.
- Inclusive of records over the whole area of the fishery
- Catch and effort records recorded and submitted through eCatch reporting to PIRSA

Trigger PRI = 1.32 undersize/potlift

9.2.3 Industry input

Performance indicators occasionally require interpretation as a measure of fishery performance due to the influences of various external factors that may not necessarily be related to stock abundance. Industry will be given an opportunity to provide factual and credible evidence to support the impacts of these external factors on performance indicators each year in the decision making process.

Annual estimates of high grading will be monitored to assess potential impact of this operating practice on commercial catch rate. The RLFMAC will consider annual estimates of high grading each year in recommending a TACC.

9.3 Decision rules for setting TACC

9.3.1 TACC setting decision rules

TACCs are recommended for ranges of CPUE as described in Table 4.

Table 4: Decision rule table for TACC for the Southern Zone.

CPUE (kg/potlift)	TACC (t)
<0.40	0
0.4-0.44	337
0.45-0.49	480
0.5-0.54	639
0.55-0.59	812
0.6-0.69	897
0.7-0.79	947
0.8-1.59	1246
1.6-1.99	1320
2.0-2.39	1400
2.4+	1495

9.3.2 Meta Rules

1. PRI rule - A TACC increase will be considered when a CPUE trigger reference point has been reached and PRI is at or above the trigger reference point.
2. One-step rule - If a TACC increase is considered under meta rule 1, a TACC can increase by only one level in any year regardless of the absolute CPUE estimate.
3. Consecutive year rule - A TACC increase under meta rule 1 will only be considered if there was no TACC increase in the previous season.

9.4 TACC decision making process

The decision making process for setting TACC will be undertaken each year prior to the start of the fishing season including consultation through a recognised consultative process:

1. Performance indicators for the fishery for the current quota period⁷ will be presented by SARDI and provided to members of the established consultative group prior to a formal meeting of that group.
2. The representative industry association will be invited to provide direct input on external factors that may have contributed to variations in catch rate estimates in the current quota period⁷. This information will be provided to the established consultative group responsible for providing advice to PIRSA on management of the Southern Zone Rock Lobster Fishery.
3. The established consultative group will hold a formal meeting before 31 July in each year and recommend a TACC to PIRSA for the Southern Zone Rock Lobster Fishery guided by the harvest strategy decision rules following consideration of the following information:
 - (a) The most up-to-date status for fishery and/or provisional CPUE and PRI.
 - (b) Industry input on external factors affecting the indicators.

If the TACC recommended through the established consultative processes is not consistent with the decision rules in this harvest strategy, the recommending consultative body will provide a comprehensive report describing the information that has driven the recommendation.

4. PIRSA will consider the recommended TACC. If the TACC recommendation is consistent with the decision rules in this harvest strategy and CPUE is at or above the trigger reference point, a report will be provided to the Minister (or his/her delegate) recommending the TACC.
5. If the TACC recommendation is inconsistent with the decision rules in this harvest strategy, or CPUE is below the trigger reference point, a detailed review of

performance indicators and a comprehensive report justifying the recommendations will be provided by the RLFMAC for consideration by PIRSA.

PIRSA will provide a comprehensive report to the Minister or his/her delegate describing the information that has driven the recommendation.

6. A TACC recommendation will be provided to the Minister (or his/her delegate) prior to the commencement of the upcoming fishing season.
7. The Minister (or his/her delegate) will consider the TACC recommendation and make a decision on the TACC by way of setting a quota unit value as soon as practicable prior to the commencement of the new season.

All endeavours to provide a TACC decision as early as possible before the commencement of the fishing season will be undertaken, pending timely delivery of the requirements set out in this process.

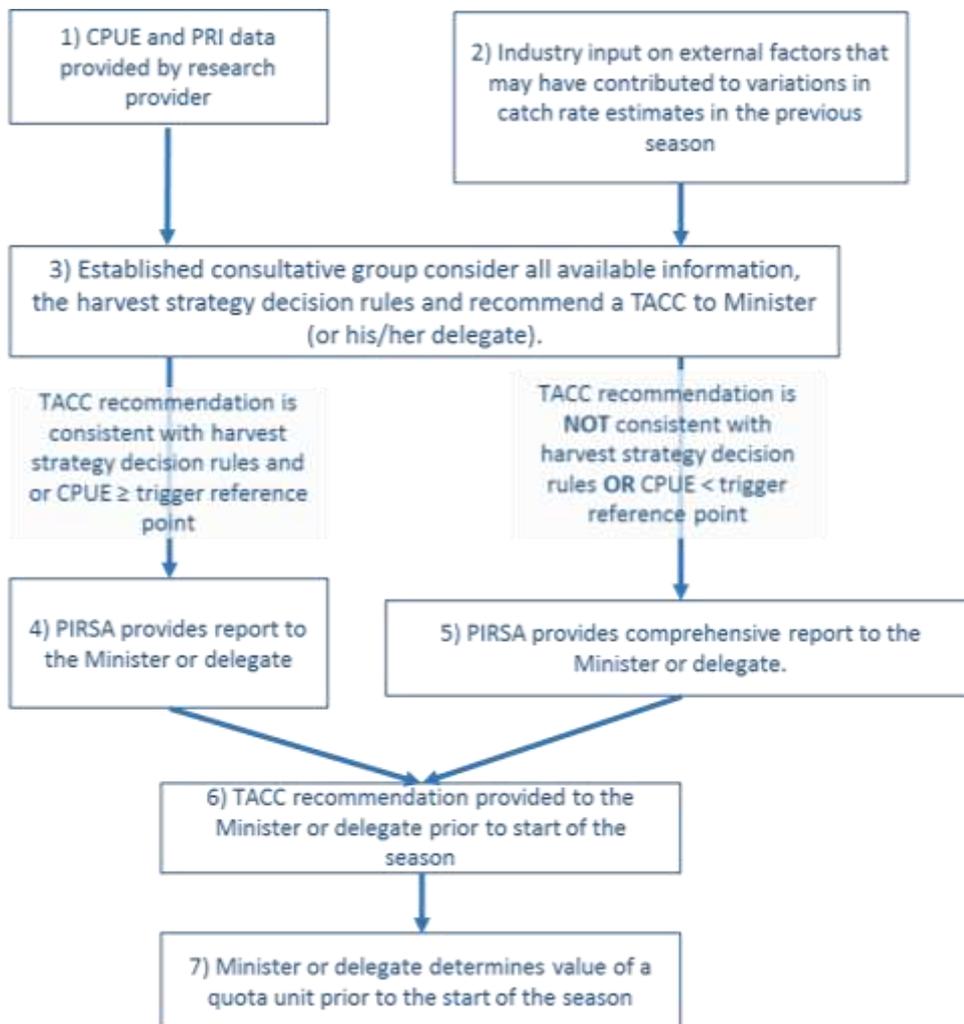


Figure 4: Decision making framework for annual TACC setting process for the Southern Zone Rock Lobster Fishery.

9.5 Additional indicators

Other data and performance measures will be used to assess the fishery but do not trigger explicit TACC adjustments. These include:

- % Unfished Egg Production (%UEP)
- Puerulus settlement index (PSI)
- Fishery Independent Monitoring survey (FIMS)
- Exploitable biomass
- Levels of exploitation
- Model estimated recruitment index
- Length-frequency data collated from voluntary pot sampling and observer program

9.5.1 Percentage of unfished egg production

%UEP = current egg production as a percentage of unfished egg production.

- Estimated using the qR model (McGarvey and Matthews 2001).

9.6 Monitoring

Monitoring of performance of the harvest strategy will be assessed based on %UEP.

Lowest acceptable rebuilding trajectory = %UEP in any year as described in Table 5. The Lowest acceptable rebuilding trajectory is the estimated %UEP in each year at 20% below a trajectory line between %UEP in 2016 (9.2%) and 22% in 2035.

Table 5: Annual Lowest acceptable rebuilding trajectory

Season	Lowest acceptable rebuilding trajectory	Season	Lowest acceptable rebuilding trajectory
2019/20	9.0%	2028/29	13.8%
2020/21	9.5%	2029/30	14.4%
2021/22	10.0%	2030/31	14.9%
2022/23	10.6%	2031/32	15.4%
2023/24	11.1%	2032/33	16.0%
2024/25	11.7%	2033/34	16.5%
2025/26	12.2%	2034/35	17.1%
2026/27	12.7%	2035/36	17.6%
2027/28	13.3%		

9.7 Stock Status Classification

The primary performance indicator used in the harvest strategy, nominal CPUE, will also be utilised for determining the stock status as described in Table 6.

Table 6: Stock status classification

Commercial Catch Rate (kg/potlift)	Status
≥ 0.6	Sustainable
< 0.6	Depleting or Recovering
≤ 0.4	Depleted

9.8 Monitoring during closure and reopening

If the fishery is closed the following set of rules will apply for monitoring the fishery during the closure, and for reopening the fishery.

- Monitoring will be conducted in collaboration with the SEPFA, SARDI and PIRSA Fisheries and Aquaculture.
- Monitoring will be by way of normal Fishery Independent Monitoring Surveys (FIMS) methodology as described in section 4.7.4.1 of this Management Plan
- If catch rates from the combined September and January FIMS for legal sized lobster is equal to or greater than 0.26 lobster/potlift, the RLFMAC may consider recommending reopening the fishery. The TACC on reopening the fishery is recommended to be set at 480 tonnes.

The costs of surveys undertaken in the event that the fishery would be closed would be cost-recovered from the industry.

The trigger reference point for reopening the fishery is equal to, or greater than, the FIMS catch rate in numbers of legal sized lobster/potlift equivalent to a commercial catch rate of 0.5 kg/potlift derived from a correlation between FIMS catch rate and commercial catch rate.

The level of TACC for reopening the Southern Zone Rock Lobster Fishery of 480 tonnes is one TACC level below that that could be set at the trigger reopening reference point. It is considered to be a precautionary level of TACC to reopen the fishery.

9.9 Review of the harvest strategy

A review of this harvest strategy will consider the performance of the harvest strategy in regard to meeting the operational objectives and meeting lowest acceptable rebuilding trajectory as described in Table 5.

A review of the harvest strategy will be considered if %UEP is below the lowest acceptable rebuilding trajectory (described in Table 5) for two consecutive years.

During the life of this harvest strategy annual estimates of CPUE may be standardised to account for changes in fishing behaviour that significantly influence the annual catch rates estimates. If this standardisation is completed PIRSA, with advice of the established consultative group, may recommend amendments to the Harvest Strategy under section 46 of the *Fisheries Management Act 2007* with updated reference levels and CPUE ranges consistent with the standardisation.

The management plan may be reviewed at any time to incorporate such measures into the management framework of the fishery if appropriate. Section 14 of this management plan outlines the process for reviewing a management plan, including the harvest strategy.

10 Compliance and monitoring

PIRSA Fisheries and Aquaculture runs a compliance program that has dual objectives:

- to maximise voluntary compliance with fisheries rules⁸; and
- to create effective deterrence to breaching fisheries rules.

These objectives are consistent with the 'National Fisheries Compliance Policy'.

Voluntary compliance is maximised through 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 activity⁹.

⁸ Rules include regulations, licence conditions, closure notices or any other enforceable instrument under the *Fisheries Management Act 2007*.

⁹ Prosecution may include the issuing of a formal caution or an expiation notice, in addition to prosecution through the courts.

11 Resources required to implement the plan

South Australia's fisheries resources are managed in accordance with the *Fisheries Management Act 2007* established to protect, manage and develop the aquatic resources of the State in a manner that is consistent with ecologically sustainable development to the benefit of the community, and management should occur in an efficient and cost effective manner with targets set for the recovery of management costs.

The recovery of costs associated with the management of the commercial fisheries as required by the *Fisheries Management Act 2007* has been intended to ensure specific industry sectors fund the government products and services required as a direct result of their commercial activities derived from access to the State's community-owned aquatic resources. The cost for the provision of these services is recovered by PIRSA Fisheries and Aquaculture through the administration of annual fees applied to regulated licences, or fee for service work applied on a per-transaction basis if required.

The fundamental principle applied to cost recovery of management costs is that the main beneficiaries of the services (commercial licence holders) are required to bear the cost of delivering the services required to manage their activities.

In determining the level of cost recovered from industry, PIRSA is guided by relevant cost recovery policies and reviews

12 Review of plan

A review of this management plan may be conducted at any time by the Minister, and a full review of this management plan will be conducted as prescribed in the *Fisheries Management Act 2007*.

Section 49 of the *Fisheries Management Act 2007* prescribes the process of reviewing a management plan. Amendments to this management plan may also be considered under section 46 of the Act.

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14 Appendices

Appendix 1: Schedule 1 - Aquatic resources prescribed for rock lobster fisheries

Annelids

Beachworm (Class Polychaeta)
Bloodworm (Class Polychaeta)
Tubeworm (Class Polychaeta)

Crustaceans

Giant Crab (*Pseudocarcinus gigas*)
Velvet Crab (*Nectocarcinus tuberculatus*)

Molluscs

Southern Calamari (*Sepioteuthis australis*)
Cockle
Cuttlefish (*Sepia* spp)
Mussel (*Mytilus* spp)
Octopus (*Octopus* spp)
Oyster (Family *Ostreidae*)
Scallop (Family *Pectinidae*)
Gould's Squid (*Notodarus gouldi*)
Vongole

Scalefish

Australian Anchovy (*Engraulis australis*)
Barracouta (*Thyrsites atun*)
Black Bream (*Acanthopagrus butcheri*)
Cod (marine species) (Family *Moridae*)
Dory (Family *Zeidae*)
Flathead (Family *Platycephalidae*)
Flounder (Family *Bothidae* or *Pleuronectidae*)
Southern Garfish (*Hyporhamphus melanochir*)
Bluespotted Goatfish (*Upeneichthys vlamingii*)
Australian Herring (*Arripis georgianus*)
Leatherjacket (Family *Monacanthidae*)
Pink Ling (*Genypterus blacodes*)
Blue Mackerel (*Scomber australasicus*)
Common Jack Mackerel (*Trachurus declivis*)
Morwong (Family *Cheilodactylidae*)

Scalefish (cont.)

Mullet of all species (Family *Mugilidae*)
Mulloway (*Argyrosomus japonicus*)
Redfish (*Centroberyx affinis*)
Bight Redfish (*Centroberyx gerrardi*)
West Australian Salmon (*Arripis truttaceus*)
Australian Sardine (*Sardinops sagax*)
Snapper (*Chrysophrys auratus*)
Snook (*Sphyraena novaehollandiae*)
Southern Sole (*Aseraggodes haackeanus*)
Sea Sweep (*Scorpius aequipinnis*)
Swallowtail (*Centroberyx lineatus*)
Blue-eye Trevalla (*Hyperoglyphe antarctica*)
Trevally (*Carangidae* spp)
Whiting (Family *Sillaginidae*)
Wrasse (*Labridae*) (other than Western
Blue Groper (*Achoerodus gouldii*))

Sharks

Rays of all species (Class *Elasmobranchii*)
Shark of all species (Class *Elasmobranchii*)
other than White Shark (*Carcharodon carcharias*)
Skate of all species (Class *Elasmobranchii*)

