

**SOUTH AUSTRALIAN  
FISHERIES MANAGEMENT SERIES**

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**MANAGEMENT PLAN FOR THE SOUTH  
AUSTRALIAN SOUTHERN ZONE ROCK  
LOBSTER FISHERY**

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**prepared by the  
Southern Zone Rock Lobster Fishery Management Committee  
in association with  
Primary Industries and Resources SA**

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## **Foreword**

### **Management of Marine Resources in South Australia**

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Marine resources in South Australia are common property resources. The role of the Government, as custodian of the marine resources on behalf of the general community, is to ensure that marine resources are used in an ecologically sustainable manner and as efficiently as possible, while yielding a reasonable return to the community. This ensures that the benefits of the use of marine resources are maximised within the community.

Experience world-wide has shown that where there is unrestricted use of marine resources, there is little incentive for individuals harvesting the resource to conserve fish stocks and competition amongst users often leads to resource depletion. Left unmanaged, the increase in fishing effort that results from competition is reflected in lower individual catches in the recreational fishing sector, and over-capitalisation and reduced financial returns in the commercial fishing industry. Loss of these resources to the community can result in significant regional economic problems in some States.

In carrying out their management of the resource, Governments have the responsibility of ensuring that the basis for the sharing of the resource among all users is clearly understood and accepted as equitable, and that the allocation of fisheries resources and their level of utilisation are consistent with the needs of present and future generations.

To provide for better decision making by Government in managing the marine resources, specific fishery management committees have been established to advise the Minister for Primary Industries, Natural Resources and Regional Development. These management committees are comprised of Government managers, research scientists, commercial and recreational fishers and fish processors, and are chaired by independent chairpersons. Appointment of members and the terms of reference of the management committees are provided for under the *Fisheries (Management Committees) Regulations 1995*.

Where scientific data or evidence on some biological parameter for a fishery is lacking and management decisions must be made in an environment of uncertainty, the Government and management committee will take a precautionary approach to the management of these resources.

**Hon Rob Kerin**  
**MINISTER FOR PRIMARY INDUSTRIES,**  
**NATURAL RESOURCES AND REGIONAL DEVELOPMENT**

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## **1 Scope of the management plan**

Sustainable management of marine resources is the responsibility of the Minister for Primary Industries, Natural Resources and Regional Development under the *Fisheries Act 1982*. The principal objectives of the Act (Section 20) are:

*(a) ensuring, through proper conservation, preservation and fisheries management measures, that the living resources of the waters to which this Act applies are not endangered or overexploited; and*

*(b) achieving the optimum utilisation and equitable distribution of those resources.*

This management plan provides a statement of the policy, objectives and strategies to be employed for the sustainable management of the southern zone rock lobster fishery in State waters. Fishing for all species of rock lobster in the Genus *Jasus* is controlled under this management plan.

Regulations pertaining to the management of the southern zone rock lobster fishery in South Australia are located in the *Scheme of Management (Rock Lobster Fisheries) Regulations 1991*.

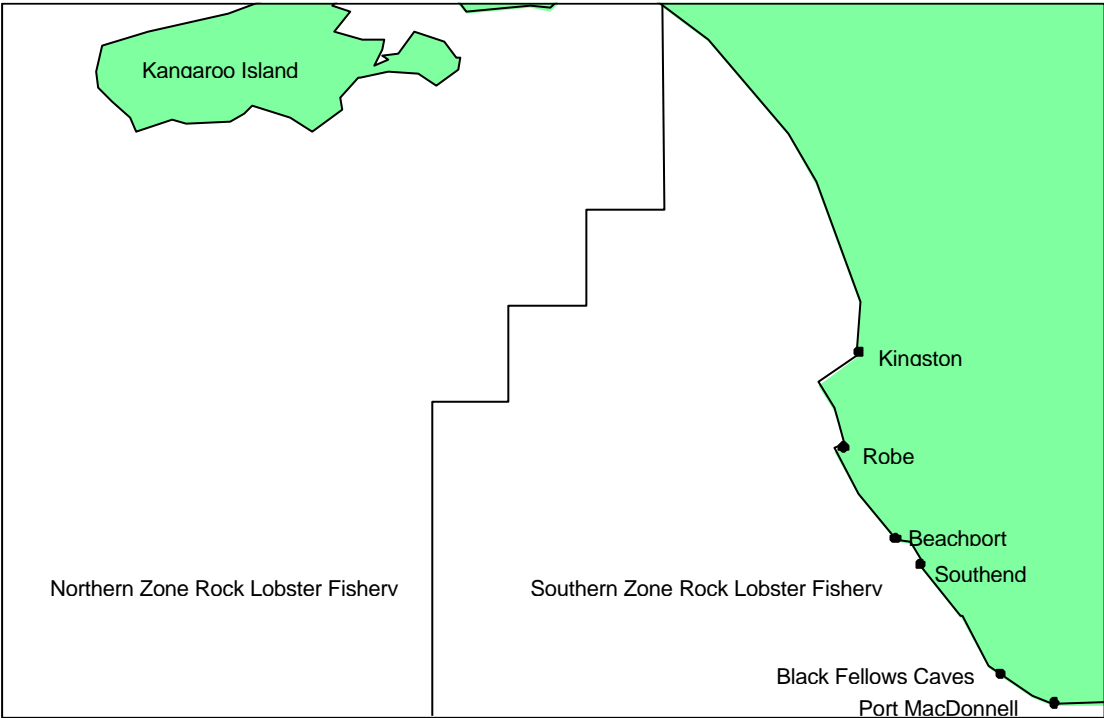
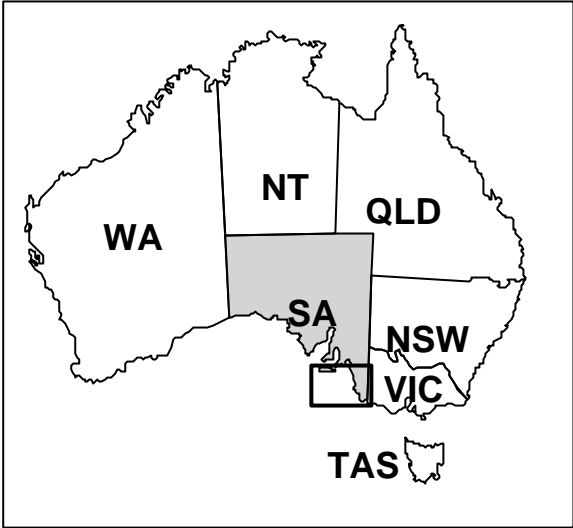
This management plan will operate for a **five** year period from 1 December 1997 subject to annual review and amendments as considered necessary by the Southern Zone Rock Lobster Fishery Management Committee and the Minister for Primary Industries, Natural Resources and Regional Development.

## **2 Description of the fishery**

### *2.1 Definition of the fishery*

The area of the southern zone of the rock lobster fishery extends from the mouth of the Murray River, south and east to the Victorian border ( $140^{\circ}58.0'E$ ) and is defined as being those coastal waters:

*“easterly of a line commencing at the point where the meridian of longitude  $139^{\circ}E$  intersects the shore of South Australia, then due south to position latitude  $36^{\circ}20.0'S$  and longitude  $139^{\circ}E$ , then due west to position latitude  $36^{\circ}20.0'S$  and longitude  $138^{\circ}40.0'E$ , then due south to position latitude  $36^{\circ}40.0'S$  and longitude  $138^{\circ}40.0'E$ , then due west to position latitude  $36^{\circ}40.0'S$  and longitude  $138^{\circ}20.0'E$ , then due south to position latitude  $37^{\circ}S$  and longitude  $138^{\circ}20.0'E$ , then due west to position latitude  $37^{\circ}S$  and longitude  $138^{\circ}E$ , then continuing due south along the meridian of longitude*



**Figure 1:** The northern and southern zones of the South Australian rock lobster fisheries. [Refer to Appendix I for statistical fishing areas]

The fishery involves the taking of rock lobster, *Jasus edwardsii*, within these waters as prescribed under the *Fisheries Act 1982* and regulations. Licensed rock lobster fishers also have access to a variety of other species, including salmon (*Arripis truttaceus*), mullet (*Argyrosomus hololepidotus*), octopus (*Octopus* spp) and snapper (*Pagrus auratus*). Some fishers have unrestricted access to king (giant) crab (*Pseudocarcinus gigas*), while other fishers are subject to a five crab bycatch per trip limit.

The southern zone rock lobster fishery is a limited entry fishery which had 185 licensees during the 1996/97 season. The majority of boats fish from one of the seven principal ports between Port MacDonnell and Kingston. The fishery is primarily a day fishery and vessels return to port at varying times during the day to unload their catch.

In the southern part of the zone, from Port MacDonnell to Beachport, there is a high density of fishable bottom (lobster habitat) from the low water mark to the margin of the continental shelf. The close proximity of the continental shelf in the southern part of the zone, combined with an abundance of lobster habitat, means that it is not necessary for fishers to travel far from their ports to fish. North of Beachport, the reef substrate becomes more scattered and the continental shelf widens.

The fishing fleet is exhibiting greater mobility across the fishing grounds. It is becoming increasingly common for vessels to fish grounds previously only fished by boats of another port. As a result, some fishing grounds are heavily fished with local stock implications.

Beehive pots of wire mesh on steel frames or 50 x 75 millimetres weldmesh with moulded plastic or cane necks, are used in the fishery. The dimensions of pots and the requirement for enabling escape of undersize rock lobster are specified in the *Fisheries (General) Regulations 1984*. Pots are usually set overnight and hauled at first light. Hydraulic or mechanical pot haulers are used.

There has been a recent shift away from traditional vessels to planing hulls enabling fishing over greater areas adjacent to the home ports. Recent technology changes have seen an increase in global positioning systems (GPS), giving greater precision in fishing activities. These changes have resulted in a higher capital investment by fishers.

The levels of bycatch of scalefish is low. Some boats retain incidental catches of the giant crab, others return crabs to the water, and some target the species during the season if they appear to be close to taking their quota. Some boats "dropline" for blue eye trevalla and ling, and "longline" or net for sharks out of season, and some of these activities require a Commonwealth permit. Most boats are slipped or removed on large trailers almost immediately after the season ends,

and are not put back in the water until the following spring. This is partially due to the scarcity of safe winter anchorages.

## *2.2 Biological characteristics*

Southern rock lobsters are distributed from Eden in NSW to southern Tasmania in the south and Dongara, Western Australia to the west. Rock lobster mate primarily in April - July with the females carrying eggs for 4 - 6 months. Rock lobster larvae moult through several stages before settling on a substrate as puerulus<sup>1</sup>. The period between egg fertilisation and settlement may last up to two years and the planktonic larvae are widely dispersed.

Growth rates are highly variable across the fishery. Highest growth rates for rock lobster in South Australia occur around the southern end of Yorke Peninsula (areas 33 and 40), while the lowest growth rates occur near the mouth of the Murray River (area 46)(see Appendix I). Size at maturity for female rock lobster varies substantially among the fishing areas, ranging from 89 millimetres carapace length in area 56 to 112 millimetres in area 40 (Prescott *et al* 1997). Rock lobsters can live for 20 years and may grow to 230 millimetres carapace length reaching weights in excess of seven kilograms.

The major predators of rock lobster in the southern zone are *Octopus* species, leather jackets and the occasional seal.

## *2.3 History of fishery management*

Fishing of rock lobsters in the waters of the southern zone fishery has been carried out since early settlement. It was not until the late 1940s when lobsters were processed for the American market at a facility in Beachport, that the number of boats began to steadily increase. It was this market for rock lobster tails during the 1950s that proved to be the catalyst for the industry to develop. Processing facilities were set up in the southern zone ports and small communities began to flourish.

The fishery was originally managed as an open access fishery with a licence costing two pounds. Operators fished all year and used up to 200 pots per day. The increasing number of boats, from three boats in 1947 to 38 in 1955 in Port MacDonnell, led to a reduction in catches and the average size of rock lobster landed. In 1958, the fishery was closed to the taking of females from 1 June to 31 October and for males from 1 to 31 October.

In August 1967, following 12 months of investigation by a Government Select Committee into the fishing industry in South Australia, the following decisions were implemented:

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<sup>1</sup> Puerulus are transparent larvae which resemble the lobster adult form prior to coloration and hardening of the carapace in the juvenile stage.

- that a pot and boat limit be imposed for each of three zones in the rock lobster fishery (this included a region around Victor Harbor in addition to the now northern and southern zones), and
- that no new boats be allowed to operate in the south-eastern zone without the approval of the Minister (Anon. 1967).

In 1968, the fishery management arrangements were changed to provide for a limited entry fishery, with 324 boats. A commercial catch logbook became compulsory in the same year. In 1970, the South East Professional Fishermen's Association (SEPFA) was formed as the peak industry body for the southern zone rock lobster commercial fishers.

In 1975, another full-scale review of the fishery was commissioned following two reviews by the Commonwealth (Anon. 1975, 1976). A major outcome of the review was to recommend the introduction of a buy-back scheme within the fishery to enhance its viability (Copes 1978). In 1980, the fishery was closed during winter following assessments of its potential impacts, with the season starting on 1 October and finishing on 30 April (Lewis & Gleeson 1978, Lewis 1979, Byrne 1979, Goldsworthy 1980, Stimson 1980).

In 1984, the number of pots held by all fishers was reduced by 15% and each licence was limited to a maximum of 80 and a minimum of 40 pots. Analysis of the pot reduction showed that whilst it had a small affect on fishing effort, it failed to induce significant rationalisation within the fishery (Staniford 1987). Remaining fishers responded to the reduced pot numbers by working the smaller number of pots more intensively.

To improve the economic performance of the fishery a buyback scheme was introduced in 1987. The buyback scheme successfully removed 41 licences (boats) and 2,455 pots from the fishery. However, the remaining fishers increased their fishing effort by increasing the number of days spent fishing, and this dissipated any potential benefits for the stock derived from the scheme (Staniford 1993).

The fishery is currently managed by regulations governing inputs to and outputs from the fishery. The season currently runs from 0600 hours on 1 October to 1800 hours on 30 April. There is a minimum size limit of 98.5 millimetres carapace length; a prohibition on the taking of berried lobsters; and several sanctuaries where lobster fishing is prohibited. The dimensions of the rock lobster pots, including the mesh size and escape gaps, are specified to control the efficiency of the pot and limit retention of undersize lobsters. Fishers may hold between 40 and 100 pots per licence. A maximum of 80 pots may be used to take rock lobster at any one time (if at least 80 pots are held against the licence).

Since 1993/94, the fishery has been controlled by a quota system. The total allowable commercial catch (TACC) was set at 1,718 tonnes and 1,740 tonnes during the 1993/94 and 1994/95 seasons, respectively. The TACC is divided proportionally into individual transferable quotas (ITQs) and allocated according to the number of pots held against the licence. The daily catch of individual boats is monitored by catch and disposal records (CDR), purchase records, and sales and transfer records that provide an audit paper trail from the point of landing to the point of sale by a wholesaler or exporter. The TACC for the 1995/96 and 1996/97 seasons was 1,720 tonnes.

### *Development and implementation of a quota system*

The quota management system was introduced to the fishery with the primary aim being to ensure that catches would not exceed the sustainable harvest level for the fishery. Seven options were presented to industry (Anon 1995) being:

- individual transferable quotas,
- a fishery total allowable catch,
- pot reductions,
- gear restrictions,
- time and area closures,
- buyback schemes, and
- changes to lobster size limits.

From the above options, the Minister for Primary Industries introduced a competitive TACC of 1,650 tonnes in 1992/93. Many fishers were unsure whether quota management was appropriate for the fishery, however, there was little support for other options once a TACC had been set. A pot reduction and buyback scheme had been used previously to control fishing effort.

With a competitive TACC set for the fishery, the most difficult task in implementing a quota management system was to develop a fair and equitable method of allocating the TACC amongst fishers in the southern zone. This was a very controversial and complex issue for both the Government and the fishery management committee to resolve.

Three alternative allocation methods were initially considered based on:

- a fisher's share of the total number of pots in the fishery (standard pot allocation);
- a fisher's share of the total historical catch from the fishery; or
- a combination of the above.

For the first year of quota management, individual quotas were allocated according to a method referred to as the "Adjusted Preferred" or "Presser Model". This method selected each fisher's greatest relative share of either pots or catch

history. Determining a fisher's share by the total number of pots in the fishery was straightforward. However, determining a fisher's share of the catch history was more complex.

A number of years had to be chosen in order to determine a fisher's relative share of the catch history for the fishery. In June 1991, the then Director of Fisheries advised SEPFA that if a quota system was to be introduced in the future, and if the allocation involves consideration of historic catches, catch history up to (and including) the 1990/91 season would be used as the basis for allocation. This was to avoid licence holders falsifying catch and effort returns in an attempt to establish an inflated catch history.

The method for determining shares of catch history in the fishery for the purposes of the "Adjusted Preferred" method was to average the catch per pot for the best two years of the 1988/89, 1989/90 and 1990/91 seasons, and then multiply this by the number of pots endorsed on the licence holder's fishing licence at the end of the 1990/91 fishing season.

After adding the highest percentage shares of all fishers (eg shares in either pots or catch history) the total percentage figure was about 110%. To ensure that the TAC was not exceeded, all fishers allocations were reduced by 10%. This meant that all licence holders received an allocation that was about 10% less than their most preferred allocation system, regardless of whether this was catch history or pots.

The Minister responsible for fisheries at the time gave an undertaking that management of the fishery (including the allocation method) would be reviewed at the end of the 1993/94 season. The review was conducted from May 1994 until August 1994, with most effort focusing on a review of the quota allocation method.

An exhaustive process of management committee meetings, port meetings and consultations with individual licence holders resulted in the management committee recommending that the current quota allocation method be adapted so that quota would be allocated on the basis of an equal share of the quota per pot at the end of a three year period - the "APACHE" (Adjusted Preferred Allocation Catch History Equation) Model.

The Minister for Primary Industries instructed the management committee to consider further the impact of this recommendation on licence holders with a history of high catches. The management committee laboured over the issue and while still supporting the "APACHE" model agreed that the system should be implemented over a four year period to allow high catch history licence holders an extra season to adapt to the changes.

Whilst the recommendation to implement the APACHE four year method of quota allocation was supported by the management committee and accepted by the

Director of Fisheries and the Minister for Primary Industries, around 25 percent of licence holders did not support the method. This generally equates to the number of licence holders who would benefit under an allocation system based on catch history.

A high catch history licence holder successfully challenged the regulations which implemented the APACHE model in the Supreme Court of South Australia in March 1995 (BR Lawrie v Minister for Primary Industries, J Jefferson and TJ Moran). As a result, the fishery reverted to a competitive quota managed fishery for the remainder of the 1994/95 season. Fishers voted to continue to support the allocation model and continued fishing on this basis. The Minister successfully appealed this decision in the Full Supreme Court of South Australia in July 1995 (Minister for Primary Industries & ORS v Lawrie). All three judges agreed that the appeal should be allowed and the recommendations of the management committee and the “APACHE” model remain in force.

During the four years of the APACHE allocation method, pots transferred were allocated the average weight of the pot quota across the fishery. The 1997/98 season saw the end of the APACHE model with all pots being allocated a standard per pot allocation of the TACC.

#### 2.4 Trends in the commercial catch

Historical catch and value data for the southern zone rock lobster fishery is presented in Table 1. From 1993/94, the fishery has been controlled by a TACC, but due to a number of considerations (eg stock abundance, environment, boat breakdown, bad weather,), the TACC in most years is not taken. For example, the TAC in 1996/97 was 1,720 tonnes but only 1,643 tonnes was landed.

**Table 1.** Total catch and total value in the southern zone rock lobster fishery from 1977/78 to 1995/96. Data collected prior to 1977/78 were combined for both rock lobster fishing zones (Prescott *et al* 1997).

Season	Total Catch (tonnes)	TACC	Total Value (\$ millions)	Potlifts (millions)
77/78	1 249		4.771	1.7788
78/79	1 356		5.763	1.877
79/80	1 389		6.724	1.5239
80/81	2 140		11.644	2.0444
81/82	2 090		12.486	2.1666
82/83	1 877		12.614	2.2023
83/84	1 734		12.177	2.2572
84/85	1 537		16.347	1.9867
85/86	1 547		17.294	2.0217
86/87	1 458		22.067	1.9125
87/88	1 657		25.717	2.1314
88/89	1 407		17.080	1.8876
89/90	1 528		22.505	1.7983

90/91	1 562		26.687	1.9094
91/92	1 940		36.347	2.0511
92/93	1 754		34.832	1.7606
93/94	1 669	1 718	43.164	1.6445
94/95	1 720	1 740	48.574	1.5111
95/96	1 684	1 720	44.569	1.5934
96/97	1 643	1 720	47.647	1.7568
97/98				
98/99				

**Note:** this table does not include the recreational catch or illegal catch.

## *2.5 Research and stock assessment*

The South Australian Research and Development Institute (SARDI) is the preferred research provider of the Government and this agency conducts the majority of the research and monitoring programs for the rock lobster fishery. Research needs and priorities for management of the fishery are determined by the Rock Lobster Research Sub-Committee, a joint sub-committee made up of representatives from both the northern and southern zone management committees. A five year strategic research plan has been developed by the northern and southern zone rock lobster management committees and is attached as Appendix II.

South Australia has established good monitoring programs collecting commercial data, pot-catch data, length frequency data, larval settlement indices and temperature records. Catch and effort data are available from 1950, however the data quality improved after the introduction of limited entry and fishery logbooks in 1968.

A review of research requirements in the fishery was commissioned by industry in 1995 and completed in February 1996. The report set out research directions for the industry for the subsequent three years (Breen 1996). The research directions focus on monitoring through a catch sampling program, collection of data for yield per recruit, egg per recruit analysis and production, and modelling information.

SARDI currently provides annual stock assessment reports on the southern zone rock lobster fishery to the management committee by 31 May each year (Prescott *et al* 1997).

## *2.6 The recreational catch*

Recreational fishers also participate in the fishery throughout South Australia, though they account for only a small percentage of the total catch. Estimates of the total recreational catch range between 90 and 130 tonnes per year (Anon. 1995, Prescott *et al* 1997). Recreational fishers have access to the fishery by diving, drop netting and a limited number have access to the use of pots. The latter device requires registration and the number of registered recreational fishers has increased with the addition of new pot registrations in September 1997. There are approximately 6,000 registrations comprising some 12,000 pots. The management of the recreational rock lobster fishery is currently under review.

In the south-east of South Australia, rock lobsters are taken by recreational fishers predominantly by pots and drop nets. Diving for lobsters occurs mainly during the summer months.

Lobster pots are used to collect lobsters throughout the season with peak effort during holiday periods (eg Christmas and Easter). Most tourist fishers concentrate within close proximity to the ports of Port MacDonnell, Southend, Beachport and Robe. Most local recreational fishers fish in areas such as Number Two Rocks, Nene Valley, Green Point, Carpenters Rocks, Pelican Point and Cape Douglas.

Drop nets are considered to be the most successful method of catching lobsters quickly along the south-east coast although fishers must be very skilful in using them and good weather is required. Marginal diving conditions occur along the south-east coastline and this is thought to be the reason why it has been observed that most divers do not catch the bag limit of five lobsters.

The recreational pot-caught lobster catch was estimated to be approximately 53 tonnes and 62 tonnes live weight during the 1990/91 and 1991/92 seasons respectively (Prescott *et al* 1997). The 17.6 percent increase in catch between the two seasons mirrors very closely the increase in catch in the commercial fishery which was 18.5 percent during the same period. The estimated recreational pot catch was approximately two percent of the total pot fishery in the State. Even if this level of the recreational catch taken by pots was underestimated by 50%, the catch taken would still be less than five percent of the total recreational and commercial pot catch (Appendix III).

While the overall catch by recreational pot fishers is small, it should be noted that it can be significant in localised areas. There are some areas where recreational fishing effort may exceed the commercial effort. Examples in the south-east are at Nora Creina and waters adjacent to Gleeson's Landing.

Lobsters taken by divers and drop net fishers have not been estimated. Data collection from these groups is made more difficult than it is for the pot fishers by the fact that there is no licence required by these fishers.

### *2.7 Illegal catch*

No estimates are available of the illegal catch (Prescott *et al* 1997).

### *2.8 Processing and Markets*

There are a number of processors trading in rock lobster in the southern zone. Processors are based in the major fishing ports and the majority of these facilities have live holding capabilities. This reflects the market demand for live product, principally for Asian markets. There are only small sales of frozen rock lobster tails to the United States of America. This latter product was the main market for the industry until the late 1980s when market focus shifted into Asia which offered higher prices and lower consignment costs.

The globalisation of the rock lobster market over the past ten years has resulted in greater certainty and reduced fluctuations in market price.

Western Australia is the largest supplier of rock lobster in Australia and a major competitor. Increased production in Western Australia may significantly affect domestic market prices.

### **3 Fishery management objectives and strategies**

The priority for management of the southern zone rock lobster fishery is to ensure that annual harvest levels are biologically sustainable so that future generations may benefit from exploitation of the resource.

Commensurate with this priority are a number of more specific biological, economic, environmental, and social objectives that have been developed by the Southern Zone Rock Lobster Fishery Management Committee to complement the broad directives of section 20 of the *Fisheries Act 1982*.

#### **3.1 Biological objectives**

- 1. To maintain rock lobster populations at sustainable levels across the fishery.**
- 2. To harvest rock lobster at a size likely to provide for adequate levels of recruitment.**

#### *Strategies*

- adopt a 'precautionary approach'<sup>2</sup> in the management of the rock lobster resource;
- set a sustainable total allowable commercial catch for the fishery each year;
- restrict the number of licences in the fishery to a maximum of 185;
- control the catch taken by the recreational sector; and
- set legal minimum size limits which protect a proportion of the adult spawning stock.

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<sup>2</sup> the management committee shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures to prevent overfishing.

### ***3.2 Economic objectives***

- 1. To maintain the economic return from the southern zone rock lobster fishery at a level which provides for fair and reasonable benefits to licence holders.**
- 2. Optimise yield from the fishery.**
- 3. To recover an economic return from licence holders sufficient to cover attributed costs of management, research and compliance for the fishery.**
- 4. To provide for economic efficiency and flexibility in management arrangements by developing harvesting strategies that minimise costs.**
- 5. To protect the resource through the provision of adequate compliance resources.**

#### *Strategies*

- allocate total allowable commercial catches to licence holders as individual transferable pot quotas;
- set licence fees at a level sufficient to recover all attributed management, research and compliance costs;
- set legal minimum size limits which assist in optimising yield;
- develop harvest strategies which minimise commercial fishing costs;
- develop flexible management arrangements; and
- support cost effective compliance strategies to protect the resource from illegal harvesting

### ***3.3 Environmental objectives***

- 1. To minimise the environmental impact of rock lobster fishing.**
- 2. To minimise potential conflict with other users of marine resources.**

#### *Strategies*

- promote environmentally sensitive fishing practices in the industry and promote actions that reduce fishery impacts; and

- identify the potential for conflict with other marine resource users and determine strategies to reduce these conflicts.

### **3.4 Social objectives**

- 1. To maintain and provide for reasonable levels of public access to the rock lobster resource.**
- 2. To ensure a high level of awareness of occupational health, safety and welfare issues in the fishery.**
- 3. To keep the community informed regarding the status of the rock lobster fishery.**
- 4. To maintain the regional development nature of the rock lobster fishery.**

#### *Strategies*

- monitor participation and catch by the recreational sector in the fishery;
- promote occupational health and safety issues within the industry;
- develop educational and awareness packages for the community about the fishery; and
- develop management arrangements which ensure continued levels of access to the fishery by owner/operators in regional communities.

## **4 Compliance and enforcement**

The annual compliance budget for the southern zone of the rock lobster fishery is approximately \$950,000 and accounts for costs incurred for a monitoring program focused on policing minimum size regulations, catch disposal records, port scales, processors, northern zone/southern zone and South Australian/Victorian border issues.

The quota system is managed through a paper audit trail from the time rock lobster are landed to the point of sale. Prior to landing their catch, fishers are required to complete a form giving an accurate number and an estimated weight of lobsters caught and the port at which they intend to land. Landing must occur at one of the ports with certified weigh scales. These are located at Beachport, Robe, Blackfellows Caves, Southend, Cape Jaffa, Carpenters Rocks and Port MacDonnell. A further set of scales has been positioned at Victor Harbor for the 1997/98 season.

On landing, the catch must be weighed at the certified scales and the exact weight entered on the CDR form. The CDR form is then lodged in a locked box at the scales, collected every 24 hours and delivered to the Fisheries Compliance Office at Mt Gambier. CDR information is entered onto a database and individual catches recorded against allocated pot quotas. Further paperwork is completed by processors upon purchase and sale of rock lobster.

An outline of the compliance plan for the fishery is provided in Appendix IV.

## **5 Reference points and performance indicators**

Reference points are agreed quantitative measures used to assess performance of the fishery based on clearly defined management objectives.

*Reference points begin as conceptual criteria which capture in broad terms the management objectives for the fishery. To implement fishery management it must be possible to convert the conceptual reference point into a technical reference point, which can be calculated or quantified on the basis of biological or economic characteristics of the fishery (Caddy and Mahon 1995).*

Reference points used for rational exploitation of fish resources can be placed in two categories: target reference points and limit reference points. Target reference points are considered as indicators of stock status which are a desirable management target, whilst a limit reference point is an agreed level at which stock stress may occur, and immediate action is required to remedy the situation before long term damage to resource productivity may result.

### *5.1 Biological reference points*

Considering the stated biological objectives for the fishery, the following reference points may be used to assess the stock status of the southern zone rock lobster fishery:

- exploitation rate - indicates the level of available lobsters taken by the fishery.
- catch rate - directly relative to current stock abundance.
- egg production - reflects reproductive capacity of the fishery.
- abundance of pre-recruits - provides a forecasting tool on future stock abundance.
- mean size of rock lobster - indicates changes in stock structure.

Historical data available from commercial catch returns, catch sampling programs and the SARDI stock assessment model for the fishery is shown in table 2.

In determining the annual reference points to measure performance of the fishery, the management committee will be guided by the following principles:

- \* to maintain and improve the average catch rate above the 1993/94 level.

- \* to maintain the spawning biomass at a level which sustains the reproductive capacity of the stock.
- \* a desire by industry to maintain the annual catch around 1,700 tonnes.

**Table 2:** Historical data available for use in assessing appropriate biological reference points for the southern zone rock lobster fishery.

<b>REFERENCE POINT</b>	<b>1992/93</b>	<b>1993/94</b>	<b>1994/95</b>	<b>1995/96</b>	<b>1996/97</b>
<b>Exploitation rate (%) *</b>	<b>0.42</b>	<b>0.40</b>	<b>0.41</b>	<b>0.41</b>	<b>0.40</b>
<b>Egg production (billions) #</b>	<b>1,254 (14%)</b>	<b>1,228 (15%)</b>	<b>1,243 (14%)</b>	<b>1,235 (15%)</b>	<b>1,227 (15%)</b>
<b>Pre-recruit abundance ^</b>	<b>1.47</b>	<b>1.32</b>	<b>1.51</b>	<b>1.41</b>	<b>1.17</b>
<b>Catch rates (kg/pot lift)</b>	<b>0.9961</b>	<b>1.0146</b>	<b>1.1383</b>	<b>1.0568</b>	<b>0.9351</b>
<b>Mean size + (kg)</b>	<b>0.7831</b>	<b>0.8156</b>	<b>0.8077</b>	<b>0.8038</b>	<b>0.8049</b>

\* The exploitation rate is the fraction of the population harvested annually, determined from the dynamic qR method employing annual catches by weight and number.

# Total egg production (including only legal sized females) has been derived from the qR stock assessment model. (Percent virgin egg production)

^ The ratio of pre-recruits includes all undersize rock lobster reported in commercial logbooks between November and March (inclusive)/total reported potlifts.

+ mean size of rock lobster landed across the fishery.

### *Management action on reaching a reference point outside the historical range for the fishery*

When one or more of the reference points described by the management committee are reached or exceeded, the management committee will undertake the following actions:

1. notify the Minister for Primary Industries, Natural Resources and Regional Development and participants in the fishery as appropriate,
  2. undertake an examination of the causes and implications of ‘triggering’ a reference point,
  3. consult with the southern zone rock lobster industry and Director of Fisheries on the need for alternative management strategies or actions, which may include:
    - changes to the TACC in subsequent years;
    - changes to the minimum size limit; or
    - changes to the fishing season; and
1. provide a report to the Minister and industry, within three months of the initial notification, on the outcomes of a review of the effect of triggering a target reference point.

### *Marine park effects on management of the fishery*

The establishment of the Great Australian Bight Marine Park in State waters and the intent to extend the park into Commonwealth waters has resulted in the loss of fishing grounds to the rock lobster fishery.

The management committee may support future declarations of marine reserves if it can be demonstrated that the reserves are essential for the proper conservation of the marine resource and after full consultation has occurred with the committee and the wider fishing industry.

Declaration of any marine park which has an impact on the sustainable operation of the fishery must be accompanied by adequate funding to provide for continued sustainability of that fishery.

### *5.2 Economic performance indicators*

Considering the stated economic objectives for the fishery, the following performance indicators are used to assess the economic status of the southern zone rock lobster fishery:

- Gross Value of Product (GVP);
- cost of management programs compared with GVP;
- Return on Investment (ROI); and
- determination of any major operating cost increases (eg possible future loss of fuel rebate)

### *5.3 Management committee performance indicators*

The primary responsibility for ecologically sustainable development of the southern zone rock lobster resource rests with the Minister for Primary Industries, Natural Resources and Regional Development. However, to assess the effectiveness and efficiency of the Southern Zone Rock Lobster Fishery Management Committee in managing the resource, and to provide for transparency in the management process and improve accountability, performance indicators are required.

The primary performance indicators used to assess the effectiveness and efficiency of the management committee is the acceptance of advice from the committee by the Minister for Primary Industries, Natural Resources and Regional Development, and the quality of the information which the committee supplies to the Minister. Further information on the strategic direction of the management committee and key performance measures can be found in the Southern Zone Rock Lobster Fishery Management Committee Strategic and Business Plan.

#### 5.4 Compliance performance indicators

Compliance costs for the southern zone rock lobster fishery are a significant part of the overall management costs for the fishery. The effectiveness and efficiency of compliance protocols and programs needs to be assessed annually to ensure effectiveness in service delivery and that costs are minimised where possible without raising the level of compliance risk.

The following performance indicators are used to assess the effectiveness and efficiency of the compliance and audit operations for the southern zone rock lobster fishery:

- reduction in illegal activity determined by number of reports for offences;
- cost effective use of compliance resources;
- every fisher formally checked at the scales at least once per year; and
- greater support from stakeholders for Fishwatch.

Biological reference points and performance indicators will be reviewed on an annual basis. Changes may occur to biological reference points as more scientific information on the stock status of the southern zone rock lobster fishery is provided from the strategic research program. Other performance indicators may also change to ensure the management of the fishery is subject to a continuous improvement program.

## **6 Review of the management plan**

The Southern Zone Rock Lobster Fishery Management Committee is required under the *Fisheries (Management Committee) Regulations 1995* to provide the Minister for Primary Industries, Natural Resources and Regional Development on or before the 30 November each year a report on the operations of the management committee during the preceding financial year. This report will include a report on the reference points which were reached during the reporting period and any actions that resulted. The performance of the management committee and fishery operations will also be rated against the stated objectives.

This management plan is a dynamic document which reflects current understanding of the southern zone rock lobster fishery and as such may change over time. No radical departure from the stated management arrangements, biological reference points or performance indicators will occur unless the management committee is otherwise directed by the Minister for Primary Industries, Natural Resources and Regional Development during the life of this plan.

Six months before the end of the five year period (1 June 2002) this management plan will undergo a major review.

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## **Appendix I**

### FISHERY LOGBOOK STATISTICAL AREAS

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## **Appendix II**

### **FIVE YEAR STRATEGIC RESEARCH PLAN FOR THE SOUTH AUSTRALIAN SOUTHERN ZONE ROCK LOBSTER FISHERY**

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#### **Principles**

- linked to explicit quantifiable management objectives
- provide defensible values for the performance indicators to evaluate stock status
- annual stock assessment reports in uniform format
- cost-effective delivery of information

#### **Guidelines**

The development of a five-year strategic plan for South Australian rock lobster reflects a need of the industry and of managers for reliable, cost-effective, performance indicators of the status of the rock lobster resource. These performance indicators are quantitative indices which can be updated annually and can be used to reliably assess the effectiveness of current management of rock lobster stocks in South Australia.

The plan also takes into account the conduct and transfer of information of a major biological study of rock lobsters done from 1993–1996. This study produced a valuable information resource and an operational dynamic model of the South Australian rock lobster fishery. The research plan addresses the transition from a study of the fisheries biology of lobsters to an annual assessment of the two stocks (southern and northern zones). The latter assessment is noted to be the core research necessary above all to ensure that management decisions are based on defensible, robust, information. Such core research has been identified as part of an independent review of research needs for the South Australian rock lobster fishery (Breen 1996). The review identified priorities for research and resources necessary to deliver prioritised research programs.

Further to the core research programs, funded through licence-fee contributions, are discrete research projects which, although not directly related to stock assessment, have demonstrable value in providing additional information to the rock lobster industry. In the plan, such projects are promoted through the fisheries management committee for external funding (eg FRDC). Relevant research projects already considered include:

- condition indices and methods for non-destructive determination of growth
- identification of methods to reduce incidental predation of rock lobsters in pots

# **Assessing stocks of rock lobster: core research programs 1997- 2002**

## **1. Performance indicators**

The research has been designed to deliver the following performance indicators annually:

- catch rate
- exploitation rate
- total egg production
- abundance of pre-recruits

These performance indicators are described below:

### ***catch rates***

Catch rates are used as indicators of the relative biomass of lobsters. Catch rate data will be derived from compulsory catch logbook data and from independent catch sampling aboard commercial vessels.

### ***exploitation rate***

This is the proportion of the stock removed by fishing. This indicator will be derived from several methods the main ones being: consideration of catches (weights and numbers of lobsters), analysis of length frequency methods. As the exploitation rate is a derived index it is estimated with error. Uncertainty in the estimate will be explicitly stated.

### ***total egg production***

An estimate of the total number of eggs produced as a function of lobsters remaining in each stock after fishing. The estimate will be derived from the catch-sampling program and application of biological parameters available from the completed population dynamics study.

### ***abundance of pre-recruits***

An index of potential recruitment to the fishery. Expressed in two ways:

- the relative abundance of pueruli on collectors at selected sites in the southern and northern zones
- the abundance of under-size lobsters retained in pots (from the catch-sampling program).

## ***mean size***

The size (weight) of rock lobster landed across the fishery by statistical area.

## **2. Sources of data**

The following will be used as inputs to the derivation of performance indicators:

- catch and effort data (from monthly returns),
- seasonal information on abundance and size composition by sex of lobsters sampled aboard commercial vessels in selected areas and depth zones (pot sampling),
- estimates of growth, movement, size at maturity, and length/weight relationship by MFA derived from the population dynamics study, and
- seasonal information on abundance of pueruli settling on collectors placed at coastal sites in the southern and northern zones.

## **Other projects/proposals**

Other projects of potential benefit to the South Australia are summarised below:

### ***Rock lobster condition***

A project to assess sources of variation in growth and condition of lobsters. Important outcomes include:

- reliable prediction of rock lobster condition and market potential
- non-destructive method for the estimation of growth rate of lobsters

**start:** 1996                      **finish:** 1998                      **funding:** FRDC

### ***Reducing incidental predation on rock lobsters***

A project to examine potential mechanisms for reducing the incidental predation of rock lobsters in pots. Important predators include octopus, leather jackets, and seals.

**start:** 1998                      **finish:** 2000                      **funding:** industry

## South Australian Rock Lobster - five year research plan

<b>Research activity</b>	<b>1997/98</b>	<b>1998/99</b>	<b>1999/20</b>	<b>2000/01</b>	<b>2001/02</b>
complete publication of the population dynamics study	#				
design catch sampling program	#				
update rock lobster model	#			#	
commercial catch sampling					
produce stock assessment report for southern zone	by May 31	by May 31	by May 31	by May 31	by May 31
produce stock assessment report for northern zone	by June 30	by June 30	by June 30	by June 30	by June 30
summarise catch and effort information	May and November	May and November	May and November	May and November	May and November
rock lobster condition/growth *		#			
incidental predation *				#	
<b># = final report; * = external funding opportunity</b>					

### Appendix III

#### Recreational Catch of Rock Lobster in South Australia

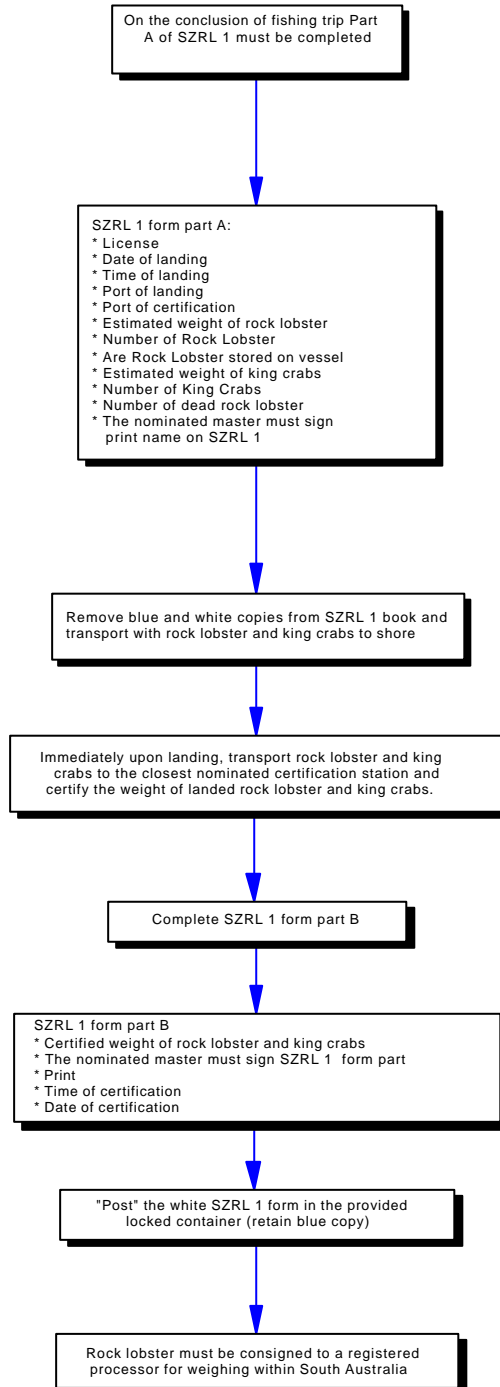
**Table 2.** The estimated recreational catch (kilograms) of lobsters taken by pots in South Australia per month for 1990/91 and 1991/92 (Tyrer 1994). The area codes are (FLE) Fleurieu Peninsula, (KIS) Kangaroo Island South, (LEP) Lower Eyre Peninsula, (LSE) Lower South East, (USE) Upper South East, (WEC) West Coast and (YOP) Yorke Peninsula.

<b>1990-1991 SEASON</b>									
<b>AREA</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>AREA</b>
<b>FLE</b>		870	2621	3138	1565	739	86	33	9052
<b>KIS</b>		485	1512	1883	442	370	25	18	4735
<b>LEP</b>		19	174	128	18	7	4	0	350
<b>LSE</b>	664	1273	1943	5492	3133	1510	916	0	14931
<b>USE</b>	270	289	1326	3369	1678	812	397	0	8141
<b>WEC</b>		788	1739	1489	637	257	288	13	5211
<b>YOP</b>		883	1940	4965	2072	329	196	80	10465
<b>MONTH</b>	934	4607	1125	2046	9545	4024	1912	144	<b>52885</b>
<b>1991-1992 SEASON</b>									
<b>AREA</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>AREA</b>
<b>FLE</b>		1007	1879	2690	1361	596	139	6	7678
<b>KIS</b>		280	1235	1365	282	160	114	0	3436
<b>LEP</b>		98	193	356	177	126	69	18	1037
<b>LSE</b>	870	1713	4952	7482	5053	2853	1461	0	24384
<b>USE</b>	382	574	2040	3443	2363	961	1068	0	10831
<b>WEC</b>		754	1536	1727	884	461	177	39	5578
<b>YOP</b>		868	2054	3837	1658	581	238	39	9275
<b>MONTH</b>	1252	5294	1388	2090	1177	5738	3266	102	<b>62219</b>

# Appendix IV

## COMPLIANCE PROTOCOLS

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*Note:*

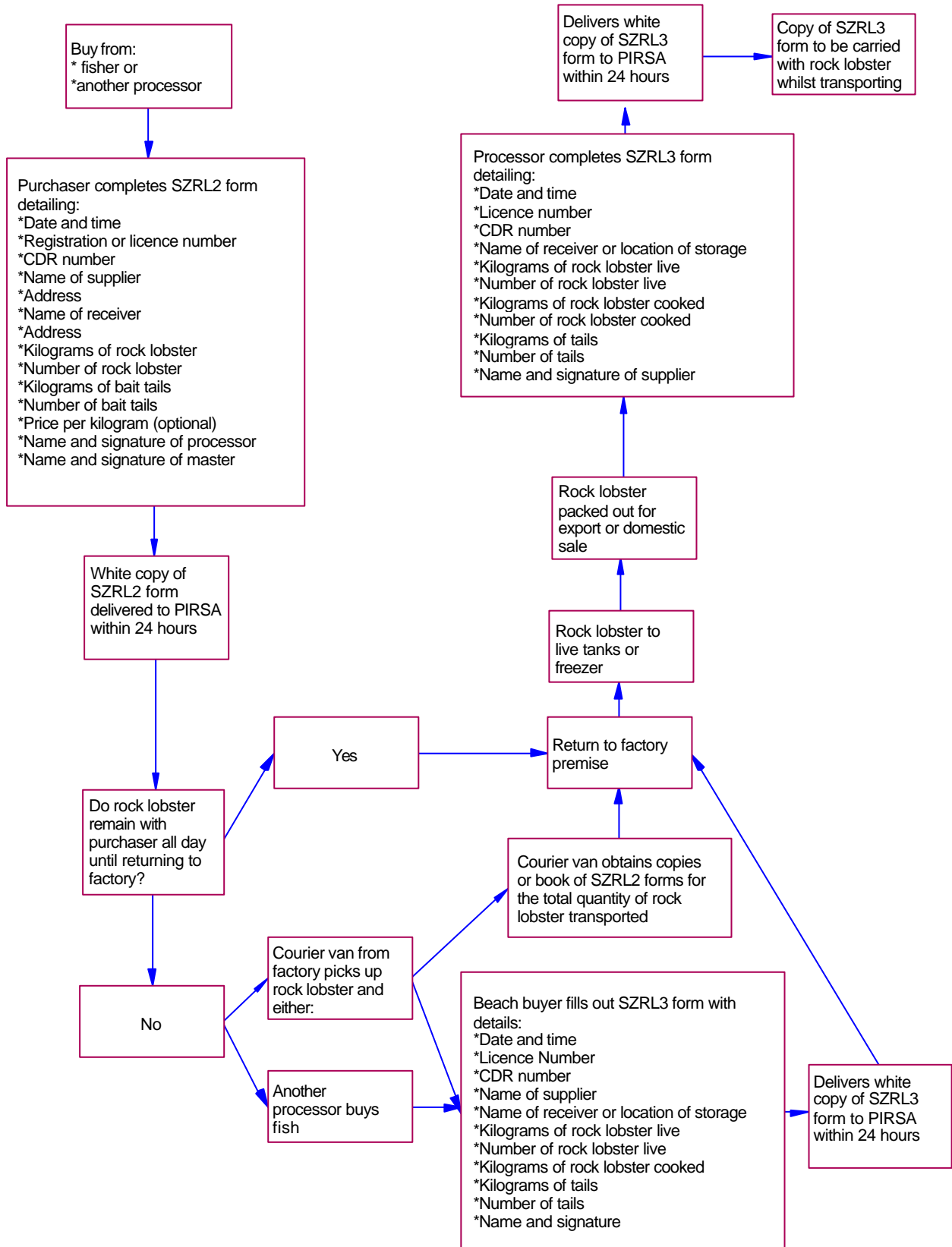
1) The SZRL 1 book must remain on board registered vessel at all times

2) Conclusion of a fishing trip means when rock lobster which were taken during fishing trip leaves the registered boat or when the registered boat containing rock lobster taken during a fishing trip is removed from the water.

3) No more than five King Crabs shall be on board the registered boat at any time.

4) Rock Lobster that are to be disposed as bait tails shall have the meat of the tail marked along its length with a conspicuous dye which is visible after any processing and when offered for sale.

## Southern Zone Rock Lobster Fishery in South Australia - Fish Processor Flow Chart



## **Appendix V**

### **MEMBERSHIP OF THE MANAGEMENT COMMITTEE**

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Independent Chairperson

7 voting members representing the commercial sector (one from each port - Kingston, Robe, Beachport, Southend, Carpenters Rocks, Blackfellows Caves and Port MacDonnell)

fishery manager (PIRSA) (non voting)

research scientist (currently SARDI) (non voting)

South Australian Fishing Industry Council (SAFIC) representative (non voting)

South Australian Recreational Fishing Advisory Council (SARFAC) representative (non voting)

1 adviser from the fish processing sector

1 adviser from the South East Professional Fishermen's Association

Paper No.	Title	Issue Date
1	A draft management plan for the blue crab fishery in South Australia	August 1994
2	A discussion paper on the management options for the South Australian recreational rock lobster fishery	September 1994
3	South Australian Shellfish Quality Assurance Program Report no. 1	November 1994
4	A review of net fishing in South Australia	November 1994
5	A review of the management arrangements for the Southern Zone Rock Lobster fishery	September 1995
6	Options for the management of the White Shark in South Australia	May 1995
7	Cost recovery in South Australia's commercial fisheries	October 1995
8	The role of management committees, peak industry bodies and government in fisheries management decision making	October 1995
9	A review of the management and prioritisation of fisheries research	November 1995
10	A management proposal for the Northern Zone Rock Lobster Fishery's 1995/96 season and an assessment of the effort reduction package implemented during the 1994/95 season	October 1995
11	Management plan for the South Australian abalone fishery	February 1996
12	Assessment, management and research support for the Gulf St Vincent prawn fishery	November 1995
13	A management plan for the experimental Pilchard Fishery	November 1995
14	South Australian Shellfish Quality Assurance Program Report No .2	November 1995
15	A draft plan for the management of the specimen shell fishery in South Australia	March 1996
16	A discussion paper on issues relating to the development of rock lobster aquaculture and rock lobster holding systems at sea in South Australia	March 1996
17	A draft plan for structural adjustment in the South Australian River Fishery	
18	Economic analysis of management options for the Gulf St Vincent Prawn Fishery	April 1996
19	The roles and structure of fisheries management committees and the responsibilities of chairpersons and members	April 1996
20	Review of research and management of the Spencer Gulf prawn fishery	October 1996
21	South Australian Shellfish Quality Assurance program Report No. 3	
22	The cost recovery process for 1996/97	October 1996
23	A discussion paper on the management and development of recreational fishing in South Australia	November 1996
24	Development of at-sea rock lobster holding systems in South Australia	
25	South Australian recreational fishing survey 1997	May 1997
26	Fishcare South Australia - fish for the future	May 1997
27	Management plan for the South Australian abalone fishery	May 1997
28	Management plan for the South Australian northern zone rock lobster fishery	June 1997
29	Management plan for the South Australian southern zone rock lobster fishery	September 1997
		December 1997
		December 1997